Espacenet

CN104118374A Automobile emergency start device

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Automobile emergency start device

Abstract

The invention relates to an automobile start device, in particular to an automobile emergency start device which comprises an inner battery, a charging input interface, a display module, a control module, a relay, an input key and an output terminal. A main contact of the relay is connected with the inner battery and the output terminal; the control module comprises a micro processor, and the micro processor controls the relay to open and close through a relay switch circuit to control currents to be output from the inner battery to the output terminal. The automobile emergency start device further comprises an outer battery reverse-connection detection circuit used for providing outer battery wiring correctness signals. The inner battery and an outer battery are connected with the start device through the relay. Under normal circumstances and under the circumstance that an automobile starts successfully and the relay is in an off state, sparks are not generated when the start device is connected with or taken off from the automobile. Meanwhile, when connection of the output terminal and the outer battery is wrong in polarity, the micro processor controls the relay not to close, and accordingly large currents generated due to wrong polarity connection can be prevented.

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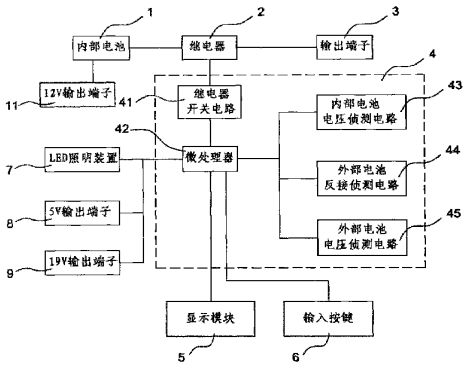
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(54)发明名称

一种汽车应急启动装置

(57)摘要

本发明涉及一种汽车启动装置，具体涉及一种汽车应急启动装置。本发明包括内部电池，充电输入接口，显示模块，控制模块，继电器，输入按键和输出端子，其中所述继电器主触点分别与内部电池和输出端子连接；控制模块中包含微处理器，所述微处理器通过继电器开关电路控制继电器开合用以控制内部电池向输出端子输出电流；还包括用于提供外部电池接线正误信号的外部电池反接侦测电路。本装置内部电池与外部电池通过继电器接入，在通常情况和汽车启动成功后继电器处于关断状态，使本装置在接入与取下时不产生火花。同时输出端子与外部电池相连接的极性接错时，微处理器控制继电器不吸合，可防止极性接错而产生的大电流。



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1. 一种汽车应急启动装置，包括内部电池 (1)，充电输入 (10) 接口，显示模块 (5)，控制模块 (4)，继电器 (2)，输入按键 (6) 和输出端子 (3)，其特征是所述继电器 (2) 主触点分别与内部电池 (1) 和输出端子 (3) 连接；控制模块 (4) 中包含微处理器 (42)，所述微处理器 (42) 通过继电器开关电路 (41) 控制继电器 (2) 开合用以控制内部电池 (1) 向输出端子 (3) 输出电流；控制模块 (4) 中还包括用于提供外部电池接线正误信号的外部电池反接侦测电路 (44)。

2. 根据权利要求 1 所述的汽车应急启动装置，其特征是控制模块 (4) 中还包括内部电池电压侦测电路 (43)，所述内部电池电压侦测电路 (43) 与微处理器 (42) 信号连接。

3. 根据权利要求 1 所述的汽车应急启动装置，其特征是控制模块 (4) 中还包括外部电池电压侦测电路 (45)，所述外部电池电压侦测电路 (45) 与微处理器 (42) 信号连接。

4. 根据权利要求 1 所述的汽车应急启动装置，其特征是所述装置内还包括 LED 照明装置 (7) 和 LED 照明驱动电路。

5. 根据权利要求 1 到 4 任一所述的汽车应急启动装置，其特征是所述装置内还包括 5V 电压输出电路和 19V 电压输出电路；5V 输出电路与 5V 输出端子 (8) 相连接，19V 输出电路与 19V 输出端子 (9) 相连接。

6. 根据权利要求 1 到 4 任一所述的汽车应急启动装置，其特征是所述装置内还包括 12V 输出端子 (11)，所述 12V 输出端了与内部电池 (1) 连接。

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一种汽车应急启动装置

技术领域

[0001] 本发明涉及一种汽车启动装置，具体涉及一种汽车应急启动装置。

背景技术

[0002] 汽车是社会生产中不可缺少的一种交通运输工具。目前的燃油汽车都在汽车内部设置蓄电池，汽车发动机在运转过程中通过发电机对蓄电池进行充电，当汽车发动机停止运转时，可以由蓄电池提供电力供应汽车使用或使发动机启动。汽车内部所设置的蓄电池一般为铅酸电池。铅酸电池在经过一定次数的充放电循环后会电池容量越变越低。经过长期使用还可能使电池直接报废。当汽车在使用过程中，可能会由于电池过放电或电池失效而使汽车无法启动。常见的方法是用一个单独的蓄电池替换汽车蓄电池，使汽车启动，常见的这种汽车应急启动电源是铅酸电池代替原汽车蓄电池。在使用的时候，由于铅酸电池自身比较笨重，体积庞大，同时也没有极性检测功能，当接入的应急启动电源极性和原汽车蓄电池极性相反时可能会产生很大的电流使蓄电池损坏，严重时甚至会发生爆炸。同时这样的单独铅酸电池作为汽车启动应急电源，在接入的时候也没有防火花设计，可以在接入或断开应急电源瞬间产生火花，存在不安全因素。

发明内容

[0003] 本发明针对上述不足之处而提供的一种汽车应急启动电源。本发明的汽车应急启动电源，当应急启动电源接入汽车电路中电源极性接反时不与通电。同时本发明的汽车应急启动电源接入或断开与汽车连接时可有效防止电火花产生，提高了安全性。

[0004] 本发明是这样实现的，一种汽车应急启动装置，包括内部电池，充电输入接口，显示模块，控制模块，继电器，输入按键和输出端子，其中所述继电器主触点分别与内部电池和输出端子连接；控制模块中包含微处理器，所述微处理器通过继电器开关电路控制继电器开合用以控制内部电池向输出端子输出电流；控制模块中还包括用于提供外部电池接线正误信号的外部电池反接侦测电路。

[0005] 为使显示模块可以显示内部电池电压，其特征是控制模块中还包括内部电池电压侦测电路，所述内部电池电压侦测电路与微处理器信号连接。

[0006] 为使显示模块可以显示外部电池电压，控制模块中还包括外部电池电压侦测电路，所述外部电池电压侦测电路与微处理器信号连接。

[0007] 本发明的汽车应急启动装置，还包括 LED 照明装置和 LED 照明驱动电路。

[0008] 为方便使用，本发明的汽车应急启动装置内还包括 5V 电压输出电路和 19V 电压输出电路；5V 输出电路与 5V 输出端子相连接，19V 输出电路与 19V 输出端子相连接。本发明的汽车应急启动装置内还包括 12V 输出端子，所述 12V 输出端子与内部电池连接。

[0009] 本发明的汽车应急启动装置，采用内置电池方案，同时内部电池与外部电池通过继电器接入，通常情况下继电器处于关断状态，当本装置与外部汽车电池相连接时，本装置将侦测到外部电池电压，同时会将此电压显示在 LCD 上，此时，按动输入按键中的 JUMP 按键

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可以控制继电器的通断，使本汽车应急启动装置在接入时不产生火花。应用本装置成功启动汽车后，本装置将在 2 秒钟之内关断续电器，使外部电池与内部电池断开连接，使本汽车应急启动装置在移开时也不会产生火花，同时也不会产生汽车发电机给本装置反向充电之情形。同时本装置内部设置有外部电池反接侦测电路，当本发明的汽车应急启动装置输出端子与外部电池相连接的极性接错时，微处理器控制继电器不吸合，可有效防止极性接错而产生的大电流。

附图说明

[0010] 图 1 为本发明系统结构示意图。

[0011] 图 2 为本发明控制模块电路原理图。

[0012] 图 3 为本发明 LED 照明装置电路原理图。

[0013] 图 4 为本发明 5V 输出电路原理图。

[0014] 图 5 为本发明 19V 输出电路原理图。

[0015] 图 6 为本发明的主视示意图。

[0016] 图 7 为本发明的仰视示意图。

[0017] 图 8 为本发明的右视示意图。

[0018] 图 9 为本发明的左视示意图。

[0019] 附图中 :1- 内部电池，2- 继电器，3- 输出端子，4- 控制模块，5- 显示模块，6- 输入按键，7-LED 照明装置，8-5V 输出端子，9-19V 输出端子，10- 充电输入，11-12V 输出端子。

具体实施方式

[0020] 下面结合附图和具体实施例对本发明作进一步详细说明，但本发明并不限于下述实施方式，任何在本实施例原理上所做的改变或替代方案，均落入本发明要求保护的范围之中。

[0021] 结合附图 1 到图 9，一种汽车应急启动装置，包括内部电池 1，充电输入 10 接口，显示模块 5，控制模块 4，继电器 2，输入按键 6 和输出端子 3，其中所述继电器 2 主触点触头分别与内部电池 1 和输出端子 3 连接 ；控制模块 4 中包含微处理器 42，所述微处理器 42 通过继电器开关电路 41 控制继电器 2 开合用以控制内部电池 1 向输出端子 3 输出电流 ；控制模块 4 中还包括用于提供外部电池接线正误信号的外部电池反接侦测电路 44。

[0022] 为使显示模块 5 可以显示内部电池 1 电压，其特征是控制模块 4 中还包括内部电池电压侦测电路 43，所述内部电池电压侦测电路 43 与微处理器 42 信号连接。

[0023] 为使显示模块 5 可以显示外部电池电压，控制模块 4 中还包括外部电池电压侦测电路 45，所述外部电池电压侦测电路 45 与微处理器 42 信号连接。

[0024] 本发明的汽车应急启动装置，还包括 LED 照明装置 7 和 LED 照明驱动电路。

[0025] 为方便使用，本发明的汽车应急启动装置内还包括 5V 电压输出电路和 19V 电压输出电路 ；5V 输出电路与 5V 输出端子 8 相连接，19V 输出电路与 19V 输出端子 9 相连接。本发明的汽车应急启动装置内还包括 12V 输出端子 11，所述 12V 输出端子 11 与内部电池 1 连接。

[0026] 当汽车由于汽车自带电池原因不能启动时，把本发明的汽车应急启动装置输出端

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子 3 与外部电池即待启动汽车自带电池相连接。通常情况下继电器处于关断状态，如果输出端子 3 与外部电池连接时极性有误，通过外部电池反接侦测电路 44 提供信号到微处理器 42，使微处理器 42 控制继电器 2 不能吸合从而可以避免因极性接错而产生的大电流。如果输出端子 3 与外部电池极性正确，外部电池电压侦测电路 45 工作，微处理器 42 会检测出外部电池电压，同时会将此电压显示在 LCD 上，如果外部电池电压在正常范围，则可以按动输入按键 6 中的 JUMP 按键使继电器 2 吸合，以便内部电池 1 通过输出端子 3 向待启动汽车输出电流。当汽车启动 2 秒后，微处理器 42 会控制继电器 2 断开，以便取下输出端子 3 接线。由于继电器 2 断开后输出端子 3 中没有电流，所以在取下时不会产生火花。当汽车已启动且取下输出端子 3 接线后，本发明的汽车应急启动装置工作完成。

[0027] 通过内部电池电压侦测电路 43 提供给微处理器 42 信号，可以在显示模块 5 上显示出内部电池 1 电压，以方便对电池使用状态进行监控。通过外部电池电压侦测电路 45 提供给微处理器 42 信号，可以在显示模块 5 上显示出外部电池电压，以方便了解外部电池情况。

[0028] 为了让内部电池 1 可以充电，在本装置上设置有充电输入 10 接口。同时本装置上还设置有 LED 照明装置 7，以方便光线强度不够时用作照明。本装置上还设置了 5V 输出端子 8 和 19V 输出端子 9 以及 12V 输出端子 11，在平时可以当一般电源供其它用电设备使用。

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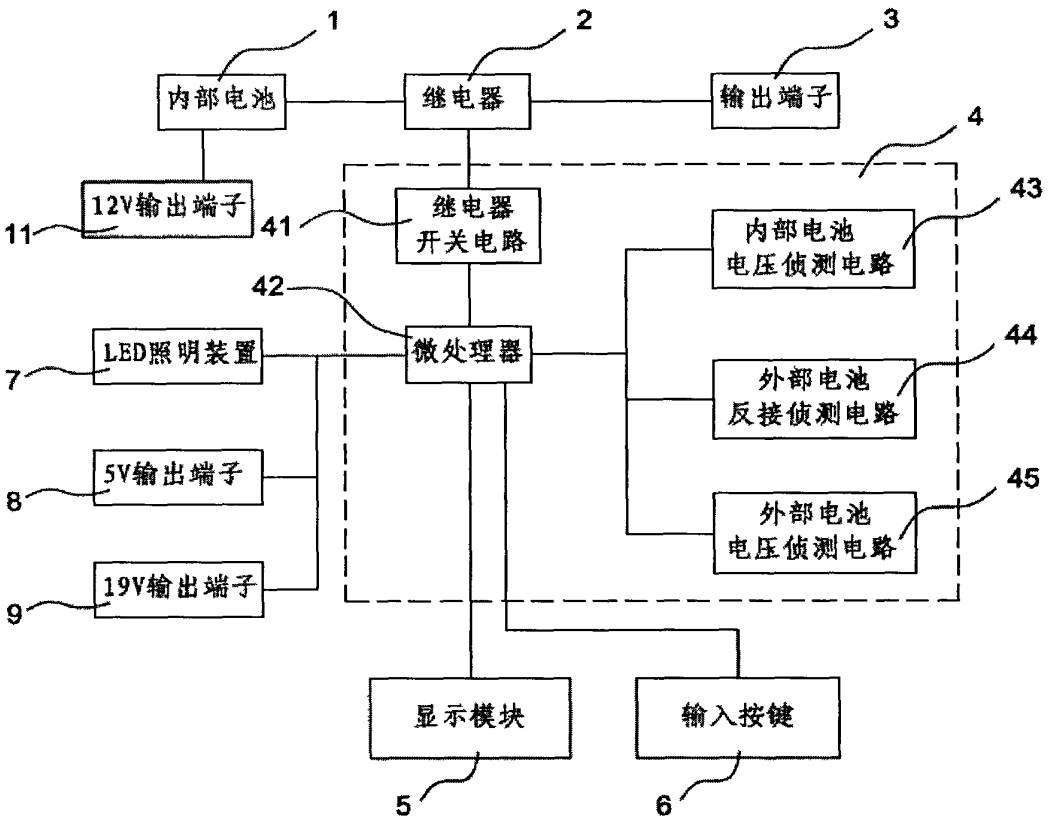


图 1

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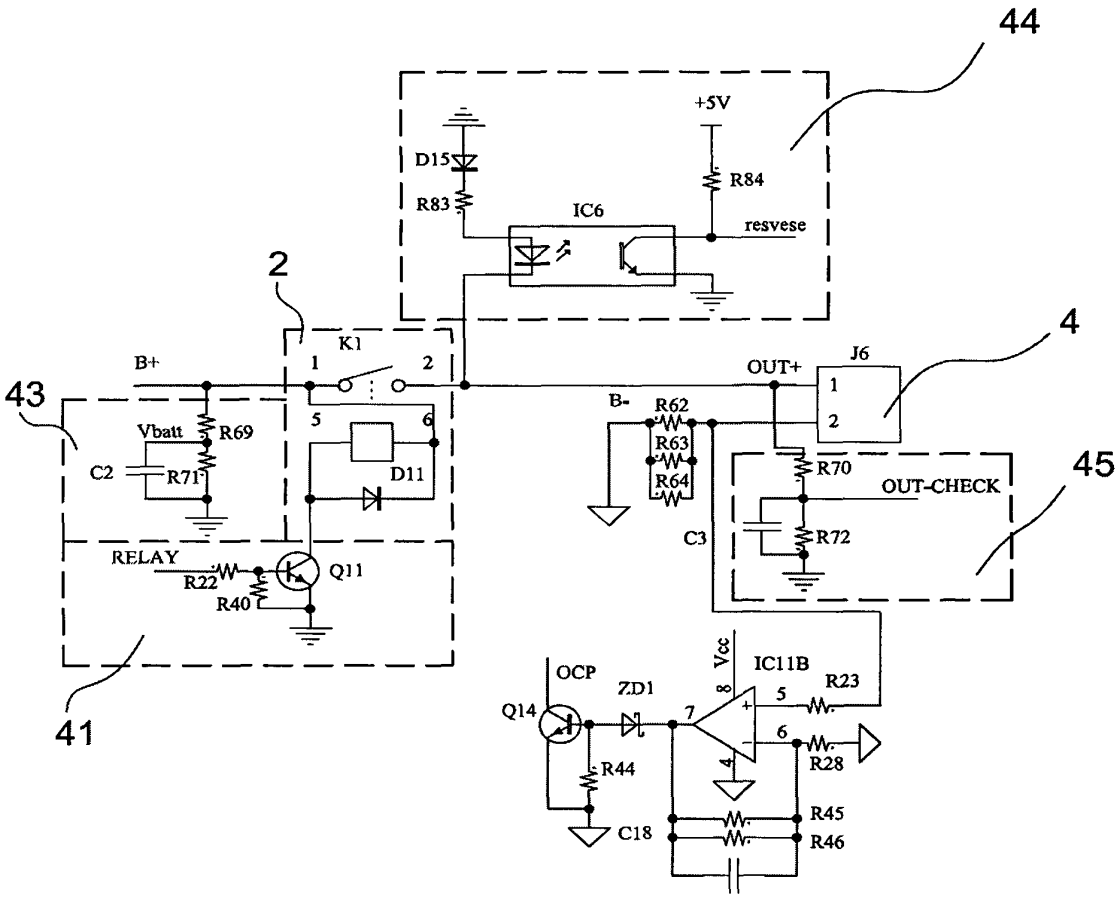


图 2

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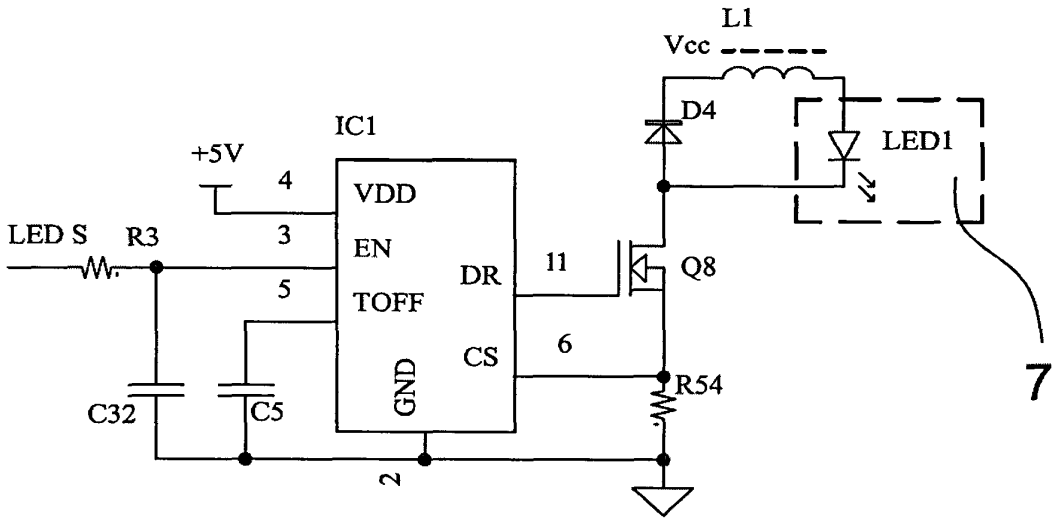


图 3

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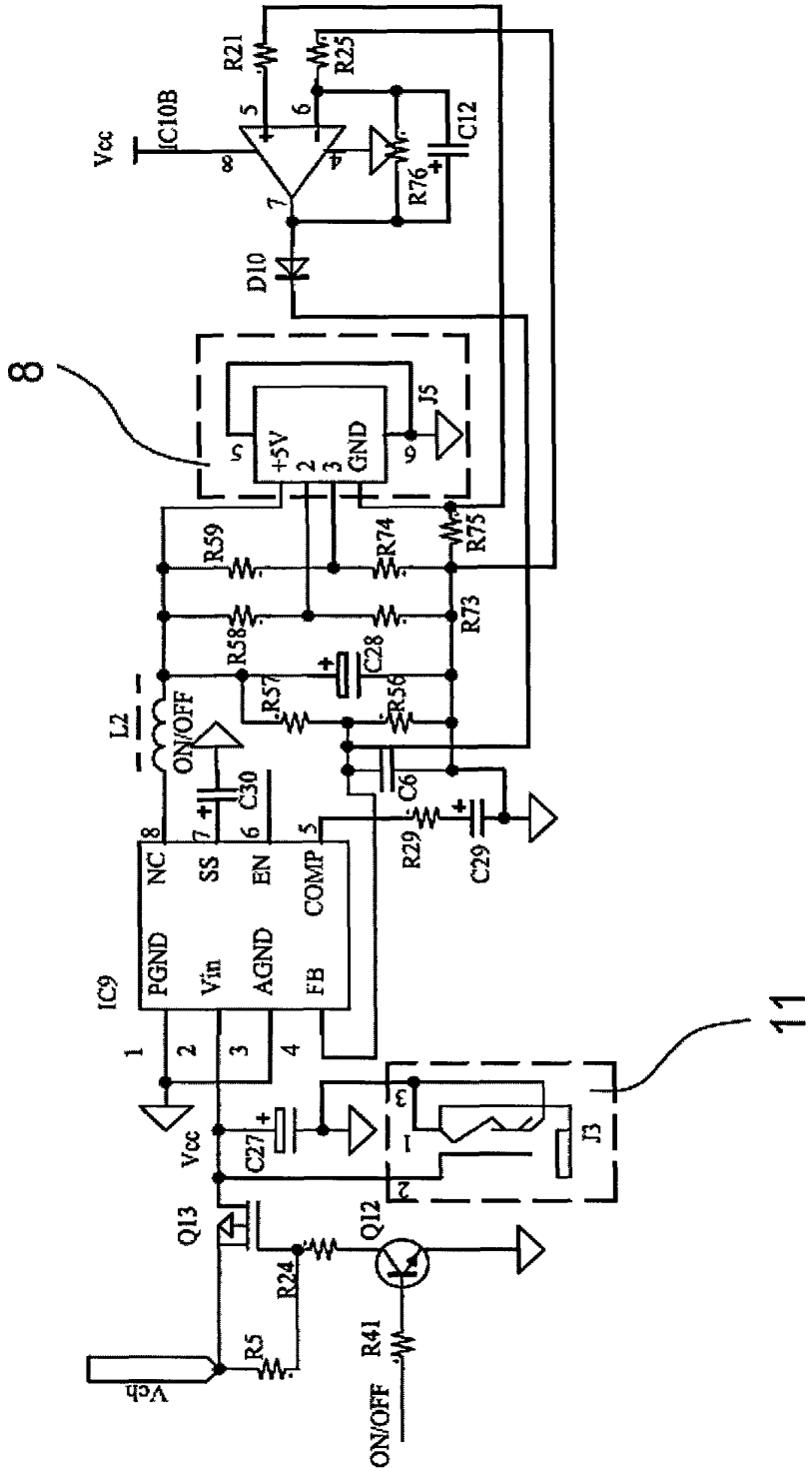


图 4

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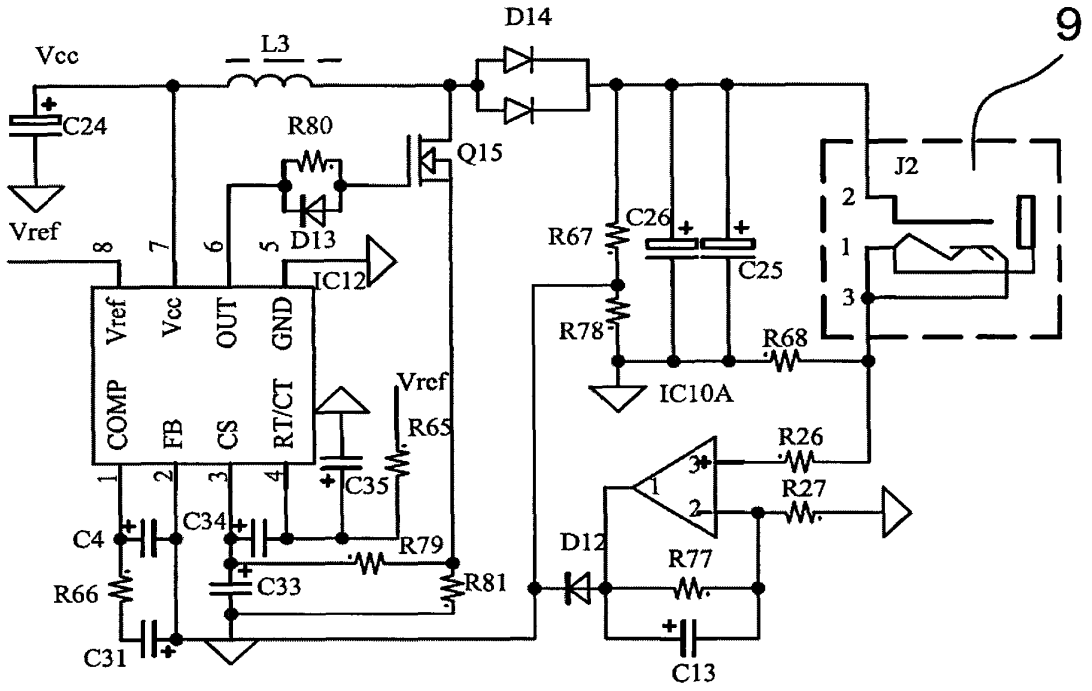


图 5

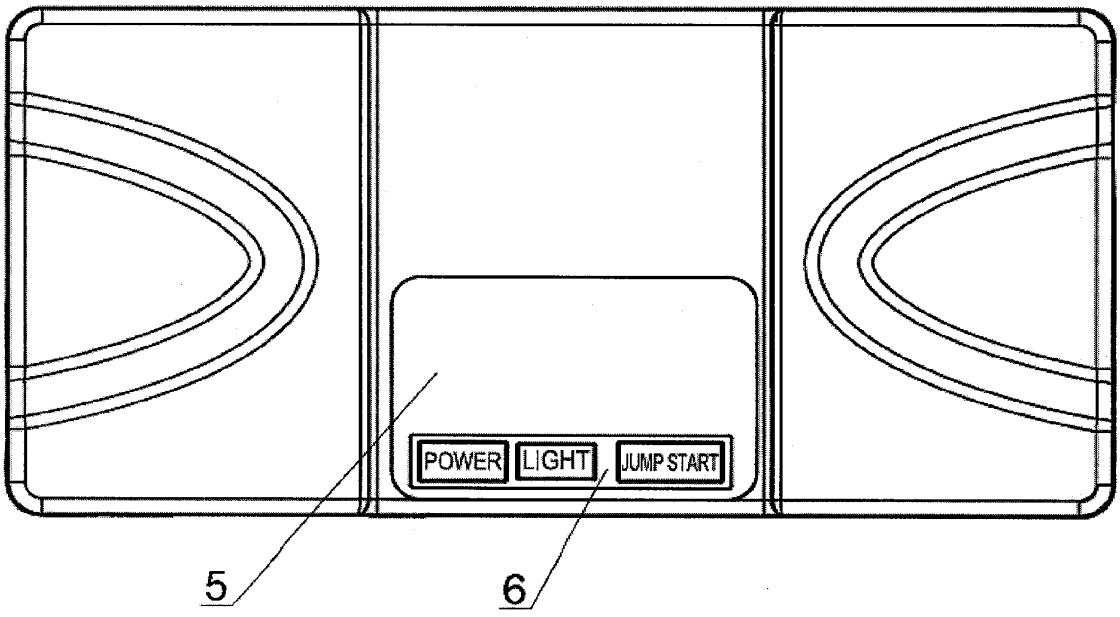


图 6

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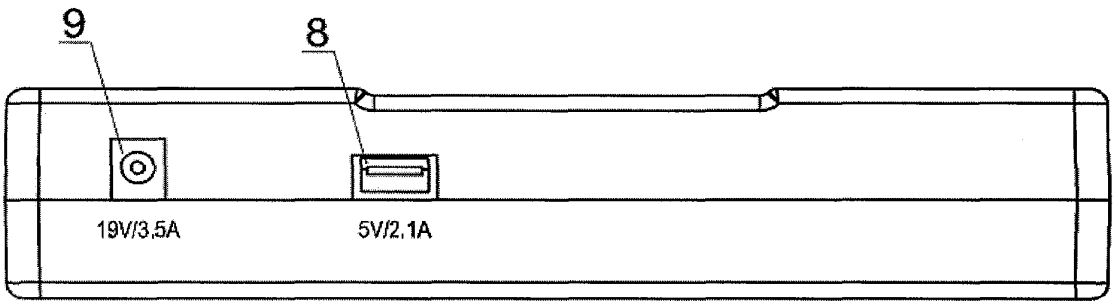


图 7

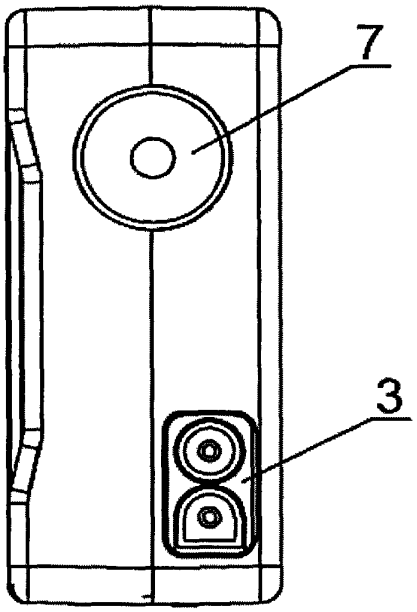


图 8

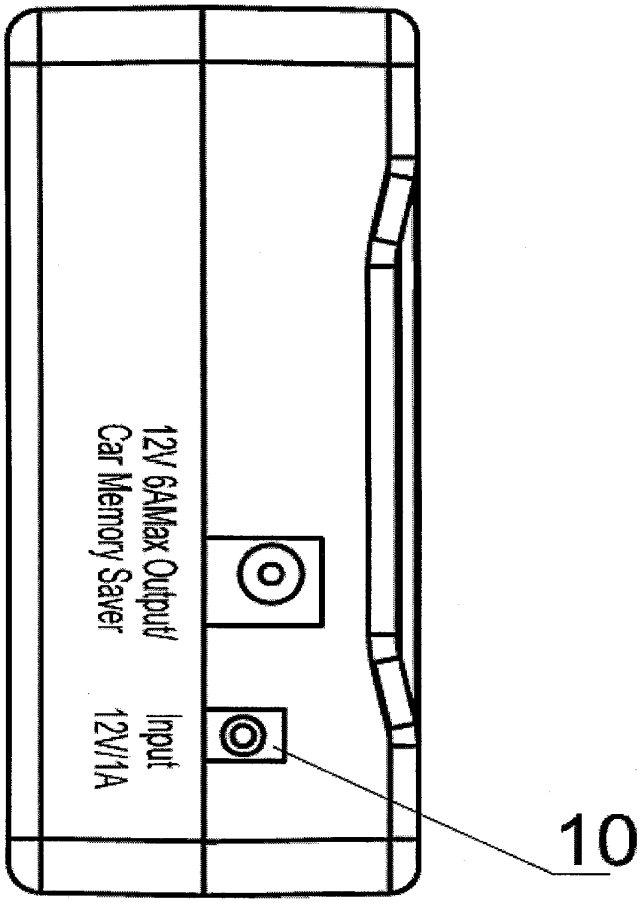


图 9

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UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.

Before the Honorable Clark S. Cheney
Administrative Law Judge

In the Matter of **CERTAIN PORTABLE BATTERY JUMP STARTERS AND COMPONENTS THEREOF**	**Inv. No. 337-TA-1256**

RESPONSE OF CLORE AUTOMOTIVE, LLC TO THE AMENDED COMPLAINT AND NOTICE OF INVESTIGATION

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Clore Automotive, LLC

Pursuant to 19 C.F.R. § 210.13, Respondent Clore Automotive, LLC ("Clore" or "Respondent"), by and through its undersigned attorneys, submits this response ("Response") to the Amended Complaint under Section 337 of the Tariff Act of 1930 filed by The NOCO Company ("NOCO" or "Complainant") on February 3, 2021 and supplements thereto[1], and the Notice of Institution of Investigation issued by the United States International Trade Commission ("ITC" or "Commission") on March 17, 2021, and published in the Federal Register on March 23, 2021 (the "Notice of Investigation").

RESPONSE TO THE COMPLAINT

Respondent denies that it has engaged in unfair competition or violated Section 337 of the Tariff Act of 1930, as amended, by importing, selling for importation, or selling within the United States after importation any product that infringes any valid and enforceable intellectual property right at issue in this Investigation. Respondent further denies that any patent claims at issue in this Investigation are valid or enforceable. The responses below reflect the current status of Respondent's knowledge and belief regarding the subject matter of the allegations to which it responds. Respondent reserves the right to supplement, modify, and/or amend its responses based on any additional facts or developments that become available or that arise after the filing of this Response.

[1] Clore disputes any and all allegations stated against Clore related to a violation of Section 337 that have been presented in any of the various versions of NOCO's complaints, amended complaints, or letters identifying changes to be made to the complaint. As a result of the manner in which NOCO serially amended its allegations through multiple letters, without providing a comprehensive version of an operative complaint in a single document, it was necessary for Clore to compile what it understood to be NOCO's operative allegations in the complaint, which are restated in the numbered paragraphs herein. To the extent that NOCO has stated other allegations against Clore, Clore disputes and denies such allegations to the extent the allegations purport to state a violation of Section 337.

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Respondent denies each and every allegation averred in the Complaint that is not expressly admitted below. Any factual allegation admitted below is admitted as to only the specific admitted facts, and not as to any purported conclusions, characterizations, implications, or speculations that might follow from the admitted facts. On personal knowledge, Respondent responds to the numbered paragraphs of the Complaint as follows:

I. INTRODUCTION[2]

1. The NOCO Company ("NOCO" or "Complainant"), a 100 plus year old company designing and creating premium battery products in the United States for the automotive industry, respectfully requests that the U.S. International Trade Commission ("Commission") commence an investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("Section 337") to remedy the unlawful importation into the United States, the sale for importation, offer for sale, and/or the sale within the United States after importation by the owner, importer, or consignee, of certain portable battery jump starters and components thereof that infringe one or more of the valid and enforceable United States patents owned by NOCO.

RESPONSE: Respondent admits that NOCO filed a Complaint pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, requesting that the Commission institute an investigation against certain Respondents. Respondent denies that it has engaged in any unlawful activity that constitutes a violation of Section 337. Respondent denies any remaining allegations in Paragraph 1.

2. On information and belief, the Proposed Respondents, as listed in Section II.B., *supra*, are manufacturers, importers, trading companies, and retailers based in China and the United States. Respondents have engaged, and continue to engage, in unfair acts in violation of Section 337 through the unlicensed importation, sale for importation, offer for sale, and/or sale after importation into the United States of portable battery jump starters having certain safety features ("Accused Products"). Upon information and belief, the Accused Products have been imported into the United States.

RESPONSE: Respondent admits that Complainant's allegations are based on alleged unfair

[2] Clore repeats the headings in the Complaint for reference purposes only. To the extent such headings purport to express factual allegations to which a response is required, Clore specifically denies any such allegations.

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acts in violation of Section 337 through the alleged unlicensed importation, sale for importation, offer for sale, and/or sale after importation into the United States of portable battery jump starters having certain safety features. To the extent Paragraph 2 contains legal conclusions, no response is required. To the extent a response is required, Respondent denies Complainant's allegations that it has violated or that it continues to violate Section 337 in any manner. Respondent denies any remaining allegations in Paragraph 2.

3. The Accused Products infringe one or more of the Asserted Claims of United States Patent Nos. 9,007,015 and 10,604,024 (collectively, the "Asserted Patents"), which are both owned by NOCO. Pursuant to Commission Rule 210.12(a)(9)(i), copies of the '015 Patent and the '024 Patent, are attached to this Complaint as Exhibits 1 – 2, respectively.

RESPONSE: Respondent admits that NOCO alleges infringement of one or more claims of U.S. Patent No. 9,007,015 ("the '015 Patent") and one or more claims of U.S. Patent No. 10,604,024 ("the '024 Patent") (collectively, the "Asserted Patents"). Respondent lacks knowledge or information sufficient to form a belief as to NOCO's alleged ownership of the Asserted Trademarks and therefore denies such allegations. To the extent Paragraph 3 contains legal conclusions, no response is required. To the extent a response is required, Respondent denies that the Asserted Patents are infringed, valid, and/or enforceable. Respondent admits that Exhibits 1 and 2 to the Complaint appear to be, on their face, copies of the '015 Patent and '024 Patent, respectively. Respondent denies any remaining allegations in Paragraph 3 and any corresponding footnotes.

4. Certain of Respondents' Accused Products also infringe one or more of U.S. Trademark Reg. Nos. 4,811,656 and 4,811,749 (collectively, the "Asserted Trademarks"), which are both owned by NOCO, in violation of Section 337(a)(1)(C). Pursuant to Commission Rule 210.12(a)(9)(i), copies of the '656 Trademark and '749 Trademark are attached to this Complaint as Exhibits 3-4, respectively.

RESPONSE: Respondent admits that NOCO alleges infringement of one or more of U.S. Trademark Reg. Nos. 4,811,656 and 4,811,749 (collectively, the "Asserted Trademarks").

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Respondent lacks knowledge or information sufficient to form a belief as to NOCO's alleged ownership of the Asserted Trademarks and therefore denies such allegations. To the extent Paragraph 4 contains legal conclusions, no response is required. Complainant's allegations of trademark infringement do not appear to be directed at Respondent, and Respondent lacks knowledge or information to form a belief as to the allegations regarding trademark infringement and therefore denies the allegations. Respondent admits that Exhibits 3 and 4 to the Complaint appear to be, on their face, copies of the '656 Trademark and '749 Trademark, respectively. Respondent further admits that, in Footnote 2, NOCO represents that certified copies of the '656 Trademark and '749 Trademark have been requested and will be filed upon receipt. Respondent denies any remaining allegations in Paragraph 4 and any corresponding footnotes.

5. Complainant asserts that the Accused Products infringe at least the following claims of one or more Asserted Patents in violation of Section 337(a)(1)(B)(i), either literally or under the doctrine of equivalents:

Asserted Patent	Asserted Claims
9,007,015	**1**, 4, 11, 14, 18, 19, 21
10,604,024	**1,** 4, 5, 6, 16, 19, 23, 24, 26, **29**, **30**

Table 1. The Asserted Claims

RESPONSE: Respondent admits that Paragraph 5 identifies asserted claims. To the extent Paragraph 5 contains legal conclusions, no response is required. To the extent a response is required, Respondent specifically denies infringing, directly or otherwise, any valid and enforceable claim of the Asserted Patents. Respondent denies any remaining allegations in Paragraph 5 and any corresponding footnotes.

6. Pursuant to Commission Rules 210.10(b)(1) and 210.12(a)(12), Complainant states that a plain English description of the category of Accused Products is portable, battery-powered devices that are used to jump-start batteries such as those in automobiles, trucks, and other vehicles, and related components, namely battery cables and clamps.

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RESPONSE: To the extent Paragraph 6 contains legal conclusions, no response is required. To the extent a response is required, Respondent lacks knowledge or information to form a belief as to the remaining allegations of Paragraph 6 and therefore denies such allegations.

7. As required by Section 337(a)(2) and (3), a domestic industry exists and is well established in the United States for each of the Asserted Products and for products and technology protected by the Asserted Patents and Asserted Trademarks.

RESPONSE: To the extent Paragraph 7 contains legal conclusions, no response is required. To the extent a response is required, Respondent denies that a domestic industry as required by Section 337(a)(2) and (3) exists or is well established in the United States for each of the Accused Products and for products and technology allegedly protected by the Asserted patents and Asserted Trademarks. Respondent otherwise lacks knowledge or information to form a belief as to the remaining allegations of Paragraph 7 and therefore denies them.

8. Complainant NOCO seeks a general exclusion order pursuant to Section 337(d)(2) excluding from entry into the United States all products that infringe one or more claims of any of the Asserted Patents and/or are sold or advertised using the Asserted Trademarks. Complainant further seeks cease and desist orders pursuant to Section 337(f) directing Respondents and those acting in conjunction with Respondents to cease the importation, offering for sale, promotion, marketing, advertising, demonstration, and warehousing of inventory for distribution, sale, and use of such products within the United States. Complainant also seeks a bond pursuant to Section 337(j).

RESPONSE: Respondent admits that Complainant seeks certain relief from the Commission and to the extent Paragraph 8 contains legal conclusions, no response is required. To the extent a response is required, Respondent denies that Complainant is entitled to any relief from the Commission, and specifically denies infringing any valid and enforceable claim of the Asserted Patents and the Asserted Trademarks. Respondent denies any remaining allegations in Paragraph 8.

9. In the alternative, should the Commission find that a general exclusion order is not appropriate, NOCO respectfully requests that limited exclusion orders be entered against each

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named Respondent and its subsidiaries, predecessors, affiliates, agents, successors, and assigns.

RESPONSE: Respondent admits that Complainant seeks certain relief from the Commission and to the extent Paragraph 9 contains legal conclusions, no response is required. To the extent a response is required, Respondent denies that Complainant is entitled to any relief from the Commission. Respondent denies any remaining allegations in Paragraph 9.

II. THE PARTIES

A. Complainant NOCO

10. Complainant NOCO is an Ohio corporation having its principal place of business at 30339 Diamond Parkway #102, Glenwillow, Ohio 44139.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 10 and therefore denies such allegations.

11. NOCO is a privately held family company that was founded in the United States over 100 years ago. Joseph H. Nook, a tire and battery distributor from Cleveland, Ohio, founded The NOCO Company in 1914. Mr. Nook set out to develop a product that would prevent battery corrosion. After several hundred different formulations, Mr. Nook began commercially manufacturing and distributing the world's first Battery Corrosion Preventative which he called "NCP2," which is an acronym for "No Corrosion Product" which is applied in "2 Steps." The NCP2 brand quickly became a household name in every major battery and automotive shop. For over 100 years, the NCP2 brand has been preventing battery corrosion on over a billion vehicles and applications worldwide.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 11 and therefore denies such allegations.

12. Today, NOCO, still owned and managed by the Nook family, remains a leading innovator in the automotive battery industry, and designs and manufactures premium consumer battery chargers, jump starters, solar panels, and portable power devices as well as a wide range related battery products and accessories.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 12 and therefore denies such allegations.

13. NOCO has all right, title, and interest in the Asserted Patents and Asserted Trademarks. *See* Exs. 6 and 7.

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RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to NOCO's alleged ownership of all right, title, and interest in the Asserted Patents and Asserted Trademarks and therefore denies such allegations. To the extent a further response is necessary, Respondent admits that Exhibits 6 and 7 appear to include, on their face, documents titled "Assignment" that were filed with the USPTO. Respondent denies any remaining allegations in Paragraph 13.

14. NOCO takes significant measures to protect its intellectual property rights. NOCO first began noticing the appearance of the Accused Products in the U.S. marketplace in 2014 shortly after the introduction of its Boost® products and since then has continuously endeavored to stop the entities involved. NOCO's IPR protection efforts are outlined in Section XI, *infra.*

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to allegations of Paragraph 14 and therefore denies such allegations.

B. Proposed Respondents

15. The sections below provide information sufficient to identify the Proposed Respondents. Additional information regarding the Proposed Respondents' unfair acts as they relate to the Accused Products can be found in Section VI below, and in the attached Confidential Declaration of Anne Hurst. *See* Ex. 44C. For the purposes of this Complaint, the Proposed Respondents are grouped by the entity that is believed to be the manufacturer of a particular design, and all entities related to the importation of that design.

RESPONSE: Respondent admits that NOCO, in the subsequent sections and relevant Confidential Declarations, provides information alleging to identify the Proposed Respondents. Respondent denies that it has engaged in any unfair acts as they relate to the Accused Products. Respondent denies any remaining allegations of Paragraph 15, including those enumerated in the corresponding footnotes.

1. Carku Respondents

a) Advance Auto Parts, Inc.

16. On information and belief, Respondent Advance Auto Part, Inc. ("Advance Auto")

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is a company organized and existing under the laws of the United States, having its principal place of business located at 2635 East Millbrook Road, Raleigh, North Carolina 27604.

RESPONSE: Paragraph 16 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 16 as well as the footnote in the section heading, and therefore denies such allegations.

17. On information and belief, Advance Auto is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 17 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 17 and therefore denies such allegations.

b) Antigravity Batteries LLC

18. On information and belief, Respondent Antigravity Batteries LLC ("Antigravity") is a company organized and existing under the laws of the United States, having its principal place of business located at 15622 Broadway Center Street, Gardena, California 90248.

RESPONSE: Paragraph 18 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 18 and therefore denies such allegations.

19. On information and belief, Antigravity is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 19 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 19 and therefore denies such

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allegations.

c) Aukey Technology Co., Ltd.

20. On information and belief, Respondent Aukey Technology Ltd. ("Aukey") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 102, Building P09, Huanancity Elec-Trading Center, Longgang District, Shenzhen, China.

RESPONSE: Paragraph 20 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 20 and therefore denies such allegations.

21. On information and belief, Aukey is in the business of manufacturing jump starters in China. Aukey sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 21 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 21 and therefore denies such allegations.

d) Autogen Technology Co., Ltd.

22. On information and belief, Respondent Autogen Technology Co., Ltd. ("Autogen") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Bld 21B No 3021 Kaixuan Rd, Shanghai, China.

RESPONSE: Paragraph 22 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 22 and therefore denies such allegations.

23. On information and belief, Autogen is in the business of manufacturing jump starters in China. Autogen sells, offers for sale, imports, and/or has imported into the United States,

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inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 23 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 23 and therefore denies such allegations.

e) Gooloo Technologies LLC

24. On information and belief, Respondent Gooloo Technologies LLC ("Gooloo") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 303 Room Bantian Business Center Bantian Wuhe Road, Longgang Dist., Shenzhen China 51800. Gooloo is believed to be affiliated with Shenzhen Gooloo E-Commerce Co., Ltd.

RESPONSE: Paragraph 24 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 24 and therefore denies such allegations.

25. On information and belief, Gooloo is in the business of manufacturing jump starters in China. Gooloo Tech sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 25 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 25 and therefore denies such allegations.

f) Guangzhou Unique Electronics Co., Ltd.

26. On information and belief, Respondent Guangzhou Unique Electronics Co., Ltd. ("Guangzhou Unique Electronics") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at NO. 9, Jinfa Logistics Park, Baiyun Lake Street, Baiyun District, Guagnzhou, China 510000.

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RESPONSE: Paragraph 26 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 26 and therefore denies such allegations.

27. On information and belief, Guangzhou Unique Electronics is in the business of manufacturing jump starters in China. Guangzhou Unique Electronics sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: Paragraph 27 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 27 and therefore denies such allegations.

g) Horizon Tool, Inc.

28. On information and belief, Respondent Horizon Tool, Inc. ("Horizon Tool") is a company organized and existing under the laws of the United States, having its principal place of business located at 7918 Industrial Village Road, Greensboro, North Carolina 27409. Horizon Tool is believed to be affiliated with AllStart LLC and Cal-Van & Horizon Tool Inc.

RESPONSE: Paragraph 28 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 28 and therefore denies such allegations.

29. On information and belief, Horizon Tool is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 29 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 29 and therefore denies such

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allegations.

h) Huizhou Grepro E-Commerce

30. On information and belief, Respondent Huizhou Grepro E-Commerce ("Huizhou Grepro") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 2004 B Kaibinsiji Build, Yunshanxi Road, Huicheng District, Huizhou, China.

RESPONSE: Paragraph 30 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 30 and therefore denies such allegations.

31. On information and belief, Huizhou Grepro is in the business of manufacturing jump starters in China. Huizhou Grepro sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 31 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 31 and therefore denies such allegations.

i) Medcursor, Inc.

32. On information and belief, Medcursor, Inc. ("Medcursor") is a company organized and existing under the laws of the United States, having its principal place of business located at 6130 W Flamingo Road, Suite 1818, Las Vegas, Nevada 89103.

RESPONSE: Paragraph 32 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 32 and therefore denies such allegations.

33. On information and belief, Medcursor is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: Paragraph 33 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 33 and therefore denies such allegations.

j) Nekteck, Inc.

34. On information and belief, Nekteck, Inc. ("Nekteck") is a company organized and existing under the laws of the United States, having its principal place of business located at 421 S Brookhurst Street, Suite 127, Anaheim, California 92804.

RESPONSE: Paragraph 34 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 34 and therefore denies such allegations.

35. On information and belief, Nekteck is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 35 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 35 and therefore denies such allegations.

k) PowerMax Battery (U.S.A.), Inc.

36. On information and belief, PowerMax Battery (U.S.A.), Inc. ("PowerMax") is a company organized and existing under the laws of the United States, having its principal place of business located at 1520 S Grove Avenue, Ontario, California 91761.

RESPONSE: Paragraph 36 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 36 and therefore denies such

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allegations.

37. On information and belief, PowerMax is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 37 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 37 and therefore denies such allegations.

l) Prime Global Products, Inc.

38. On information and belief, Prime Global Products, Inc. ("Prime Global Products") is a company organized and existing under the laws of the United States, having its principal place of business located at 2220 Airport Industrial Drive, Suite 100, Ball Ground, Georgia 30107.

RESPONSE: Paragraph 38 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 38 and therefore denies such allegations.

39. On information and belief, Prime Global Products is in the business of manufacturing jump starters in China. Prime Global Products sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 39 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 39 and therefore denies such allegations.

m) Shenzhen Carku Technology Co., Ltd.

40. On information and belief, Respondent Shenzhen Carku Technology Co., Ltd. ("Carku") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Building A, Qixing Creative Workshop (Dalang), Lianrun

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Road, Gaofeng Community, Dalang Street, Longhua New District, China. Carku is believed to be affiliated with MigOwatt Group LLC.

RESPONSE: Paragraph 40 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 40 and therefore denies such allegations.

41. On information and belief, Carku is in the business of manufacturing jump starters in China. Carku sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 41 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 41 and therefore denies such allegations.

n) Shenzhen Moock Technology Co., Ltd.

42. On information and belief, Respondent Shenzhen Moock Technology Co., Ltd. ("Shenzhen Moock") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 718, Zerun Center, Bantian Street, Longgang District, Shenzhen, Guangdong, China.

RESPONSE: Paragraph 42 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 42 and therefore denies such allegations.

43. On information and belief, Shenzhen Moock is in the business of manufacturing jump starters in China. Shenzhen Moock sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 43 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 43 and therefore denies such allegations.

o) Shenzhen Take Tools Co., Ltd.

44. On information and belief, Respondent Shenzhen Take Tools Co., Ltd. ("Shenzhen Take Tools") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. B714, Niulanqian Building, Minzhi Road, Longhua District, Shenzhen, Guangdong, China 518000.

RESPONSE: Paragraph 44 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 44 and therefore denies such allegations.

45. On information and belief, Shenzhen Take Tools is in the business of manufacturing jump starters in China. Shenzhen Take Tools sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 45 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 45 and therefore denies such allegations.

p) Sictec Instruments Co., Ltd.

46. On information and belief, Respondent Sictec Instruments Co., Ltd. ("Sictec Instruments") is a Hong Kong corporation that is organized and existing under the laws of Hong Kong and has a principal place of business located at Suites 908-090, Level 9, Landmark North, 39 Lung Sum Avenue, Sheung Shui, Hong Kong 999077.

RESPONSE: Paragraph 46 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 46 and therefore denies such allegations.

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47. On information and belief, Sictec Instruments is in the business of manufacturing jump starters in Hong Kong. Sictec Instruments sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 47 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 47 and therefore denies such allegations.

q) Walmart Inc.

48. On information and belief, Walmart Inc. ("Walmart") is a company organized and existing under the laws of the United States, having its principal place of business located at 702 S.W. 8th Street, Bentonville, Arkansas 72716. Walmart is believed to be affiliated with Wal-Mart Stores, Inc.; Sam's West, Inc (d/b/a Sam's Club); and Sam's East, Inc. (d/b/a Sam's Club).

RESPONSE: Paragraph 48 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 48 and therefore denies such allegations.

49. On information and belief, Walmart is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 49 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 49 and therefore denies such allegations.

r) 70mai Co., Ltd.

50. On information and belief, 70mai Co., Ltd. ("70mai") is a company organized and existing under the laws of the United States, having its principal place of business located at Room 2220, Building 2, No. 588, Zixing Road, Minhang District, Shanghai, China.

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RESPONSE: Paragraph 50 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 50 and therefore denies such allegations.

51. On information and belief, 70mai is in the business of manufacturing jump starters in China. 70mai sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 51 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 51 and therefore denies such allegations.

2. Boltpower Respondents

a) Anker Technology (UK) Ltd.

52. On information and belief, Respondent Anker Technology (UK) Ltd., ("Anker Technology UK") is a United Kingdom company organized and existing under the laws of the United Kingdom and has a principal place of business located at Suite B, Fairgate House, 205 Kings Road, Tyseley, Birmingham, United Kingdom B11 2AA. Anker is believed to be affiliated with Anker Technology Co., Ltd. and Anker Innovations Ltd.

RESPONSE: Paragraph 52 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 52 and the section heading above and therefore denies such allegations.

53. On information and belief, Anker Innovations, Anker Technology, and Anker Technology (UK) are in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 53 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 53 and therefore denies such allegations.

b) Arteck Electronic Co., Ltd.

54. On information and belief, Respondent Arteck Electronic Co., Ltd. ("Arteck Electronic") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. 1104-51, Tower B, Jinfengcheng Building, Shennan East Road No. 501, Shenzhen, Guangdong, China 518100.

RESPONSE: Paragraph 54 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 54 and therefore denies such allegations.

55. On information and belief, Arteck Electronic is in the business of manufacturing jump starters in China. Arteck Electronic sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 55 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 55 and therefore denies such allegations.

c) Best Parts, Inc.

56. On information and belief, Respondent Best Parts, Inc. ("Best Parts") is a company organized and existing under the laws of the United States, having its principal place of business located at 123 S Front Street, Memphis, Tennessee 38103-3607.

RESPONSE: Paragraph 56 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 56 and therefore denies such allegations.

57. On information and belief, Best Parts is in the business of importing and/or selling

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within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 57 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 57 and therefore denies such allegations.

d) Circus Link, Inc.

58. On information and belief, Respondent Circus Link, Inc. ("Circus Link") is a company organized and existing under the laws of the United States, having its principal place of business located at 2132 S. Grove Ave, Unit N, Ontario, California 91761.

RESPONSE: Paragraph 58 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 58 and therefore denies such allegations.

59. On information and belief, Circus Link is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 59 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 59 and therefore denies such allegations.

e) Deltran USA, LLC

60. On information and belief, Respondent Deltran USA, LLC ("Deltran") is a company organized and existing under the laws of the United States, having its principal place of business located at 801 International Speedway Blvd., DeLand, Florida 32724.

RESPONSE: Paragraph 60 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 60 and therefore denies such allegations.

61. On information and belief, Deltran is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 61 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 61 and therefore denies such allegations.

f) FlyLink Tech Technologies Co., Ltd.

62. On information and belief, Respondent FlyLink Tech Technologies Co., Ltd. ("FlyLink Tech") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 2 Floor, 9 Building, Hengling Ind. Park Min Zhi Street, Bao'an District, Shenzhen China.

RESPONSE: Paragraph 62 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 62 and therefore denies such allegations.

63. On information and belief, FlyLink Tech is in the business of manufacturing jump starters in China. FlyLink Tech sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 63 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 63 and therefore denies such allegations.

g) Fconegy Co., Ltd.

64. On information and belief, Respondent Fconegy Co., Ltd. ("Fconegy") is a Chinese

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corporation that is organized and existing under the laws of China and has a principal place of business located at 20th Floor, Hefeng Building, Meilong Rd., Longhua New District, Shenzhen Guangdong, China.

RESPONSE: Paragraph 64 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 64 and therefore denies such allegations.

65. On information and belief, Fconegy is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 65 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 65 and therefore denies such allegations.

h) Guangdong Boltpower Energy Co., Ltd.

66. On information and belief, Respondent Guangdong Boltpower Energy Co., Ltd. ("Boltpower") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 3-6 Floor KelunTe Building No. 5 Ganli Road, Longgang District, Shenzhen City, Guangdong, China. Boltpower is believed to be affiliated with Dongguan Boltpower Co., Ltd. and Hunan Boltpower New Energy Co., Ltd.

RESPONSE: Paragraph 66 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 66 and therefore denies such allegations.

67. On information and belief, Boltpower is in the business of manufacturing jump starters in China. Boltpower sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: Paragraph 67 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 67 and therefore denies such allegations.

i) Guangzhou Autolion Electric Technology Co., Ltd.

68. On information and belief, Respondent Guangzhou Autolion Electronic Technology Co., Ltd. ("Autolion") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 902, No. 69, Xianlie Middle Road, Yuexiu District, Guagnzhou, Guangdong, China.

RESPONSE: Paragraph 68 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 68 and therefore denies such allegations.

69. On information and belief, Autolion is in the business of manufacturing jump starters in China. Autolion sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: Paragraph 69 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 69 and therefore denies such allegations.

j) Integrated Supply Network, LLC

70. On information and belief, Integrated Supply Network, LLC ("Integrated Supply Network") is a company organized and existing under the laws of the United States, having its principal place of business located at 2727 Interstate Drive, Lakeland, Florida 33805.

RESPONSE: Paragraph 70 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 70 and therefore denies such

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allegations.

71. On information and belief, Integrated Supply Network is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 71 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 71 and therefore denies such allegations.

k) K-Tool International

72. On information and belief, K-Tool International ("K-Tool") is a company organized and existing under the laws of the United States, having its principal place of business located at 45255 Five Mile Road Plymouth, Michigan 48170.

RESPONSE: Paragraph 72 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 72 and therefore denies such allegations.

73. On information and belief, K-Tool is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 73 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 73 and therefore denies such allegations.

l) Lowe's Companies, Inc.

74. On information and belief, Lowe's Companies, Inc. ("Lowe's") is a company organized and existing under the laws of the United States, having its principal place of business located at 1000 Lowe's Blvd. Mooresville, North Carolina.

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RESPONSE: Paragraph 74 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 74 and therefore denies such allegations.

75. On information and belief, Lowe's is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 75 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 75 and therefore denies such allegations.

m) Matco Tools Corporation

76. On information and belief, Matco Tools Corporation ("Matco") is a company organized and existing under the laws of the United States, having its principal place of business located at 4403 Allen Road Stow, Ohio 44224.

RESPONSE: Paragraph 76 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 76 and therefore denies such allegations.

77. On information and belief, Matco is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 77 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 77 and therefore denies such allegations.

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n) MonoPrice, Inc.

78. On information and belief, Mono Price, Inc. ("MonoPrice") is a company organized and existing under the laws of the United States, having its principal place of business located at 1 Pointe Drive, 4th Floor Brea, California 92821.

RESPONSE: Paragraph 78 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 78 and therefore denies such allegations.

79. On information and belief, MonoPrice is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 79 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 79 and therefore denies such allegations.

o) National Automotive Parts Association, LLC

80. On information and belief, National Automotive Parts Association, LLC ("NAPA") is a company organized and existing under the laws of the United States, having its principal place of business located at 2085 Marietta Blvd Northwest Atlanta, GA 30318. NAPA is believed to be affiliated with Genuine Parts Company, a company organized and existing under the Laws of the United States, having its principal place of business located at 2999 Wildwood Parkway, Atlanta, Georgia 30339.

RESPONSE: Paragraph 80 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 80 and therefore denies such allegations.

81. On information and belief, NAPA is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: Paragraph 81 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 81 and therefore denies such allegations.

p) O'Reilly Automotive, Inc.

82. On information and belief, O'Reilly Automotive, Inc. ("O'Reilly") is a company organized and existing under the laws of the United States, having its principal place of business located at 233 South Patterson Avenue Springfield, Missouri 65802.

RESPONSE: Paragraph 82 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 82 and therefore denies such allegations.

83. On information and belief, O'Reilly is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 83 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 83 and therefore denies such allegations.

q) Pep Boys

84. On information and belief, Pep Boys ("Pep Boys") is a company organized and existing under the laws of the United States, having its principal place of business located at 3111 West Allegheny Avenue Philadelphia, Pennsylvania 19132.

RESPONSE: Paragraph 84 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 84 and therefore denies such

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allegations.

85. On information and belief, Pep Boys is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 85 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 85 and therefore denies such allegations.

r) Schumacher Power Technology Ltd.

86. On information and belief, Respondent Schumacher Power Technology Ltd. ("Schumacher") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. 30, Century Road, Binhai County, Yancheng, Jiangsu, China, 215127. Schumacher is believed to be affiliated with Schumacher Electric Corp.

RESPONSE: Paragraph 86 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 86 and therefore denies such allegations.

87. On information and belief, Schumacher is in the business of manufacturing jump starters in China. Schumacher sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 87 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 87 and therefore denies such allegations.

Schumacher Electric Corp.

87a) On information and belief, Respondent Schumacher Electric Corp. ("Schumacher") is a company organized and existing under the laws of the United States, having its principal place of business located at 801 E Business Center Drive Mount Prospect, Illinois 60056.

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RESPONSE: Paragraph 87a of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 87a and therefore denies such allegations

87b) On information and belief, Schumacher is in the business of manufacturing jump starters in China. Schumacher sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 87b of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 87b and therefore denies such allegations

s) Shenzhen Chic Electrics Co., Ltd.

88. On information and belief, Respondent Shenzhen Chic Electrics., Ltd. ("Shenzhen Chic Electrics") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 2 #5 Floor, Hualangjia Industrial Zone, Kukeng Community, Guanlan Street, Longhua New District, Shenzhen China.

RESPONSE: Paragraph 88 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 88 and therefore denies such allegations.

89. On information and belief, Shenzhen Chic Electrics is in the business of manufacturing jump starters in China. Shenzhen Chic Electrics sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 89 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 89 and therefore denies such

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allegations.

t) Shenzhen Dingjiang Technology Co., Ltd. LLLC

90. On information and belief, Respondent Shenzhen Dingjiang Technology Co., Ltd. LLLC ("Shenzhen Dingjiang Technology") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 701G, HuafengBao'anZhigu Innovation Park Yintian 4th Road, Xixiang St., Bao'an District, Shenzhen, China 518000.

RESPONSE: Paragraph 90 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 90 and therefore denies such allegations.

91. On information and belief, Shenzhen Dingjiang Technology is in the business of manufacturing jump starters in China. Shenzhen Dingjiang Technology sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: Paragraph 91 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 91 and therefore denies such allegations.

u) Shenzhen Lianfatong Technology Co., Ltd.

92. On information and belief, Respondent Shenzhen Lianfatong Technology Co., Ltd. ("Shenzhen Lianfatong") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 3A-E, Ganyutong Building, Qingji Road, Qinghu Community, Longhua Street, Longhua New District, Shenzhen, Guangdong, China 518000.

RESPONSE: Paragraph 92 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 92 and therefore denies such allegations.

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93. On information and belief, Shenzhen Lianfatong is in the business of manufacturing jump starters in China. Shenzhen Lianfatong sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: Paragraph 93 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 93 and therefore denies such allegations.

v) Shenzhen Li Feng Maoyiyouxiangongsi

94. On information and belief, Respondent Shenzhen Li Feng Maoyiyouxiangongsi ("Shenzhen Li Feng Maoyiyouxiangongsi") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at China Da Wan Xin Cun Dong, 38 Dong 201 Long Gang Qu Yuan Shan Jie Dao, DaKang, Shenzhen Guangdong, China 518000.

RESPONSE: Paragraph 94 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 94 and therefore denies such allegations.

95. On information and belief, Shenzhen Li Feng Maoyiyouxiangongsi is in the business of manufacturing jump starters in China. Shenzhen Li Feng Maoyiyouxiangongsi sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: Paragraph 95 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 95 and therefore denies such allegations.

w) Shenzhen Mediatek Tong Technology Co., Ltd.

96. On information and belief, Respondent Shenzhen Mediatek Tong Technology Co., Ltd. ("Shenzhen Mediatek") is a Chinese corporation that is organized and existing under the laws

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of China and has a principal place of business located at Room 3A-E, Qianyu Tong Building, Qingji Road, Longhua Street, Longhua New District, Shenzhen, China.

RESPONSE: Paragraph 96 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 96 and therefore denies such allegations.

97. On information and belief, Shenzhen Mediatek is in the business of manufacturing jump starters in China. Shenzhen Mediatek sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: Paragraph 97 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 97 and therefore denies such allegations.

x) Shenzhen Topdon Technology Co., Ltd.

98. On information and belief, Respondent Shenzhen Topdon Technology Co., Ltd. ("Shenzhen Topdon") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 5th Floor, Building 12, Taihua Wutong Island, Intersection of Shunchang Road and Hangkong Road, Xixiang Subdistrict, Baoan District, Guangdong, Shenzhen, China 518112.

RESPONSE: Paragraph 98 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 98 and therefore denies such allegations.

99. On information and belief, Shenzhen Topdon is in the business of manufacturing jump starters in China. Shenzhen Topdon sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: Paragraph 99 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 99 and therefore denies such allegations.

y) Shenzhen Valuelink E-Commerce Co., Ltd.

100. On information and belief, Respondent Shenzhen Valuelink E-Commerce Co., Ltd. ("Shenzhen Valuelink") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 2nd Two-way ChangJiangPu, Heao Community, HengGang Street Office, Longgang District, Shenzhen, China 518000.

RESPONSE: Paragraph 100 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 100 and therefore denies such allegations.

101. On information and belief, Shenzhen Valuelink is in the business of manufacturing jump starters in China. Shenzhen Valuelink sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 101 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 101 and therefore denies such allegations.

z) Smart Well Enterprise Limited

102. On information and belief, Smart Well Enterprise Limited ("Smart Well") is a Hong Kong company organized and existing under the laws of Hong Kong, having its principal place of business located at 14/F., Chun Wo Commercial Centre, 25 Wing Wo Street, Central, Hong Kong.

RESPONSE: Paragraph 102 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 102 and therefore denies such allegations.

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103. On information and belief, Smart Well is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: Paragraph 103 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 103 and therefore denies such allegations.

aa) Tii Trading Inc.

104. On information and belief, Tii Trading Inc. ("Tii Trading") is a company organized and existing under the laws of the United States, having its principal place of business located at 13200 Brooks Drive, Suite F, Baldwin Park, California 91706.

RESPONSE: Paragraph 104 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 104 and therefore denies such allegations.

105. On information and belief, Tii Trading is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 105 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 105 and therefore denies such allegations.

bb) Zhejiang Qingyou Electronic Commerce Co., Ltd.

106. On information and belief, Zhejiang Qingyou Electronic Commerce Co., Ltd. ("Zhejiang Qingyou Electronic") is a company organized and existing under the laws of the United States, having its principal place of business located at Room 266-270, Building 7, No. 253, Tinglan Street, Qiaosi Street, Yuhang District, Hangzhou, Zhejiang, China.

RESPONSE: Paragraph 106 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 106 and therefore denies such allegations.

107. On information and belief, Zhejiang Qingyou Electronic is in the business of manufacturing jump starters in China. Zhejiang Qingyou Electronic sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 107 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 107 and therefore denies such allegations.

3. Smartech Respondents

a) Smartech Products, Inc.

108. On information and belief, Smartech Products, Inc. ("Smartech") is a company organized and existing under the laws of the United States, having its principal place of business located at 8700 Larkin Road, Suite B, Savage, Maryland 20763.

RESPONSE: Paragraph 108 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 108 and therefore denies such allegations.

109. On information and belief, Smartech is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 109 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 109 and therefore denies such allegations.

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4. Weego Respondents

a) Shenzhen Jieruijia Technology Co., Ltd.

110. On information and belief, Respondent Shenzhen Jieruijia Technology Co., Ltd. ("Shenzhen Jieruijia") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. 8 Mu Dun Road, No. 1 Industrial Zone, Lou Cun Community, Gong Ming, Guagn Ming District, Shenzhen City, China.

RESPONSE: Paragraph 110 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 110 and therefore denies such allegations.

111. On information and belief, Shenzhen Jieruijia is in the business of manufacturing jump starters in China. Shenzhen Jieruijia sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 111 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 111 and therefore denies such allegations.

b) Paris Corporation

112. On information and belief, Paris Corporation ("Paris Corporation") is a company organized and existing under the laws of the United States, having its principal place of business located at 800 Highland Drive Westhampton, New Jersey 08060.

RESPONSE: Paragraph 112 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 112 and therefore denies such allegations.

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113. On information and belief, Paris Corporation is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 113 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 113 and therefore denies such allegations.

5. WinPlus Respondents

a) Shenzhen Winplus Technology Co., Ltd.

114. On information and belief, Respondent Shenzhen Winplus Technology Co., Ltd. ("Shenzhen Winplus") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 307, Building 5, LixiangJiayaun, Jindaotian Road, Buji, Longgang District, Shenzhen, China 518000. Shenzhen Winplus is believed to be affiliated with Winplus Technology (Hk) Ltd., a Hong Kong company organized and existing under the laws of Hong Kong with a principal place of business located at Flat/Room 1103 11F, Hang Seng Mongkok Building, 677 Nathan Road, Mongkok, Hong Kong.

RESPONSE: Paragraph 114 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 114 and therefore denies such allegations.

115. On information and belief, Shenzhen Winplus is in the business of manufacturing jump starters in China. Shenzhen Winplus Battery sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 115 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 115 and therefore denies such allegations.

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b) Winplus North America, Inc.

116. On information and belief, Winplus North America, Inc. ("Winplus North America") is a company organized and existing under the laws of the United States, having its principal place of business located at 2975 Red Hill Ave, Suite 100, Costa Mesa, California 92626.

RESPONSE: Paragraph 116 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 116 and therefore denies such allegations.

117. On information and belief, Winplus is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 117 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 117 and therefore denies such allegations.

6. Great Neck Respondents

a) AutoZone, Inc.

118. On information and belief, Respondent AutoZone, Inc. ("AutoZone") is a company organized and existing under the laws of the United States, having its principal place of business located at 123 South Front Street, Memphis, Tennessee 38103.

RESPONSE: Paragraph 118 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 118 and therefore denies such allegations.

119. On information and belief, AutoZone is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: Paragraph 119 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 119 and therefore denies such allegations.

b) Great Neck Global, Inc. & Great Neck Saw Manufacturers, Inc.

120. On information and belief, Respondent Great Neck Global, Inc. ("Great Neck Global") is a Taiwanese corporation that is organized and existing under the laws of Taiwan and has a principal place of business located at No. 19, Lane 96, Section 2, Zhongshan North Road, Taipei, Taiwan 104.

RESPONSE: Paragraph 120 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 120 and therefore denies such allegations.

121. Great Neck is believed to be associated and/or operate under the name Great Neck Saw Manufacturers, Inc., ("Great Neck U.S.") a company organized and existing under the laws of the United States, having its principal place of business located at 165 East 2nd Street, Mineola, New York 11501.

RESPONSE: Paragraph 121 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 121 and therefore denies such allegations.

122. On information and belief, Great Neck Global is in the business of manufacturing jump starters in Taiwan. On information and belief, Great Neck U.S. sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 122 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 122 and therefore denies such allegations.

7. ThiEye Respondents

a) Dongguan Hangchebao Energy Technology Co., Ltd.

123. On information and belief, Respondent Dongguan Hangchebao Energy Technology Co., Ltd. ("Hangchebao") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 201, Changde Road No. 37, Humen Town Dongguan City, Guangdong, China.

RESPONSE: Paragraph 123 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 123 and therefore denies such allegations.

124. On information and belief, Hangchebao is in the business of manufacturing jump starters in China. Hanchebao sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: Paragraph 124 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 124 and therefore denies such allegations.

b) ThiEye Technologies Co., Ltd.

125. On information and belief, Respondent ThiEye Technologies Co., Ltd. ("ThiEye Technologies") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 405, 4th Floor, Building B, Bantian International Center, Longgang District, China.

RESPONSE: Paragraph 125 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 125 and therefore denies such

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allegations.

126. On information and belief, ThiEye Technologies is in the business of manufacturing jump starters in China. ThiEye Technologies sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 126 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 126 and therefore denies such allegations.

8. Energen/ Performance Tool Respondents

a) Best Buy Co., Inc.

127. On information and belief, Respondent Best Buy Co., Inc. ("Best Buy") is a company organized and existing under the laws of the United States, having its principal place of business located at 7601 Penn Avenue, South Richfield, Minnesota 552423.

RESPONSE: Paragraph 127 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 127 and therefore denies such allegations.

128. On information and belief, Best Buy is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 128 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 128 and therefore denies such allegations.

b) Chao Fung Trading Co. Ltd.

129. On information and belief, Respondent Chao Fung Trading Co. Ltd. ("Chao Fung

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Trading") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 911 Jinmao Toer Mingzhou Road W Beilun District Ningbo, China (Taiwan).

RESPONSE: Paragraph 129 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 129 and therefore denies such allegations.

130. On information and belief, Chao Fung Trading is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 130 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 130 and therefore denies such allegations.

c) Energen, Inc.

131. On information and belief, Respondent Energen, Inc. ("Energen") is a company organized and existing under the laws of the United States, having its principal place of business located at 17008 Evergreen Place Unit B, City of Industry, California 91745.

RESPONSE: Paragraph 131 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 131 and therefore denies such allegations.

132. On information and belief, Energen is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 132 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 132 and therefore denies such allegations.

d) Wilmar Corporation

133. On information and belief, Wilmar Corporation ("Wilmar") is a company organized and existing under the laws of the United States, having its principal place of business located at P.O. Box 88259 Tukwila, Washington 98138.

RESPONSE: Paragraph 133 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 133 and therefore denies such allegations.

134. On information and belief, Wilmar is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 134 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 134 and therefore denies such allegations.

9. Halo Respondents

Halo2Cloud, LLC2
6 Central Row
Hartford, Connecticut 06103

a) Halo2Cloud, LLC

134a) On information and belief, Respondent Halo2Cloud, LLC ("Halo2Cloud") is a company organized and existing under the laws of the United States, having its principal place of business located at 6 Central Row, Hartford, Connecticut 06103.

RESPONSE: Paragraph 134a of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 134a and therefore denies such allegations.

134b) On information and belief, Halo2Cloud is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 134b of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 134b and therefore denies such allegations.

QVC, Inc.
1200 Wilson Drive
West Chester, PA 19380

b) QVC, Inc.

134c) On information and belief, QVC, Inc. ("QVC") is a company organized and existing under the laws of the United States, having its principal place of business located at 250 Dove Court Santa Paula, California 93060.

RESPONSE: Paragraph 134c of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 134c and therefore denies such allegations.

134d) On information and belief, QVC is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 134d of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 134d and therefore denies such allegations.

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c) Zagg Co. Rrd Gst

134e) On information and belief, Zagg Co. Rrd Gst ("Zagg") is a company organized and existing under the laws of the United States, having its principal place of business located at 381 Airtech Parkway, Plainfield, Indiana 46168. Zagg is believed to be affiliated with Zagg, Inc., company organized an existing under the laws of the United States, having its principal place of business located at 910 West Legacy Center Way, Suite 500, Midvale, Utah 84047.

RESPONSE: Paragraph 134e of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 134e and therefore denies such allegations.

134f) On information and belief, Zagg is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Paragraph 134f of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 134f and therefore denies such allegations.

10. Jump-n-Carry Respondents

Clore Automotive, LLC
8735 Rosehill Suite 220
Lenexa, Kansas 66215

134g) On information and belief, Respondent Clore Automotive, LLC ("Clore Automotive") is a company organized and existing under the laws of the United States, having its principal place of business located at 8735 Rosehill Suite 220, Lenexa, Kansas 66215.

RESPONSE: Respondent admits that it is a company organized and existing under the laws of the United States and maintains its principle place of business at 8735 Rosehill Suite 220, Lenexa, Kansas 66215.

134h) On information and belief, Clore Automotive is in the business of importing and/or selling

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within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: Respondent admits that it is in the business of importing and/or selling jump starters within the United States after importation. Respondent specifically denies that any products imported or sold by Respondent infringe any valid or enforceable claim of the Asserted Patents.

III. THE PRODUCTS AT ISSUE

135. The products at issue are portable battery jump starter packs that allow users to safely jump start cars, boats, motorcycles, and more without connecting to another vehicle. The Accused Products and components thereof in this matter include safety features claimed by Complainant's Asserted Patents that prevent injury to the user and damage to the battery being jump started.

RESPONSE: Respondent admits that the products at issue are portable battery jump starter packs that are compatible with a variety of vehicles and do not require connection to a secondary vehicle to function. Respondent further admits that the Accused Products and associated components include safety features intended to prevent injury to the user and damage to the battery being charged. Respondent denies any remaining allegations in Paragraph 135.

136. Since the early days of automobiles, the prevalent method to recharge a dead car battery has been through the use of "jumper cables," where two cables are run from a live battery in a running vehicle to a dead battery of a second vehicle. The many problems associated with jumper cables are well known, including the fact that a second car with a live battery is needed to perform a jump start, and the danger of sparking and short circuits, especially when the cables from the live battery to the dead battery are misconnected (referred to as "reverse polarity") or not fully connected.

RESPONSE: Respondent admits that, prior to the advent of portable battery jump starting technology, "jumper cables" were utilized to transfer charge from one battery to another. To the extent Paragraph 136 contains legal conclusions, no response is required. Respondent denies all remaining allegations of Paragraph 136.

137. Numerous efforts to improve the jump-starting process have been undertaken over

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the years, most of which have had significant deficiencies such as lack of portability or failure to solve safety problems and did not achieve significant popularity.

RESPONSE: To the extent Paragraph 137 contains legal conclusions, no response is required. Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 137 and therefore denies such allegations.

138. The advent of lithium-ion batteries has permitted the introduction of compact jump starters that do not require the use of a second vehicle, providing consumer convenience as well as certain safety advantages over prior jump-starting devices.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 138 and therefore denies such allegations.

A. Complainant's Jump Starters

139. NOCO has successfully developed innovative automobile battery products in the United States for over 100 years. In 2014, NOCO introduced the Boost® lithium jump starter, which incorporates the patented safety features described herein. A photograph of one model of NOCO's Boost® jumping a dead battery is shown below, and a video demonstrating how the Boost® operates can be found at https://www.youtube.com/watch?v=QULcgAZUs0Y

[image omitted]

Fig. 1- NOCO Boost® Pro™ (GB150)- 3,000A Jump Starter

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 139 and any corresponding footnotes and therefore denies such allegations.

140. NOCO currently offers a range of products for the charging, jump-starting, and storage of vehicle batteries. The products at issue here include the entire line of NOCO Boost® jump starters, namely, the Boost® Sport™, Boost® Plus™, Boost® XL™, Boost® HD™, Boost® Pro™, and Boost® Max™. *See* Ex. 8.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 140 and its corresponding footnotes and therefore denies such allegations.

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141. The NOCO Boost® jump starters are ultra-portable, lightweight, and compact. They outperform traditional lead-acid battery booster packs at a fraction of the size and weight. The Boost® jump starters provide users a safe and easy-to-use car battery jump starter pack without the worry of incorrect connections or sparks. Boost® jump starters safely connect to any 12-volt vehicle battery due to NOCO's mistake-proof design featuring spark-proof technology and reverse polarity protection. All Boost® jump starters also feature a 2.1A USB output port to power any USB device, and an LED flashlight with 7 light modes, including SOS and Emergency Strobe. *See* Ex. 8. NOCO offers six Boost® models, which provide a range from 500A to 20,000A for a wide variety of vehicle batteries and applications.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 141 and any exhibits referenced therein and therefore denies such allegations.

142. Since its introduction, the Boost® has become known for its safety, ease of use, and reliability, among other features. As a result, the Boost® has enjoyed tremendous popularity, becoming one of the, if not the, market-leading compact lithium jump starters in the United States.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 142 and therefore denies such allegations.

B. Respondents' Jump Starters

143. On information and belief, the Accused Products include portable battery jump starters that are manufactured in China and then imported into the United States. These products incorporate the patented technology claimed in the Asserted Patents. Examples of infringing jump starter models offered by three of the Respondents are shown below:

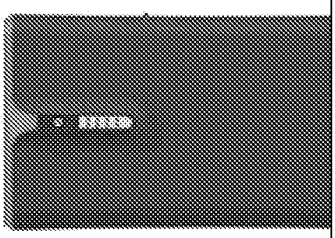
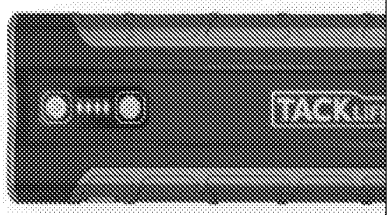
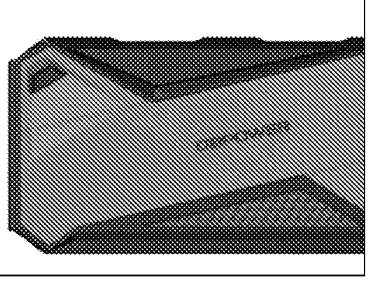
Gooloo GP1500	Tacklife T8 Max	DB Power DJS50
		

Fig. 2- Examples of Accused Products

RESPONSE: Paragraph 143 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 143 and therefore denies such allegations. Respondent specifically denies that any products imported or sold by Respondent infringe any valid or enforceable claim of the Asserted Patents.

144. It is often difficult to determine the source of the Accused Products, as the Chinese manufacturers of these products frequently distribute them through several entities, even when the products are made in the same facility. There have also been instances of the Chinese manufacturers changing their names or using trading companies to ship the products to the United States. For these reasons, there are many instances in which neither the shipping documents nor the product packaging indicate the manufacturer of the product.

RESPONSE: Paragraph 144 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 144 and therefore denies such allegations. Respondent specifically denies that it engages in the activities described in Paragraph 144 and further denies that any products imported or sold by Respondent infringe any valid or enforceable claim of the Asserted Patents.

145. Respondents target customers in the United States through their own websites and also sell the accused jump starters via online marketplaces, including Amazon. Numerous Respondents' Accused Products are also sold in brick-and-mortar retail locations in the United States and/or on the websites of these retailers.

RESPONSE: Paragraph 145 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 145 and therefore denies such allegations. Respondent specifically denies that any products imported or sold by Respondent infringe any valid or enforceable claim of the Asserted Patents.

IV. THE ASSERTED PATENTS

146. The Asserted Patents generally relate to portable battery jump starters and safety features contained therein. These jump starters can be used to jump start the batteries of many vehicles including cars, trucks, boats, and motorcycles.

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RESPONSE: Respondent admits that the Asserted Patents purport to generally relate to jump starters and safety features. Respondent denies the remaining allegations of Paragraph 146.

147. The identification, ownership, non-technical description, foreign counterparts, and licensees for each Asserted Patent are identified below.

RESPONSE: Paragraph 147 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 147 and therefore denies such allegations.

A. U.S. Patent No. 9,007,015

1. Identification of the Patent and Ownership

148. The '015 Patent, titled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection" issued on April 15, 2015, naming Jonathan L. Nook, William K. Nook, James R. Stanfield, and Derek M. Underhill as the inventors. Ex. 1 (Certified copy of '015 Patent) at 1. The '015 Patent is based on U.S. Patent Application No. 14/325,938 filed on July 8, 2014. *Id.* The '015 Patent is a continuation of Application No. PCT/US2014/045343, filed on July 3, 2014. The '015 Patent will expire on July 3, 2034.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to NOCO's alleged ownership of the '015 Patent and therefore denies such allegations. Respondent admits that the '015 Patent appears, on its face, to be titled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection." Respondent admits that Paragraph 148 references Exhibit 1, which appears, on its face, to be a copy of the '015 patent. Respondent admits that the '015 Patent appears, on its face, to include certain "Related U.S. Application Data." Respondent denies that the claims of the '015 Patent are valid and enforceable. To the extent Paragraph 148 contains legal conclusions, no response is required. To the extent a response is required, Respondent lacks knowledge or information to form a belief as to the remaining allegations of Paragraph 148 and therefore denies such allegations.

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149. This Complaint is accompanied by a certified copy of the prosecution history for the '015 Patent and the references cited therein. *See* Appx. A1 and A2.

RESPONSE: Respondent admits that NOCO has included what appears to be a certified copy of the prosecution history of the '015 Patent and the references cited therein. Such document speaks for itself. The remaining allegations of Paragraph 149 are not directed to Respondent and therefore no response is required. To the extent a response is required, Respondent lacks knowledge or information to form a belief as to the remaining allegations of Paragraph 149 and therefore denies such allegations.

150. NOCO owns by assignment all rights, title, and interest in the '015 Patent. *See* Ex. 6.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to NOCO's alleged ownership by assignment of all rights, title, and interest in the '732 Patent and therefore denies such allegations.

2. Non-Technical Description of the Patent

151. The '015 Patent relates to an improved portable jump starter incorporating a rechargeable lithium-ion battery and a microcontroller. The '015 Patent describes a novel apparatus that incorporates a power switch actuated by a microcontroller such that power will be delivered from the lithium-ion power pack to the output port only when the battery is connected to the output port and only when the battery is connected with the proper polarity of positive and negative terminals. This solves the problem of sparking or potential damage to the battery and/or bodily injury when the jumper terminals or clamps of the cables were inadvertently brought in contact with each other, or when positive and negative terminals were connected to the opposite polarity terminals in the vehicle to be jumped.

RESPONSE: Respondent admits that the allegations of Paragraph 151 are intended to be "non-technical." Respondent specifically denies that the '015 Patent describes a "novel apparatus," and denies the suggestion that the '015 Patent "solves" a problem that had not already been solved by others. To the extent Paragraph 151 contains legal conclusions, no response is required. To the extent a response is required, denied.

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152. The '015 Patent has 23 claims, 1 of which is an independent claim. Complainant is asserting claims 1, 4, 11, 14, 18, 19 and 21.

RESPONSE: The allegations of Paragraph 152 are not directed to Respondent and therefore no response is required. To the extent a response is required, denied.

3. Foreign Counterparts of the Patent

153. The following is a list of current foreign patents and foreign applications that are presently understood to correspond or otherwise relate to the '015 Patent:

- CA2,916,782 (Canada)
- GB2527858 (United Kingdom)
- DE10204114997B4 (Germany)
- (Australia) Patent Application (Approved) No. 20201223
- (Germany) Patent Application No. 102014020005.1
- (Germany) Patent Application No. 102014020004.3

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 153 and therefore denies such allegations.

154. NOCO owns all right, title, and interest in and to each of these foreign patents and applications, there are no other foreign patents corresponding to the '015 Patent, and there are no other pending, rejected, or abandoned foreign patent applications corresponding to the '015 Patent.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to NOCO's alleged ownership of all rights, title, and interest in the '015 Patent and therefore denies such allegations.

4. Licensees to the Patent

155. All licensees to the '015 Patent are identified in Confidential Ex. 5C. There are no other licensees relating to the '015 Patent.

RESPONSE: Respondent admits that Confidential Exhibit 5C appears, on its face, to be the licensees of the '015 Patent. Respondent lacks knowledge or information sufficient to form a

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belief as to the remaining allegations of Paragraph 155 and therefore denies such allegations.

B. U.S. Patent No. 10,604,024

1. Identification of the Patent and Ownership

156. The '024 Patent, titled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection" issued on March 31, 2020 naming Jonathan L. Nook, William K. Nook, James R. Stanfield, and Derek M. Underhill as the inventors. Ex. 2 (Certified copy of '024 Patent) at 1. The '024 Patent is based on U.S. Patent Application No. 15/691,884 filed on Aug. 31, 2017. *Id.* The '024 Patent is a continuation of Application No. 14/619,655, filed February 11, 2015, now U.S. Patent No. 9,770,992, which claims priority to PCT/US2014/045434, filed July 3, 2014. The '024 Patent will expire on July 3, 2034.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to NOCO's alleged ownership of the '024 Patent and therefore denies such allegations. Respondent admits that the '024 Patent appears, on its face, to be titled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection." Respondent admits that Paragraph 156 references Exhibit 2, which appears, on its face, to be a copy of the '024 patent. Respondent admits that the '024 Patent appears, on its face, to include certain "Related U.S. Application Data." Respondent denies that the claims of the '024 Patent are valid and enforceable. To the extent Paragraph 156 contains legal conclusions, no response is required. To the extent a response is required, Respondent lacks knowledge or information to form a belief as to the remaining allegations of Paragraph 156 and therefore denies such allegations.

157. This Complaint is accompanied by a certified copy of the prosecution history for the '024 Patent and the references cited therein. *See* Appx. B1 and B2.

RESPONSE: Respondent admits that the Complaint is accompanied by what appears to be certified copies of the prosecution history for the '024 Patent and the references cited therein. The remaining allegations of Paragraph 157 are not directed at Respondent and therefore no response is required. To the extent a response is required, denied.

158. NOCO owns by assignment all rights, title, and interest in the '024 Patent. See Ex.

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7.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to NOCO's alleged ownership of all rights, title, and interest in the '024 Patent and therefore denies such allegations.

2. Non-Technical Description of the Patent

159. The '024 Patent relates to an improved portable jump starter incorporating a rechargeable lithium-ion battery and a microcontroller. The '024 Patent is a continuation of the '015 Patent but claims inventive features not claimed in that patent, including: the device being turned on when the microcontroller receives *simultaneous* signals from the sensors indicating that the device's battery clamps are connected to the vehicle battery proper polarity; and the device being *turned off* when the microcontroller receives signals from the sensors indicating that the device's battery clamps have become disconnected from the vehicle battery and/or an improper polarity condition.

RESPONSE: Respondent admits that the allegations of Paragraph 159 are intended to be "non-technical." Respondent specifically denies that the '024 Patent "claims inventive features." To the extent Paragraph 159 contains legal conclusions, no response is required. To the extent a response is required, denied.

160. The '024 Patent has 30 claims, 3 of which are independent claims. Complainant is asserting claims 1, 4, 5, 6, 16, 19, 23, 24, 26, 29, 30.

RESPONSE: Respondent lacks knowledge and information sufficient to form a belief as to the allegations of Paragraph 160 and therefore denies the same.

3. Foreign Counterparts of the Patent

161. *See* Section IV.A.3, *supra*.

RESPONSE: The allegations of Paragraph 161 are not directed to Respondent and therefore no response is required. To the extent a response is required, denied.

4. Licensees to the Patent

162. All licensees to the '024 Patent are identified in Confidential Ex. 5C. There are no other licensees relating to the '024 Patent.

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RESPONSE: Respondent lacks knowledge and information sufficient to form a belief as to the allegations of Paragraph 162 and therefore denies the same.

V. THE ASSERTED TRADEMARKS

A. U.S. Trademark Reg. No. 4,811,656

163. The federal registration of the ULTRASAFE mark, Reg. No. 4,811,656, issued on September 15, 2015 to NOCO. NOCO has continuously used this mark in commerce since at least August 2014 for its jump starters (Classes 021 023, 026, 036, and 038.). Affidavits have been filed pursuant to Section 8 and 15 of the Lanham Act, 15 U.S.C.§§ 1058 and 1065, and this registration is incontestable. A copy of the Certificate of Registration for the Registered Trademark is attached hereto as Exhibit 3.

RESPONSE: Respondent admits that the federal registration for the ULTRASAFE MARK, Reg. No. 4,811,656 appears to have been issued on September 15, 2015 to NOCO. Respondent further admits that NOCO has attached what appears to be, on its face, a Certificate of Registration for the Registered Trademark as Exhibit 3. Respondent lacks knowledge and information sufficient to form a belief as to the remaining allegations of Paragraph 163 and therefore denies the same.

164. Pursuant to Commission Rule 210.12(d), NOCO will file a certified copy of the prosecution history of the ULTRASAFE trademark for U.S. Trademark Reg. No. 4,811,656, as Appendix C.

RESPONSE: Respondent lacks knowledge and information sufficient to form a belief as to the remaining allegations of Paragraph 164 and any corresponding footnotes and therefore denies the same.

B. U.S. Trademark Reg. No. 4,811,749

165. The federal registration of the SAFELY JUMP START A DEAD BATTERY IN SECONDS mark, Reg. No. 4,811,749, issued on September 15, 2015 to NOCO. NOCO has continuously used this mark in commerce since at least August 2014 for its jump starters (Classes 021, 023, 026, 036, 038, 100, 101, and 102). Affidavits have been filed pursuant to Section 8 and 15 of the Lanham Act, 15 U.S.C. §§ 1058 and 1065, and this registration is incontestable. A copy of the Certificate of Registration for the Registered Trademark is attached hereto as Exhibit 4.

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RESPONSE: Respondent admits that the federal registration for the SAFELY JUMP START A DEAD BATTERY IN SECONDS mark, Reg. No. 4,811,749 appears to have been issued on September 15, 2015 to NOCO. Respondent further admits that NOCO has attached what appears to be, on its face, a Certificate of Registration for the Registered Trademark as Exhibit 4. Respondent lacks knowledge and information sufficient to form a belief as to the remaining allegations of Paragraph 165 and therefore denies the same.

166. Pursuant to Commission Rule 210.12(d), NOCO will file a certified copy of the prosecution history of the "Safely Jump Start a Dead Battery in Seconds" trademark for U.S. Trademark Reg. No. 4,811,749, as Appendix D.

RESPONSE: Respondent lacks knowledge and information sufficient to form a belief as to the remaining allegations of Paragraph 166 and any corresponding footnotes and therefore denies the same.

VI. UNFAIR ACTS OF THE PROPOSED RESPONDENTS

A. Infringement of the Asserted Patents

167. On information and belief, Respondents, without authorization, have been and still are infringing each of the Asserted Patents in the United States. Respondents' unlawful and unfair acts include the importation into the United States, sale for importation into the United States, or sale within the United States after importation of the infringing Accused Products. Respondents have violated, and continue to violate, Section 337 of the Tariff Act of 1930 in view of U.S. patent laws. Respondents are not licensed under the Asserted Patents.

RESPONSE: To the extent Paragraph 167 contains legal conclusions, no response is required. Respondent specifically denies that the products that it imports or sells infringe, directly or otherwise, literally or under the doctrine of equivalents, any valid and enforceable claim of the Asserted Patents. Respondent lacks knowledge or information sufficient to form a belief as to the remaining allegations of Paragraph 167 and therefore denies such allegations.

168. Specifically, NOCO asserts that the Respondents directly infringe, literally or under the doctrine of equivalents, at least the following independent claims of the Asserted Patents, in

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violation of 35 U.S.C. §§ 271(a) and Section 337 (a)(1)(B)(i):

Claim Chart	'015 Patent	'024 Patent
Claim Chart 01-Carku	1	1, 29, 30
Claim Chart 02- Boltpower	1	1, 29, 30
Claim Chart 03- Smartech	1	1, 29, 30
Claim Chart 04-Weego	1	1, 29, 30
Claim Chart 05-Winplus	1	1, 29, 30
Claim Chart 06- Great Neck	1	
Claim Chart 07- ThiEye	1	1, 29, 30
Claim Chart 08- Energen/ Performance	1	1, 29, 30
Claim Chart 09- HALO	1	1, 29, 30
Claim Chart 10- Clore	1	1, 29, 30

Table 2. Asserted Independent Claims Infringed by Proposed Respondents

RESPONSE: To the extent Paragraph 168 contains legal conclusions, no response is required. Respondent specifically denies that the products that it imports or sells infringe, directly or otherwise, literally or under the doctrine of equivalents, any valid and enforceable claim of the Asserted Patents. Respondent lacks knowledge or information sufficient to form a belief as to the remaining allegations of Paragraph 168 and therefore denies such allegations.

169. For purposes of assessing infringement, the Accused Products are divided into groups based on suspected manufacturer. The claim charts are designated Claim Chart 01 through Claim Chart 10, and the Accused Products within each design group are set forth on Exhibit 9. The Accused Products within each design group share a common design, at least with respect to the portions relevant to the infringement analysis of the independent claims of the '015 and '024 Patent claims. Each of the Respondents imports, sells for importation, and/or sells within the United States after importation at least one of the Accused Products and therefore directly infringes, literally or under the doctrine of equivalents, one or more of claims 1, 4, 11, 14, 18, 19, 21 of the '015 Patent and/or one or more of claims 1, 4, 5, 6, 16, 19, 23, 24, 26, 29, 30 of the '024 Patent with respect to such Respondent's Accused Products.

RESPONSE: Respondent denies that the products that it imports or sells infringe, directly or otherwise, literally or under the doctrine of equivalents any valid and enforceable claim of the Asserted Patents. Respondent lacks knowledge or information sufficient to form a belief as to the remaining allegations of Paragraph 169 and therefore denies such allegations.

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1. Claim Chart 01- Carku Accused Products

a) Carku Design

170. The Accused Products in Claim Chart 01 ("Carku Design") are lithium battery powered jump starters having a cable assembly that includes a relay and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an optocoupler sensor. The Carku Design Accused Products are offered by numerous sellers under multiple brand names. On information and belief, the Carku Design Accused Products are manufactured by at least Respondent Carku. The Tacklife T8 Pro model jump starter is representative of the Carku Design Accused Products.

RESPONSE: Paragraph 170 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 170 and therefore denies such allegations.

b) Infringement of the '015 Patent

171. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Carku Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Carku Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Carku Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: Paragraph 171 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 171 and therefore denies such allegations.

172. A claim chart comparing independent claim 1 of the '015 Patent to the representative Carku Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 111.

RESPONSE: Paragraph 172 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 172 and therefore denies such allegations.

c) Infringement of the '024 Patent

173. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Carku Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Carku Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Carku Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: Paragraph 173 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 173 and therefore denies such allegations.

174. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Carku Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 111.

RESPONSE: Paragraph 174 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 174 and therefore denies such allegations.

2. Claim Chart 02- Boltpower Accused Products

a) Boltpower Design

175. The Accused Products in Claim Chart 02 ("Boltpower Design") are lithium battery powered jump starters that includes a relay and two sensors. The Boltpower Design Accused Products are offered by numerous sellers under multiple brand names. The BEATIT D11, Lemsir V1, and BEATIT D10 Pro model jump starters are representative of the three designs of Accused Products manufactured by Boltpower.

RESPONSE: Paragraph 175 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 175 and therefore denies such allegations.

b) Infringement of the '015 Patent

176. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Boltpower Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Boltpower Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Boltpower Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: Paragraph 176 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 176 and therefore denies such allegations.

177. A claim chart comparing independent claim 1 of the '015 Patent to the representative Boltpower Design Accused Products, and including photographs and drawings where applicable, is attached as Ex. 112.

RESPONSE: Paragraph 177 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 177 and therefore denies such allegations.

c) Infringement of the '024 Patent

178. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Boltpower Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Boltpower Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Boltpower Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

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RESPONSE: Paragraph 178 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 178 and therefore denies such allegations.

179. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Boltpower Design Accused Products, and including photographs and drawings where applicable, is attached as Ex. 112.

RESPONSE: Paragraph 179 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 179 and therefore denies such allegations.

3. Claim Chart 03- Smartech Accused Products

a) Smartech Design

180. The Accused Products in Claim Chart 03 ("Smartech Design") are lithium battery powered jump starters offered under the SMARTECH brand and have a cable assembly that includes a relay and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an operational amplifier sensor. The SMARTECH JS-10000 model jump starter is representative of the Smartech Design Accused Products.

RESPONSE: Paragraph 180 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 180 and therefore denies such allegations.

b) Infringement of the '015 Patent

181. On information and belief, select Respondents, including Respondent Smartech, import, sell for importation, and/or sell within the United States after importation the Design 05 Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Smartech Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The

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Smartech Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: Paragraph 181 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 181 and therefore denies such allegations.

182. A claim chart comparing independent claim 1 of the '015 Patent to the representative Smartech Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 113.

RESPONSE: Paragraph 182 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 182 and therefore denies such allegations.

c) Infringement of the '024 Patent

183. On information and belief, select Respondents, including Respondent Smartech, import, sell for importation, and/or sell within the United States after importation the Smartech Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Smartech Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Smartech Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: Paragraph 183 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 183 and therefore denies such allegations.

184. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Smartech Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 113.

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RESPONSE: Paragraph 184 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 184 and therefore denies such allegations.

4. Claim Chart 04- Weego Accused Products

a) Weego Design

185. The Accused Products in Claim Chart 04 ("Weego Design") are lithium battery powered jump starters offered under the WEEGO brand and have a cable assembly that includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an optocoupler sensor. The WEEGO 22S model jump starter is representative of the Weego Design Accused Products.

RESPONSE: Paragraph 185 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 185 and therefore denies such allegations.

b) Infringement of the '015 Patent

186. On information and belief, select Respondents, including Respondent Carku, import, sell for importation, and/or sell within the United States after importation the Weego Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Weego Design Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Weego Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: Paragraph 186 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 186 and therefore denies such allegations.

187. A claim chart comparing independent claim 1 of the '015 Patent to the

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representative Weego Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 114.

RESPONSE: Paragraph 187 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 187 and therefore denies such allegations.

c) Infringement of the '024 Patent

188. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Weego Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Weego Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Weego Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: Paragraph 188 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 188 and therefore denies such allegations.

189. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Weego Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 114.

RESPONSE: Paragraph 189 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 189 and therefore denies such allegations.

5. Claim Chart 05- Winplus Accused Products

a) Winplus Design

190. The Accused Products in Claim Chart 05 ("Winplus Design") are lithium battery

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powered jump starters offered under the WINPLUS and TYPE-S brands and have a cable assembly that includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is also a resistive divider sensor. On information and belief, the WINPLUS and TYPE S brand jump starters are manufactured by Respondent Shenzhen Winplus. The Type S–AC56388-BLK model jump starter is representative of the Winplus Design Accused Products.

RESPONSE: Paragraph 190 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 190 and therefore denies such allegations.

b) Infringement of the '015 Patent

191. On information and belief, select Respondents, including Respondent Winplus, import, sell for importation, and/or sell within the United States after importation the Winplus Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Winplus Design Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Winplus Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: Paragraph 191 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 191 and therefore denies such allegations.

192. A claim chart comparing independent claim 1 of the '015 Patent to the representative Winplus Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 115.

RESPONSE: Paragraph 192 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 192 and therefore denies such allegations.

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c) Infringement of the '024 Patent

193. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Winplus Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Winplus Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Winplus Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: Paragraph 193 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 193 and therefore denies such allegations.

194. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Winplus Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 115.

RESPONSE: Paragraph 194 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 194 and therefore denies such allegations.

6. Claim Chart 06- Great Neck Accused Products

a) Great Neck Design

195. The Accused Products in Claim Chart 06 ("Great Neck Design") are lithium battery powered jump starters having a SMART CLAMP branded cable assembly. The cable assembly includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, includes a resistive divider sensor and transistor. The second sensor, which is the claimed reverse polarity sensor, is a resistive divider sensor. The Great Neck Accused Products are offered under at least the OEM Tools brand. The OEMTOOLS 24474 model jump starter is representative of the Great Neck Accused Products.

RESPONSE: Paragraph 195 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 195 and therefore denies such allegations.

b) Infringement of the '015 Patent

196. On information and belief, select Respondents, including OEM Tools, import, sell for importation, and/or sell within the United States after importation the Great Neck Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Great Neck Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Great Neck Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: Paragraph 196 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 196 and therefore denies such allegations.

197. A claim chart comparing independent claim 1 of the '015 Patent to the representative Great Neck Accused Product, and including photographs and drawings where applicable, is attached as Ex. 116.

RESPONSE: Paragraph 197 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 197 and therefore denies such allegations.

7. Claim Chart 07- ThiEye Accused Products

a) ThiEye Design

198. The Accused Products in Claim Chart 07 ("ThiEye Design") are lithium battery powered jump starters having a SMART CABLE branded cable assembly. The cable assembly includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is also a resistive sensor. The ThiEye Design Accused Products manufactured by Respondent ThiEye are offered under multiple brands, namely BUTURE, Finnemge, and UTRAI. The BUTURE BR500 model jump starter is representative of the ThiEye Design Accused Products.

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RESPONSE: Paragraph 198 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 198 and therefore denies such allegations.

b) Infringement of the '015 Patent

199. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the ThiEye Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the ThiEye Design Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The ThiEye Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: Paragraph 199 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 199 and therefore denies such allegations.

200. A claim chart comparing independent claim 1 of the '015 Patent to the representative ThiEye Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 117.

RESPONSE: Paragraph 200 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 200 and therefore denies such allegations.

c) Infringement of the '024 Patent

201. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the ThiEye Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the ThiEye Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The ThiEye Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the

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United States.

RESPONSE: Paragraph 201 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 201 and therefore denies such allegations.

202. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative ThiEye Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 117.

RESPONSE: Paragraph 202 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 202 and therefore denies such allegations.

8. Claim Chart 08- Energen/Performance Tool Accused Products

a) Energen/Performance Tool Design

203. The Accused Products in Claim Chart 08 ("Energen/ Performance Tool Design") are lithium battery powered jump starters having a cable assembly labeled as "SMART BOOSTER CABLE". The cable assembly includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive sensor. The second sensor, which is the claimed reverse polarity sensor, is a resistive divider sensor. The Energen/Performance Tool Accused Products are offered under multiple brands, including Energen and Performance Tool. The ENERGEN AL12 model jump starter is representative of the Design 11 Accused Products.

RESPONSE: Paragraph 203 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 203 and therefore denies such allegations.

b) Infringement of the '015 Patent

204. On information and belief, select Respondents import, sell for importation, and/or

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sell within the United States after importation the Energen/Performance Tool Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Energen/Performance Tool Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Energen/Performance Tool Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: Paragraph 204 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 204 and therefore denies such allegations.

205. A claim chart comparing independent claim 1 of the '015 Patent to the representative Design 11 Accused Product, and including photographs and drawings where applicable, is attached as Ex. 118.

RESPONSE: Paragraph 205 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 205 and therefore denies such allegations.

c) Infringement of the '024 Patent

206. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Energen/Performance Tool Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Energen/Performance Tool Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Energen/Performance Tool Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: Paragraph 206 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 206 and therefore denies such allegations.

207. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the

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representative Energen/Performance Tool Accused Product, and including photographs and drawings where applicable, is attached as Ex. 118.

RESPONSE: Paragraph 207 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 207 and therefore denies such allegations.

9. Claim Chart 09- HALO Accused Products

a) HALO Design

208. The Accused Products in Claim Chart 09 ("HALO Design") are lithium battery powered jump starters offered under the HALO BOLT brand, that include a relay and two sensors within the main housing of the jump starter. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an optocoupler sensor. The HALO BOLT 4400 model jump starter is representative of the HALO Design Accused Products.

RESPONSE: Paragraph 208 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 208 and therefore denies such allegations.

b) Infringement of the '015 Patent

209. On information and belief, select Respondents, including Halo2Cloud, import, sell for importation, and/or sell within the United States after importation the HALO Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the HALO Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The HALO Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: Paragraph 209 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 209 and therefore denies such

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allegations.

210. A claim chart comparing independent claim 1 of the '015 Patent to the representative HALO Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 119.

RESPONSE: Paragraph 210 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 210 and therefore denies such allegations.

c) Infringement of the '024 Patent

211. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the HALO Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the HALO Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The HALO Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: Paragraph 211 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 211 and therefore denies such allegations.

212. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative HALO Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 119.

RESPONSE: Paragraph 212 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 212 and therefore denies such allegations.

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10. Claim Chart 10- Clore Accused Products

a) Clore Design

213. The Accused Products in Claim Chart 10 ("Clore Design") are lithium battery powered jump starters offered under the Jump-n-Carry brand that have the power switch and two sensors within the main housing of the jump starter. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is optocoupler sensor. The Jump-n-Carry JNC345 model jump starter is representative of the Clore Design Accused Products.

RESPONSE: Respondent admits that NOCO has, at Claim Chart 10, alleged that certain jump starter products infringe certain claims of the '024 Patent and the '015 Patent. Respondent specifically denies that the products that it imports and sells within the United States after importation infringe any valid and enforceable claim of the Asserted Patents. To the extent Paragraph 213 contains legal conclusions, no response is required. Respondent denies all remaining allegations of Paragraph 213.

b) Infringement of the '015 Patent

214. On information and belief, select Respondents, including Respondent Clore Automotive, sell for importation, and/or sell within the United States after importation the Clore Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Clore Design Accused Products also infringe one or more of dependent claims 4, 10, 14, 18, 19 and 21 of the '015 Patent. The Clore Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: Respondent specifically denies that the products that it imports and sells within the United States after importation infringe any valid and enforceable claim of the Asserted Patents. Further answering, Paragraph 214 states a legal conclusion to which no response is required. To the extent one is required, Respondent denies that the "Clore Design Accused Products" satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States." Respondent denies the remaining allegations of Paragraph 214.

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215. A claim chart comparing independent claim 1 of the '015 Patent to the representative Clore Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 120.

RESPONSE: Respondent admits that NOCO has attached, as Exhibit 120, a claim chart purportedly comparing independent claims relating to the '015 Patent to certain products of Respondent. Respondent specifically denies that any products identified in Exhibit 120 infringe any valid and enforceable claim of the Asserted Patents. Respondent denies the remaining allegations of Paragraph 215.

c) Infringement of the '024 Patent

216. On information and belief, select Respondents, including Respondent Clore Automotive, import, sell for importation, and/or sell within the United States after importation the Clore Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Clore Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Clore Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: Respondent specifically denies that the products that it imports and sells within the United States after importation infringe any valid and enforceable claim of the Asserted Patents. Further answering, Paragraph 216 states a legal conclusion to which no response is required. To the extent one is required, Respondent denies that the "Clore Design Accused Products" satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States." Respondent denies the remaining allegations of Paragraph 216.

217. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Clore Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 120.

RESPONSE: Respondent admits that NOCO has attached, as Exhibit 120, a claim chart purportedly comparing independent claims relating to the '024 Patent to certain products of

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Respondent. Respondent specifically denies that any products identified in Exhibit 120 infringe any valid and enforceable claim of the Asserted Patents. Respondent denies the remaining allegations of Paragraph 217.

B. Infringement of the Asserted Trademarks

218. NOCO owns all right, title, and interest in the Asserted Trademarks and has standing to bring an action for trademark infringement under the Lanham Act, 15 U.S.C. § 1051 et seq.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to NOCO's alleged ownership of the Asserted Trademarks and therefore denies such allegations. To the extent Paragraph 4 contains legal conclusions, no response is required. To the extent a response is required, Respondent denies Complainant's allegations that the Asserted Trademarks are infringed.

219. The Asserted Trademarks are on the Principal Register and such registration is prima facie evidence of validity, including secondary meaning. 15 U.S.C. § 1057(b). The Asserted Trademarks are used in commerce by NOCO to market, advertise, and sell the Boost® jump starters.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 219 and therefore denies the same.

220. As explained below, a number of the Respondents use at least one of the Asserted Trademarks in point-of-sale displays posted on online retail stores with the intention of attracting U.S. consumers. These point-of-sale webpages, which include Respondents' own sites as well as third-party commerce sites including Amazon, contain images superimposed with NOCO's Asserted Trademarks and/or use NOCO's Asserted Trademarks in the descriptions of the Accused Products. The webpages provide means for purchasing the Accused Products. Such displays are likely to cause confusion or mistake, and to deceive potential consumers and the public as to the source, origin, sponsorship or approval of Respondents' Accused Products, or as to the affiliation, connection, or association between Respondents and/or their jump starters and NOCO and/or the Boost(R) jump starters.

RESPONSE: Paragraph 220 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 220 and therefore denies such allegations.

221. The exhibits cited below are screenshots of the Accused Products being displayed on a webpage where the product may be purchased. The importation of the Accused Products via these webpages is further described in Section VII.

RESPONSE: Paragraph 221 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 221 and therefore denies such allegations.

222. The Asserted Trademarks are valid, owned by NOCO, and these webpages demonstrate a likelihood of confusion at the point-of-sale, and therefore Respondents are in violation of Section 32 of the Lanham Act. 15 U.S.C. § 1114.
The Respondents identified in the table below import into the United States, sell for importation, and/or sell in the United States after importation certain jump starters and components thereof, using point of sale webpages, and/or packaging that infringe the NOCO Trademarks:

Ultrasafe ('656 TM)	Safely Jump Start a Dead Battery in Seconds ('749 TM)
Audew	Autown
Autown	Beatit
Jumtop	Imazing
Sanrock	Jumtop
Topdon	Nexpow
Trekpow	Sanrock
	Trekpow

Table 3. Accused Products Infringing NOCO Asserted Trademarks

[image omitted]
Fig. 3- NOCO Website- Use of the '749 Trademark

[image omitted]
Fig. 4- NOCO Website- Use of the '656 and '749 Trademarks. Ex. 104

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RESPONSE: Paragraph 222 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 222 and therefore denies such allegations.

Audew

223. The Audew brand uses the NOCO "Ultrasafe" and "Safely Jump Start a Dead Battery in Seconds" trademarks on its website and Amazon listing for its jump starters, which infringes NOCO's '656 and '749 Trademarks and are likely to cause confusion at the point-of-sale. *See* Ex. 27 and 50; *see also* Ex. 121 (importation evidence).

RESPONSE: Paragraph 223 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 223 and therefore denies such allegations.

Autown

224. The Amazon listing for the Autown brand of jump starters includes the phrase "jump starter your dead battery in seconds," and "jump start dead battery fast and safely" which infringes NOCO's '749 Trademark and is likely to cause confusion at the point-of-sale. *See* Ex. 28 and 29. The Autown brand also markets its products using the term "ultra-safe" infringing the '656 Trademark. *See* Ex. 29; *see also* Ex. 52 (importation evidence).

RESPONSE: Paragraph 224 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 224 and therefore denies such allegations.

Beatit

225. The Beatit brand uses the phrases "Safely Jumper start a dead battery in seconds" and "jump start a dead battery in seconds" on their Amazon listings for its jump starters, both of which infringe NOCO's '749 Trademark and are likely to cause confusion at the point-of -sale. *See* Ex. 30; *see also* Ex. 122 (importation evidence).

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RESPONSE: Paragraph 225 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 225 and therefore denies such allegations.

Imazing

226. The Imazing brand jump starter listing on Amazon uses the phrase "safely jump start a dead battery in seconds" which infringes the NOCO '749 Trademark and is likely to cause confusion at the point-of-sale. *See* Ex. 33; *see also* Ex. 124 (importation evidence).

RESPONSE: Paragraph 226 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 226 and therefore denies such allegations.

Jumtop

227. The Jumtop brand of jump starters uses the phrases "ULTRA SAFE," "ultra-safe" and "jump start a dead battery in seconds" on its Amazon listings for its jump starters, which infringes both the NOCO '656 and '749 Trademarks and is likely to cause confusion at the point-of-sale. *See* Ex. 34, 35 and 36; *see also* Ex. 72 (importation evidence).

RESPONSE: Paragraph 227 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 227 and therefore denies such allegations.

Nexpow

228. The Nexpow brand of jump starters uses the phrase "jump start a dead battery in seconds" on its Amazon listing for its jump starters, which infringes the NOCO '749 Trademark and is likely to cause confusion at the point-of-sale. *See* Ex. 37; *see also* Ex. 79 (importation evidence).

RESPONSE: Paragraph 228 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 228 and therefore denies such allegations.

Sanrock

229. The Sanrock brand of jump starters uses the phrases "safely jump start a dead battery in seconds" and "ultra-safe" in its Amazon listings for its jump starters, which infringes the NOCO '656 and '749 Trademarks and is likely to cause confusion at the point-of-sale. *See* Ex. 38 and 39; *see also* Ex. 86 (importation evidence).

[image omitted]

Fig.5- Image from Sanrock Amazon listing showing infringement of '749 Trademark

RESPONSE: Paragraph 229 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 229 and therefore denies such allegations.

Topdon

230. The Topdon brand of jump starters uses the phrase "ultra safe" on the packaging of its Volcano jump starters, infringing the NOCO '656 Trademark. *See* Ex. 40; *see also* Ex. 92 (importation evidence).

RESPONSE: Paragraph 230 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 230 and therefore denies such allegations.

Trekpow

231. The Trekpow brand of jump starters uses the phrases "ultra-safe," "jump start dead battery in seconds," and "safely jump start a dead battery in seconds" in its Amazon listings, which infringes the NOCO '656 and '749 Trademarks and is likely to cause confusion at the point-of-sale. *See* Ex. 41, 42 and 43; *see also* Ex. 95 (importation evidence).

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RESPONSE: Paragraph 231 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 231 and therefore denies such allegations.

VII. SPECIFIC INSTANCES OF IMPORTATION AND SALE

232. As stated above, on information and belief, a subset of Respondents manufactures and/or have manufactured outside the United States, import into the United States, and/or sell for importation into the United States the Accused Products. Other named Respondents import into the United States and/or sell after importation into the United States the Accused Products. The Accused Products, certain portable battery jump starters and related components, are imported, sold for importation, and/or sold after importation as described below.

RESPONSE: Respondent specifically denies that the products that it imports or sells infringe any valid and enforceable claim of the Asserted Patents. To the extent a response is required the remaining allegations of Paragraph 232, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 232 and therefore denies such allegations.

A. Carku Brands

1. AllStart

233. On information and belief, model numbers Boost (No. 550), Boost Max (No. 560), Boost Ultra (No. 590), and Micro-Boost (No. 540) (collectively, the "AllStart Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name AllStart. *See* Ex. 44C, ¶¶ 5-6.

RESPONSE: Paragraph 233 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 233 and therefore denies such allegations.

234. On information and belief, products sold under the brand AllStart are manufactured by and/or imported for sale by Respondents Horizon Tool, Carku, and Boltpower. *See* Ex. 44C, ¶¶

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5-6.

RESPONSE: Paragraph 234 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 234 and therefore denies such allegations.

235. The AllStart Accused Products are sold after importation into the United States. For example, a receipt from cal-vantools.com showing the purchase of an AllStart Boost (No.550) at an address in the United States is attached as Ex. 46. On information and belief, the AllStart Accused Products are also sold by Walmart, Advance Auto, and Horizon Tool. *See, e.g.,* https://www.walmart.com/ip/AllStart-540-Micro-Boost-Battery-Jump-Starter-500AMP-V6-Engines/635710663.

RESPONSE: Paragraph 235 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 235 and therefore denies such allegations.

236. The packaging of the AllStart Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 5 (citing Ex. 46).

RESPONSE: Paragraph 236 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 236 and therefore denies such allegations.

2. Antigravity Batteries

237. On information and belief, model numbers XP-1, XP-10, XP-10-HD, and XP-3 (collectively, the "Antigravity Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Antigravity. *See* Ex. 44C, ¶¶ 9-10.

RESPONSE: Paragraph 237 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 237 and therefore denies such allegations.

238. On information and belief, products sold under the brand Antigravity are manufactured by and/or imported for sale by Respondents Antigravity, Carku, and Gulin. *See* Ex. 44C, ¶¶ 9-10.

RESPONSE: Paragraph 238 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 238 and therefore denies such allegations.

239. The Antigravity Accused Products are sold after importation into the United States. For example, a receipt from antigravitybatteries.com showing the purchase of an Antigravity XP-1 and XP-10-HD at an address in the United States is attached as Ex. 48. The Antigravity Accused Products are also sold by Respondent Walmart. *See, e.g.,* https://www.walmart.com/ip/Antigravity-Batteries-XP-10-HD-Heavy-Duty-MICRO-START-Jump-Starter-Portable-Power-Supply-Kit/580014186.

RESPONSE: Paragraph 239 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 239 and therefore denies such allegations.

240. The packaging of the Antigravity Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 10 (citing Ex. 48).

RESPONSE: Paragraph 240 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 240 and therefore denies such allegations.

3. Audew

241. On information and belief, model numbers Epower-146 (1000A/10800mAh), 500A/13800mAH, 800A/16800mAh, Epower-172 (1500A/17000mAh), and Epower-

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155 (1500A/2000mAh) (collectively, the "Audew Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Audew. *See* Ex. 44C, ¶¶ 13-14.

RESPONSE: Paragraph 241 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 241 and therefore denies such allegations.

242. On information and belief, products sold under the brand Audew are manufactured by and/or imported for sale by Respondents Carku and Guangzhou Unique Electronics. *See* Ex. 44C, ¶¶ 13-14; Ex. 121.

RESPONSE: Paragraph 242 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 242 and therefore denies such allegations.

243. The Audew Accused Products are sold after importation into the United States. For example, a receipt from audew.com showing the purchase of an Audew Epower-146 (1000A/10800mAh) and Epower-172 (1500A/17000mAh) at an address in the United States is attached as Ex. 121. The Audew Accused Products are also sold by Respondent Walmart. *See, e.g.,* https://www.walmart.com/ip/Audew-Jump-Starter-Car-Auto-Battery-Jump-Starter-Portable-2000A-Charger-20000mAh/226026281?findingMethod=wpa.

RESPONSE: Paragraph 243 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 243 and therefore denies such allegations.

244. The packaging of the Audew Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 11; Ex. 121.

RESPONSE: Paragraph 244 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 244 and therefore denies such allegations.

4. Autogen

245. On information and belief, model number MJS-P111B (4000A) (the "Autogen Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Autogen. *See* Ex. 44C, ¶¶ 15-16.

RESPONSE: Paragraph 245 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 245 and therefore denies such allegations.

246. On information and belief, products sold under the brand Autogen are manufactured by and/or imported for sale by Respondents Autogen and Carku. *See* Ex. 44C, ¶¶ 15-16.

RESPONSE: Paragraph 246 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 246 and therefore denies such allegations.

247. The Autogen Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Autogen MJS-P111B (4000A) at an address in the United States is attached as Ex. 51.

RESPONSE: Paragraph 247 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 247 and therefore denies such allegations.

248. The packaging of the Autogen Accused Product indicates that the product was "Made in China." *See* Ex. 44C, ¶ 15 (citing Ex. 51).

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RESPONSE: Paragraph 248 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 248 and therefore denies such allegations.

5. Freeman

249. On information and belief, model number P800AJS (the "Freeman Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Freeman. *See* Ex. 44C, ¶¶ 47-48.

RESPONSE: Paragraph 249 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 249 and therefore denies such allegations.

250. On information and belief, products sold under the brand Freeman are manufactured by and/or imported for sale by Respondents Prime Global Products and Carku. *See* Ex. 44C, ¶¶ 47-48.

RESPONSE: Paragraph 250 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 250 and therefore denies such allegations.

251. The Freeman Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Freeman P800AJS at an address in the United States is attached as Ex. 66.

RESPONSE: Paragraph 251 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 251 and therefore denies such allegations.

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252. The packaging of the Freeman Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 47 (citing Ex. 66).

RESPONSE: Paragraph 252 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 252 and therefore denies such allegations.

6. **Gooloo**

253. On information and belief, model numbers GP1500, GP200, GP37-Plus, GP80 (800A), and GT-1500 (collectively, the "Gooloo Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Gooloo. *See* Ex. 44C, ¶¶ 49-51.

RESPONSE: Paragraph 253 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 253 and therefore denies such allegations.

254. On information and belief, products sold under the brand Gooloo are manufactured by and/or imported for sale by Respondent Gooloo and Carku. *See* Ex. 44C, ¶¶ 41-42.

RESPONSE: Paragraph 254 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 254 and therefore denies such allegations.

255. The Gooloo Accused Products are sold after importation into the United States. For example, receipts from Amazon.com showing the purchase of a Gooloo GP80 (800A), GP200, and GT-1500 at an address in the United States is attached as Ex. 67. The Gooloo Accused Products are also sold by Respondent Walmart. *See, e.g.,* https://www.walmart.com/ip/GOOLOO-800Amp-12-Volt-SuperSafe-Car-Jump-Starter-with-LED-Flashlight-and-USB-for-Up-to-4-5-Liter-Gasoline/801082784

RESPONSE: Paragraph 255 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 255 and therefore denies such allegations.

256. The packaging of the Gooloo Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 49-50 (citing Ex. 57).

RESPONSE: Paragraph 256 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 256 and therefore denies such allegations.

7. Grepro

257. On information and belief, model numbers GP-JS-1500A (GP71C) and GP-JS-500A (collectively, the "Grepro Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Grepro. *See* Ex. 44C, ¶¶ 52-53.

RESPONSE: Paragraph 257 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 257 and therefore denies such allegations.

258. On information and belief, products sold under the brand Grepro aremanufactured by and/or imported for sale by Respondents Huizhou Grepro E-Commerce and Carku. See Ex. 44C, ¶¶ 52-53. The Grepro Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Grepro GP-JS-1500A (GP71C) at an address in the United States is attached as Ex. 131.

RESPONSE: Paragraph 258 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 258 and therefore denies such allegations.

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259. The packaging of the Grepro Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 52 (citing Ex. 68); Ex. 131.

RESPONSE: Paragraph 259 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 259 and therefore denies such allegations.

8. **iClever**

260. On information and belief, model number IC-JQ21Y (the "iClever Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name iClever. *See* Ex. 44C, ¶¶ 56-58.

RESPONSE: Paragraph 260 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 260 and therefore denies such allegations.

261. On information and belief, products sold under the brand iClever are manufactured by and/or imported for sale by Respondent Carku. *See* Ex. 44C, ¶¶ 56-58.

RESPONSE: Paragraph 261 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 261 and therefore denies such allegations.

262. On information and belief, the iClever Accused Product is sold after importation into the United States. *See* Ex. 44C, ¶¶ 56-58 (citing Ex. 70).

RESPONSE: Paragraph 262 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 262 and therefore denies such

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allegations.

263. On information and belief, the iClever Accused Product is manufactured in China. *See* Ex. 44C, ¶¶ 56-58 (citing Ex. 70).

RESPONSE: Paragraph 263 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 263 and therefore denies such allegations.

9. M Moock

264. On information and belief, model numbers MK200 (1500A) and MK800 (2000A) (collectively, the "M Moock Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name M Moock. *See* Ex. 44C, ¶¶ 74-75.

RESPONSE: Paragraph 264 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 264 and therefore denies such allegations.

265. On information and belief, products sold under the brand M Moock are manufactured by and/or imported for sale by Respondent Shenzhen Moock. *See* Ex. 44C, ¶¶ 74-75.

RESPONSE: Paragraph 265 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 265 and therefore denies such allegations.

266. The M Moock Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a M Moock MK800 (2000A) at an address in the United States is attached as Ex. 125.

RESPONSE: Paragraph 266 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 266 and therefore denies such allegations.

267. The packaging of the M Moock Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 71; Ex. 125.

RESPONSE: Paragraph 267 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 267 and therefore denies such allegations.

10. Nekteck

268. On information and belief, model numbers NK-JS19800 (2000A/19800mAh), NK-JS12000 (D31) (500A/12000mAh), NK-JS12000 (600A/16800mAh), and D45 (800A/20000mAh) (collectively, the "Nekteck Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Nekteck. *See* Ex. 44C, ¶¶ 76-77.

RESPONSE: Paragraph 268 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 268 and therefore denies such allegations.

269. On information and belief, products sold under the brand Nekteck are manufactured by and/or imported for sale by Respondents Nekteck, Medcursor, and Sictec Instruments. *See* Ex. 44C, ¶¶ 76-77.

RESPONSE: Paragraph 269 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 269 and therefore denies such allegations.

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270. The Nekteck Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Nekteck NK-JS12000 (D31) (500A/12000mAh) and NK-JS12000 (600A/16800mAh) at an address in the United States is attached as Ex. 132.

RESPONSE: Paragraph 270 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 270 and therefore denies such allegations.

271. The packaging of the Nekteck Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 76 (citing Ex. 78); Ex. 132.

RESPONSE: Paragraph 271 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 271 and therefore denies such allegations.

11. PowerMax

272. On information and belief, model numbers PM91004 and PM91006 (collectively, the "PowerMax Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name PowerMax. *See* Ex. 44C, ¶¶ 88-89

RESPONSE: Paragraph 272 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 272 and therefore denies such allegations.

273. On information and belief, products sold under the brand PowerMax are manufactured by and/or imported for sale by Respondents PowerMax and Carku. *See* Ex. 44C, ¶¶ 88-89.

RESPONSE: Paragraph 273 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 273 and therefore denies such allegations.

274. The PowerMax Accused Products are sold after importation into the United States. For example, a receipt from Home Depot (homedepot.com) showing the purchase of a PowerMax PM91006 at an address in the United States is attached as Ex. 84.

RESPONSE: Paragraph 274 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 274 and therefore denies such allegations.

275. On information and belief, the PowerMax Accused Products are manufactured in China. *See* Ex. 44C, ¶ 88 (citing Ex. 84).

RESPONSE: Paragraph 275 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 275 and therefore denies such allegations.

12. Tacklife

276. On information and belief, model numbers KP120, KP200, T6, T8 (Newer Model), T8 Max, T8 MAX, and T8 Pro (collectively, the "Tacklife Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Tacklife. *See* Ex. 44C, ¶¶ 103-107.

RESPONSE: Paragraph 276 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 276 and therefore denies such allegations.

277. On information and belief, products sold under the brand Tacklife are manufactured by and/or imported for sale by Respondents Aukey and Shenzhen Take Tools. *See* Ex. 44C, ¶¶ 103-107.

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RESPONSE: Paragraph 277 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 277 and therefore denies such allegations.

278. The Tacklife Accused Products are sold after importation into the United States. For example, receipts from Amazon.com showing the purchase of a Tacklife T8, T8 (Newer Model), T8 MAX, and T8 Pro at an address in the United States are attached as Ex. 126.

RESPONSE: Paragraph 278 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 278 and therefore denies such allegations.

279. The packaging of the Tacklife Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 103-106; Ex. 126.

RESPONSE: Paragraph 279 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 279 and therefore denies such allegations.

13. Xiaomi

280. On information and belief, model number Midrive PS02 (11100 mAh 600A) (the "Xiaomi Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Xiaomi. *See* Ex. 44C, ¶¶ 131-132; Ex. 130C.

RESPONSE: Paragraph 280 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 280 and therefore denies such allegations.

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281. On information and belief, products sold under the brand Xiaomi are manufactured by and/or imported for sale by Respondents 70mai and Carku. *See* Ex. 44C, ¶¶ 131-133; Ex. 130C.

RESPONSE: Paragraph 281 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 281 and therefore denies such allegations.

282. The Xiaomi Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a PS02 (11100 mAh 600A) jump starter at an address in the United States is attached as Ex. 129. In addition, Walmart.com and Amazon.com listings indicate the Xiaomi Accused Product is manufactured by and/or imported by Respondent 70mai. *See* Ex. 44C, ¶¶ 131-133 (citing Ex. 102); Ex. 130C.

RESPONSE: Paragraph 282 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 282 and therefore denies such allegations.

283. The packaging of the Xiaomi Accused Product identifies "70mai Co., Ltd." and indicates it was "Made in China." *See* Ex. 44C, ¶¶ 131-133 (citing Ex. 102); Ex. 130C (citing Ex. 129).

RESPONSE: Paragraph 283 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 283 and therefore denies such allegations.

B. Boltpower Brands

1. Ampeak

284. On information and belief, model number JS1 (the "Ampeak Accused Product")is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Ampeak. *See* Ex. 44C, ¶¶ 7-8.

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RESPONSE: Paragraph 284 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 284 and therefore denies such allegations.

285. On information and belief, products sold under the brand Ampeak are manufactured by and/or imported for sale by Respondent Valuelink. *See* Ex. 44C, ¶¶ 5-6.

RESPONSE: Paragraph 285 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 285 and therefore denies such allegations.

286. The Ampeak Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Ampeak JS1 at an address in the United States is attached as Ex. 47.

RESPONSE: Paragraph 286 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 286 and therefore denies such allegations.

287. The packaging of the Ampeak Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 7 (citing Ex. 47).

RESPONSE: Paragraph 287 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 287 and therefore denies such allegations.

2. Arteck

288. On information and belief, model numbers A7, D29, JS08, and JS12 (collectively, the "Arteck Accused Products") are manufactured outside the United States and sold for

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importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Arteck. *See* Ex. 44C, ¶¶ 11-12.

RESPONSE: Paragraph 288 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 288 and therefore denies such allegations.

289. On information and belief, products sold under the brand Arteck are manufactured by and/or imported for sale by Respondents Arteck Electronic and Boltpower. *See* Ex. 44C, ¶¶ 11-12.

RESPONSE: Paragraph 289 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 289 and therefore denies such allegations.

290. The Arteck Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Arteck A7 at an address in the United States is attached as Ex. 49.

RESPONSE: Paragraph 290 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 290 and therefore denies such allegations.

291. The packaging of the Arteck Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 11 (citing Ex. 49).

RESPONSE: Paragraph 291 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 291 and therefore denies such allegations.

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3. Autown

292. On information and belief, model numbers RP-PI-01 (1000A), RP-PI02 (500A/10000mAh), RP-PI-03 (800A), and RP-PI-04 (2000A) (collectively, the "Autown Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Autown. *See* Ex. 44C, ¶¶ 17-18.

RESPONSE: Paragraph 292 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 292 and therefore denies such allegations.

293. On information and belief, products sold under the brand Autown are manufactured by and/or imported for sale by Respondents Boltpower and Zhejiang Qingyou Electronic. *See* Ex. 44C, ¶¶ 17-18.

RESPONSE: Paragraph 293 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 293 and therefore denies such allegations.

294. The Autown Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Autown RP-PI-03 (800A) at an address in the United States is attached as Ex. 52.

RESPONSE: Paragraph 294 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 294 and therefore denies such allegations.

295. The packaging of the Autown Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 17 (citing Ex. 52).

RESPONSE: Paragraph 295 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 295 and therefore denies such allegations.

4. Battery Tender

296. On information and belief, model numbers 030-1011-WAL (1000A/8000mAh), 030-1011-WH (1000A/8000mAh), 030-1000-PM (600A/6000mAh), and 030-1010-WH (800A/7200mAh) (collectively, the "Battery Tender Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Battery Tender. *See* Ex. 44C, ¶¶ 19-20.

RESPONSE: Paragraph 296 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 296 and therefore denies such allegations.

297. On information and belief, products sold under the brand Battery Tender are manufactured by and/or imported for sale by Respondents Deltran and Boltpower. *See* Ex. 44C, ¶¶ 19-20.

RESPONSE: Paragraph 297 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 297 and therefore denies such allegations.

298. The Battery Tender Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Battery Tender 030-1010-WH (800A/7200mAh) at an address in the United States is attached as Ex. 53.

RESPONSE: Paragraph 298 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 298 and therefore denies such allegations.

299. The packaging of the Battery Tender Accused Products indicates that the products

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are "Made in China." *See* Ex. 44C, ¶ 19 (citing Ex. 53).

RESPONSE: Paragraph 299 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 299 and therefore denies such allegations.

5. Beatit

300. On information and belief, model numbers B10 (500A), B10 Pro (800A), B7 (1200A), BP101 (2200A), D11 (800A), G18 (2000A), and G22 (1500A) (collectively, the"Beatit Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Beatit. *See* Ex. 44C, ¶¶ 21-23.

RESPONSE: Paragraph 300 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 300 and therefore denies such allegations.

301. On information and belief, products sold under the brand Beatit are manufactured by and/or imported for sale by Respondents Boltpower, Shenzhen Mediatek Tong, and Lianfatong. *See* Ex. 44C, ¶¶ 21-23.

RESPONSE: Paragraph 301 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 301 and therefore denies such allegations.

302. The Beatit Accused Products are sold after importation into the United States. For example, receipts from Amazon.com showing the purchase of a Beatit B10, B10 Pro (800A), B7 (1200A), BP101 (2200A), D11 (800A), and G18 (200A) at an address in the United States is attached as Ex. 122.

RESPONSE: Paragraph 302 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 302 and therefore denies such allegations.

303. The packaging of the Beatit Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 21-22; Ex. 122.

RESPONSE: Paragraph 303 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 303 and therefore denies such allegations.

6. Boltpower

304. On information and belief, model numbers A7P, D28, D29, G33A, and N02 (collectively, the "Boltpower Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Boltpower. *See* Ex. 44C, ¶¶ 24-26.

RESPONSE: Paragraph 304 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 304 and therefore denies such allegations.

305. On information and belief, products sold under the brand Boltpower are manufactured by and/or imported for sale by Respondent Boltpower and Tii Trading. *See* Ex. 44C, ¶¶ 24-26.

RESPONSE: Paragraph 305 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 305 and therefore denies such allegations.

306. The Boltpower Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com and eBay.com showing the purchase of a Boltpower A7P, D28, D29, G33A, and N02 at an address in the United States is attached as Ex. 55.

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RESPONSE: Paragraph 306 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 306 and therefore denies such allegations.

307. The packaging of the Boltpower Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 24-25 (citing Ex. 55).

RESPONSE: Paragraph 307 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 307 and therefore denies such allegations.

7. DB Power/Valuelink

308. On information and belief, model numbers DJS50 (800A/18000mAh), DJS80, G15, G16 (2000A/20800mAh), A09, DJS40, DJS50, DJS60, G09D, and N01(collectively, the "DB Power Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name DB Power. *See* Ex. 44C, ¶¶ 31-32.

RESPONSE: Paragraph 308 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 308 and therefore denies such allegations.

309. On information and belief, products sold under the brand DB Power are manufactured by and/or imported for sale by Respondents Boltpower and Shenzhen Valuelink. *See* Ex. 44C, ¶¶ 31-32.

RESPONSE: Paragraph 309 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 309 and therefore denies such allegations.

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310. The DB Power Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a DB Power DJS50 (800A/1800mAh) and G16 (2000A/20800mAh) at an address in the United States is attached as Ex. 58.

RESPONSE: Paragraph 310 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 310 and therefore denies such allegations.

311. The packaging of the DB Power Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 31 (citing Ex. 58).

RESPONSE: Paragraph 311 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 311 and therefore denies such allegations.

8. DieHard

312. On information and belief, model numbers 43448 (8000mAH) and DH110 (400A) (collectively, the "DieHard Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name DieHard. *See* Ex. 44C, ¶¶ 33-34.

RESPONSE: Paragraph 312 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 312 and therefore denies such allegations.

313. On information and belief, products sold under the brand Schumacher are manufactured by and/or imported for sale by Respondents Boltpower and Schumacher. *See* Ex. 44C, ¶¶ 33-34.

RESPONSE: Paragraph 313 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 313 and therefore denies such allegations.

314. The DieHard Accused Products are sold after importation into the United States. For example, receipts from Amazon.com and menards.com showing the purchase of a Die Hard DH110 and 43448 at an address in the United States are attached as Ex. 59. On information and belief, the DieHard Accused Products are also sold by Walmart. *See, e.g.,* https://www.walmart.com/ip/Diehard-Jumpstart-400amp/126963604?wmlspartner=wlpa&selectedSellerId=5227

RESPONSE: Paragraph 314 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 314 and therefore denies such allegations.

315. The packaging of the DieHard Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 33 (citing Ex. 59).

RESPONSE: Paragraph 315 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 315 and therefore denies such allegations.

9. Duralast

316. On information and belief, model numbers DL-2000lI and DL-800L (collectively, the "Duralast Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Duralast. *See* Ex. 44C, ¶¶ 35-36.

RESPONSE: Paragraph 316 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 316 and therefore denies such allegations.

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317. On information and belief, products sold under the brand Duralast are manufactured by and/or imported for sale by Respondents Boltpower, Schumacher, and Best Parts. *See* Ex. 44C, ¶¶ 21-23

RESPONSE: Paragraph 317 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 317 and therefore denies such allegations.

318. The Duralast Accused Products are sold after importation into the United States. For example, a receipt from Autozone.com showing the purchase of a Duralast DL-800L at an address in the United States is attached as Ex. 60.

RESPONSE: Paragraph 318 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 318 and therefore denies such allegations.

319. The packaging of the Duralast Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 35 (citing Ex. 60).

RESPONSE: Paragraph 319 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 319 and therefore denies such allegations.

10. EverStart

320. On information and belief, model number SL097 (collectively, the "EverStart Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name EverStart. *See* Ex. 44C, ¶¶ 39-40.

RESPONSE: Paragraph 320 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 320 and therefore denies such allegations.

321. On information and belief, products sold under the brand EverStart are manufactured by and/or imported for sale by Respondents Boltpower and Schumacher. *See* Ex. 44C, ¶¶ 39-40.

RESPONSE: Paragraph 321 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 321 and therefore denies such allegations.

322. The EverStart Accused Products are sold after importation into the United States. For example, a receipt from Walmart.com showing the purchase of an EverStart SL097 at an address in the United States is attached as Ex. 62.

RESPONSE: Paragraph 322 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 322 and therefore denies such allegations.

323. The packaging of the EverStart Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 39 (citing Ex. 62).

RESPONSE: Paragraph 323 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 323 and therefore denies such allegations.

11. Fconegy

324. On information and belief, model numbers FC100 and FC200 (collectively, the "Fconegy Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Fconegy. *See* Ex. 44C, ¶¶ 41-42.

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RESPONSE: Paragraph 324 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 324 and therefore denies such allegations.

325. On information and belief, products sold under the brand Fconegy are manufactured by and/or imported for sale by Respondents Boltpower and Fconegy. *See* Ex. 44C, ¶¶ 41-42; Ex. 31.

RESPONSE: Paragraph 325 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 325 and therefore denies such allegations.

326. The Fconegy Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Fconegy FC100 at an address in the United States is attached as Ex. 63.

RESPONSE: Paragraph 326 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 326 and therefore denies such allegations.

327. The packaging of the Fconegy Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 41 (citing Ex. 63).

RESPONSE: Paragraph 327 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 327 and therefore denies such allegations.

12. Flylinktech

328. On information and belief, model numbers CF100, CF200, CF300, CF400, and

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CF600 (collectively, the "Flylinktech Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Flylinktech. *See* Ex. 44C, ¶¶ 43-44.

RESPONSE: Paragraph 328 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 328 and therefore denies such allegations.

329. On information and belief, products sold under the brand Flylinktech are manufactured by and/or imported for sale by Respondents Boltpower and Flylink Tech Company. *See* Ex. 44C, ¶¶ 43-44.

RESPONSE: Paragraph 329 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 329 and therefore denies such allegations.

330. The Flylinktech Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Flylinktech CF600 at an address in the United States is attached as Ex. 64.

RESPONSE: Paragraph 330 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 330 and therefore denies such allegations.

331. The packaging of the Flylinktech Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 43 (citing Ex. 64).

RESPONSE: Paragraph 331 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 331 and therefore denies such

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allegations.

13. Imazing

332. On information and belief, model numbers G26, G27, G29P, IM23, IM25, IM27/G26, IM29/G29, IM31, and J8 (collectively, the "Imazing Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Imazing. *See* Ex. 44C, ¶¶ 59-60.

RESPONSE: Paragraph 332 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 332 and therefore denies such allegations.

333. On information and belief, products sold under the brand Imazing are manufactured by and/or imported for sale by Respondents Boltpower, Circus Link, and Smart Well. *See* Ex. 44C, ¶¶ 59-60.

RESPONSE: Paragraph 333 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 333 and therefore denies such allegations.

334. The Imazing Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Imazing J8 and IM23, and IM31 at an address in the United States is attached as Ex. 124. The Imazing Accused Products are also sold by Respondent Walmart. *See, e.g.,* https://www.walmart.com/ip/Imazing-Portable-Car-Lithium-Jump-Starter-2500A-Peak-21000mAh-Up-10L-Gas-Diesel-Engine-12V-Auto-Battery-Booster-Power-Pack-Jumper-Cables-QC-3-0-110V-/180839543

RESPONSE: Paragraph 334 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 334 and therefore denies such allegations.

335. The packaging of the Imazing Accused Products indicates that the products are

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"Made in China." *See* Ex. 44C, ¶ 59; Ex. 124.

RESPONSE: Paragraph 335 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 335 and therefore denies such allegations.

14. Jumtop

336. On information and belief, model numbers N13, D09, E18, and N12 (collectively, the "Jumtop Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Jumtop. *See* Ex. 44C, ¶¶ 63-64.

RESPONSE: Paragraph 336 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 336 and therefore denies such allegations.

337. On information and belief, products sold under the brand Jumtop are manufactured by and/or imported for sale by Respondents Boltpower and Autolion. *See* Ex. 44C, ¶¶ 63-64.

RESPONSE: Paragraph 337 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 337 and therefore denies such allegations.

338. The Jumtop Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Jumtop N13 at an address in the United States is attached as Ex. 72.

RESPONSE: Paragraph 338 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 338 and therefore denies such

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allegations.

339. The packaging of the Jumtop Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 63 (citing Ex. 72).

RESPONSE: Paragraph 339 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 339 and therefore denies such allegations.

15. KTI (K-Tool International)

340. On information and belief, model numbers KTI-74391, KTI-74392, and KTI-74393 (collectively, the "K-Tool Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name K-Tool. *See* Ex. 44C, ¶¶ 65-66.

RESPONSE: Paragraph 340 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 340 and therefore denies such allegations.

341. On information and belief, products sold under the brand K-Tool are manufactured by and/or imported for sale by Respondents K-Tool and Boltpower. *See* Ex. 44C, ¶¶ 65-66.

RESPONSE: Paragraph 341 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 341 and therefore denies such allegations.

342. The K-Tool Accused Products are sold after importation into the United States. For example, a receipt from Walmart.com showing the purchase of a K-Tool KTI-74392 at an address in the United States is attached as Ex. 73. The K-Tool Accused Products are also sold by Respondent Advance Auto Parts. *See, e.g.,* https://shop.advanceautoparts.com/p/k-tool-international-jump-starter-power-s-kti74392/12009092-P?searchTerm=kti%20jump%20starter

RESPONSE: Paragraph 342 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 342 and therefore denies such allegations.

343. The packaging of the K-Tool Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 65 (citing Ex. 73).

RESPONSE: Paragraph 343 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 343 and therefore denies such allegations.

16. Lemsir

344. On information and belief, model numbers L6 (800A/10800mAh), V1 (2000A/21000mAh), V2 (1500A/15600mAh), V3 (2200A/21000mAh), and V8 (800A/12800mAh) (collectively, the "Lemsir Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Lemsir. *See* Ex. 44C, ¶¶ 67-68.

RESPONSE: Paragraph 344 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 344 and therefore denies such allegations.

345. On information and belief, products sold under the brand Lemsir are manufactured by and/or imported for sale by Respondents Boltpower, Shenzhen Mediatek Tong, and Lianfatong. *See* Ex. 44C, ¶¶ 67-68.

RESPONSE: Paragraph 345 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 345 and therefore denies such allegations.

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346. The Lemsir Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Lemsir V8 (800A/12800mAh) at an address in the United States is attached as Ex. 74.

RESPONSE: Paragraph 346 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 346 and therefore denies such allegations.

347. The packaging of the Lemsir Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 67 (citing Ex. 74).

RESPONSE: Paragraph 347 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 347 and therefore denies such allegations.

17. Loftek

348. On information and belief, model numbers Y29 and G21 (collectively, the"Loftek Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Loftek. *See* Ex. 44C, ¶¶ 69-70.

RESPONSE: Paragraph 348 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 348 and therefore denies such allegations.

349. On information and belief, products sold under the brand Loftek are manufactured by and/or imported for sale by Respondent Boltpower. *See* Ex. 44C, ¶¶ 69-70.

RESPONSE: Paragraph 349 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 349 and therefore denies such

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allegations.

350. The Loftek Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Loftek G21 at an address in the United States is attached as Ex. 75.

RESPONSE: Paragraph 350 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 350 and therefore denies such allegations.

351. The packaging of the Loftek Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 69 (citing Ex. 75).

RESPONSE: Paragraph 351 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 351 and therefore denies such allegations.

18. Matco Tools

352. On information and belief, model numbers MICROJUMP, MINIJUMP3, and VERSAPRO3 (collectively, the "Matco Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Matco. *See* Ex. 44C, ¶¶ 71-73.

RESPONSE: Paragraph 352 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 352 and therefore denies such allegations.

353. On information and belief, products sold under the brand Matco are manufactured by and/or imported for sale by Respondents Matco, Boltpower, Carku, and Horizon Tool. *See* Ex. 44C, ¶¶ 71-73.

RESPONSE: Paragraph 353 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 353 and therefore denies such allegations.

354. The Matco Accused Products are sold after importation into the United States. For example, receipts from matcotools.com showing the purchase of a Matco MICROJUMP and VERSAPRO3 at an address in the United States is attached as Ex. 76.

RESPONSE: Paragraph 354 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 354 and therefore denies such allegations.

355. The packaging of the Matco Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 71-72 (citing Ex. 76).

RESPONSE: Paragraph 355 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 355 and therefore denies such allegations.

19. Nexpow

356. On information and belief, model numbers G7 (2000A) and G7 (1500A) (collectively, the "Nexpow Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Nexpow. *See* Ex. 44C, ¶¶ 78-79.

RESPONSE: Paragraph 356 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 356 and therefore denies such allegations.

357. On information and belief, products sold under the brand Nexpow are manufactured by and/or imported for sale by Respondents Boltpower and Hangchebao. *See* Ex. 44C, ¶¶ 78-79.

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RESPONSE: Paragraph 357 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 357 and therefore denies such allegations.

358. The Nexpow Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Nexpow G17 (1500A) at an address in the United States is attached as Ex. 79.

RESPONSE: Paragraph 358 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 358 and therefore denies such allegations.

359. The packaging of the Nexpow Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 78 (citing Ex. 79).

RESPONSE: Paragraph 359 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 359 and therefore denies such allegations.

20. PowerCache

360. On information and belief, model numbers 39602 and 39603 (G19) (collectively, the "PowerCache Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name PowerCache. *See* Ex. 44C, ¶¶ 86-87.

RESPONSE: Paragraph 360 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 360 and therefore denies such allegations.

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361. On information and belief, products sold under the brand PowerCache are manufactured by and/or imported for sale by Respondents Boltpower and MonoPrice. *See* Ex. 44C, ¶¶ 86-87.

RESPONSE: Paragraph 361 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 361 and therefore denies such allegations.

362. The PowerCache Accused Products are sold after importation into the United States. For example, a receipt from Monoprice.com showing the purchase of a PowerCache 39603 (G19) at an address in the United States is attached as Ex. 83.

RESPONSE: Paragraph 362 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 362 and therefore denies such allegations.

363. The packaging of the PowerCache Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 86-87 (citing Ex. 83).

RESPONSE: Paragraph 363 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 363 and therefore denies such allegations.

21. Roav

364. On information and belief, model numbers Pro 1000A and Pro 800 (collectively, the "Roav Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Roav. *See* Ex. 44C, ¶¶ 90-91.

RESPONSE: Paragraph 364 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 364 and therefore denies such allegations.

365. On information and belief, products sold under the brand Roav are manufactured by and/or imported for sale by Respondents Boltpower and Anker Technology (UK). *See* Ex.85.

RESPONSE: Paragraph 365 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 365 and therefore denies such allegations.

366. The Roav Accused Products are sold after importation into the United States. For example, a receipt from bestbuy.com showing the purchase of a Roav Pro 800 at an address in the United States is attached as Ex. 85. On information and belief, the Roav Accused Products are also sold by Respondents NAPA, Walmart and Best Buy. *See, e.g.,* https://www.bestbuy.com/site/anker-roav-jump-starter-pro-black/6297939.p?skuId=6297939

RESPONSE: Paragraph 366 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 366 and therefore denies such allegations.

367. The packaging of the Roav Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 90 (citing Ex. 85).

RESPONSE: Paragraph 367 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 367 and therefore denies such allegations.

22. Sanrock

368. On information and belief, model number G37 (the "Sanrock Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Sanrock. *See* Ex. 44C, ¶¶ 92-93.

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RESPONSE: Paragraph 368 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 368 and therefore denies such allegations.

369. On information and belief, products sold under the brand Sanrock are manufactured by and/or imported for sale by Respondents Boltpower and Shenzhen Li Feng Maoyiyouxiangognsi. *See* Ex. 44C, ¶¶ 92-93.

RESPONSE: Paragraph 369 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 369 and therefore denies such allegations.

370. The Sanrock Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Sanrock G37 at an address in the United States is attached as Ex. 86.

RESPONSE: Paragraph 370 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 370 and therefore denies such allegations.

371. The packaging of the Sanrock Accused Product indicates that the product is "Made in China." *See* Ex. 44C, ¶ 92 (citing Ex. 86).

RESPONSE: Paragraph 371 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 371 and therefore denies such allegations.

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23. Schumacher

372. On information and belief, model numbers SL1312 (600A), SL1314 (600A), SL1315 (800A), SL1316 (1000A), SL1317 (1000A), SL1327 (800A), SL 1396 (800A) (collectively, the "Schumacher Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Schumacher. *See* Ex. 44C, ¶¶ 94-98.

RESPONSE: Paragraph 372 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 372 and therefore denies such allegations.

373. On information and belief, products sold under the brand Schumacher are manufactured by and/or imported for sale by Respondents Boltpower, Schumacher, and Pep Boys. *See* Ex. 44C, ¶¶ 94-98.

RESPONSE: Paragraph 373 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 373 and therefore denies such allegations.

374. The Schumacher Accused Products are sold after importation into the United States. For example, receipts from batterychargers.com, Walmart.com, Oreillyauto.com, and homedepot.com showing the purchase of a Schumacher SL 1312, SL1315, SL1316, and SL1396 at an address in the United States are attached as Ex. 87. On information and belief, the Schumacher Accused Products are also sold by Respondents AutoZone, Advance Auto, NAPA, and Lowe's. *See, e.g.,* https://www.lowes.com/pd/Schumacher-Electric-1200-Amp-Car-Battery-Jump-Starter-with-Digital-Display/1000569111;

RESPONSE: Paragraph 374 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 374 and therefore denies such allegations.

375. The packaging of the Schumacher Accused Products indicates that the products are

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"Made in China." *See* Ex. 44C, ¶ 97 (citing Ex. 87).

RESPONSE: Paragraph 375 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 375 and therefore denies such allegations.

24. Tooliom

376. On information and belief, model number Epower-125 (2000A) (the "Tooliom Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Tooliom. *See* Ex. 44C, ¶¶ 108-109.

RESPONSE: Paragraph 376 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 376 and therefore denies such allegations.

377. On information and belief, products sold under the brand Tooliom are manufactured by and/or imported for sale by Respondents Boltpower and Carku. See Ex. 44C, ¶¶ 108-109.

RESPONSE: Paragraph 377 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 377 and therefore denies such allegations.

378. The Tooliom Accused Product is after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Tooliom Epower-125 (2000A) at an address in the United States is attached as Ex. 91.

RESPONSE: Paragraph 378 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 378 and therefore denies such

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allegations.

379. The packaging of the Tooliom Accused Product indicates that the product is "Made in China." *See* Ex. 44C, ¶ 108 (citing Ex. 91).

RESPONSE: Paragraph 379 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 379 and therefore denies such allegations.

25. Topdon

380. On information and belief, model numbers VOLCANO1500 and VOLCANO2000 (collectively, the "Topdon Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Topdon. *See* Ex. 44C, ¶¶ 110-111.

RESPONSE: Paragraph 380 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 380 and therefore denies such allegations.

381. On information and belief, products sold under the brand Topdon are manufactured by and/or imported for sale by Respondents Boltpower, Shenzhen Topdon, and Shenzhen Dingjiang Technology. *See* Ex. 44C, ¶¶ 110-111.

RESPONSE: Paragraph 381 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 381 and therefore denies such allegations.

382. The Topdon Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Topdon VOLCANO2000 at an address in the United States is attached as Ex. 92.

RESPONSE: Paragraph 382 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 382 and therefore denies such allegations.

383. The packaging of the Topdon Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 110 (citing Ex. 92).

RESPONSE: Paragraph 383 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 383 and therefore denies such allegations.

26. Topvision

384. On information and belief, model number G26 (the "Topvision Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Topvision. *See* Ex. 44C, ¶¶ 112-113.

RESPONSE: Paragraph 384 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 384 and therefore denies such allegations.

385. On information and belief, products sold under the brand Topvision are manufactured by and/or imported for sale by Respondent Boltpower. *See* Ex. 44C, ¶¶ 112-113.

RESPONSE: Paragraph 385 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 385 and therefore denies such allegations.

386. The Topvision Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Topvision G26 at an address in the United States is attached as Ex. 93.

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RESPONSE: Paragraph 386 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 386 and therefore denies such allegations.

387. The packaging of the Topvision Accused Product indicates that the products is "Made in China." *See* Ex. 44C, ¶ 112 (citing Ex. 93).

RESPONSE: Paragraph 387 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 387 and therefore denies such allegations.

27. Trekpow

388. On information and belief, model numbers A18, G22, and TJ2500 (collectively, the "Trekpow Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Trekpow. *See* Ex. 44C, ¶¶ 116-117.

RESPONSE: Paragraph 388 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 388 and therefore denies such allegations.

389. On information and belief, products sold under the brand Trekpow are manufactured by and/or imported for sale by Respondent Boltpower. *See* Ex. 44C, ¶¶ 116-117.

RESPONSE: Paragraph 389 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 389 and therefore denies such allegations.

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390. The Trekpow Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Trekpow G22 at an address in the United States is attached as Ex. 95.

RESPONSE: Paragraph 390 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 390 and therefore denies such allegations.

391. The packaging of the Trekpow Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 116.

RESPONSE: Paragraph 391 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 391 and therefore denies such allegations.

28. Vavofo

392. On information and belief, model number G23P (the "Vavofo Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Vavofo. *See* Ex. 44C, ¶¶ 122-124.

RESPONSE: Paragraph 392 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 392 and therefore denies such allegations.

393. On information and belief, products sold under the brand Vavofo are manufactured by and/or imported for sale by Respondent Boltpower. *See* Ex. 44C, ¶¶ 122-124.

RESPONSE: Paragraph 393 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 393 and therefore denies such

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allegations.

394. On information and belief, the Vavofo Accused Product is sold after importation into the United States. For example, a listing from Amazon.com indicating the Vavofo Accused Product is manufactured by Respondent Boltpower is attached as Ex. 98.

RESPONSE: Paragraph 394 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 394 and therefore denies such allegations.

395. The Vavofo Accused Product also indicates that the product is "Made in China." *See* Ex. 44C, ¶ 122 (citing Ex. 98).

RESPONSE: Paragraph 395 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 395 and therefore denies such allegations.

29. Vekkia

396. On information and belief, model numbers THOR-1000 and THOR-3000(collectively, the "Vekkia Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Vekkia. *See* Ex. 44C, ¶¶ 125-126.

RESPONSE: Paragraph 396 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 396 and therefore denies such allegations.

397. On information and belief, products sold under the brand Vekkia are manufactured by and/or imported for sale by Respondents Boltpower and Chic Electrics. *See* Ex. 44C, ¶¶ 124-126.

RESPONSE: Paragraph 397 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 397 and therefore denies such allegations.

398. The Vekkia Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Vekkia THOR-1000 at an address in the United States is attached as Ex. 128.

RESPONSE: Paragraph 398 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 398 and therefore denies such allegations.

399. The packaging of the Vekkia Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 125; Ex. 128.

RESPONSE: Paragraph 399 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 399 and therefore denies such allegations.

30. **Yaber**

400. On information and belief, model numbers YR100, YR200, YR 600, YR500, YR700, and YR400 (collectively, the "Yaber Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Yaber. *See* Ex. 44C, ¶¶ 134-135.

RESPONSE: Paragraph 400 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 400 and therefore denies such allegations.

401. On information and belief, products sold under the brand Yaber are manufactured

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by and/or imported for sale by Respondents Boltpower and ThiEye Technologies. *See* Ex. 44C, ¶¶ 134-135.

RESPONSE: Paragraph 401 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 401 and therefore denies such allegations.

402. The Yaber Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Yaber YR400 at an address in the United States is attached as Ex. 103.

RESPONSE: Paragraph 402 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 402 and therefore denies such allegations.

403. The packaging of the Yaber Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 134 (citing Ex. 103).

RESPONSE: Paragraph 403 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 403 and therefore denies such allegations.

C. Smartech Brands

1. Smartech

404. On information and belief, model numbers JS-10000, JS-15000, JS-15000N, JS-6000, JS-8000, JS-8000N, and TECH-5000P (collectively, the "Smartech Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Smartech. *See* Ex. 44C, ¶¶ 99-100.

RESPONSE: Paragraph 404 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 404 and therefore denies such allegations.

405. On information and belief, products sold under the brand Smartech are manufactured by and/or imported for sale by Respondent Smartech. *See* Ex. 44C, ¶¶ 99-100.

RESPONSE: Paragraph 405 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 405 and therefore denies such allegations.

406. The Smartech Accused Products are sold after importation into the United States. For example, a receipt from smartech.com showing the purchase of a Smartech JS-10000, JS-15000, JS-15000N, JS-8000N, and TECH-5000P at an address in the United States is attached as Ex. 88. The Smartech Accused Products are also sold by Respondent Walmart. *See, e.g.,* https://www.walmart.com/ip/Smartech-JS-15000N-15000-mAh-Lithium-Powered-Vehicle-Jump-Starter-and-Power-Bank-Starter-and-Power-Bank/286772303

RESPONSE: Paragraph 406 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 406 and therefore denies such allegations.

407. The packaging of the Smartech Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 99 (citing Ex. 88).

RESPONSE: Paragraph 407 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 407 and therefore denies such allegations.

D. Weego Brands

1. Weego

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408. On information and belief, model numbers 22, 44.1, 66.2, 154, 22s (collectively, the "Weego Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Weego. *See* Ex. 44C, ¶¶ 127-128.

RESPONSE: Paragraph 408 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 408 and therefore denies such allegations.

409. On information and belief, products sold under the brand Weego are manufactured by and/or imported for sale by Respondents Paris Corporation and Carku. *See* Ex. 44C, ¶¶ 127-128.

RESPONSE: Paragraph 409 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 409 and therefore denies such allegations.

410. The Weego Accused Products are sold after importation into the United States. For example, a receipt from myweego.com showing the purchase of a Weego 22s at an address in the United States is attached as Ex. 101. The Weego Accused Products are also sold by Respondent Walmart. *See, e.g.,* https://www.walmart.com/ip/Weego-22s-Jump-Starter-1700-Peak-300- Cranking-Amps-Simple-and-Safe-Lithium-Ion-Water-Resistant-USA-Designed-and-Engineered/337164284

RESPONSE: Paragraph 410 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 410 and therefore denies such allegations.

411. The packaging of the Weego Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 127 (citing Ex. 101).

RESPONSE: Paragraph 411 of the Complaint is not directed at Respondent, thus no response is

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required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 411 and therefore denies such allegations.

E. Winplus Brands

1. Type S

412. On information and belief, model numbers AC56388-BLK, AC56789-AM, AC56794-1 (collectively, the "Type S Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Type S. *See* Ex. 44C, ¶¶ 118-119.

RESPONSE: Paragraph 412 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 412 and therefore denies such allegations.

413. On information and belief, products sold under the brand Type S are manufactured by and/or imported for sale by Respondents Shenzhen Winplus and Winplus North America. *See* Ex. 44C, ¶¶ 118-119.

RESPONSE: Paragraph 413 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 413 and therefore denies such allegations.

414. The Type S Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Type S AC56388-BLK at an address in the United States is attached as Ex. 96. The Type S Accused Products are also available from Respondent Walmart. *See, e.g.*, https://www.walmart.com/ip/Type-S-Lithium-Jump-Starter-Portable-Power-Bank-w-Built-in-Wireless-Charging/571679308

RESPONSE: Paragraph 414 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 414 and therefore denies such

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allegations.

415. The packaging of the Type S Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 118 (citing Ex. 96).

RESPONSE: Paragraph 415 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 415 and therefore denies such allegations.

2. Winplus

416. On information and belief, model numbers AC530171-1, AC55717-1, AC55929-6/1, AC55929-60, (collectively, the "Winplus Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Winplus. *See* Ex. 44C, ¶¶ 129-130.

RESPONSE: Paragraph 416 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 416 and therefore denies such allegations.

417. On information and belief, products sold under the brand Winplus are manufactured by and/or imported for sale by Respondents Shenzhen Winplus and Winplus North America. *See* Ex. 44C, ¶¶ 129-130.

RESPONSE: Paragraph 417 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 417 and therefore denies such allegations.

418. The Winplus Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Winplus AC55717-1 at an address in the United States is attached as Ex. 100. On information and belief, the Winplus Accused Products are also sold by Respondents Walmart, Pep Boys, Advanced Auto, and AutoZone. *See* http://winplus.com/usa/support/retail-locations/

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RESPONSE: Paragraph 418 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 418 and therefore denies such allegations.

419. The packaging of the Winplus Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 129 (citing Ex. 100).

RESPONSE: Paragraph 419 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 419 and therefore denies such allegations.

F. Great Neck Brands

1. OEM Tools

420. On information and belief, model numbers 24474 (8000mAh), 24475 (12000mAh), and 24476 (18000mAh) (collectively, the "OEM Tools Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name OEM Tools. *See* Ex. 44C, ¶¶ 80-81.

RESPONSE: Paragraph 420 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 420 and therefore denies such allegations.

421. On information and belief, products sold under the brand OEM Tools are manufactured by and/or imported for sale by Respondent Great Neck. *See* Ex. 44C, ¶¶ 80-81.

RESPONSE: Paragraph 421 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 421 and therefore denies such

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allegations.

422. The OEM Tools Accused Products are sold after importation into the United States. For example, a receipt from Autozone.com showing the purchase of a OEM Tools 24474 (8000mAh) at an address in the United States is attached as Ex. 80.

RESPONSE: Paragraph 422 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 422 and therefore denies such allegations.

423. The packaging of the OEM Tools Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 80 (citing Ex. 80).

RESPONSE: Paragraph 423 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 423 and therefore denies such allegations.

G. ThiEye Brands

1. Buture

424. On information and belief, model numbers BR300 and BR500 (collectively, the "Buture Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Buture. *See* Ex. 44C, ¶¶ 27-28.

RESPONSE: Paragraph 424 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 424 and therefore denies such allegations.

425. On information and belief, products sold under the brand Buture are manufactured by and/or imported for sale by Respondent ThiEye Technologies. *See* Ex. 44C, ¶¶ 27-28.

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RESPONSE: Paragraph 425 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 425 and therefore denies such allegations.

426. The Buture Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Buture BR500 at an address in the United States is attached as Ex. 56.

RESPONSE: Paragraph 426 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 426 and therefore denies such allegations.

427. The packaging of the Buture Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 27 (citing Ex. 56).

RESPONSE: Paragraph 427 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 427 and therefore denies such allegations.

2. **Fnnemge**

428. On information and belief, model number Q9C (the "Fnnemge Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Fnnemge. *See* Ex. 44C, ¶¶ 45-46.

RESPONSE: Paragraph 428 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 428 and therefore denies such allegations.

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429. On information and belief, products sold under the brand Fnnemge are manufactured by and/or imported for sale by Respondents ThiEye and Hangchebao. *See* Ex. 44C, ¶¶ 45-46.

RESPONSE: Paragraph 429 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 429 and therefore denies such allegations.

430. The Fnnemge Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Fnnemge Q9C at an address in the United States is attached as Ex. 123.

RESPONSE: Paragraph 430 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 430 and therefore denies such allegations.

431. The packaging of the Fnnemge Accused Product indicates that the product is "Made in China." *See* Ex. 44C, ¶¶ 45; Ex. 123.

RESPONSE: Paragraph 431 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 431 and therefore denies such allegations.

3. **Utrai**

432. On information and belief, model number Jstar One (the "Utrai AccusedProduct") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Utrai. *See* Ex. 44C, ¶¶ 120-121.

RESPONSE: Paragraph 432 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 432 and therefore denies such allegations.

433. On information and belief, products sold under the brand Utrai are manufactured by and/or imported for sale by Respondent ThiEye Technologies. See Ex. 44C, ¶¶ 120-121.

RESPONSE: Paragraph 433 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 433 and therefore denies such allegations.

434. The Utrai Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Utrai Jstar One at an address in the United States is attached as Ex. 127.

RESPONSE: Paragraph 434 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 434 and therefore denies such allegations.

435. The packaging of the Utrai Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 120; Ex. 127.

RESPONSE: Paragraph 435 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 435 and therefore denies such allegations.

H. Energen & Performance Tool Brands

1. Energen

436. On information and belief, model numbers AL12 and AL6 (collectively, the "Energen Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Energen. *See* Ex. 44C, ¶¶ 37-38.

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RESPONSE: Paragraph 436 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 436 and therefore denies such allegations.

437. On information and belief, products sold under the brand Energen are manufactured by and/or imported for sale by Respondent Energen. *See* Ex. 44C, ¶¶ 37-38.

RESPONSE: Paragraph 437 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 437 and therefore denies such allegations.

438. The Energen Accused Products are sold after importation into the United States. For example, a receipt from myenergen.com showing the purchase of an Energen AL12 at an address in the United States is attached as Ex. 61. The Energen Accused Products are also sold by Respondents Best Buy and Walmart. *See* https://myenergen.com/resellers/

RESPONSE: Paragraph 438 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 438 and therefore denies such allegations.

439. The packaging of the Energen Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 37 (citing Ex. 61).

RESPONSE: Paragraph 439 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 439 and therefore denies such allegations.

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2. Performance Tool

440. On information and belief, model number W16750 (collectively, the "Performance Tool Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Performance Tool. *See* Ex. 44C, ¶¶ 82-83.

RESPONSE: Paragraph 440 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 440 and therefore denies such allegations.

441. On information and belief, products sold under the brand Performance Tool are manufactured by and/or imported for sale by Respondent Wilmar Corporation and Chao Fung Trading Co. *See* Ex. 44C, ¶¶ 82-83.

RESPONSE: Paragraph 441 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 441 and therefore denies such allegations.

442. The Performance Tool Accused Products are sold after importation into the United States. For example, a receipt from carid.com showing the purchase of a Performance Tool W16750 at an address in the United States is attached as Ex. 81. The Performance Tool Accused Products are also sold by Respondent Walmart. *See, e.g.,* https://www.walmart.com/ip/Performance-Tool-W1665-900-amp-Jump-Starter-Inflator/55558632

RESPONSE: Paragraph 442 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 442 and therefore denies such allegations.

443. The packaging of the Performance Tool Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 82-83 (citing Ex. 81).

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RESPONSE: Paragraph 443 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 443 and therefore denies such allegations.

I. Halo Brands

1. HALO

444. On information and belief, model numbers Bolt 44000, Bolt 57720, Bolt 58830, Bolt Flashlight, and Bolt Wireless (collectively, the "Halo Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Halo. *See* Ex. 44C, ¶¶ 54-55.

RESPONSE: Paragraph 444 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 444 and therefore denies such allegations.

445. On information and belief, products sold under the brand Halo are manufactured by and/or imported for sale by Respondents Carku, ZhongKang, and Halo2Cloud. *See* Ex. 44C, ¶¶ 54-55.

RESPONSE: Paragraph 445 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 445 and therefore denies such allegations.

446. The Halo Accused Products are sold after importation into the United States. For example, a receipt from Zagg.com showing the purchase of a Halo Bolt 44000 at an address in the United States is attached as Ex. 69.

RESPONSE: Paragraph 446 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information

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sufficient to form a belief as to the allegations of Paragraph 446 and therefore denies such allegations.

447. The packaging of the Halo Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 54 (citing Ex. 69).

RESPONSE: Paragraph 447 of the Complaint is not directed at Respondent, thus no response is required. To the extent a response is required, Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 447 and therefore denies such allegations.

J. Clore Brands

1. Jump-N-Carry

448. On information and belief, model numbers JNC325 and JNC345 (collectively, the "Jump-N-Carry Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Jump-N-Carry. *See* Ex. 44C, ¶¶ 61-62.

RESPONSE: Respondent admits that products carrying the model numbers JNC325 and JNC345 are manufactured outside the United States and subsequently sold in the United States after importation under the brand name Jump-N-Carry. Respondent specifically denies that the products that it imports or sells infringe, directly or otherwise, literally or under the doctrine of equivalents, any valid and enforceable claim of the Asserted Patents. Respondent denies the remaining allegations of Paragraph 448.

449. On information and belief, products sold under the brand Jump-N-Carry are manufactured by and/or imported for sale by Respondent Clore Automotive. *See* Ex. 44C, ¶¶ 61-62.

RESPONSE: Respondent admits that it imports and sells products sold under the brand Jump-N-Carry. Respondent specifically denies that the products that it imports or sells infringe, directly or otherwise, literally or under the doctrine of equivalents any valid and enforceable

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claim of the Asserted Patents. Respondent denies the remaining allegations of Paragraph 449.

450. The Jump-N-Carry Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Jump-N-Carry JNC345 at an address in the United States is attached as Ex. 107.

RESPONSE: Respondent admits that certain products under the Jump-N-Carry brand are sold after importation into the United States. Respondent specifically denies that the products that it imports or sells infringe, directly or otherwise, literally or under the doctrine of equivalents, any valid and enforceable claim of the Asserted Patents. Respondent lacks knowledge or information sufficient to form a belief as to the remaining allegations of Paragraph 450 and therefore denies such allegations.

451. The packaging of the Jump-N-Carry Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 61 (citing Ex. 107).

RESPONSE: Respondent admits that Exhibit 107 contains an image of packaging for a Jump-N-Carry product, which on its face displays the text "Made in China." Respondent denies the remaining allegations of paragraph 451.

VIII. HARMONIZED TARIFF SCHEDULE ITEM NUMBERS

452. The Accused Products are classified under at least the following subheadings of the Harmonized Tariff Schedule of the United States: 8504.40 (static converters) 8506.50 (lithium batteries); 8507.10, 8507.60 (lithium-ion electric storage batteries); 8511.40, 8511.50 (starter motors and generators), 8516.60, 8516.71 (ovens, coffee or tea makers); 8539.50.00 (LED lamps). These classifications are exemplary in nature and not intended to restrict the scope of any exclusion order or other remedy ordered by the Commission.

RESPONSE: Respondent admits that the Clore Design Accused Products fall within HTS subheading 8507.60. Respondent lacks knowledge or information to form a belief as to the remaining allegations of Paragraph 452 and therefore denies such allegations.

IX. DOMESTIC INDUSTRY

453. As required by 19 U.S.C. § 1337(a)(2), a domestic industry, as defined by 19 U.S.C. § 1337(a)(3), exists in the United States with respect to the Asserted Patents. Since its founding in

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1914 with the development of battery corrosion preventative products in Cleveland, Ohio, where NOCO remains headquartered to this day, NOCO continues to research, develop, manufacture, and sell innovative battery-related products.

RESPONSE: To the extent Paragraph 453 contains legal conclusions, no response is required. To the extent a response is required, Respondent denies that a domestic industry as required by 19 U.S.C. §§ 1337(a)(2) and (3) exists in the United States with respect to the Asserted Patents. Respondent otherwise lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 453 and therefore denies them.

A. Technical Prong

454. NOCO has, and continues to make, significant and substantial investments in plant and equipment, labor and capital, and engineering and research and development with respect to the products that practice one or more claims of the Asserted Patents ("NOCO Domestic Industry Products"), including all six of the NOCO Boost® jump starter models. The NOCO Boost® jump starters practice at least the following claims of the Asserted Patents shown in Table 4:

Asserted Patent	Exemplary DI Claim(s)	Exemplary DI Product
9,007,015	1	GB40
10,604,024	1, 29, 30	GB40

Table 4. Asserted Patents Practiced by Domestic Industry Products

RESPONSE: Respondent lacks knowledge or information to admit or deny the allegations of Paragraph 454 and therefore denies the allegations.

455. The NOCO Domestic Industry Products all practice the claims of the Asserted Patents in the same manner. Claim charts demonstrating how the representative NOCO Domestic Industry Product practices these claims are attached as Confidential Exhibit 10C. This claim chart provides a basis for the domestic industry relating to both the '015 and '024 Patents.

RESPONSE: Respondent admits that claim charts are attached as Confidential Exhibits 10C to the Complaint. To extent Paragraph 455 contains legal conclusions, no response is required. Respondent lacks knowledge or information to admit or deny the allegations of Paragraph 455 and therefore denies the allegations.

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456. The Asserted Trademarks appear in NOCO's website marketing materials and product information. *See* Ex. 8 and 104. This use of the Asserted Trademarks in commerce provides a basis for the domestic industry relating to both the '656 and '749 Trademarks.

RESPONSE: To the extent Paragraph 456 contains legal conclusions, no response is required. To the extent a response is required, Respondent denies that a domestic industry as required by 19 U.S.C. §§ 1337(a)(2) and (3) exists in the United States with respect to the Asserted Patents and Asserted Trademarks. Respondent otherwise lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 456 and therefore denies them.

B. Economic Prong

457. NOCO conducts all of its engineering, research and development, product design, testing, and sample construction in the United States. As such, NOCO has made significant investments in plant and equipment, labor and capital, and substantial investments in engineering, research and development with respect to the Asserted Patents and Asserted Trademarks in the United States, satisfying the requirements of 19 U.S.C. § 337(a)(3)(A)-(C). NOCO has invested, and continued to invest, in the United States millions of dollars per year in activities related to the design, engineering, development, testing, marketing, distribution, customer service, and warranty fulfillment relating to the NOCO Domestic Industry Products.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 457 and therefore denies them.

458. NOCO's headquarters in Glenwillow, Ohio houses NOCO's sales and marketing department, and serves as the main distribution center for North America. NOCO conducts product testing, compliance activities, and other technical support the Glenwillow facility. Accompanying this Complaint as Confidential Exhibit 105C is the Declaration of Jeffery Weiner, which provides information about NOCO's investments in connection with the NOCO Domestic Industry Products. Ex. 105C (DI Dec.) at ¶¶16-35.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 458 and therefore denies them.

459. NOCO conducts its design, research, and development activities at its facility in Peoria, Arizona. *Id.* at ¶13. NOCO conducts additional product design activities at its facility in Tempe, Arizona. *Id.* at ¶ 14.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the

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allegations of Paragraph 459 and therefore denies them.

460. NOCO has also employed significant labor and capital with respect to the NOCO Domestic Industry Products. *See* Ex. 105C at ¶¶ 22-30.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 460 and therefore denies them.

461. The first NOCO Boost® jump starter was introduced in 2014, and NOCO has continually improved the product since then. Notably, NOCO's spending on research and development has increased in each of the past three years. Ex. 105C at ¶33. From 2017 to the present, NOCO has paid several million dollars in payroll to engineering and technical personnel in the United States, whose employment pertains to the engineering and technical aspects of the Boost® product line, including the patented subject matter. *Id.* at ¶34. NOCO has also invested in customer-specific design projects.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 461 and therefore denies them.

462. Since 2016 the majority of NOCO's revenue has been derived from sales of its Boost® line of jump starters. *Id.* at ¶15.

RESPONSE: Respondent lacks knowledge or information sufficient to form a belief as to the allegations of Paragraph 462 and therefore denies them.

X. RELATED LITIGATION

463. As of the date of the filing of this complaint, there have been 20 lawsuits involving the '015 Patent in U.S. District Courts. A chart outlining this litigation and its status is included as Ex. 108. The '015 Patent is also involved in two pending Inter Partes Review proceedings pending before the Patent Trial and Appeal Board ("PTAB") of the United States Patent and Trademark Office. One was filed by Carku (IPR2020-00944) on May 14, 2020 and the PTAB has instituted review. The other was filed by Shenzhen Mediatek Tong Technology Co, Ltd. on July 29, 2020; NOCO filed its preliminary response to the petition on December 16, 2020 and the PTAB's decision on whether or not to institute review is expected by March 2021.

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations of Paragraph 463 and therefore denies such allegations.

464. There has been no litigation involving the '024 Patent.

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations

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of Paragraph 464 and therefore denies such allegations.

465. As of the date of filing the complaint, there have been thirteen district court actions involving the Asserted Trademarks. *See* Ex. 109. There have been no proceedings before the PTAB.

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations of Paragraph 465 and therefore denies such allegations.

466. Other than the litigation specified above, to Complainant's knowledge, the Asserted Patents and Asserted Trademarks are not and have not been the subject of any current or prior litigation.

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations of Paragraph 466 and therefore denies such allegations.

XI. GEO

467. A general exclusion order is needed to prevent the circumvention of an order limited to the Proposed Respondents due to the widespread pattern of infringement, as well as the difficulty in identifying the source of the Accused Products. 19 U.S.C. § 1337 (d)(2). This is evidenced by the fact that Accused Products continue to enter the market despite NOCO's aggressive ongoing enforcement measures.

RESPONSE: To the extent a response to Complainant's request for relief is required, Respondent denies that Complainant is entitled to any relief whatsoever, including without limitation the requested relief of a general exclusion order.

468. Starting in 2014, NOCO began noticing the appearance of the Accused Products in the marketplace. NOCO responded by filing lawsuits against five foreign entities that were offering infringing jump starters on Amazon.com. Since then, NOCO has filed sixteen additional lawsuits, including suits in Canada, the United Kingdom and Germany. As a result of these efforts, NOCO secured a permanent injunction against two of the foreign entities barring them from selling or offering to sell jump starters that infringe NOCO's '015 patent and entered into a settlement agreement with a third foreign entity providing a substantial payment for past damages and a license for future sales. The remaining suits are pending.

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations of Paragraph 468 and therefore denies such allegations.

469. Despite these efforts, and successful litigation outcomes, NOCO continues to notice

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new market entrants selling jump starters with the same features as the NOCO Boost® products. NOCO vigilantly monitors Amazon.com listings and works with Amazon to remove listings for infringing products. NOCO estimates that in the past two years, it has had to file hundreds of takedown notices with Amazon. NOCO also filed a lawsuit against numerous defendants, including named Respondents Shenzhen Valuelink, Aukey, Shenzhen Mediatek, Gooloo, Guangzhou Unique Electronics, alleging that these companies, *inter alia*, manipulated Amazon.com algorithms, which determine the product that will receive the "Amazon's Choice" Badge, such that defendants' products would receive the "Amazon's Choice" Badge instead of NOCO. *See The NOCO Company v. Shenzhen Valuelink E-Commerce Co., Ltd., et al.*, N.D. Ohio, No. 1:20-cv-00049-SO, (Jan. 9, 2020).

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations of Paragraph 469 and therefore denies such allegations.

470. In pursuit of these enforcement efforts, NOCO has expended significant employee time in addition to legal fees. Through continuous monitoring, NOCO employees identify infringing products or abuse (e.g., manipulation of the Amazon platform) weekly, sometimes daily.

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations of Paragraph 470 and therefore denies such allegations.

471. In addition to products infringing the Asserted Patents, NOCO regularly sees 1) unauthorized use of NOCO trademarks; 2) unauthorized use of NOCO copyrighted images - in whole, or in part, meaning an entity has slightly modified a NOCO image to use with their product; 3) copying NOCO content with a similar look and stylization. For example, the FCOEnegy website (Ex. 31) uses a photo copied from the NOCO website that includes NOCO- branded jumper cables:

[image omitted]

Fig. 6- Excerpt from FCOEngergy website, Ex. 31

[image omitted]

Fig. 7- Photo from NOCO Website's HD Boost Battery Clamp Listing (Ex. 110)

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations of Paragraph 471 and therefore denies such allegations.

472. Notably, NOCO has filed no less than 50 claims of infringement through Amazon Brand Registry for the Asserted Trademark ULTRASAFE.

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations

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of Paragraph 472 and therefore denies such allegations.

473. In terms of abuse or manipulation of the Amazon marketplace, NOCO has identified the following types of activities by proposed Respondents or other sellers of the Accused Products: 1) manipulating Amazon organic search ranking; 2) depressing legitimate products organic search ranking; 3) fake positive and negative reviews; 4) false product return claims to force a product takedown; 5) altering competitive products' browse nodes; 6) manipulating the Amazon Choice badge; and 7) altering NOCO content.

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations of Paragraph 473 and therefore denies such allegations.

474. Each instance of infringement or abuse is reported to NOCO's Global HQ, at which point it is either submitted to Amazon Brand Registry or becomes the subject of a lawsuit. For some types of infringement, NOCO has elected to stop using Brand Registry after finding that Amazon often simply modifies the listing with the infringing content; NOCO is now filing lawsuits in almost every instance. In 2020, NOCO enrolled in the Amazon SVS Program, at a cost of approximately $500,000 to help resolve these issues more efficiently. Registering with the SVS Program was critical as the number of infractions and instance of abuse were too high for the category manager assigned to NOCO to assist in resolution. The abuse by NOCO's competitors has become so prevalent that Amazon has placed the NOCO products into multiple exclusive protection programs.

RESPONSE: Respondent lacks knowledge or information to form a belief as to the allegations of Paragraph 474 and therefore denies such allegations.

XII. REQUESTED RELIEF

475. Proposed Respondents have infringed and will continue to infringe the Asserted Patents and Asserted Trademarks as specified in Section VI above unless the Commission prohibits the importation into and sale within the United States after importation of the Accused Products.

RESPONSE: Respondent denies the allegations of Paragraph 475.

476. Accordingly, NOCO respectfully requests that the United States International Trade Commission:

a) Institute an immediate investigation pursuant to Section 337(b)(1) of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, into Proposed Respondents' violations of Section 337 arising from the sale for importation into the United States, importation, and/or sale within

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the United States after importation of certain portable battery jump starters and components thereof that infringe the Asserted Patents and/or Asserted Trademarks;

b) Schedule and conduct a hearing, pursuant to 19 U.S.C. § 1337 (c), for purposes of receiving evidence and hearing arguments concerning whether Proposed Respondents have violated Section 337 and, following the hearing, determine that Proposed Respondents have violated Section 337;

c) Issue a permanent general exclusion order, pursuant to 19 U.S.C. § 1337(d)(1), excluding from entry into the United States certain portable battery jump starters and components thereof that are imported, sold for importation, or sold after importation that infringe one or more claims of the Asserted Patents and/or Asserted Trademarks, including, without limitation, the specific Accused Products identified in this Complaint and the exhibits hereto; or, in the alternative, issue permanent limited exclusion orders specifically directed to each named Respondent and its subsidiaries, predecessors, affiliates, agents, successors, and assigns, excluding from entry into the United States certain portable battery jump starters and components that infringe one or more claims of the Asserted Patents and/or Asserted Trademarks;

d) Issue permanent orders, pursuant to 19 U.S.C. § 1337(f), directing Proposed Respondents and any of their principals, stockholders, officers, directors, employees, agents, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns to cease and desist from importing, selling, selling for importation, offering for sale, using, demonstrating, promoting, marketing, and/or advertising in the United States Respondents' portable battery jump starters and components thereof that infringe one or more claims of the Asserted Patents and/or Asserted Trademarks, including,

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without limitation, the specific Accused Products identified in this Complaint and the exhibits hereto;

e) Impose a bond on importation and sales of infringing products during the 60-day Presidential review period pursuant to 19 U.S.C. § 1337(j); and

f) Grant all such other and further relief as it deems appropriate under the law, based upon the facts complained of herein and as determined by the Investigation.

RESPONSE: To the extent a response to Complainant's request for relief is required, Respondent denies that Complainant is entitled to any relief whatsoever, including without limitation the relief requested in Paragraph 476 of the Complaint.

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CLORE'S ADDITIONAL DEFENSES

Clore specifically alleges and assert the following defenses in response to the allegations set forth in the Complaint. The inclusion of these additional defenses in this Response is not a concession that Clore bears the burden of proof with respect to any of them. Discovery has only recently begun and, therefore, Clore has not fully collected and reviewed all information that may be relevant to the matters and issues raised herein. Accordingly, pursuant to 19 C.F.R. § 210.14, Clore reserves the right to supplement, modify, and/or amend its defenses, and to take further positions as discovery proceeds in this Investigation.

FIRST ADDITIONAL DEFENSE

(Failure to State a Claim)

The Complaint fails to state a claim upon which relief may be granted.

SECOND ADDITIONAL DEFENSE

(No Unfair Act)

No unfair act has occurred in violation of 19 U.S.C. § 1337.

THIRD ADDITIONAL DEFENSE

(Invalidity)

Upon information and belief, the asserted claims of the Asserted Patents are invalid for failing to comply with one or more of the conditions of patentability set forth in the United States patent statute, including 35 U.S.C. §§ 101, 102, 103, and/or 112.

The asserted claims of the Asserted Patents are invalid under 35 U.S.C. §§ 102 and/or 103 in view of at least the prior art listed below:

- U.S. Patent Application Publication No. 2013/0154543 ("Richardson")
- Chinese Patent No. 202696190 ("Zhang")

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- U.S. Patent No. 9,954,391 ("Lei")
- Wanzong: U.S. Patent No. 5,319,298 ("Wanzong")
- WO Publication No. 2010/129723 to Baxter ("Baxter")
- Richardet: U.S. Patent No. 8,172,603 ("Richardet")
- Klang: U.S. Patent No. 6,424,158 ("Klang")
- U.S. Patent Application No. 3004/0130298 ("Krieger")
- U.S. Patent No. 6,803,743 ("George"); and
- U.S. Patent No. 9,506,446 ("Xinfang").

Further, on information and belief, one or more of the asserted claims of the Asserted Patents are invalid for lack of written description and/or enablement under 35 U.S.C. § 112 ¶ 1, and for failing to comply with the definiteness requirement of 35 U.S.C. § 112 ¶ 2.

FOURTH ADDITIONAL DEFENSE

(Non-infringement)

Respondent has not, and does not, import into the United States, sell for importation, or sell within the United States after importation any article that infringes any valid and enforceable claim of the Asserted Patents, literally or under the doctrine of equivalents. Respondent has not otherwise committed any act in violation of 35 U.S.C. § 271 or 19 U.S.C. § 1337. Complainants have failed to show that Respondent's products practice each and every limitation of any asserted claim of the Asserted Patents. Respondent's investigation is ongoing. Respondent reserves the right to alter, amend, or supplement this additional defense as this Investigation proceeds.

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FIFTH ADDITIONAL DEFENSE

(Lack of Domestic Industry)

To the extent that Respondent determines through discovery and investigation that there is no violation of Section 337 because Complainants have not adequately alleged and cannot prove the existence of a domestic industry, as required by Section 337(a)(2) and defined by Section 337(a)(3), in connection with the Asserted Patents, or that such domestic industry is in the process of being established, Respondent reserves the right to assert the lack of domestic industry as a defense.

SIXTH ADDITIONAL DEFENSE

(Prosecution History Estoppel / Disclaimer)

Complainant's patent infringement claims are barred, in whole or in part, based on prosecution history estoppel and/or prosecution disclaimer. Respondent has not infringed, and is not infringing, the asserted claims of the '015 or '204 Patents at least due in part to statements, representations, admissions, elections, positions, concessions, and filings made to the U.S. Patent and Trademark Office during prosecution of the applications that matured into the '015 and '204 Patents and/or during *inter partes* review proceedings related to the '015 Patent, that, in part or collectively, constitute prosecution history estoppel and/or prosecution disclaimer. In addition, during prosecution of the '015 and '204 Patents, the applications narrowed the scope of the claims for reasons related to patentability, thereby surrendering subject matter Complainant now seeks to recover, to the extent it accuses Respondent of infringement under the doctrine of equivalents.

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SEVENTH ADDITIONAL DEFENSE

(Other Defenses)

Respondent reserves the right to amend its Response to include other additional defenses that it may learn of during the course of the Investigation.

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REQUEST FOR RELIEF

WHEREFORE, Clore respectfully requests that the Commission:

(a) Determine that Clore does not violate Section 337 of the Tariff Act of 1930, as amended (19 U.S.C. § 1337).

(b) Determine that Clore does not infringe any valid and enforceable claim of the Asserted Patents.

(c) Determine that the claims of the Asserted Patents are invalid and/or unenforceable.

(d) Determine that there is no domestic industry from any of the Asserted Patents.

(e) Determine that, even if an unfair act by Clore is found, the relief sought should be denied because of public interest concerns.

(f) Enter an order terminating the Investigation with prejudice and grant such other relief as the Commission may deem proper.

(g) Deny all relief requested in the Complaint.

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RESPONSE TO THE NOTICE OF INVESTIGATION

Pursuant to Commission Rule 210.13, Respondent hereby responds to the Notice of Investigation issued by the Commission on March 17, 2021, and published in the Federal Register on March 23, 2021, as follows:

Respondent admits that The NOCO Company ("NOCO" or "Complainant") filed an amended complaint with the U.S. International Trade Commission on February 3, 2021, under Section 337 of the Tariff Act of 1930, as amended, as set forth in the Notice of Investigation. Respondent admits that the Notice of Investigation generally summarizes the allegations set forth in the Complaint.

Respondent admits that the Commission has instituted an Investigation as set forth in the Commission's Notice of Investigation. Respondent denies that it has engaged in unfair competition or violated Section 337 of the Tariff Act of 1930, as amended, by importing, selling for importation, or selling within the United States after importation any products that infringe any valid and enforceable intellectual property right at issue in this Investigation. Respondent further denies that any patent claim at issue in this Investigation is valid or enforceable. Respondent further denies that there is a protectable domestic industry, or that it is in the public interest to grant any relief to Complainant. Respondent reserves all rights to assert the defenses set forth in its Response to the Complaint in addition to any defense that may be identified during discovery in this Investigation.

At this stage of the Investigation and without conducting discovery as to identification of the Accused Products, Respondent provides in attached **Confidential Exhibit A** estimates of imports/sales based on an early understanding of the scope of the Accused Products. Respondent

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specifically denies that any of the supplied data refer or relate to any unlawful act under Section 337 or otherwise.

Dated: April 12, 2021

Respectfully submitted,

/s/ Beau Jackson

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Clore Automotive, LLC

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VERIFICATION OF RESPONSE

I, Michael Canipe, declare, in accordance with 19 C.F.R. §§ 210.4(c) and 210.13(b), under penalty of perjury, that the following statements are true:

1. I have read the foregoing Response to the Complaint and Notice of Investigation ("Response");

2. The Response is not being presented for any improper purpose, such as to harass or to cause unnecessary delay or needless increase in the cost of the investigation or related proceeding;

3. To the best of my knowledge, information and belief, based on reasonably inquiry, the Response contains claims, defenses, and other legal contentions that are warranted by existing law or by a non-frivolous argument for the extensions, modification, or reversal of existing law or the establishment of new law;

4. The allegations and other factual contentions contained in the Response have evidentiary support or, if specifically so identified, are likely to have evidentiary support after a reasonable opportunity for further investigation or discovery; and

5. The denials of factual contentions contained in the Response are warranted on the evidence or, if specifically so identified, are reasonably based on a lack of information or belief.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: 9-APR-2021

Michael Canipe
Signature

Michael Canipe
Name

EVP + CFO
Title

CLORE AUTOMOTIVE, LLC

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing *RESPONSE OF CLORE AUTOMOTIVE, LLC TO THE AMENDED COMPLAINT AND NOTICE OF INVESTIGATION* was served to the parties, in the manner indicated below, this the 12th day of April 2021.

The Honorable Lisa R. Barton Secretary to the Commission U.S. International Trade Commission 500 E Street, SW, Suite 112 Washington, DC 20436	☒ **VIA ELECTRONIC FILING** [EDIS]
The Honorable Clark S. Cheney Administrative Law Judge U.S. International Trade Commission 500 E Street, SW Washington, DC 20436	☒ **VIA ELECTRONIC MAIL** Cheney337@usitc.gov Patricia.Chow@usitc.gov Benjamin.Rudofsky@usitc.gov
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Todd Taylor Office of Unfair Import Investigations U.S. International Trade Commission 500 E Street, SW., Suite 401 Washington, DC 20436	☒ **VIA ELECTRONIC MAIL** Todd.Taylor@usitc.gov
Complainant The NOCO Company	
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Respondent National Automotive Parts Association, LLC	
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Respondent Advance Auto Parts, Inc.	
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Respondents AutoZone, Inc. and Best Parts, Inc	
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Respondents Guangdong Boltpower Energy Co., Ltd. and Best Buy Co., Inc	
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Respondents Schumacher Electric Corporation and Schumacher Power Technology Ltd **Respondents Lowe's Companies, Inc.** **Respondents O'Reilly Automotive, Inc.** **Respondents Walmart Inc.**	
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Respondent Smartech Products, Inc.	
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/s/ Anna Florian, Paralegal
HUSCH BLACKWELL LLP

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PURSUANT TO PROTECTIVE ORDER

UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.

In the Matter of **CERTAIN PORTABLE BATTERY JUMP STARTERS AND COMPONENTS THEREOF**	**Investigation No. 337-TA-1256**

DELTRAN USA, LLC'S RESPONSE TO THE AMENDED COMPLAINT AND NOTICE OF INVESTIGATION

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PURSUANT TO PROTECTIVE ORDER

RESPONSE TO AMENDED COMPLAINT[1]

Respondent Deltran USA, LLC ("Deltran" or "Respondent"), by and through its counsel, hereby submits the following Response to Complainant The NOCO Company's ("NOCO" or "Complainant") Amended Complaint Under Section 337 of the Tariff Act of 1930, as Amended (the "Amended Complaint") and to the Notice of Investigation.

I. INTRODUCTION[2]

1. The NOCO Company ("NOCO" or "Complainant"), a 100 plus year old company designing and creating premium battery products in the United States for the automotive industry, respectfully requests that the U.S. International Trade Commission ("Commission") commence an investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("Section 337") to remedy the unlawful importation into the United States, the sale for importation, offer for sale, and/or the sale within the United States after importation by the owner, importer, or consignee, of certain portable battery jump starters and components thereof that infringe one or more of the valid and enforceable United States patents owned by NOCO.[3]

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[1] NOCO submitted six supplements to its Amended Complaint, on February 4, 5, 8, 22, 23, and March 4, 2021. NOCO's supplements included withdrawn allegations, additional allegations, and multiple additional exhibits (including claim charts) that were not submitted with the original Complaint or Amended Complaint. To the extent any allegations set forth in NOCO's supplements and/or additional exhibits are not specifically addressed in the paragraphs herein, such allegations are denied.

[2] Deltran repeats the headings set forth in the Amended Complaint for the sake of convenience and simplicity. In doing so, Deltran makes no admissions regarding the substance of the heading or any other allegations of the Amended Complaint. Unless otherwise stated, to the extent that a particular heading can be construed as an allegation, Deltran specifically denies all such allegations.

[3] For ease of reference, Deltran recites verbatim each paragraph of the Complaint and provides a response immediately after each paragraph.

Response to Paragraph 1: Deltran admits that NOCO's Amended Complaint requests that the Commission commence an investigation under Section 337 and requests various forms of relief under Section 337, but denies that NOCO is entitled to any of its requested relief. Deltran denies that it has unlawfully imported into the United States, sold for importation, offered for sale, or sold within the United States after importation, certain portable battery jump starters and components thereof. Deltran further denies that it infringes any claims of the Asserted Patents. In addition, Deltran denies that the Asserted Patents are valid or enforceable. Deltran lacks information sufficient to form a belief as to the truth of the remainder of the allegations contained in this paragraph, and therefore denies them.

2. On information and belief, the Proposed Respondents, as listed in Section II.B., *supra*, are manufacturers, importers, trading companies, and retailers based in China and the United States. Respondents have engaged, and continue to engage, in unfair acts in violation of Section 337 through the unlicensed importation, sale for importation, offer for sale, and/or sale after importation into the United States of portable battery jump starters having certain safety features ("Accused Products"). Upon information and belief, the Accused Products have been imported into the United States.

Response to Paragraph 2: Deltran admits that it is an importer and retailer based in the United States. Deltran further admits that Deltran's Accused Products (i.e., the accused Battery Tender® branded products discussed further in paragraphs 296-299) have been imported into the United States. Deltran denies that it has engaged in unfair acts in violation of Section 337. Deltran lacks information sufficient to form a belief as to the truth of the remainder of the allegations contained in this paragraph, and therefore denies them.

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3. The Accused Products infringe one or more of the Asserted Claims of United States Patent Nos. 9,007,015 and 10,604,024 (collectively, the "Asserted Patents"), which are both owned by NOCO. Pursuant to Commission Rule 210.12(a)(9)(i), copies of the '015 Patent and the '024 Patent, are attached to this Complaint as Exhibits 1 – 2, respectively.

Response to Paragraph 3: Deltran denies that its products infringe any claims of the '015 patent or the '024 patent. Deltran admits that documents purporting to be the Asserted Patents are attached as Exhibits 1 and 2 to the Complaint. Deltran is without information sufficient to form a belief as to the remaining allegations of this paragraph and therefore denies them.

4. Certain of Respondents' Accused Products also infringe one or more of U.S. Trademark Reg. Nos. 4,811,656 and 4,811,749 (collectively, the "Asserted Trademarks"), which are both owned by NOCO, in violation of Section 337(a)(1)(C). Pursuant to Commission Rule 210.12(a)(9)(i), copies of the '656 Trademark and '749 Trademark are attached to this Complaint as Exhibits 3-4, respectively.

Response to Paragraph 4: Deltran admits that documents purporting to be the Asserted Trademarks are attached as Exhibits 3 and 4 to the Complaint. Deltran is without information sufficient to form a belief as to the remaining allegations of this paragraph and therefore denies them. NOCO has not alleged that Deltran infringes the Asserted Trademarks.

5. Complainant asserts that the Accused Products infringe at least the following claims of one or more Asserted Patents in violation of Section 337(a)(1)(B)(i), either literally or under the doctrine of equivalents:

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Asserted Patent	Asserted Claims
9,007,015	**1,** 4, 11, 14, 18, 19, 21
10,604,024	**1**, 4, 5, 6, 16, 19, 23, 24, 26, **29, 30**

Table 1. The Asserted Claims

Response to Paragraph 5: Deltran admits that NOCO is alleging that the Accused Products infringe the Asserted Claims of the Asserted Patents. Deltran denies that its products infringe any claims of the Asserted Patents. Deltran denies the remaining allegations of paragraph 5.

6. Pursuant to Commission Rules 210.10(b)(1) and 210.12(a)(12), Complainant states that a plain English description of the category of Accused Products is portable, battery-powered devices that are used to jump-start batteries such as those in automobiles, trucks, and other vehicles, and related components, namely battery cables and clamps.

Response to Paragraph 6: Deltran admits that Complainant "states that a plain English description of the category of Accused Products is portable, battery-powered devices that are used to jump-start batteries such as those in automobiles, trucks, and other vehicles, and related components, namely battery cables and clamps."

7. As required by Section 337(a)(2) and (3), a domestic industry exists and is well established in the United States for each of the Asserted Products and for products and technology protected by the Asserted Patents and Asserted Trademarks.

Response to Paragraph 7: Deltran denies that a domestic industry exists and is well established in the United States. Deltran further denies that there are products and technology "protected by the Asserted Patents," as those patents are invalid and/or unenforceable. Deltran is

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without information sufficient to form a belief as to the remaining allegations of this paragraph and therefore denies them.

8. Complainant NOCO seeks a general exclusion order pursuant to Section 337(d)(2) excluding from entry into the United States all products that infringe one or more claims of any of the Asserted Patents and/or are sold or advertised using the Asserted Trademarks. Complainant further seeks cease and desist orders pursuant to Section 337(f) directing Respondents and those acting in conjunction with Respondents to cease the importation, offering for sale, promotion, marketing, advertising, demonstration, and warehousing of inventory for distribution, sale, and use of such products within the United States. Complainant also seeks a bond pursuant to Section 337(j).

Response to Paragraph 8: Deltran admits that NOCO seeks a general exclusion order, cease and desist orders, and a bond. Deltran denies that NOCO is entitled to any of its requested relief.

9. In the alternative, should the Commission find that a general exclusion order is not appropriate, NOCO respectfully requests that limited exclusion orders be entered against each named Respondent and its subsidiaries, predecessors, affiliates, agents, successors, and assigns.

Response to Paragraph 9: Deltran admits that NOCO requests that limited exclusion orders be entered in the event the Commission finds that a general exclusion order is not appropriate. Deltran denies that a limited exclusion order is appropriate as to Deltran. Deltran is without information sufficient to form a belief as to the remaining allegations of this paragraph and therefore denies them.

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II. THE PARTIES

A. Complainant NOCO

10. Complainant NOCO is an Ohio corporation having its principal place of business at 30339 Diamond Parkway #102, Glenwillow, Ohio 44139.

Response to Paragraph 10: Deltran lacks information sufficient to form a belief as to the truth of the allegations contained in Paragraph 10. Accordingly, these allegations are denied.

11. NOCO is a privately held family company that was founded in the United States over 100 years ago. Joseph H. Nook, a tire and battery distributor from Cleveland, Ohio, founded The NOCO Company in 1914. Mr. Nook set out to develop a product that would prevent battery corrosion. After several hundred different formulations, Mr. Nook began commercially manufacturing and distributing the world's first Battery Corrosion Preventative which he called "NCP2," which is an acronym for "No Corrosion Product" which is applied in "2 Steps." The NCP2 brand quickly became a household name in every major battery and automotive shop. For over 100 years, the NCP2 brand has been preventing battery corrosion on over a billion vehicles and applications worldwide.

Response to Paragraph 11: Deltran lacks information sufficient to form a belief as to the truth of the allegations contained in Paragraph 11. Accordingly, these allegations are denied.

12. Today, NOCO, still owned and managed by the Nook family, remains a leading innovator in the automotive battery industry, and designs and manufactures premium consumer battery chargers, jump starters, solar panels, and portable power devices as well as a wide range related battery products and accessories.

Response to Paragraph 12: Deltran lacks information sufficient to form a belief as to the truth of the allegations contained in Paragraph 12. Accordingly, these allegations are denied.

13. NOCO has all right, title, and interest in the Asserted Patents and Asserted Trademarks. *See* Exs. 6 and 7.

Response to Paragraph 13: Deltran lacks knowledge or information sufficient to form a belief as to the allegations of this paragraph and therefore denies them.

14. NOCO takes significant measures to protect its intellectual property rights. NOCO first began noticing the appearance of the Accused Products in the U.S. marketplace in 2014 shortly after the introduction of its Boost® products and since then has continuously endeavored to stop the entities involved. NOCO's IPR protection efforts are outlined in Section XI, *infra*.

Response to Paragraph 14: Deltran admits that Section XI of the Amended Complaint discusses NOCO's purported efforts to enforce the Asserted Patents and Asserted Trademarks. Deltran lacks information sufficient to form a belief as to the truth of the remainder of the allegations contained in this paragraph and therefore denies them.

B. Proposed Respondents

15. The sections below provide information sufficient to identify the Proposed Respondents. Additional information regarding the Proposed Respondents' unfair acts as they relate to the Accused Products can be found in Section VI below, and in the attached Confidential Declaration of Anne Hurst. *See* Ex. 44C. For the purposes of this Complaint, the Proposed Respondents are grouped by the entity that is believed to be the manufacturer of a particular design, and all entities related to the importation of that design.

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Response to Paragraph 15: Deltran admits that NOCO's Amended Complaint groups the Proposed Respondents by the entity that NOCO believes to be the manufacturer of a particular design and the entities that NOCO believes to be related to the importation of that design. Deltran denies that Section VI of the Amended Complaint and the Confidential Declaration of Anne Hurst contain information regarding any "unfair acts" purportedly committed by Deltran. Deltran expressly denies that it has committed any unfair acts in violation of Section 337, and expressly denies that its products infringe any claims of the Asserted Patents. Deltran lacks knowledge or information sufficient to form a belief as to the remainder of the allegations of this paragraph and therefore denies them.

1. Carku Respondents

a) Advance Auto Parts, Inc.

16. On information and belief, Respondent Advance Auto Part, Inc. ("Advance Auto") is a company organized and existing under the laws of the United States, having its principal place of business located at 2635 East Millbrook Road, Raleigh, North Carolina 27604.

Response to Paragraph 16: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

17. On information and belief, Advance Auto is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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Response to Paragraph 17: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

b) Antigravity Batteries LLC

18. On information and belief, Respondent Antigravity Batteries LLC ("Antigravity") is a company organized and existing under the laws of the United States, having its principal place of business located at 15622 Broadway Center Street, Gardena, California 90248.

Response to Paragraph 18: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

19. On information and belief, Antigravity is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 19: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

c) Aukey Technology Co., Ltd.

20. On information and belief, Respondent Aukey Technology Ltd. ("Aukey") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 102, Building P09, Huanancity Elec-Trading Center, Longgang District, Shenzhen, China.

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Response to Paragraph 20: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

21. On information and belief, Aukey is in the business of manufacturing jump starters in China. Aukey sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 21: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

d) Autogen Technology Co., Ltd.

22. On information and belief, Respondent Autogen Technology Co., Ltd. ("Autogen") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Bld 21B No 3021 Kaixuan Rd, Shanghai, China.

Response to Paragraph 22: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

23. On information and belief, Autogen is in the business of manufacturing jump starters in China. Autogen sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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Response to Paragraph 23: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

e) Gooloo Technologies LLC

24. On information and belief, Respondent Gooloo Technologies LLC ("Gooloo") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 303 Room Bantian Business Center Bantian Wuhe Road, Longgang Dist., Shenzhen China 51800. Gooloo is believed to be affiliated with Shenzhen Gooloo E-Commerce Co., Ltd.

Response to Paragraph 24: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

25. On information and belief, Gooloo is in the business of manufacturing jump starters in China. Gooloo Tech sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 25: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

f) Guangzhou Unique Electronics Co., Ltd.

26. On information and belief, Respondent Guangzhou Unique Electronics Co., Ltd. ("Guangzhou Unique Electronics") is a Chinese corporation that is organized and existing under

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the laws of China and has a principal place of business located at NO. 9, Jinfa Logistics Park, Baiyun Lake Street, Baiyun District, Guagnzhou, China 510000.

Response to Paragraph 26: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

27. On information and belief, Guangzhou Unique Electronics is in the business of manufacturing jump starters in China. Guangzhou Unique Electronics sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

Response to Paragraph 27: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

g) Horizon Tool, Inc.

28. On information and belief, Respondent Horizon Tool, Inc. ("Horizon Tool") is a company organized and existing under the laws of the United States, having its principal place of business located at 7918 Industrial Village Road, Greensboro, North Carolina 27409. Horizon Tool is believed to be affiliated with AllStart LLC and Cal-Van & Horizon Tool Inc.

Response to Paragraph 28: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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29. On information and belief, Horizon Tool is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 29: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

h) Huizhou Grepro E-Commerce

30. On information and belief, Respondent Huizhou Grepro E-Commerce ("Huizhou Grepro") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 2004 B Kaibinsiji Build, Yunshanxi Road, Huicheng District, Huizhou, China.

Response to Paragraph 30: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

31. On information and belief, Huizhou Grepro is in the business of manufacturing jump starters in China. Huizhou Grepro sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 31: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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i) Medcursor, Inc.

32. On information and belief, Medcursor, Inc. ("Medcursor") is a company organized and existing under the laws of the United States, having its principal place of business located at 6130 W Flamingo Road, Suite 1818, Las Vegas, Nevada 89103.

Response to Paragraph 32: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

33. On information and belief, Medcursor is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 33: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

j) Nekteck, Inc.

34. On information and belief, Nekteck, Inc. ("Nekteck") is a company organized and existing under the laws of the United States, having its principal place of business located at 421 S Brookhurst Street, Suite 127, Anaheim, California 92804.

Response to Paragraph 34: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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35. On information and belief, Nekteck is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 35: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

k) PowerMax Battery (U.S.A.), Inc.

36. On information and belief, PowerMax Battery (U.S.A.), Inc. ("PowerMax") is a company organized and existing under the laws of the United States, having its principal place of business located at 1520 S Grove Avenue, Ontario, California 91761.

Response to Paragraph 36: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

37. On information and belief, PowerMax is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 37: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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l) Prime Global Products, Inc.

38. On information and belief, Prime Global Products, Inc. ("Prime Global Products") is a company organized and existing under the laws of the United States, having its principal place of business located at 2220 Airport Industrial Drive, Suite 100, Ball Ground, Georgia 30107.

Response to Paragraph 38: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

39. On information and belief, Prime Global Products is in the business of manufacturing jump starters in China. Prime Global Products sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 39: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

m) Shenzhen Carku Technology Co., Ltd.

40. On information and belief, Respondent Shenzhen Carku Technology Co., Ltd. ("Carku") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Building A, Qixing Creative Workshop (Dalang), Lianrun Road, Gaofeng Community, Dalang Street, Longhua New District, China. Carku is believed to be affiliated with MigOwatt Group LLC.

Response to Paragraph 40: Deltran admits that Carku has a place of business located in China. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the

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remainder of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

41. On information and belief, Carku is in the business of manufacturing jump starters in China. Carku sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 41: Deltran admits that Carku has manufactured jump starters in China. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

n) Shenzhen Moock Technology Co., Ltd.

42. On information and belief, Respondent Shenzhen Moock Technology Co., Ltd. ("Shenzhen Moock") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 718, Zerun Center, Bantian Street, Longgang District, Shenzhen, Guangdong, China.

Response to Paragraph 42: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

43. On information and belief, Shenzhen Moock is in the business of manufacturing jump starters in China. Shenzhen Moock sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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Response to Paragraph 43: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

o) Shenzhen Take Tools Co., Ltd.

44. On information and belief, Respondent Shenzhen Take Tools Co., Ltd. ("Shenzhen Take Tools") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. B714, Niulanqian Building, Minzhi Road, Longhua District, Shenzhen, Guangdong, China 518000.

Response to Paragraph 44: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

45. On information and belief, Shenzhen Take Tools is in the business of manufacturing jump starters in China. Shenzhen Take Tools sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 45: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

p) Sictec Instruments Co., Ltd.

46. On information and belief, Respondent Sictec Instruments Co., Ltd. ("Sictec Instruments") is a Hong Kong corporation that is organized and existing under the laws of Hong

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Kong and has a principal place of business located at Suites 908-090, Level 9, Landmark North, 39 Lung Sum Avenue, Sheung Shui, Hong Kong 999077.

Response to Paragraph 46: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

47. On information and belief, Sictec Instruments is in the business of manufacturing jump starters in Hong Kong. Sictec Instruments sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 47: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

q) Walmart Inc.

48. On information and belief, Walmart Inc. ("Walmart") is a company organized and existing under the laws of the United States, having its principal place of business located at 702 S.W. 8th Street, Bentonville, Arkansas 72716. Walmart is believed to be affiliated with Wal-Mart Stores, Inc.; Sam's West, Inc (d/b/a Sam's Club); and Sam's East, Inc. (d/b/a Sam's Club).

Response to Paragraph 48: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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49. On information and belief, Walmart is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 49: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

r) 70mai Co., Ltd.

50. On information and belief, 70mai Co., Ltd. ("70mai") is a company organized and existing under the laws of the United States, having its principal place of business located at Room 2220, Building 2, No. 588, Zixing Road, Minhang District, Shanghai, China.

Response to Paragraph 50: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

51. On information and belief, 70mai is in the business of manufacturing jump starters in China. 70mai sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 51: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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2. Boltpower Respondents

a) Anker Technology (UK) Ltd.

52. On information and belief, Respondent Anker Technology (UK) Ltd., ("Anker Technology UK") is a United Kingdom company organized and existing under the laws of the United Kingdom and has a principal place of business located at Suite B, Fairgate House, 205 Kings Road, Tyseley, Birmingham, United Kingdom B11 2AA. Anker is believed to be affiliated with Anker Technology Co., Ltd. and Anker Innovations Ltd.

Response to Paragraph 52: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

53. On information and belief, Anker Innovations, Anker Technology, and Anker Technology (UK) are in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 53: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

b) Arteck Electronic Co., Ltd.

54. On information and belief, Respondent Arteck Electronic Co., Ltd. ("Arteck Electronic") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. 1104-51, Tower B, Jinfengcheng Building, Shennan East Road No. 501, Shenzhen, Guangdong, China 518100.

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Response to Paragraph 54: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

55. On information and belief, Arteck Electronic is in the business of manufacturing jump starters in China. Arteck Electronic sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 55: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

c) Best Parts, Inc.

56. On information and belief, Respondent Best Parts, Inc. ("Best Parts") is a company organized and existing under the laws of the United States, having its principal place of business located at 123 S Front Street, Memphis, Tennessee 38103-3607.

Response to Paragraph 56: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

57. On information and belief, Best Parts is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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Response to Paragraph 57: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

d) Circus Link, Inc.

58. On information and belief, Respondent Circus Link, Inc. ("Circus Link") is a company organized and existing under the laws of the United States, having its principal place of business located at 2132 S. Grove Ave, Unit N, Ontario, California 91761.

Response to Paragraph 58: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

59. On information and belief, Circus Link is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 59: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

e) Deltran USA, LLC

60. On information and belief, Respondent Deltran USA, LLC ("Deltran") is a company organized and existing under the laws of the United States, having its principal place of business located at 801 International Speedway Blvd., DeLand, Florida 32724.

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Response to Paragraph 60: Denied as stated. Deltran admits that it is a limited liability company organized and existing under the laws of the State of Florida with its principal place of business located at 801 E International Speedway Blvd., DeLand, Florida 32724.

61. On information and belief, Deltran is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 61: Deltran admits that it imports portable jump starters into the United States, and sells portable jump starters in the United States after importation. Deltran denies that the Accused Products sold by Deltran infringe any claims of the Asserted Patents.

f) FlyLink Tech Technologies Co., Ltd.

62. On information and belief, Respondent FlyLink Tech Technologies Co., Ltd. ("FlyLink Tech") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 2 Floor, 9 Building, Hengling Ind. Park Min Zhi Street, Bao'an District, Shenzhen China.

Response to Paragraph 62: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

63. On information and belief, FlyLink Tech is in the business of manufacturing jump starters in China. FlyLink Tech sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 63: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

g) Fconegy Co., Ltd.

64. On information and belief, Respondent Fconegy Co., Ltd. ("Fconegy") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 20th Floor, Hefeng Building, Meilong Rd., Longhua New District, Shenzhen Guangdong, China.

Response to Paragraph 64: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

65. On information and belief, Fconegy is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 65: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

h) Guangdong Boltpower Energy Co., Ltd.

66. On information and belief, Respondent Guangdong Boltpower Energy Co., Ltd. ("Boltpower") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 3-6 Floor KelunTe Building No. 5 Ganli Road,

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Longgang District, Shenzhen City, Guangdong, China. Boltpower is believed to be affiliated with Dongguan Boltpower Co., Ltd. and Hunan Boltpower New Energy Co., Ltd.

Response to Paragraph 66: Denied as stated. Deltran admits that Guangdong Boltpower Energy Co., Ltd.'s Shenqhen headquarters is located at Floor 3-6, KeLunTe Building, BuLan Road, Buji Street, LongGang District, ShenZhen, China. Deltran further admits that Dongguan Boltpower Co., Ltd. is affiliated with Guangdong Boltpower Energy Co., Ltd. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

67. On information and belief, Boltpower is in the business of manufacturing jump starters in China. Boltpower sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

Response to Paragraph 67: Deltran admits that Boltpower manufactures jump starters in China. Deltran denies that the specific jump starter products manufactured by Boltpower which Deltran imports and sells in the United States infringe any claims of the Asserted Patents. Deltran is not accused of infringing the Asserted Trademarks. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

i) Guangzhou Autolion Electric Technology Co., Ltd.

68. On information and belief, Respondent Guangzhou Autolion Electronic Technology Co., Ltd. ("Autolion") is a Chinese corporation that is organized and existing under

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the laws of China and has a principal place of business located at Room 902, No. 69, Xianlie Middle Road, Yuexiu District, Guagnzhou, Guangdong, China.

Response to Paragraph 68: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

69. On information and belief, Autolion is in the business of manufacturing jump starters in China. Autolion sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

Response to Paragraph 69: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

j) Integrated Supply Network, LLC

70. On information and belief, Integrated Supply Network, LLC ("Integrated Supply Network") is a company organized and existing under the laws of the United States, having its principal place of business located at 2727 Interstate Drive, Lakeland, Florida 33805.

Response to Paragraph 70: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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71. On information and belief, Integrated Supply Network is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 71: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

k) K-Tool International

72. On information and belief, K-Tool International ("K-Tool") is a company organized and existing under the laws of the United States, having its principal place of business located at 45255 Five Mile Road Plymouth, Michigan 48170.

Response to Paragraph 72: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

73. On information and belief, K-Tool is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 73: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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l) Lowe's Companies, Inc.

74. On information and belief, Lowe's Companies, Inc. ("Lowe's") is a company organized and existing under the laws of the United States, having its principal place of business located at 1000 Lowe's Blvd. Mooresville, North Carolina.

Response to Paragraph 74: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

75. On information and belief, Lowe's is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 75: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

m) Matco Tools Corporation

76. On information and belief, Matco Tools Corporation ("Matco") is a company organized and existing under the laws of the United States, having its principal place of business located at 4403 Allen Road Stow, Ohio 44224.

Response to Paragraph 76: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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77. On information and belief, Matco is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 77: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

n) MonoPrice, Inc.

78. On information and belief, Mono Price, Inc. ("MonoPrice") is a company organized and existing under the laws of the United States, having its principal place of business located at 1 Pointe Drive, 4th Floor Brea, California 92821.

Response to Paragraph 78: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

79. On information and belief, MonoPrice is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 79: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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o) National Automotive Parts Association, LLC

80. On information and belief, National Automotive Parts Association, LLC ("NAPA") is a company organized and existing under the laws of the United States, having its principal place of business located at 2085 Marietta Blvd Northwest Atlanta, GA 30318. NAPA is believed to be affiliated with Genuine Parts Company, a company organized and existing under the Laws of the United States, having its principal place of business located at 2999 Wildwood Parkway, Atlanta, Georgia 30339.

Response to Paragraph 80: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

81. On information and belief, NAPA is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 81: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

p) O'Reilly Automotive, Inc.

82. On information and belief, O'Reilly Automotive, Inc. ("O'Reilly") is a company organized and existing under the laws of the United States, having its principal place of business located at 233 South Patterson Avenue Springfield, Missouri 65802.

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Response to Paragraph 82: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

83. On information and belief, O'Reilly is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 83: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

q) Pep Boys

84. On information and belief, Pep Boys ("Pep Boys") is a company organized and existing under the laws of the United States, having its principal place of business located at 3111 West Allegheny Avenue Philadelphia, Pennsylvania 19132.

Response to Paragraph 84: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

85. On information and belief, Pep Boys is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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Response to Paragraph 85: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

r) Schumacher Power Technology Ltd.

86. On information and belief, Respondent Schumacher Power Technology Ltd. ("Schumacher") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. 30, Century Road, Binhai County, Yancheng, Jiangsu, China, 215127. Schumacher is believed to be affiliated with Schumacher Electric Corp.

Response to Paragraph 86: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

87. On information and belief, Schumacher is in the business of manufacturing jump starters in China. Schumacher sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 87: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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Schumacher Electric Corp.[4]

87a) On information and belief, Respondent Schumacher Electric Corp. ("Schumacher") is a company organized and existing under the laws of the United States, having its principal place of business located at 801 E Business Center Drive Mount Prospect, Illinois 60056.

Response to Paragraph 87a): Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

87b) On information and belief, Schumacher is in the business of manufacturing jump starters in China. Schumacher sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 87b): Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

s) Shenzhen Chic Electrics Co., Ltd.

88. On information and belief, Respondent Shenzhen Chic Electrics., Ltd. ("Shenzhen Chic Electrics") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 2 #5 Floor, Hualangjia Industrial Zone, Kukeng Community, Guanlan Street, Longhua New District, Shenzhen China.

[4] NOCO added paragraphs 87a) and 87b) to its Amended Complaint via its Sixth Supplement to the Amended Complaint dated March 4, 2021.

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Response to Paragraph 88: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

89. On information and belief, Shenzhen Chic Electrics is in the business of manufacturing jump starters in China. Shenzhen Chic Electrics sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 89: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

t) Shenzhen Dingjiang Technology Co., Ltd. LLLC

90. On information and belief, Respondent Shenzhen Dingjiang Technology Co., Ltd. LLLC ("Shenzhen Dingjiang Technology") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 701G, HuafengBao'anZhigu Innovation Park Yintian 4th Road, Xixiang St., Bao'an District, Shenzhen, China 518000.

Response to Paragraph 90: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

91. On information and belief, Shenzhen Dingjiang Technology is in the business of manufacturing jump starters in China. Shenzhen Dingjiang Technology sells, offers for sale,

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imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

Response to Paragraph 91: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

u) Shenzhen Lianfatong Technology Co., Ltd.

92. On information and belief, Respondent Shenzhen Lianfatong Technology Co., Ltd. ("Shenzhen Lianfatong") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 3A-E, Ganyutong Building, Qingji Road, Qinghu Community, Longhua Street, Longhua New District, Shenzhen, Guangdong, China 518000.

Response to Paragraph 92: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

93. On information and belief, Shenzhen Lianfatong is in the business of manufacturing jump starters in China. Shenzhen Lianfatong sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

Response to Paragraph 93: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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v) Shenzhen Li Feng Maoyiyouxiangongsi

94. On information and belief, Respondent Shenzhen Li Feng Maoyiyouxiangongsi ("Shenzhen Li Feng Maoyiyouxiangongsi") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at China Da Wan Xin Cun Dong, 38 Dong 201 Long Gang Qu Yuan Shan Jie Dao, DaKang, Shenzhen Guangdong, China 518000.

Response to Paragraph 94: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

95. On information and belief, Shenzhen Li Feng Maoyiyouxiangongsi is in the business of manufacturing jump starters in China. Shenzhen Li Feng Maoyiyouxiangongsi sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

Response to Paragraph 95: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

w) Shenzhen Mediatek Tong Technology Co., Ltd.

96. On information and belief, Respondent Shenzhen Mediatek Tong Technology Co., Ltd. ("Shenzhen Mediatek") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 3A-E, Qianyu Tong Building, Qingji Road, Longhua Street, Longhua New District, Shenzhen, China.

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Response to Paragraph 96: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

97. On information and belief, Shenzhen Mediatek is in the business of manufacturing jump starters in China. Shenzhen Mediatek sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

Response to Paragraph 97: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

x) Shenzhen Topdon Technology Co., Ltd.

98. On information and belief, Respondent Shenzhen Topdon Technology Co., Ltd. ("Shenzhen Topdon") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 5th Floor, Building 12, Taihua Wutong Island, Intersection of Shunchang Road and Hangkong Road, Xixiang Subdistrict, Baoan District, Guangdong, Shenzhen, China 518112.

Response to Paragraph 98: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

99. On information and belief, Shenzhen Topdon is in the business of manufacturing jump starters in China. Shenzhen Topdon sells, offers for sale, imports, and/or has imported into

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the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

Response to Paragraph 99: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

y) Shenzhen Valuelink E-Commerce Co., Ltd.

100. On information and belief, Respondent Shenzhen Valuelink E-Commerce Co., Ltd. ("Shenzhen Valuelink") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 2nd Two-way ChangJiangPu, Heao Community, HengGang Street Office, Longgang District, Shenzhen, China 518000.

Response to Paragraph 100: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

101. On information and belief, Shenzhen Valuelink is in the business of manufacturing jump starters in China. Shenzhen Valuelink sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 101: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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z) Smart Well Enterprise Limited

102. On information and belief, Smart Well Enterprise Limited ("Smart Well") is a Hong Kong company organized and existing under the laws of Hong Kong, having its principal place of business located at 14/F., Chun Wo Commercial Centre, 25 Wing Wo Street, Central, Hong Kong.

Response to Paragraph 102: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

103. On information and belief, Smart Well is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

Response to Paragraph 103: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

aa) Tii Trading Inc.

104. On information and belief, Tii Trading Inc. ("Tii Trading") is a company organized and existing under the laws of the United States, having its principal place of business located at 13200 Brooks Drive, Suite F, Baldwin Park, California 91706.

Response to Paragraph 104: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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105. On information and belief, Tii Trading is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 105: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

bb) Zhejiang Qingyou Electronic Commerce Co., Ltd.

106. On information and belief, Zhejiang Qingyou Electronic Commerce Co., Ltd. ("Zhejiang Qingyou Electronic") is a company organized and existing under the laws of the United States, having its principal place of business located at Room 266-270, Building 7, No. 253, Tinglan Street, Qiaosi Street, Yuhang District, Hangzhou, Zhejiang, China.

Response to Paragraph 106: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

107. On information and belief, Zhejiang Qingyou Electronic is in the business of manufacturing jump starters in China. Zhejiang Qingyou Electronic sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 107: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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3. Smartech Respondents

a) Smartech Products, Inc.

108. On information and belief, Smartech Products, Inc. ("Smartech") is a company organized and existing under the laws of the United States, having its principal place of business located at 8700 Larkin Road, Suite B, Savage, Maryland 20763.

Response to Paragraph 108: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

109. On information and belief, Smartech is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 109: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

4. Weego Respondents

a) Shenzhen Jieruijia Technology Co., Ltd.

110. On information and belief, Respondent Shenzhen Jieruijia Technology Co., Ltd. ("Shenzhen Jieruijia") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. 8 Mu Dun Road, No. 1 Industrial Zone, Lou Cun Community, Gong Ming, Guagn Ming District, Shenzhen City, China.

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Response to Paragraph 110: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

111. On information and belief, Shenzhen Jieruijia is in the business of manufacturing jump starters in China. Shenzhen Jieruijia sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 111: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

b) Paris Corporation

112. On information and belief, Paris Corporation ("Paris Corporation") is a company organized and existing under the laws of the United States, having its principal place of business located at 800 Highland Drive Westhampton, New Jersey 08060.

Response to Paragraph 112: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

113. On information and belief, Paris Corporation is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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Response to Paragraph 113: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

5. WinPlus Respondents

a) Shenzhen Winplus Technology Co., Ltd.

114. On information and belief, Respondent Shenzhen Winplus Technology Co., Ltd. ("Shenzhen Winplus") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 307, Building 5, LixiangJiayaun, Jindaotian Road, Buji, Longgang District, Shenzhen, China 518000. Shenzhen Winplus is believed to be affiliated with Winplus Technology (Hk) Ltd., a Hong Kong company organized and existing under the laws of Hong Kong with a principal place of business located at Flat/Room 1103 11F, Hang Seng Mongkok Building, 677 Nathan Road, Mongkok, Hong Kong.

Response to Paragraph 114: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

115. On information and belief, Shenzhen Winplus is in the business of manufacturing jump starters in China. Shenzhen Winplus Battery sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 115: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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b) Winplus North America, Inc.

116. On information and belief, Winplus North America, Inc. ("Winplus North America") is a company organized and existing under the laws of the United States, having its principal place of business located at 2975 Red Hill Ave, Suite 100, Costa Mesa, California 92626.

Response to Paragraph 19: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

117. On information and belief, Winplus is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 117: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

6. Great Neck Respondents

a) AutoZone, Inc.

118. On information and belief, Respondent AutoZone, Inc. ("AutoZone") is a company organized and existing under the laws of the United States, having its principal place of business located at 123 South Front Street, Memphis, Tennessee 38103.

Response to Paragraph 118: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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119. On information and belief, AutoZone is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 119: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

b) Great Neck Global, Inc. & Great Neck Saw Manufacturers, Inc.

120. On information and belief, Respondent Great Neck Global, Inc. ("Great Neck Global") is a Taiwanese corporation that is organized and existing under the laws of Taiwan and has a principal place of business located at No. 19, Lane 96, Section 2, Zhongshan North Road, Taipei, Taiwan 104.

Response to Paragraph 120: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

121. Great Neck is believed to be associated and/or operate under the name Great Neck Saw Manufacturers, Inc., ("Great Neck U.S.") a company organized and existing under the laws of the United States, having its principal place of business located at 165 East 2nd Street, Mineola, New York 11501.

Response to Paragraph 121: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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122. On information and belief, Great Neck Global is in the business of manufacturing jump starters in Taiwan. On information and belief, Great Neck U.S. sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 122: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

7. ThiEye Respondents

a) Dongguan Hangchebao Energy Technology Co., Ltd.

123. On information and belief, Respondent Dongguan Hangchebao Energy Technology Co., Ltd. ("Hangchebao") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 201, Changde Road No. 37, Humen Town Dongguan City, Guangdong, China.

Response to Paragraph 123: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

124. On information and belief, Hangchebao is in the business of manufacturing jump starters in China. Hanchebao sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

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Response to Paragraph 124: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

b) ThiEye Technologies Co., Ltd.

125. On information and belief, Respondent ThiEye Technologies Co., Ltd. ("ThiEye Technologies") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 405, 4th Floor, Building B, Bantian International Center, Longgang District, China.

Response to Paragraph 125: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

126. On information and belief, ThiEye Technologies is in the business of manufacturing jump starters in China. ThiEye Technologies sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 126: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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8. Energen/ Performance Tool Respondents

a) Best Buy Co., Inc.

127. On information and belief, Respondent Best Buy Co., Inc. ("Best Buy") is a company organized and existing under the laws of the United States, having its principal place of business located at 7601 Penn Avenue, South Richfield, Minnesota 552423.

Response to Paragraph 127: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

128. On information and belief, Best Buy is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 128: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

b) Chao Fung Trading Co. Ltd.

129. On information and belief, Respondent Chao Fung Trading Co. Ltd. ("Chao Fung Trading") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 911 Jinmao Toer Mingzhou Road W Beilun District Ningbo, China (Taiwan).

Response to Paragraph 129: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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130. On information and belief, Chao Fung Trading is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 130: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

c) Energen, Inc.

131. On information and belief, Respondent Energen, Inc. ("Energen") is a company organized and existing under the laws of the United States, having its principal place of business located at 17008 Evergreen Place Unit B, City of Industry, California 91745.

Response to Paragraph 131: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

132. On information and belief, Energen is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 132: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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d) Wilmar Corporation

133. On information and belief, Wilmar Corporation ("Wilmar") is a company organized and existing under the laws of the United States, having its principal place of business located at P.O. Box 88259 Tukwila, Washington 98138.

Response to Paragraph 133: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

134. On information and belief, Wilmar is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 134: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

9. Halo Respondents[5]

a) Halo2Cloud LLC

134a) On information and belief, Respondent Halo2Cloud, LLC ("Halo2Cloud") is a company organized and existing under the laws of the United States, having its principal place of business located at 6 Central Row, Hartford, Connecticut 06103.

[5] NOCO added paragraphs 134a) – 134h) to its Amended Complaint via its Sixth Supplement to the Amended Complaint dated March 4, 2021.

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Response to Paragraph 134a): Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

134b) On information and belief, Halo2Cloud is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 134b): Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

b) QVC, Inc.

134c) On information and belief, QVC, Inc. ("QVC") is a company organized and existing under the laws of the United States, having its principal place of business located at 250 Dove Court Santa Paula, California 93060.

Response to Paragraph 134c): Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

134d) On information and belief, QVC is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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Response to Paragraph 134d): Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

c) Zagg Co. Rrd Gst

134e) On information and belief, Zagg Co. Rrd Gst ("Zagg") is a company organized and existing under the laws of the United States, having its principal place of business located at 381 Airtech Parkway, Plainfield, Indiana 46168. Zagg is believed to be affiliated with Zagg, Inc., company organized an existing under the laws of the United States, having its principal place of business located at 910 West Legacy Center Way, Suite 500, Midvale, Utah 84047.

Response to Paragraph 134e): Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

134f) On information and belief, Zagg is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 134f): Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

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10. Jump-n-Carry Respondents

Clore Automotive, LLC

134g) On information and belief, Respondent Clore Automotive, LLC ("Clore Automotive") is a company organized and existing under the laws of the United States, having its principal place of business located at 8735 Rosehill Suite 220, Lenexa, Kansas 66215.

Response to Paragraph 134g): Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

134h) On information and belief, Clore Automotive is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

Response to Paragraph 134h): Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

III. THE PRODUCTS AT ISSUE

135. The products at issue are portable battery jump starter packs that allow users to safely jump start cars, boats, motorcycles, and more without connecting to another vehicle. The Accused Products and components thereof in this matter include safety features claimed by Complainant's Asserted Patents that prevent injury to the user and damage to the battery being jump started.

Response to Paragraph 135: Deltran admits that the accused Battery Tender® branded products sold by Deltran are portable battery jump starter packs that allow users to safely jump start vehicles without connecting to another vehicle. Deltran further admits that the accused

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Battery Tender® products include safety features long present in jump starters that prevent injury to the user and damage to the battery being jump started. Deltran denies that any features of the accused Battery Tender® products are covered by any claims of the Asserted Patents. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Respondents other than Deltran, and therefore denies them.

136. Since the early days of automobiles, the prevalent method to recharge a dead car battery has been through the use of "jumper cables," where two cables are run from a live battery in a running vehicle to a dead battery of a second vehicle. The many problems associated with jumper cables are well known, including the fact that a second car with a live battery is needed to perform a jump start, and the danger of sparking and short circuits, especially when the cables from the live battery to the dead battery are misconnected (referred to as "reverse polarity") or not fully connected.

Response to Paragraph 136: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

137. Numerous efforts to improve the jump-starting process have been undertaken over the years, most of which have had significant deficiencies such as lack of portability or failure to solve safety problems and did not achieve significant popularity.

Response to Paragraph 137: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

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138. The advent of lithium-ion batteries has permitted the introduction of compact jump starters that do not require the use of a second vehicle, providing consumer convenience as well as certain safety advantages over prior jump-starting devices.

Response to Paragraph 138: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

A. Complainant's Jump Starters

139. NOCO has successfully developed innovative automobile battery products in the United States for over 100 years. In 2014, NOCO introduced the Boost® lithium jump starter, which incorporates the patented safety features described herein. A photograph of one model of NOCO's Boost® jumping a dead battery is shown below, and a video demonstrating how the Boost® operates can be found at https://www.youtube.com/watch?v=QULcgAZUs0Y

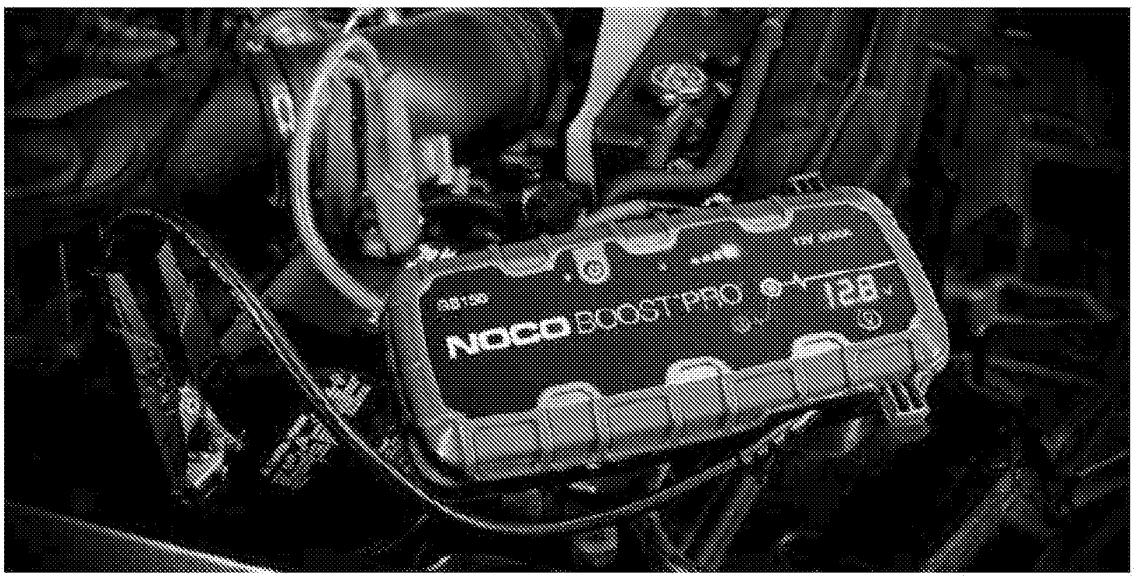


Fig. 1- NOCO Boost® Pro™ (GB150)- 3,000A Jump Starter

Response to Paragraph 139: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

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140. NOCO currently offers a range of products for the charging, jump-starting, and storage of vehicle batteries. The products at issue here include the entire line of NOCO Boost® jump starters, namely, the Boost® Sport™, Boost® Plus™, Boost® XL™, Boost® HD™, Boost® Pro™, and Boost® Max™. *See* Ex. 8.

Response to Paragraph 140: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

141. The NOCO Boost® jump starters are ultra-portable, lightweight, and compact. They outperform traditional lead-acid battery booster packs at a fraction of the size and weight. The Boost® jump starters provide users a safe and easy-to-use car battery jump starter pack without the worry of incorrect connections or sparks. Boost® jump starters safely connect to any 12-volt vehicle battery due to NOCO's mistake-proof design featuring spark-proof technology and reverse polarity protection. All Boost® jump starters also feature a 2.1A USB output port to power any USB device, and an LED flashlight with 7 light modes, including SOS and Emergency Strobe. *See* Ex. 8. NOCO offers six Boost® models, which provide a range from 500A to 20,000A for a wide variety of vehicle batteries and applications.

Response to Paragraph 141: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

142. Since its introduction, the Boost® has become known for its safety, ease of use, and reliability, among other features. As a result, the Boost® has enjoyed tremendous popularity, becoming one of the, if not the, market-leading compact lithium jump starters in the United States.

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Response to Paragraph 142: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

B. Respondents' Jump Starters

143. On information and belief, the Accused Products include portable battery jump starters that are manufactured in China and then imported into the United States. These products incorporate the patented technology claimed in the Asserted Patents. Examples of infringing jump starter models offered by three of the Respondents are shown below:

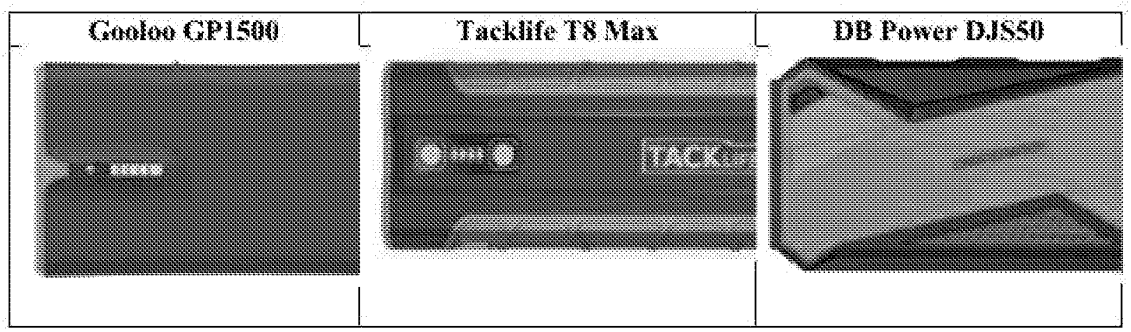


Fig. 2- Examples of Accused Products

Response to Paragraph 143: Deltran admits that the accused Battery Tender® products are made in China. Deltran denies that the accused Battery Tender® products infringe any claims of the Asserted Patents. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Respondents other than Deltran and products other than Deltran's Accused Products, and therefore denies them.

144. It is often difficult to determine the source of the Accused Products, as the Chinese manufacturers of these products frequently distribute them through several entities, even when the products are made in the same facility. There have also been instances of the Chinese

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manufacturers changing their names or using trading companies to ship the products to the United States. For these reasons, there are many instances in which neither the shipping documents nor the product packaging indicate the manufacturer of the product.

Response to Paragraph 144: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

145. Respondents target customers in the United States through their own websites and also sell the accused jump starters via online marketplaces, including Amazon. Numerous Respondents' Accused Products are also sold in brick-and-mortar retail locations in the United States and/or on the websites of these retailers.

Response to Paragraph 145: Deltran admits that the accused Battery Tender® products are sold in brick-and-mortar retail locations in the United States and via online marketplaces. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Respondents other than Deltran and products other than Deltran's Accused Products, and therefore denies them.

IV. THE ASSERTED PATENTS

146. The Asserted Patents generally relate to portable battery jump starters and safety features contained therein. These jump starters can be used to jump start the batteries of many vehicles including cars, trucks, boats, and motorcycles.

Response to Paragraph 146: Deltran admits the allegations of this paragraph.

147. The identification, ownership, non-technical description, foreign counterparts, and licensees for each Asserted Patent are identified below.

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Response to Paragraph 147: Deltran admits that in certain paragraphs of the Amended Complaint below, NOCO purports to discuss the identification, ownership, non-technical description, foreign counterparts, and licensees for each Asserted Patent. Deltran lacks knowledge or information sufficient to form a belief as to the truth of those allegations, and therefore denies them.

A. U.S. Patent No. 9,007,015

1. Identification of the Patent and Ownership

148. The '015 Patent, titled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection" issued on April 15, 2015, naming Jonathan L. Nook, William K. Nook, James R. Stanfield, and Derek M. Underhill as the inventors. Ex. 1 (Certified copy of '015 Patent) at 1. The '015 Patent is based on U.S. Patent Application No. 14/325,938 filed on July 8, 2014. *Id.* The '015 Patent is a continuation of Application No. PCT/US2014/045343, filed on July 3, 2014. The '015 Patent will expire on July 3, 2034.

Response to Paragraph 148: Deltran admits that United States Patent No. 9,007,015 (the "'015 Patent") is titled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection," that it names Jonathan L. Nook, William K. Nook, James R. Stanfield, and Derek M. Underhill as inventors, and that it purports on its face to have issued on April 14, 2015 from an application filed on July 8, 2014, which purports to be a continuation of an application filed on July 3, 2014. The remainder of the allegations of this paragraph are legal conclusions to which no response is required. To the extent a response is required, Deltran denies such allegations.

149. This Complaint is accompanied by a certified copy of the prosecution history for the '015 Patent and the references cited therein. *See* Appx. A1 and A2.

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Response to Paragraph 149: Denied as stated. Deltran admits that Appendix A1 to the Complaint purports to be a copy of at least a portion of the prosecution history of the '015 patent and Appendix A2 purports to include copies of references cited therein. Deltran denies that Appendix A1 and A2 contain complete and accurate copies of the entirety of the prosecution history of the '015 patent. For example, it appears that at least the complete records of the IPRs that have been filed against claims of the '015 patent are not included in their entirety in Appendix A1 or A2.

150. NOCO owns by assignment all rights, title, and interest in the '015 Patent. *See* Ex. 6.

Response to Paragraph 150: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

2. Non-Technical Description of the Patent

151. The '015 Patent relates to an improved portable jump starter incorporating a rechargeable lithium-ion battery and a microcontroller. The '015 Patent describes a novel apparatus that incorporates a power switch actuated by a microcontroller such that power will be delivered from the lithium-ion power pack to the output port only when the battery is connected to the output port and only when the battery is connected with the proper polarity of positive and negative terminals. This solves the problem of sparking or potential damage to the battery and/or bodily injury when the jumper terminals or clamps of the cables were inadvertently brought in contact with each other, or when positive and negative terminals were connected to the opposite polarity terminals in the vehicle to be jumped.

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Response to Paragraph 151: The disclosure of the '015 patent speaks for itself. To the extent this paragraph purports to argue that the claims of the '015 patent are valid – e.g., by describing an "improved" portable jump starter and a "novel" apparatus – such allegations are denied. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph, and therefore denies them.

152. The '015 Patent has 23 claims, 1 of which is an independent claim. Complainant is asserting claims 1, 4, 11, 14, 18, 19 and 21.

Response to Paragraph 152: The disclosure of the '015 patent speaks for itself. Deltran admits that NOCO purports to be asserting claims 1, 4, 11, 14, 18, 19, and 21.

3. Foreign Counterparts of the Patent

153. The following is a list of current foreign patents and foreign applications that are presently understood to correspond or otherwise relate to the '015 Patent:

- CA2,916,782 (Canada)
- GB2527858 (United Kingdom)
- DE10204114997B4 (Germany)
- (Australia) Patent Application (Approved) No. 20201223
- (Germany) Patent Application No. 102014020005.1
- (Germany) Patent Application No. 102014020004.3

Response to Paragraph 153: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

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154. NOCO owns all right, title, and interest in and to each of these foreign patents and applications, there are no other foreign patents corresponding to the '015 Patent, and there are no other pending, rejected, or abandoned foreign patent applications corresponding to the '015 Patent.

Response to Paragraph 154: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

4. Licensees to the Patent

155. All licensees to the '015 Patent are identified in Confidential Ex. 5C. There are no other licensees relating to the '015 Patent.

Response to Paragraph 155: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

B. U.S. Patent No. 10,604,024

1. Identification of the Patent and Ownership

156. The '024 Patent, titled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection" issued on March 31, 2020 naming Jonathan L. Nook, William K. Nook, James R. Stanfield, and Derek M. Underhill as the inventors. Ex. 2 (Certified copy of '024 Patent) at 1. The '024 Patent is based on U.S. Patent Application No. 15/691,884 filed on Aug. 31, 2017. *Id.* The '024 Patent is a continuation of Application No. 14/619,655, filed February 11, 2015, now U.S. Patent No. 9,770,992, which claims priority to PCT/US2014/045434, filed July 3, 2014. The '024 Patent will expire on July 3, 2034.

Response to Paragraph 156: Deltran admits that the '024 patent is titled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection," that it names Jonathan L. Nook, William K. Nook, James R. Stanfield, and Derek M. Underhill as inventors, and that it purports

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on its face to have issued on March 31, 2020 from an application filed on August 31, 2017, which purports to be a continuation of an application filed on February 11, 2015 and which purports to claim priority to an application filed on July 3, 2014. The remainder of the allegations of this paragraph are legal conclusions to which no response is required. To the extent a response is required, Deltran denies such allegations.

157. This Complaint is accompanied by a certified copy of the prosecution history for the '024 Patent and the references cited therein. *See* Appx. B1 and B2.

Response to Paragraph 157: Deltran admits that Appendix B1 to the Complaint purports to be a copy of at least a portion of the prosecution history of the '024 patent and Appendix B2 purports to include copies of references cited therein. Deltran lacks knowledge or information sufficient to form a belief as to whether or not Appendix B1 and B2 are complete and accurate copies of the prosecution history of the '024 patent and cited references, and on that basis denies such allegations.

158. NOCO owns by assignment all rights, title, and interest in the '024 Patent. *See* Ex. 7.

Response to Paragraph 158: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

2. Non-Technical Description of the Patent

159. The '024 Patent relates to an improved portable jump starter incorporating a rechargeable lithium-ion battery and a microcontroller. The '024 Patent is a continuation of the '015 Patent but claims inventive features not claimed in that patent, including: the device being

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turned on when the microcontroller receives *simultaneous* signals from the sensors indicating that the device's battery clamps are connected to the vehicle battery proper polarity; and the device being *turned off* when the microcontroller receives signals from the sensors indicating that the device's battery clamps have become disconnected from the vehicle battery and/or an improper polarity condition.

Response to Paragraph 159: The disclosure of the '024 patent speaks for itself. To the extent this paragraph purports to argue that the claims of the '024 patent are valid – e.g., by describing an "improved" portable jump starter and "inventive features" – such allegations are denied. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph, and therefore denies them.

160. The '024 Patent has 30 claims, 3 of which are independent claims. Complainant is asserting claims 1, 4, 5, 6, 16, 19, 23, 24, 26, 29, 30.

Response to Paragraph 160: The disclosure of the '024 patent speaks for itself. Deltran admits that NOCO purports to be asserting claims 1, 4, 5, 6, 16, 19, 23, 24, 26, 29, 30.

3. Foreign Counterparts of the Patent

161. *See* Section IV.A.3, *supra*.

Response to Paragraph 161: Deltran incorporates by reference its responses to paragraphs 153 and 154.

4. Licensees to the Patent

162. All licensees to the '024 Patent are identified in Confidential Ex. 5C. There are no other licensees relating to the '024 Patent.

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Response to Paragraph 162: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

V. THE ASSERTED TRADEMARKS

A. U.S. Trademark Reg. No. 4,811,656

163. The federal registration of the ULTRASAFE mark, Reg. No. 4,811,656, issued on September 15, 2015 to NOCO. NOCO has continuously used this mark in commerce since at least August 2014 for its jump starters (Classes 021 023, 026, 036, and 038.). Affidavits have been filed pursuant to Section 8 and 15 of the Lanham Act, 15 U.S.C.§§ 1058 and 1065, and this registration is incontestable. A copy of the Certificate of Registration for the Registered Trademark is attached hereto as Exhibit 3.

Response to Paragraph 163: NOCO has not accused Deltran of infringing the Asserted Trademarks, so Deltran is not required to respond to this paragraph. To the extent a response is required, Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

164. Pursuant to Commission Rule 210.12(d), NOCO will file a certified copy of the prosecution history of the ULTRASAFE trademark for U.S. Trademark Reg. No. 4,811,656, as Appendix C.

Response to Paragraph 164: NOCO has not accused Deltran of infringing the Asserted Trademarks, so Deltran is not required to respond to this paragraph. To the extent a response is required, Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

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B. U.S. Trademark Reg. No. 4,811,749

165. The federal registration of the SAFELY JUMP START A DEAD BATTERY IN SECONDS mark, Reg. No. 4,811,749, issued on September 15, 2015 to NOCO. NOCO has continuously used this mark in commerce since at least August 2014 for its jump starters (Classes 021, 023, 026, 036, 038, 100, 101, and 102). Affidavits have been filed pursuant to Section 8 and 15 of the Lanham Act, 15 U.S.C. §§ 1058 and 1065, and this registration is incontestable. A copy of the Certificate of Registration for the Registered Trademark is attached hereto as Exhibit 4.

Response to Paragraph 165: NOCO has not accused Deltran of infringing the Asserted Trademarks, so Deltran is not required to respond to this paragraph. To the extent a response is required, Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

166. Pursuant to Commission Rule 210.12(d), NOCO will file a certified copy of the prosecution history of the "Safely Jump Start a Dead Battery in Seconds" trademark for U.S. Trademark Reg. No. 4,811,749, as Appendix D.

Response to Paragraph 166: NOCO has not accused Deltran of infringing the Asserted Trademarks, so Deltran is not required to respond to this paragraph. To the extent a response is required, Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

VI. UNFAIR ACTS OF THE PROPOSED RESPONDENTS

A. Infringement of the Asserted Patents

167. On information and belief, Respondents, without authorization, have been and still are infringing each of the Asserted Patents in the United States. Respondents' unlawful and unfair

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acts include the importation into the United States, sale for importation into the United States, or sale within the United States after importation of the infringing Accused Products. Respondents have violated, and continue to violate, Section 337 of the Tariff Act of 1930 in view of U.S. patent laws. Respondents are not licensed under the Asserted Patents.

Response to Paragraph 167: Deltran denies the allegations of this paragraph to the extent they relate to Deltran's activities and Deltran's Accused Products. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Respondents other than Deltran and products other than Deltran's Accused Products, and therefore denies them.

168. Specifically, NOCO asserts that the Respondents directly infringe, literally or under the doctrine of equivalents, at least the following independent claims of the Asserted Patents, in violation of 35 U.S.C. §§ 271(a) and Section 337 (a)(1)(B)(i):

Claim Chart	'015 Patent	'024 Patent
Claim Chart 01 – Carku	1	1, 29, 30
Claim Chart 02 – Boltpower	1	1, 29, 30
Claim Chart 03 – Smartech	1	1, 29, 30
Claim Chart 04 – Weego	1	1, 29, 30
Claim Chart 05 – Winplus	1	1, 29, 30
Claim Chart 06 – Great Neck	1	
Claim Chart 07 – ThiEye	1	1, 29, 30
Claim Chart 08 – Energen/ Performance	1	1, 29, 30
Claim Chart 09 – HALO	1	1, 29, 30
Claim Chart 10 – Clore	1	1, 29, 30

Table 2. Asserted Independent Claims Infringed by Proposed Respondents

Response to Paragraph 168: Deltran denies the allegations of this paragraph to the extent they relate to Deltran's activities and Deltran's Accused Products. Deltran denies that it infringes any claims of the Asserted Patents. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to

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Respondents other than Deltran and products other than Deltran's Accused Products, and therefore denies them.

169. For purposes of assessing infringement, the Accused Products are divided into groups based on suspected manufacturer. The claim charts are designated Claim Chart 01 through Claim Chart 10, and the Accused Products within each design group are set forth on Exhibit 9. The Accused Products within each design group share a common design, at least with respect to the portions relevant to the infringement analysis of the independent claims of the '015 and '024 Patent claims. Each of the Respondents imports, sells for importation, and/or sells within the United States after importation at least one of the Accused Products and therefore directly infringes, literally or under the doctrine of equivalents, one or more of claims 1, 4, 11, 14, 18, 19, 21 of the '015 Patent and/or one or more of claims 1, 4, 5, 6, 16, 19, 23, 24, 26, 29, 30 of the '024 Patent with respect to such Respondent's Accused Products.

Response to Paragraph 169: Deltran admits that NOCO has categorized the various accused products in this Investigation into ten separate groups, as set forth in its ten separate claim charts (Claim Chart 01 through Claim Chart 10). Deltran denies that "the Accused Products within each design group are set forth on Exhibit 9" insofar as NOCO appears to have withdrawn Exhibit 9. *See* Amended Complaint, Table of Exhibits, at p. v (indicating that Exhibit 9 is withdrawn). Deltran further denies that it infringes any claims of the Asserted Patents. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph, and therefore denies them.

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1. Claim Chart 01- Carku Accused Products

a) Carku Design

170. The Accused Products in Claim Chart 01 ("Carku Design") are lithium battery powered jump starters having a cable assembly that includes a relay and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an optocoupler sensor. The Carku Design Accused Products are offered by numerous sellers under multiple brand names. On information and belief, the Carku Design Accused Products are manufactured by at least Respondent Carku. The Tacklife T8 Pro model jump starter is representative of the Carku Design Accused Products.

Response to Paragraph 170: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

b) Infringement of the '015 Patent

171. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Carku Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Carku Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Carku Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

Response to Paragraph 171: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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172. A claim chart comparing independent claim 1 of the '015 Patent to the representative Carku Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 111.

Response to Paragraph 172: Deltran admits that Exhibit 111 to the Amended Complaint purports to be a claim chart comparing independent claim 1 of the '015 Patent to a product that NOCO characterizes as a representative Carku Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 111 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

c) Infringement of the '024 Patent

173. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Carku Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Carku Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Carku Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

Response to Paragraph 173: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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174. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Carku Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 111.

Response to Paragraph 174: Deltran admits that Exhibit 111 to the Amended Complaint purports to be a claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to a product that NOCO characterizes as a representative Carku Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 111 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

2. Claim Chart 02 - Boltpower Accused Products

a) Boltpower Design

175. The Accused Products in Claim Chart 02 ("Boltpower Design") are lithium battery powered jump starters that includes a relay and two sensors. The Boltpower Design Accused Products are offered by numerous sellers under multiple brand names. The BEATIT D11, Lemsir V1, and BEATIT D10 Pro model jump starters are representative of the three designs of Accused Products manufactured by Boltpower.

Response to Paragraph 175: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents other than Deltran and products other than Deltran's Accused Products, and therefore denies them. By way of further response, Claim Chart 02 does not include an element-by-element analysis of the Battery Tender® products sold by Deltran. Rather, NOCO's Claim Chart 02 only includes an element-by-element analysis of the BEATIT D11, Lemsir V1, and BEATIT D10 Pro products. NOCO states, without any analysis or explanation, that those three products are "representative" of all

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accused products manufactured by Boltpower, including the Battery Tender® products sold by Deltran. Deltran, however, does not sell the BEATIT D11, Lemsir V1, and BEATIT D10 Pro products.

b) Infringement of the '015 Patent

176. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Boltpower Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Boltpower Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Boltpower Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

Response to Paragraph 176: Deltran denies that the accused Battery Tender® products infringe any claims of the Asserted Patents. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Respondents other than Deltran and products other than Deltran's Accused Products, and therefore denies them.

177. A claim chart comparing independent claim 1 of the '015 Patent to the representative Boltpower Design Accused Products, and including photographs and drawings where applicable, is attached as Ex. 112.

Response to Paragraph 177: Deltran admits that Exhibit 112 to the Amended Complaint purports to be a claim chart comparing independent claim 1 of the '015 Patent to three products that NOCO characterizes as "representative Boltpower Design Accused Products" – i.e., the Beatit

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D11, Lemsir V1, and Beatit D10 Pro. Because Deltran does not make, use, sell, offer to sell, or import any of the products depicted in Exhibit 112, Deltran lacks knowledge or information regarding whether any of them are "representative" of the Battery Tender® products sold by Deltran. Accordingly, Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in this paragraph and in Exhibit 112, and therefore denies them. Deltran further denies that any products it makes, uses, sells, offers to sell, or imports, infringe any claims of the Asserted Patents.

By way of further response, to the extent the claim charts set forth in Exhibits 139 and 140 (pertaining to the Battery Tender® 600 and 800 products)[6] were intended to supplement Exhibit 112, Deltran denies the allegations set forth in those claim charts.

c) Infringement of the '024 Patent

178. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Boltpower Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Boltpower Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Boltpower Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

Response to Paragraph 178: Deltran denies that the accused Battery Tender® products infringe any claims of the Asserted Patents. Deltran lacks knowledge or information sufficient to

[6] NOCO submitted Exhibits 139 and 140 with its Fouth Supplement to the Amended Complaint dated February 22, 2021.

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form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Respondents other than Deltran and products other than Deltran's Accused Products, and therefore denies them.

179. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Boltpower Design Accused Products, and including photographs and drawings where applicable, is attached as Ex. 112.

Response to Paragraph 179: Deltran admits that Exhibit 112 to the Amended Complaint purports to be a claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to three products that NOCO characterizes as "representative Boltpower Design Accused Products" – i.e., the Beatit D11, Lemsir V1, and Beatit D10 Pro. Because Deltran does not make, use, sell, offer to sell, or import any of the products depicted in Exhibit 112, Deltran lacks knowledge or information regarding whether any of them are "representative" of the Battery Tender® products sold by Deltran. Accordingly, Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in this paragraph and in Exhibit 112, and therefore denies them. Deltran further denies that any products it makes, uses, sells, offers to sell, or imports, infringe any claims of the Asserted Patents.

By way of further response, to the extent the claim charts set forth in Exhibits 139 and 140 (pertaining to the Battery Tender® 600 and 800 products) were intended to supplement Exhibit 112, Deltran denies the allegations set forth in those claim charts.

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3. Claim Chart 03 - Smartech Accused Products

a) Smartech Design

180. The Accused Products in Claim Chart 03 ("Smartech Design") are lithium battery powered jump starters offered under the SMARTECH brand and have a cable assembly that includes a relay and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an operational amplifier sensor. The SMARTECH JS-10000 model jump starter is representative of the Smartech Design Accused Products.

Response to Paragraph 180: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

b) Infringement of the '015 Patent

181. On information and belief, select Respondents, including Respondent Smartech, import, sell for importation, and/or sell within the United States after importation the Design 05 Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Smartech Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Smartech Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

Response to Paragraph 181: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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182. A claim chart comparing independent claim 1 of the '015 Patent to the representative Smartech Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 113.

Response to Paragraph 182: Deltran admits that Exhibit 113 to the Amended Complaint purports to be a claim chart comparing independent claim 1 of the '015 Patent to a product that NOCO characterizes as a representative Smartech Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 113 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

c) Infringement of the '024 Patent

183. On information and belief, select Respondents, including Respondent Smartech, import, sell for importation, and/or sell within the United States after importation the Smartech Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Smartech Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Smartech Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

Response to Paragraph 183: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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184. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Smartech Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 113.

Response to Paragraph 184: Deltran admits that Exhibit 113 to the Amended Complaint purports to be a claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to a product that NOCO characterizes as a representative Smartech Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 113 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

4. Claim Chart 04 - Weego Accused Products

a) Weego Design

185. The Accused Products in Claim Chart 04 ("Weego Design") are lithium battery powered jump starters offered under the WEEGO brand and have a cable assembly that includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an optocoupler sensor. The WEEGO 22S model jump starter is representative of the Weego Design Accused Products.

Response to Paragraph 185: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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b) Infringement of the '015 Patent

186. On information and belief, select Respondents, including Respondent Carku, import, sell for importation, and/or sell within the United States after importation the Weego Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Weego Design Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Weego Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

Response to Paragraph 186: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

187. A claim chart comparing independent claim 1 of the '015 Patent to the representative Weego Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 114.

Response to Paragraph 187: Deltran admits that Exhibit 114 to the Amended Complaint purports to be a claim chart comparing independent claim 1 of the '015 Patent to a product that NOCO characterizes as a representative Weego Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 114 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

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c) Infringement of the '024 Patent

188. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Weego Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Weego Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Weego Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

Response to Paragraph 188: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

189. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Weego Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 114.

Response to Paragraph 189: Deltran admits that Exhibit 114 to the Amended Complaint purports to be a claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to a product that NOCO characterizes as a representative Weego Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 114 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

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5. Claim Chart 05 - Winplus Accused Products

a) Winplus Design

190. The Accused Products in Claim Chart 05 ("Winplus Design") are lithium battery powered jump starters offered under the WINPLUS and TYPE-S brands and have a cable assembly that includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is also a resistive divider sensor. On information and belief, the WINPLUS and TYPE S brand jump starters are manufactured by Respondent Shenzhen Winplus. The Type S–AC56388-BLK model jump starter is representative of the Winplus Design Accused Products.

Response to Paragraph 190: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

b) Infringement of the '015 Patent

191. On information and belief, select Respondents, including Respondent Winplus, import, sell for importation, and/or sell within the United States after importation the Winplus Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Winplus Design Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Winplus Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

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Response to Paragraph 191: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

192. A claim chart comparing independent claim 1 of the '015 Patent to the representative Winplus Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 115.

Response to Paragraph 192: Deltran admits that Exhibit 115 to the Amended Complaint purports to be a claim chart comparing independent claim 1 of the '015 Patent to a product that NOCO characterizes as a representative Winplus Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 115 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

c) Infringement of the '024 Patent

193. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Winplus Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Winplus Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Winplus Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

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Response to Paragraph 193: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

194. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Winplus Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 115.

Response to Paragraph 194: Deltran admits that Exhibit 115 to the Amended Complaint purports to be a claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to a product that NOCO characterizes as a representative Winplus Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 115 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

6. Claim Chart 06 - Great Neck Accused Products

a) Great Neck Design

195. The Accused Products in Claim Chart 06 ("Great Neck Design") are lithium battery powered jump starters having a SMART CLAMP branded cable assembly. The cable assembly includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, includes a resistive divider sensor and transistor. The second sensor, which is the claimed reverse polarity sensor, is a resistive divider sensor. The Great Neck Accused Products are offered under at least the OEM Tools brand. The OEMTOOLS 24474 model jump starter is representative of the Great Neck Accused Products.

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Response to Paragraph 195: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

b) Infringement of the '015 Patent

196. On information and belief, select Respondents, including OEM Tools, import, sell for importation, and/or sell within the United States after importation the Great Neck Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Great Neck Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Great Neck Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

Response to Paragraph 196: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

197. A claim chart comparing independent claim 1 of the '015 Patent to the representative Great Neck Accused Product, and including photographs and drawings where applicable, is attached as Ex. 116.

Response to Paragraph 197: Deltran admits that Exhibit 116 to the Amended Complaint purports to be a claim chart comparing independent claim 1 of the '015 Patent to a product that NOCO characterizes as a representative Great Neck Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 116

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as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

7. Claim Chart 07 - ThiEye Accused Products

a) ThiEye Design

198. The Accused Products in Claim Chart 07 ("ThiEye Design") are lithium battery powered jump starters having a SMART CABLE branded cable assembly. The cable assembly includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is also a resistive sensor. The ThiEye Design Accused Products manufactured by Respondent ThiEye are offered under multiple brands, namely BUTURE, Finnemge, and UTRAI. The BUTURE BR500 model jump starter is representative of the ThiEye Design Accused Products.

Response to Paragraph 198: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

b) Infringement of the '015 Patent

199. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the ThiEye Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the ThiEye Design Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The ThiEye Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

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Response to Paragraph 199: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

200. A claim chart comparing independent claim 1 of the '015 Patent to the representative ThiEye Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 117.

Response to Paragraph 200: Deltran admits that Exhibit 117 to the Amended Complaint purports to be a claim chart comparing independent claim 1 of the '015 Patent to a product that NOCO characterizes as a representative ThiEye Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 117 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

c) Infringement of the '024 Patent

201. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the ThiEye Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the ThiEye Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The ThiEye Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

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Response to Paragraph 201: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

202. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative ThiEye Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 117.

Response to Paragraph 202: Deltran admits that Exhibit 117 to the Amended Complaint purports to be a claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to a product that NOCO characterizes as a representative ThiEye Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 117 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

8. Claim Chart 08 - Energen/Performance Tool Accused Products

a) Energen/Performance Tool Design

203. The Accused Products in Claim Chart 08 ("Energen/ Performance Tool Design") are lithium battery powered jump starters having a cable assembly labeled as "SMART BOOSTER CABLE". The cable assembly includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive sensor. The second sensor, which is the claimed reverse polarity sensor, is a resistive divider sensor. The Energen/Performance Tool Accused Products are offered under multiple brands, including Energen and Performance Tool. The ENERGEN AL12 model jump starter is representative of the Design 11 Accused Products.

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Response to Paragraph 203: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

b) Infringement of the '015 Patent

204. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Energen/Performance Tool Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Energen/Performance Tool Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Energen/Performance Tool Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

Response to Paragraph 204: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

205. A claim chart comparing independent claim 1 of the '015 Patent to the representative Design 11 Accused Product, and including photographs and drawings where applicable, is attached as Ex. 118.

Response to Paragraph 205: Deltran admits that Exhibit 118 to the Amended Complaint purports to be a claim chart comparing independent claim 1 of the '015 Patent to a product that NOCO characterizes as a representative Design 11 Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 118 as

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they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

c) Infringement of the '024 Patent

206. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Energen/Performance Tool Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Energen/Performance Tool Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Energen/Performance Tool Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

Response to Paragraph 206: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

207. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Energen/Performance Tool Accused Product, and including photographs and drawings where applicable, is attached as Ex. 118.

Response to Paragraph 207: Deltran admits that Exhibit 118 to the Amended Complaint purports to be a claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to a product that NOCO characterizes as a representative Energen/Performance Tool Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 118 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

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9. Claim Chart 09 - HALO Accused Products

a) HALO Design

208. The Accused Products in Claim Chart 09 ("HALO Design") are lithium battery powered jump starters offered under the HALO BOLT brand, that include a relay and two sensors within the main housing of the jump starter. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an optocoupler sensor. The HALO BOLT 4400 model jump starter is representative of the HALO Design Accused Products.

Response to Paragraph 208: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

b) Infringement of the '015 Patent

209. On information and belief, select Respondents, including Halo2Cloud, import, sell for importation, and/or sell within the United States after importation the HALO Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the HALO Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The HALO Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

Response to Paragraph 209: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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210. A claim chart comparing independent claim 1 of the '015 Patent to the representative HALO Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 119.

Response to Paragraph 210: Deltran admits that Exhibit 119 to the Amended Complaint purports to be a claim chart comparing independent claim 1 of the '015 Patent to a product that NOCO characterizes as a representative HALO Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 119 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

c) Infringement of the '024 Patent

211. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the HALO Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the HALO Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The HALO Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

Response to Paragraph 211: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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212. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative HALO Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 119.

Response to Paragraph 212: Deltran admits that Exhibit 119 to the Amended Complaint purports to be a claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to a product that NOCO characterizes as a representative HALO Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 119 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

10. Claim Chart 10 - Clore Accused Products

a) Clore Design

213. The Accused Products in Claim Chart 10 ("Clore Design") are lithium battery powered jump starters offered under the Jump-n-Carry brand that have the power switch and two sensors within the main housing of the jump starter. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is optocoupler sensor. The Jump-n-Carry JNC345 model jump starter is representative of the Clore Design Accused Products.

Response to Paragraph 213: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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b) Infringement of the '015 Patent

214. On information and belief, select Respondents, including Respondent Clore Automotive, sell for importation, and/or sell within the United States after importation the Clore Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Clore Design Accused Products also infringe one or more of dependent claims 4, 10, 14, 18, 19 and 21 of the '015 Patent. The Clore Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

Response to Paragraph 214: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

215. A claim chart comparing independent claim 1 of the '015 Patent to the representative Clore Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 120.

Response to Paragraph 215: Deltran admits that Exhibit 120 to the Amended Complaint purports to be a claim chart comparing independent claim 1 of the '015 Patent to a product that NOCO characterizes as a representative Clore Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 120 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

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c) Infringement of the '024 Patent

216. On information and belief, select Respondents, including Respondent Clore Automotive, import, sell for importation, and/or sell within the United States after importation the Clore Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Clore Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Clore Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

Response to Paragraph 216: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

217. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Clore Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 120.

Response to Paragraph 217: Deltran admits that Exhibit 120 to the Amended Complaint purports to be a claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to a product that NOCO characterizes as a representative Clore Design Accused Product. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations set forth in Exhibit 120 as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

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B. Infringement of the Asserted Trademarks

218. NOCO owns all right, title, and interest in the Asserted Trademarks and has standing to bring an action for trademark infringement under the Lanham Act, 15 U.S.C. § 1051 et seq.

Response to Paragraph 218: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

219. The Asserted Trademarks are on the Principal Register and such registration is prima facie evidence of validity, including secondary meaning. 15 U.S.C. § 1057(b). The Asserted Trademarks are used in commerce by NOCO to market, advertise, and sell the Boost® jump starters.

Response to Paragraph 219: NOCO's allegation that "such registration is prima facie evidence of validity, including secondary meaning" is a legal conclusion to which no response is required. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph, and therefore denies them.

220. As explained below, a number of the Respondents use at least one of the Asserted Trademarks in point-of-sale displays posted on online retail stores with the intention of attracting U.S. consumers. These point-of-sale webpages, which include Respondents' own sites as well as third-party commerce sites including Amazon, contain images superimposed with NOCO's Asserted Trademarks and/or use NOCO's Asserted Trademarks in the descriptions of the Accused Products. The webpages provide means for purchasing the Accused Products. Such displays are likely to cause confusion or mistake, and to deceive potential consumers and the public as to the source, origin, sponsorship or approval of Respondents' Accused Products, or as to the affiliation,

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connection, or association between Respondents and/or their jump starters and NOCO and/or the Boost(R) jump starters.

Response to Paragraph 220: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

221. The exhibits cited below are screenshots of the Accused Products being displayed on a webpage where the product may be purchased. The importation of the Accused Products via these webpages is further described in Section VII.

Response to Paragraph 221: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

222. The Asserted Trademarks are valid, owned by NOCO, and these webpages demonstrate a likelihood of confusion at the point-of-sale, and therefore Respondents are in violation of Section 32 of the Lanham Act. 15 U.S.C. § 1114. The Respondents identified in the table below import into the United States, sell for importation, and/or sell in the United States after importation certain jump starters and components thereof, using point of sale webpages, and/or packaging that infringe the NOCO Trademarks:

Ultrasafe ('656 TM)	**Safely Jump Start a Dead Battery in Seconds ('749 TM)**
Audew	Autown
Autown	Beatit
Jumtop	Imazing
Sanrock	Jumtop
Topdon	Nexpow
Trekpow	Sanrock
	Trekpow

Table 3. Accused Products Infringing NOCO Asserted Trademarks

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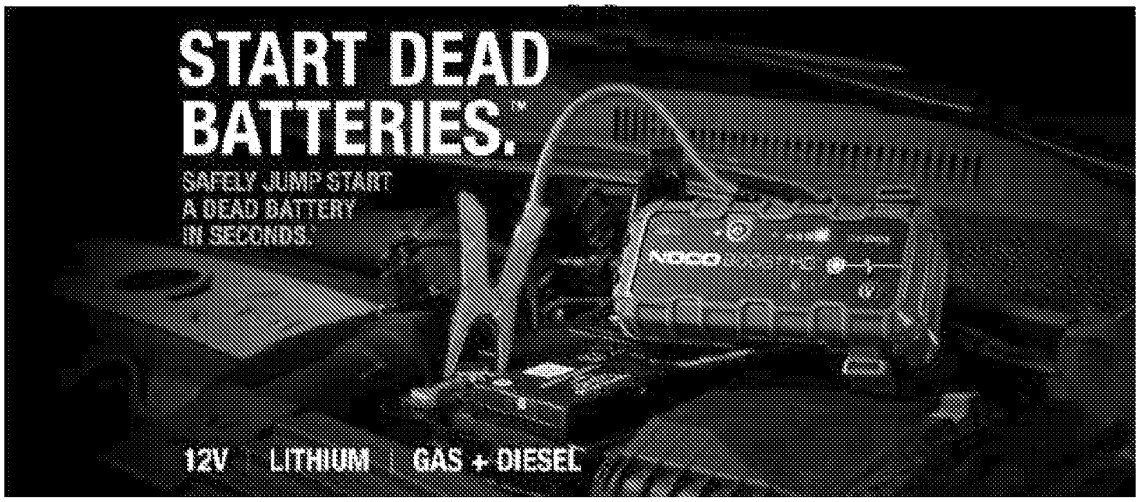


Fig. 3- NOCO Website- Use of the '749 Trademark



Fig. 4- NOCO Website- Use of the '656 and '749 Trademarks. Ex. 104

Response to Paragraph 222: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

Audew

223. The Audew brand uses the NOCO "Ultrasafe" and "Safely Jump Start a Dead Battery in Seconds" trademarks on its website and Amazon listing for its jump starters, which

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infringes NOCO's '656 and '749 Trademarks and are likely to cause confusion at the point-of-sale. *See* Ex. 27 and 50; *See also* Ex. 121 (importation evidence).

Response to Paragraph 223: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

Autown

224. The Amazon listing for the Autown brand of jump starters includes the phrase "jump starter your dead battery in seconds," and "jump start dead battery fast and safely" which infringes NOCO's '749 Trademark and is likely to cause confusion at the point-of-sale. *See* Ex. 28 and 29. The Autown brand also markets its products using the term "ultra-safe" infringing the '656 Trademark. *See* Ex. 29; *See also* Ex. 52 (importation evidence).

Response to Paragraph 224: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

Beatit

225. The Beatit brand uses the phrases "Safely Jumper start a dead battery in seconds" and "jump start a dead battery in seconds" on their Amazon listings for its jump starters, both of which infringe NOCO's '749 Trademark and are likely to cause confusion at the point-of -sale. *See* Ex. 30; *See also* Ex. 122 (importation evidence).

Response to Paragraph 225: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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Imazing

226. The Imazing brand jump starter listing on Amazon uses the phrase "safely jump start a dead battery in seconds" which infringes the NOCO '749 Trademark and is likely to cause confusion at the point-of-sale. *See* Ex. 33; *See also* Ex. 124 (importation evidence).

Response to Paragraph 226: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

Jumtop

227. The Jumtop brand of jump starters uses the phrases "ULTRA SAFE," "ultra-safe" and "jump start a dead battery in seconds" on its Amazon listings for its jump starters, which infringes both the NOCO '656 and '749 Trademarks and is likely to cause confusion at the point-of-sale. *See* Ex. 34, 35 and 36; *See also* Ex. 72 (importation evidence).

Response to Paragraph 227: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

Nexpow

228. The Nexpow brand of jump starters uses the phrase "jump start a dead battery in seconds" on its Amazon listing for its jump starters, which infringes the NOCO '749 Trademark and is likely to cause confusion at the point-of-sale. *See* Ex. 37; *See also* Ex. 79 (importation evidence).

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Response to Paragraph 228: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

Sanrock

229. The Sanrock brand of jump starters uses the phrases "safely jump start a dead battery in seconds" and "ultra-safe" in its Amazon listings for its jump starters, which infringes the NOCO '656 and '749 Trademarks and is likely to cause confusion at the point-of-sale. *See* Ex. 38 and 39; *See also* Ex. 86 (importation evidence).



Fig.5- Image from Sanrock Amazon listing showing infringement of '749 Trademark

Response to Paragraph 229: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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Topdon

230. The Topdon brand of jump starters uses the phrase "ultra safe" on the packaging of its Volcano jump starters, infringing the NOCO '656 Trademark. *See* Ex. 40; *See also* Ex. 92 (importation evidence).

Response to Paragraph 230: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

Trekpow

231. The Trekpow brand of jump starters uses the phrases "ultra-safe," "jump start dead battery in seconds," and "safely jump start a dead battery in seconds" in its Amazon listings, which infringes the NOCO '656 and '749 Trademarks and is likely to cause confusion at the point-of-sale. *See* Ex. 41, 42 and 43; *See also* Ex. 95 (importation evidence).

Response to Paragraph 231: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

VII. SPECIFIC INSTANCES OF IMPORTATION AND SALE

232. As stated above, on information and belief, a subset of Respondents manufactures and/or have manufactured outside the United States, import into the United States, and/or sell for importation into the United States the Accused Products. Other named Respondents import into the United States and/or sell after importation into the United States the Accused Products. The Accused Products, certain portable battery jump starters and related components, are imported, sold for importation, and/or sold after importation as described below.

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Response to Paragraph 232: Deltran admits that the accused Battery Tender® products sold by Deltran are imported into the United States and sold within the United States after importation. Deltran denies that it has committed any acts that constitute a violation of Section 337. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

A. Carku Brands

1. AllStart

233. On information and belief, model numbers Boost (No. 550), Boost Max (No. 560), Boost Ultra (No. 590), and Micro-Boost (No. 540) (collectively, the "AllStart Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name AllStart. *See* Ex. 44C, ¶¶ 5-6.

Response to Paragraph 233: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

234. On information and belief, products sold under the brand AllStart are manufactured by and/or imported for sale by Respondents Horizon Tool, Carku, and Boltpower. *See* Ex. 44C, ¶¶ 5-6.

Response to Paragraph 234: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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235. The AllStart Accused Products are sold after importation into the United States. For example, a receipt from cal-vantools.com showing the purchase of an AllStart Boost (No.550) at an address in the United States is attached as Ex. 46. On information and belief, the AllStart Accused Products are also sold by Walmart, Advance Auto, and Horizon Tool. *See*, *e.g.*, https://www.walmart.com/ip/AllStart-540-Micro-Boost-Battery-Jump-Starter-500AMP-V6-Engines/635710663.

Response to Paragraph 235: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

236. The packaging of the AllStart Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 5 (citing Ex. 46).

Response to Paragraph 236: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

2. Antigravity Batteries

237. On information and belief, model numbers XP-1, XP-10, XP-10-HD, and XP-3 (collectively, the "Antigravity Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Antigravity. *See* Ex. 44C, ¶¶ 9-10.

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Response to Paragraph 237: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

238. On information and belief, products sold under the brand Antigravity are manufactured by and/or imported for sale by Respondents Antigravity, Carku, and Gulin. *See* Ex. 44C, ¶¶ 9-10.

Response to Paragraph 238: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

239. The Antigravity Accused Products are sold after importation into the United States. For example, a receipt from antigravitybatteries.com showing the purchase of an Antigravity XP-1 and XP-10-HD at an address in the United States is attached as Ex. 48. The Antigravity Accused Products are also sold by Respondent Walmart. *See*, *e.g.*, https://www.walmart.com/ip/Antigravity-Batteries-XP-10-HD-Heavy-Duty-MICRO-START-Jump-Starter-Portable-Power-Supply-Kit/580014186.

Response to Paragraph 239: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

240. The packaging of the Antigravity Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 10 (citing Ex. 48).

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Response to Paragraph 240: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

3. Audew

241. On information and belief, model numbers Epower-146 (1000A/10800mAh), 500A/13800mAH, 800A/16800mAh, Epower-172 (1500A/17000mAh), and Epower-155 (1500A/2000mAh) (collectively, the "Audew Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Audew. *See* Ex. 44C, ¶¶ 13-14.

Response to Paragraph 241: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

242. On information and belief, products sold under the brand Audew are manufactured by and/or imported for sale by Respondents Carku and Guangzhou Unique Electronics. *See* Ex. 44C, ¶¶ 13-14; Ex. 121.

Response to Paragraph 242: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

243. The Audew Accused Products are sold after importation into the United States. For example, a receipt from audew.com showing the purchase of an Audew Epower-146

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(1000A/10800mAh) and Epower-172 (1500A/17000mAh) at an address in the United States is attached as Ex. 121. The Audew Accused Products are also sold by Respondent Walmart. *See*, *e.g.*, https://www.walmart.com/ip/Audew-Jump-Starter-Car-Auto-Battery-Jump-Starter-Portable-2000A-Charger-20000mAh/226026281?findingMethod=wpa.

Response to Paragraph 243: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

244. The packaging of the Audew Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 11; Ex. 121.

Response to Paragraph 244: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

4. Autogen

245. On information and belief, model number MJS-P111B (4000A) (the "Autogen Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Autogen. *See* Ex. 44C, ¶¶ 15-16.

Response to Paragraph 245: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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246. On information and belief, products sold under the brand Autogen are manufactured by and/or imported for sale by Respondents Autogen and Carku. *See* Ex. 44C, ¶¶ 15-16.

Response to Paragraph 246: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

247. The Autogen Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Autogen MJS-P111B (4000A) at an address in the United States is attached as Ex. 51.

Response to Paragraph 247: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

248. The packaging of the Autogen Accused Product indicates that the product was "Made in China." *See* Ex. 44C, ¶ 15 (citing Ex. 51).

Response to Paragraph 248: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

5. Freeman

249. On information and belief, model number P800AJS (the "Freeman Accused Product") is manufactured outside the United States and sold for importation into the United States,

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imported into the United States, and/or sold within the United States after importation under the brand name Freeman. *See* Ex. 44C, ¶¶ 47-48.

Response to Paragraph 249: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

250. On information and belief, products sold under the brand Freeman are manufactured by and/or imported for sale by Respondents Prime Global Products and Carku. *See* Ex. 44C, ¶¶ 47-48.

Response to Paragraph 250: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

251. The Freeman Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Freeman P800AJS at an address in the United States is attached as Ex. 66.

Response to Paragraph 251: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

252. The packaging of the Freeman Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 47 (citing Ex. 66).

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Response to Paragraph 252: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

6. Gooloo

253. On information and belief, model numbers GP1500, GP200, GP37-Plus, GP80 (800A), and GT-1500 (collectively, the "Gooloo Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Gooloo. *See* Ex. 44C, ¶¶ 49-51.

Response to Paragraph 253: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

254. On information and belief, products sold under the brand Gooloo are manufactured by and/or imported for sale by Respondent Gooloo and Carku. *See* Ex. 44C, ¶¶ 41-42.

Response to Paragraph 254: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

255. The Gooloo Accused Products are sold after importation into the United States. For example, receipts from Amazon.com showing the purchase of a Gooloo GP80 (800A), GP200, and GT-1500 at an address in the United States is attached as Ex. 67. The Gooloo Accused Products are also sold by Respondent Walmart. *See*, *e.g.*, https://www.walmart.com/ip/GOOLOO-

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800Amp-12-Volt-SuperSafe-Car-Jump-Starter-with-LED-Flashlight-and-USB-for-Up-to-4-5-Liter-Gasoline/801082784

Response to Paragraph 255: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

256. The packaging of the Gooloo Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 49-50 (citing Ex. 57).

Response to Paragraph 256: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

7. Grepro

257. On information and belief, model numbers GP-JS-1500A (GP71C) and GP-JS-500A (collectively, the "Grepro Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Grepro. *See* Ex. 44C, ¶¶ 52-53.

Response to Paragraph 257: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

258. On information and belief, products sold under the brand Grepro are manufactured by and/or imported for sale by Respondents Huizhou Grepro E-Commerce and Carku. *See* Ex. 44C, ¶¶ 52-53. The Grepro Accused Products are sold after importation into the United States. For

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example, a receipt from Amazon.com showing the purchase of a Grepro GP-JS-1500A (GP71C) at an address in the United States is attached as Ex. 131.

Response to Paragraph 258: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

259. The packaging of the Grepro Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 52 (citing Ex. 68); Ex. 131.

Response to Paragraph 259: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

8. iClever

260. On information and belief, model number IC-JQ21Y (the "iClever Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name iClever. *See* Ex. 44C, ¶¶ 56-58.

Response to Paragraph 260: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

261. On information and belief, products sold under the brand iClever are manufactured by and/or imported for sale by Respondent Carku. *See* Ex. 44C, ¶¶ 56-58.

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Response to Paragraph 261: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

262. On information and belief, the iClever Accused Product is sold after importation into the United States. *See* Ex. 44C, ¶¶ 56-58 (citing Ex. 70).

Response to Paragraph 262: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

263. On information and belief, the iClever Accused Product is manufactured in China. *See* Ex. 44C, ¶¶ 56-58 (citing Ex. 70).

Response to Paragraph 263: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

9. M Moock

264. On information and belief, model numbers MK200 (1500A) and MK800 (2000A) (collectively, the "M Moock Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name M Moock. *See* Ex. 44C, ¶¶ 74-75.

Response to Paragraph 264: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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265. On information and belief, products sold under the brand M Moock are manufactured by and/or imported for sale by Respondent Shenzhen Moock. *See* Ex. 44C, ¶¶ 74-75.

Response to Paragraph 265: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

266. The M Moock Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a M Moock MK800 (2000A) at an address in the United States is attached as Ex. 125.

Response to Paragraph 266: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

267. The packaging of the M Moock Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 71; Ex. 125.

Response to Paragraph 267: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

10. Nekteck

268. On information and belief, model numbers NK-JS19800 (2000A/19800mAh), NK-JS12000 (D31) (500A/12000mAh), NK-JS12000 (600A/16800mAh), and D45

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(800A/20000mAh) (collectively, the "Nekteck Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Nekteck. *See* Ex. 44C, ¶¶ 76-77.

Response to Paragraph 268: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

269. On information and belief, products sold under the brand Nekteck are manufactured by and/or imported for sale by Respondents Nekteck, Medcursor, and Sictec Instruments. *See* Ex. 44C, ¶¶ 76-77.

Response to Paragraph 269: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

270. The Nekteck Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Nekteck NK-JS12000 (D31) (500A/12000mAh) and NK-JS12000 (600A/16800mAh) at an address in the United States is attached as Ex. 132.

Response to Paragraph 270: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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271. The packaging of the Nekteck Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 76 (citing Ex. 78); Ex. 132.

Response to Paragraph 271: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

11. PowerMax

272. On information and belief, model numbers PM91004 and PM91006 (collectively, the "PowerMax Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name PowerMax. *See* Ex. 44C, ¶¶ 88-89

Response to Paragraph 272: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

273. On information and belief, products sold under the brand PowerMax are manufactured by and/or imported for sale by Respondents PowerMax and Carku. *See* Ex. 44C, ¶¶ 88-89.

Response to Paragraph 273: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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274. The PowerMax Accused Products are sold after importation into the United States. For example, a receipt from Home Depot (homedepot.com) showing the purchase of a PowerMax PM91006 at an address in the United States is attached as Ex. 84.

Response to Paragraph 274: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

275. On information and belief, the PowerMax Accused Products are manufactured in China. *See* Ex. 44C, ¶ 88 (citing Ex. 84).

Response to Paragraph 275: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

12. Tacklife

276. On information and belief, model numbers KP120, KP200, T6, T8 (Newer Model), T8 Max, T8 MAX, and T8 Pro (collectively, the "Tacklife Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Tacklife. *See* Ex. 44C, ¶¶ 103-107.

Response to Paragraph 276: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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277. On information and belief, products sold under the brand Tacklife are manufactured by and/or imported for sale by Respondents Aukey and Shenzhen Take Tools. *See* Ex. 44C, ¶¶ 103-107.

Response to Paragraph 277: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

278. The Tacklife Accused Products are sold after importation into the United States. For example, receipts from Amazon.com showing the purchase of a Tacklife T8, T8 (Newer Model), T8 MAX, and T8 Pro at an address in the United States are attached as Ex. 126.

Response to Paragraph 278: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

279. The packaging of the Tacklife Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 103-106; Ex. 126.

Response to Paragraph 279: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

13. Xiaomi

280. On information and belief, model number Midrive PS02 (11100 mAh 600A) (the "Xiaomi Accused Product") is manufactured outside the United States and sold for importation

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into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Xiaomi. *See* Ex. 44C, ¶¶ 131-132; Ex. 130C.

Response to Paragraph 280: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

281. On information and belief, products sold under the brand Xiaomi are manufactured by and/or imported for sale by Respondents 70mai and Carku. *See* Ex. 44C, ¶¶ 131-133; Ex. 130C.

Response to Paragraph 281: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

282. The Xiaomi Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a PS02 (11100 mAh 600A) jump starter at an address in the United States is attached as Ex. 129. In addition, Walmart.com and Amazon.com listings indicate the Xiaomi Accused Product is manufactured by and/or imported by Respondent 70mai. *See* Ex. 44C, ¶¶ 131-133 (citing Ex. 102); Ex. 130C.

Response to Paragraph 282: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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283. The packaging of the Xiaomi Accused Product identifies "70mai Co., Ltd." and indicates it was "Made in China." *See* Ex. 44C, ¶¶ 131-133 (citing Ex. 102); Ex. 130C (citing Ex. 129).

Response to Paragraph 283: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

B. Boltpower Brands

1. Ampeak

284. On information and belief, model number JS1 (the "Ampeak Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Ampeak. *See* Ex. 44C, ¶¶ 7-8.

Response to Paragraph 284: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

285. On information and belief, products sold under the brand Ampeak are manufactured by and/or imported for sale by Respondent Valuelink. *See* Ex. 44C, ¶¶ 5-6.

Response to Paragraph 285: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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286. The Ampeak Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Ampeak JS1 at an address in the United States is attached as Ex. 47.

Response to Paragraph 286: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

287. The packaging of the Ampeak Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 7 (citing Ex. 47).

Response to Paragraph 287: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

2. Arteck

288. On information and belief, model numbers A7, D29, JS08, and JS12 (collectively, the "Arteck Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Arteck. *See* Ex. 44C, ¶¶ 11-12.

Response to Paragraph 288: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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289. On information and belief, products sold under the brand Arteck are manufactured by and/or imported for sale by Respondents Arteck Electronic and Boltpower. *See* Ex. 44C, ¶¶ 11¬12.

Response to Paragraph 289: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

290. The Arteck Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Arteck A7 at an address in the United States is attached as Ex. 49.

Response to Paragraph 290: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

291. The packaging of the Arteck Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 11 (citing Ex. 49).

Response to Paragraph 291: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

3. Autown

292. On information and belief, model numbers RP-PI-01 (1000A), RP-PI02 (500A/10000mAh), RP-PI-03 (800A), and RP-PI-04 (2000A) (collectively, the "Autown Accused Products") are manufactured outside the United States and sold for importation into the United

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States, imported into the United States, and/or sold within the United States after importation under the brand name Autown. *See* Ex. 44C, ¶¶ 17-18.

Response to Paragraph 292: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

293. On information and belief, products sold under the brand Autown are manufactured by and/or imported for sale by Respondents Boltpower and Zhejiang Qingyou Electronic. *See* Ex. 44C, ¶¶ 17-18.

Response to Paragraph 293: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

294. The Autown Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Autown RP-PI-03 (800A) at an address in the United States is attached as Ex. 52.

Response to Paragraph 294: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

295. The packaging of the Autown Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 17 (citing Ex. 52).

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Response to Paragraph 295: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

4. Battery Tender

296. On information and belief, model numbers 030-1011-WAL (1000A/8000mAh), 030-1011-WH (1000A/8000mAh), 030-1000-PM (600A/6000mAh), and 030-1010-WH (800A/7200mAh) (collectively, the "Battery Tender Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Battery Tender. *See* Ex. 44C, ¶¶ 19-20.

Response to Paragraph 296: Deltran admits the allegations of this paragraph.

297. On information and belief, products sold under the brand Battery Tender are manufactured by and/or imported for sale by Respondents Deltran and Boltpower. *See* Ex. 44C, ¶¶ 19-20.

Response to Paragraph 297: Deltran admits that Boltpower manufactures Battery Tender® branded Accused Products, that Battery Tender® Accused Products are imported into the United States by Deltran, and that Battery Tender® Accused Products are sold in the United States by Deltran. Deltran denies that it manufactures Battery Tender® Accused Products. To the extent this paragraph makes additional allegations not addressed in the previous two sentences of this response, Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph, and therefore denies them.

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298. The Battery Tender Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Battery Tender 030-1010-WH (800A/7200mAh) at an address in the United States is attached as Ex. 53.

Response to Paragraph 298: Deltran admits that it sells Battery Tender® Accused Products in the United States after importation. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph, and therefore denies them.

299. The packaging of the Battery Tender Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 19 (citing Ex. 53).

Response to Paragraph 299: Deltran admits the allegations of this paragraph.

5. Beatit

300. On information and belief, model numbers B10 (500A), B10 Pro (800A), B7 (1200A), BP101 (2200A), D11 (800A), G18 (2000A), and G22 (1500A) (collectively, the "Beatit Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Beatit. *See* Ex. 44C, ¶¶ 21-23.

Response to Paragraph 300: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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301. On information and belief, products sold under the brand Beatit are manufactured by and/or imported for sale by Respondents Boltpower, Shenzhen Mediatek Tong, and Lianfatong. *See* Ex. 44C, ¶¶ 21-23.

Response to Paragraph 301: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

302. The Beatit Accused Products are sold after importation into the United States. For example, receipts from Amazon.com showing the purchase of a Beatit B10, B10 Pro (800A), B7 (1200A), BP101 (2200A), D11 (800A), and G18 (200A) at an address in the United States is attached as Ex. 122.

Response to Paragraph 302: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

303. The packaging of the Beatit Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 21-22; Ex. 122.

Response to Paragraph 303: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

6. Boltpower

304. On information and belief, model numbers A7P, D28, D29, G33A, and N02 (collectively, the "Boltpower Accused Products") are manufactured outside the United States and

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sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Boltpower. *See* Ex. 44C, ¶¶ 24-26.

Response to Paragraph 304: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

305. On information and belief, products sold under the brand Boltpower are manufactured by and/or imported for sale by Respondent Boltpower and Tii Trading. *See* Ex. 44C, ¶¶ 24-26.

Response to Paragraph 305: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

306. The Boltpower Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com and eBay.com showing the purchase of a Boltpower A7P, D28, D29, G33A, and N02 at an address in the United States is attached as Ex. 55.

Response to Paragraph 306: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

307. The packaging of the Boltpower Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 24-25 (citing Ex. 55).

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Response to Paragraph 307: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

7. DB Power/Valuelink

308. On information and belief, model numbers DJS50 (800A/18000mAh), DJS80, G15, G16 (2000A/20800mAh), A09, DJS40, DJS50, DJS60, G09D, and N01(collectively, the "DB Power Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name DB Power. *See* Ex. 44C, ¶¶ 31-32.

Response to Paragraph 308: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

309. On information and belief, products sold under the brand DB Power are manufactured by and/or imported for sale by Respondents Boltpower and Shenzhen Valuelink. *See* Ex. 44C, ¶¶ 31-32.

Response to Paragraph 309: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

310. The DB Power Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a DB Power DJS50

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(800A/1800mAh) and G16 (2000A/20800mAh) at an address in the United States is attached as Ex. 58.

Response to Paragraph 310: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

311. The packaging of the DB Power Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 31 (citing Ex. 58).

Response to Paragraph 311: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

8. DieHard

312. On information and belief, model numbers 43448 (8000mAH) and DH110 (400A) (collectively, the "DieHard Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name DieHard. *See* Ex. 44C, ¶¶ 33-34.

Response to Paragraph 312: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

313. On information and belief, products sold under the brand Schumacher are manufactured by and/or imported for sale by Respondents Boltpower and Schumacher. *See* Ex. 44C, ¶¶ 33-34.

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Response to Paragraph 313: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

314. The DieHard Accused Products are sold after importation into the United States. For example, receipts from Amazon.com and menards.com showing the purchase of a Die Hard DH110 and 43448 at an address in the United States are attached as Ex. 59. On information and belief, the DieHard Accused Products are also sold by Walmart. *See*, *e.g.*, https://www.walmart.com/ip/Diehard-Jumpstart-400amp/126963604?wmlspartner=wlpa&selectedSellerId=5227

Response to Paragraph 314: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

315. The packaging of the DieHard Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 33 (citing Ex. 59).

Response to Paragraph 315: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

9. Duralast

316. On information and belief, model numbers DL-2000lI and DL-800L (collectively, the "Duralast Accused Products") are manufactured outside the United States and sold for

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importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Duralast. *See* Ex. 44C, ¶¶ 35-36.

Response to Paragraph 316: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

317. On information and belief, products sold under the brand Duralast are manufactured by and/or imported for sale by Respondents Boltpower, Schumacher, and Best Parts. *See* Ex. 44C, ¶¶ 21-23

Response to Paragraph 317: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

318. The Duralast Accused Products are sold after importation into the United States. For example, a receipt from Autozone.com showing the purchase of a Duralast DL-800L at an address in the United States is attached as Ex. 60.

Response to Paragraph 318: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

319. The packaging of the Duralast Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 35 (citing Ex. 60).

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Response to Paragraph 319: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

10. EverStart

320. On information and belief, model number SL097 (collectively, the "EverStart Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name EverStart. *See* Ex. 44C, ¶¶ 39-40.

Response to Paragraph 320: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

321. On information and belief, products sold under the brand EverStart are manufactured by and/or imported for sale by Respondents Boltpower and Schumacher. *See* Ex. 44C, ¶¶ 39-40.

Response to Paragraph 321: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

322. The EverStart Accused Products are sold after importation into the United States. For example, a receipt from Walmart.com showing the purchase of an EverStart SL097 at an address in the United States is attached as Ex. 62.

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Response to Paragraph 322: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

323. The packaging of the EverStart Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 39 (citing Ex. 62).

Response to Paragraph 323: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

11. Fconegy

324. On information and belief, model numbers FC100 and FC200 (collectively, the "Fconegy Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Fconegy. *See* Ex. 44C, ¶¶ 41-42.

Response to Paragraph 324: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

325. On information and belief, products sold under the brand Fconegy are manufactured by and/or imported for sale by Respondents Boltpower and Fconegy. *See* Ex. 44C, ¶¶ 41-42; Ex. 31.

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Response to Paragraph 325: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

326. The Fconegy Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Fconegy FC100 at an address in the United States is attached as Ex. 63.

Response to Paragraph 326: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

327. The packaging of the Fconegy Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 41 (citing Ex. 63).

Response to Paragraph 327: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

12. Flylinktech

328. On information and belief, model numbers CF100, CF200, CF300, CF400, and CF600 (collectively, the "Flylinktech Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Flylinktech. *See* Ex. 44C, ¶¶ 43¬44.

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Response to Paragraph 328: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

329. On information and belief, products sold under the brand Flylinktech are manufactured by and/or imported for sale by Respondents Boltpower and Flylink Tech Company. *See* Ex. 44C, ¶¶ 43-44.

Response to Paragraph 329: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

330. The Flylinktech Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Flylinktech CF600 at an address in the United States is attached as Ex. 64.

Response to Paragraph 330: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

331. The packaging of the Flylinktech Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 43 (citing Ex. 64).

Response to Paragraph 331: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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13. Imazing

332. On information and belief, model numbers G26, G27, G29P, IM23, IM25, IM27/G26, IM29/G29, IM31, and J8 (collectively, the "Imazing Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Imazing. *See* Ex. 44C, ¶¶ 59-60.

Response to Paragraph 332: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

333. On information and belief, products sold under the brand Imazing are manufactured by and/or imported for sale by Respondents Boltpower, Circus Link, and Smart Well. *See* Ex. 44C, ¶¶ 59-60.

Response to Paragraph 333: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

334. The Imazing Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Imazing J8 and IM23, and IM31 at an address in the United States is attached as Ex. 124. The Imazing Accused Products are also sold by Respondent Walmart. *See*, *e.g.*, https://www.walmart.com/ip/Imazing-Portable-Car-Lithium-Jump-Starter-2500A-Peak-21000mAh-Up-10L-Gas-Diesel-Engine-12V-Auto-Battery-Booster-Power-Pack-Jumper-Cables-QC-3-0-110V-/180839543

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Response to Paragraph 334: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

335. The packaging of the Imazing Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 59; Ex. 124.

Response to Paragraph 335: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

14. Jumtop

336. On information and belief, model numbers N13, D09, E18, and N12 (collectively, the "Jumtop Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Jumtop. *See* Ex. 44C, ¶¶ 63-64.

Response to Paragraph 336: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

337. On information and belief, products sold under the brand Jumtop are manufactured by and/or imported for sale by Respondents Boltpower and Autolion. *See* Ex. 44C, ¶¶ 63-64.

Response to Paragraph 337: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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338. The Jumtop Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Jumtop N13 at an address in the United States is attached as Ex. 72.

Response to Paragraph 338: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

339. The packaging of the Jumtop Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 63 (citing Ex. 72).

Response to Paragraph 339: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

15. KTI (K-Tool International)

340. On information and belief, model numbers KTI-74391, KTI-74392, and KTI-74393 (collectively, the "K-Tool Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name K-Tool. *See* Ex. 44C, ¶¶ 65-66.

Response to Paragraph 340: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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341. On information and belief, products sold under the brand K-Tool are manufactured by and/or imported for sale by Respondents K-Tool and Boltpower. *See* Ex. 44C, ¶¶ 65-66.

Response to Paragraph 341: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

342. The K-Tool Accused Products are sold after importation into the United States. For example, a receipt from Walmart.com showing the purchase of a K-Tool KTI-74392 at an address in the United States is attached as Ex. 73. The K-Tool Accused Products are also sold by Respondent Advance Auto Parts. *See*, *e.g.*, https://shop.advanceautoparts.com/p/k-tool-international-jump-starter-power-s-kti74392/12009092-P?searchTerm=kti%20jump%20starter.

Response to Paragraph 342: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

343. The packaging of the K-Tool Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 65 (citing Ex. 73).

Response to Paragraph 343: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

16. Lemsir

344. On information and belief, model numbers L6 (800A/10800mAh), V1 (2000A/21000mAh), V2 (1500A/15600mAh), V3 (2200A/21000mAh), and V8

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(800A/12800mAh) (collectively, the "Lemsir Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Lemsir. *See* Ex. 44C, ¶¶ 67-68.

Response to Paragraph 344: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

345. On information and belief, products sold under the brand Lemsir are manufactured by and/or imported for sale by Respondents Boltpower, Shenzhen Mediatek Tong, and Lianfatong. *See* Ex. 44C, ¶¶ 67-68.

Response to Paragraph 345: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

346. The Lemsir Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Lemsir V8 (800A/12800mAh) at an address in the United States is attached as Ex. 74.

Response to Paragraph 346: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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347. The packaging of the Lemsir Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 67 (citing Ex. 74).

Response to Paragraph 347: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

17. Loftek

348. On information and belief, model numbers Y29 and G21 (collectively, the "Loftek Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Loftek. *See* Ex. 44C, ¶¶ 69-70.

Response to Paragraph 348: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

349. On information and belief, products sold under the brand Loftek are manufactured by and/or imported for sale by Respondent Boltpower. *See* Ex. 44C, ¶¶ 69-70.

Response to Paragraph 349: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

350. The Loftek Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Loftek G21 at an address in the United States is attached as Ex. 75.

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Response to Paragraph 350: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

351. The packaging of the Loftek Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 69 (citing Ex. 75).

Response to Paragraph 351: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

18. Matco Tools

352. On information and belief, model numbers MICROJUMP, MINIJUMP3, and VERSAPRO3 (collectively, the "Matco Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Matco. *See* Ex. 44C, ¶¶ 71-73.

Response to Paragraph 352: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

353. On information and belief, products sold under the brand Matco are manufactured by and/or imported for sale by Respondents Matco, Boltpower, Carku, and Horizon Tool. *See* Ex. 44C, ¶¶ 71-73.

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Response to Paragraph 353: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

354. The Matco Accused Products are sold after importation into the United States. For example, receipts from matcotools.com showing the purchase of a Matco MICROJUMP and VERSAPRO3 at an address in the United States is attached as Ex. 76.

Response to Paragraph 354: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

355. The packaging of the Matco Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 71-72 (citing Ex. 76).

Response to Paragraph 355: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

19. Nexpow

356. On information and belief, model numbers G7 (2000A) and G7 (1500A) (collectively, the "Nexpow Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Nexpow. *See* Ex. 44C, ¶¶ 78-79.

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Response to Paragraph 356: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

357. On information and belief, products sold under the brand Nexpow are manufactured by and/or imported for sale by Respondents Boltpower and Hangchebao. *See* Ex. 44C, ¶¶ 78-79.

Response to Paragraph 357: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

358. The Nexpow Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Nexpow G17 (1500A) at an address in the United States is attached as Ex. 79.

Response to Paragraph 358: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

359. The packaging of the Nexpow Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 78 (citing Ex. 79).

Response to Paragraph 359: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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20. PowerCache

360. On information and belief, model numbers 39602 and 39603 (G19) (collectively, the "PowerCache Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name PowerCache. *See* Ex. 44C, ¶¶ 86-87.

Response to Paragraph 360: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

361. On information and belief, products sold under the brand PowerCache are manufactured by and/or imported for sale by Respondents Boltpower and MonoPrice. *See* Ex. 44C, ¶¶ 86-87.

Response to Paragraph 361: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

362. The PowerCache Accused Products are sold after importation into the United States. For example, a receipt from Monoprice.com showing the purchase of a PowerCache 39603 (G19) at an address in the United States is attached as Ex. 83.

Response to Paragraph 362: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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363. The packaging of the PowerCache Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 86-87 (citing Ex. 83).

Response to Paragraph 363: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

21. Roav

364. On information and belief, model numbers Pro 1000A and Pro 800 (collectively, the "Roav Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Roav. *See* Ex. 44C, ¶¶ 90-91.

Response to Paragraph 364: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

365. On information and belief, products sold under the brand Roav are manufactured by and/or imported for sale by Respondents Boltpower and Anker Technology (UK). *See* Ex.85.

Response to Paragraph 365: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

366. The Roav Accused Products are sold after importation into the United States. For example, a receipt from bestbuy.com showing the purchase of a Roav Pro 800 at an address in the United States is attached as Ex. 85. On information and belief, the Roav Accused Products are also

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sold by Respondents NAPA, Walmart and Best Buy. *See*, *e.g.*, https://www.bestbuy.com/site/anker-roav-jump-starter-pro-black/6297939.p?skuId=6297939

Response to Paragraph 366: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

367. The packaging of the Roav Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 90 (citing Ex. 85).

Response to Paragraph 367: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

22. Sanrock

368. On information and belief, model number G37 (the "Sanrock Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Sanrock. *See* Ex. 44C, ¶¶ 92-93.

Response to Paragraph 368: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

369. On information and belief, products sold under the brand Sanrock are manufactured by and/or imported for sale by Respondents Boltpower and Shenzhen Li Feng Maoyiyouxiangognsi. *See* Ex. 44C, ¶¶ 92-93.

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Response to Paragraph 369: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

370. The Sanrock Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Sanrock G37 at an address in the United States is attached as Ex. 86.

Response to Paragraph 370: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

371. The packaging of the Sanrock Accused Product indicates that the product is "Made in China." *See* Ex. 44C, ¶ 92 (citing Ex. 86).

Response to Paragraph 371: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

23. Schumacher

372. On information and belief, model numbers SL1312 (600A), SL1314 (600A), SL1315 (800A), SL1316 (1000A), SL1317 (1000A), SL1327 (800A), SL 1396 (800A) (collectively, the "Schumacher Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Schumacher. *See* Ex. 44C, ¶¶ 94-98.

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Response to Paragraph 372: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

373. On information and belief, products sold under the brand Schumacher are manufactured by and/or imported for sale by Respondents Boltpower, Schumacher, and Pep Boys. *See* Ex. 44C, ¶¶ 94-98.

Response to Paragraph 373: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

374. The Schumacher Accused Products are sold after importation into the United States. For example, receipts from batterychargers.com, Walmart.com, Oreillyauto.com, and homedepot.com showing the purchase of a Schumacher SL 1312, SL1315, SL1316, and SL1396 at an address in the United States are attached as Ex. 87. On information and belief, the Schumacher Accused Products are also sold by Respondents AutoZone, Advance Auto, NAPA, and Lowe's. *See*, *e.g.*, https://www.lowes.com/pd/Schumacher-Electric-1200-Amp-Car-Battery-Jump-Starter-with-Digital-Display/1000569111;

Response to Paragraph 374: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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375. The packaging of the Schumacher Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 97 (citing Ex. 87).

Response to Paragraph 375: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

24. Tooliom

376. On information and belief, model number Epower-125 (2000A) (the "Tooliom Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Tooliom. *See* Ex. 44C, ¶¶ 108-109.

Response to Paragraph 376: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

377. On information and belief, products sold under the brand Tooliom are manufactured by and/or imported for sale by Respondents Boltpower and Carku. *See* Ex. 44C, ¶¶ 108-109.

Response to Paragraph 377: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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378. The Tooliom Accused Product is after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Tooliom Epower-125 (2000A) at an address in the United States is attached as Ex. 91.

Response to Paragraph 378: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

379. The packaging of the Tooliom Accused Product indicates that the product is "Made in China." *See* Ex. 44C, ¶ 108 (citing Ex. 91).

Response to Paragraph 379: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

25. Topdon

380. On information and belief, model numbers VOLCANO1500 and VOLCANO2000 (collectively, the "Topdon Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Topdon. *See* Ex. 44C, ¶¶ 110-111.

Response to Paragraph 380: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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381. On information and belief, products sold under the brand Topdon are manufactured by and/or imported for sale by Respondents Boltpower, Shenzhen Topdon, and Shenzhen Dingjiang Technology. *See* Ex. 44C, ¶¶ 110-111.

Response to Paragraph 381: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

382. The Topdon Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Topdon VOLCANO2000 at an address in the United States is attached as Ex. 92.

Response to Paragraph 382: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

383. The packaging of the Topdon Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 110 (citing Ex. 92).

Response to Paragraph 383: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

26. Topvision

384. On information and belief, model number G26 (the "Topvision Accused Product") is manufactured outside the United States and sold for importation into the United States, imported

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into the United States, and/or sold within the United States after importation under the brand name Topvision. *See* Ex. 44C, ¶¶ 112-113.

Response to Paragraph 384: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

385. On information and belief, products sold under the brand Topvision are manufactured by and/or imported for sale by Respondent Boltpower. *See* Ex. 44C, ¶¶ 112-113.

Response to Paragraph 385: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

386. The Topvision Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Topvision G26 at an address in the United States is attached as Ex. 93.

Response to Paragraph 386: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

387. The packaging of the Topvision Accused Product indicates that the products is "Made in China." *See* Ex. 44C, ¶ 112 (citing Ex. 93).

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Response to Paragraph 387: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

27. Trekpow

388. On information and belief, model numbers A18, G22, and TJ2500 (collectively, the "Trekpow Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Trekpow. *See* Ex. 44C, ¶¶ 116-117.

Response to Paragraph 388: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

389. On information and belief, products sold under the brand Trekpow are manufactured by and/or imported for sale by Respondent Boltpower. *See* Ex. 44C, ¶¶ 116-117.

Response to Paragraph 389: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

390. The Trekpow Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Trekpow G22 at an address in the United States is attached as Ex. 95.

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Response to Paragraph 390: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

391. The packaging of the Trekpow Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 116.

Response to Paragraph 391: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

28. Vavofo

392. On information and belief, model number G23P (the "Vavofo Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Vavofo. *See* Ex. 44C, ¶¶ 122-124.

Response to Paragraph 392: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

393. On information and belief, products sold under the brand Vavofo are manufactured by and/or imported for sale by Respondent Boltpower. *See* Ex. 44C, ¶¶ 122-124.

Response to Paragraph 393: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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394. On information and belief, the Vavofo Accused Product is sold after importation into the United States. For example, a listing from Amazon.com indicating the Vavofo Accused Product is manufactured by Respondent Boltpower is attached as Ex. 98.

Response to Paragraph 394: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

395. The Vavofo Accused Product also indicates that the product is "Made in China." *See* Ex. 44C, ¶ 122 (citing Ex. 98).

Response to Paragraph 395: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

29. Vekkia

396. On information and belief, model numbers THOR-1000 and THOR-3000(collectively, the "Vekkia Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Vekkia. *See* Ex. 44C, ¶¶ 125-126.

Response to Paragraph 396: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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397. On information and belief, products sold under the brand Vekkia are manufactured by and/or imported for sale by Respondents Boltpower and Chic Electrics. *See* Ex. 44C, ¶¶ 124¬126.

Response to Paragraph 397: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

398. The Vekkia Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Vekkia THOR-1000 at an address in the United States is attached as Ex. 128.

Response to Paragraph 398: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

399. The packaging of the Vekkia Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 125; Ex. 128.

Response to Paragraph 399: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

30. Yaber

400. On information and belief, model numbers YR100, YR200, YR 600, YR500, YR700, and YR400 (collectively, the "Yaber Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States,

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and/or sold within the United States after importation under the brand name Yaber. *See* Ex. 44C, ¶¶ 134-135.

Response to Paragraph 400: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

401. On information and belief, products sold under the brand Yaber are manufactured by and/or imported for sale by Respondents Boltpower and ThiEye Technologies. *See* Ex. 44C, ¶¶ 134-135.

Response to Paragraph 401: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

402. The Yaber Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Yaber YR400 at an address in the United States is attached as Ex. 103.

Response to Paragraph 402: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

403. The packaging of the Yaber Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 134 (citing Ex. 103).

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Response to Paragraph 403: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

C. Smartech Brands

1. Smartech

404. On information and belief, model numbers JS-10000, JS-15000, JS-15000N, JS-6000, JS-8000, JS-8000N, and TECH-5000P (collectively, the "Smartech Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Smartech. *See* Ex. 44C, ¶¶ 99-100.

Response to Paragraph 404: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

405. On information and belief, products sold under the brand Smartech are manufactured by and/or imported for sale by Respondent Smartech. *See* Ex. 44C, ¶¶ 99-100.

Response to Paragraph 405: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

406. The Smartech Accused Products are sold after importation into the United States. For example, a receipt from smartech.com showing the purchase of a Smartech JS-10000, JS-15000, JS-15000N, JS-8000N, and TECH-5000P at an address in the United States is attached as

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Ex. 88. The Smartech Accused Products are also sold by Respondent Walmart. *See*, *e.g.*, https://www.walmart.com/ip/Smartech-JS-15000N-15000-mAh-Lithium-Powered-Vehicle-Jump-Starter-and-Power-Bank-Starter-and-Power-Bank/286772303

Response to Paragraph 406: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

407. The packaging of the Smartech Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 99 (citing Ex. 88).

Response to Paragraph 407: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

D. Weego Brands

1. Weego

408. On information and belief, model numbers 22, 44.1, 66.2, 154, 22s (collectively, the "Weego Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Weego. *See* Ex. 44C, ¶¶ 127-128.

Response to Paragraph 408: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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409. On information and belief, products sold under the brand Weego are manufactured by and/or imported for sale by Respondents Paris Corporation and Carku. *See* Ex. 44C, ¶¶ 127¬128.

Response to Paragraph 409: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

410. The Weego Accused Products are sold after importation into the United States. For example, a receipt from myweego.com showing the purchase of a Weego 22s at an address in the United States is attached as Ex. 101. The Weego Accused Products are also sold by Respondent Walmart. *See*, *e.g.*, https://www.walmart.com/ip/Weego-22s-Jump-Starter-1700-Peak-300-Cranking-Amps-Simple-and-Safe-Lithium-Ion-Water-Resistant-USA-Designed-and-Engineered/337164284

Response to Paragraph 410: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

411. The packaging of the Weego Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 127 (citing Ex. 101).

Response to Paragraph 411: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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E. Winplus Brands

1. Type S

412. On information and belief, model numbers AC56388-BLK, AC56789-AM, AC56794-1 (collectively, the "Type S Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Type S. *See* Ex. 44C, ¶¶ 118-119.

Response to Paragraph 412: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

413. On information and belief, products sold under the brand Type S are manufactured by and/or imported for sale by Respondents Shenzhen Winplus and Winplus North America. *See* Ex. 44C, ¶¶ 118-119.

Response to Paragraph 413: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

414. The Type S Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Type S AC56388-BLK at an address in the United States is attached as Ex. 96. The Type S Accused Products are also available from Respondent Walmart. *See*, *e.g.*, https://www.walmart.com/ip/Type-S-Lithium-Jump-Starter-Portable-Power-Bank-w-Built-in-Wireless-Charging/571679308

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Response to Paragraph 414: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

415. The packaging of the Type S Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 118 (citing Ex. 96).

Response to Paragraph 415: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

2. Winplus

416. On information and belief, model numbers AC530171-1, AC55717-1, AC55929-6/1, AC55929-60, (collectively, the "Winplus Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Winplus. *See* Ex. 44C, ¶¶ 129-130.

Response to Paragraph 416: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

417. On information and belief, products sold under the brand Winplus are manufactured by and/or imported for sale by Respondents Shenzhen Winplus and Winplus North America. *See* Ex. 44C, ¶¶ 129-130.

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Response to Paragraph 417: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

418. The Winplus Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Winplus AC55717-1 at an address in the United States is attached as Ex. 100. On information and belief, the Winplus Accused Products are also sold by Respondents Walmart, Pep Boys, Advanced Auto, and AutoZone. *See* http://winplus.com/usa/support/retail-locations/

Response to Paragraph 418: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

419. The packaging of the Winplus Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 129 (citing Ex. 100).

Response to Paragraph 419: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

F. Great Neck Brands

1. OEM Tools

420. On information and belief, model numbers 24474 (8000mAh), 24475 (12000mAh), and 24476 (18000mAh) (collectively, the "OEM Tools Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United

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States, and/or sold within the United States after importation under the brand name OEM Tools. *See* Ex. 44C, ¶¶ 80-81.

Response to Paragraph 420: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

421. On information and belief, products sold under the brand OEM Tools are manufactured by and/or imported for sale by Respondent Great Neck. *See* Ex. 44C, ¶¶ 80-81.

Response to Paragraph 421: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

422. The OEM Tools Accused Products are sold after importation into the United States. For example, a receipt from Autozone.com showing the purchase of a OEM Tools 24474 (8000mAh) at an address in the United States is attached as Ex. 80.

Response to Paragraph 422: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

423. The packaging of the OEM Tools Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 80 (citing Ex. 80).

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Response to Paragraph 423: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

G. ThiEye Brands

1. Buture

424. On information and belief, model numbers BR300 and BR500 (collectively, the "Buture Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Buture. *See* Ex. 44C, ¶¶ 27-28.

Response to Paragraph 424: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

425. On information and belief, products sold under the brand Buture are manufactured by and/or imported for sale by Respondent ThiEye Technologies. *See* Ex. 44C, ¶¶ 27-28.

Response to Paragraph 425: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

426. The Buture Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Buture BR500 at an address in the United States is attached as Ex. 56.

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Response to Paragraph 426: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

427. The packaging of the Buture Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 27 (citing Ex. 56).

Response to Paragraph 427: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

2. Fnnemge

428. On information and belief, model number Q9C (the "Fnnemge Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Fnnemge. *See* Ex. 44C, ¶¶ 45-46.

Response to Paragraph 428: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

429. On information and belief, products sold under the brand Fnnemge are manufactured by and/or imported for sale by Respondents ThiEye and Hangchebao. *See* Ex. 44C, ¶¶ 45-46.

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Response to Paragraph 429: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

430. The Fnnemge Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Fnnemge Q9C at an address in the United States is attached as Ex. 123.

Response to Paragraph 430: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

431. The packaging of the Fnnemge Accused Product indicates that the product is "Made in China." *See* Ex. 44C, ¶¶ 45; Ex. 123.

Response to Paragraph 431: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

3. Utrai

432. On information and belief, model number Jstar One (the "Utrai Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Utrai. *See* Ex. 44C, ¶¶ 120-121.

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Response to Paragraph 432: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

433. On information and belief, products sold under the brand Utrai are manufactured by and/or imported for sale by Respondent ThiEye Technologies. *See* Ex. 44C, ¶¶ 120-121.

Response to Paragraph 433: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

434. The Utrai Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Utrai Jstar One at an address in the United States is attached as Ex. 127.

Response to Paragraph 434: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

435. The packaging of the Utrai Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 120; Ex. 127.

Response to Paragraph 435: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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H. Energen & Performance Tool Brands

1. Energen

436. On information and belief, model numbers AL12 and AL6 (collectively, the "Energen Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Energen. *See* Ex. 44C, ¶¶ 37-38.

Response to Paragraph 436: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

437. On information and belief, products sold under the brand Energen are manufactured by and/or imported for sale by Respondent Energen. *See* Ex. 44C, ¶¶ 37-38.

Response to Paragraph 437: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

438. The Energen Accused Products are sold after importation into the United States. For example, a receipt from myenergen.com showing the purchase of an Energen AL12 at an address in the United States is attached as Ex. 61. The Energen Accused Products are also sold by Respondents Best Buy and Walmart. *See* https://myenergen.com/resellers/

Response to Paragraph 438: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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439. The packaging of the Energen Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 37 (citing Ex. 61).

Response to Paragraph 439: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

2. Performance Tool

440. On information and belief, model number W16750 (collectively, the "Performance Tool Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Performance Tool. *See* Ex. 44C, ¶¶ 82-83.

Response to Paragraph 440: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

441. On information and belief, products sold under the brand Performance Tool are manufactured by and/or imported for sale by Respondent Wilmar Corporation and Chao Fung Trading Co. *See* Ex. 44C, ¶¶ 82-83.

Response to Paragraph 441: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

442. The Performance Tool Accused Products are sold after importation into the United States. For example, a receipt from carid.com showing the purchase of a Performance Tool

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W16750 at an address in the United States is attached as Ex. 81. The Performance Tool Accused Products are also sold by Respondent Walmart. *See*, *e.g.*, https://www.walmart.com/ip/Performance-Tool-W1665-900-amp-Jump-Starter-Inflator/55558632

Response to Paragraph 442: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

443. The packaging of the Performance Tool Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 82-83 (citing Ex. 81).

Response to Paragraph 443: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

I. Halo Brands

1. HALO

444. On information and belief, model numbers Bolt 44000, Bolt 57720, Bolt 58830, Bolt Flashlight, and Bolt Wireless (collectively, the "Halo Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Halo. *See* Ex. 44C, ¶¶ 54-55.

Response to Paragraph 444: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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445. On information and belief, products sold under the brand Halo are manufactured by and/or imported for sale by Respondents Carku, ZhongKang, and Halo2Cloud. *See* Ex. 44C, ¶¶ 54-55.

Response to Paragraph 445: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

446. The Halo Accused Products are sold after importation into the United States. For example, a receipt from Zagg.com showing the purchase of a Halo Bolt 44000 at an address in the United States is attached as Ex. 69.

Response to Paragraph 446: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

447. The packaging of the Halo Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 54 (citing Ex. 69).

Response to Paragraph 447: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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J. Clore Brands

1. Jump-N-Carry

448. On information and belief, model numbers JNC325 and JNC345 (collectively, the "Jump-N-Carry Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Jump-N-Carry. *See* Ex. 44C, ¶¶ 61-62.

Response to Paragraph 448: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

449. On information and belief, products sold under the brand Jump-N-Carry are manufactured by and/or imported for sale by Respondent Clore Automotive. *See* Ex. 44C, ¶¶ 61-62.

Response to Paragraph 449: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

450. The Jump-N-Carry Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Jump-N-Carry JNC345 at an address in the United States is attached as Ex. 107.

Response to Paragraph 450: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

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451. The packaging of the Jump-N-Carry Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶¶ 61 (citing Ex. 107).

Response to Paragraph 451: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph as they pertain to Respondents and Accused Products other than Deltran and its Accused Products, and therefore denies them.

VIII. HARMONIZED TARIFF SCHEDULE ITEM NUMBERS

452. The Accused Products are classified under at least the following subheadings of the Harmonized Tariff Schedule of the United States: 8504.40 (static converters) 8506.50 (lithium batteries); 8507.10, 8507.60 (lithium-ion electric storage batteries); 8511.40, 8511.50 (starter motors and generators), 8516.60, 8516.71 (ovens, coffee or tea makers); 8539.50.00 (LED lamps). These classifications are exemplary in nature and not intended to restrict the scope of any exclusion order or other remedy ordered by the Commission.

Response to Paragraph 452: Deltran admits that the accused Battery Tender® products sold by Deltran are classified under the following Harmonized Tariff Schedule number: 8507.60.0020. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they pertain to Accused Products other than Deltran's Accused Products, and therefore denies them.

IX. DOMESTIC INDUSTRY

453. As required by 19 U.S.C. § 1337(a)(2), a domestic industry, as defined by 19 U.S.C. § 1337(a)(3), exists in the United States with respect to the Asserted Patents. Since its founding in 1914 with the development of battery corrosion preventative products in Cleveland, Ohio, where

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NOCO remains headquartered to this day, NOCO continues to research, develop, manufacture, and sell innovative battery-related products.

Response to Paragraph 453: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

A. Technical Prong

454. NOCO has, and continues to make, significant and substantial investments in plant and equipment, labor and capital, and engineering and research and development with respect to the products that practice one or more claims of the Asserted Patents ("NOCO Domestic Industry Products"), including all six of the NOCO Boost® jump starter models. The NOCO Boost® jump starters practice at least the following claims of the Asserted Patents shown in Table 4:

Asserted Patent	Exemplary DI Claim(s)	Exemplary DI Product
9,007,015	1	GB40
10,604,024	1, 29, 30	GB40

Table 4. Asserted Patents Practiced by Domestic Industry Products

Response to Paragraph 454: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

455. The NOCO Domestic Industry Products all practice the claims of the Asserted Patents in the same manner. Claim charts demonstrating how the representative NOCO Domestic Industry Product practices these claims are attached as Confidential Exhibit 10C. This claim chart provides a basis for the domestic industry relating to both the '015 and '024 Patents.

Response to Paragraph 455: Deltran admits that a claim chart purporting to show that NOCO's products practice the claims of the Asserted Patents is attached to the Complaint as

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Confidential Exhibit 10C. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph, and therefore denies them.

456. The Asserted Trademarks appear in NOCO's website marketing materials and product information. *See* Ex. 8 and 104. This use of the Asserted Trademarks in commerce provides a basis for the domestic industry relating to both the '656 and '749 Trademarks.

Response to Paragraph 456: NOCO has not accused Deltran of infringing the Asserted Trademarks, so Deltran is not required to respond to this paragraph. To the extent a response is required, Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

B. Economic Prong

457. NOCO conducts all of its engineering, research and development, product design, testing, and sample construction in the United States. As such, NOCO has made significant investments in plant and equipment, labor and capital, and substantial investments in engineering, research and development with respect to the Asserted Patents and Asserted Trademarks in the United States, satisfying the requirements of 19 U.S.C. § 337(a)(3)(A)-(C). NOCO has invested, and continued to invest, in the United States millions of dollars per year in activities related to the design, engineering, development, testing, marketing, distribution, customer service, and warranty fulfillment relating to the NOCO Domestic Industry Products.

Response to Paragraph 457: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

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458. NOCO's headquarters in Glenwillow, Ohio houses NOCO's sales and marketing department, and serves as the main distribution center for North America. NOCO conducts product testing, compliance activities, and other technical support the Glenwillow facility. Accompanying this Complaint as Confidential Exhibit 105C is the Declaration of Jeffery Weiner, which provides information about NOCO's investments in connection with the NOCO Domestic Industry Products. Ex. 105C (DI Dec.) at ¶¶16-35.

Response to Paragraph 458: Deltran admits that Confidential Exhibit 105C is a document purporting to be a Declaration of Jeffrey Weiner. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph, and therefore denies them.

459. NOCO conducts its design, research, and development activities at its facility in Peoria, Arizona. *Id.* at ¶13. NOCO conducts additional product design activities at its facility in Tempe, Arizona. *Id.* at ¶ 14.

Response to Paragraph 459: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

460. NOCO has also employed significant labor and capital with respect to the NOCO Domestic Industry Products. *See* Ex. 105C at ¶¶ 22-30.

Response to Paragraph 460: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

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461. The first NOCO Boost® jump starter was introduced in 2014, and NOCO has continually improved the product since then. Notably, NOCO's spending on research and development has increased in each of the past three years. Ex. 105C at ¶33. From 2017 to the present, NOCO has paid several million dollars in payroll to engineering and technical personnel in the United States, whose employment pertains to the engineering and technical aspects of the Boost® product line, including the patented subject matter. *Id.* at ¶34. NOCO has also invested in customer-specific design projects.

Response to Paragraph 461: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

462. Since 2016 the majority of NOCO's revenue has been derived from sales of its Boost® line of jump starters. *Id.* at ¶15.

Response to Paragraph 462: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

X. RELATED LITIGATION

463. As of the date of the filing of this complaint, there have been 20 lawsuits involving the '015 Patent in U.S. District Courts. A chart outlining this litigation and its status is included as Ex. 108. The '015 Patent is also involved in two pending Inter Partes Review proceedings pending before the Patent Trial and Appeal Board ("PTAB") of the United States Patent and Trademark Office. One was filed by Carku (IPR2020-00944) on May 14, 2020 and the PTAB has instituted review. The other was filed by Shenzhen Mediatek Tong Technology Co, Ltd. on July 29, 2020; NOCO filed its preliminary response to the petition on December 16, 2020 and the PTAB's decision on whether or not to institute review is expected by March 2021.

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Response to Paragraph 463: Deltran admits that there is a pending case in the U.S. District Court for the Middle District of Florida filed by NOCO against Deltran for alleged infringement of the '015 patent. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph, and therefore denies them.

464. There has been no litigation involving the '024 Patent.

Response to Paragraph 464: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

465. As of the date of filing the complaint, there have been thirteen district court actions involving the Asserted Trademarks. *See* Ex. 109. There have been no proceedings before the PTAB.

Response to Paragraph 465: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

466. Other than the litigation specified above, to Complainant's knowledge, the Asserted Patents and Asserted Trademarks are not and have not been the subject of any current or prior litigation.

Response to Paragraph 466: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

XI. GEO

467. A general exclusion order is needed to prevent the circumvention of an order limited to the Proposed Respondents due to the widespread pattern of infringement, as well as the

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difficulty in identifying the source of the Accused Products. 19 U.S.C. § 1337 (d)(2). This is evidenced by the fact that Accused Products continue to enter the market despite NOCO's aggressive ongoing enforcement measures.

Response to Paragraph 467: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

468. Starting in 2014, NOCO began noticing the appearance of the Accused Products in the marketplace. NOCO responded by filing lawsuits against five foreign entities that were offering infringing jump starters on Amazon.com. Since then, NOCO has filed sixteen additional lawsuits, including suits in Canada, the United Kingdom and Germany. As a result of these efforts, NOCO secured a permanent injunction against two of the foreign entities barring them from selling or offering to sell jump starters that infringe NOCO's '015 patent and entered into a settlement agreement with a third foreign entity providing a substantial payment for past damages and a license for future sales. The remaining suits are pending.

Response to Paragraph 468: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

469. Despite these efforts, and successful litigation outcomes, NOCO continues to notice new market entrants selling jump starters with the same features as the NOCO Boost® products. NOCO vigilantly monitors Amazon.com listings and works with Amazon to remove listings for infringing products. NOCO estimates that in the past two years, it has had to file hundreds of takedown notices with Amazon. NOCO also filed a lawsuit against numerous defendants, including named Respondents Shenzhen Valuelink, Aukey, Shenzhen Mediatek, Gooloo,

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Guangzhou Unique Electronics, alleging that these companies, *inter alia*, manipulated Amazon.com algorithms, which determine the product that will receive the "Amazon's Choice" Badge, such that defendants' products would receive the "Amazon's Choice" Badge instead of NOCO. *See The NOCO Company v. Shenzhen Valuelink E-Commerce Co., Ltd., et al.*, N.D. Ohio, No. 1:20-cv-00049-SO, (Jan. 9, 2020).

Response to Paragraph 469: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

470. In pursuit of these enforcement efforts, NOCO has expended significant employee time in addition to legal fees. Through continuous monitoring, NOCO employees identify infringing products or abuse (*e.g.*, manipulation of the Amazon platform) weekly, sometimes daily.

Response to Paragraph 470: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

471. In addition to products infringing the Asserted Patents, NOCO regularly sees 1) unauthorized use of NOCO trademarks; 2) unauthorized use of NOCO copyrighted images - in whole, or in part, meaning an entity has slightly modified a NOCO image to use with their product; 3) copying NOCO content with a similar look and stylization. For example, the FCOEnegy website (Ex. 31) uses a photo copied from the NOCO website that includes NOCO-branded jumper cables:

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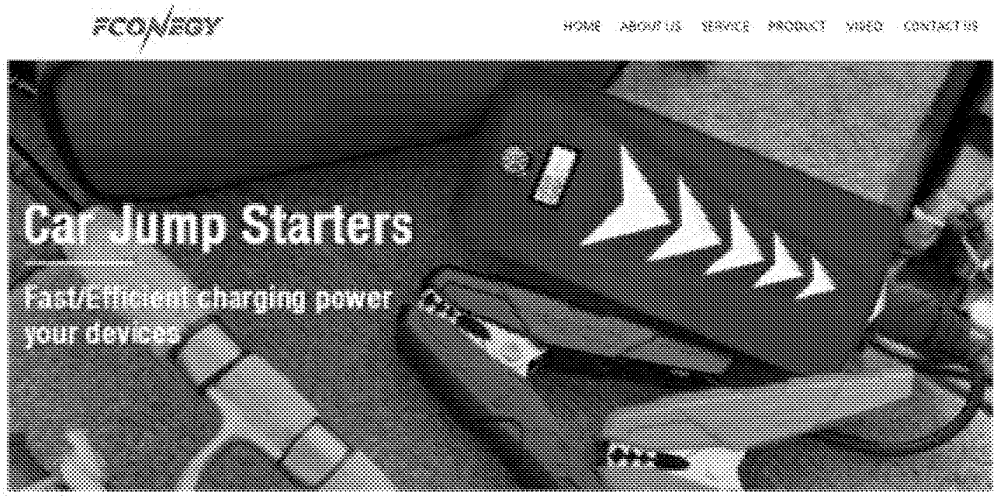


Fig. 6- Excerpt from FCOEngergy website, Ex. 31



Fig. 7- Photo from NOCO Website's HD Boost Battery Clamp Listing (Ex. 110)

Response to Paragraph 471: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

472. Notably, NOCO has filed no less than 50 claims of infringement through Amazon Brand Registry for the Asserted Trademark ULTRASAFE.

Response to Paragraph 472: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

473. In terms of abuse or manipulation of the Amazon marketplace, NOCO has identified the following types of activities by proposed Respondents or other sellers of the Accused Products: 1) manipulating Amazon organic search ranking; 2) depressing legitimate products organic search ranking; 3) fake positive and negative reviews; 4) false product return claims to force a product takedown; 5) altering competitive products' browse nodes; 6) manipulating the Amazon Choice badge; and 7) altering NOCO content.

Response to Paragraph 473: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

474. Each instance of infringement or abuse is reported to NOCO's Global HQ, at which point it is either submitted to Amazon Brand Registry or becomes the subject of a lawsuit. For some types of infringement, NOCO has elected to stop using Brand Registry after finding that Amazon often simply modifies the listing with the infringing content; NOCO is now filing lawsuits in almost every instance. In 2020, NOCO enrolled in the Amazon SVS Program, at a cost of approximately $500,000 to help resolve these issues more efficiently. Registering with the SVS Program was critical as the number of infractions and instance of abuse were too high for the category manager assigned to NOCO to assist in resolution. The abuse by NOCO's competitors

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has become so prevalent that Amazon has placed the NOCO products into multiple exclusive protection programs.

Response to Paragraph 474: Deltran lacks knowledge or information sufficient to form a belief as to the truth of the allegations of this paragraph, and therefore denies them.

XII. REQUESTED RELIEF

475. Proposed Respondents have infringed and will continue to infringe the Asserted Patents and Asserted Trademarks as specified in Section VI above unless the Commission prohibits the importation into and sale within the United States after importation of the Accused Products.

Response to Paragraph 475: Deltran denies that it infringes any claims of the Asserted Patents. NOCO has not accused Deltran of infringing the Asserted Trademarks. Deltran lacks knowledge or information sufficient to form a belief as to the truth of the remainder of the allegations of this paragraph as they relate to Respondents other than Deltran and Accused Products other than Deltran's Accused Products, and therefore denies them.

476. Accordingly, NOCO respectfully requests that the United States International Trade Commission:

a) Institute an immediate investigation pursuant to Section 337(b)(1) of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, into Proposed Respondents' violations of Section 337 arising from the sale for importation into the United States, importation, and/or sale within the United States after importation of certain portable battery jump starters and components thereof that infringe the Asserted Patents and/or Asserted Trademarks;

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b) Schedule and conduct a hearing, pursuant to 19 U.S.C. § 1337 (c), for purposes of receiving evidence and hearing arguments concerning whether Proposed Respondents have violated Section 337 and, following the hearing, determine that Proposed Respondents have violated Section 337;

c) Issue a permanent general exclusion order, pursuant to 19 U.S.C. § 1337(d)(1), excluding from entry into the United States certain portable battery jump starters and components thereof that are imported, sold for importation, or sold after importation that infringe one or more claims of the Asserted Patents and/or Asserted Trademarks, including, without limitation, the specific Accused Products identified in this Complaint and the exhibits hereto; or, in the alternative, issue permanent limited exclusion orders specifically directed to each named Respondent and its subsidiaries, predecessors, affiliates, agents, successors, and assigns, excluding from entry into the United States certain portable battery jump starters and components that infringe one or more claims of the Asserted Patents and/or Asserted Trademarks;

d) Issue permanent orders, pursuant to 19 U.S.C. § 1337(f), directing Proposed Respondents and any of their principals, stockholders, officers, directors, employees, agents, distributors, controlled (whether by stock ownership or otherwise) and majority-owned business entities, successors, and assigns to cease and desist from importing, selling, selling for importation, offering for sale, using, demonstrating, promoting, marketing, and/or advertising in the United States Respondents' portable battery jump starters and components thereof that infringe one or more claims of the Asserted Patents and/or Asserted Trademarks, including, without limitation, the specific Accused Products identified in this Complaint and the exhibits hereto;

e) Impose a bond on importation and sales of infringing products during the 60-day Presidential review period pursuant to 19 U.S.C. § 1337(j); and

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f) Grant all such other and further relief as it deems appropriate under the law, based upon the facts complained of herein and as determined by the Investigation.

Response to Paragraph 476: Deltran denies that NOCO is entitled to any relief.

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RESPONSE TO THE NOTICE OF INVESTIGATION

1. Pursuant to Commission Rule 210.13(b), Deltran hereby responds to the Notice of Institution of Investigation (the "Notice") issued by the United States International Trade Commission (the "Commission") on March 17, 2021. Without admitting any of the specific or general allegations set forth in the Amended Complaint as referenced in the Notice, Deltran provides the following response.

2. Deltran admits that an Amended Complaint was filed on behalf of The NOCO Company with the Commission on February 3, 2021 pursuant to Section 337 of the Tariff Act of 1930, as amended. Deltran admits that the Amended Complaint alleges certain violations of Section 337 of the Tariff Act based on the importation into the United States, the sale for importation, and the sale within the United States after importation of certain portable battery jump starters and components thereof by reason of alleged infringement of certain claims of U.S. Patent No. 9,007,015 (the "'015 patent") and U.S. Patent No. 10,604,024 (the "'024 patent") (together, the "Asserted Patents") by certain Respondents and alleged infringement of U.S. Trademark Reg. Nos. 4,811,656 and 4,811,749 (collectively, the "Asserted Trademarks") by certain Respondents. Deltran denies that it has violated Section 337.

3. Deltran admits that the Amended Complaint alleges that an industry in the United States exists as required by subsection (a)(2) of Section 337, but Deltran lacks sufficient information and knowledge to form a belief as to the truth of NOCO's allegation that it meets the domestic industry requirement, and therefore denies such allegation on that basis. Deltran admits that NOCO requested that the Commission institute an investigation and, after the investigation, issue a general exclusion order and cease and desist order, as set forth in the Summary of the Notice. Deltran denies that NOCO is entitled to any relief.

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Deltran admits that the Commission instituted an investigation as set forth in paragraphs (1) through (4) of the Notice, and that the Scope of Investigation as described in the Notice is consistent with the allegations in the Amended Complaint. Deltran denies that there is a violation of Section 337 by reason of the alleged infringement of any asserted claim of the Asserted Patents. Deltran further denies that a protectable domestic industry exists with respect to the Asserted Patents, and further denies that it is in the public interest to grant any relief to NOCO in connection with this Investigation.

5. Except as expressly admitted, Deltran denies the allegations in the Notice.

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INFORMATION REQUIRED UNDER COMMISSION RULE 210.13(b) –
CONFIDENTIAL BUSINESS INFORMATION SUBJECT TO PROTECTIVE ORDER

Pursuant to Commission Rule 210.13(b), Deltran provides the following information with the sole intention of supplying statistical and other data required by 19 C.F.R. § 210.13(b). Deltran specifically denies that any of the supplied data refers or relates to any unlawful act under Section 337 or otherwise, and Deltran specifically denies that any of its products infringe any of the claims of the Asserted Patents. Discovery has only recently begun and is ongoing. Deltran reserves the right to amend and/or supplement the information provided below.

1. Approximately 46,000 units of the Deltran Accused Products (i.e., Battery Tender® 030-1011-WH (1000A/8000mAh), Battery Tender® 030-1000-PM (600A/6000mAh), Battery Tender® 030-1010-WH (800A/7200mAh)) have been imported into the United States by Deltran since January 1, 2020. The approximate value of such products is $1,467,000.

2. Deltran's Accused Products may fall within the following classifications of the Harmonized Tariff Schedules of the United States: 8507.60.0020.

3. Deltran does not conduct any manufacturing. The names and addresses of the manufacturers of Deltran's Accused Products are as follows:

Dongguan Boltpower Co., Ltd.
Floor 3 A building No. 1 Keyuan Road
Keyuan Industrial Park
Tangxia Town, Dongguan City, China.

4. Pursuant to Commission Rule 210.13(b), Deltran states that, in 2020, the United States market represented approximately 95% of Deltran's worldwide market for the Deltran Accused Products.

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5. Because the Commission is currently not accepting paper copies of electronic filings in light of the COVID-19 pandemic[7], Deltran will not submit physical samples of the subject articles as exhibits to this Response. *See* 19 C.F.R. § 210.13(c). However, Deltran reserves the right to submit samples of its Accused Products at the hearing or at such other time as Deltran, the Administrative Law Judge, or the Commission determines is appropriate.

6. This information is preliminary in nature and will be supplemented and amended as appropriate.

[7] *See* https://www.usitc.gov/press_room/featured_news/usitc_response_covid_19.htm ("No in-person paper-based filings or paper copies of any electronic filings will be accepted until further notice.")

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DEFENSES

Deltran sets forth below certain defenses based on the information available to it at this time. Deltran notes that discovery in this Investigation is at a very early stage, and Deltran's analysis of its defenses is ongoing. Moreover, the parties have not yet exchanged claim constructions, and the Administrative Law Judge has not yet construed the claims of the asserted patents. Accordingly, Deltran reserves the right to assert additional defenses as this Investigation proceeds. Further, by identifying the following defenses, Deltran does not admit that it has the burden of proof with respect to any of these defenses.

FIRST DEFENSE (Non-Infringement of the '015 patent)

1. Deltran's Accused Products do not infringe one or more claims of the '015 Patent because they lack one or more required limitations of those claims, either literally or under the doctrine of equivalents, including but not limited to the microcontroller, the vehicle battery isolation sensor, and/or the reverse polarity sensor as claimed in the '015 Patent.

2. The Accused Products do not include a vehicle battery isolation sensor. No "sensor" in the Accused Products detects the presence of a battery.

3. The Accused Products, in contrast to the claims of the '015 Patent, include a VOUT circuit in which VOUT is the voltage at the battery clamp output. In the VOUT circuit, the VOUT voltage is reduced in a conventional resistive divider to produce an analog output comprising voltage VOUT_DET. The VOUT_DET voltage is always proportional to the voltage at VOUT. More particularly, the VOUT_DET voltage will vary in a continuous way over a wide range of values in exact proportion to the voltage at VOUT. The purpose of reducing the battery clamp output voltage in this way is to ensure that it does not cause damage when used as an input to the microcontroller. The VOUT_DET voltage is monitored by the microcontroller under various test

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conditions to determine if certain criteria are satisfied. The test conditions are established by a network of transistors in a pulsing circuit. The transistor network operates under the control of the microcontroller to selectively apply different excitation signals to the output of the cable clamps at VOUT. Using the VOUT circuit, the microcontroller evaluates the measured voltage at VOUT under the various applied test conditions.

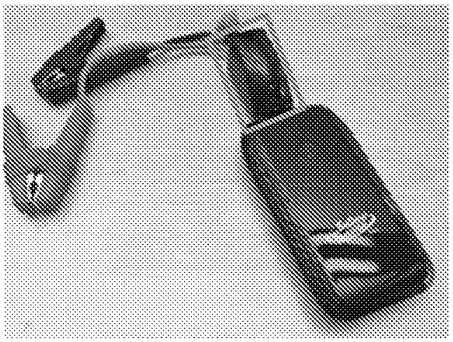
4. NOCO identifies only this pulsing circuit as the "vehicle battery isolation sensor" in Exhibits 139 and 140 to the Complaint. This circuit is not a sensor as the term is used in the '015 Patent specification and claims. This circuit generates and transmits short duration or pulsed signals through the transistors and across VOUT. It does not "sense" anything nor does it receive any signals or measurements as an input. Therefore, it is not a "vehicle battery isolation sensor" or the equivalent of such sensor.

5. Additionally, the VOUT circuit in the Accused Products is not a "vehicle battery isolation sensor" or the equivalent of such sensor as it does not "detect the presence of a vehicle battery."

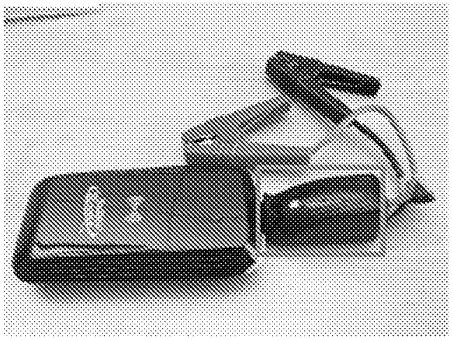
6. The Accused Products also do not include a reverse polarity sensor. NOCO incorrectly points to the VOUT circuit which works in conjunction with the pulsing circuit as noted above with varying voltages created by the transistor/pulsing circuit under command from the microcontroller to control the operation of the device when used for vehicle charging. This is not a sensor, much less a polarity sensor, as the conditions tested are generated by the microcontroller through the pulsing circuit.

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7. The Accused Products do not include the power switch claimed in the '015 Patent. The claim unambiguously requires the claimed power switch to be ***between*** the internal power supply and the output port. NOCO previously provided the following image of the 800A/1000A products in its Infringement Contentions served in a district court litigation against Deltran: Infringement Contentions, Exhibit 1 at 2 (annotated to show the location of the power switch).



800A



1000A

8. NOCO expressly admits that the accused power switch is "within the cable assembly." Complaint, Exhibit 139 at 6. However, the "output port" is located in the battery housing and is ***not*** properly understood to be the alligator clips attachable to the power source at the power source output. Therefore, by NOCO's own admission, the accused power switch is not "between said internal power supply and said output port" as required by the claim.

9. The microcontroller as claimed in the '015 Patent must be configured to receive input signals from two (2) sensors: (1) the claimed vehicle isolation sensor and (2) the claimed reverse polarity sensor. In contrast, the Accused Products have neither sensor but rather uses only a single circuit for purposes of allowing a microcontroller to determine load conditions. The single circuit used for determining load is the VOUT circuit described above. Consequently, the Accused Products do not satisfy this limitation.

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SECOND DEFENSE (Non-Infringement of the '024 patent)

10. Deltran's Accused Products do not infringe one or more claims of the '024 Patent because they lack one or more required limitations of those claims, either literally or under the doctrine of equivalents, including but not limited to the microcontroller, the vehicle battery isolation sensor, and/or the reverse polarity sensor as claimed in the '024 Patent.

11. The Accused Products do not include a vehicle battery isolation sensor. No "sensor" in the Accused Products detects the presence of a battery.

12. The Accused Products, in contrast to the claims the '024 Patent, include a VOUT circuit in which VOUT is the voltage at the battery clamp output. In the VOUT circuit, the VOUT voltage is reduced in a conventional resistive divider to produce an analog output comprising voltage VOUT_DET. The VOUT_DET voltage is always proportional to the voltage at VOUT. More particularly, the VOUT_DET voltage will vary in a continuous way over a wide range of values in exact proportion to the voltage at VOUT. The purpose of reducing the battery clamp output voltage in this way is to ensure that it does not cause damage when used as an input to the microcontroller. The VOUT_DET voltage is monitored by the microcontroller under various test conditions to determine if certain criteria are satisfied. The test conditions are established by a network of transistors in a pulsing circuit. The transistor network operates under the control of the microcontroller to selectively apply different excitation signals to the output of the cable clamps at VOUT. Using the VOUT circuit, the microcontroller evaluates the measured voltage at VOUT under the various applied test conditions.

13. NOCO identifies only this pulsing circuit as the "vehicle battery isolation sensor" in Exhibits 139 and 140 to the Complaint. This circuit is not a sensor as the term is used in the '024 Patent specification and claims. This circuit generates and transmits short duration or pulsed

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signals through the transistors and across VOUT. It does not "sense" anything nor does it receive any signals or measurements as an input. Therefore, it is not a "vehicle battery isolation sensor" or the equivalent of such sensor.

14. Additionally, the VOUT circuit in the Accused Products is not a "vehicle battery isolation sensor" or the equivalent of such sensor as it does not "detect the presence of a vehicle battery."

15. The Accused Products also do not include a reverse polarity sensor. Plaintiff incorrectly points to the VOUT circuit which works in conjunction with the pulsing circuit as noted above with varying voltages created by the transistor/pulsing circuit under command from the microcontroller to control the operation of the device when used for vehicle charging. This is not a sensor much less a polarity sensor as the conditions tested are generated by the microcontroller through the pulsing circuit.

16. The microcontroller as claimed in the '024 Patent must be configured to receive input signals from two (2) sensors: (1) the claimed vehicle isolation sensor and (2) the claimed reverse polarity sensor. In contrast, the Accused Products have neither sensor but rather uses only a single circuit for purposes of allowing a microcontroller to determine load conditions. The single circuit used for determining load is the VOUT circuit described above. Consequently, the Accused Products do not satisfy this limitation.

THIRD DEFENSE (Invalidity of the '015 patent)

17. The Asserted Claims of the '015 Patent are invalid because they are anticipated or rendered obvious under 35 U.S.C. §§ 102 and/or 103; are not enabled and/or lack written description under 35 U.S.C. § 112(a); and/or are indefinite under 35 U.S.C. § 112(b).

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18. At least the following prior art references, alone or in combination, render one or more of the Asserted Claims of the '015 Patent invalid under §§ 102 and/or 103:

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2015/0137740	Allos	System and Method for Mobile Charging	11/13/2013*	5/21/2015
WO	2012/080996	Tracy	A JUMP STARTER	12/16/2010*	6/21/2012
U.S.	2005/0116688	YIN	Power source with an anti-reverse connection and short circuit protection circuit for starting motor vehicles	11/28/2003*	6/2/2005
U.S.	2006/0220610	Solberg	Power management controller	4/5/2005	10/5/2006
EP	0 616 409	Herbert	Portable electrical power supply	9/21/1994	9/21/1994
U.S.	2004/0239290	Krieger	Combination jump starter and high frequency charger	3/21/2003*	12/2/2004
U.S.	2003/0141845	Krieger	High frequency battery charger and method of operating same	1/25/2002*	7/31/2003
U.S.	6,822,425	Krieger	High frequency battery charger and method of operating same	1/25/2002*	11/23/2004
U.S.	2014/0368155	Chen	Smart vehicle rescue battery apparatus	6/18/2013	12/18/2014
U.S.	2006/0176011	Lui	Battery charger with polarity switching capability	2/7/2005	8/10/2006
U.S.	2001/0025618	Kelling	Capacitive remote vehicle starter	3/24/2000*	10/4/2001
U.S.	6,679,212	Kelling	Capacitive remote vehicle starter	3/24/2000*	1/20/2004
U.S.	2014/0084844	Weflen	Self-contained automotive battery booster system	9/23/2013*	3/27/2014
U.S.	9,809,183	Weflen	Self-contained automotive battery booster system	9/23/2013*	11/7/2017

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2004/0150373	Chan	Vehicle jump starter with polarity compensation	1/30/2003	8/5/2004
U.S.	2012/0025766	Reade	Charging Apparatus and Portable Power Supply	7/27/2010*	2/2/2012
U.S.	9,153,978	Reade	Charging Apparatus and Portable Power Supply	7/27/2010*	10/6/2015
U.S.	2006/0244412	Bonzer	Automotive jump-starter with polarity detection, current routing circuitry and lighted cable connection pairs	5/2/2005	11/2/2006
U.S.	6,759,833	Chen	Charger capable of switching polarity	5/6/2003	7/6/2004
U.S.	3,590,357	Reid	Battery booster	11/5/1969	6/29/1971
U.S.	5,194,799	Tomant-schger	Booster battery assembly	3/11/1991	3/16/1993
U.S.	2014/0210399	Urschel	Portable electric power source for aircraft	1/25/2013	7/31/2014
U.S.	3,638,108	Channing	Method of testing an automobile battery and electrical system while in circuit, using a booster battery	4/28/1969	1/25/1972
WO	2012/036556	Eidsvig	Device for charging of rechargeable batteries	9/13/2010*	3/22/2012**
U.S.	2015/0306964	Wang	Automobile charger	4/28/2014*	10/29/2015
U.S.	9,525,297	Wang	Automobile charger	4/28/2014*	12/20/2016
WO	2011/113734	Reichow	On-board electrical system for a vehicle	3/13/2010*	9/22/2011**
U.S.	2013/0162029	Reichow	On-board electrical system for a vehicle	3/13/2010*	6/27/2013
U.S.	9,243,601	Reichow	On-board electrical system for a vehicle	3/13/2010*	1/26/2016
U.S.	6,650,086	Chang	Automatic detecting and switching vehicle charger	11/26/2002	11/18/2003

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Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	6,147,471	Hunter	Single-point direct current connector	10/1/1999	11/14/2000
U.S.	2004/0130298	Krieger	Microprocessor controlled booster apparatus with polarity protection	2/19/2002*	7/8/2004
U.S.	7,345,450	Krieger	Microprocessor controlled booster apparatus with polarity protection	2/19/2002*	3/18/2008
U.S.	2002/0041174	Purkey	Apparatus for providing supplemental power to an electrical system and related methods	10/10/2000*	4/11/2002
U.S.	6,426,606	Purkey	Apparatus for providing supplemental power to an electrical system and related methods	10/10/2000*	7/30/2002
U.S.	6,344,733	Crass	Portable jump-starting battery pack with charge monitoring system	1/31/2000*	2/5/2002
U.S.	5,281,904	Tomkins	Multi mode cordless battery charger	9/29/1992	1/25/1994
U.S.	2015/0054336	Liu Xinfang	Mobile power bank	8/23/2013*	2/26/2015
U.S.	9,506,446	Liu Xinfang	Mobile power bank	8/23/2013*	11/29/2016
WO	2014/106407	Lei	Emergency power source	1/7/2013*	10/7/2014**
U.S.	2015/0340907	Lei	Emergency power source	1/7/2013*	11/26/2014
U.S.	9,954,391	Lei	Emergency power source	1/7/2013*	4/24/2018
U.S.	2008/0143290	Chavakula	Multi-Power Charger and Battery Backup System	12/19/2006	7/19/2008
U.S.	7,893,657	Chavakula	Multi-Power Charger and Battery Backup System	12/19/2006	2/22/2011

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2011/0175461	Tinaphong	Method and apparatus for harvesting energy	1/7/2010	7/21/2011
U.S.	8,362,745	Tinaphong	Method and apparatus for harvesting energy	1/7/2010	1/29/2013
USB Implementers Forum, Inc.			Battery Charging Specification, Revision 1.1	4/15/2009	4/15/2009
Shenzhen Carku Technology Co., LTD.			Carku Product Brochure for the Epower-20 jump starter product	4/15/2014	4/15/2014
Shenzhen Carku Technology Co., LTD.			Carku Product Brochure for the Epower-21 jump starter product	4/15/2014	4/15/2014
Fairchild Semiconductor Corporation			MC78XX/LM78XX /MC78XXA 3-Terminal 1A Positive Voltage Regulator	2001	2001
U.S.	2013/0154543	Richardson	Method and apparatus for providing supplemental power to an engine	5/6/2009	6/20/2013
U.S.	6,424,158	Klang	Apparatus and method for carrying out diagnostic tests on batteries and for rapidly charging batteries	7/27/1998	7/23/2002
WO	2010/129723	Baxter	Low-voltage connection with safety circuit and method for determining proper connection polarity	5/5/2009	11/11/2010
U.S.	8,172,603	Richardet	Quick-release battery cable system	3/16/2009	5/8/2012

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
CN	202696190	Zhang	Intelligent emergent start power source with self-equipped voice prompt function	5/23/2012	1/23/2013

* The date shown is the date the U.S. or WIPO patent document is effective as prior art pursuant to 35 U.S.C. §102(d)(2). The document is also effective as prior art at least as of its actual filing date in the U.S. pursuant to 35 U.S.C. §102(d)(1).

** The date shown is the publication date of the WIPO patent document. The document is also effective as prior art at least as its actual filing date in the U.S. pursuant to 35 U.S.C. §102(d)(1).

19. Numerous products and systems (collectively "Product Prior Art") were publicly known, in public use, offered for sale, sold, and/or invented in the U.S. (and not abandoned, suppressed, or concealed) prior to the purported effective filing date of the '015 Patent and/or prior to the alleged invention date of the claimed inventions. This Public Prior Art anticipates or renders obvious (alone or in combination with other references) one or more of the Asserted Claims of the '015 Patent under 35 U.S.C. §§ 102(a), (b), (e), (g), and/or § 103(a).

20. Most notably, one of the products NOCO previously accused of infringement in a related District Court action, the Battery Tender® Portable Power Pack, is a private label product based on a lithium ion battery jump starter that was publicly known and used and on sale prior to the priority date of the '015 patent. NOCO's allegation that such product infringes the '015 patent is necessarily an admission by NOCO, as a matter of law, that such product anticipates the '015 patent.

21. In addition, there were dozens of portable jump starters on the market prior to the priority date of the '015 patent, and others launched in the United States at approximately the same time as the '015 patent. Deltran identifies the following products as invalidating prior art:

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Item Offered for Sale or Publicly Used or Known	Date Offered for Sale or Became Publicly Used or Known	Identity of Person Offering for Sale or Making Use or Making
MICRO-START/PPS	As late as July 29, 2013	Antigravity Batteries
E-Power	As late as April 15, 2013	Carku
Battery Tender® Power Pack	Prior to July 3, 2014	Carku/Deltran USA LLC
PowerAll	As late as March 26, 2014	Gryphon Mobile Electronics LLC
Electromate 400	As late as 2013	Black & Decker

22. The '015 Patent also is invalid as anticipated under 35 U.S.C. §§ 102(a), (b), or (e) or rendered obvious under 35 U.S.C. § 103, as set forth below. The '015 Patent, under NOCO's apparent understanding of the Asserted Claims in its Infringement Contentions, generally recites, with regard to claim 1, an apparatus for jump starting a vehicle that includes an internal power supply, an output port, a vehicle battery isolation sensor, a reverse polarity sensor, a power switch, and a microcontroller. *See* '015 Patent at 8:4-37 (claim 1). The vehicle battery isolation sensor is configured to detect the presence of a vehicle battery connected between the positive and negative polarity outputs of the output port. *Id.* at 8:9-12. The reverse polarity sensor is configured to detect the polarity of the vehicle battery and to provide an output signal indicating whether the battery is

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properly connected with the positive and negative outputs. *Id.* at 8:13-20. The microcontroller is configured to receive signals from the vehicle battery isolation and reverse polarity sensors and to output a signal to the power switch such that the power switch is turned on when the signals indicate the presence of a battery and proper polarity and is turned off when the signals do not indicate the presence of a battery or improper polarity. *Id.* at 8:21-37. The claims dependent on claim 1 recite limitations on the internal power source (claims 2-3), other well-known limitations regarding individual internal components (claims 4-9), USB ports (claims 10-11), various limitations regarding a light source (claims 12-18), a manual override switch (claims 19-20), and cable terminals (claims 21-23). *See Id.* at 8:38-10:22. Neither the named inventors of the '015 Patent, nor anyone else at NOCO, invented any of these features. Rather, the '015 Patent merely combines prior art elements according to known methods to yield predictable results and therefore are invalid for obviousness.

23. Accordingly, to the extent the references and products disclosed above are found not to anticipate the '015 Patent, they render the Asserted Claims obvious under 35 U.S.C. § 103 either alone or in combination with each other and/or the knowledge of a person of ordinary skill in the art. It would have been obvious to a person of ordinary skill in the art as of the purported effective filing date of the '015 Patent to combine the various references cited herein so as to practice the Asserted Claims. The prior art items render the Asserted Claims obvious because, as discussed above, any features or elements purportedly not explicitly disclosed in the cited art were known to persons skilled in the art in the field at the time, and could have been added by those persons to the device or method disclosed by the prior art, and adding that known feature would yield predictable results, so that the subject matter of the claim as a whole would have been obvious

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at the time the invention was made to a person having ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007).

24. The motivation to combine comes from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obviousness to try, the nature of the problem faced, or knowledge possessed by a person of ordinary skill.

FOURTH DEFENSE (Invalidity of the '024 patent)

25. The Asserted Claims of the '024 Patent are invalid because they are anticipated or rendered obvious under 35 U.S.C. §§ 102 and/or 103; are not enabled and/or lack written description under 35 U.S.C. § 112(a); and/or are indefinite under 35 U.S.C. § 112(b).

26. At least the following prior art references, alone or in combination, render one or more of the Asserted Claims of the '024 Patent invalid under §§ 102 and/or 103:

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2015/0137740	Allos	System and Method for Mobile Charging	11/13/2013*	5/21/2015
WO	2012/080996	Tracy	A JUMP STARTER	12/16/2010*	6/21/2012
U.S.	2005/0116688	YIN	Power source with an anti-reverse connection and short circuit protection circuit for starting motor vehicles	11/28/2003*	6/2/2005
U.S.	2006/0220610	Solberg	Power management controller	4/5/2005	10/5/2006
EP	0 616 409	Herbert	Portable electrical power supply	9/21/1994	9/21/1994
U.S.	2004/0239290	Krieger	Combination jump starter and high frequency charger	3/21/2003*	12/2/2004

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Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2003/0141845	Krieger	High frequency battery charger and method of operating same	1/25/2002*	7/31/2003
U.S.	6,822,425	Krieger	High frequency battery charger and method of operating same	1/25/2002*	11/23/2004
U.S.	2014/0368155	Chen	Smart vehicle rescue battery apparatus	6/18/2013	12/18/2014
U.S.	2006/0176011	Lui	Battery charger with polarity switching capability	2/7/2005	8/10/2006
U.S.	2001/0025618	Kelling	Capacitive remote vehicle starter	3/24/2000*	10/4/2001
U.S.	6,679,212	Kelling	Capacitive remote vehicle starter	3/24/2000*	1/20/2004
U.S.	2014/0084844	Weflen	Self-contained automotive battery booster system	9/23/2013*	3/27/2014
U.S.	9,809,183	Weflen	Self-contained automotive battery booster system	9/23/2013*	11/7/2017
U.S.	2004/0150373	Chan	Vehicle jump starter with polarity compensation	1/30/2003	8/5/2004
U.S.	2012/0025766	Reade	Charging Apparatus and Portable Power Supply	7/27/2010*	2/2/2012
U.S.	9,153,978	Reade	Charging Apparatus and Portable Power Supply	7/27/2010*	10/6/2015
U.S.	2006/0244412	Bonzer	Automotive jump-starter with polarity detection, current routing circuitry and lighted cable connection pairs	5/2/2005	11/2/2006
U.S.	6,759,833	Chen	Charger capable of switching polarity	5/6/2003	7/6/2004
U.S.	3,590,357	Reid	Battery booster	11/5/1969	6/29/1971
U.S.	5,194,799	Tomant-schger	Booster battery assembly	3/11/1991	3/16/1993

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Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2014/0210399	Urschel	Portable electric power source for aircraft	1/25/2013	7/31/2014
U.S.	3,638,108	Channing	Method of testing an automobile battery and electrical system while in circuit, using a booster battery	4/28/1969	1/25/1972
WO	2012/036556	Eidsvig	Device for charging of rechargeable batteries	9/13/2010*	3/22/2012**
U.S.	2015/0306964	Wang	Automobile charger	4/28/2014*	10/29/2015
U.S.	9,525,297	Wang	Automobile charger	4/28/2014*	12/20/2016
WO	2011/113734	Reichow	On-board electrical system for a vehicle	3/13/2010*	9/22/2011**
U.S.	2013/0162029	Reichow	On-board electrical system for a vehicle	3/13/2010*	6/27/2013
U.S.	9,243,601	Reichow	On-board electrical system for a vehicle	3/13/2010*	1/26/2016
U.S.	6,650,086	Chang	Automatic detecting and switching vehicle charger	11/26/2002	11/18/2003
U.S.	6,147,471	Hunter	Single-point direct current connector	10/1/1999	11/14/2000
U.S.	2004/0130298	Krieger	Microprocessor controlled booster apparatus with polarity protection	2/19/2002*	7/8/2004
U.S.	7,345,450	Krieger	Microprocessor controlled booster apparatus with polarity protection	2/19/2002*	3/18/2008
U.S.	2002/0041174	Purkey	Apparatus for providing supplemental power to an electrical system and related methods	10/10/2000*	4/11/2002
U.S.	6,426,606	Purkey	Apparatus for providing supplemental power to an electrical	10/10/2000*	7/30/2002

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Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
			system and related methods		
U.S.	6,344,733	Crass	Portable jump-starting battery pack with charge monitoring system	1/31/2000*	2/5/2002
U.S.	5,281,904	Tomkins	Multi mode cordless battery charger	9/29/1992	1/25/1994
U.S.	2015/0054336	Liu Xinfang	Mobile power bank	8/23/2013*	2/26/2015
U.S.	9,506,446	Liu Xinfang	Mobile power bank	8/23/2013*	11/29/2016
WO	2014/106407	Lei	Emergency power source	1/7/2013*	10/7/2014**
U.S.	2015/0340907	Lei	Emergency power source	1/7/2013*	11/26/2014
U.S.	9,954,391	Lei	Emergency power source	1/7/2013*	4/24/2018
U.S.	2008/0143290	Chavakula	Multi-Power Charger and Battery Backup System	12/19/2006	7/19/2008
U.S.	7,893,657	Chavakula	Multi-Power Charger and Battery Backup System	12/19/2006	2/22/2011
U.S.	2011/0175461	Tinaphong	Method and apparatus for harvesting energy	1/7/2010	7/21/2011
U.S.	8,362,745	Tinaphong	Method and apparatus for harvesting energy	1/7/2010	1/29/2013
USB Implementers Forum, Inc.			Battery Charging Specification, Revision 1.1	4/15/2009	4/15/2009
Shenzhen Carku Technology Co., LTD.			Carku Product Brochure for the Epower-20 jump starter product	4/15/2014	4/15/2014
Shenzhen Carku Technology Co., LTD.			Carku Product Brochure for the Epower-21 jump starter product	4/15/2014	4/15/2014
Fairchild Semiconductor Corporation			MC78XX/LM78XX /MC78XXA 3-	2001	2001

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
			Terminal 1A Positive Voltage Regulator		
U.S.	2013/0154543	Richardson	Method and apparatus for providing supplemental power to an engine	5/6/2009	6/20/2013
U.S.	6,424,158	Klang	Apparatus and method for carrying out diagnostic tests on batteries and for rapidly charging batteries	7/27/1998	7/23/2002
WO	2010/129723	Baxter	Low-voltage connection with safety circuit and method for determining proper connection polarity	5/5/2009	11/11/2010
U.S.	8,172,603	Richardet	Quick-release battery cable system	3/16/2009	5/8/2012
CN	202696190	Zhang	Intelligent emergent start power source with self-equipped voice prompt function	5/23/2012	1/23/2013

* The date shown is the date the U.S. or WIPO patent document is effective as prior art pursuant to 35 U.S.C. §102(d)(2). The document is also effective as prior art at least as of its actual filing date in the U.S. pursuant to 35 U.S.C. §102(d)(1).

** The date shown is the publication date of the WIPO patent document. The document is also effective as prior art at least as its actual filing date in the U.S. pursuant to 35 U.S.C. §102(d)(1).

27. Numerous products and systems (collectively "Product Prior Art") were publicly known, in public use, offered for sale, sold, and/or invented in the U.S. (and not abandoned, suppressed, or concealed) prior to the purported effective filing date of the '024 Patent and/or prior to the alleged invention date of the claimed inventions. This Public Prior Art anticipates or renders

obvious (alone or in combination with other references) one or more of the Asserted Claims of the patents-in-suit under 35 U.S.C. §§ 102(a), (b), (e), (g), and/or § 103(a).

28. Most notably, one of the products NOCO previously accused of infringement in a related District Court action, the Battery Tender® Portable Power Pack, is a private label product based on a lithium ion battery jump starter that was publicly known and used and on sale prior to the priority date of the '024 Patent. NOCO's allegation that such product infringes the '024 Patent is necessarily an admission by NOCO, as a matter of law, that such product anticipates the '024 Patent.

29. In addition, there were dozens of portable jump starters on the market prior to the priority date of the '024 Patent, and others launched in the United States at approximately the same time as the '024 Patent. Deltran identifies the following products as invalidating prior art:

Item Offered for Sale or Publicly Used or Known	**Date Offered for Sale or Became Publicly Used or Known**	**Identity of Person Offering for Sale or Making Use or Making**
MICRO-START/PPS	As late as July 29, 2013	Antigravity Batteries
E-Power	As late as April 15, 2013	Carku
Battery Tender® Power Pack	Prior to July 3, 2014	Carku/Deltran USA LLC
PowerAll	As late as March 26, 2014	Gryphon Mobile Electronics LLC

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Electromate 400	As late as 2013	Black & Decker

30. The '024 Patent also is invalid as anticipated under 35 U.S.C. §§ 102(a), (b), or (e) or rendered obvious under 35 U.S.C. § 103, as set forth below. The '024 Patent, under NOCO's apparent understanding of the Asserted Claims in its Infringement Contentions, generally recite, with regard to claim 1, an apparatus for jump starting a vehicle that includes a power supply, positive and negative polarity vehicle battery terminal connectors, a vehicle battery isolation sensor, a reverse polarity sensor, a power switch, and a microcontroller. *See* '024 Patent at 8:31-9:13 (claim 1). The vehicle battery isolation sensor is configured to detect the presence of a vehicle battery connected between the positive and negative polarity vehicle battery terminal connectors. *Id.* at 8:35-42. The reverse polarity sensor is configured to detect the polarity of the vehicle battery and to provide an output signal indicating whether the battery is properly connected with the positive and negative polarity vehicle battery terminal connectors. *Id.* at 8:43-52. The microcontroller is configured to receive signals from the vehicle battery isolation and reverse polarity sensors and provide an activating output signal to the power switch such that the power switch is turned on when the signals indicate the presence of a battery and proper polarity and a deactivating output signal to the power switch such that the power switch is turned off when the signals do not indicate the presence of a battery or improper polarity. *Id.* at 8:54-9:13. Independent claims 29 and 30 have similar limtiations to claim 1. The claims dependent on claim 1 recite limitations on sensors (claims 2-3, 10), other well-known limitations regarding the vehicle battery terminal connectors (claims 4-6), well-known limitations on the power supply (claims 7-8), limitation on the power switch (claim 9), various limitations adding conventional components (claims 11-14), USB ports (claims 15-16), various limitations regarding a light source (claims 17-

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19), a display and other indicators (claims 20-23) a manual override switch (claims 24-25), and cable terminals (claims 26-28). *See Id.* at 9:14-10:52. Neither the named inventors of the '024 Patent, nor anyone else at NOCO, invented any of these features. Rather, the '024 Patent merely combines prior art elements according to known methods to yield predictable results and therefore are invalid for obviousness.

31. Accordingly, to the extent the references and products disclosed above are found not to anticipate the '024 Patent, they render the Asserted Claims obvious under 35 U.S.C. § 103 either alone or in combination with each other and/or the knowledge of a person of ordinary skill in the art. It would have been obvious to a person of ordinary skill in the art as of the purported effective filing date of the '024 Patent to combine the various references cited herein so as to practice the Asserted Claims. The prior-art items render the claim obvious because, as discussed above, any features or elements purportedly not explicitly disclosed in the cited art were known to persons skilled in the art in the field at the time, and could have been added by those persons to the device or method disclosed by the prior art, and adding that known feature would yield predictable results, so that the subject matter of the claim as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007).

32. The motivation to combine comes from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obviousness to try, the nature of the problem faced, or knowledge possessed by a person of ordinary skill.

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FIFTH DEFENSE (Unenforceability of the '015 patent)

33. An intentional concealment of prior art that is material to the patentability of the inventions claimed in a patent, an affirmative misrepresentation of a material fact, and/or the submission of false material information with an intent to deceive the United States Patent & Trademark Office ("USPTO") constitutes inequitable conduct before the USPTO.

34. The '015 Patent is unenforceable because one or more persons involved in the prosecution of the '015 Patent deliberately withheld one or more material prior art references from the USPTO and made material misrepresentations to the USPTO during the prosecution of the '015 Patent. The single most reasonable inference that the ALJ and Commission can draw from each of these acts is that the deliberate withholding of these material prior art references and the material misrepresentations were done with specific intent to deceive the USPTO.

35. Upon information and belief, NOCO and the named inventors on the '015 Patent were well aware of various prior art products and product literature that disclosed many if not all of the elements of the claims of the '015 Patent, including elements that the inventors argued to the USPTO during prosecution were not present in the prior art. In short, the applicants withheld material prior art and mischaracterized (or did not fully disclose) the scope of the prior art the USPTO cited.

36. In particular, Shezhen Carku Technology Co., Ltd. ("Carku") began offering for sale portable, lithium ion battery, jump starter products at least as early as 2013. Indeed, Carku featured such products and literature at the Canton Fair in China (one of the largest consumer electronics trade shows in the world), which NOCO (and Deltran and other industry participants) attended.

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37. Based on the products that Carku showcased in 2013, Deltran and, upon information and belief, NOCO requested additional information and demonstrations from Carku for purposes of evaluating whether Carku could supply or private label such a product. As detailed below and as Deltran expects the facts will prove, NOCO evaluated the Carku product and then decided to manufacture its own, as well as apply for the '015 Patent without telling the USPTO about Carku's prior art products and disclosures to NOCO.

38. Carku also began offering its portable jump starters for sale on Amazon in 2013. A Carku Epower jump starter product identified as "2013 Newest EPOWER Multi-Function Jump Starter 12V Car 13200mAh Portable Battery Power for Car Laptop and Mobile Phone," which later was called Carku's "Epower-01" product, was available for sale on Amazon.com starting on November 12, 2013.

39. Upon information and belief, on or about December 22, 2013, Yingchun Wan (Wanny), Sales Manager for Carku sent Jonathan Nook (President of the NOCO Company) a catalog of Carku products by email. On or about December 23, 2013, Mr. Wan sent Mr. Nook a quotation for two samples of Carku Epower-01-elite product. Upon further information and belief, on January 9, 2014, Ms. Linda Szymanski, Procurement and Inventory Manager at NOCO, made payment for the requested samples. Mr. Wan subsequently sent two samples of Carku's Epower-01-elite product to NOCO through FedEx on January 10, 2014.

40. Upon information and belief, on January 9, 2014, Mr. Wan shared two testing reports relating to the Carku Epower-01-elite product with Mr. Nook, which described Carku's smart jumper cable and Epower product lines. Upon further information and belief, on January 16, 2014, Mr. Wan met with at least two of the named inventors of the '015 Patent, including Mr.

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Nook. At this meeting, Mr. Wan demonstrated the Carku Epower-01-elite jump starter and Carku's smart cable products.

41. Upon information and belief, on or about January 17, 2014, Mr. Nook, in an email, expressed NOCO's interest in Carku's smart cable and smart circuits contained therein, and subsequently requested Carku to ship samples of Carku's smart cable to NOCO's engineers. Upon further information and belief, on or about January 22, 2014, Mr. Nook again requested Carku to ship samples of Carku's smart cable to NOCO's engineers.

42. Upon information and belief, Mr. Wan responded to Mr. Nook stating that he would send samples to NOCO after Carku and NOCO signed a collaboration or other sort of joint development agreement. However, neither Mr. Nook nor anyone on behalf of NOCO ever signed an agreement with Carku, nor did Carku ever reach an agreement for NOCO to treat Carku's catalog, sample products, brochures, or other technical information confidentially or not to disclose any of the information, catalogs, samples, or technical information Carku had shared with Mr. Nook or NOCO.

43. Through sending emails with the Carku product catalog and Carku product brochures to Mr. Nook, sending samples of the Carku product to NOCO, and demonstrating the Carku product to NOCO in person, Carku made that information publicly available, including making said information publicly available to Mr. Nook and to the NOCO company.

44. The Carku Epower products were publicly available and/or on sale in the United States as early as November 12, 2013.

45. NOCO was aware of the Carku Epower products at least as early as December 22, 2013, when Mr. Wan sent Mr. Nook a catalog of Carku products by email, which was well before the '015 Patent application's filing date of July 3, 2014.

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46. Thus, NOCO, including at least two inventors of the '015 Patent, was aware of the existence of the Carku Epower products prior to the effective filing date of the '015 Patent.

47. During prosecution of the '015 Patent, at least two of the named inventors of the '015 Patent (including Mr. Nook), NOCO, and their counsel, knew or should of known that all patent applicants and their counsel are under a duty to act with good faith and candor before the USPTO and are required under 37 C.F.R. § 1.56 to disclose material information to the USPTO.

48. The attorneys and agents who prosecuted the '015 Patent on behalf of the inventors of the '015 Patent (including Mr. Nook), and NOCO were registered patent attorneys who knew or should have known of their duty of good faith and candor before the USPTO and the requirement of 37 C.F.R. § 1.56 to disclose material information to the USPTO.

49. The purported point of novelty of the '015 Patent – that the vehicle battery isolation sensor is separate from the reverse polarity sensor and the microcontroller receives distinct signals from the two sensors and closes the power switch only when the sensors indicate that the vehicle battery is present and the vehicle battery has been connected with a correct polarity – was present in the Carku Epower products prior to the effective filing date of the '015 Patent. This was also disclosed to at least inventor Mr. Nook prior to the effective filing date of the '015 Patent, through for example, the Carku brochures, Carku catalogs, the various email correspondences between Mr. Nook and Mr. Wan, and the demonstration Mr. Wan provided to NOCO of the Carku Epower products.

50. Furthermore, while many of the dependent claims of the '015 Patent cover features such as a USB port for charging USB-chargeable devices, a flashlight, a visual alarm indicating an emergency situation, or visual indicators on the internal power supply capacity (*see, e.g.,* '015 Patent Claims 10, 12, 14, and 15), all of these aforementioned features were present in the Carku

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Epower products and disclosed to at least Mr. Nook prior to the effective filing date of the '015 Patent.

51. None of the at least two inventors of the '015 Patent (including Mr. Nook), NOCO, or any of the prosecuting counsel submitted the Carku Epower prior art products or the Carku prior art catalog or brochure to the USPTO during prosecution of the '015 Patent. This brochure and catalog were likely the most relevant and pertinant information Mr. Nook, one of the inventors listed on the '015 Patent, knew applying to several pending claims.

52. The Carku Epower products were made publicly available and/or on sale before the effective filing date of the '015 Patent. Therefore, the Carku Epower products constitute material prior art, the disclosure of which would have led the USPTO to not allow one or more claims of the '015 Patent.

SIXTH DEFENSE (Unenforceability of the '024 patent)

53. An intentional concealment of prior art that is material to the patentability of the inventions claimed in a patent, an affirmative misrepresentation of a material fact, and/or the submission of false material information with an intent to deceive the United States Patent & Trademark Office ("USPTO") constitutes inequitable conduct before the USPTO.

54. The '024 Patent is unenforceable because one or more persons involved in the prosecution of the '024 Patent deliberately withheld one or more material prior art references from the USPTO and made material misrepresentations to the USPTO during the prosecution of the '024 Patent. The single most reasonable inference that the ALJ and Commission can draw from each of these acts is that the deliberate withholding of these material prior art references and the material misrepresentations were done with specific intent to deceive the USPTO.

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55. Upon information and belief, NOCO and the named inventors on the '024 Patent were well aware of various prior art products and product literature that disclosed many if not all of the elements of the claims of the '024 Patent, including elements that the inventors argued to the USPTO during prosecution were not present in the prior art. In short, the applicants withheld material prior art and mischaracterized (or did not fully disclose) the scope of the prior art the USPTO cited.

56. In particular, Shezhen Carku Technology Co., Ltd. ("Carku") began offering for sale portable, lithium ion battery, jump starter products at least as early as 2013. Indeed, Carku featured such products and literature at the Canton Fair in China (one of the largest consumer electronics trade shows in the world), which NOCO (and Deltran and other industry participants) attended.

57. Based on the products that Carku showcased in 2013, Deltran and, upon information and belief, NOCO requested additional information and demonstrations from Carku for purposes of evaluating whether Carku could supply or private label such a product. As detailed below and as Deltran expects the facts will prove, NOCO evaluated the Carku product and then decided to manufacture its own, as well as apply for the '024 Patent without telling the USPTO about Carku's prior art products and disclosures to NOCO.

58. Carku also began offering its portable jump starters for sale on Amazon in 2013. A Carku Epower jump starter product identified as "2013 Newest EPOWER Multi-Function Jump Starter 12V Car 13200mAh Portable Battery Power for Car Laptop and Mobile Phone," which later was called Carku's "Epower-01" product, was available for sale on Amazon.com starting on November 12, 2013.

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59. Upon information and belief, on or about December 22, 2013, Yingchun Wan (Wanny), Sales Manager for Carku sent Jonathan Nook (President of the NOCO Company) a catalog of Carku products by email. On or about December 23, 2013, Mr. Wan sent Mr. Nook a quotation for two samples of Carku Epower-01-elite product. Upon further information and belief, on January 9, 2014, Ms. Linda Szymanski, Procurement and Inventory Manager at NOCO, made payment for the requested samples. Mr. Wan subsequently sent two samples of Carku's Epower-01-elite product to NOCO through FedEx on January 10, 2014.

60. Upon information and belief, on January 9, 2014, Mr. Wan shared two testing reports relating to the Carku Epower-01-elite product with Mr. Nook, which described Carku's smart jumper cable and Epower product lines. Upon further information and belief, on January 16, 2014, Mr. Wan met with at least two of the named inventors of the '024 Patent, including Mr. Nook. At this meeting, Mr. Wan demonstrated the Carku Epower-01-elite jump starter and Carku's smart cable products.

61. Upon information and belief, on or about January 17, 2014, Mr. Nook, in an email, expressed NOCO's interest in Carku's smart cable and smart circuits contained therein, and subsequently requested Carku to ship samples of Carku's smart cable to NOCO's engineers. Upon further information and belief, on or about January 22, 2014, Mr. Nook again requested Carku to ship samples of Carku's smart cable to NOCO's engineers.

62. Upon information and belief, Mr. Wan responded to Mr. Nook stating that he would send samples to NOCO after Carku and NOCO signed a collaboration or other sort of joint development agreement. However, neither Mr. Nook nor anyone on behalf of NOCO ever signed an agreement with Carku, nor did Carku ever reach an agreement for NOCO to treat Carku's catalog, sample products, brochures, or other technical information confidentially or not to disclose

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any of the information, catalogs, samples, or technical information Carku had shared with Mr. Nook or NOCO.

63. Through sending emails with the Carku product catalog and Carku product brochures to Mr. Nook, sending samples of the Carku product to NOCO, and demonstrating the Carku product to NOCO in person, Carku made that information publicly available, including making said information publicly available to Mr. Nook and to the NOCO company.

64. The Carku Epower products were publicly available and/or on sale in the United States as early as November 12, 2013.

65. NOCO was aware of the Carku Epower products at least as early as December 22, 2013, when Mr. Wan sent Mr. Nook a catalog of Carku products by email, which was well before the '024 Patent application's filing date of July 3, 2014.

66. Thus, NOCO, including at least two inventors of the '024 Patent, was aware of the existence of the Carku Epower products prior to the effective filing date of the '024 Patent.

67. During prosecution of the '024 Patent, at least two of the named inventors of the '024 Patent (including Mr. Nook), NOCO, and their counsel, knew or should of known that all patent applicants and their counsel are under a duty to act with good faith and candor before the USPTO and are required under 37 C.F.R. § 1.56 to disclose material information to the USPTO.

68. The attorneys and agents who prosecuted the '024 Patent on behalf of the inventors of the '024 Patent (including Mr. Nook), and NOCO were registered patent attorneys who knew or should have known of their duty of good faith and candor before the USPTO and the requirement of 37 C.F.R. § 1.56 to disclose material information to the USPTO.

69. The purported point of novelty of the '024 Patent – that the vehicle battery isolation sensor is separate from the reverse polarity sensor and the microcontroller receives distinct signals

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from the two sensors and closes the power switch only when the sensors indicate that the vehicle battery is present and the vehicle battery has been connected with a correct polarity – was present in the Carku Epower products prior to the effective filing date of the '024 Patent. This was also disclosed to at least inventor Mr. Nook prior to the effective filing date of the '024 Patent, through for example, the Carku brochures, Carku catalogs, the various email correspondences between Mr. Nook and Mr. Wan, and the demonstration Mr. Wan provided to NOCO of the Carku Epower products.

70. Furthermore, while many of the dependent claims of the '024 Patent cover features such as a USB port for charging USB-chargeable devices, a flashlight, a visual alarm indicating an emergency situation, or visual indicators on the internal power supply capacity (*see, e.g.,* '024 Patent Claims 15, 17, 20, 22, and 23), all of these aforementioned features were present in the Carku Epower products and disclosed to at least Mr. Nook prior to the effective filing date of the '024 Patent.

71. None of the at least two inventors of the '024 Patent (including Mr. Nook), NOCO, or any of the prosecuting counsel submitted the Carku Epower prior art products or the Carku prior art catalog or brochure to the USPTO during prosecution of the '024 Patent. This brochure and catalog were likely the most relevant and pertinant information Mr. Nook, one of the inventors listed on the '024 Patent, knew applying to several pending claims.

72. The Carku Epower products were made publicly available and/or on sale before the effective filing date of the '024 Patent. Therefore, the Carku Epower products constitute material prior art, the disclosure of which would have led the USPTO to not allow one or more claims of the '024 Patent.

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SEVENTH DEFENSE (Lack of Domestic Industry)

73. NOCO has not adequately alleged and cannot prove the existence of a domestic industry, as required by Section 337(a)(2) and defined by Section 337(a)(3), in connection with the Asserted Patents, at least because NOCO cannot establish the existence of a "significant investment" in plant, equipment, labor, capital, licensing, research and development, or other activities relating to the NOCO products it contends are covered by the Asserted Patents.

EIGHTH DEFENSE (Equitable Defenses)

74. Some or all of NOCO's claims for relief are barred by the equitable doctrines of waiver, estoppel, unclean hands, and/or acquiescence.

NINTH DEFENSE (Exclusion Order Not in the Public Interest)

75. Even if it is found that some of the Respondents have engaged in an unfair act, an order excluding importation of battery jump starters would be injurious to the public interest. NOCO seeks to unfairly eliminate competition in the marketplace, thereby seeking to corner the market. This is contrary to the public interest and will result in a decrease in quality and choices, and increase in costs and product prices being passed to the consumer. By allowing various battery jump starters to compete in the marketplace, including NOCO's products and Deltran's Accused Products, consumers benefit from more options.

TENTH DEFENSE (No Unlawful Act)

76. No act of Deltran constitutes an unfair method of competition or an unfair act in the importation, sale for importation, or sale after importation of infringing articles that warrants relief under Section 337 of the Tariff Act of 1930, as amended.

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ELEVENTH DEFENSE (Additional Defenses)

77. As this Investigation has only just begun, Deltran intends to rely upon further defenses as may become apparent during the proceedings in this Investigation. Deltran further incorporates by reference any defenses asserted by other parties to this Investigation to the extent not inconsistent with the defenses already stated herein or later raised, and reserves any and all additional defenses available, now existing or later arising, as may be discovered during the course of this Investigation.

WHEREFORE, Deltran prays that the Commission:

(a) find that Deltran has not violated Section 337;

(b) find that Deltran has not infringed any claims of the Asserted Patents;

(c) find the Asserted Patents to be invalid and/or unenforceable;

(d) find that Complainant has failed to satisfy the domestic industry requirement;

(e) deny Complainant's requested relief as it relates to Deltran;

(f) terminate the investigation as to Deltran; and

(g) provide such other relief to Deltran as the Commission deems appropriate.

Dated: April 12, 2021

Respectfully submitted,

/s/ Austen C. Endersby

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Counsel for Respondent Deltran USA, LLC

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VERIFICATION OF RESPONDENT DELTRAN USA, LLC IN SUPPORT OF RESPONSE TO THE AMENDED COMPLAINT AND NOTICE OF INVESTIGATION

I, Michael Prelec, Jr., Executive Vice President of Respondent Deltran USA, LLC, in accordance with the provisions of Commission Rule 210.13(b), declare that:

1. I am duly authorized to execute this verification.

2. I have read Respondent Deltran USA, LLC's Response to the Amended Complaint and Notice of Investigation ("Response") and am familiar with its contents.

3. To the best of my knowledge, information, and belief founded after reasonable inquiry, the foregoing Response and statements made therein:

(a) are not being made for any improper purpose;

(b) are well grounded in fact and are warranted by existing law or a good faith argument for the extension, modification, or reversal of existing law;

(c) have evidentiary support or are likely to have evidentiary support after a reasonable opportunity for further investigation or discovery; and

(d) to the extent they deny factual contentions, are warranted on the evidence or are reasonably based on a lack of information or belief.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed this 12th day of April 2021, at DeLand, Florida.

Michael Prelec, Jr.
CEO
Deltran USA, LLC

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CERTIFICATE OF SERVICE

I, Austen C. Endersby, hereby certify that on this 12th day of April, 2021, copies of the foregoing document were filed and served on the following:

The Honorable Lisa R. Barton Secretary of the Commission **U.S. INTERNATIONAL TRADE COMMISSION** 500 E. Street, SW, Room 112-A Washington, DC 20436	Via EDIS
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/s/ Austen C. Endersby
Austen C. Endersby

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26 October 2021

Examination report No. 3 for standard patent application

Griffith Hack
Level 10
161 Collins St
MELBOURNE VIC 3000
Australia

Your reference	P41255AU05
Application number	2020201224
Applicant name	The NOCO Company
Earliest priority date	03 July 2014

Final date for acceptance:	**29 October 2021**
Date of this report:	26 October 2021
Examination request date:	20 February 2020

Dear Griffith Hack,

Your application has been examined under *section 45 of the Patents Act 1990*. I consider that this application does not meet the requirements of the Act because there are issues with the application that are explained in the report details.

You have until **29 October 2021** to overcome all my objection(s) otherwise this application will lapse.

You will also need to pay any annual continuation fees that apply. Your next continuation fee is due on **3 July 2022**.

Details of this patent application can be viewed on AusPat, our Australian patent search database.

Yours sincerely,

Rifat Shahriar
Section: ELEC 2 - ELECTRONICS & COMMUNICATIONS
Phone: +61 2 6283 3173

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Report details

Basis of the report

In examining this application I have considered:

- the specification as filed
- allowed and/or proposed amendment/s under S104 up to and including amendment item number 5, filed on 19 October 2021.

Summary of novelty, inventive step and patentable subject matter

	Satisfy requirements?	***Claim numbers***
Novelty/inventive step	**Yes**	NONE
	No	1 to 19
Patentable subject matter	**Yes**	1 to 19
	No	NONE

Detailed objections on issues that have been identified

Section 40 (support, disclosure, clarity, lack of unity)

5 Claim 1 lacks support under subsection 40(3) as this claim does not seem to adequately set out the features necessary for the definition of the invention, which are purportedly features that define the invention as designated in the description.

For example, claim 1 defines "the power switch configured to switch power on *only when* the depleted or discharged battery is *properly connected* to the positive and negative battery connectors". However, claim 1 does not define any means (such as a sensor) for detecting polarity of the connected discharged battery and a controller to control power delivery from the claimed jump starting device to the discharged battery depending of the sensed connection polarity. It would appear that this configuration means, to prevent accidental incorrect connection, is central to the invention. Furthermore, in light of the description (paras [0026, 0030]), these features (i.e. a reverse sensor and a microcontroller) are considered essential for the operation of the claimed jump starting device. Due to the absence of these essential features, claim 1 is considered inconsistent with the body of the specification and thus lacks support.

6 Claim 3, while appended to claim 1, lacks an antecedent for the feature "the USB charging circuit". For the purpose of examination, this feature is considered as *the USB input charge circuit* of claim 1.

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Documents cited or considered relevant

D8 : JP 3182855 U (ASIA BRAIGHT INDUSTRIAL (HONG KONG) CO. LTD) 11 April 2013, English translation of the document available on Espacenet is considered for this report. [1]
Category: **X** Claims: 1-19

D9 : US 2012/0187897 A1 (LENK KENNETH LAWRENCE et al.) 26 July 2012 [1]
Category: **A**

D10 : US 2008/0157732 A1 (ADVANCED ANALOGIC TECH INC) 03 July 2008 [1]
Category: **A**

[1] Document found in a top-up search. See attached Search Information Statement for details.

New Documents

I apologise for any inconvenience that raising new citation/s at this stage may have caused.

Special categories of cited documents:

X: The claimed invention cannot be considered novel under *subsection 7(1)* in light of the document and/or cannot be considered to involve an inventive step under *subsection 7(2)* of the Act in light of the common general knowledge considered together with the document.
A: Document defining the general state of the art which is not considered to be of particular relevance.

Novelty and inventive step

7 Thank you for your response to the previous examination report. The arguments provided by the applicant regarding novelty and inventive step, and patentable subject matter are acknowledged.

The examiner apologises for raising new citations D8-D10 which have been located as result of a top-up search. This search was necessitated in light of applicant's submissions and further with the intent of providing the applicant with additional and relevant art in light of their commercial interests.

Notwithstanding the support objection, claims 1 to 19 lack an inventive step in light of the prior art document D8 combined with the common general knowledge in the art.

Regarding claim 1, D8 discloses a jump starting device (fig. 3, vehicle auxiliary power supply device 100, para [0033]) for boosting or charging a depleted or discharged battery having a positive battery terminal and a negative battery terminal, the jump starting device comprising:

a rechargeable battery (a lithium ion storage battery 2, para [0023]);

a positive battery connector for connecting the jump starting device to the positive battery terminal of the depleted or discharged battery; a negative battery connector for connecting the jump starting device to the negative battery terminal of the depleted or discharged battery (fig. 7, 121A, 121B, para [0050]);

a power switch (fig. 3, jump start switch 42, para [0055]) connected in circuit with the rechargeable battery and the positive and negative battery connectors, the power switch configured to switch power on or off from the rechargeable battery to the depleted or

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discharged battery, the power switch configured to switch power on only when the depleted or discharged battery is properly connected to the positive and negative battery connectors (para [0056]);

Regarding the remaining feature of claim 1, D8 discloses a DC input terminal 20 (fig. 3) to be connected to cigar plug 111B (fig. 4B) of an automobile for charging its storage battery (paras [0042, 0043]) but does not specifically disclose *a USB input connector and associated USB input charge circuit comprising DC-DC converter for increasing the charge voltage from the USB charger to the rechargeable battery*.

However, charging a battery from a USB outlet utilising a *DC-DC boost converter* (to achieve the current outcome of increasing the charge voltage from the USB charger) has been well-known in the art of battery charging well before the priority date of this application (see for example D9, para [0035] and D10, para [0281]). Having regard to the disclosure of D8 combined with the common general knowledge in the art, a skilled person would naturally employ the feature of a USB charging arrangement in D8's device without the exercise of any inventive skill in a routine manner in light of the problem to be solved.

Additional features added in the appended claims 2-19 are also disclosed in D8 or are mere choices of design and therefore are considered not to make any patentable contribution over the teachings of D8. For example, additional features of claims 6 and 7 relating to rechargeable battery and its safety are disclosed in paras [0044, 0045, 0079]. Additional features of claims 8 to 11 relating to USB output and its control are also disclosed in D8 in fig. 3, paras [0027, 0030, 0064].

Additional comments

A copy of this report has been dispatched via email to Ray Tettman (ray.tettman@griffithhack.com.au).

In view of the impending FDA, applicant may wish to contemplate lodgment of a divisional application with a view to the entitlement of priority.

This report has been reviewed by the Examiner's supervisor.

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Search information statement

Search details

Application number: 2020201224
Earlier search results available: Yes
Search completion date: 26 October 2021

Search strategy

Databases: Google, Google Patents, Espacenet

CPC: H02J1/00, H02J7/00, B60R16/00, F02N11/00

Keywords: portable, jump starter, vehicle, USB charging, 5V input, DC-DC boost converter.

Approximately 30 documents are viewed and analysed.

Applicant(s)/Inventor(s) name searched in internal databases provided by IP Australia

asn=(The NEAR NOCO NEAR Company) AND inn=((Nook NEAR Jonathan NEAR Lewis) OR (Underhill NEAR Derek NEAR Michael) OR (Stanfield NEAR James NEAR Richard) OR (Nook NEAR William NEAR Knight))

Database searched: DOCDB and DWPI
Number of results: 64 (viewed)

Applicant.ApplicantName:"The NOCO Company" AND Inventor.InventorName:("Nook Jonathan Lewis" OR "Underhill Derek Michael" OR "Stanfield James Richard" OR "Nook William Knight")

Databases searched: IP Australia internal databases
Number of results: 2 (viewed)

END OF REPORT

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Espacenet

CN104795527A Battery module

Applicants: MICROVAST POWER SYSTEMS CO LTD

Inventors: DENG GUOYOU,GUO FENG,WU YANG

Classifications:

IPC ***H01M10/058; H01M2/26;***

CPC **H01M10/04 (CN); H01M10/0486 (EP,US); H01M10/0525 (US); H01M10/058 (CN); H01M10/0585 (US); H01M10/482 (US); H01M10/486 (EP,US); H01M2/0237 (EP,US); H01M2/1077 (EP,US); H01M2/18 (EP,US); H01M2/26 (CN,US); H01M2/266 (EP,US); H01M2/305 (US); H01M4/661 (EP,US);** H01M10/052 (EP,US); H01M10/647 (EP,US); H01M10/654 (EP,US); H01M2/1235 (EP,US); H01M2004/027 (US); H01M2004/028 (US); H01M2220/20 (EP,US); Y02E60/10 (EP,US);

Priorities: CN201410026625A 2014-01-21

Application: CN104795527A·2014-01-21

Publication: CN104795527A·2015-07-22

Published as: CN104795527A;**CN104795527B; US2017084899A1; US9819001B2**

Battery module

Abstract

The invention discloses a battery module. The battery module comprises battery units and current collectors; the opposite two ends of each battery unit are provided with a cathode electrode ear and an anode electrode ear respectively; adjacent battery units are connected in a Z-shaped pattern by series connection of the electrode ears with the current collectors. The cathode electrode ears are aluminium foil electrode ears or copper foil electrode ears; the anode electrode ears are copper foil electrode ears or aluminium foil electrode ears; the cathode electrode ears and the anode electrode ears are made of different materials; the current collectors are combined current collectors, and are composed of aluminium sheets and copper sheets.

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(19)中华人民共和国国家知识产权局

(12)发明专利申请

(10)申请公布号 CN 104795527 A
(43)申请公布日 2015.07.22

(21)申请号 201410026625.5

(22)申请日 2014.01.21

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(51)Int.Cl.
H01M 2/26(2006.01)
H01M 10/058(2010.01)

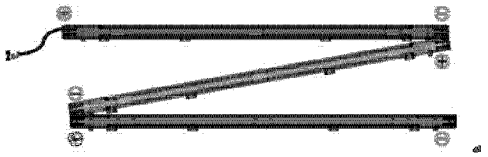
权利要求书1页 说明书6页 附图4页

(54)发明名称

电池模块

(57)摘要

本发明公开了一种电池模块，它包括电池单元和集流片，所述电池单元设置正极极耳及负极极耳，所述正极极耳及负极极耳分别位于电池单元的相对两端，相邻的电池单元通过集流片将极耳串联连接形成Z型排列。所述电池单元的正极极耳为铝箔极耳或铜箔极耳，负极极耳为铜箔极耳或铝箔极耳，且正极极耳和负极极耳的材料不相同，所述集流片为组合式集流片，所述集流片由铝片和铜片组合而成。



CN 104795527 A

1. 一种电池模块，包括电池单元和集流片，所述电池单元设置正极极耳及负极极耳，所述正极极耳及负极极耳分别位于电池单元的相对两端，相邻的电池单元通过集流片串联或并联连接形成 Z 型排列。

2. 根据权利要求 1 所述的电池模块，其特征在于：所述电池单元的长宽比为 2:1 至 8:1。

3. 根据权利要求 1 所述的电池模块，其特征在于：所述电池单元的长宽比为 4:1 至 6:1。

4. 根据权利要求 1 所述的电池模块，其特征在于：所述电池单元的正极极耳为铝箔极耳或铜箔极耳，负极极耳为铜箔极耳或铝箔极耳，且单个电池单元的正极极耳和负极极耳的材料不相同，所述集流片为组合式集流片，所述集流片由铝片和铜片组合而成。

5. 根据权利要求 4 所述的电池模块，其特征在于：所述铝片和铜片之间铆接固定或焊接固定。

6. 根据权利要求 5 所述的电池模块，其特征在于：所述铝片和铜片上分别设置焊接槽。

7. 根据权利要求 6 所述的电池模块，其特征在于：所述铜箔极耳焊接在铜片的焊接槽上，所述铝箔极耳焊接在铝片的焊接槽上。

8. 根据权利要求 1 所述的电池模块，其特征在于：所述相邻电池单元之间设置隔片，所述隔片的表面积大于电池单元的表面积。

9. 根据权利要求 8 所述的电池模块，其特征在于：所述隔片上设置凹凸纹，所述凹凸纹分布在整个隔片上。

10. 根据权利要求 9 所述的电池模块，其特征在于：所述凹凸纹选自菱形凹凸纹、方形凹凸纹、三角形凹凸纹、条形凹凸纹和橘纹中的至少一种。

11. 根据权利要求 1 所述的电池模块，其特征在于：所述电池模块上还设置温度传感器，温度传感器设置在电池模块的极耳处。

12. 根据权利要求 1 所述的电池模块，其特征在于：所述电池模块两端极耳的位置设置线束部件，线束部件上设置线束通道。

13. 根据权利要求 1 所述的电池模块，其特征在于：所述电池单元的极耳两端均设置固定框，固定框上设置夹持电池单元极耳的阻挡部分，将电池单元夹持在两个固定框的中间。

14. 根据权利要求 13 所述的电池模块，其特征在于：所述固定框之间设置缓冲环，所述缓冲环套设在电池单元上。

15. 根据权利要求 1 所述的电池模块，其特征在于：所述电池模块的两个端面分别设置缓冲垫。

16. 根据权利要求 1 至 15 任一所述的电池模块，其特征在于：所述电池模块被设置在电池箱内，所述电池箱的开口由盖板密封。

17. 根据权利要求 16 所述的电池模块，其特征在于：所述箱体的外壁上设置数根纵向加强筋。

18. 根据权利要求 16 所述的电池模块，其特征在于：所述箱体的外表面设置防爆槽，所述防爆槽的切口深度为箱体壁厚度的 20% ～ 50%。

19. 根据权利要求 18 所述的电池模块，其特征在于：所述防爆槽包括 U 型槽。

20. 根据权利要求 16 所述的电池模块，其特征在于：所述箱体上设置与盖板连接的柔性连接条。

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电池模块

技术领域

[0001] 本发明涉及一种软包电池模块。

背景技术

[0002] 锂离子电池是一种平均输出电压高，输出功率大，自放电小，无记忆效应，工作温度范围宽（为 -20℃～ 60℃），循环性能优越，允放电效率高，使用寿命长，不含有毒有害物质的绿色电池。它是依靠锂离子在正、负极之间的往返嵌入、脱嵌完成电池充电和放电工作的。

[0003] 虽然电动汽车与传统汽车相比存在诸多优势，但是将锂离子电池组应用到电动汽车中还存在诸多问题，其中最待解决的就是锂离子电池的成组技术，其中涉及最多的就是电池组的能量密度问题，直接影响电动汽车的续航里程。

[0004] 锂离子电池组的能量密度主要由电池组的构架决定，一般是先将锂离子电池单元并联之后，再将并联模块串联组成，而电池单元的极耳的连接需要使用集流片，现有技术中，电池单元的并联是直接将电池单元的极耳焊接在集流片上，而串联是使用导线将集流片连接起来；但是这种电池模块的组合存在以下缺点：1、电池组在运行过程中，容易将导线与集流片的焊点震松，从而导致虚焊和脱焊；2、由于电池组中还存在其他采样用的采样线等线材，再加入导线，使得电池组内部较为凌乱，占用过多空间。

[0005] 申请号为 CN201010142205.5，名称为“电池组”的发明专利公开了一种由数个软包电池单元构成的电池组，包括与两电池连接的连接装置，通过导线的作用将电池和连接装置连接在一起，大大占用了电池组的空间，降低了能量密度，且导线与连接装置为点焊接，在使用过程中，容易被震松，导致虚焊和脱焊的发生。

[0006] 又如，Tesla 公司投放在市场上，能量密度最大的产品 ModelS 采用的电池模块，其尺寸为长 2.7m，宽 1.5m，厚度为 0.1m 至 0.18m，由 7600 个 18650 电池组成，一节 18650 电池单元中，电池外壳大约为 0.02dm，去除电池顶部和底部的部件之后极片的长度为 0.65-0.05，故单节 18650 电池单元的极片的体积为 $3.14*((0.18-0.004)/2)^2*(0.6)=0.0146$ 升，整个车辆所用的电池的极片的体积为 0.0146*7600=111 升，电池模块的体积为 27*15*1+3*15*0.8=441L。综上，此电池组中极片所占体积比（Electrode Volume Ratio 下文简称 EVR）为 111/441=25.2%，在其他材料相同的情况下，极片所占比例越高，电池组的能量密度越高，反之也就越低，25.2% 的 EVR 对于电动体积能量密度的提高制约较大，不利于动力电池的布置使电动车行驶里程达到传统燃油车的指标从而满足顾客的需求（传统汽车单次加油行驶里程大多在 600 公里左右，而 Tesla 的行驶里程最长的也只有单次充电 400 公里左右）。

[0007] 而且此电池组采用的是圆柱型电池单元，将圆柱型电池单元焊接到连接片上只能通过点焊的方式，且由于电池单元两极与连接片的接触面积较小，减小了电流通过能力，也增加了发热量，而将如此数量的圆柱型电池单元组合成电池组，产生的热量将非常巨大，用于散热的设计也更加复杂，浪费的电能也就更多，又进一步降低了整个锂离子动力电池组

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能量的有效利用。

发明内容

[0008] 本发明的目的是提供一种电池模块，包括电池单元和集流片，所述电池单元设置正极极耳及负极极耳，所述正极极耳及负极极耳分别位于电池单元的相对两端，相邻的电池单元通过集流片将极耳串联或并联连接形成 Z 型排列。

[0009] 根据本发明的电池模块，其中，电池单元的长宽比为 2:1 至 8:1 ；采用长宽比为 2:1 至 8:1 的软包电池单元有利于提高体积密度，进而提高整个电池组的能量密度。优选地，电池单元的长宽比为 4:1 至 6:1。

[0010] 所述电池单元的正极极耳为铝箔极耳或铜箔极耳，负极极耳为铜箔极耳或铝箔极耳，且正极极耳和负极极耳的材料不相同，所述集流片为组合式集流片，所述集流片由铝片和铜片组合而成。 根据本发明的另一种实施方式，电池单元的正极极耳和负极极耳可以同时为铝箔极耳或铜箔极耳，此时，集流片可以采用单一金属铝或铜的集流片。

[0011] 当电池单元的正极极耳为铝箔极耳或铜箔极耳，负极极耳为铜箔极耳或铝箔极耳，且正极极耳和负极极耳的材料不相同，在组装成电池组的过程中，将电池单元并联连接，仅需将相同材料的极耳焊接在一起 ；若要对电池单元进行串联，则需要将铜箔极耳和铝箔极耳焊接到集流片上，由于集流片由铝片和铜片组合而成，故只需将铜箔极耳焊接到铜片上，将铝箔焊接到铝片上，电池单元之间通过集流片串联连接并形成 Z 型排列。此种电池组结构增加了电池组的 EVR（Electrode Volume Ratio ），从而增加了电池组的能量密度，下文的实施例将通过对传统圆柱形电池组与本方案中的电池组的 EVR 作对比来做进一步说明。

[0012] 作为优选，所述铝片和铜片之间可以铆接固定，也可以焊接固定在一起。

[0013] 将铝片和铜片连接在一起，而铆接的方式既能保证连接的稳定性，也能保证大电流的通过能力。

[0014] 作为优选，所述铝片和铜片上分别设置焊接槽。

[0015] 在铝片和铜片上分别设置焊接槽，便于电池单元的正极极耳和负极极耳的焊接。

[0016] 作为优选，所述铜箔极耳焊接在铜片的焊接槽上，所述铝箔极耳焊接在铝片的焊接槽上。

[0017] 将铜箔极耳焊接在铜片的焊接槽上，铝箔极耳焊接在铝片的焊接槽上可以保证电池单元的极耳与集流片的焊接强度。作为优选，所述铜箔极耳与铜片的焊接槽完全焊接，所述铝箔极耳与铝片的焊接槽完全焊接。

[0018] 现有技术中，极耳与集流片的焊接多为点焊，而且使用导线连接集流片的方式必须通过导线才能实现串并联，而点焊在长期使用之后存在虚焊或脱焊现象，极大影响了电池组的使用寿命，也容易导致危险的发生 ；本方案中由于采用新型集流片的缘故，可以避免导线连接的传统方式，将极耳与集流片上的焊接槽完全焊接，增加了接触面积，减小内阻，对于抑制电池组的产热有优异效果。并且使用独特涉及的电池单元和集流片，配合 Z 型排列极大提高了电池组的能量密度。

[0019] 作为优选，所述相邻电池单元之间设置隔片，所述隔片的表面积大于电池单元的表面积。

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[0020] 将电池单元成组设计之后，为了追求电池组的稳定性并兼顾电池组的能量密度电池单元之间的间距尽可能压缩，容易导致热量散布不均。在电池单元之间设置隔片，有助于将电池单元产生的热量均匀分布。

[0021] 作为优选，所述隔片上设置凹凸纹，所述凹凸纹分布在整个隔片上。在隔片上设置凹凸纹，有利于增加隔片的表面积，增大了隔片与电池单元的接触面积，增强了隔片的散热能力，有利于使得电池组内部温度更均匀。

[0022] 作为优选，所述凹凸纹选自菱形凹凸纹、方形凹凸纹、三角形凹凸纹、条形凹凸纹和橘纹中的至少一种。

[0023] 凹凸纹选自菱形凹凸纹、方形凹凸纹、三角形凹凸纹、条形凹凸纹和橘纹中的至少一种，纹路从隔片的底部延伸至顶部，便于加工，同时增大隔片表面积以获得更好的散热效果。

[0024] 电池单元的极耳两端均设置固定框，固定框上设置夹持电池单元极耳的阻挡部分，将电池单元夹持在两个固定框的中间。同时在固定框之间设置套设在电池单元上的缓冲环。

[0025] 由于本技术方案中使用软包电池单元，缓冲环可以为橡胶制成，将缓冲环套设在电池单元上，对电池单元起到缓冲作用，将其夹在两个固定框的中间，保证在使用过程中位置固定不移动，可以达到如下效果：在电池组受到冲击时，可以有效地起到缓冲作用；在电池单元成组过程中，收紧电池模块的过程中，保护软包电池单元不受挤压。

[0026] 作为优选，电池模块上还设置温度传感器。当电池组发生异常时，温度传感器可以监测到电池单元的温度参数变化。电池组在正常工作时，其各项参数都是稳定的，一旦发生故障后，电池组内的某个电池单元可能会发生膨胀，温度急剧上升，在电池组内设置温度传感器可以检测这些变化，并且在温度传感器预设几组对比数值，可以根据温度传感器的检测结果对电池组作出相应的调整，例如使得电池组从供电电路中断路或者减小电池组的放电电压等。

[0027] 作为优选，温度传感器设置在电池模块的极耳处。对于软包电池来说，其发热量最大的部位位于极耳周围，若其发生故障，温度变化最为剧烈的也是这个部位，将温度传感器设置在电池模块的极耳处可以在电池单元发生异常的初期就发现，在及时做出补救措施之后，可以避免危险的扩散，保证电池组的安全。

[0028] 作为优选，所述电池模块两端极耳的位置设置线束部件，线束部件上设置线束通道，从电池模块上引出的采样线束从线束通道内穿过，比如温度传感器线束等。

[0029] 作为优选，所述电池单元的极耳两端均设置固定框，固定框上设置夹持电池单元极耳的阻挡部分，将电池单元夹持在两个固定框的中间；这种设计可以将电池单元夹在固定框中间，使得电池单元保持较好的稳定性，并且使得极耳露出，便于连接。

[0030] 作为优选，所述固定框之间设置缓冲环，所述缓冲环套设在电池单元上。

[0031] 本发明中使用软包电池单元，缓冲环为橡胶制成，将缓冲套套设在电池单元上，对电池单元起到缓冲作用，将其夹在两个固定框的中间，保证在使用过程中位置固定不移动，可以达到如下效果：在电池组受到冲击时，可以有效地起到缓冲作用；在电池单元成组过程中，收紧电池模块的过程中，保护软包电池单元不受挤压。

[0032] 作为优选，所述电池模块的两个端面分别设置缓冲垫。

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[0033] 电池组在充电时会发生膨胀，在电池模块的两个端面分别设置缓冲垫可以起到缓冲的作用，避免将电池箱胀破后发生事故。

[0034] 作为优选，所述箱体的外壁上设置数根纵向加强筋。

[0035] 当电池箱由铝合金制成时，在箱体的外壁上设置数根纵向加强筋可以增加电池箱的强度，加强抗压和抗扭曲能力，同时也增大了箱体的表面积，优化了散热性能。当电池箱由强度较高的不锈钢制成时，箱体外壁上可以不另设置加强筋。

[0036] 作为优选，所述箱体的外表面设置防爆槽，所述防爆槽的切口深度为箱体壁厚度的 20% ～ 50%。

[0037] 作为优选，所述防爆槽包括 U 型槽。

[0038] 当电池组内部发生异常，体积急剧膨胀的时候防爆槽，比如 U 型槽，可以在达到箱体破裂压力前提前破开以达到泄压的目的，并且可以引导爆破方向，从而避免电池箱的内压积聚过大而发生更剧烈的爆炸，同时也可防止端板与箱体分离被炸飞。

[0039] 作为优选，所述箱体上设置与两块盖板连接的柔性连接条。

[0040] 箱体上设置柔性连接条，柔性连接条的另一端固定在盖板上，并且两块盖板均通过柔性连接条与箱体连接，当电池箱内压过大，防爆槽也不能完全保证不发生爆炸时，为防止端板被炸飞伤及人员，柔性连接条能够将端板牢牢锁住，即使电池箱爆炸也能保证端板不炸飞，进一步提升电池组的安全性能。

[0041]

附图说明

[0042] 图 1 是电池模块的结构示意图；

图 2 是电池模块的集流片的结构示意图；

图 3 是 Z 字型电池模块的俯视图；

图 4 是本发明的一种实施方式的电池模块的结构示意图；

图 5 是本发明的一种实施方式的电池模块的爆炸图；

图 6 是本发明的一种实施方式的电池模块的结构示意图；

图 7 是本发明公开的一种实施方式的电池箱的结构示意图；

图 8 是本发明公开的一种实施方式的电池箱的爆炸图；

其中 1、电池模块，11、电池单元，2、集流片，21、铜片，22、铝片，23、焊接槽，12、固定框，13、线束部件，132、线束通道，14、缓冲环，15、温度传感器，16、密封片， 3、电池箱， 33、加强筋，34、箱体，35、盖板，36、柔性连接条，37、U 型槽。

[0043] 实施方式

实施例 1

如图 1 至图 3 所示，本实施例提供一种电池模块 1，包括电池单元 11 和集流片 2，电池单元 11 设置正极极耳及负极极耳，正极极耳及负极极耳分别位于电池单元 11 的相对两端，电池单元 11 的正极极耳为铝箔极耳，负极极耳为铜箔极耳，集流片 2 为组合式集流片，集流片 2 由铝片 22 和铜片 21 组合而成，铝片 22 和铜片 21 之间铆接固定，铝片 22 和铜片 21 上分别设置焊接槽 23。

[0044] 在组装电池模块 1 的过程中，首先将电池单元 11 串联连接，把需要串联的电池单

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元 11 的铝箔极耳焊接在铝片 22 的焊接槽 23 上，将铜箔极耳焊接在铜片 21 的焊接槽 23 上，使得电池模块中的电池单元首尾连接形成 Z 字型。

[0045] 此实施例的优点在于超高的能量密度和电池组结构的稳定性；本实施例中电池组的长为 14dm、宽为 4.3dm、高为 1dm，电池组由 3 并，96 串电池单元组成，电池单元中极片的长为 3.6dm、宽为 0.8dm、厚为 0.036dm，电池箱 3 的容量为 14*4.3*1=60L，电池组中所有极片体积为 3.6*0.8*0.036*3*96=30L，故 EVR 为 30/60=50%，远大于背景技术中 Tesla 使用的 EVR 仅为 25.2% 的电池组，在极片隔膜等材料完全一致前提下，极大提高了电池组的能量密度。

[0046] 实施例 2

如图 1 至图 4 所示，本实施例提供一种电池模块 1，包括电池单元 11 和集流片 2，电池单元 11 设置正极极耳及负极极耳，正极极耳及负极极耳分别位于电池单元 11 的相对两端，电池单元 11 的正极极耳为铝箔极耳，负极极耳为铜箔极耳，集流片 2 为组合式集流片，集流片 2 由铝片 22 和铜片 21 组合而成，铝片 22 和铜片 21 之间铆接固定，铝片 22 和铜片 21 上分别设置焊接槽 23；电池单元 1 的长宽比为 4:1。

[0047] 在组装电池模块 1 的过程中，首先将三个同样的电池单元 11 并联连接，把需要并联的电池单元 11 的铝箔极耳焊接在铝片 22 的焊接槽 23 上，将铜箔极耳焊接在铜片 21 的焊接槽 23 上。然后再将并联好的电池单元的铜箔极耳焊接在上一个并联好的电池单元正极集流片的铜片 21 的焊接槽 23 上，铝箔极耳焊接在下一个并联好的电池单元正极集流片的铝片 22 的焊接槽 23 上。使得电池模块中并联后的电池单元首尾连接形成 Z 字型。

[0048] 电池模块 1 的末端均设置固定框 12，将电池单元夹持在两个固定框 12 的中间，同时在固定框 12 之间设置套设在电池单元上的缓冲环 14，固定框 12 上设置夹持电池单元极耳的阻挡部分。

[0049] 此实施例的优点在于保证较高的能量密度情况下，设计的缓冲结构使得电池组具备一定的防震和抗冲击能力。

[0050] 实施例 3

如图 1 至图 8 所示，本实施例提供一种电池模块 1，包括电池单元 11、集流片 2 和电池箱，盖板将电池箱的开口密封，箱体 34 的外壁上设置数根纵向加强筋 33，箱体 34 和盖板 35 之间设置缓冲环 14 和密封片 16，电池单元 11 设置正极极耳及负极极耳，正极极耳及负极极耳分别位于电池单元 11 的相对两端，电池单元 11 的正极极耳为铝箔极耳，负极极耳为铜箔极耳，集流片 2 为组合式集流片，集流片 2 由铝片 22 和铜片 21 组合而成，铝片 22 和铜片 21 之间铆接固定，铝片 22 和铜片 21 上分别设置焊接槽 23；箱体 34 的外表面设置切口深度为箱体 34 壁厚度的 20% 的 U 型槽 37；箱体 34 上设置与盖板 35 连接的柔性连接条 36；电池单元 1 的长宽比为 4:1。

[0051] 在组装电池模块 1 的过程中，首先将三个同样的电池单元 11 并联连接，把需要并联的电池单元 11 的铝箔极耳焊接在铝片 22 的焊接槽 23 上，将铜箔极耳焊接在铜片 21 的焊接槽 23 上。然后再将并联好的电池单元的铜箔极耳焊接在上一个并联好的电池单元正极集流片的铜片 21 的焊接槽 23 上，铝箔极耳焊接在下一个并联好的电池单元正极集流片的铝片 22 的焊接槽 23 上。使得电池模块中并联后的电池单元首尾连接形成 Z 字型；相邻电池单元 11 之间设置表面积大于电池单元 11 的铝制隔片，隔片上设置条形凹凸纹。

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[0052] 电池模块 1 的末端均设置固定框 12，将电池单元夹持在两个固定框 12 的中间，同时在固定框 12 之间设置套设在电池单元上的缓冲环 14，固定框 12 上设置夹持电池单元极耳的阻挡部分；固定框之间设置缓冲环，缓冲环套设在电池单元上，电池模块的两个端面分别设置缓冲垫。

[0053] 电池模块 1 上还设置温度传感器 15，温度传感器 15 设置在电池模块 1 的极耳处，当电池组发生异常时，温度传感器 15 可以监测到电池单元的温度参数变化。电池模块 1 两端极耳的位置设置线束部件 13，线束部件 13 上设置线束通道 132，从电池模块 1 上引出的采样线束从线束通道 132 内穿过。

[0054] 此实施例的优点在于保证较高的能量密度情况下，同时可以提供对电池模块温度的检测，更有利于提高电池模块的安全性能。

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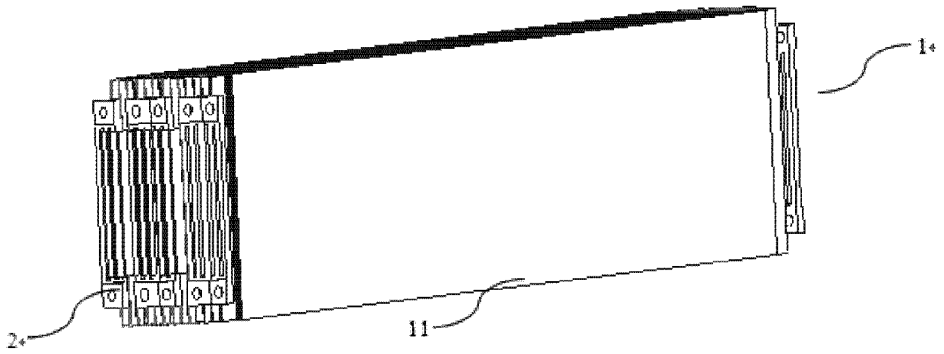


图 1

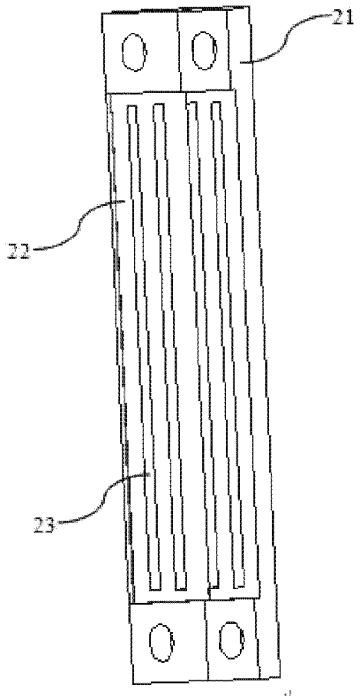


图 2

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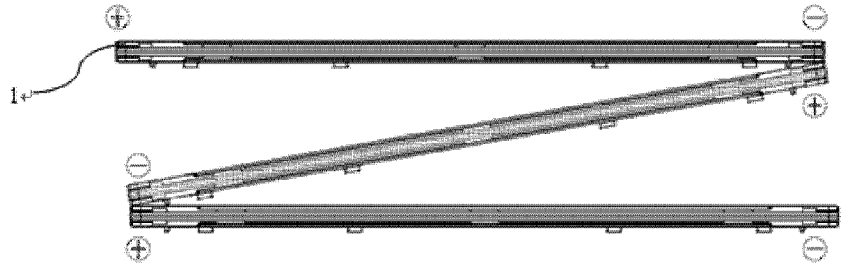


图 3

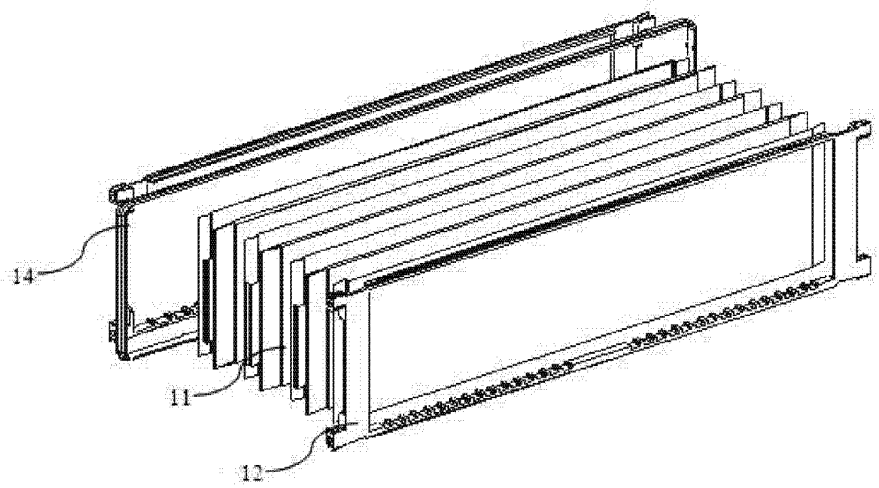


图 4

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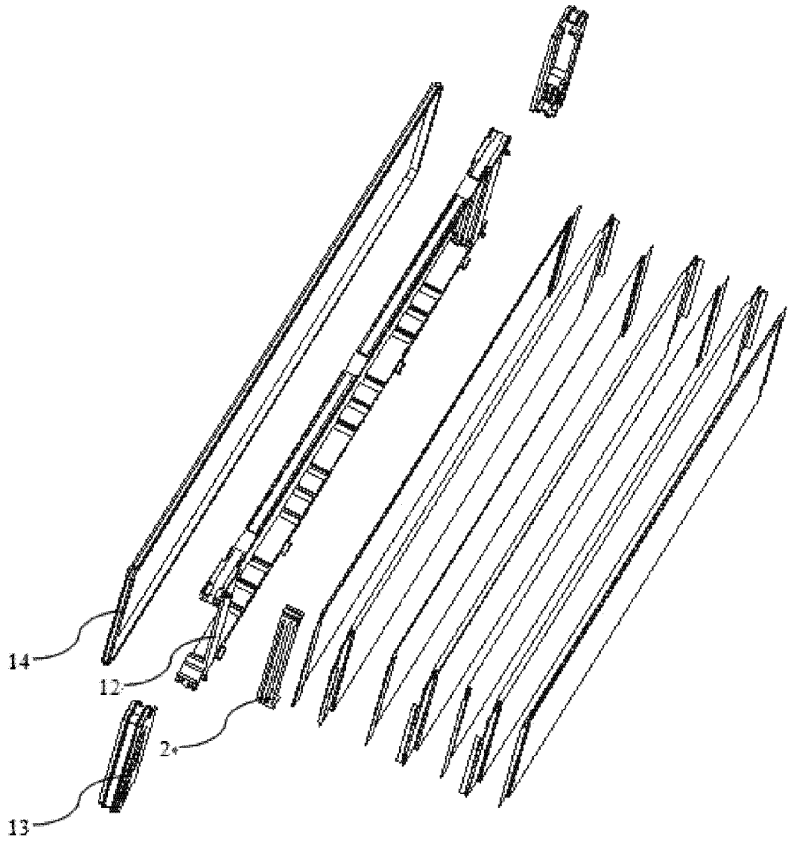


图 5

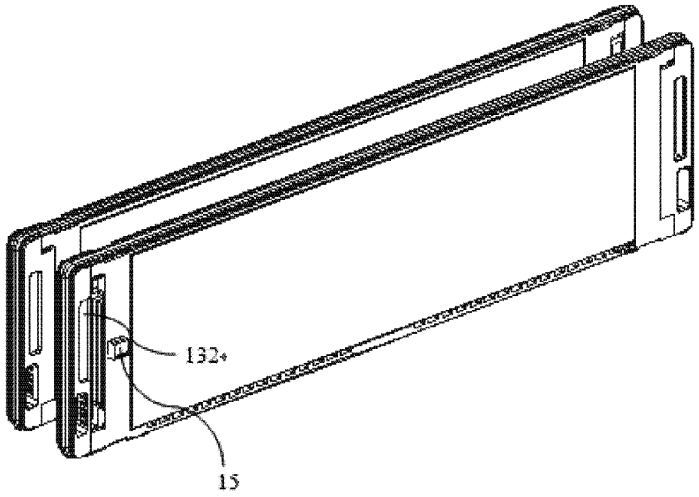


图 6

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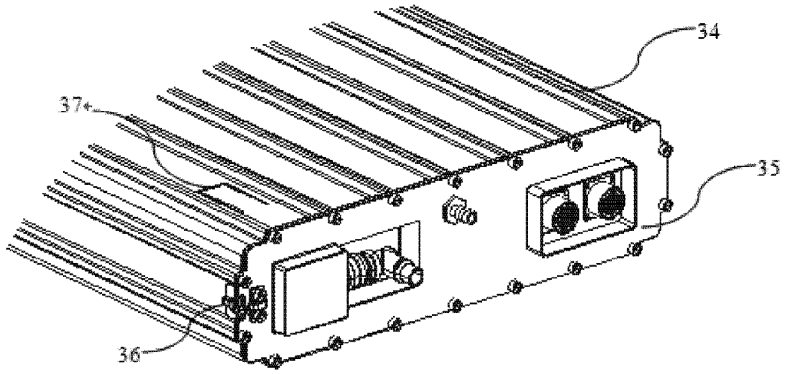


图 7

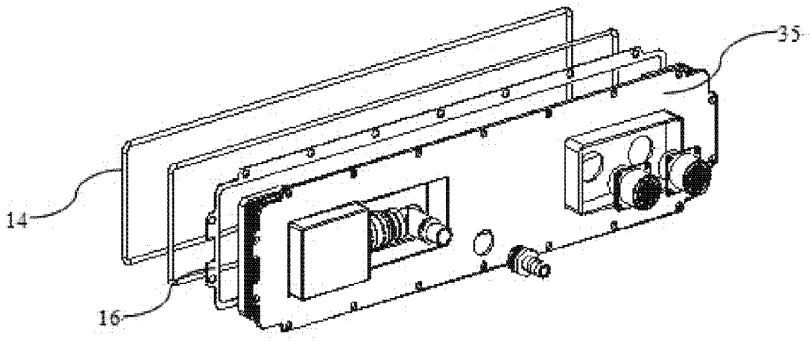


图 8

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Espacenet

CN204966731U Multi -functional output terminal of charger heavy current

Applicants: PRIME ELECTRIC (SHENZHEN) CO LTD

Inventors: SHEN XIAOLONG

Classifications:
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Multi -functional output terminal of charger heavy current

Abstract

The utility model provides a multi -functional output terminal of charger heavy current can give big electricity charging utensils family, provides the selection of plugging into of two kinds of batteries: with line ear snap -on to battery terminal, remove with the provisional battery terminal of plugging into of pliers when using during stationary use. The problem of " line ear + pliers " dual - purpose combination under the condition of heavy current, the line to tong arm binding site seriously generate heat and the pressure drop big is solved. Thereby avoid scalding one's hand, charging voltage is low and a series of problems such as vicious circle of " generate heat - end of a thread oxidation - pressure drop increase - generate heat the aggravation ".

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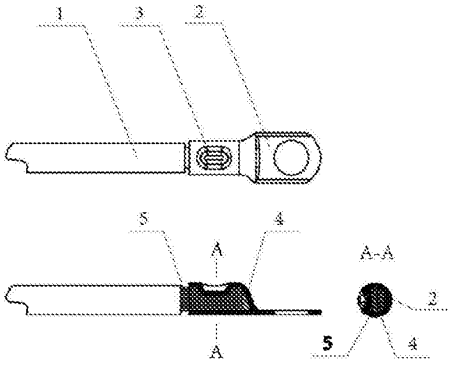
权利要求书1页 说明书3页 附图3页

(54)实用新型名称

一种充电器大电流多功能输出端子

(57)摘要

本实用新型提供了一种充电器大电流多功能输出端子，可以给大电流充电器用户，提供两种电池接驳选择：固定使用时用线耳直接固定到电池端子，移动使用时用钳子临时性接驳电池端子。解决了“线耳 钳子”两用组合在大电流的情况下，线到钳臂结合部位严重发热及压降大问题。从而避免烫手、充电电压低以及“发热－线头氧化－压降增大－发热加剧”的恶性循环等一系列的问题。



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1. 一种充电器大电流多功能输出端子，其特征在于：包括有可以直接固接在电池端子上的线耳结构和可以临时性接驳线耳机构的钳子结构，

所述线耳结构包括有输出线 (1) 及其末端铜丝 (5) 和线耳 (2)，所述末端铜丝固接于线耳 (2) 尾部线管内，所述末端铜丝 (5) 上覆盖有锡膏；

所述钳子结构包括有钳臂 (9)、钳子塑胶外壳 (11) 和设置在钳臂 (9) 末端用于临时性固定线耳结构的线耳连接结构。

2. 根据权利要求 1 所述的一种充电器大电流多功能输出端子，其特征还在于：所述铜丝 (5) 伸入线耳 (2) 尾部线管的固接方式为在线管上冲压出冲压口 (3)。

3. 根据权利要求 1 所述的一种充电器大电流多功能输出端子，其特征还在于：所述线耳连接结构包括有黄铜螺母 (6) 和塑胶压线扣 (14)。

4. 根据权利要求 3 所述的一种充电器大电流多功能输出端子，其特征还在于：所述黄铜螺母 (6) 通过铆压的方式植入钳臂 (9) 末端，并在螺母于钳臂表面接触边缘点焊。

5. 根据权利要求 3 所述的一种充电器大电流多功能输出端子，其特征还在于：所述黄铜螺母 (6) 为非倒角平面螺母。

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一种充电器大电流多功能输出端子

技术领域

[0001] 本实用新型涉及一种充电器大电流多功能输出端子，特别是一种可以固定固定使用和移动使用的充电器大电流多功能输出端子。

背景技术

[0002] 目前市面上也有“线耳 + 钳子”两用组合，但由于输出线头到钳臂结合部位内阻大，只能用到小电流 (<15Amp) 的充电器上。如果用于大电流充电器，电流一大，将会导致发热烫手、充电电压低，长时间使用出现“发热 - 线头氧化 - 压降增大 - 发热加剧”的恶性循环，导致接触不良，甚至火灾等严重后果。所以在一些大电流 (15-80A) 的充电器上，要么直接用线耳，要么直接用钳子。

[0003] 为什么传统输出线头到钳臂结合部位内阻大？传统的做法是直接冲压，由于铜丝是圆柱形，冲压后，铜丝与铜丝之间会有大量的虚位，铜丝与线管内壁有大量虚位，铜丝如果有散乱，内部虚位更会成倍增加，这种虚位会导致整体接触面减少，线束中心铜丝与周围铜丝接触不好，线束表面铜丝与线管内壁接触不好，因此整体结构的接触电阻就会很大，大电流的情况下，就会发热严重。而铜丝之间的虚位，给空气进入结构内部提供了有利条件，在发热情况下，很容易导致铜丝和线管内壁氧化，氧化会导致接触电阻的增大，实测经常出现几兆欧甚至更大电阻，这样的结果是加剧发热，恶性循环，最终接触不良，甚至出现火灾。可见传统结构，不但发热大，也非常不稳定。

实用新型内容

[0004] 本实用新型要解决的技术问题在于，针对现有技术的上述缺陷，提供针对现有技术中的不足，本实用新型要解决的技术问题在于提供了一种充电器大电流多功能输出端子。

[0005] 本实用新型解决其技术问题所采用的技术方案是：

[0006] 提供一种充电器大电流多功能输出端子，包括有可以直接固接在电池端子上的线耳结构和可以临时性接驳线耳机构的钳子结构，所述线耳结构包括有输出线及其末端铜丝和线耳，所述末端铜丝浸上低温锡膏后，伸入线耳尾部线管固接，并对所述尾部线管进行局部加热；所述钳子结构包括有钳臂、钳子塑胶外壳和设置在钳末端用于临时性固定线耳结构的线耳连接结构。

[0007] 优选的，铜丝伸入线耳尾部线管的固接方式为在线管上冲压出冲压口，目的是锁紧铜丝与线耳，避免意外分离。

[0008] 优选的，线耳连接结构包括有黄铜螺母和塑胶压线扣，用来固定线耳，使线耳子与钳子固定成一个整体，使用时随时可以拆卸收藏。

[0009] 优选的，黄铜螺母通过铆压的方式植入钳臂末端，并在螺母于钳臂表面接触边缘点焊，这种“铆压 + 点焊”的结构方式，为螺母与钳臂提供了充分的接触和可靠的强度，避免操作扭力和热应力导致螺母与钳臂出现松动和接触不好现象。

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[0010] 优选的，黄铜螺母为非倒角平面螺母，为线耳的安装提供了足够的接触面，尽可能的减少了接触电阻。

[0011] 一种充电器大电流多功能输出端子，本实用新型的有益效果是：通过有效减低线耳于铜线之间的电阻，进一步降低了大电流充电时产生的发热量，从而为大电流充电提供了固定充电和移动充电两种可供客户自由选择的充电方式，提高了大电流充电的安全性，方便客户使用，以及避免了烫手、充电电压低以及“发热－线头氧化－压降增大－发热加剧”的恶性循环等一系列的问题。

附图说明

[0012] 下面将结合附图及实施例对本实用新型作进一步说明：

[0013] 图 1 大电流充电器输出线通过线耳直接连接电池电极端示意图

[0014] 图 2 大电流充电器输出线通过“线耳＋钳子”连接电池电极端示意图

[0015] 图 3 线耳与输出线连接处结构示意图

[0016] 图 4 钳臂与螺母连接处结构示意图

[0017] 图 5 线耳与钳子连接装配示意图

[0018] 图 6 线耳与钳子装配后的成品示意图

[0019] 图中，1. 充电器 DC 输出线 2. 铜线耳 3. 线耳冲压口 4. 焊接锡料 5. 输出线末端铜丝 6. 平面黄铜螺母 7. 螺母焊接点 8. 螺母铆压结构 9. 钳臂 10. 塑胶压线扣 11. PC 钳子塑胶外壳 12. 螺钉 13. 弹簧垫圈 14. 输出线固定扣

具体实施方式

[0020] 下面结合附图对本实用新型的具体实施方式进一步详细说明。

[0021] 图 1 是大电流充电器输出线通过线耳直接连接电池电极端示意图，也就是固定充电时的状态示意图。

[0022] 图 2 大电流充电器输出线通过“线耳＋钳子”连接电池电极端示意图，也就是移动充电时的状态示意图，插拔简单随时可以收好。

[0023] 图 3 实施例中，充电器输出线 1 的末端铜丝 5 浸上熔点 150℃低温锡膏后，伸入线耳 2 尾部的线管中，并在线管上冲压出冲压口 3，锁紧铜丝与线耳。然后用红外局部加热装置，对线管进行加热到 160℃左右，让焊锡充分熔接铜丝和线管内壁。以少量的低温锡膏做填充，不但封堵了空气进入，也将铜丝线管连成了一体，巧妙地解决了铜丝散乱，铜丝与线管内部接触不良等问题。

[0024] 图 4 实施例中，6.5mm 厚 M8 的黄铜螺母 6 通过铆压的方式，植入到钳臂 9 的末端，并在螺母和钳臂的接触边缘用点焊加固。这种“铆压＋点焊”的结构方式，为螺母与钳臂提供了充分的接触和可靠的强度，避免操作扭力和热应力导致螺母与钳臂出现松动和接触不好现象。而且所使用的螺母为 M8 大螺母的六角平面，为与线耳的安装提供了足够的接触面。

[0025] 图 5 实施例中，线耳 (2) 与 M8 螺母 (6)，通过 M8 螺钉 (12) 和 M8 弹簧垫片 (13) 锁定到一块，然后将塑胶压线扣 (14) 压入钳臂 (2) 的对应位置，就可以将充电输出线 (1) 固定，完成线耳和钳子的连接，使他们成为“线耳＋钳子”的可移动的整体，方便客户选用。

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[0026] 本实用新型可以给大电流充电器（15-80A）用户，提供两种电池接驳选择：固定使用时用线耳直接固定到电池端子，移动使用时用钳子临时性接驳电池端子。解决了“线耳+钳子”两用组合在大电流的情况下，线到钳臂结合部位严重发热及压降大问题。从而避免烫手、充电电压低以及“发热－线头氧化－压降增大－发热加剧”的恶性循环等一系列的问题，保证了大电流充电的安全性，提高了电能的利用率。

[0027] 如上所述，仅为本实用新型治具具体实施方式，不能以此为限定本实用新型具体实施范围，凡根据本实用新型权利要求及说明内容所作的变化与修改，皆在本实用新型的保护范围内。

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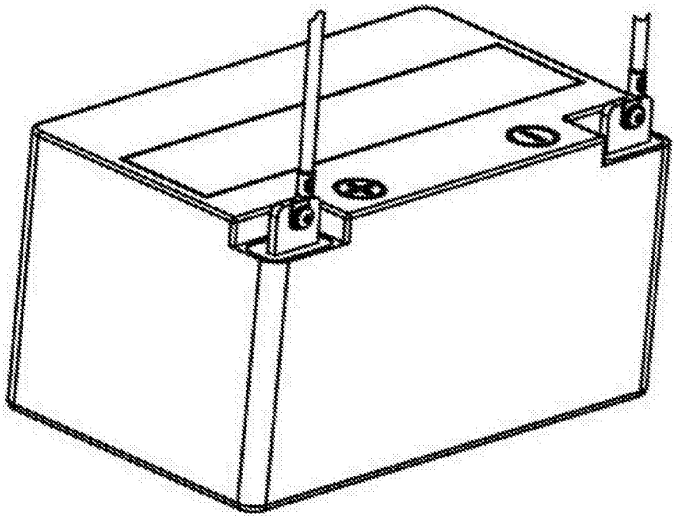


图 1

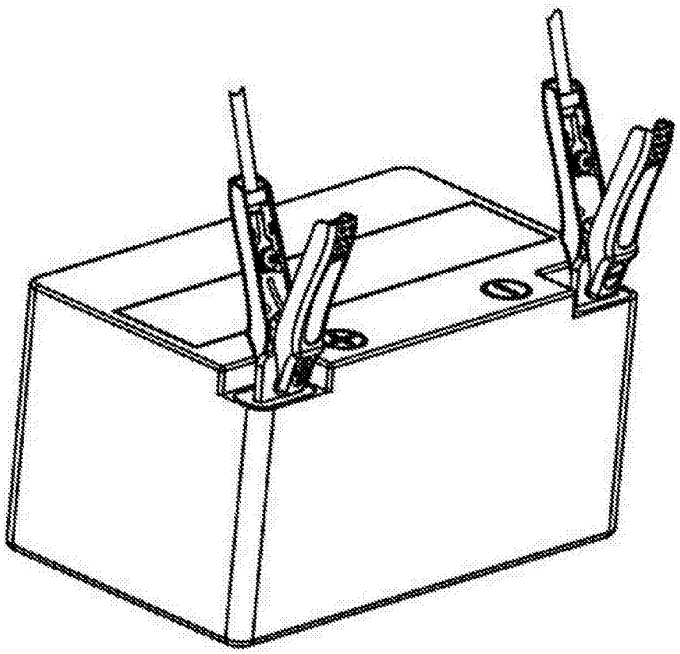


图 2

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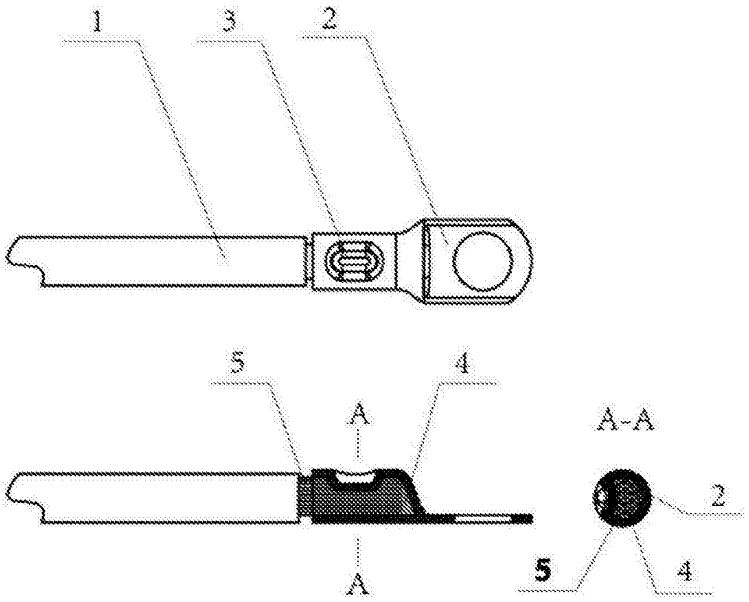


图 3

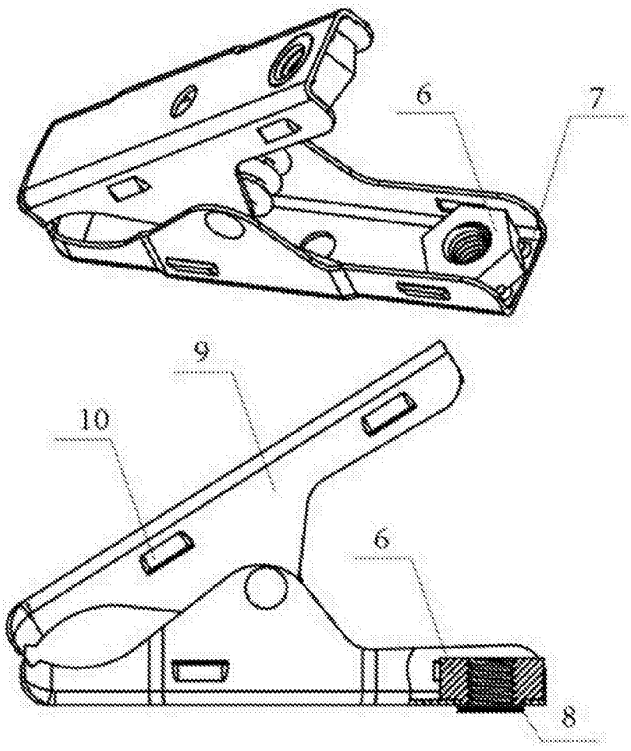


图 4

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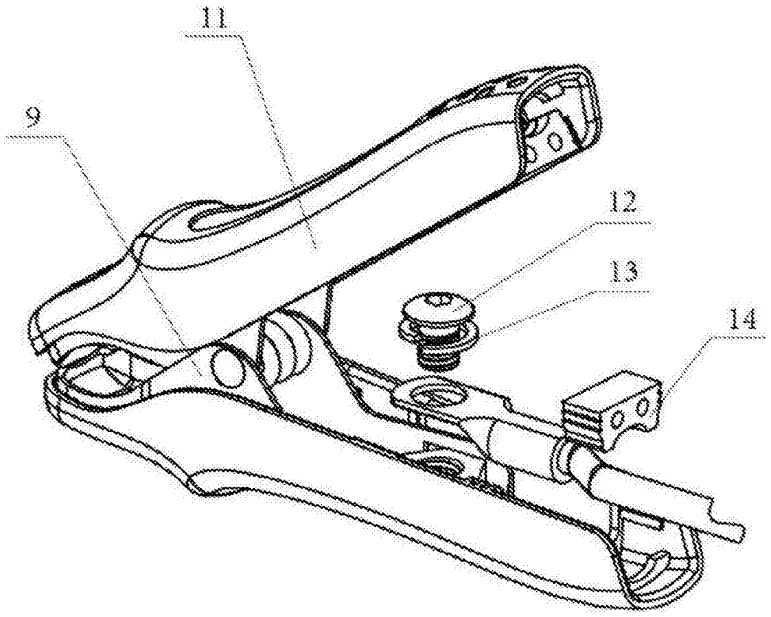


图 5

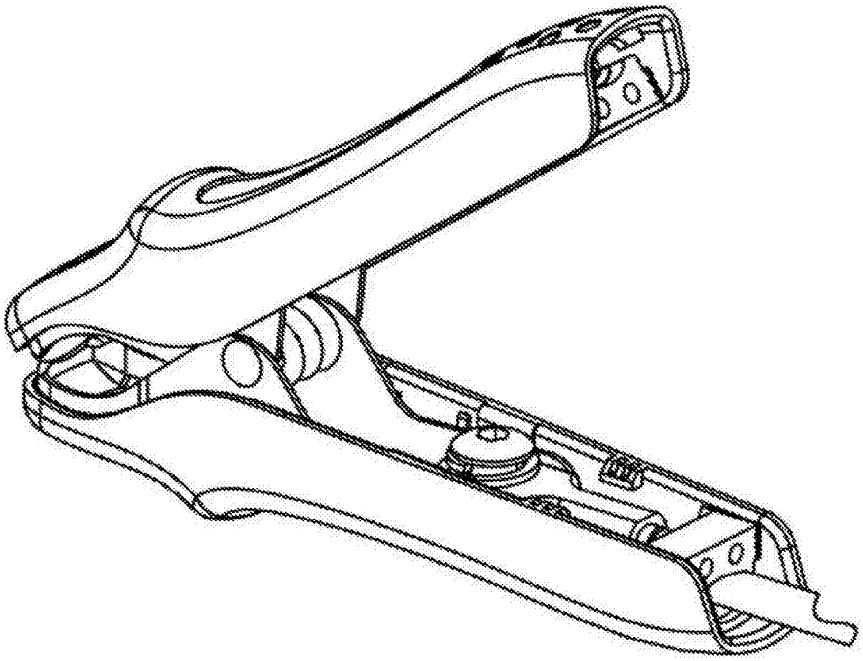


图 6

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Battery Charging Specification

Revision 1.1

April 15, 2009

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BC 1.1	April 15, 2009	Terry Remple	Major updates to all sections. Added Data Contact Detect protocol, and Accessory Charger Adapter.

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Acronyms

ACA	Accessory Charger Adapter
DBP	Dead Battery Provision
FS	Full Speed
GPS	Global Positioning System
HS	High Speed
LS	Low Speed
PC	Personal Computer
PHY	Physical Layer Interface for High Speed USB
SOF	Start of Frame
TPL	Targetted Peripheral List
USB	Universal Serial Bus
USB-IF	USB Implementers Forum
VBUS	Voltage line of the USB interface

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1. Introduction

1.1 Scope

The Battery Charging Working Group is chartered with creating specifications that define limits as well as detection, control and reporting mechanisms to permit devices to draw current in excess of the USB 2.0 specification for charging and/or powering up from dedicated chargers, hosts, hubs and charging downstream ports. These mechanisms are backward compatible with USB 2.0 compliant hosts and peripherals.

1.2 Background

The USB ports on personal computers are convenient places for portable devices to draw current for charging their batteries. This convenience has led to the creation of USB Chargers that simply expose a USB standard-A receptacle. This allows portable devices to use the same USB cable to charge from either a PC or from a USB Charger.

If a portable device is attached to a USB host or hub, then the USB 2.0 specification requires that after connecting, a portable device must draw less than:

- 2.5 mA average if the bus is suspended
- 100 mA if bus is not suspended and not configured
- 500 mA if bus is not suspended and configured for 500 mA

If a portable device is attached to a USB Charger, it is allowed to draw a current of I_{DEV_DCHG}. If a portable device is attached to a charging downstream port, it is allowed to draw a current of $I_{DEV\_CDP\_LFS}$ or $I_{DEV\_CDP\_HS}$, regardless of suspend.

In order for a portable device determine how much current it is allowed to draw from an upstream USB port, there needs to be mechanisms that allow the portable device to distinguish between a host or hub and a USB charger. This specification defines just such mechanisms.

Since portable devices can be attached to USB chargers from various manufacturers, it is important that all USB chargers behave the same way. This specification defines the requirements for a USB charger. USB chargers that meet these requirements and pass the associated compliance tests are eligible to be added to the USB-IF Integrators List.

If a portable device has a dead or weak battery, then the Connect Timing Engineering Change Notice (ECN) issued by the USB-IF on the USB 2.0 spec allows that device to draw up to 100 mA for a time of $T_{SVLD\_CON\_WKB}$. The conditions associated with this ECN are contained in Section 2 of this specification, and are referred to as the Dead Battery Provision.

1.3 Reference Documents

The following specifications contain information relevant to the Battery Charging Specification.

- OTG and Embedded Host Supplement, Revision 2.0
- USB 2.0 Specification

1.4 Definitions of Terms

This section contains definitions for some of the terms used in this specification.

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1.4.1 Attach versus Connect

This specification makes a distinction between the words "attach" and "connect". A downstream device is considered to be attached to an upstream port when there is a physical cable between the two.

A downstream device is considered to be connected to an upstream port when it is attached to the upstream port, and when the downstream device has pulled either the D+ or D- data line high through a 1.5 kΩ resistor, in order to enter low-speed, full-speed or high-speed signaling.

1.4.2 Downstream Port

In this specification, a Downstream Port refers to either a Standard Downstream Port or a Charging Downstream Port.

1.4.3 Standard Downstream Port

In this specification, a Standard Downstream Port refers to a downstream port on a device that complies with the USB 2.0 definition of a host or hub. A Standard Downstream Port expects a downstream device to draw less than 2.5 mA average when unconnected or suspended, up to 100 mA maximum when connected and not suspended, and up to 500 mA maximum if so configured and not suspended. A downstream device can be enumerated when it is connected to a Standard Downstream Port.

A Standard Downstream Port pulls the D+ and D- lines to ground through a 15 kΩ (typical) resistor.
A Standard Downstream Port may have the ability to sense when a Portable Device is driving the D+ line to V_{DP_SRC}, and then react in some way. Portable Devices are required to drive D+ to V_{DP_SRC} whenever they draw more than I_{SUSP} while not connected, as described in the Dead Battery Provision.

1.4.4 Charging Downstream Port

A Charging Downstream Port is a downstream port on a device that complies with the USB 2.0 definition of a host or a hub, except that it is required to support the Charging Downstream Port features specified herein.

When not in a USB session, a Charging Downstream Port outputs a voltage of V_{DM_SRC} on its D- line when it senses a voltage greater than V_{DAT_REF} but less than V_{LGC}, on its D+ line.

A Charging Downstream Port is capable of outputting a current of I_{CDP} from V_{BUS} at any time.

1.4.5 Dedicated Charging Port

A Dedicated Charging Port is a downstream port on a device that outputs power through a USB connector, but is not capable of enumerating a downstream device. A Dedicated Charging Port is required to output at a minimum current of I_{DCHG} at an average voltage of V_{CHG}.

A Dedicated Charging Port is required to short the D+ line to the D- line.

1.4.6 Charging Port

A Charging Port is either a Dedicated Charging Port or a Charging Downstream Port.

1.4.7 USB Charger

A USB Charger is a device with a Dedicated Charging Port, such as a wall adapter or car power adapter.

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1.4.8 Portable Device

A Portable Device is considered to be any USB or OTG device that is capable of operating from its own battery, and is also capable of drawing current from USB for the purposes of operating and/or charging its battery.

1.4.9 Dead Battery Threshold

The Dead Battery Threshold is defined as the maximum charge level of a battery such that below this threshold, a device is assured of not being able to power up successfully.

A Dead Battery is defined as one that is below the Dead Battery Threshold.

1.4.10 Weak Battery Threshold

The Weak Battery Threshold is defined as the minimum charge level of a battery such that above this threshold, a device is assured of being able to power up successfully.

A Weak Battery is defined as one that is above the Dead Battery Threshold and below the Weak Battery Threshold. A device with a Weak Battery may or may not be able to power up a device successfully.
A Good Battery is defined as one that is above the Weak Battery Threshold.

1.5 Parameter Values

Parameter names are used throughout the paper, instead of parameter values. All parameter values are found in Section 5.

2. Dead Battery Provision

2.1 Background

The USB 2.0 specification allows a downstream device to draw a suspend current of up to 2.5 mA average from a Standard Downstream Port when the device is not connected or when the bus is suspended. If the bus is not suspended, then the device can draw up to 500mA, depending on the configuration the host enables.

This limit of only 2.5 mA when not connected can be problematic for Portable Devices with a Dead Battery or a Weak Battery. Some Portable Devices require more than 100mA for several seconds just to power up. Thus, some Portable Devices with Dead Batteries or Weak Batteries may not be able to power up when attached to a Standard Downstream Port if they can only draw 2.5mA when not connected.

After a Portable Device detects that it is attached to a Charging Port, it is allowed to draw up to 1.8A as described in Section 3.

2.2 Provision Conditions

Portable Devices that draw more than 2.5mA from a Downstream Port while not connected may still be certified, providing they meet the conditions specified below. These conditions are in addition to the compliance tests required for all devices.

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2.2.1 Compliance Testing

When submitting Portable Devices for compliance testing that use the Dead Battery Provision, the vendor shall provide a Dead Battery for the tests, and shall declare whether or not the Portable Device should be tested with no battery.

2.2.2 No Battery Case

Portable Devices that do not have a battery installed may also use the Dead Battery Provision, provided they meet the following requirements:

- If a good battery were installed, the Portable Device would be able to run off of battery power
- The case where the battery is not installed is an exceptional use case for this Portable Device, and not likely to occur very often, if at all.

Bus-powered devices that do not normally have a battery are not eligible to use the Dead Battery Provision. Examples of such devices would include a bus-powered hub, bus-powered printer or bus-powered mouse.

2.2.3 Dead/Weak/No Battery – No Connect

Any USB device is allowed to draw a current of I_{SUSP} for an unlimited amount of time from a Downstream Port when not connected.

In addition to this, a Portable Device with a Dead Battery, Weak Battery or no battery is allowed to draw I_{UNIT} from a Downstream Port for up to T_{UNIT_ISUSP} after attaching, in order to determine if it will likely be able to connect. If, after this time, the Portable Device determines that it definitely will not be able to connect, then the Portable Device shall reduce its current draw to less than I_{SUSP}.

For example, consider a Portable Device that does not have a battery installed. If it needed the battery to get to a state where it could connect, then the Portable Device can only draw current for T_{UNIT_ISUSP} to determine that it will never be able to connect.

2.2.4 Dead/Weak/No Battery – With Connect

A Portable Device with a Dead Battery, Weak Battery or no battery is allowed to draw I_{UNIT} from a Downstream Port under the following conditions.

- Portable Device shall drive the D+ line to V_{DP_SRC} from the time it starts drawing more than I_{SUSP}, until the time that it connects
- Portable Device shall use this current to get to a state where it connects and enumerates
- Portable Device shall not draw more than I_{SUSP} after a time of $T_{SVLD\_CON\_WKB}$ plus T_{CON_ISUSP} from detecting a voltage on V_{BUS}

See Section 3.4.4 for timing details.

In contrast, a self powered device or portable device with a good battery is not allowed to draw more than I_{SUSP} after a time of $T_{SVLD\_CON\_PWD}$ plus T_{CON_ISUSP} from detecting a voltage on V_{BUS}.

2.2.5 Current Usage – Direct Power Up

If a Portable Device is able to power up, connect and enumerate with less than I_{UNIT}, then such a device with a Dead Battery or Weak Battery is allowed to use the current from a Downstream Port to power up directly.

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2.2.6 Current Usage – Battery Charging

If a Portable Device is not able to power up and connect with less than I_{UNIT}, then such a device with a Dead Battery or Weak Battery is allowed to use I_{UNIT} from the Downstream Port to first charge its battery to its Weak Battery Threshold. Upon reaching its Weak Battery Threshold, the Portable Device is required to power up, connect and enumerate.

2.2.7 Current Usage – Unrelated Modes

The Portable Device is not allowed to delay connecting and enumerating in order to go into modes that are unrelated to powering up, connecting and enumerating. Such modes might include, but are not limited to:

- Charging the battery beyond the Weak Battery Threshold
- Making a phone call
- Playing a game, song or video
- Establishing a wireless connection such as Bluetooth or WiFi or GPS

2.2.8 Inrush Tests

A Portable Device with a Dead Battery, Weak Battery or no battery shall pass inrush tests.

2.2.9 Drawing Current After Connect

After a Portable Device with a Dead Battery, Weak Battery or no battery connects, it is allowed to draw up to I_{UNIT} for T_{CON_ISUSP}. After T_{CON_ISUSP}, the device is required to comply with the USB 2.0 specification rules for going into the suspended state.

2.2.10 Connect and Disconnect

A Portable Device is allowed to draw more than I_{SUSP} under the Dead Battery Provision only when it is disconnected.

A Portable Device is allowed to connect and disconnect multiple times from when it first detects VBUS until $T_{SVLD\_CON\_WKB}$ later.

After $T_{SVLD\_CON\_WKB}$ plus T_{CON_ISUSP} from detecting VBUS, a Portable Device must not draw more than I_{SUSP} when it is disconnected, regardless of the state of its battery.

2.2.11 Specify Connect Times

When applying to use the Dead Battery Provision for a Portable Device, the vendor shall specify both the typical and maximum times that a device with a Dead Battery, Weak Battery or no battery will take to connect after being attached to a Downstream Port. These attach to connect times shall assume a new battery and room temperature.

2.3 OTG Considerations

A Portable Device with a Dead Battery cannot differentiate between a PC and an OTG A-device. Thus, the Portable Device will treat both the same.

If an OTG A-device is connected to a Portable Device with a dead battery, then the OTG A-device is under no obligation to provide any more current than it normally would to any device on its Targeted Peripheral List (TPL).

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If a Portable Device with a Dead Battery draws more current than the OTG A-device can provide, then the OTG A-device is allowed to end the session by dropping VBUS. If the Portable Device does not connect before the OTG A-device would normally time out the session, then the OTG A-device is allowed to end the session by dropping VBUS.

3. Charging Port Detection

3.1 Overview

Figure 3-1 is a block diagram showing a Portable Device attached to a USB port.

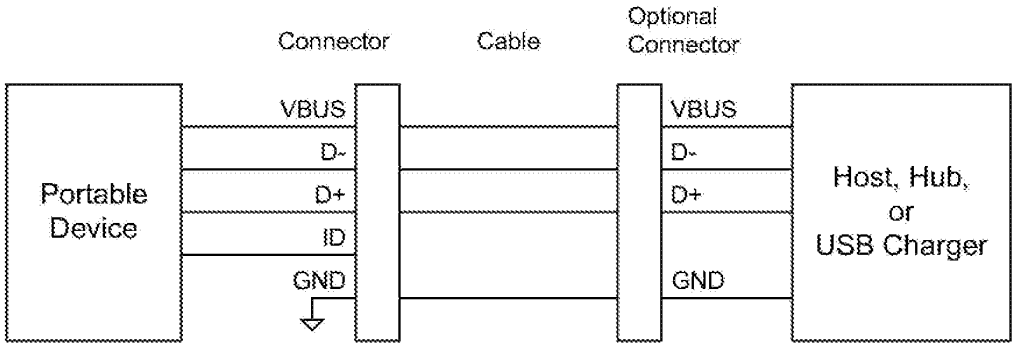


Figure 3-1 System Overview

Upon being attached to a USB port, a Portable Device detects that the voltage on VBUS is greater than its session valid voltage. For peripheral only devices, the session valid voltage can be between 0.8V to 4.0V. For OTG devices, the session valid voltage can be between 0.8V to 2.0V.

A Portable Device that does not support charger detection will assume that it is attached to a Standard Downstream Port and the Dead Battery Provision as defined in Section 2 will apply. A Portable Device that does support charger detection can check if the upstream port is a Standard Downstream Port or a Charging Port. If such a Portable Device is attached to a Charging Port, then it is allowed to draw currents as defined in Section 3.4.

The requirements specified in the following subsections for Portable Devices only apply to Portable Devices that implement the charger detection mechanism being described in that subsection.

3.2 Charger Detection Hardware

This section briefly describes the hardware used to do charger detection. The following sections provide more details of its operation.

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3.2.1 Dedicated Charging Port

Figure 3-2 shows a Portable Device attached to a Dedicated Charging Port.

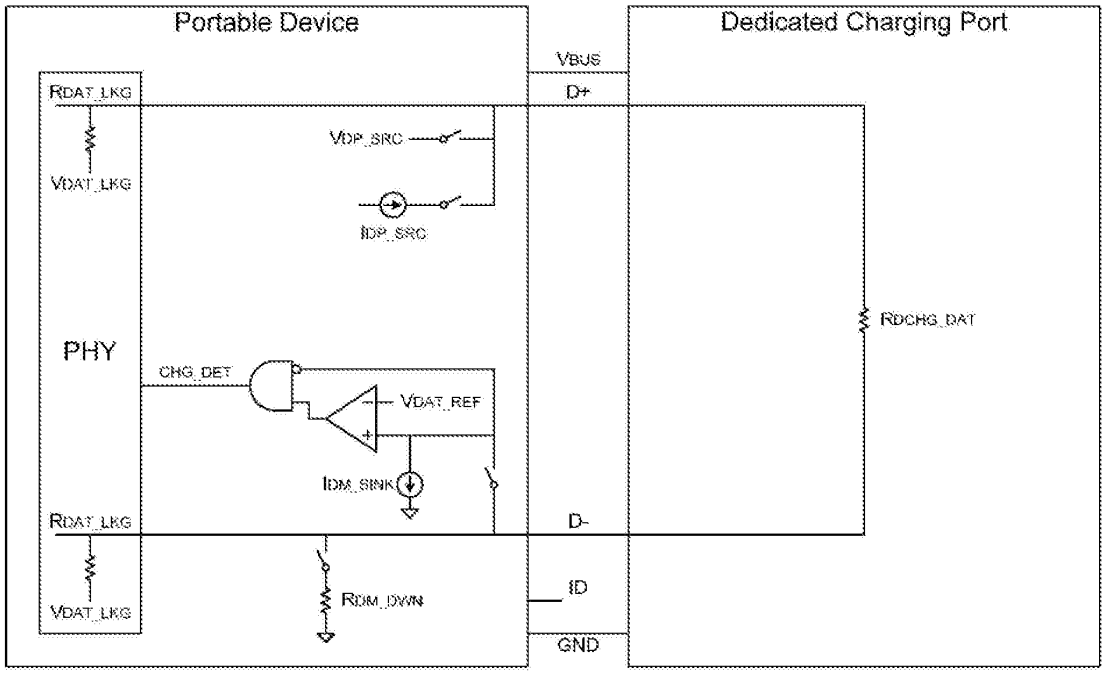


Figure 3-2 Dedicated Charging Port

The Portable Device contains a current source, I_{DP_SRC}, and a pull-down resistor, R_{DM_DWN}, which are used to detect when the data pins of the plug have made contact with the data pins of the receptacle. See Section 3.3 for more details.

The Portable Device also contains a voltage source, V_{DP_SRC}, a current sink, I_{DM_SINK}, and a comparator, V_{DAT_REF}, for determining whether the Portable Device is attached to a Charging Port or a Standard Downstream Port.

As shown above, the Portable Device is attached to a Dedicated Charging Port. A Dedicated Charging Port is required to short the D+ and D- lines with a resistance of R_{DCHG_DAT}. The Portable Device first checks that the connector pins have made contact by turning on I_{DP_SRC} and R_{DM_DWN}. If the pins have made contact, then D+ goes low.

To detect the presence of a Dedicated Charging Port, the Portable Device turns on V_{DP_SRC} and I_{DM_SINK}. If nothing is attached to the Portable Device, then D- gets pulled to ground by I_{DM_SINK}. The voltage on D- is less than V_{DAT_REF}, so the CHG_DET signal is low. If a Dedicated Charging Port is attached to the Portable Device, then the voltage on D- is V_{DP_SRC}. This is greater than V_{DAT_REF} and less than V_{LGC}, so the CHG_DET signal is high.

The charger detection mechanism is defined such that it will work when the PHY has a leakage resistance of R_{DAT_LKG} and a leakage voltage of V_{DAT_LKG}.

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3.2.2 Standard Downstream Port

Figure 3-3 shows a Portable Device attached to a Standard Downstream Port.

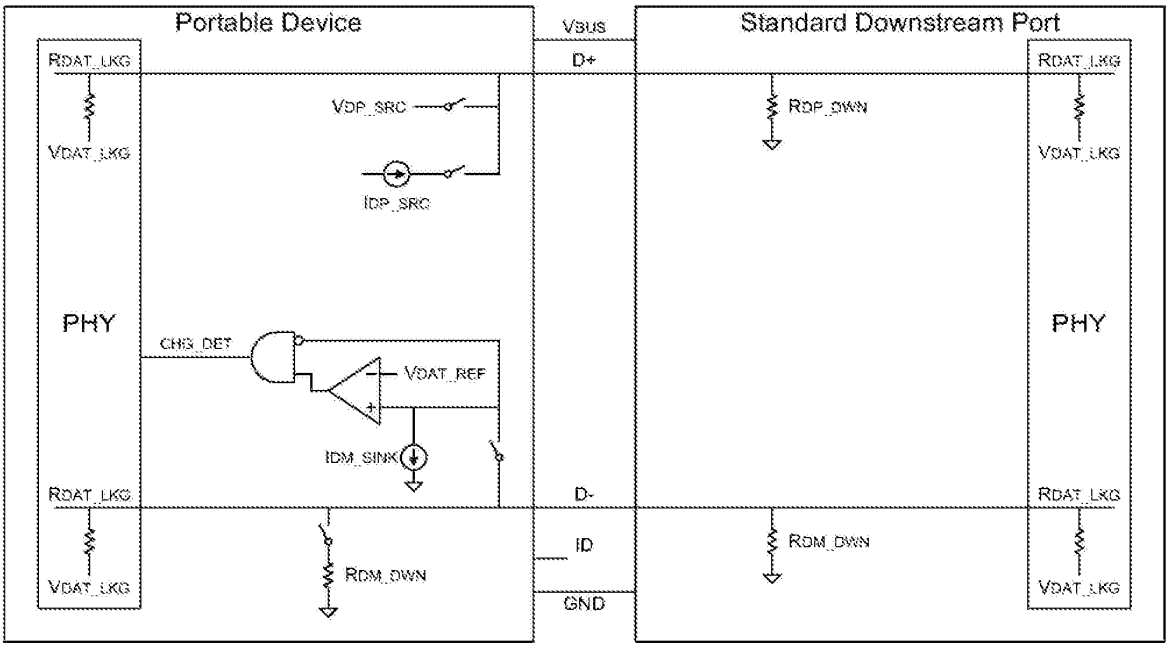


Figure 3-3 Standard Downstream Port

When the Portable Device turns on V_{DP_SRC} and I_{DM_SINK}, the D- line remains below V_{DAT_REF}, and the CHG_DET signal is not asserted. The Portable Device knows that it is not attached to a Charging Port.

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3.2.3 Charging Downstream Port

Figure 3-4 shows a Portable Device attached to a Charging Downstream Port.

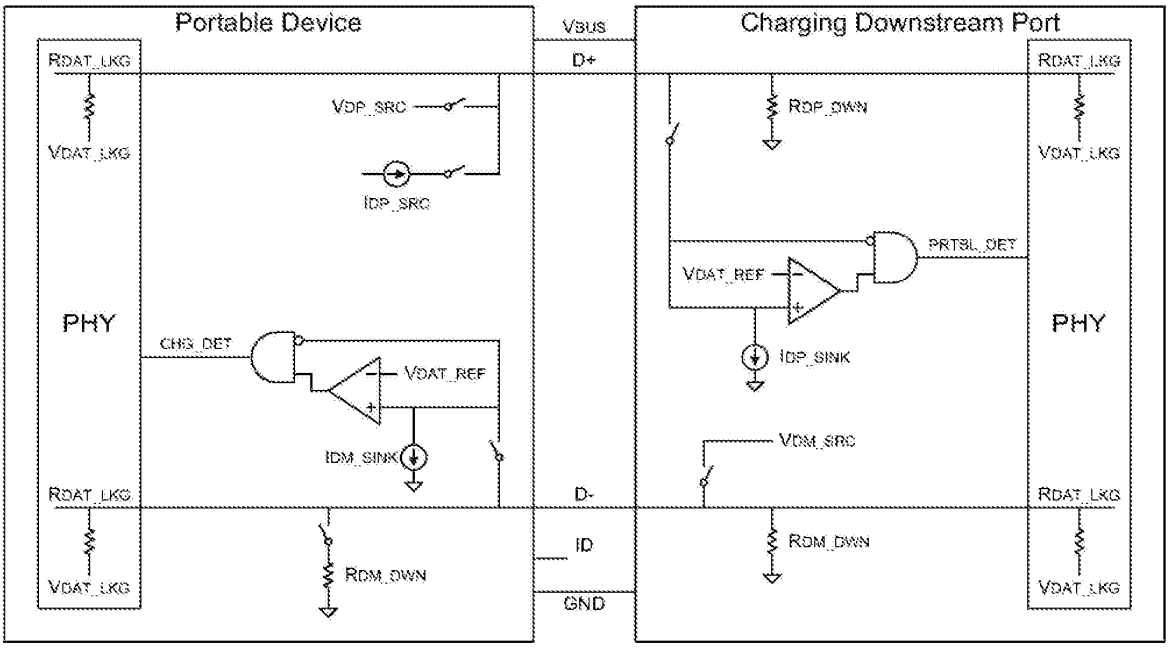


Figure 3-4 Charging Downstream Port

As before, the Portable Device turns on VDP_SRC and IDM_SINK to check if it is attached to a Charging Port. When the Charging Downstream Port detects that D+ is greater than VDAT_REF and less than VLGC, then PRTBL_DET is asserted and the Charging Downstream Port knows that a Portable Device is attached. The Charging Downstream Port responds by driving a voltage of VDM_SRC onto D-. This causes the CHG_DET signal in the Portable Device to be asserted, and the Portable Device knows that it is attached to a Charging Port.

Once the Portable Device knows that it is attached to a Charging Port, it can distinguish between a Dedicating Charging Port and a Charging Downstream Port by pulling either D+ or D- to a logic high. If the Portable Device is attached to a Dedicated Charging Port, then the other data line will go high as well. If the Portable Device is attached to a Charging Downstream Port, then the other data line will stay low.

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3.3 Data Contact Detect

3.3.1 Problem Description

USB plugs and receptacles are designed such that when the plug is inserted into the receptacle, the power pins make contact before the data pins make contact. This is illustrated in Figure 3-5.

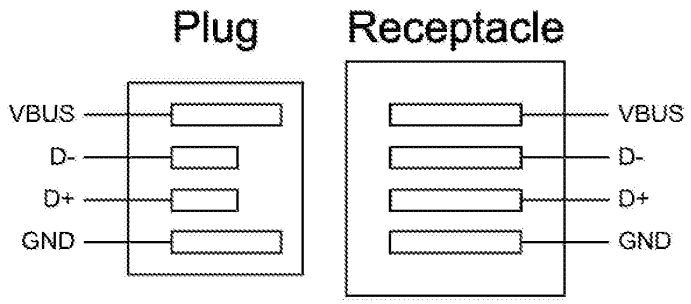


Figure 3-5 Data Pin Offset

As a result, when a Portable Device is attached to an upstream port, the Portable Device will detect VBUS before the data pins have made contact. The time between power pins and data pins making contact depends on how fast the plug is inserted into the receptacle. Delays of more than several hundred milliseconds have been observed.

The way that a Portable Device distinguishes between a Charging Port and a Standard Downstream Port is to look at the data lines. If the Portable Device makes a decision before the data pins have made contact, then the Portable Device will determine that it is attached to a Standard Downstream Port.

If a Portable Device is attached to a Charging Port, and incorrectly determines that it is attached to a Standard Downstream Port, then the following would occur. The Portable Device will connect, and wait to be enumerated. While waiting to be enumerated, the Portable Device would only be allowed to draw I_{SUSP}, even though it was attached to a Charging Port.

- To avoid this situation, the Portable Device is required to detect when the data pins have made contact.

3.3.2 Hardware Detection

In order to detect when the data pins have made contact, the Portable Device is required to pre-bias the data pins in such a way that when contact is made, at least one of the data pins changes state. Once this state change has been detected, the Portable Device is then allowed to check if it is attached to a Charging Port or a Standard Downstream Port.

This section describes a contact detect mechanism that works with worst case resistances allowed by the USB 2.0 spec, for both the Portable Device and remote device. If the Portable Device is known to have resistances that are tighter than those allowed by the USB 2.0 spec, or if the Portable Device uses a comparator instead of a the single ended receiver, then the Portable Device is allowed to use a different method for pre-biasing the data pins. However, whatever method is used is required to work for worst case resistances in the remote device.

The recommended method for Data Contact Detection is for the Portable Device to use a current source on the D+ line. When the Portable Device detects that VBUS is asserted, it turns on the current source, I_{DP_SRC}, on D+, and turns on the pull-down resistor, R_{DM_DWN}, on D-. If nothing is attached to the Portable

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Device, the D+ line stays high. When either a Charging Port or Standard Downstream Port is attached to the Portable Device, the D+ line goes low.

Figure 3-6 shows the case where nothing is attached to the Portable Device.

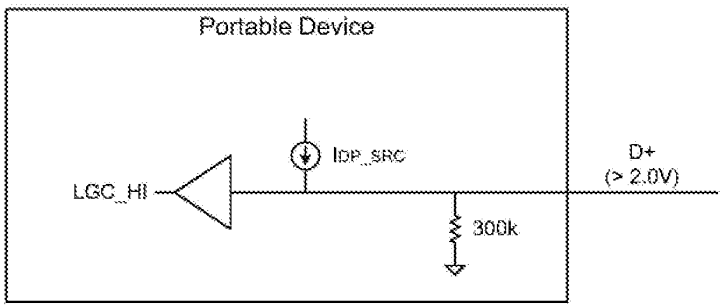


Figure 3-6 Data Contact Detect – No Remote Device

The current source, I_{DP_SRC}, is pulling the D+ line high. As per the USB 2.0 spec, the PHY is allowed to have an input impedance of 300kΩ. If this 300kΩ were pulling D+ to ground, then the minimum current required to keep D+ at logic high is:

- $I_{DP\_SRC} > V / R = 2V / 300k\Omega = 7uA$

Figure 3-7 shows the case where the Portable Device is attached to a Standard Downstream Port.

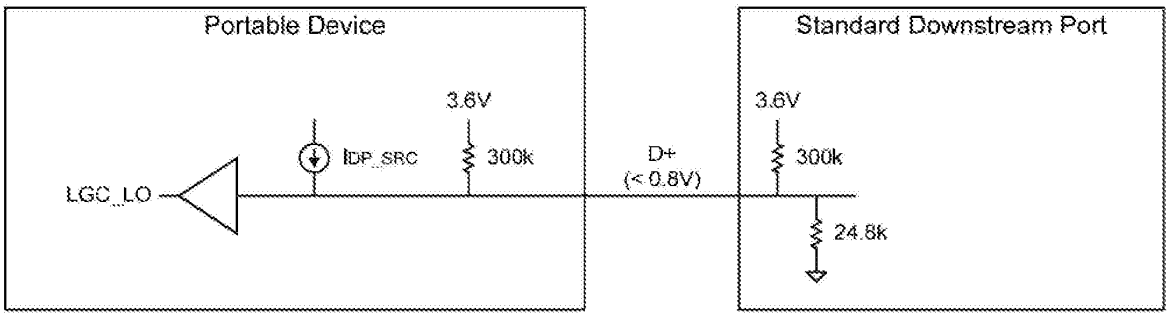


Figure 3-7 Data Contact Detect – Standard Downstream Port

In this case, the D+ line should go to a logic low when the Portable Device is attached to a Standard Downstream Port. The pull-down resistor in the Standard Downstream Port is pulling the D+ line low, and could have a value as high as 24.8kΩ. The leakage current from the Portable Device and Downstream Port could both be pulling D+ high. In order for D+ to go to logic low, the current from I_{DP_SRC} must be less than:

- $I_{DP\_SRC} < .8V / 24.8k - (3.6V - .8V) / 300k - (3.6V - .8V) / 300k = 14uA$

If the Portable Device is attached to a Charging Downstream Port, then the Charging Downstream Port pulls the D+ line low with a resistance of R_{DP_DWN} and with current sink of I_{DP_SNK}. The D+ line at the Portable Device will again go low as soon as the D+ pins on the connector make contact.

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Figure 3-8 shows the case where the Portable Device is attached to a Dedicated Charging Port. Electrically, it is the same as when the Portable Device is attached to a Downstream Port.

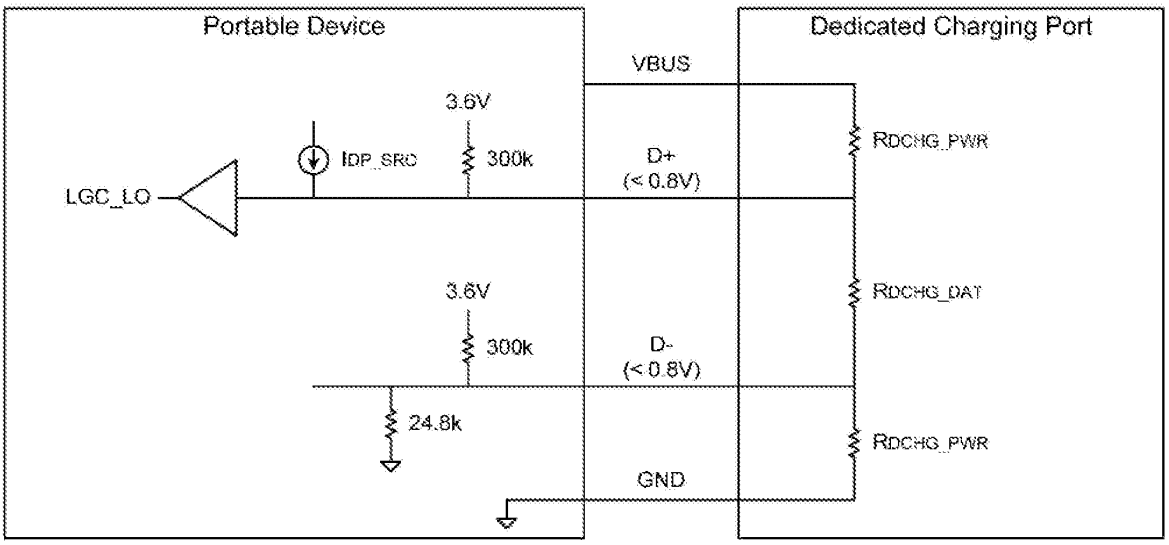


Figure 3-8 Data Contact Detect – Dedicated Charging Port

The protocol for doing Data Contact Detect is as follows:

- Portable Device detects VBUS asserted
- Portable Device turns on I_{DP_SRC} and the D- pull-down resistor
- Portable Device waits for D+ line to be low for a time of T_{DCD_DBNC}
- Portable Device turns off I_{DP_SRC} and D- pull-down resistor

The resistance between D+/- and VBUS or GND of a Dedicated Charger is required to be R_{DCHG_PWR}.

The DCD protocol defined above does not work when a Portable Device is attached to a PS2 port, because a PS2 port pulls the D+ line high. Thus, a Portable Device that implements the above DCD protocol will not be able to charge from a PS2 port.

In general, attaching the USB port of a Portable Device to a different type of port, such as PS2, RS232 or others, through various adaptors or combinations of adaptors cannot be expected to work and could cause damage.

3.3.3 Charger Detect Delay

For legacy Portable Devices that cannot do Data Contact Detect as required in the above subsection, it is recommended that such devices use delays to minimize the chances of doing charger detection before the data pins have made contact.

At the very least, such legacy Portable Devices should wait several hundred milliseconds after VBUS has gone high, before determining that they are not attached to a Charging Port. If, after waiting several hundred milliseconds, a legacy Portable Device has not detected a Charging Port, then it should assume it is attached to a Standard Downstream Port and connect. If a legacy Portable Device does not subsequently receive a USB reset, it should disconnect and check again to see if it is attached to a Charging Port.

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This approach is not recommended for new designs as it is not deterministic.

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3.4 Charger Detection Timing

3.4.1 High Speed

Figure 3-9 shows the timing associated with charger detection for a HS Portable Device with a good battery.

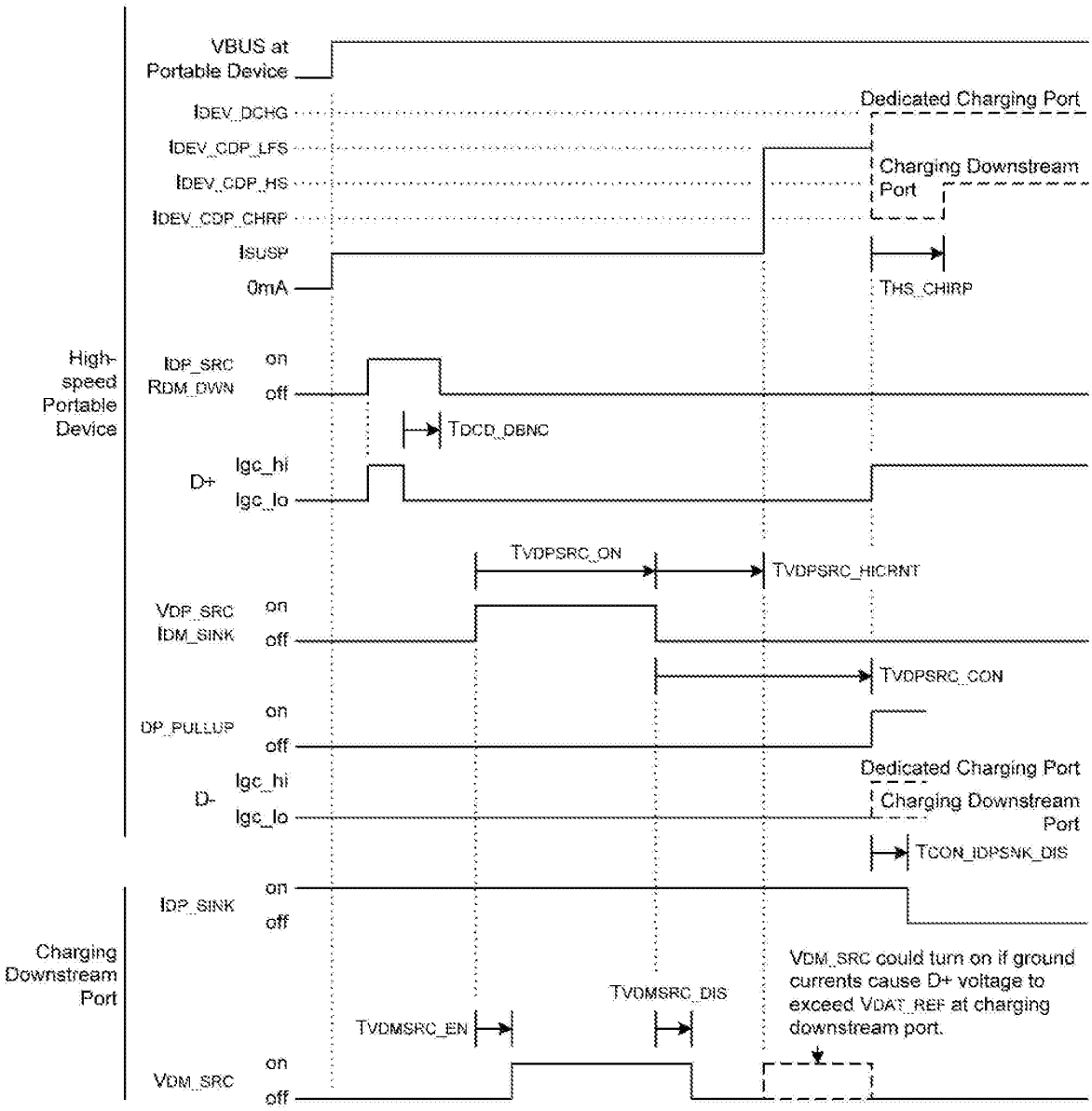


Figure 3-9 High-speed Charger Detection Timing

Notes:
1) DP_PULLUP is the waveform for a Portable Device pulling the D+ line high with a resistance of 1.5k typical.

The timing shown in Figure 3-9 is described below.

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After VBUS is detected, a Portable Device with a good battery is allowed to draw I_{SUSP}.

If the Portable Device implements Data Contact Detect as described in Section **Error! Reference source not found.**, it turns on I_{DP_SRC} and either R_{DM_DWN} or I_{DM_SINK}. When the Portable Device detects that the D+ line has been low for a time of T_{DCD_DBNC}, then the Portable Device knows that the data pins have made contact. The Portable Device then turns off I_{DP_SRC} and R_{DM_DWN}.

To check for a Charging Port, the Portable Device turns on V_{DP_SRC} and I_{DM_SINK}. After a time of T_{VDPSRC_ON}, the Portable Device is allowed to check the status of the D- line. If D- is above V_{DAT_REF} and below V_{LGC} min, then the Portable Device is attached to a Charging Port. As soon as the Portable Device detects that it is attached to a Charging Port, it can turn off V_{DP_SRC} and I_{DM_SINK}. After a time of T_{VDPSRC_HICRNT} , the Portable Device is allowed to draw up to $I_{DEV\_CDP\_LFS}$ from the Charging Port.

When the Portable Device is ready to be enumerated, it connects to the upstream port by asserting its D+ pull-up resistor. D+ then goes to logic high. If the Portable Device is attached to a Dedicated Charging Port, then D- line will also go to logic high, since a Dedicated Charging Port shorts D+ and D-. If D- goes to logic high, then the Portable Device is allowed to draw up to I_{DEV_DCHG}.

If the Portable Device is attached to a Charging Downstream Port, then when D+ is pulled high, the D- line will remain at logic low. If D- stays at logic low, the Portable Device shall reduce its current draw to $I_{DEV\_CDP\_CHRP}$ during the HS chirp. After the chirp is complete, the Portable Device is then allowed to increase its current draw to $I_{DEV\_CDP\_HS}$.

After a Portable Device determines it is attached to a Charging Port, it is required to connect by asserting D+. The reason for this is that the Charging Port could be a Charging Downstream Port. When the Charging Downstream Port detects the connect event, it will then enumerate the Portable Device.

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3.4.2 Full Speed

Figure 3-10 shows the timing associated with charger detection for a FS Portable Device with a good battery.

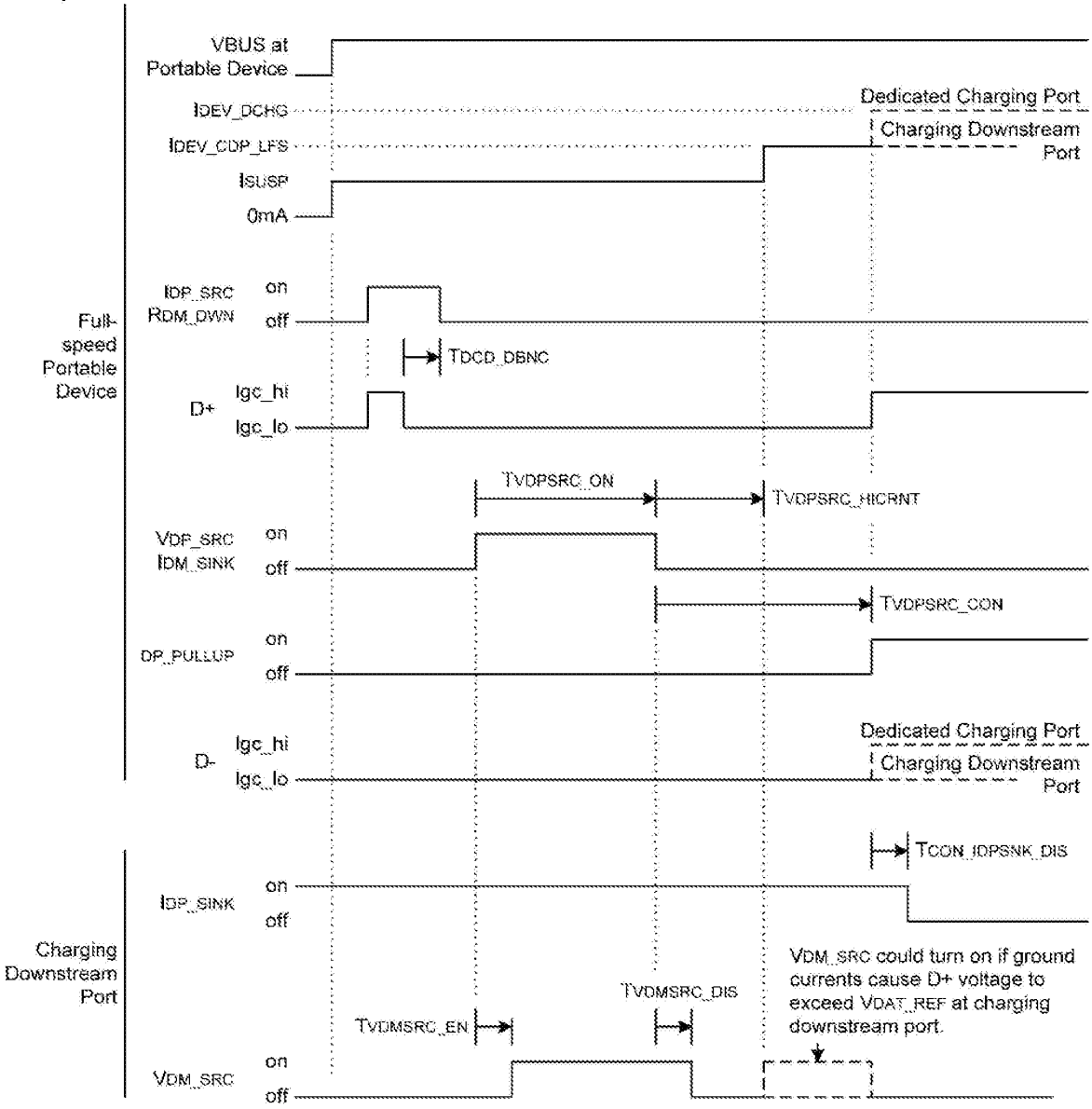


Figure 3-10 Full-Speed Charger Detection Timing

The charger detection timing for a FS Portable Device is the same as for that of a HS portable device, except that after the Portable Device connects, it can continue drawing up to IDEV_CDP_LFS from VBUS.

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3.4.3 Low Speed

Figure 3-11 shows the timing associated with charger detection for a LS Portable Device with a good battery.

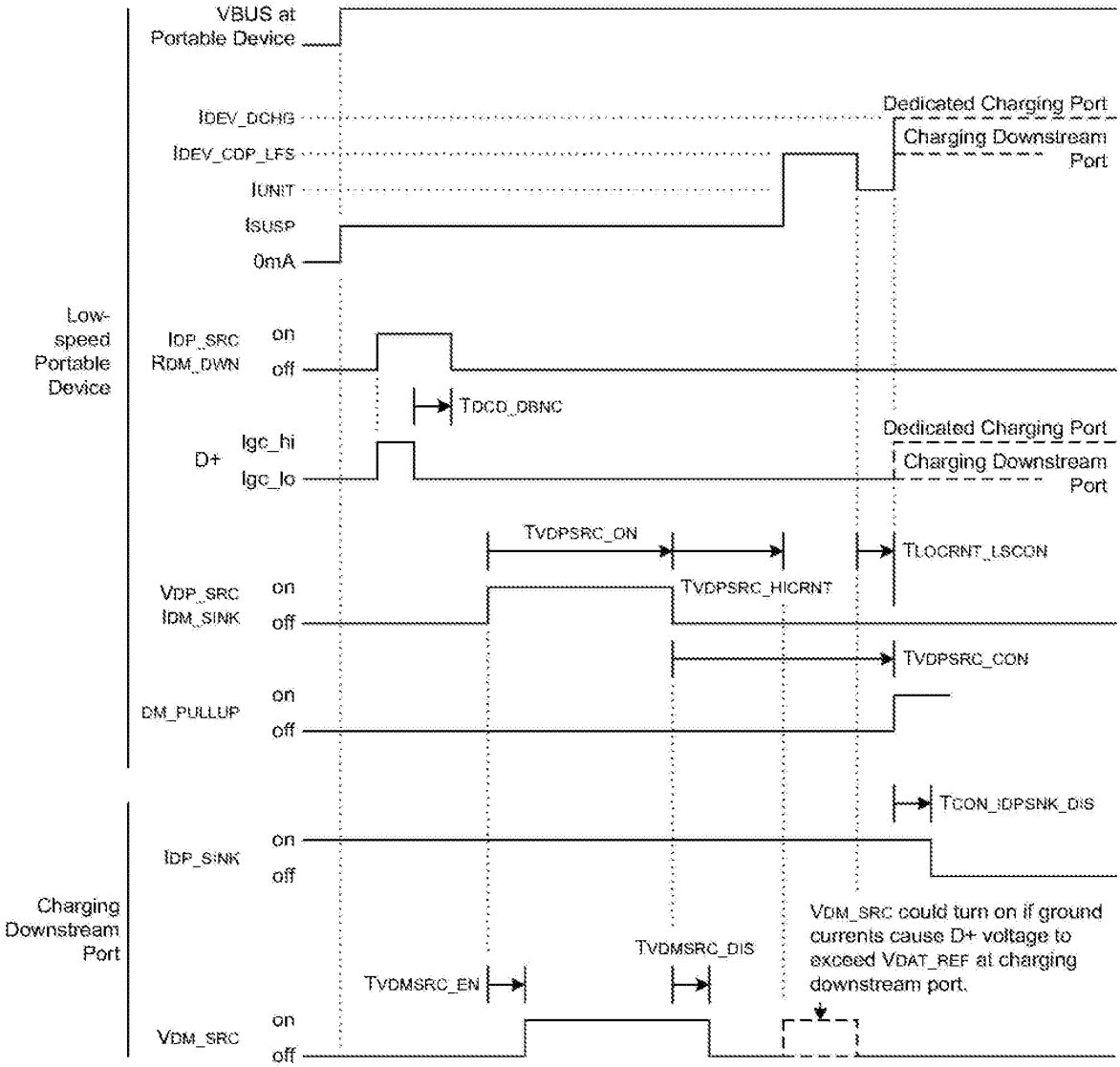


Figure 3-11 Low-Speed Charger Detection Timing

Notes:
1) DM_PULLUP is the waveform for a Portable Device pulling the D- line high with a resistance of 1.5k typical.

The charger detection timing for a LS Portable Device is the same as for that of a FS, except for a time of TLOCRNT_LSCON before the Portable Device connects. During this time before connecting, the LS Portable Device is required to reduce its current draw to less than IUNIT. The reason for this is as follows.

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Before connecting, the Portable Device is outputting a logic low (<300 mV) on D+. If the Portable Device were drawing 1500 mA from the Charging Downstream Port, then the Portable Device ground could be up to 375 mV higher than that of the Charging Downstream Port. (As shown in Figure 7-47 of the USB 2.0 specification, a ground current of 100 mA can result in a voltage offset of 25 mV.)

If the Charging Downstream Port detected 675mV on its D+ line, (that is, 300mV + 375mV), it would then turn on the V_{DM_SRC} voltage source on its D- line. If the Charging Downstream Port were driving the D- line, then the Portable Device would not be able to pull D- high to connect.

After a LS Portable Device has connected, it is then allowed to draw up to $I_{DEV\_CDP\_LFS}$ from a Charging Downstream Port.

3.4.4 Dead Battery

Figure 3-12 shows the timing associated with charger detection for a Portable Device with a dead or weak battery.

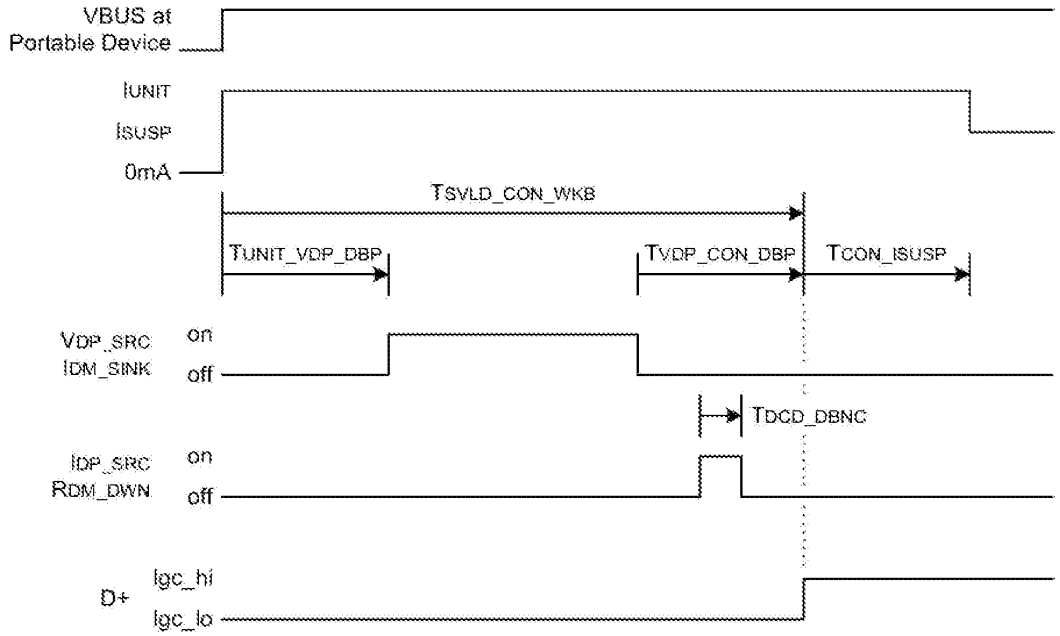


Figure 3-12 Dead Battery Charger Detection Timing

A Portable Device with a weak or dead battery is allowed to draw I_{UNIT} from VBUS anytime after VBUS is asserted. The Portable Device is required to assert V_{DP_SRC} within $T_{UNIT\_VDP\_DBP}$ of drawing more than I_{SUSP}. V_{DP_SRC} must then remain asserted while the Portable Device draws more than I_{SUSP}.

When the Portable Device is ready to connect, it should first disable V_{DP_SRC}, and then enable I_{DP_SRC} for a time of T_{DCD_DBNC} to check if the data pins have made contact. If the data pins have not made contact, then the Portable Device should inform the user that it is not attached to a valid charger or host port.

Within $T_{VDP\_CON\_DBP}$ of disabling V_{DP_SRC}, the Portable Device is required to connect. After T_{CON_ISUSP} of connecting, the Portable Device is required to drop down to I_{SUSP} whenever the bus is suspended.

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If the Portable Device detects that it is attached to a Charger Port during the time that V_{DP_SRC} is asserted, then it is not required to connect within $T_{SVLD\_CON\_WKB}$. When the Portable Device does connect, it shall comply with the timing defined in the previous subsections for connecting to a Charger Port as either a LS, FS or HS device.

3.5 Charging Current Limits

The standard-A connectors defined in the USB 2.0 specification are rated for 1500 mA. Charging Ports are allowed to use standard-A connectors. If a Charging Port is capable of outputting more than 1500mA, then that port shall use a version of the standard-A connector that can handle the maximum output current.

A Dedicated Charging Port is required to current limit at some current in the range of I_{DCHG}. In order for a Portable Device to force a Dedicated Charging Port into current limit mode, a Portable Device is allowed to attempt to draw a current that is greater than I_{DCHG}, and which can be as high as I_{DEV_DCHG} max. The reason why a Portable Device would force the Dedicated Charging Port to current limit is so that the charger output voltage would drop, and the Portable Device would not have to dissipate as much power.

3.6 Ground Current and Noise Margins

As shown in Figure 7-47 of the USB 2.0 specification, a current of 100 mA through the ground wire of a USB cable can result in a voltage difference of 25 mV between the host ground and the device ground. As the charging current increases, this ground difference has the effect of reducing noise margins.

3.6.1 Low-speed and Full-speed Communication

The maximum current that a Portable Device is allowed to draw from a Charging Downstream Port is $I_{DEV\_CDP\_LFS}$. At this current, the Portable Device ground can be 375 mV higher than the Charging Downstream Port ground. As shown in Table 7-7 of the USB 2.0 specification, a logic output low from the Portable Device can be as high as 300 mV. When added to the 375 mV offset of the Portable Device ground, this means the Charging Downstream Port could see a voltage of 675 mV on D+/- when the Portable Device is outputting a logic low.

As shown in Table 7-7 of the USB 2.0 specification, the Downstream Port input logic threshold can be as low as 800 mV. When compared to the 675 mV coming from the Portable Device, this leaves a noise margin of 125 mV. Thus, a Portable Device is able to communicate with a Charging Downstream Port at low-speed or full-speed when drawing a current of $I_{DEV\_CDP\_LFS}$ max.

3.6.2 High-speed Communication

Table 7-7 of the USB 2.0 specification indicates that a high-speed USB PHY is recommended to work when the common mode voltage of the received signal (V_{HSCM}) is between -50mV and +500mV.

As per Table 7-7 of the USB 2.0 spec, the minimum common mode voltage that a PHY can transmit is:

- $V_{HS\_CM\_TX} = (V_{HS\_OL} + V_{HS\_OH}) / 2$
- $V_{HS\_CM\_TX}$ (minimum) = (-10 mV + 360 mV) / 2 = 175 mV

Since the common voltage of a transmitted signal is essentially DC, it does not get attenuated by the cable. Thus, the common mode voltage of the transmitted signal is the same as the common mode voltage of the receive signal. There is, of course, a small time at the start of each packet where the common mode voltage of the transmitted signal changes from ground to >175mV. During this transition period, the common mode voltage of the receive signal will lag that of the transmitted signal, but will achieve steady state before the sync word completes.

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When a Portable Device is drawing current from a Charging Downstream Port, the return current through the ground line of the cable causes the ground voltage of the Portable Device to be higher than that of the Charging Downstream Port. If the ground voltage of the Portable Device is 225 mV higher than that of the Charging Downstream Port, then the minimum common mode voltage seen by the portable device is -50mV.

As shown in Figure 7-47 of the USB 2.0 specification, a ground current of 100 mA can result in a voltage offset of 25 mV. Thus, the maximum charging current that can be allowed during high-speed communication is 900mA, or IDEV_CDP_HS.

During the HS chirp sequence, the Portable Device is required to output a chirp K. As per the USB 2.0 spec, (page 179, Table 7-7), the max chirp K differential level is 900mV. The maximum output low of the Portable Device is 10mV, which results in an actual swing on the D- line of 10mV to 910mV. This translates to a maximum common mode voltage of 460mV.

As per section 7.1.4.2 of the USB spec, the host is required to receive the chirp K over a maximum common mode voltage range of -50mV to 600mV. In order to keep the common mode voltage of the chirp K at the host below 600mV, the charging current should not raise the Portable Device ground by more than 140mV.

As shown in Figure 7-47 of the USB 2.0 specification, a ground current of 100mA can result in voltage offset of 25mV. Thus, the maximum charging current that can be allowed during the HS chirp is 560mA, or IDEV_CDP_CHRP.

When the Portable Device is first attached to a Charging Downstream Port, the Portable Device is required to adjust its current below IDEV_CDP_CHRP before it connects. However, after the Portable Device has connected, the host is able to issue a reset at any time. In this case, the Portable Device is required to respond with a chirp K within 6ms of the start of the reset.

If the current drawn by a portable device is controlled by software, it may not be possible for the Portable Device to reduce its current from IDEV_CDP_HS to IDEV_CDP_CHRP within 6ms. In this case, it may be necessary for the portable device to limit its current to IDEV_CDP_CHRP at all times. Alternatively, the portable device could limit the max chirp K voltage to something less than 910mV, in which case it could charge at currents higher than IDEV_CDP_CHRP. For each 50mV that the chirp K voltage is below 910mV, the common mode voltage goes down by 25mV, and the Portable Device is able to draw an extra 100mA.

3.7 Charger Detect Output Signal

For some implementations, the Charger Detect circuitry may be located with the PHY, while the circuitry that draws power from VBUS may be located in a Power Management Unit (PMU). In order for the PMU to know if the Portable Device was attached to a Charging Port, the PMU would need to receive a signal from the PHY.

In such cases, it is recommended that the interface between the PHY and the PMU be an active low, open drain, charger detect signal, as shown in Figure 3-13.

The PHY must be designed such that the charger detect signal (CHG_DET_N) is not clamped when the PHY is not powered. If the CHG_DET_N were clamped when the PHY was not powered, then the PMU could incorrectly determine that a charger was detected.

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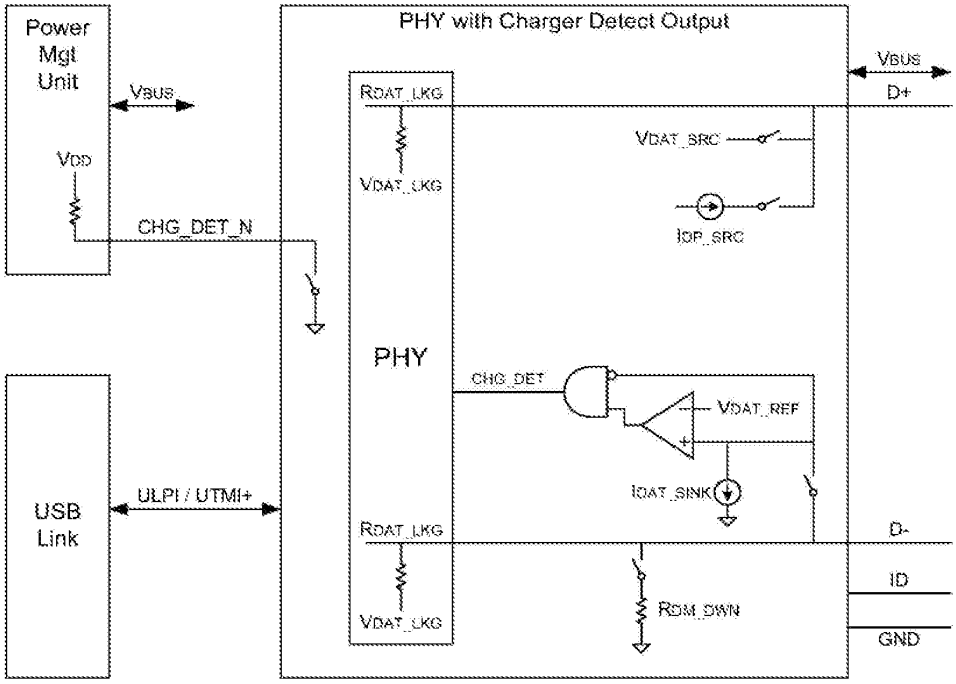


Figure 3-13 Charger Detect Output Signal

3.8 Signal Integrity

In order for a Portable Device to detect a Charging Port, the Portable Device needs to have additional circuitry as shown in Figure 3-2. When implementing this additional circuitry on a Portable Device, it must be done in such as way so that the portable device can still pass compliance testing.

For instance, Section 7.1.6.2 of the USB 2.0 specification recommends that the total capacitance to ground of either the D+ or D- line (C_{HSLOAD}) be less than 10 pF. If the detection circuitry adds too much capacitance or stub length to either line, then eye pattern may be affected.

3.9 Resistive Detection Mechanism

For legacy Portable Devices that do not have the charger detection mechanism described in the previous sections, it is possible to use resistors to detect the presence of a Dedicated Charging Port. However, detection mechanisms using resistors are not recommended for new designs, for the following reasons:

- they cannot made to work with Standard Downstream Ports under worst case conditions of input impedance on D+/-
- they do not work with Charging Downstream Ports
- they will incorrectly identify a PS2 port as a Charging Downstream Port, and allow current to be drawn that would damage the motherboard

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4. Charging Specifications

4.1 Charging Port

A Charging Port shall have an average output voltage of V_{CHG} when it is not in current limit mode. The time over which voltage is averaged is T_{VBUS_AVG}.

A Dedicated Charging Port shall go into current limit mode at some current within the range of I_{DCHG}. A Charging Downstream Port is not required to go into current limit mode, but may do so at some current within the range of I_{CDP}. In current limit mode, the output voltage of a Charging Port shall drop to a level that allows the Charging Port to continue outputting its maximum current.

If the output voltage of a Charging Port drops to $V_{CHG\_SHT\_DWN}$, then the Charging Port is allowed to reduce its output current. This is referred to as shutdown mode. This voltage may be measured at the output of the Charging Port, and does not need to include the voltage drop across the cable. A Charging Port shall remain in voltage limit or current limit mode at voltages above $V_{CHG\_SHT\_DWN}$.

If a Charging Port goes into shutdown mode due to a short across VBUS and ground, and the short is subsequently removed, then the Charging Port output voltage shall recover within a time of $T_{SHT\_DWN\_REC}$. If a Charging Port does support the shutdown mode, then it is recommended that during shutdown, the Charging Port limit its output current to I_{CHG_SHTDWN}.

A Charging Port shall output a voltage of V_{DM_SRC} on D- when it sees voltage less than V_{LGC} and greater than V_{DAT_REF} on its D+ line. A Dedicated Charging Port is required to do this by shorting the D+ line to the D- line through a resistance of R_{DCHG_DAT}.

A Dedicated Charging Port is required to have an impedance between D+ and GND of R_{DCHG_PWR}. A Dedicated Charging Port is also required to have a capacitance between D+ and GND of C_{DCHG_PWR}. These same two requirements also apply to D+ and VBUS, D- and GND, and D- and VBUS.

If the current drawn from a Charging Port is less than 500mA, then transient load currents shall not cause the output voltage from the charger to go below V_{CHG_UNDSHT}. Under no circumstances shall the transient voltage of a Charging Port exceed V_{CHG_OVRSHT}. The average voltage on VBUS during any such transients shall still be V_{CHG}, where the averaging period is T_{VBUS_AVG}.

A Charging Port is required to have a standard-A receptacle or a captive cable terminating in a micro-B plug.

If there is a single failure within a device with a Charging Port, then the output voltage on VBUS shall not exceed V_{CHG_FAIL}. A Portable Device is not required to operate or survive either of these voltages on its VBUS pin. However, these voltages shall not cause a Portable Device to fail in such a way as to harm the user.

A Charging Port is required to tolerate its VBUS pin being driven by any voltage less than V_{CHG} max at the same time as it is driving a voltage of V_{CHG} onto the VBUS pin.

A device having a Dedicated Charging Port is required to specify on its packaging or casing, the rated current at which the output voltage of the Dedicated Charging Port is capable to supply V_{CHG}. The actual current at which the Dedicated Charging Port voltage drops to 3.6V is required to be within +50%/-0% of the current value specified on the package or casing.

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Figure 4-1 shows a graph of the Dedicated Charging Port output voltage versus output current.

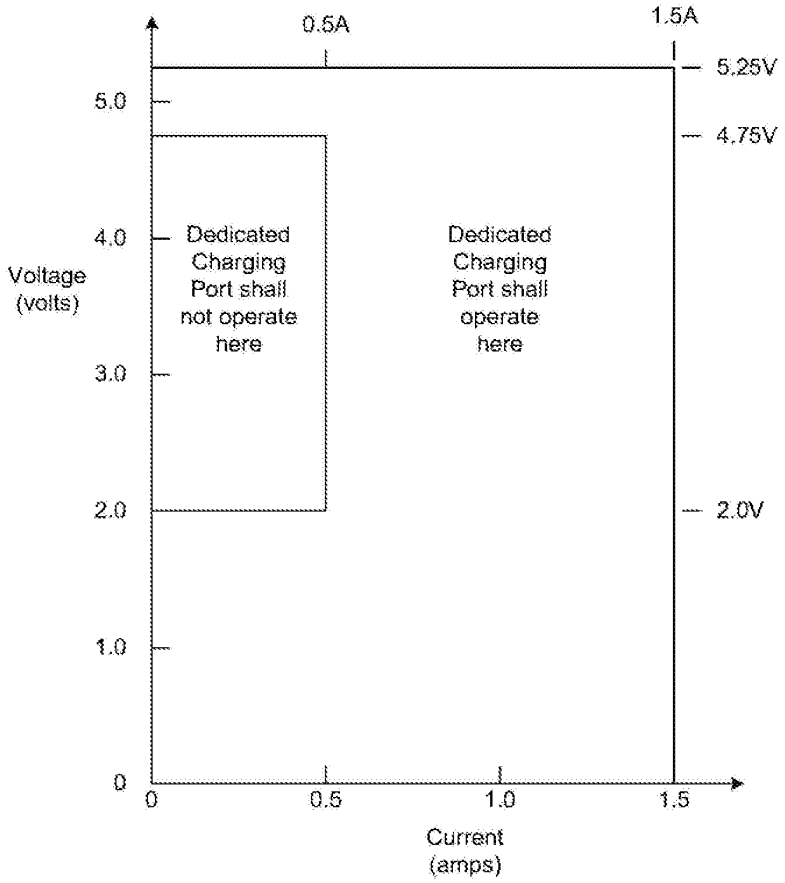


Figure 4-1 Dedicated Charging Port Voltage versus Current

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4.2 Portable Devices

Portable Devices shall limit the amount of current they attempt to draw from a Dedicated Charging Port to IDEV_DCHG. Figure 4-2 shows the current a Portable Device can draw from a Dedicated Charging Port.

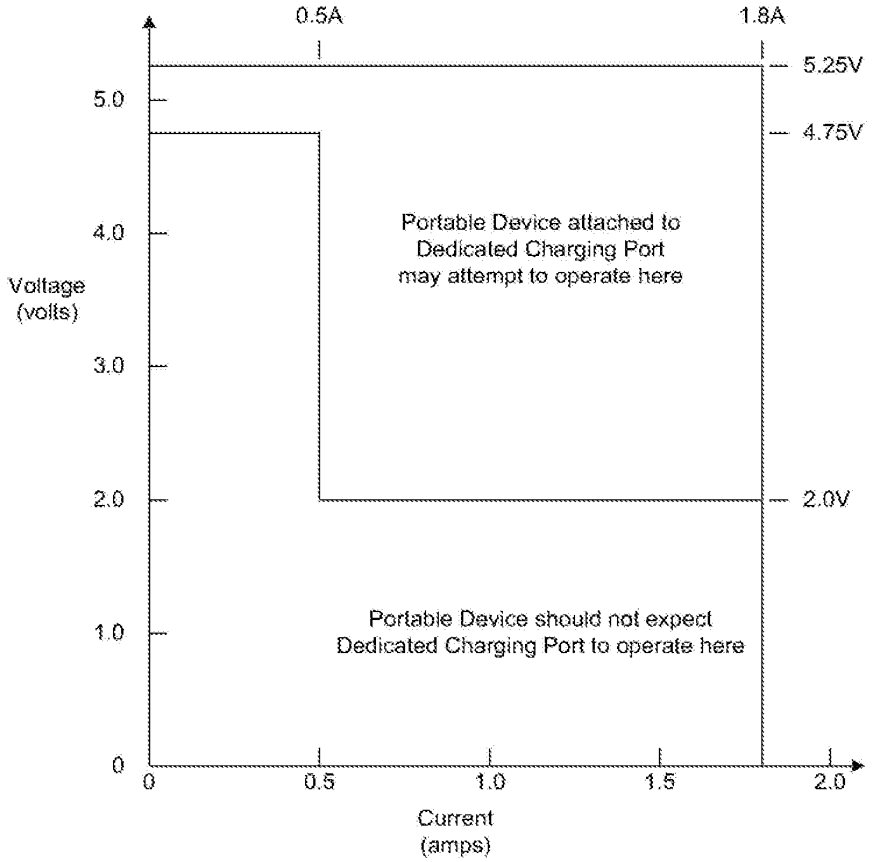


Figure 4-2 Portable Device Current from Dedicated Charging Port

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Portable Devices shall limit the amount of current they draw from a Charging Downstream Port to $I_{DEV\_CDP\_LFS}$ when they are connected at LS or FS. They shall limit their current draw to $I_{DEV\_CDP\_HS}$ when they are connected at HS. Figure 4-3 shows the current a Portable Device can draw from a Charging Downstream Port.

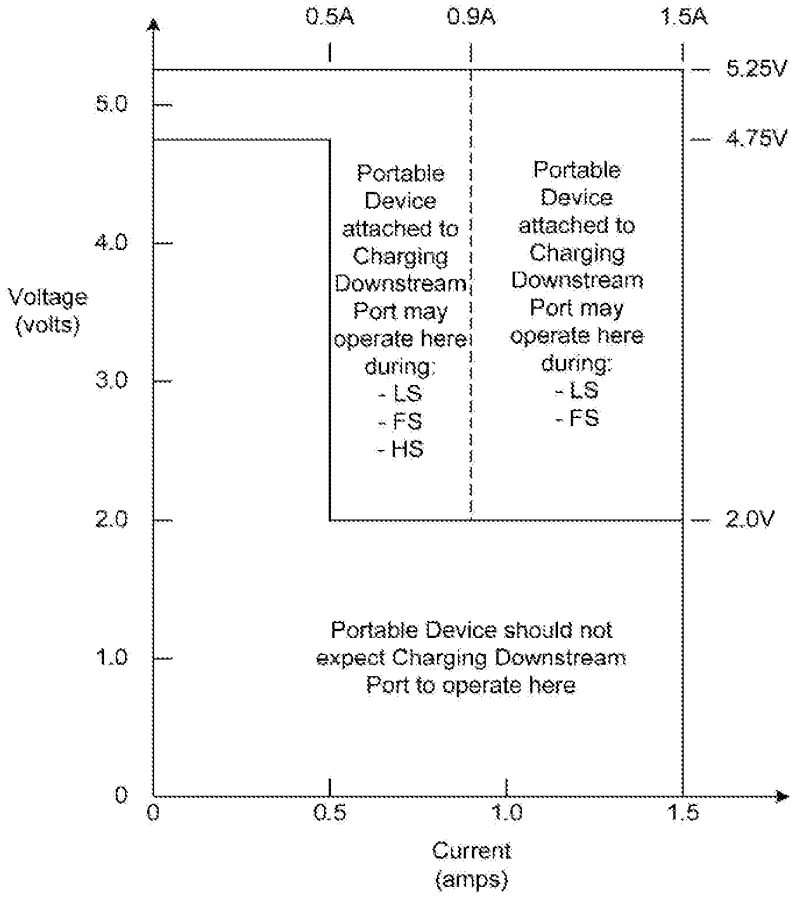


Figure 4-3 Portable Device Current from Charging Downstream Port

Portable Devices shall not cause the voltage between VBUS and GND to drop below $V_{CHG\_SHT\_DWN}$ under normal operating conditions. This voltage shall be measured at the Portable Device.

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Figure 4-4 shows an example of how a Portable Device might limit the amount of current it draws from a Charging Port.

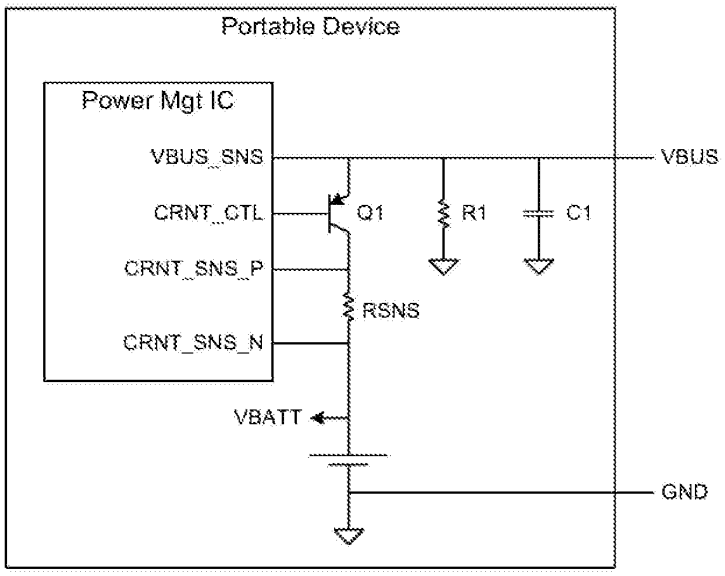


Figure 4-4 Current Limiting Example

In the example shown in Figure 4-4, the Portable Device measures how much current is being drawn from the Charging Port through RSNS. It then controls the amount of current coming into the Portable Device by adjusting the base current of Q1.

With the above implementation, the Portable Device will not cause the voltage on VBUS to go below $V_{CHG\_SHT\_DWN}$ as long as the battery voltage is greater than $V_{CHG\_SHT\_DWN}$.

Portable Devices that cause a Charging Downstream Port to enter current limiting mode must ensure that signaling levels on D+ and D- remain within the USB 2.0 specifications.

4.3 Devices With Multiple Downstream Ports

If a device has multiple Downstream Ports, and one of these ports is a Charging Downstream Port, then the following restrictions apply.

If a Charging Downstream Port on a device goes into current limit mode, such that the VBUS voltage at that port drops below V_{CHG}, then that event shall not cause the VBUS voltage at another Downstream Port of the same device to drop below V_{CHG}.

If a device has at least one Charging Downstream Port and at least one Standard Downstream Port, then the marking and/or position of these ports shall be such that the user can readily distinguish the difference.

If a device has multiple Charging Downstream Ports, then all such ports shall have the same current output capability.

If a device has multiple Charging Downstream Ports, and each port is capable of outputting some level of current, it is not necessary for all of the Charging Downstream Ports to be able to output that level of current

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at the same time. A device is allowed to dynamically adjust the current limit of each port, as long as the current at each port remains within I_{CDP}.

A device with Downstream Ports is not allowed to also have Dedicated Charging Ports.

5. Parameter Values

This section lists the values of parameters defined in this specification.

Table 5-1 Voltages

Parameter	Symbol	Conditions	Min	Max	Units	Ref
ACA disable voltage	V_{ACA_DIS}	Note 2	6.5		V	6.7
ACA operating voltage	V_{ACA_OPR}		3.0	6.0	V	6.7
Charger Output Voltage	V_{CHG}	I_{CHG} < 500 mA	4.75	5.25	V	4.1
Charger Failure Voltage	V_{CHG_FAIL}		-.3	9.0	V	4.1
Charger Overshoot Voltage	V_{CHG_OVRSHT}			6.0	V	4.1
Charger Shut Down Voltage	$V_{CHG\_SHT\_DWN}$			2.0	V	4.1
Charger Undershoot Voltage	V_{CHG_UNDSHT}		4.1		V	4.1
Data Line Leakage Voltage	V_{DAT_LKG}		0	3.6	V	3.9
Data Detect Voltage	V_{DAT_REF}		0.25	0.4	V	3.2
D- Source Voltage	V_{DM_SRC}	Note 1	0.5	0.7	V	3.2
D+ Source Voltage	V_{DP_SRC}	Note 1	0.5	0.7	V	3.2
Logic Threshold	V_{LGC}		0.8	2.0	V	1.4.4

Notes:
1) The voltage sources, V_{DP_SRC} and V_{DM_SRC}, shall be able to source at least 250uA when the output voltage is in the specified range.

2) ACA shall be disabled for any voltage greater than V_{ACA_DIS} min.

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Table 5-2 Currents

Parameter	Symbol	Conditions	Min	Max	Units	Ref
Charging Port Shutdown Current	I_{CHG_SHTDWN}			100	mA	4.1
Dedicated Charging Port Output Current	I_{DCHG}		0.5	1.5	A	3.5
Portable Device Current from Dedicated Charging Port	I_{DEV_DCHG}			1.8	A	3.5
Portable Device Current from Charging Downstream Port at Low or Full Speed	$I_{DEV\_CDP\_LFS}$			1.5	A	3.5
Portable Device Current from Charging Downstream Port at High-speed	$I_{DEV\_CDP\_HS}$	After connecting. See Figure 3-9.		900	mA	3.5
Portable Device Current from Charging Downstream Port during chirp	$I_{DEV\_CDP\_CHRP}$			560	mA	3.6.2
D- Sink Current	I_{DM_SINK}		50	150	µA	3.2
D+ Sink Current	I_{DP_SINK}	Note 1	50	150	µA	3.2
Data Contact Detect Current Source	I_{DP_SRC}		7	13	uA	**Error! Reference source not found.**
Charging Downstream Port Output Current	I_{CDP}		0.5		A	3.5
Leakage current on ID_OTG pin from contamination	$I_{ID\_LKG\_CONT}$		-1	1	µA	6.7
Suspend current	I_{SUSP}	Averaged over 1sec		2.5	mA	2.2
Unit load current	I_{UNIT}			100	mA	2.2

Notes
1) The I_{DP_SINK} current sink must operate over a voltage range of .15V to 3.6V. As shown in Figure 3-9, I_{DP_SINK} remains turned on till after D+ goes to a logic high.

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Table 5-3 Resistances

Parameter	Symbol	Conditions	Min	Max	Units	Ref
Charger to Accessory port	$R_{ACA\_CHG\_ACC}$	VBUS_CHG @ V_{ACA_OPR}		400	mΩ	6.7
OTG to Accessory port	$R_{ACA\_OTG\_ACC}$	VBUS_OTG @ V_{ACA_OPR}		200	mΩ	6.7
Charger to OTG or Accessory ports when ACA disabled	$R_{ACA\_CHG\_DIS}$	VBUS_OTG @ V_{ACA_DIS}	10		kΩ	6.7
Charger to OTG port	$R_{ACA\_CHG\_OTG}$	VBUS_CHG @ V_{ACA_OPR}		200	mΩ	6.7
Data line leakage resistance	R_{DAT_LKG}		300		kΩ	3.9
D- Pull-down resistance	R_{DM_DWN}		14.25	24.8	kΩ	3.2
D+ Pull-down resistance	R_{DP_DWN}		14.25	24.8	kΩ	3.2
Dedicated Charging Port resistance across D+/-	R_{DCHG_DAT}			200	Ω	3.2.1
Dedicated Charging Port resistance from D+/- to VBUS / GND	R_{DCHG_PWR}		2		MΩ	4.1
ACA ID pull-down, OTG device as A-device	R_{ID_A}	Note 1,2,3	119	132	kΩ	6.5
ACA ID pull-down, OTG device as B-device, can't connect	R_{ID_B}	Note 1,2,3	65	72	kΩ	6.5
ACA ID pull-down, OTG device as B-device, can connect	R_{ID_C}	Note 1,2,3	35	39	kΩ	6.5
ACA ID pull-down when ID_OTG pin is floating	R_{ID_FLOAT}	Note 1,2	220		kΩ	6.5
ACA ID pull-down when ID_OTG pin is grounded	R_{ID_GND}	Note 1,2		1	kΩ	6.5
OTG to ACA ground resistance	$R_{OTG\_ACA\_GND}$			100	mΩ	6.7

Notes
1) The resistance presented on the ID_OTG pin by the ACA shall be within the specified range for all ID_OTG voltages between 0.5V and 3.6V, and shall include any leakage currents from the ACA.

2) When detecting the resistance on the ID_OTG pin of an ACA, the OTG device is required to allow for an additional leakage current of $I_{ID\_LKG\_CONT}$.

3) Nominal values for these resistors are R_{ID_A} = 124k, R_{ID_B} = 68k and R_{ID_C} = 36.5k.

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Table 5-4 Capacitances

Parameter	Symbol	Conditions	Min	Max	Units	Ref
Dedicated Charging Port capacitance from D+ or D- to VBUS or GND	C_{DCHG_PWR}			1	nF	4.1

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Table 5-5 Times

Parameter	Symbol	Conditions	Min	Max	Units	Ref
ID resistance to VBUS switch delay	TACA_ID_VBUS		20	40	ms	6.5
Connect to D+ sink disable	TCON_IDPSNK_DIS			20	ms	3.4
Connect to suspend current time	TCON_ISUSP			1	sec	**Error! Reference source not found.**
Data contact detect debounce	TDCD_DBNC		10		ms	**Error! Reference source not found.**
Current limit prior to LS connect	TLOCRNT_LSCON		20		ms	3.4.3
Charger shut down recover time	TSHT_DWN_REC			2	sec	4.1
Session valid to connect time for powered up peripheral	TSVLD_CON_PWD			1	sec	2.2.4
Session valid to connect for peripheral with dead or weak battery	TSVLD_CON_WKB			45	min	2.2.4
Unit current to D+ voltage under DBP	TUNIT_VDP_DBP			1	sec	3.4.4
Unit load to suspend current	TUNIT_ISUSP			1	sec	2.2.3
VBUS voltage averaging time	TVBUS_AVG			1	sec	4.1
D- voltage source enable time	TVDMSRC_EN		1	20	ms	3.4
D- voltage source disable time	TVDMSRC_DIS			20	ms	3.4
D+ voltage under DBP to connect	TVDP_CON_DBP			1	sec	3.4.4
D+ voltage source off to connect	TVDPSRC_CON		40		ms	3.4
D+ voltage source off to high current	TVDPSRC_HICRNT		40		ms	3.4
D+ voltage source on time	TVDPSRC_ON		40		ms	3.4

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6. Accessory Charger Adapter

6.1 Introduction

As portable devices get smaller, it becomes more desirable for the portable device to only have one external connector. If the only connector a device has is a USB connector, then a problem arises when the user wants to attach the device to a charger at the same time as it is already attached to something else.

For example, consider a user in a car with a cell phone that is attached to a headset. If the phone battery goes low, the user would like to charge the phone, and at the same time continue to talk through the headset. If the phone has only one connector, it is not possible to attach both a headset and a charger to the phone through the same connector.

Another example would be as follows. Consider a portable device that has a single connector, which can also act as a handheld PC. When such a device is put into a docking station, it would act as a host to various USB peripherals, such as a hub, keyboard, mouse, printer, etc. However, while in the docking station, the device should also be able to charge at the same time.

The purpose of this section is to describe a method that allows a single USB port to be attached to both a charger and another device at the same time. This method makes use of an Accessory Charger Adapter.

6.2 Adapter Ports

Figure 6-1 shows the ports of an Accessory Charger Adapter (ACA).

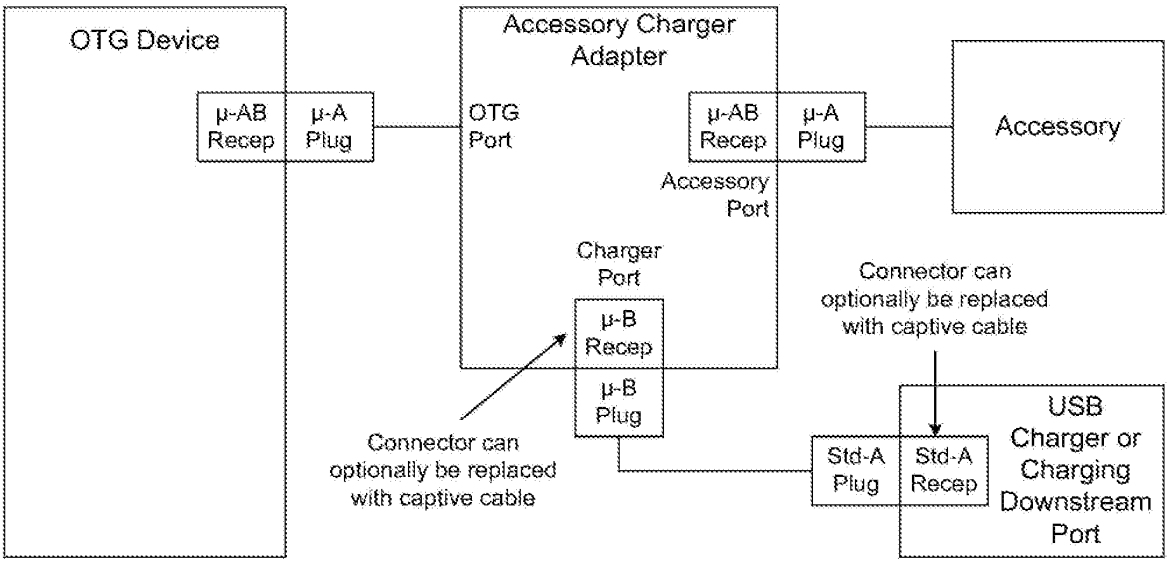


Figure 6-1 Accessory Charger Adapter Ports

An ACA has three ports. The OTG port attaches to the OTG device. The OTG Port is required to have captive cable, terminating in a micro-A plug. The micro-A plug ensures that the OTG port of the ACA can only be attached to an OTG device, since only an OTG device is allowed to have a micro-AB receptacle.

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The Accessory Port attaches to an Accessory. It is required to have a micro-AB receptacle in order for it to be able to attach to a downstream B-device. Since the Accessory Port can accept either a micro-A plug or a micro-B plug, the accessory could be either an A-device or a B-device.

The Charger Port attaches to either a USB Charger or to a Charging Downstream Port. An ACA is required to have one of the following mechanical interfaces:

- Micro-B receptacle
- Captive cable terminating in a Standard-A plug
- Captive cable terminating in a charger

If an ACA has either a micro-B receptacle or a standard-A plug, then the ACA is required to clearly label the Charger Port as Charger Only. The reason for this is that with either a micro-B receptacle or a standard-A plug, it is physically possible to attach either a PC or an OTG device to the Charger Port. However, the Charger Port will not allow charging from either a Standard Downstream Port or an OTG device. This labeling requirement is shown in Figure 6-2.

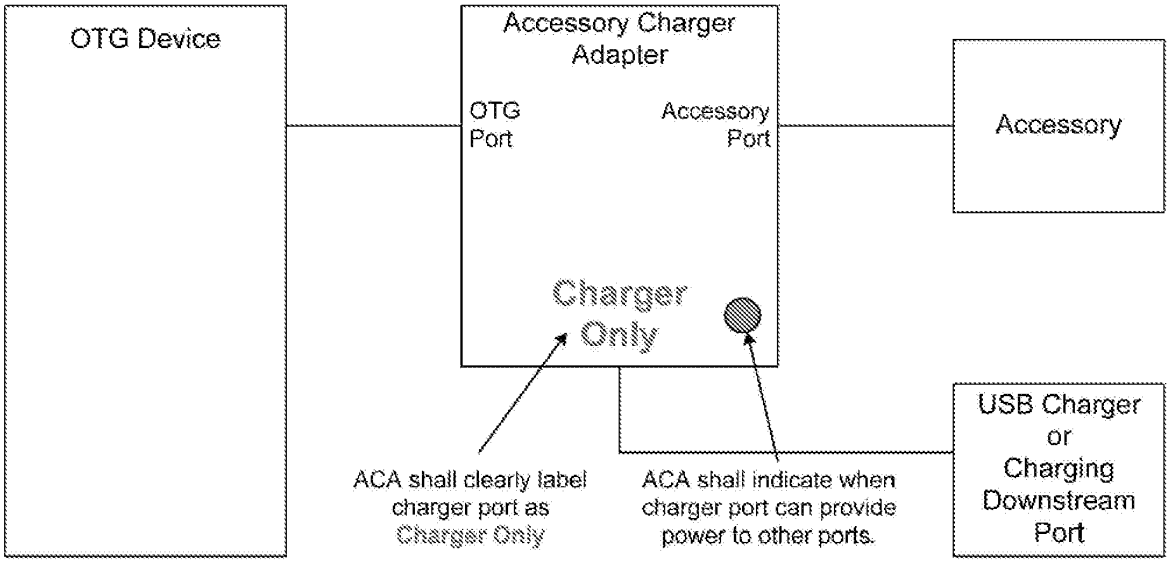


Figure 6-2 Charger Port Labeling and Indicator

The ACA shall also provide some sort of indication when the Charger Port can provide power to the OTG and Accessory Ports.

6.3 Connectivity Options

The primary application for an ACA is to allow an OTG device to attach to a charger, at the same time as it is attached to a downstream B-device. Both the OTG device and the downstream B-device can draw power from the charger, while at the same time the OTG device is communicating with the downstream B-device.

However, given the types of connectors on each of the ACA ports, it is possible to attach different types of devices to each port.

Table 6-1 shows the different combinations of devices that can be attached to each ACA port, and provides comments on their operation.

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Table 6-1 Connectivity Options

OTG Port	Charger Port	Accessory Port	HNP Support	SRP Support	OTG Dev Charges From	Accessory Draws Current From
nothing	USB Charger	B-dev	-	-	-	Charger Port
nothing	USB Charger	A-dev	-	-	-	-
OTG dev	nothing	B-dev	yes	yes	-	OTG Port
OTG dev	nothing	A-dev	yes	yes	Accessory Port	-
OTG dev	nothing	charger	-	-	Accessory Port	-
OTG dev	PC, OTG dev	nothing	-	-	-	-
OTG dev	PC, OTG dev	B-dev	yes	yes	-	OTG Port
OTG dev	PC, OTG dev	A-dev	yes	yes	Accessory Port	-
OTG dev	PC, OTG dev	charger	-	-	Accessory Port	-
OTG dev	USB Charger	nothing	-	-	Charger Port	-
OTG dev	USB Charger	B-dev	yes	no	Charger Port	Charger Port
OTG dev	USB Charger	A-dev	yes	yes	Charger Port	-
OTG dev	USB Charger	charger	-	-	Charger Port	-

The ACA does not allow data communication through the Charger Port. The ACA only allows charging from the Charger Port when a USB Charger is attached. It does not allow charging from the Charger Port whenever a Standard Downstream Port or an OTG device is attached.

In the case where both an OTG device and a B-device are charging from the Charger Port, it is not possible or necessary to support SRP, since VBUS is already asserted at both the OTG Port and Accessory Port.

When both the OTG Port and Accessory Port are drawing current from the Charger Port, it is up to the OTG device to manage current from the Charger Port. A USB Charger is required to provide a minimum of IDCHG. If the OTG device knows that the accessory is drawing less than IDCHG min, then the OTG device can draw whatever is not being drawn by the accessory and ACA. The OTG device is also allowed to draw current from the USB Charger such that the USB Charger goes into current limit mode. However, the OTG must manage this such that the voltage on VBUS_ACC remains high enough to support operation of the accessory.

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6.4 Architecture

Figure 6-3 shows the architecture of an ACA.

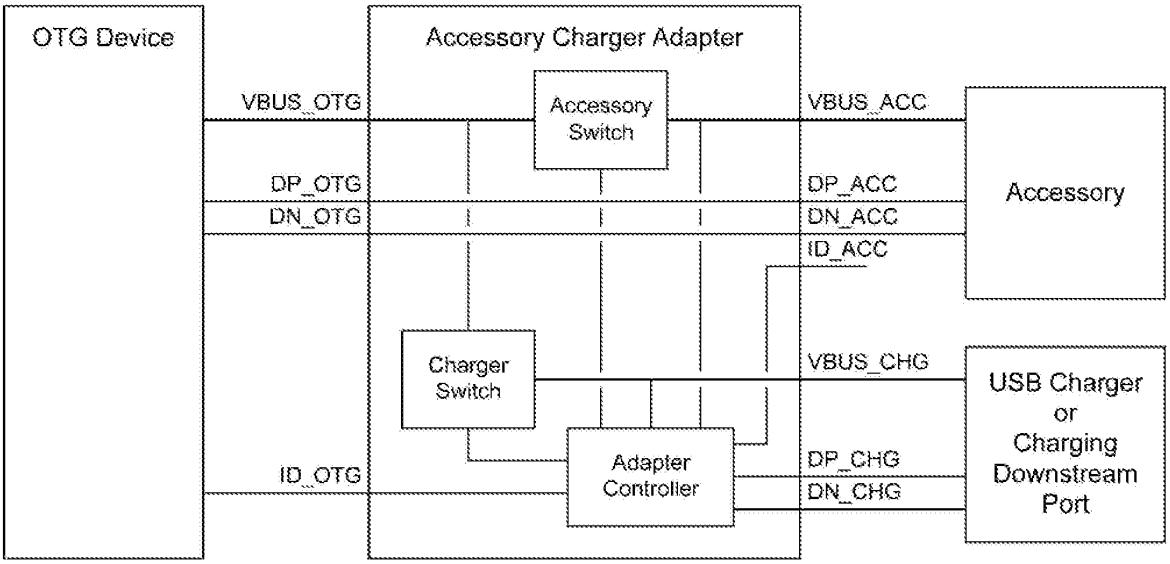


Figure 6-3 Accessory Charger Adapter Architecture

The Accessory Switch allows current to flow between VBUS_OTG and VBUS_ACC. The Charger Switch allows current to flow from VBUS_CHG and VBUS_OTG. The Adapter Controller performs several functions. These functions include:

- sensing the state of the ID_ACC pin, (grounded or floating)
- outputting a state onto the ID_OTG pin, (grounded, R_{ID_A}, R_{ID_B}, R_{ID_C} or floating)
- using the DP_CHG and DN_CHG pins to detect if a charger is attached to the Charger Port
- sensing the voltage on the VBUS_ACC pin
- controlling the Charger and Accessory Switches

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6.5 Modes of Operation

The operation of the ACA is shown in Table 6-2, and is described below. The table assumes that an OTG device is always attached to the OTG Port.

Table 6-2 Modes of Operation

Row	Charger Port	Accessory Port	VBUS_ ACC In	ID_ACC	Charger Switch	Access Switch	ID_OTG	OTG Device
					Note 1	Note 1		
1	non-charger	nothing	low	float	open	closed	R_{ID_FLOAT}	B-dev
2	non-charger	B-device	low	ground	open	closed	R_{ID_GND}	A-dev
3	non-charger	A-dev off	low	float	open	closed	R_{ID_FLOAT}	B-dev
4	non-charger	A-dev on	high	float	open	closed	R_{ID_FLOAT}	B-dev
5	charger	nothing	low	float	closed	open	R_{ID_B}	B-dev
6	charger	B-device	low	ground	closed	closed	R_{ID_A}	A-dev
7	charger	A-dev off	low	float	closed	open	R_{ID_B}	B-dev
8	charger	A-dev on	high	float	closed	open	R_{ID_C}	B-dev

Note 1: Open refers to the high impedance state of the switch. Closed refers to the low impedance state of the switch.

In order for the ACA to detect that a USB Charger is attached to the Charger Port, it checks for VBUS, and also checks the data lines using the method described in Section 3. If a USB Charger is not detected, then the ACA leaves the Charger Switch open, and rows 1 to 4 in Table 6-2 apply. Thus, if a Standard Downstream Port were attached to the Charger Port, the Charger Switch would remain open. The resistance between the ID_OTG pin and ground of the ACA shall be R_{ID_FLOAT} or R_{ID_GND} as indicated in the table.

In rows 5 and 7, a charger is attached to the Charger Port, and either nothing is attached to the Accessory Port, or an A-device that is not asserting VBUS is attached to the Accessory Port. The ID resistance of R_{ID_B} indicates to the OTG device that it is allowed to charge, and that it is allowed to initiate SRP. The OTG device is not allowed to connect, (that is, leave DP_OTG asserted). The reason for this is that if an A-device is on the Accessory Port and is not asserting VBUS, then the USB spec requires the data lines remain at a logic low.

In row 8, a charger is attached to the Charger Port, and an A-device that is asserting VBUS is attached to the Accessory Port. The ID resistance of R_{ID_C} indicates to the OTG device that it is allowed to charge, and that it is allowed to connect. However, it is not allowed to do SRP, since the A-device is already asserting VBUS.

In row 6, a charger is attached to the Charger Port, and a B-device is attached to the Accessory Port. The ID resistance of R_{ID_A} indicates to the OTG device that it is allowed to charge, and that it should default to acting as host.

In row 2, the Accessory Switch is closed, and the OTG device is outputting power to the accessory. If a USB Charger is then attached to the Charger Port, the ACA will transition to row 6, and the Charger Switch will be closed. The OTG device will detect that the ID pin resistance has changed to R_{ID_A}, and should stop driving a voltage onto its VBUS pin. After the ACA closes the Charger Switch, and before the OTG device stops driving VBUS, there is brief time during which both the USB Charger and the OTG device are driving VBUS. This overlap prevents the accessory from losing power, and potentially needing to be powered up again. Due to this overlap, both the OTG device and the USB Charger are required to tolerate having a voltage less than V_{CHG} max driven on VBUS at the same time as they are outputting a voltage on VBUS.

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When transitioning from row 4 to row 8, the ACA is required to open the Accessory Switch and close the Charger Switch a time of $T_{ACA\_ID\_VBUS}$ before changing the ID_OTG resistance. This allows for the case where a PC is attached to the Accessory Port. The OTG device should not start drawing a current of I_{DEV_DCHG} from the ACA until after the Charger Switch has been closed

When transitioning from row 8 to row 4, the ACA is required to change ID_OTG resistance a time of $T_{ACA\_ID\_VBUS}$ before closing the Accessory Switch and opening the Charger Switch. This allows for the case where a PC is attached to the Accessory Port. The OTG device should reduce its current to that allowed by the PC before the Accessory Switch closes.

6.6 Legacy Considerations

Previous versions of the OTG supplement only define the floating and ground states on the ID pin. An impedance to ground on the ID pin of greater than 100k was defined to be the floating state, whereas impedances between 10ohms and 100k could be interpreted by a legacy OTG device as either ground or floating. Thus, a legacy OTG device could incorrectly interpret resistances of R_{ID_A}, R_{ID_B} and R_{ID_C} as either grounded or floating.

If a legacy OTG device interpreted the R_{ID_A} resistance as floating, then:
- it would not be aware of the opportunity to draw I_{DCHG} from VBUS
- it would default to peripheral, when it should default to host

If a legacy OTG device interpreted the R_{ID_B} resistance as grounded, then:
- it would try to drive VBUS_OTG at the same time as the ACA was driving VBUS_OTG
- it would default to host, when it should default to peripheral

If a legacy OTG device interpreted the R_{ID_B} resistance as floating, then:
- it would not be aware of the opportunity to draw up to I_{DCHG} from VBUS
- it would not be aware of the opportunity to do SRP
- it would be required to connect, and potentially violate the USB back-drive voltage spec

If a legacy OTG device interpreted the R_{ID_C} resistance as grounded, then:
- it would try to drive VBUS_OTG at the same time as the ACA was driving VBUS_OTG
- it would default to host, when it should default to peripheral

If a legacy OTG device interpreted the R_{ID_C} resistance as floating, then:
- it would not be aware of the opportunity to draw up to I_{DCHG} from VBUS

6.7 Requirements

An ACA is required to draw less than I_{SUSP} from its Charger Port when anything other than a USB Charger is attached to it.

An ACA is required to draw less than I_{SUSP} from its Accessory Port when a USB Charger is attached to the Charger Port.

The resistance between the VBUS_CHG and VBUS_OTG pins of an ACA shall be $R_{ACA\_CHG\_OTG}$ when the Charger Switch is closed in Table 6-2, and the voltage on VBUS_CHG is at V_{ACA_OPR}.

The resistance between the VBUS_CHG and VBUS_ACC pins of an ACA shall be $R_{ACA\_CHG\_ACC}$ when the Charger Switch and Accessory Switch are closed in Table 6-2, and the voltage on VBUS_CHG is at V_{ACA_OPR}.

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The resistance between the VBUS_OTG and VBUS_ACC pins of an ACA shall be $R_{ACA\_OTG\_ACC}$ when the Charger Switch and Accessory Switch are closed in Table 6-2, and the voltage on VBUS_CHG is at V_{ACA_OPR}.

The resistance between the VBUS_CHG and either the VBUS_OTG or VBUS_ACA pins of an ACA shall be $R_{ACA\_CHG\_DIS}$ when the voltage on the VBUS_CHG pin is V_{ACA_DIS}.

The resistance between the internal ground of the ACA and the ground pin of a micro-AB receptacle attached to the OTG port of an ACA shall be $R_{OTG\_ACA\_GND}$. This requirement limits the difference between OTG and ACA ground under conditions of high charging current. This in turn allows the OTG device to reliably detect the ACA ID resistance under conditions of high charging current.

When a charger, OTG device and accessory are all attached to an ACA, then under worst case conditions of ACA resistance, charger output voltage, OTG current and accessory current, the voltage on the VBUS_OTG and VBUS_ACC pins may not be above 4.4V. It is the responsibility of the OTG device to ensure that the accessory has enough voltage to operate, or to inform the user that this configuration is not supported.

6.8 Docking Station

The operation of the ACA defined in this section can also be used to implement a docking station, such as the example configuration shown in Figure 6-4.

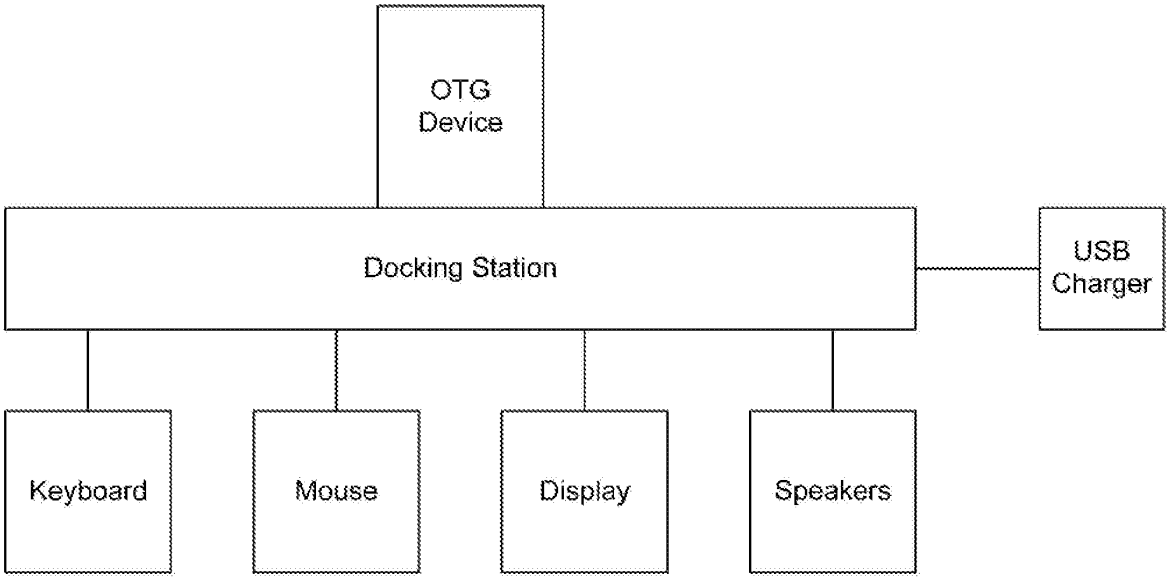


Figure 6-4 Docking Station

In this case, the docking station would contain a hub, and the OTG device would always act as host to the hub. The charger would provide power for the OTG device, as well as for the docking station and any peripherals that were attached.

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IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF FLORIDA
ORLANDO DIVISION

THE NOCO COMPANY, an Ohio corporation, Plaintiff, v. DELTONA TRANSFORMER CORPORATION, a Florida Corporation. and DELTRAN USA, LLC, a Florida Limited Liability Company Defendants.	Case 6:20-cv-00050-PGB-GJK

DEFENDANT DELTONA TRANSFORMER CORPORATION'S INVALIDITY CONTENTIONS

Defendant Deltona Transformer Corporation ("DTC") submits its Invalidity Contentions ("Invalidity Contentions") with respect to United States Patent No. 9,007,015 ("the '015 Patent"). Pursuant to the Case Management and Scheduling Order in this action (Doc. 30 at 3-4) and this Court's order dated May 7, 2020 (Doc. 38), DTC's "Disclosure of Non-Infringement and Invalidity Contentions" are due no later than May 13, 2020. This document contains DTC's Invalidity Contentions. The Non-Infringement Contentions are contained in a separate document served herewith.

On April 6, 2020, Plaintiff The NOCO Company, Inc. ("NOCO" or "Plaintiff") served its Disclosure of Infringement Contentions ("Infringement Contentions"). In those contentions,

NOCO asserted infringement of claims 1-3, 9-13, 15, 17, and 19 of the '015 Patent (the "Asserted Claims").

The Asserted Claims are invalid because they are anticipated or rendered obvious under 35 U.S.C. §§ 102 and 103; are not enabled and/or lack written description under 35 U.S.C. § 112(a); and/or are indefinite under 35 U.S.C. § 112(b).

These Invalidity Contentions reflect DTC's knowledge, thinking, and contentions as of the date of service. The disclosures are based upon DTC's current knowledge, information, or belief. Discovery and DTC's search for prior art are ongoing and are expected to include additional patents and printed publications as well as prior art products, some details of which are in the possession, custody, and control of Plaintiff and third parties. Expert discovery has not yet begun. Furthermore, DTC has received limited documents from NOCO and minimal third-party discovery. Additionally, to the extent the Court's claim construction renders additional prior art relevant to invalidity, DTC reserves the right to supplement these contentions.

The parties have not exchanged proposed claim constructions, and the Court has not issued a claim construction ruling. DTC's contentions are based in part on the implied claim constructions in NOCO's Infringement Contentions against DTC. DTC's reliance on NOCO's Infringement Contentions does not mean that DTC agrees with NOCO's contentions or implied constructions. Rather, DTC has attempted to disclose the invalidating prior art and other grounds for invalidity of which they are currently aware based on their understanding of the scope of NOCO's contentions. Nothing in DTC's Invalidity Contentions should be presumed to represent DTC's position regarding the construction of any claim terms except to the extent

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the terms identified as indefinite are not capable of construction. DTC's positions in its Invalidity Contentions do not constitute any concession by DTC for purposes of infringement. *See, e.g.*, *Vanmoor v. Wal-Mart Stores, Inc.*, 201 F.3d 1363, 1366 (Fed. Cir. 2000).

In addition, DTC's identification of prior art disclosures that anticipate or render obvious a particular claim limitation is not an admission that the claim limitation satisfies the requirements of 35 U.S.C. § 112. Where DTC asserts that an asserted claim is invalid under 35 U.S.C. § 112, DTC nonetheless has provided prior art disclosures that anticipate or render obvious the Asserted Claim on the assumption that NOCO will contend the claim is definite.

DTC reserves the right to present additional items of prior art under 35 U.S.C. § 102, or § 103 located during the course of discovery or further investigation. In addition, DTC reserves the right to assert further grounds of invalidity under 35 U.S.C. §§ 102 and 103 to the extent that discovery or further investigation yields information forming the bases for such invalidity. DTC further reserves the right to modify and supplement, without prejudice, their Invalidity Contentions in response to any findings as to the priority date(s) of the Asserted Claims; the Court's construction of the Asserted Claims; positions otherwise taken by NOCO or their expert(s) concerning claim construction, infringement, equivalents, or invalidity issues; or any amendment by NOCO of their Infringement Contentions, in accordance with the Federal Rules of Civil Procedure and other applicable rules and statutes.

I. PRIOR ART

Subject to the reservations above, DTC identifies each item of prior art presently known that anticipates or renders obvious the Asserted Claims. The patents/applications, publications,

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and systems identified are also relevant for their showing of the state of the art and reasons and motivations for making improvements, additions, and combinations.

A. Prior Art Patents

DTC identifies the patents and published applications set forth below as prior art references, each of which anticipates or renders obvious (alone or in combination with other references) one or more of the Asserted Claims of the patents-in-suit under 35 U.S.C. § 102 or § 103. Prior art patents and applications included in these contentions may be related (such as a divisional, continuation, continuation-in-part, parent, or child) to earlier- or later-filed patents or publications, may have counterparts filed in other jurisdictions, or may incorporate (or be incorporated by) other patents or publications by reference. The listed patents and applications are intended to be representative of those other patents or publications to the extent they exist and includes all earlier published and/or filed related and/or incorporated references disclosed in those documents. DTC accordingly reserves the right to modify, amend, or supplement these contentions with those related patents or patent applications, as well as other prior art references, upon further investigation.

Table 1 – Prior Art Patents/Publications

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2015/0137740	Allos	System and Method for Mobile Charging	11/13/2013*	5/21/2015
WO	2012/080996	Tracy	A JUMP STARTER	12/16/2010*	6/21/2012
U.S.	2005/0116688	YIN	Power source with an anti-reverse connection and	11/28/2003*	6/2/2005

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Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
			short circuit protection circuit for starting motor vehicles		
U.S.	2006/0220610	Solberg	Power management controller	4/5/2005	10/5/2006
EP	0 616 409	Herbert	Portable electrical power supply	9/21/1994	9/21/1994
U.S.	2004/0239290	Krieger	Combination jump starter and high frequency charger	3/21/2003*	12/2/2004
U.S.	2003/0141845	Krieger	High frequency battery charger and method of operating same	1/25/2002*	7/31/2003
U.S.	6,822,425	Krieger	High frequency battery charger and method of operating same	1/25/2002*	11/23/2004
U.S.	2014/0368155	Chen	Smart vehicle rescue battery apparatus	6/18/2013	12/18/2014
U.S.	2006/0176011	Lui	Battery charger with polarity switching capability	2/7/2005	8/10/2006
U.S.	2001/0025618	Kelling	Capacitive remote vehicle starter	3/24/2000*	10/4/2001
U.S.	6,679,212	Kelling	Capacitive remote vehicle starter	3/24/2000*	1/20/2004
U.S.	2014/0084844	Weflen	Self-contained automotive battery booster system	9/23/2013*	3/27/2014
U.S.	9,809,183	Weflen	Self-contained automotive battery booster system	9/23/2013*	11/7/2017
U.S.	2004/0150373	Chan	Vehicle jump starter with polarity compensation	1/30/2003	8/5/2004

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2012/0025766	Reade	Charging Apparatus and Portable Power Supply	7/27/2010*	2/2/2012
U.S.	9,153,978	Reade	Charging Apparatus and Portable Power Supply	7/27/2010*	10/6/2015
U.S.	2006/0244412	Bonzer	Automotive jump-starter with polarity detection, current routing circuitry and lighted cable connection pairs	5/2/2005	11/2/2006
U.S.	6,759,833	Chen	Charger capable of switching polarity	5/6/2003	7/6/2004
U.S.	3,590,357	Reid	Battery booster	11/5/1969	6/29/1971
U.S.	5,194,799	Tomant-schger	Booster battery assembly	3/11/1991	3/16/1993
U.S.	2014/0210399	Urschel	Portable electric power source for aircraft	1/25/2013	7/31/2014
U.S.	3,638,108	Channing	Method of testing an automobile battery and electrical system while in circuit, using a booster battery	4/28/1969	1/25/1972
WO	2012/036556	Eidsvig	Device for charging of rechargeable batteries	9/13/2010*	3/22/2012**
U.S.	2015/0306964	Wang	Automobile charger	4/28/2014*	10/29/2015
U.S.	9,525,297	Wang	Automobile charger	4/28/2014*	12/20/2016
WO	2011/113734	Reichow	On-board electrical system for a vehicle	3/13/2010*	9/22/2011**

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2013/0162029	Reichow	On-board electrical system for a vehicle	3/13/2010*	6/27/2013
U.S.	9,243,601	Reichow	On-board electrical system for a vehicle	3/13/2010*	1/26/2016
U.S.	6,650,086	Chang	Automatic detecting and switching vehicle charger	11/26/2002	11/18/2003
U.S.	6,147,471	Hunter	Single-point direct current connector	10/1/1999	11/14/2000
U.S.	2004/0130298	Krieger	Microprocessor controlled booster apparatus with polarity protection	2/19/2002*	7/8/2004
U.S.	7,345,450	Krieger	Microprocessor controlled booster apparatus with polarity protection	2/19/2002*	3/18/2008
U.S.	2002/0041174	Purkey	Apparatus for providing supplemental power to an electrical system and related methods	10/10/2000*	4/11/2002
U.S.	6,426,606	Purkey	Apparatus for providing supplemental power to an electrical system and related methods	10/10/2000*	7/30/2002
U.S.	6,344,733	Crass	Portable jump-starting battery pack with charge monitoring system	1/31/2000*	2/5/2002
U.S.	5,281,904	Tomkins	Multi mode cordless battery charger	9/29/1992	1/25/1994
U.S.	2015/0054336	Liu	Mobile power bank	8/23/2013*	2/26/2015

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	9,506,446	Liu	Mobile power bank	8/23/2013*	11/29/2016
WO	2014/106407	Lei	Emergency power source	1/7/2013*	10/7/2014**
U.S.	2015/0340907	Lei	Emergency power source	1/7/2013*	11/26/2014
U.S.	9,954,391	Lei	Emergency power source	1/7/2013*	4/24/2018
U.S.	2008/0143290	Chavakula	Multi-Power Charger and Battery Backup System	12/19/2006	7/19/2008
U.S.	7,893,657	Chavakula	Multi-Power Charger and Battery Backup System	12/19/2006	2/22/2011
U.S.	2011/0175461	Tinaphong	Method and apparatus for harvesting energy	1/7/2010	7/21/2011
U.S.	8,362,745	Tinaphong	Method and apparatus for harvesting energy	1/7/2010	1/29/2013
USB Implementers Forum, Inc.			Battery Charging Specification, Revision 1.1	4/15/2009	4/15/2009

* The date shown is the date the U.S. or WIPO patent document is effective as prior art pursuant to 35 U.S.C. §102(d)(2). The document is also effective as prior art at least as of its actual filing date in the U.S. pursuant to 35 U.S.C. §102(d)(1).

** The date shown is the publication date of the WIPO patent document. The document is also effective as prior art at least as its actual filing date in the U.S. pursuant to 35 U.S.C. §102(d)(1).

C. Prior Art Offered for Sale or Publicly Used or Known

DTC identifies products and systems (collectively "Product Prior Art") that were publicly known, in public use, offered for sale, sold, and/or invented in the U.S. (and not abandoned, suppressed, or concealed) prior to the purported effective filing date of the patents-

in-suit and/or prior to the alleged invention date of the claimed inventions. This Public Prior Art anticipates or renders obvious (alone or in combination with other references) one or more of the Asserted Claims of the patents-in-suit under 35 U.S.C. §§ 102(a), (b), (e), (g), and/or § 103(a).

Most notably, one of the accused products, the Battery Tender® Portable Power Pack, is a private label product based on a lithium ion battery jump starter that was publicly known and used and on sale prior to the priority date of the '015 patent. Accordingly, to the extent that NOCO is able to establish that such product infringes the '015 patent, NOCO admits, as a matter of law, that such product anticipates the '015 patent.

In addition, DTC is currently investigating the dates of conception and reduction to practice of such Public Prior Art and when such Public Prior Art was first known or used by others. There were dozens of portable jump starters on the market prior to the priority date of the '015 patent, and others launched in the United States at approximately the same time as the '015 patent. DTC is still investigating these prior art products and intends to seek third-party discovery as appropriate during the course of this litigation. Additionally, the Court's claim construction may cause additional prior art products to be invalidating. In the course of their investigation, DTC may identify additional prior art documents describing these products and systems that may also anticipate and/or render obvious the one or more Asserted Claims of the patents-in-suit as invalidating printed publications. DTC accordingly reserves the right to modify, amend, or supplement these contentions with those products, as well as other prior art references, upon further investigation. At present, DTC identifies the following products as invalidating prior art.

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Table 2 – Product Prior Art

Item Offered for Sale or Publicly Used or Known	Date Offered for Sale or Became Publicly Used or Known[1]	Identity of Person Offering for Sale or Making Use or Making
MICRO-START/PPS	**As late as July 29, 2013**	**Antigravity Batteries**
E-Power	**As late as April 15, 2013**	**Carku**
Battery Tender Power Pack	**Prior to July 3, 2014**	**Carku/Deltran USA LLC**
PowerAll	**As late as March 26, 2014**	**Gryphon Mobile Electronics LLC**
Electromate 400	**As late as 2013**	**Black & Decker**

[1] DTC will further develop the facts as to the dates these products were offered for sale or became publicly used or known as discovery progresses.

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II. INVALIDITY UNDER 35 U.S.C. §§ 102 AND 103

The '015 Patent also is invalid as anticipated under 35 U.S.C. §§ 102(a), (b), or (e) or rendered obvious under 35 U.S.C. § 103, as set forth below.[2] The '015 Patent, under NOCO's apparent understanding of the Asserted Claims in their Infringement Contentions, generally recite, with regard to claim 1, an apparatus for jump starting a vehicle that includes an internal power supply, an output port, a vehicle battery isolation sensor, a reverse polarity sensor, a power switch, and a microcontroller. *See* '015 Patent at 8:4-37 (claim 1). The vehicle battery isolation sensor is configured to detect the presence of a vehicle battery connected between the positive and negative polarity outputs of the output port. *Id.* at 8:9-12. The reverse polarity sensor is configured to detect the polarity of the vehicle batter and to provide an output signal indicating whether the battery is properly connected with the positive and negative outputs. *Id.* at 8:13-20. The microcontroller is configured to receive signals from the vehicle battery isolation and reverse polarity sensors and to output a signal to the power switch such that the power switch is turned on when the signals indicate the presence of a battery and proper polarity and is turned off when the signals do not indicate the presence of a batter or improper polarity. *Id.* at 8:21-37. The claims dependent on claim 1 recite limitations on the internal power source (claims 2-3), other well-known limitations regarding individual internal components (claims 4-9), USB ports (claims 10-11), various limitations regarding a light source (claims 12-18), a manual override switch (claims 19-20), and cable terminals (claims

[2] To the extent the Court disagrees with DTC's non-infringement, § 112 lack of written description and § 112 indefiniteness positions, the obviousness and anticipation positions, if considered inconsistent, are offered in the alternative.

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21-23). *See Id.* at 8:38-10:22. NOCO did not "invent" any of these features. Rather, the '015 Patent merely combines prior art elements according to known methods to yield predictable results and therefore are invalid for obviousness.

Accordingly, to the extent the references disclosed in Tables 1 and 2 above are found not to anticipate the '015 Patent, they render the Asserted Claims obvious under 35 U.S.C. § 103 either alone or in combination with the knowledge of a person of ordinary skill in the art or each other. It would have been obvious to the person of ordinary skill in the art as of the purported effective filing date of the '015 Patent to combine the various references cited herein so as to practice the Asserted Claims. The prior-art items render the claim obvious because, as discussed above, the missing feature was known to persons skilled in the art in the field at the time, and could have been added by those persons to the device or method disclosed by the prior art, and adding that known feature would yield predictable results, so that the subject matter of the claim as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007).

The motivation to combine comes from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obviousness to try, the nature of the problem faced, or knowledge possessed by a person of ordinary skill. DTC reserves the right to rely on the knowledge of those skilled in the art, the testimony of expert witnesses, or other prior art, to show that it would have been obvious to include the allegedly missing limitation and to explain the motivation to combine the prior art elements.

The combinations that render the Asserted Claim obvious are identified in the claim charts attached as Charts A (publications) and B (products)[3] (collectively, "Invalidity Charts") and listed in Table 4 below. These Invalidity Charts identify where specifically in each item of prior art each element of the Asserted Claims is found. Each Invalidity Chart identifies by citation the disclosures within the prior art reference(s) that teach the relevant claim elements, limitations, or rationale supporting the combination(s). The inclusion of certain exemplary combinations in these Invalidity Charts does not exclude other combinations. The combinations are not meant to be exhaustive. The discussions in the charts are only exemplary and not an exhaustive discussion of everywhere in the cited referenced where the claim element can be found or obviated. DTC contends that it would have been obvious to a person of ordinary skill in the art to combine any of the various references cited herein so as to practice the Asserted Claim. DTC reserves the right to identify additional specific combinations as well as to detail and explain such combinations. DTC further reserves the right to amend or otherwise modify this disclosure if and when further relevant information is provided by NOCO or other circumstances change.

Table 3 – Invalidity Charts

Chart No.	References	§102 or 103
1	U.S. 2015/0137740 Allos and/or WO 2012/080996 Tracy and/or	§102 – claims 1-3, 9-13, 15, 17, and 19

[3] Included in the Products chart are certain documents that also qualify as publications – e.g., brochures, websites, advertisements, etc., and so their inclusion in the products chart should not lead to the inference that they only qualify as "on sale" prior art but rather may also qualify as published or public prior art as well.

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	U.S. 2005/0116688 YIN and/or U.S. 2006/0220610 Solberg and/or EP 0 616 409 Herbert and/or U.S. 2004/0130298 (issued as US 7,345,450) Krieger and/or U.S. 2004/0239290 Krieger and/or U.S. 2003/0141845 Krieger and/or U.S. 2007/0285049 to Krieger and/or U.S. 2014/0368155 Chen and/or U.S. 2006/0176011 Lui and/or U.S. 2001/0025618(issued as US 6,679,212) Kelling and/or U.S. 2014/0084844 (issued as US 9,809,183) Weflen and/or U.S. 2004/0150373 Chan and/or U.S. 2012/0025766 (issued as US 9,153,978) Reade and/or U.S. 2006/0244412 Bonzer and/or U.S. 6,759,833 Chen and/or U.S. 3,590,357 Reid and/or U.S. 5,194,799 Tomantschger and/or U.S. 2014/0210399 Urschel and/or U.S. 3,638,108 Channing and/or WO 2012/036556 Eidsvig and/or U.S. 2015/0306964 (issued as US 9,525,297) Wang and/or WO 2011/113734 (issued as US 9,243,601) Reichow and/or U.S. 6,650,086 Chang and/or U.S. 6,147,471 Hunter and/or U.S. 2002/0041174 (issued as US 6,426,606) Purkey and/or U.S. 6,344,733 Crass and/or U.S. 5,281,904 Tomkins and/or U.S. 2015/0054336 (issued as US 9,506,446) Liu and/or U.S. 2015/0340907 (issued as US 9,954,391) Lei and/or U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula and/or U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong and/or USB Implementers Forum, Inc.	§103 – claims 1-3, 9-13, 15, 17, and 19

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2	Antigravity Batteries MICRO-START/PPS and/or Carku E-Power and/or Deltran Battery Tender Power Pack and/or Gryphon Mobile Electronics LLC PowerAll and/or Black & Decker Electromate 400	§102 – claims 1-3, 9-13, 15, 17, and 19 §103 – claims 1-3, 9-13, 15, 17, and 19
	U.S. 2015/0137740 Allos alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2005/0116688 Yin, U.S. 2004/0239290 Krieger, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1-3, 9, 15, 17, 19 §103 – claims 10-13
	U.S. 2005/0116688 Yin alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of WO 2012/080996 A1 Tracey, U.S. 2005/0116688 Yin, U.S. 2006/0220610 Solberg, EP 0 616 409 Herbert, U.S. 2004/0239290 Krieger, U.S. 2003/0141845 Krieger, U.S. 2004/0130298 (issued as US 7,345,450) Krieger, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 2014/0210399 Urschel, U.S. 3,638,108 Channing, WO 2012/036556 Eidsvig, U.S. 2015/0306964 (issued as US 9,525,297) Wang, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 6,344,733 Crass, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1, 12, 17 §103 – claims 2, 3, 9-11, 13, 15, 19

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	U.S. 2006/0220610 Solberg alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of WO 2012/080996 A1 Tracey, U.S. 2005/0116688 Yin, EP 0 616 409 Herbert, U.S. 2004/0239290 Krieger, U.S. 2003/0141845 Krieger, U.S. 2004/0130298 (issued as US 7,345,450) Krieger, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 2014/0210399 Urschel, U.S. 3,638,108 Channing, WO 2012/036556 Eidsvig, U.S. 2015/0306964 (issued as US 9,525,297) Wang, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 6,344,733 Crass, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1, 9, 17, 19 §103 – claims 2, 3, 10-13, 15
	U.S. 2004/0239290 Krieger alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2006/0220610 Solberg, EP 0 616 409 Herbert, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,638,108 Channing, U.S. 2015/0306964 (issued as US 9,525,297) Wang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1, 3, 11, 12, 15, 17, 19 §103 – claims 2, 9, 10-13
	U.S. 2004/0130298 (issued as US 7,345,450) Krieger alone (§102) or in combination (§103) with knowledge	§102 – claims 1, 3, 15, 17

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	of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2005/0116688 Yin, U.S. 2006/0220610 Solberg, EP 0 616 409 Herbert, U.S. 2004/0239290 Krieger, U.S. 2003/0141845 Krieger, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 3,638,108 Channing, U.S. 2015/0306964 (issued as US 9,525,297) Wang, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§103 – claims 2, 9-13, 19
	U.S. 2007/0285049 Krieger alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2005/0116688 Yin, U.S. 2004/0239290 Krieger, U.S. 2006/0244412 Bonzer, U.S. 2014/0210399 Urschel, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1, 3, 9, 10, 15, 17, 19 §103 – claims 2, 11-13
	U.S. 2004/0150373 Chan alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2005/0116688 Yin, U.S. 2006/0220610 Solberg, EP 0 616 409 Herbert, U.S. 2004/0239290 Krieger, U.S. 2003/0141845 Krieger, U.S. 2004/0130298 (issued as US 7,345,450) Krieger, U.S. 2007/0285049 Krieger, U.S. 2001/0025618 (issued as US 6,679,212) Kelling, U.S. 2014/0084844 (issued as	§102 – claim 1 §103 – claims 2, 3, 9-13, 15, 17, 19

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	US 9,809,183) Weflen, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 2014/0210399 Urschel, U.S. 3,638,108 Channing, WO 2012/036556 Eidsvig, U.S. 2015/0306964 (issued as US 9,525,297) Wang, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 6,344,733 Crass, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	
	U.S. 2015/0306964 (issued as US 9,525,297) Wang alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2004/0239290 Krieger, U.S. 2004/0130298 (issued as US 7,345,450) Krieger, U.S. 2007/0285049 Krieger, U.S. 2001/0025618 (issued as US 6,679,212) Kelling, U.S. 2014/0084844 (issued as US 9,809,183) Weflen, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 2014/0210399 Urschel, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1, 9, 15 §103 – claims 2, 3, 10-13, 17, 19
	U.S. 2015/0340907 (issued as US 9,954,391) Lei alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2006/0220610	§102 – claims 1, 2, 9, 12, 13, 15, 17 §103 – claims 3, 10, 11, 19

	Solberg, U.S. 2004/0239290 Krieger, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 3,638,108 Channing, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	

While DTC has identified citations in the references for the claim limitations, each and every disclosure of the same limitation in the same reference is not necessarily identified. In an effort to focus the issues, DTC cites only portions of the references, even when a reference may contain additional support for or disclosure of a particular claim element. Where DTC cites a particular figure, table, or image relating to a prior art reference, the citation should be understood to encompass any text referring or relating to the directly cited material, in addition to the directly cited material itself. Similarly, where a cited portion of text refers to a figure, table, or image, the citation should be understood to include the figure as well.

DTC's reference to a prior art apparatus in these contentions should be interpreted as a reference to the product itself and any corresponding patents, publications, or product literature cited in these contentions that relates to the cited apparatus. In addition, DTC may rely on other documents or things that have not yet been located to support their contentions regarding such prior art apparatuses that are referenced in these contentions. Any physical embodiments of

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the references described in the Invalidity Charts that were publicly available during the relevant time period also constitute prior art.

For any claim limitation that NOCO alleges is not disclosed in a particular prior art reference, DTC reserves the right to assert that such limitation is inherent, that the limitation would have been obvious to one of ordinary skill in the art at the relevant time, or that the limitation is disclosed in one or more prior art references that individually or in combination would have rendered the asserted claim obvious.

DTC further reserves the right to identify and rely on additional art or teachings within the cited art. Unless otherwise stated, it should be presumed that DTC intends to rely upon each reference in its entirety to the extent relevant or appropriate, including references cited in or referenced within the prior art identified below.

The prior art references produced by DTC reflect the "state of the art" as of the purported effective filing date of the '015 Patent or the alleged invention date of the Asserted Claims. These references illustrate the scope and content of the prior art, the knowledge of those skilled in the relevant field, as well as the motivations of skilled persons to modify and combine known systems and components during the relevant time period. Persons of ordinary skill in the art read a prior art reference as a whole, and in the context of other publications and literature. Accordingly, DTC may rely on uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions of references that are cited. DTC may also rely on uncited portions of the prior art references, other publications, and the testimony of experts to establish that a

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person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

III. INVALIDITY BASED ON 35 U.S.C. § 112

The Asserted Claims are invalid under 35 U.S.C. § 112, first paragraph, for lack of written description and/or enablement, and second paragraph, for failing to particularly point out and distinctly claim the subject matter that the applicants regard as their invention. DTC's invalidity contentions under 35 U.S.C. § 112 are set forth below.

In making these contentions, DTC is not necessarily proposing a specific level of ordinary skill in the art, and these contentions are based at least in part on what NOCO may contend is the level of ordinary skill in the art. DTC does not concede that NOCO's contentions as to the level of ordinary skill in the art are proper and may contest any such contentions. DTC further reserve the right to modify and supplement, without prejudice, their Invalidity Contentions in light of positions taken by NOCO or their expert witness(es) concerning claim construction, infringement, equivalents or invalidity issues, or claim construction positions adopted by the Court.

Indefiniteness

The Asserted Claims are invalid as indefinite because they do not "particularly point[] out and distinctly claim[] the subject matter." 35 U.S.C. § 112(b). A patent is indefinite "if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014).

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For example, the following claim terms are not reasonably certain and are nowhere defined or explained with specificity in the '015 Patent or prosecution history:

Claim	**Element**	**Reason for invalidity under 35 U.S.C. § 112, ¶ 1**
1	vehicle isolation sensor	This term lacks antecedent basis.
1	signals from said sensors	It is not possible to discern with reasonable certainty which signals are referred to because there is no recited signal from the vehicle isolation sensor

As a result, the claims fail to reasonably apprise those skilled in the art as to their scope when read in light of the specification, rendering the limits of the patent unknown.

V. DOCUMENT PRODUCTION

In connection with their disclosure of these contentions, DTC also produces documents.

Dated: May 13, 2020

Respectfully submitted,

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on May 13, 2020, a true and correct copy of the foregoing document is being served via e-mail on counsel for Plaintiff, as follows:

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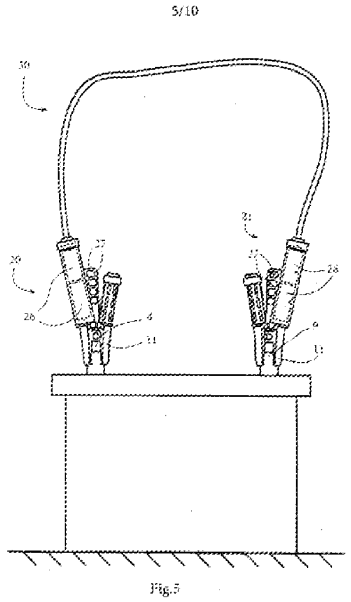
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Exhibit 1. Printed Publications

Claim No.	Claim	Printed Publications
1[PRE]	Apparatus for jump starting a vehicle engine, comprising:	To the extent the preamble is limiting, the following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, the limitation: **<u>WO 2012/080996 A1 to Tracey et al.</u>** Abstract ("A jump starter (1, 30, 50) for a flat battery, such as a vehicle battery…."); 1:7 ("This invention relates to a jump starter system for a battery, especially a vehicle battery."); 2:1-2 ("According to the invention, there is provided a jump starter for a battery such as a vehicle battery…."; 5:7-9 ("Referring to Figs. 1 and 2 there is illustrated a jump starter system 1 according to the invention. The jump starter system comprises a first crocodile clip 2 having a first handle 3 for connection to one terminal 4 of a flat vehicle battery 5."); Figure 2.  5/10 Fig.5

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Claim No.	Claim	Printed Publications
		U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger ¶3 [1:22-25] ("It is well known that when an engine of an automobile is not able to be started due to insufficient electric power, a battery of the automobile can be jump started by power from a battery of another automobile or from a battery in a booster device to thereby start the engine."); ¶9 [2:8-11] ("There is therefore a need for a self-contained jump starter system that can be used as a jump starter, tester, and diagnostic system for a vehicle to assist in performing vehicle diagnostics and minor vehicle repairs."); ¶35 [6:45-47] ("Once a proper polarity connection is made between the batteries, the depleted battery 11 is charged or the vehicle is jump started."); ¶43 [8:40-42] ("Referring now to FIG. 5, an example of a microprocessor controlled jump starter system according to an embodiment of the invention is described. The microprocessor 60 can be programmed to perform essentially all of the control functions needed for operation of the jump starter."); ¶49 [9:47-51] ("The microprocessor 60 may also be used to conduct a test of an alternator of a vehicle. When the alternator of a vehicle is working properly, the voltage level of the depleted battery 11 rises rapidly immediately after the battery is jump-started.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶5 ("Dual-mode battery chargers currently exist. When operated in a first mode, the battery charger delivers a high current output for a short duration of time. This short duration, high current can be used to **jump-start a vehicle with a dead battery**.); ¶22 ("However, the boost circuit is adapted provide a high current that can be used to jump-start a vehicle with a depleted battery."); ¶41 ("The boost circuit 16 is used to provide a high current boost that can be used to jump-start a vehicle with a dead battery."); ¶48 ("Referring again to FIG. 1, boost circuit 16 is now described. Boost circuit 16 provides a high current pulse that can be used to jump-start a dead battery.") **U.S. 2004/0239290 to Krieger**

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Claim No.	Claim	Printed Publications
		Abstract ("A portable jump starter/charger combination includes a housing and a jump starter battery enclosed within the housing for providing a first DC output. A battery charger is also enclosed within the housing and provides a second DC output. A function selector switch has a first input coupled to the first DC output of the jump starter battery, a second input coupled to the second DC output of the charger and an output coupled to battery cables. The function selector switch is operative to selectively connect one of the first and second inputs to the output of the function selector for either jump starting a vehicle with a dead battery or charging the dead battery through the pair of battery cables."); ¶4 ("There are a number of portable jump starters for vehicles having a dead starter battery. Such units provide the ability to jump-start a motor when another vehicle's battery is not available to the motorist. Portable jump starters usually have an internal battery which is used to jump start the vehicle."); ¶24 ("This combination of the functionalities of a jump starter and a charger provides a motorist with the ability, not only to jump-start a vehicle with a dead battery, but also to charge the battery with the same cables used for jump-starting.") **U.S. 2007/0285049 to Krieger** ¶13 ("A **power source 20**, for example a battery, such as a sealed lead acid battery, a nickel cadmium battery, a nickel metal hydride battery or the like, may be disposed in the housing 10 (FIG. 3). The **battery 20** may be adapted to provide DC power for a variety of applications."); ¶17 ("The battery 20 may also be used to provide jumpstarting power for vehicles such as cars, RVs, and the like, which cannot start due to a depleted vehicle battery.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** Abstract ("An apparatus for providing power, the apparatus having a housing; a battery module positioned inside of the housing, the battery module having: a battery, a battery circuit board coupled to the battery and an ignition output port coupled to the battery circuit board; a circuit board positioned inside of the housing

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Claim No.	Claim	Printed Publications
		and coupled to the battery module, the circuit board having: a charge module, a discharge module, a lighting module and a control module coupled to the charge module, the discharge module and the lighting module; a light source coupled to the circuit board; and wherein the apparatus is configured to provide sufficient power to **jump start a vehicle**."); ¶2 [1:19-23] ("The present invention relates to mobile power technology and, more particularly, to a mobile power bank capable of charging electronic devices, jump starting an ignition system of a vehicle with a weak or dead battery, and operating as a flashlight."); ¶6 [1:45-49] ("The present invention according to an embodiment provides a mobile power bank, vehicle ignition system jump starter, and a flashlight. The mobile power bank is capable of jump starting a vehicle by providing power for a vehicle ignition and starter motor."); ¶7 [1:62-63] ("The apparatus is configured to provide sufficient power to jump start a vehicle."); ¶12 [2:65-3:6] ("The apparatus further comprises: a light source coupled to the circuit board; a charging port coupled to the charging module; at least one Universal Serial Bus interface coupled to the discharge module; and a Light Emitting Diode indicator module coupled to the circuit board and configured to indicate a charge level of the battery; wherein the apparatus is configured to provide sufficient power to jump start a vehicle at a voltage higher than about 13.6 volts."); ¶26 [4:5-7] ("If the vehicle battery power is low, the mobile power bank 10 can be used to jump start the ignition.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶5 ("An objective of the present invention is to provide an emergency power source, which is easy to be recharged, to output a high current for starting a vehicle and accurately control the outputting of high current."); ¶7 ("Input terminals of the battery pack are connected to output terminals of a charging circuit and a solar panel input circuit, output terminals of the battery pack are connected to a high current outputting circuit for outputting a high current used for starting a vehicle, and an external smart battery detection system is connected between the battery pack and the high current outputting circuit."); ¶20 ("The emergency power source of the present invention uses lithium-ion batteries as its battery pack, which have

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Claim No.	Claim	Printed Publications
		characteristics of light weight, small size, durability, high instantaneous discharging current and rechargeability, which can meet the demand of high current for starting a vehicle."); ¶26 ("As shown in FIGS. 1 to 3, an emergency power source includes a housing having at its inside a battery pack 4 for storing electric energy. Input terminals of the battery pack 4 are connected to output terminals of a charging circuit 1 and a solar panel input circuit 2, output terminals of the battery pack 4 are connected to a high current outputting circuit 7 for outputting a high current used for starting a vehicle, and an external smart battery detection system 6 is connected between the battery pack 4 and the high current outputting circuit 7."); ¶27 ("The emergency power source uses lithium-ion batteries as its battery pack, which has the characteristics of light weight, small size, durability, high instantaneous discharge current and rechargeability, which is capable of supplying a high current for starting a vehicle."); ¶31 ("The high current outputting circuit 7 has an output voltage of 12V DC or 24V DC, and an instantaneous current ranging from 100 A to 600 A, which can be used as a starting power source for vehicles in emergency.") **U.S. 2005/0116688 to Yin** ¶1 ("The present invention relates to a power source for starting motor vehicles and more particularly pertains to a power source with a circuit for protecting against reverse polarity connection and short circuit of the battery clamps during jump starting of a motor vehicle's engine."); ¶2 ("The present invention relates to a power source for starting motor vehicles and more particularly pertains to a power source with a circuit for protecting against reverse polarity connection and short circuit of the battery clamps during jump starting of a motor vehicle's engine."); ¶19 ("Power source with an anti-reverse connection and short circuit protection circuit for starting motor vehicles according to the present invention is hereinafter described with reference to FIGS. 1 to 3.") **U.S. 2014/0368155 to Chen**

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Claim No.	Claim	Printed Publications
		¶4 ("The vehicle rescue battery is used to connect to the vehicle battery to start the vehicle engine urgently if the power of the vehicle battery is not enough to start the vehicle engine (for example, the vehicle engine has not been started for a long time)."); ¶17 ("FIG. 1 shows a block diagram of the smart vehicle rescue battery apparatus of the present invention. A smart vehicle rescue battery apparatus 10 is applied to a vehicle battery 20. The smart vehicle rescue battery apparatus 10 is used to connect to the vehicle battery 20 to start a vehicle engine (not shown in FIG. 1) if the power of the vehicle battery 20 is not enough to start the vehicle engine.") **U.S. 2015/0137740 to Allos** ¶10 ("The mobile charging system 100 further includes at least two types of circuits, including a jump start and boost circuit 104, and the charging circuit 106. The jumpstart and boost circuit 104 may be employed to provide an immediate jumpstart to a battery."); *see also* U.S. Provisional Patent Application 61/903,779 at 2-3. **U.S. 2006/0220610 to Solberg** ¶2 ("The inventions relate to charging systems, and more particularly, to energy delivery systems that are capable of delivering current to a vehicle."); ¶5 ("When a battery is dead or weakened, it is sometimes necessary to recharge the battery to a level that can be used to start a vehicle. One common way of recharging a battery is by jumping it with another battery. To jump a battery, a second battery is connected in parallel with the dead or weakened battery."); ¶19 ("A portable charging system is capable of sourcing power to start a vehicle and support other vehicle systems."); ¶44 ("The term charging is intended to broadly encompass mechanisms and methods that source a current and/or voltage that is capable of starting a vehicle as well as other mechanisms and methods that may supplement another power source within or coupled to a vehicle.") The following references also disclose, teach, or suggest this element:

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Claim No.	Claim	Printed Publications
		EP 0 616 409 to Herbert, e.g., at ¶¶17, 36-37; U.S. 2001/0025618 to Kelling, e.g., at ¶22; U.S. 2014/0084844 to Weflen, e.g., at ¶49; U.S. 2004/0150373 to Chan, e.g., at ¶¶1, 19, 21; U.S. 2006/0244412 to Bonzer, e.g., at ¶4; U.S. 6,759,833 to Chen, e.g., at 1:11-23; U.S. 3,590,357 to Reid, e.g., at 1:4-35; U.S. 5,194,799 to Tomantschger, e.g., at 1:5-21; U.S. 6,650,086 Chang; e.g., at 1:12-19; U.S. 6,147,471 to Hunter, e.g., at 1:62-67; U.S. 2002/0041174 to Purkey, e.g., at ¶46; U.S. 6,344,733 to Crass, e.g., at 2:24-41; U.S. 5,281,904 to Tomkins, e.g., at 2:63-3:7
1[A]	an internal power supply;	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **WO 2012/080996 A1 to Tracey et al.** Abstract ("The clips are interconnected (10, 28, 53) and **on-board starter batteries (15, 26)** are provided along the interconnecting cable (10) and/or at least one of the clips (20, 21). The **on-board starter battery (15, 26)** may comprise a lithium iron phosphate battery.") 2:10-14 ("an **on-board starter battery** means provided along the interconnection means and/or adjacent at least one of the clips"); 5:12-14 ("In the invention there is an **on-board starter battery** which comprises a plurality of interconnected batteries 15 which may be of the lithium iron phosphate type.") **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶28 [5:11-15] ("FIG. 1 illustrates a battery booster device including a polarity protection circuit according to an exemplary embodiment of the invention. A **boosting battery 2** with a positive terminal 4 and a negative terminal 6 is provided in the booster device.") **U.S. 2004/0239290 to Krieger** ¶4 ("There are a number of portable jump starters for vehicles having a dead starter battery. Such units provide the ability to jump-start a motor when another vehicle's battery is not available to the motorist. Portable jump starters usually have an

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		internal battery which is used to jump start the vehicle."); ¶6 ("Further, the known devices do not take advantage of their **internal battery** in addressing other possible needs of a motorist."); ¶8 ("In an exemplary embodiment, a portable jump starter/charger apparatus is provided that comprises: a housing; an **internal battery**, housed inside the housing; a pair of jumper cables coupled to the **internal battery**; and a function selector switch operative to switch between jump starting an external battery with the pair of jumper cables, and charging an external battery with the pair of jumper cables."); ¶17 ("The DC input 302 is coupled to the jump starter circuit 304, and can charge the **internal battery 308** of the jump starter circuit 304 directly. The **internal battery 308** can also be charged by the high frequency charger 306."); ¶18 ("The jump starter circuit of the present invention may include a polarity protection circuit (not shown) that can be electrically coupled to the depleted battery and to the **internal battery 308**. The polarity protection circuit can prevent current flow between the batteries unless a proper polarity connection is achieved, i.e. the positive terminal of the **internal battery** is connected to the positive terminal of the depleted battery and the negative terminal of the **internal battery** is connected to the negative terminal of the depleted battery.") **U.S. 2007/0285049 to Krieger** ¶13 ("A **power source 20**, for example a battery, such as a sealed lead acid battery, a nickel cadmium battery, a nickel metal hydride battery or the like, may be disposed in the housing 10 (FIG. 3). The **battery 20** may be adapted to provide DC power for a variety of applications."); ¶17 ("The battery 20 may also be used to provide jumpstarting power for vehicles such as cars, RVs, and the like, which cannot start due to a depleted vehicle battery.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** Abstract ("An apparatus for providing power, the apparatus having a housing; a battery module positioned inside of the housing, the battery module having: a battery, a battery circuit board coupled to the battery and an ignition output port

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		coupled to the battery circuit board; a circuit board positioned inside of the housing and coupled to the battery module, the circuit board having: a charge module, a discharge module, a lighting module and a control module coupled to the charge module, the discharge module and the lighting module; a light source coupled to the circuit board; and wherein the apparatus is configured to provide sufficient power to jump start a vehicle."); ¶7 [1:50-55] ("Accordingly, the present invention according to an embodiment is directed to an apparatus for providing power comprising: a housing; a battery module positioned inside of the housing, the battery module further comprising: a battery, a battery circuit board coupled to the battery and an ignition output port coupled to the battery circuit board."); ¶27 [4:8-14] ("The mobile power bank 10 includes a housing 12, a control circuit board 14, and a battery module 16. The housing 12 comprises an upper cover 18 and a base cover 20. The upper cover 18 is coupled to the base cover 20 to form an enclosed, storage space. The control circuit board 14 and the battery module 16 may be accommodated and fixed inside the storage space.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶7 ("An emergency power source has a housing. The housing has at its inside a **batter[y] pack** for storing electric energy. Input terminals of the **battery pack** are connected to output terminals of a charging circuit and a solar panel input circuit, output terminals of the **battery pack** are connected to a high current outputting circuit for outputting a high current used for starting a vehicle, and an external smart battery detection system is connected between the **battery pack** and the high current outputting circuit."); ¶8 ("In certain embodiments, the battery pack consists of lithium-ion batteries connected in series or parallel, each battery having a positive electrode made of lithium iron phosphate, lithium cobalt oxide, nickel cobalt manganese ternary lithium or lithium manganate and a negative electrode made of artificial or natural graphite, the output terminal of the battery pack is further connected to a multipath DC-DC voltage regulator circuit and a LED driving circuit, each path of the DC-DC voltage regulator circuit is connected to a MCU controller circuit, and the MCU controller circuit is further connected to a smart LED electric

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		quantity display system for displaying the electric quantity of the emergency power source, an output terminal of the LED driving circuit is connected to a LED lighting lamp, and an equalization protection circuit is connected in parallel with the battery pack for protecting the battery pack."); ¶26 ("As shown in FIGS. 1 to 3, an emergency power source includes a housing having at its inside a **battery pack 4** for storing electric energy. Input terminals of the **battery pack 4** are connected to output terminals of a charging circuit 1 and a solar panel input circuit 2, output terminals of the **battery pack 4** are connected to a high current outputting circuit 7 for outputting a high current used for starting a vehicle, and an external smart battery detection system 6 is connected between the **battery pack 4** and the high current outputting circuit 7.") **U.S. 2005/0116688 to Yin** ¶5 ("To attain this, the power source of the present invention generally comprises a rechargeable battery, a flash light circuit, a positive battery clamp which is connected via a normally open contact relay to the positive terminal of the rechargeable battery, a negative battery clamp which is connected to the negative terminal of the rechargeable battery, and a circuit for protecting against reverse polarity connection and short circuit of the battery clamps …"); ¶20 ("As illustrated in FIG. 1, the power source with an anti-reverse connection and short circuit protection circuit for starting motor vehicles generally comprises a charging circuit, **an internal rechargeable battery B**, a circuit for protecting against reverse polarity connection and short circuit of the battery clamps, a flash light circuit, an electricity testing circuit, an inverting circuit, a fluorescent tube circuit, a light L and an air pump M. Save for the circuit for protecting against reverse polarity connection and short circuit of the battery clamps and the flash light circuit, the other circuits are connected in ways similar to those of the current power sources for starting vehicles in the marketplace."); ¶26 ("The power source provides electric power via the first diode D1 to the first relay JD1, thereby energizing the first relay JD1 and connecting the rechargeable battery B with the vehicle's battery to start the

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		vehicle."); ¶28 ("The rechargeable battery B provides power to the flash light circuit making the light L1 to flash.") **U.S. 2014/0368155 to Chen** ¶7 ("The smart vehicle rescue battery apparatus includes **a battery unit** …"); ¶8 ("Moreover, the battery unit is a storage battery."); ¶18 ("The smart vehicle rescue battery apparatus 10 includes **a battery unit 102** …"); ¶23 ("Moreover, the battery unit 102 is a storage battery.") **U.S. 2015/0137740 to Allos** ¶9 ("Coupled to the housing may be a **rechargeable source of energy 105**, which is in many cases a **plurality of battery cells** which may be charged, e.g., from a wall or other outlet source."); ¶16 ("The batteries may be lead acid, absorption glass mat (AGM), lithium ion, or the equivalent …"); *see also* U.S. Provisional Patent Application 61/903,779 at 1-2. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶5 ("To achieve the purpose described above, the present disclosure provides the following technical solutions: a novel automobile charger comprises a direct current power supply …"); ¶23 ("Refer to FIG. 1, a novel automobile charger comprises a **direct current power supply**, wherein the positive pole of the direct current power supply is connected with one end or lead of the DC to DC module, one end of the battery voltage detection module and one end of the load module simultaneously, while the negative pole of the direct current voltage is connected with the other end of the DC to DC module, one end of the microcontroller, one end of the automobile start control module and the other end of the battery voltage detection module simultaneously.") **U.S. 2006/0220610 to Solberg**

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		¶20 ("…a plurality of **boost modules 108 and 110**."); ¶21 ("The link may connect one or more of the outputs of the **boost modules 108 and 110** to an input of the receiver 120."); ¶24 ("In FIG. 1, the boost modules 108 and 110 are separate active energy storage elements. The energy storage elements may deliver current that is proportional to the rate of change of the voltage they store. A first boost module 108 may deliver a substantially smaller amount of current than the second boost module I 10. When the boost modules 108 and 110 are delivering current during a common time period, some second boost modules 110 may deliver a substantially larger current than some first boost modules 108. In some charging systems, the second boost module 110 delivers a boost current that is almost twice the boost current or greater than twice the boost current delivered by the first boost module 108."); ¶30 ("In FIG. 2, the first and second boost modules 208 and 210 comprise separate active circuit elements (e.g., capacitors or ultra capacitors) that store charge.") The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶¶36-37; U.S. 2006/0176011 to Lui, e.g., at ¶34; U.S. 2001/0025618 to Kelling, e.g., at ¶16; U.S. 2014/0084844 to Weflen, e.g., ¶¶21-22; U.S. 2004/0150373 to Chan, e.g., at ¶17; U.S. 2012/0025766 to Reade, e.g., at ¶¶31-32; U.S. 2006/0244412 to Bonzer, e.g., at ¶21; U.S. 6,759,833 to Chen, e.g., at 2:21-34; U.S. 3,590,357 to Reid, e.g., at 1:36-54; U.S. 5,194,799 to Tomantschger, e.g., at 6:37-55; U.S. 2014/0210399 to Urschel, e.g., at ¶30; U.S. 3,638,108 to Channing, e.g., at 3:25-31; U.S. 6,650,086 Chang; e.g., at 3:16-18; U.S. 6,344,733 to Crass, e.g., at 2:42-58; U.S. 5,281,904 to Tomkins, e.g., at 3:13-25
1[B]	an output port having positive and negative polarity outputs;	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶28 [5:15-21] ("The positive terminal 4 of the boosting battery 2 is coupled to one of a pair of alligator clamps 8, 10 to be connected to a battery to be charged 11

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		(depleted battery) via a wire or battery cable. The negative terminal 6 of the boosting battery 2 is connected to the other of the alligator clamps 8, 10 to be connected to the battery to be charged 11 via a wire or battery cable.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶64 ("Typically, the battery charger includes **a pair of clamps 60, 61** for connection to the positive terminal and the negative terminal, respectively, of the battery to be charged 21. A polarity detection circuit detects the polarity of the connection of **clamps 60, 61** and provides a signal to the microprocessor 50. In response to the signal from polarity detection circuit, the microprocessor controls the operation of the battery charger to supply power to the battery 21 or indicate an incorrect polarity accordingly.") **U.S. 2004/0239290 to Krieger** ¶5 ("However, this patent teaches jumpstarting the vehicle through a set of jumper cables, and charging the dead vehicle battery from a DC output that presumably requires a separate set of cables connected between the DC output and the terminals of the dead battery."); ¶14 ("The jump starter/charger also has two conventional jumper cables, including a positive jumper cable 106 and a negative jumper cable (not visible) in FIG. 1. The positive and negative cables are selectively coupled to the jump starting circuit and the charging circuit.") **U.S. 2007/0285049 to Krieger** ¶16 ("The jump starter therefore may include a set of jumper cables 16 that may be used to connect the battery 20 in the housing 10 to the depleted vehicle battery. Such jumper cables 16 are well known to those of ordinary skill in the art."); ¶17 ("The jumper cables may be detachable from the housing. An end of the jumper cables may include a plug 17 that may be received in the housing 10 to connect the cables to the internal battery 20. At an end of the cables 16 opposite the plug 17

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		there may be a pair of clamps 24 for connecting to the depleted battery. The housing 10 may also include clips or holsters for the jumper cables 16. The housing 10 may also be provided with pins, guides, compartments or the like in order to allow a user to wrap the jump starter cables 16 for storage, thus keeping the cables neat and accessible.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶7 [1:50-55] ("Accordingly, the present invention according to an embodiment is directed to an apparatus for providing power comprising: a housing; a battery module positioned inside of the housing, the battery module further comprising: a battery, a battery circuit board coupled to the battery and **an ignition output port** coupled to the battery circuit board."); ¶8 [1:64-2:4] ("In an embodiment, the **ignition output port** outputs power at a voltage higher than about 13.6 volts. The ignition output port may further comprise a positive and negative barrel jack. The battery may comprise a lithium iron phosphate battery cell or a lithium cobalt oxide battery cell. Optionally, the battery circuit board is configured to boost battery voltage output to the ignition output board to above about 13.6 volts."); ¶11 [2:40-43] ("Optionally, the apparatus further comprises a vehicle ignition cable having a first end coupleable to the ignition output port and a second end coupleable to terminals of a vehicle battery."); ¶13 [3:10-13]("Optionally, the apparatus further comprises a vehicle ignition cable having a first end coupleable to the **ignition output port** and a second end coupleable to terminals of a vehicle battery."); ¶34 [5:6-9] ("In an embodiment, the battery module 16 includes battery cells 42, a battery circuit board 44, an ignition output port 46, and a connecting ribbon cable 48."); ¶38 [5:52-61] ("The output of the battery cell 42 is provided to the vehicle's ignition via a vehicle ignition cable (not shown) coupleable to the ignition output port 46. In an embodiment, the vehicle ignition cable has a first end with a connector configured to fit into the ignition output port 46 and a second end with positive and negative connectors, such as clamps or clips, that are connectable to vehicle battery terminals. **The output port 46 may be a positive and negative barrel socket.** In an embodiment, the mobile power bank of the present invention is

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		provided in a kit with the vehicle ignition cable."); ¶55 [8:49-56] ("In an embodiment, sidewalls of the upper cover 18 have openings adjacent to the flashlight 28, the charging port 34, the USB interfaces 38, 40, the LED indicator module 32, and the ignition output port 46. The openings allow the flashlight 28 and LED indication lights of the LED indicator module 32 to emit light outside of the housing 12 and allow external devices and adaptors access to the charging port 34, the USB interfaces 38, 40 and the ignition output port 46.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶7 ("Input terminals of the battery pack are connected to output terminals of a charging circuit and a solar panel input circuit, output terminals of the battery pack are connected to a high current outputting circuit for outputting a high current used for starting a vehicle, and an external smart battery detection system is connected between the battery pack and the high current outputting circuit."); ¶9 ("In certain embodiments, the external smart battery detection system includes a red power source clip and a black power source clip for connecting with an external battery, a relay switchable between an ON state and an OFF state according to a detection signal, a voltage identifying system for identifying the voltage of an external lead-acid battery or a lithium-ion starting battery, and a current identifying system for identifying a current flowing through an external starting circuit, two terminals of a coil of the relay are connected to the voltage identifying system, an input terminal of the relay is connected to the current identifying system, an output terminal of the relay is connected to the high current outputting circuit, **the red and black power source clips are connected to the positive and negative electrodes of the battery pack** through an reverse-insertion-proof connector or welded wires, the voltage identifying system is connected to the red and black power source clips, the relay is a 12V or 24V relay with a rating current ranging from 20 A to 300 A and 4 to 6 pins, the external smart battery detection system is either disposed outside the emergency power source and connected to the emergency power source through a reverse-insertion-proof connector, or disposed inside the emergency power source while the red and black power source clips is disposed outside the emergency

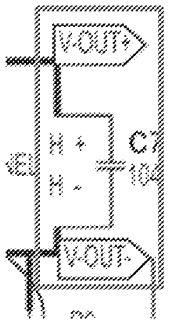
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		power."); ¶26 ("Input terminals of the battery pack 4 are connected to output terminals of a charging circuit 1 and a solar panel input circuit 2, output terminals of the battery pack 4 are connected to a high current outputting circuit 7 for outputting a high current used for starting a vehicle, and an external smart battery detection system 6 is connected between the battery pack 4 and the high current outputting circuit 7."); ¶29 ("The external smart battery detection system 6 includes a red power source clip and a black power source clip for connecting with an external battery, a relay switchable between an ON state and an OFF state according to a detection signal, a voltage identifying system for identifying the voltage of an external lead-acid battery or a lithium-ion starting battery, and a current identifying system for identifying a current flowing through an external starting circuit. The voltage identifying system is connected between two terminals of a coil of the relay, an input terminal of the relay is connected to the current identifying system, an output terminal of the relay is connected to the high current outputting circuit 7, **the red and black power source clips are connected to the battery pack through an anti-reverse connector connected to the positive and negative electrodes of the battery pack 4 or conducting wires welded to the positive and negative electrodes of the battery pack 4**.") **U.S. 2005/0116688 to Yin** ¶2 ("A power source generally comprises a battery and **two battery clamps which are connected to the positive and negative terminals of the battery respectively**."); ¶5 ("… a positive battery clamp which is connected via a normally open contact relay to the positive terminal of the rechargeable battery, a negative battery clamp which is connected to the negative terminal of the rechargeable battery …"); ¶21 ("As illustrated in FIG. 2, the positive terminal of the rechargeable battery B is connected via a normally open contact relay JD1 to one part of the positive battery clamp 1. The negative terminal of the rechargeable battery B is connected to one part of the negative battery clamp."); Figure 3 **U.S. 2014/0368155 to Chen**

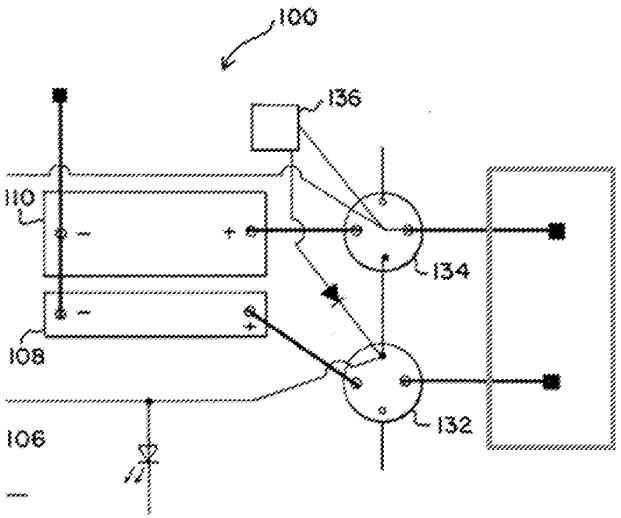
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		¶19 ("The first switch unit 104 is **electrically connected** to the battery unit 102 and the vehicle battery A. The second switch unit 106 is **electrically connected** to the battery unit 102, the first switch unit 104 and **the vehicle battery 20**. The third switch unit 108 is **electrically connected** to the battery unit 102, the first switch unit 104 and the **vehicle battery 2**0. The fourth switch unit 110 is **electrically connected** to the battery unit 102, the second switch unit 106, the third switch unit 108 and the **vehicle battery 20**."); ¶21 ("The control unit 112 is configured to turn on the first switch unit 104 and the fourth switch unit 110 and turn off the second switch unit 106 and the third switch unit 108, when the polarity of a contact connecting the first switch unit 104, the third switch unit 108 and the vehicle battery 20 is judged to be **a positive pole** and when the polarity of a contact connecting the second switch unit 106, the fourth switch unit 110 and the vehicle battery 20 is judged to be **a negative pole**."); ¶22 ("The control unit 112 is configured to turn on the first switch unit 104 and the fourth switch unit 110 and turn off the second switch unit 106 and the third switch unit 108, when the polarity of a contact connecting the first switch unit 104, the third switch unit 108 and the vehicle battery 20 is judged to be **a positive pole** and when the polarity of a contact connecting the second switch unit 106, the fourth switch unit 110 and the vehicle battery 20 is judged to be **a negative pole**.") **U.S. 2015/0137740 to Allos** ¶17 ("The mobile charging system may be connected to the electrical system of that vehicle via battery cables 18 and 19 and clamped onto each terminal of a dead battery."); *see also* U.S. Provisional Patent Application 61/903,779 at 2. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶23 ("Refer to FIG. 1, a novel automobile charger comprises a direct current power supply, wherein the positive pole of the direct current power supply is connected with one end or lead of the DC to DC module, one end of the battery voltage

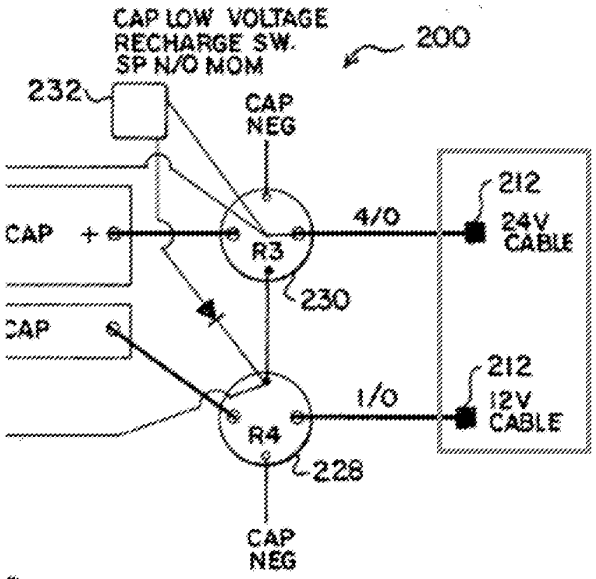
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		detection module and one end of the load module simultaneously, while the negative pole of the direct current voltage is connected with the other end of the DC to DC module, one end of the microcontroller, one end of the automobile start control module and the other end of the battery voltage detection module simultaneously. A third end of the DC to DC module is connected with the other end of the microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the load detection module respectively, wherein the other end of the load detection module is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module.")  Figure 2 **U.S. 2006/0220610 to Solberg** ¶32 ("At act 504, the operator couples the charging cables to a vehicle. The connection may comprise connecting one or both output cables to separate or common elements of the vehicle's battery or electrical system."); ¶36 ("At act 604, the operator couples the charging cables to a vehicle. The connection may comprise connecting one or both output cables to separate or common elements of the

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		vehicle's battery or electrical system."); ¶40 ("At act 702, the operator couples the charging cables to a vehicle. The connection may comprise connecting one or both output cables to separate or common elements of the vehicle's battery or electrical system.")  Figure 1

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		 Figure 2 The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶¶31, 41-44; U.S. 2014/0084844 to Weflen, e.g., ¶23; U.S. 2004/0150373 to Chan, e.g., at ¶17
1[C]	a vehicle battery isolation sensor connected in circuit with said positive and negative polarity outputs, configured to detect presence of a vehicle battery connected between said positive and negative polarity outputs;	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶44 [8:48-53] ("By way of a **feedback circuit or other means**, the microprocessor 60 can monitor the voltage and/or current being supplied to the depleted battery 11 from the booster battery 2, the voltage and/or current of the battery 11 and can

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		detect short circuits or other faults, as described in more de tail below."); ¶48 [9:33-38] ("Microprocessor 60 can be programmed to detect if clamps 8, 10 are connected to a battery or have been disconnected. To perform the detection, the microprocessor 60 deactivates the switch 12 into a non-conducting state. **Via the feedback circuit or other means**, the microprocessor **detects whether clamps 8,10 are connected to a battery**.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶67 ("Once a correct polarity connection has been established, the transistor 72 may remain on even after clamps 60, 61 are disconnected from the battery 21. The disconnected clamps are thus still powered-up. Therefore, **a means for detecting the presence of a battery at the clamps may be provided**. The microprocessor 50 can be programmed to detect when the clamps 60, 61 have been disconnected and, in response, turn transistor 72 off. **A voltage divider comprised of resistors 74 and 76 is provided for this purpose**. The voltage divider divides the voltage across the clamps 60, 61 and provides a portion of this voltage to the microprocessor 50. When the clamps are disconnected from the battery 21, the voltage across the clamps 60, 61 will greatly increase. The voltage provided by the **voltage divider** will also increase in a corresponding manner. When the voltage provided to the microprocessor 50 exceeds a selected amount, for example, 18 volts, the microprocessor 50 detects that the clamps 60, 61 have been disconnected and immediately turns off transistors 69 and 70, which turns off transistor 72. Various resistors, such as resistor 78, may also be included in the circuit."); ¶68 ("According to another embodiment of the invention, the **means for detecting the presence of a battery** at the clamps may **detect the presence of a current flowing through the clamps 60, 61**, instead of, or in addition to the voltage across the clamps. The presence of a current flowing through the clamps 60, 61 may indicate whether the clamps 60, 61 are connected to a battery. A current flows through the clamps when they are connected to a battery and no current should flow through the clamps when they are not connected to a battery. The microprocessor 50 is adapted to detect the current flowing through the clamps 60, 61. **When no current is detected**, the

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		microprocessor 50 detects that the clamps 60, 61 have been disconnected and immediately turns off transistors 69 and 70, which turns off transistor 72."); ¶76 ("If the charge complete flag is not set, the process proceeds to step 134 (in FIG. 7) and detects if a battery is connected to the charger. This check can prevent current from being supplied from the battery charger unless a battery is connected to the battery charger, preventing a, potentially hazardous situation. The **means for detecting the presence of a battery** at the clamps discussed above in connection with FIG. 5 can be perform this check.") **U.S. 2004/0239290 to Krieger** ¶16 ("An example of a high-frequency charger that may be used to implement the present invention is described in U.S. patent application Ser. No. 10/270,391, entitled "A High Frequency Battery Charger and Method of Operating Same," commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety."); ¶18 ("An example of a jump starter that may be used to implement the present invention is described in U.S. patent application Ser. No. 10/315,061 entitled "Microprocessor Controlled Jump Starter System With Polarity Protection," commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety. The jump starter circuit of the present invention may include a polarity protection circuit (not shown) that can be electrically coupled to the depleted battery and to the internal battery 308. The polarity protection circuit can prevent current flow between the batteries unless a proper polarity connection is achieved, i.e. the positive terminal of the internal battery is connected to the positive terminal of the depleted battery and the negative terminal of the internal battery is connected to the negative terminal of the depleted battery. The above-mentioned U.S. patent application Ser. No. 10/315,061 describes a polarity protection circuit that may be used to implement this aspect of the described embodiment.")¶19 ("Both the jump starter 304 and the high frequency charger 306 have their own **internal diagnostics** (not shown, but described and illustrated in the above mentioned applications incorporated herein by reference) that check, for example,

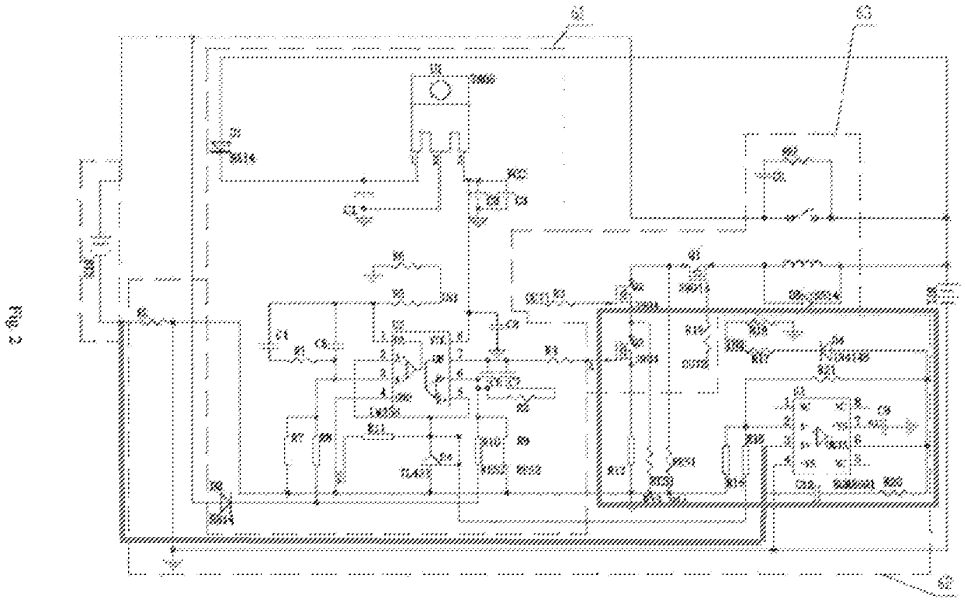
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		the status of the internal and/or depleted battery and whether the jumper cables are correctly attached to the external battery. The diagnostics can generate error codes which the microprocessor 312 can display on display 208 to notify the user of an error.") **U.S. 2007/0285049 to Krieger** ¶16 ("For example, a booster apparatus as described in U.S. patent application Ser. No. 10/315,061, which is incorporated herein by reference, may be provided.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶9 ("…a **current identifying system for identifying a current flowing through an external starting circuit**."); ¶17 ("In certain embodiments, a circuit of the current identifying system includes: a high-accuracy operational amplifier U3 whose model is SGM8591, resistors R12, R13, R14, R15, R16, R17, R18, R20, R21 and RS, capacitors C9 and C12, a switching diode D4 whose model is IN4148; and wherein pin 1 of U3 is floating, pin 2 of U3 is connected with a terminal of R16, a terminal of R15 and a terminal of R21, pin 3 of U3 is connected with a terminal of C12, a terminal of RS, and a negative electrode of BT2, pin 4 of U3 is grounded with a negative electrode of BT1 and the other terminal of RS, pin 5 of U3 is floating, pin 6 of U3 is connected with a terminal of R20, the other terminal of R21 and a positive electrode of D4, the other terminal of R20 is connected to the other terminal of C12, pin 7 of U3 is connected with terminal VCC and a terminal of C9, the other terminal of C9 is grounded, pin 8 of U3 is floating, a negative electrode of D4 is connected to a terminal of R17, the other terminal of R17 is connected with a terminal of R18 and terminal IN2, the other terminal of R18 is grounded, the other terminal of R15 is connected with a terminal of R12, a terminal of R13, and a terminal of R14."); ¶32 ("FIGS. 2 and 3 show a circuit diagram of the external smart battery detection system 6. BT1 is a rechargeable battery, which is the battery pack 4 in FIG. 1, and BT2 is a vehicle battery to be charged."); ¶33 ("Specifically, a circuit 62 of the current identifying system includes: a high-accuracy operational

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		amplifier U3 whose model is SGM8591, resistors R12, R13, R14, R15, R16, R17, R18, R20, R21 and RS, capacitors C9 and C12, a switching diode D4 whose model is IN4148; and wherein pin 1 of U3 is floating, pin 2 of U3 is connected with a terminal of R16, a terminal of R15 and a terminal of R21, pin 3 of U3 is connected with a terminal of C12, a terminal of RS, and a negative electrode of BT2, pin 4 of U3 is grounded with a negative electrode of BT1 and the other terminal of RS, pin 5 of U3 is floating, pin 6 of U3 is connected with a terminal of R20, the other terminal of R21 and a positive electrode of D4, the other terminal of R20 is connected to the other terminal of C12, pin 7 of U3 is connected with terminal VCC and a terminal of C9, the other terminal of C9 is grounded, pin 8 of U3 is floating, a negative electrode of D4 is connected to a terminal of R17, the other terminal of R17 is connected with a terminal of R18 and terminal IN2, the other terminal of R18 is grounded, the other terminal of R15 is connected with a terminal of R12, a terminal of R13, and a terminal of R14."

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		 Figure 2 ¶36 ("When the emergency power source is disconnected from the external rechargeable battery, or the current is smaller than the preset current value, R15 and R16 in the **circuit 62 of the current identifying system** provide a detection signal to U3. Then U3 sends an output signal to the MCU controller chip according to the detection signal, based on which the MCU controller chip may determine the ON or OFF state of the circuit to make proper instructions.") **U.S. 2005/0116688 to Yin** ¶21 ("The circuit for protecting against reverse polarity connection and short circuit of the battery clamps comprises two relays JD1, JD2 and at least two diodes D1, D2; **one terminal of the wire coils of the first relay JD1** and the second relay JD2

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		are connected to the positive battery clamp 1; the other terminal of the wire coil of the **first relay JD1 is connected to the positive terminal of the first diode D1** and the negative terminal of the first diode D1 is connected to the negative battery clamp; the other terminal of the wire coil of the second relay JD2 is connected to the negative terminal of the second diode D2 and the positive terminal of the second diode D2 is connected to the negative battery clamp."); ¶23 ("As illustrated in FIGS. 2 and 3, a conducting wire 2 is disposed on one part of the positive battery clamp 1. The **conducting wire 2 is connected via the wire coil of the first relay JD1** and the **first diode D1** with the negative battery clamp."); ¶24 ("In normal situations, the battery clamps have no electricity and this prevents short circuit of the battery clamps. When the battery clamps are connected to the vehicle's battery, the polarity detecting circuit will detect the polarity automatically and if the polarity is correct, the circuit will **allow the first relay JD1 to conduct electricity** and thus connect the circuit of the rechargeable battery B and the vehicle's battery to start the vehicle."); ¶26 ("The power source **provides electric power via the first diode D1 to the first relay JD1**, thereby **energizing the first relay JD1** and connecting the rechargeable battery B with the vehicle's battery to start the vehicle."); ¶27 ("After starting the vehicle, the operator removes the battery clamps from the vehicle's battery. The two parts 11, 12 of the positive battery clamp 1 will be instantly separated and this will **cause the first relay JD1 to be in an off state** and even if the two parts 11, 12 contact each other again, the first relay JD1 will remain in an off state and short circuit will not occur in the rechargeable battery B and so the rechargeable battery B will not burnt out.") **U.S. 2015/0137740 to Allos** ¶22 ("When the mobile charging system is correctly connected to a vehicle with a discharged battery, the green warning light 10 will illuminate, indicating proper connection. Component 18 with circuit C16 will have positive voltage and component 19 with circuit C1 will have negative voltage. C16 and C1 circuits are monitored by component 20 (forward polarity sense circuit), and this component includes three resistors with ratio values biased for low voltage detection. When

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		circuit C16 voltage value is 2 or more volts more positive than circuit C1, **the operational amplifier L2722 will conduct and switch its output circuit C25 to 12V positive to energize component 21 (Relay 3)**. When relay 3 N.O. (normally open) contacts are closed, 12V power from circuit C14 will connect with circuit C24 to **turn green light on** in component 10, indicating the correct and safe hook-up of the mobile charging system."); *see also* U.S. Provisional Patent Application 61/903,779 at 2. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶5 ("A third end of the DC to DC module is connected with the other end of the microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the **load detection module** respectively, wherein the other end of the **load detection module** is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶6 ("the **load detection module** which comprises the automobile storage battery or the automobile engine **detects whether the load module is correctly connected**."); ¶23 ("A third end of the DC to DC module is connected with the other end of the microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the **load detection module** respectively, wherein the other end of the **load detection module** is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶24 ("… two ends of the automobile storage battery are in parallel connection with the capacitor C7, resistors R9, 10, a capacitor C6 and a resistor R13 to form **the load detection module** together …");¶25 ("The battery voltage detection module conducts the measurement of the batter voltage, and the automobile start control

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		module conducts the power supply or the power outage for the load module through the microcontroller, wherein **the load detection module detects whether the load module is correctly connected**."); ¶26 ("The microcontroller in the present disclosure determines whether the automobile storage battery is connected with the automobile engine through the load detection module, wherein the automobile start control model is automatically activated and the battery starts to supply power to the load module when the load is correctly connected; the automobile start control model is automatically deactivated and the battery stops supplying power to the load module when assuming that the load is not connected or the positive and negative polarities are reversely connected."); Figure 2 **U.S. 2006/0220610 to Solberg** ¶23 ("With or without input and output isolation (e.g., such as through **an opt-coupler**), the control module 104 monitors an output of the charging system 100 and compares it against a fixed or a programmable voltage level or voltage range. When the voltage equals or rises above the voltage level or falls within the voltage range, the control module 104 activates the second switch 130 that couples one or more of the boost modules 108 and 110 to the outputs of the charging system 100."); ¶29 ("The output of the charging system 200 is monitored by **a voltage and/or current monitoring circuit** within the controller 204. Voltage and/or current monitored at the output interface 212 are compared against a fixed or programmed reference. When the output exceeds the reference, a control signal activates the second, third, and fourth relays 224, 228, and 230.") The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶¶37; U.S. 2004/0150373 to Chan, e.g., at ¶¶17-21; U.S. 2012/0025766 to Reade, e.g., at ¶¶79, 103, 138, 154; U.S. 2006/0244412 to Bonzer, e.g., at Fig. 3; U.S. 6,759,833 to Chen, e.g., at 2:36-43; WO 2012/036556 to Eidsvig, e.g., at 5:12-15; U.S. 2002/0041174 to Purkey, e.g., at ¶62
1[D]	a reverse polarity sensor connected in circuit with said positive and	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation:

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	negative polarity outputs, configured to detect polarity of a vehicle battery connected between said positive and negative polarity outputs and to provide an output signal indicating whether positive and negative terminals of said vehicle battery are properly connected with said positive and negative polarity outputs of said output port;	**WO 2012/080996 A1 to Tracey et al.** 3:19-20 ("In one embodiment, the protection means comprises a circuit to short gate current to ground in the event of accidental reverse polarity connection."); 6:23-24 ("An integrated circuit IC1 is connected via a resistor R2 to the positive lead 103 and is connected to the negative lead 105 via reverse polarity indicator (LED1)."); 6:28-29 ("The circuit of the jump starter circuit 100 protects from voltage mismatch, reverse polarity, short circuit, over-discharge, and over-use."); 8:16-29 ("The circuit also protects against accidental reverse polarity connection. Should the operator inadvertently connect the jump starter circuit 100 backwards to the vehicle battery (i.e. positive clamp 4 to negative terminal and vice versa), the system offers two levels of protection. The first level is passive. As the MOSFETS Ql through Q3 are non-conductive, no current flow takes place upon connection. This eliminates any potentially dangerous and destructive electrical arcing at the vehicle battery terminals. Such arcing conditions have been linked with the destruction of modern vehicle electronic controls. Secondly, current from the vehicle battery flows via the resistor R2, reverse polarity indicator LED1 and the input side of the semiconductor photo-relay type TLP222 (IC1) thus illuminating LED1 and the input photo LED in IC1 . Even if the vehicle battery is severely discharged, the current requirement of IC1 is very small and will in most cases be less than 5 mA. Should the user ignore the reverse polarity indicator LED1 and depress SWl , MOSFET gate current is shunted to ground via an output MOSFET in IC 1 thus preventing the successful triggering of Q1 -Q3 and damage to the vehicle or to the jump starter 1.") **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** Abstract ("A polarity protection circuit for a battery booster device is provided. … The polarity protection circuit is electrically connected to the battery to be charged and to the boosting battery. The polarity protection circuit prevents current flow between the batteries unless proper polarity is achieved."); ¶2 [1:15-18] ("The present invention relates to a booster device used for boosting a depleted battery and

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		in particular to microprocessor control of the booster apparatus and a polarity protection circuit."); ¶10 [2:25-28] ("The polarity protection circuit is electrically connected to the battery to be charged (depleted battery) and to a boosting battery or other power source. The polarity protection circuit prevents current flow between the batteries unless proper polarity is achieved."); ¶11 [2:40-44] ("As mention above, a polarity protection circuit is provided in the booster device and prevents current flow between the batteries unless a proper polarity connection between the two batteries is achieved."); ¶31 [5:22-30] ("The switch 12 is activated by a polarity sensing circuit 16 to allow current flow from the boosting battery 2 to the depleted battery 11. The polarity sensing circuit 16 is coupled to the boosting battery 2 and to the depleted battery 11 when the clamps 8, 10 are connected to the depleted battery 11. The polarity sensing circuit 16 senses the polarity of the connection between the boosting battery 2 and the depleted battery 11 and provides a signal indicating the state of the connection. The signal from the polarity sensing circuit 16 is provided to the switch 12. When a proper polarity connection is signaled, the switch 12 completes the boosting circuit and permits current flow to the depleted battery 11."); ¶45 [8:60-66] ("Opto-isolator 16 is coupled to clamps 8, 10 via resistor 62 such that LED 26 is forward biased when a correct polarity connection between the boosting battery 2 and the depleted battery 11 is made. When forward biased, LED 26 turns on phototransistor 22. The collector 23 of the phototransistor 22 is coupled to a supply voltage via internal circuitry in the microprocessor 60. When the phototransistor 22 is on, **a first signal** of a first voltage is present at the collector 23 and is sensed by the microprocessor 60. When the phototransistor 22 is off, **a second signal** of a second voltage is present at the collector 23 and is sensed by the microprocessor 60.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶63 ("Additional **polarity and short-circuit protection circuitry** can also be provided, as shown in the embodiment of FIG. 5. FIG. 5 is a partial schematic diagram of a battery charger showing only the short circuit and polarity protection elements to simplify the understanding of this embodiment. The other elements of

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		the battery charger can be included as shown in FIGS. 1, 3, and 4."); ¶64 ("In this embodiment, the battery charger is provided with a **polarity detection circuit**. Only when the polarity detection circuit detects that the battery has been connected to the battery charger with correct polarity is power supplied to the battery. Typically, the battery charger includes a pair of clamps 60, 61 for connection to the positive terminal and the negative terminal, respectively, of the battery to be charged 21. A **polarity detection circuit detects the polarity of the connection of clamps 60, 61 and provides a signal to the microprocessor 50**. In response to the signal from polarity detection circuit, the microprocessor controls the operation of the battery charger to supply power to the battery 21 or indicate an incorrect polarity accordingly."); ¶65 ("In the embodiment illustrated in FIG. 5, the polarity detection circuit includes an **opto-isolator 62 connected to clamps 60, 61 and to microprocessor 50**. The opto-isolator includes a light-emitting diode (LED) 63 and a phototransistor 65. When the battery 21 is connected with correct polarity, clamp 60 is connected to the positive terminal and clamp 61 is connected to the negative terminal of the battery 21. LED 63 is then forward biased and turns on phototransistor 65. When the phototransistor 65 is turned on, it provides a logic high signal to a pin a4 of the microprocessor 50. The logic high signal indicates to the microprocessor 50 that a correct polarity connection has been made. Connecting clamp 60 to the negative terminal of battery 21 reverse biases the LED 63, and no signal is provided to the microprocessor 50.") **U.S. 2004/0239290 to Krieger** ¶18 ("An example of a jump starter that may be used to implement the present invention is described in U.S. patent application Ser. No. 10/315,061 entitled "Microprocessor Controlled Jump Starter System With Polarity Protection," commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety. The jump starter circuit of the present invention may include **a polarity protection circuit** (not shown) that can be electrically coupled to the depleted battery and to the internal battery 308. The **polarity protection circuit** can prevent current flow between the batteries

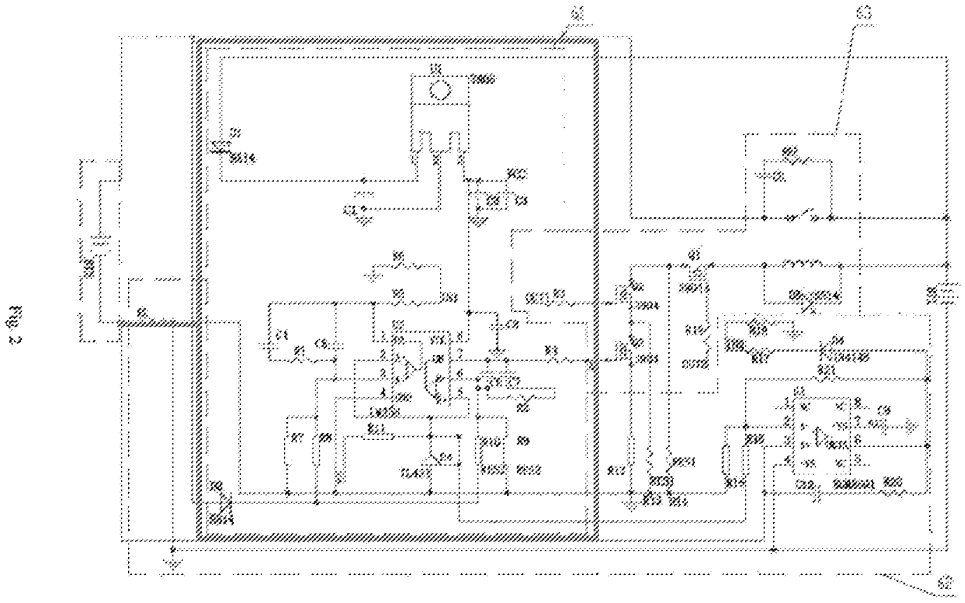
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		unless a proper polarity connection is achieved, i.e. the positive terminal of the internal battery is connected to the positive terminal of the depleted battery and the negative terminal of the internal battery is connected to the negative terminal of the depleted battery. The above-mentioned **U.S. patent application Ser. No. 10/315,061 describes a polarity protection circuit** that may be used to implement this aspect of the described embodiment.") **U.S. 2007/0285049 to Krieger** ¶16 ("The jump starter therefore may include a set of jumper cables 16 that may be used to connect the battery 20 in the housing 10 to the depleted vehicle battery. Such jumper cables 16 are well known to those of ordinary skill in the art. For example, **a booster apparatus as described in U.S. patent application Ser. No. 10/315,061**, which is incorporated herein by reference, may be provided.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶9 ("… a **voltage identifying system** for identifying the voltage of an external lead-acid battery or a lithium-ion starting battery."); ¶30 ("When the red and black power source clips are respectively connected to the positive and negative electrodes of the external battery, **if the connection is correct, a feedback voltage displayed by the voltage identifying system is positive, otherwise the feedback voltage is negative**."); ¶34 ("Specifically, the **circuit 61** of the voltage identifying system includes: a dual operational amplifier U2 whose model is LM358, a three-terminal voltage regulator circuit U1 whose model is a 7805, resistors R1, R2, R4, R5, R6, R7, R8, R9, R10 and R11, capacitors C1, C2, C3, C4, C5, C6, C7 and C8, schottky diodes D1 and D2 whose model are SS14, and a three-terminal adjustable shunt voltage reference U4 whose model is TL431; and wherein pin 1 of U2 is connected with a terminal of R5, a terminal of C5 and a terminal of C4, the other terminal of R5 is connected with a terminal of R6 and terminal IN1, the other terminal of R6 is grounded, pin 2 of U2 is connected to pin 5 of U2, a terminal of R11, a negative electrode of U4, a reference electrode of U4, and the other terminal of R16, the

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		other terminal of R11 is connected to terminal VCC, pin 3 of U2 is connected with the other terminal of C5, a terminal of R1, a terminal of R7 and a terminal of R8, the other terminal of R1 is connected to the other terminal of C4, pin 4 of U2 is grounded with the other terminal of R7, a positive electrode of U4 and a terminal of R9, the other terminal of R8 is connected with a negative electrode of D2 and a terminal of R10, a positive electrode of D2 is connected to a positive electrode of BT2, pin 6 of U2 is connected with the other terminal of R10, the other terminal of R9, a terminal of C6 and a terminal of R2, pin 7 of U2 is connected with the other terminal of C6, a terminal of C7 and a terminal of R4, the other terminal of R4 is connected to node A, the other terminal of C7 is connected to the other terminal of R2, pin 8 of U2 is connected with a terminal of C8, a terminal of C2, a terminal of C3, pin 3 of U1 and terminal VCC, the other terminal of C8 is grounded, the other terminal of C2 is grounded with the other terminal of C3, pin 1 of U1 is connected with a terminal of C1 and a negative electrode of D1, pin 2 of U1 is grounded with the other terminal of C1, a positive electrode of D1 is connected to the positive electrode of BT1."); ¶36 ("When the preset voltage value is 8.1V and the output voltage value is smaller than the preset value, R7 and R8 of the **circuit 61** of **the voltage identifying system may provide a detection signal** to U2, and U2 may send an output signal to terminal IN1 according to the detection signal. Then the MCU controller chip further controls the control switch Q2 in the circuit 63 of the relay according to the signal from terminal IN1. When the output voltage is bigger than a preset value, which may be 12.6V in the invention, R9 and R10 of the circuit 61 of the voltage identifying system may provide a detection signal to U2, and U2 may send a signal according to the detection signal to control the control switch Q3 in the circuit 63 of the relay.")

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		 Figure 2 **U.S. 2005/0116688 to Yin** ¶24 ("High current relays and **polarity detecting circuit** are used in the present invention. In normal situations, the battery clamps have no electricity and this prevents short circuit of the battery clamps. When the battery clamps are connected to the vehicle's battery, **the polarity detecting circuit will detect the polarity automatically and if the polarity is correct, the circuit will allow the first relay JD1 to conduct electricity and thus connect the circuit of the rechargeable battery B and the vehicle's battery** to start the vehicle. If the polarity is detected to be reversely connected, the circuit will maintain the first relay JD1 in an off state and the rechargeable battery B and the vehicle's battery are not connected and so the vehicle's battery will not be burnt out owing to the reverse polarity connection.");

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		¶25 ("When the battery clamps are not connected with the vehicle's battery, the first relay JD1 has no voltage and is in an off state and the battery clamps have no electricity. This can prevent danger caused by short circuit of the battery clamps."); ¶26 ("When the battery clamps and the vehicle's battery are connected with the correct polarity, **the second diode D2 is reversely biased**, the second relay JD2 is in an off state, the light L1 does not flash and the buzzer BU does not sound. The **power source provides electric power via the first diode D1** to the first relay JD1, thereby energizing the first relay JD1 and connecting the rechargeable battery B with the vehicle's battery to start the vehicle."); ¶28 ("When the two battery clamps are reversely connected to the two terminals of vehicle's battery, **the first diode D1 is in a reversed close state** in the circuit of the first relay JD1 and so the **first relay JD1 remains in an off state**, which leads to the disconnection of the rechargeable battery B and the vehicle's battery, thereby eliminating the risks of incurring high current and sparks. Simultaneously, the vehicle's battery provides power to the second relay JD2 and the buzzer BU via **the second diode D2, thereby energizing the second relay JD2 and making the buzzer BU to sound**. The rechargeable battery B provides power to the flash light circuit making the light L1 to flash.") **U.S. 2014/0368155 to Chen** ¶18 ("… a voltage polarity detection unit 114 …"); ¶19 ("The voltage polarity detection unit 114 is electrically connected to the first switch unit 104, the second switch unit 106, the third switch unit 108, the fourth switch unit 110, the vehicle battery 20 and the control unit 112."); ¶20 ("The voltage polarity detection unit 114 is configured to detect the voltage polarity of the vehicle battery 20 and inform the control unit 112."); ¶23 ("The voltage polarity detection unit 114 is, for examples but not limited to, a microprocessor, a microcontroller, or a voltage polarity detection apparatus having electronic components.") **U.S. 2015/0137740 to Allos**

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		¶45 ("This reverse source of voltage originates from the vehicle battery. Component 13 is a **reverse polarity sense circuit** that uses circuit C1 and C16 for input signals. It also uses circuit C14 from fuse No.5 for a 12 voltpower source that originates from battery 2a."); ¶46 ("The **reverse polarity sense circuit 13** includes in one implementation three resistors with ratio values biased for low voltage, e.g., approximately negative 2 volts or greater at circuit C16. An operational amplifier L2722 may be configured as a voltage comparator. This component will output positive 12 volts through circuit C23 when its negative input is more negative than its positive input with approximately 2 volts or greater. This only occurs in reverse polarity connection to vehicle battery."); ¶47 ("The **reverse polarity sense circuit** is designed and configured in this manner to have the ability to detect reverse polarity condition even if the vehicle battery is discharged from 12 volts to as low as 2 volts."); ¶48 ("Once the **reverse polarity sense circuit** detects reverse polarity, it will conduct current and switch output circuit C23 to positive 12 volts energizing component 14 relay 1 that will **result in the enabling of the reverse polarity protection feature of the mobile charging system**, and the **disabling of the boost cycle power source to component 11**."); *see also* U.S. Provisional Patent Application 61/903,779 at 2, 5. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶5 ("A third end of the DC to DC module is connected with the other end of the microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the **load detection module** respectively, wherein the other end of the **load detection module** is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶6 ("the **load detection module** which comprises the automobile storage battery or the automobile engine **detects whether the load module is correctly connected**."); ¶23 ("A third end of the DC to DC module is connected with the other end of the

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		microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the **load detection module** respectively, wherein the other end of the **load detection module** is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶24 ("… two ends of the automobile storage battery are in parallel connection with the capacitor C7, resistors R9, 10, a capacitor C6 and a resistor R13 to form **the load detection module** together …");¶25 ("The battery voltage detection module conducts the measurement of the batter voltage, and the automobile start control module conducts the power supply or the power outage for the load module through the microcontroller, wherein **the load detection module detects whether the load module is correctly connected**."); ¶26 ("The microcontroller in the present disclosure determines whether the automobile storage battery is connected with the automobile engine through the load detection module, wherein the automobile start control model is automatically activated and the battery starts to supply power to the load module when the load is correctly connected; the automobile start control model is automatically deactivated and the battery stops supplying power to the load module when assuming that the load is not connected or the positive and negative polarities are reversely connected."); Figure 2 **U.S. 2006/0220610 to Solberg** ¶23 ("When the voltage equals or rises above the voltage level or falls within the voltage range, the control module 104 activates the second switch 130 that couples one or more of the boost modules 108 and 110 to the outputs of the charging system 100. When the control module 104 detects a reverse polarity, the second switch 130 is deactivated effectively shutting down the charging system 100."); ¶29 ("When a reverse polarity connection is detected, the control signal does not flow from the controller 204, which deactivates the second relay 224 and shuts down the charging system 200.")

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		The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶38; U.S. 2006/0176011 to Lui, e.g., at ¶6; U.S. 2001/0025618 to Kelling, e.g., at ¶17; U.S. 2014/0084844 to Weflen, e.g., at ¶14; U.S. 2004/0150373 to Chan, e.g., at ¶3; U.S. 2012/0025766 to Reade, e.g., at ¶161; U.S. 2006/0244412 to Bonzer, e.g., at ¶13; U.S. 6,759,833 to Chen, e.g., at 1:34-44; U.S. 3,590,357 to Reid, e.g., at 3:61-4:62; Fig. 2; U.S. 5,194,799 to Tomantschger, e.g., at 5:24-33, 6:51-55; 2014/0210399 to Urschel, e.g., at ¶38; U.S. 3,638,108 to Channing, e.g., at 3:14-45; WO 2012/036556 to Eidsvig, e.g., at 7:25-26; U.S. 2013/0162029 to Reichow, e.g., at ¶24; U.S. 2002/0041174 to Purkey, e.g., at ¶20; U.S. 5,281,904 to Tomkins, e.g., at 3:60-4:4
1[E]	a power switch connected between said internal power supply and said output port; and	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **<u>WO 2012/080996 A1 to Tracey et al.</u>** 3:8-11 ("In one embodiment, the control circuit further comprises a **switch** in the negative lead which is turned on for use. In one embodiment, the switch is a solid state switch. In one embodiment, the **switch comprises a MOSFET switch**. In one embodiment, the switch is an SCR. In one embodiment, there is a plurality of switches arranged in parallel."); 6:24-26 ("Also, a manual contact switch 115 (SW1) is connected on one side to the positive lead 3, and on the other to a Zener diode ZD1, a resistor Rl, in turn linked with a bank of MOSFET switches Ql, Q2, and Q3."); 7:8-11: ("The battery 102 positive terminal is also connected to the momentary action single pole normally open **switch SW1 115**. This **switch**, the Zener diode ZD1 , the resistor Rl and Metal Oxide Semiconductor Field Effect Transistors (MOSFETS) Ql to Q3 comprise the power-switching and over-discharge elements."); 7: 13-20 ("To activate the jump-starter system it must be connected to a vehicle battery by means of the positive and negative jaws 56 linked to the conductors 104 and 106. The **activation switch 115 (SW1)** is then briefly depressed. This switch may be located at any convenient location of the housing[.] Current flows from the battery (BAT) via ZD1 and Rl to the gates of International

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		Rectifier IRF 1324s MOSFETS (or alternates) Ql, Q2 and Q3 via their respective gate resistors R4, R5 and R6. Capacitor CI is also charged. Once a Vgs of 10V is applied to the MOSFETS Ql, Q2, and Q3 they begin conducting from drain to source with a very low ON state resistance, typically about 0.00033 Ohms for three parallel connected parts."); 8:5-7 ("When the voltage across CI drops below the gate threshold voltage of the MOSFETS, they will rapidly come out of conduction and switch off the output.") **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶29 [5:22-30] ("A switch 12 is coupled to one of the wires or battery cables to be connected to the depleted battery 11. The switch 12 is activated to complete a boosting circuit between the boosting battery 2 and the depleted battery 11 only when a correct polarity connection between the batteries is attained. In the embodiment shown, the switch 12 is arranged between the negative terminal 6 of the boosting battery 2 and the alligator clamp 10 intended to be connected to the negative terminal of the depleted battery 11.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶66 ("**Transistor 72 acts as a switch to connect battery 21 to the charger circuit.** Only when switch 72 is closed will transistor 69 complete the connection between the battery charger and the battery 21. The opening and closing of transistor 72 is controlled via transistors 69 and 70. A control electrode of transistor 69 receives the control signal from the microprocessor. When the control signal is received, transistor 69 turns on, which, in turn, turns on transistor 70. Current flow through transistor 70 activates a control electrode for transistor 72 and turns transistor 72 on, completing the circuit between the charger circuit and battery 21. Only when the control signal is provided to transistor 69 is it possible for transistor 72 to be turned on.") **U.S. 2004/0239290 to Krieger**

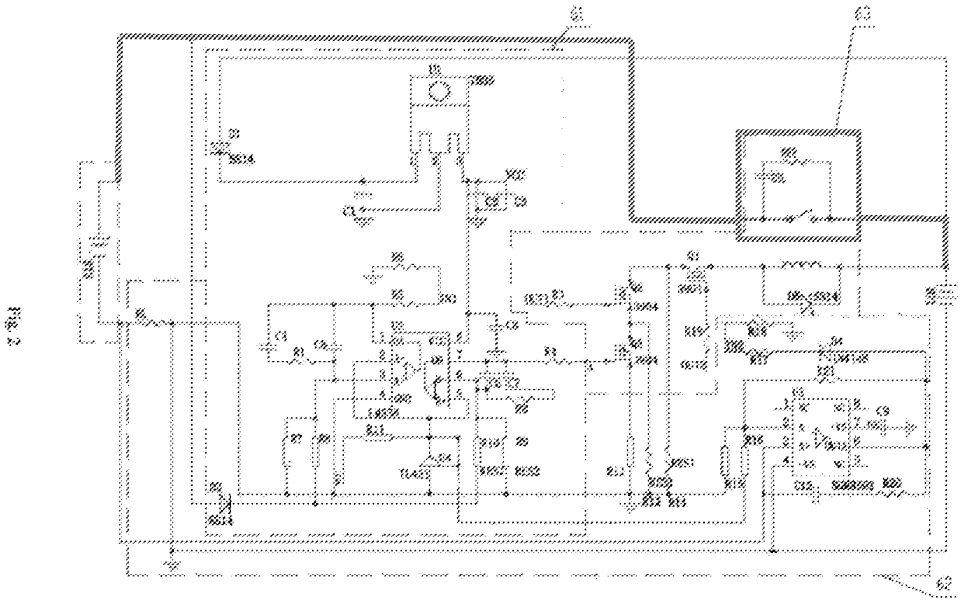
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		¶18 ("An example of a jump starter that may be used to implement the present invention is described in U.S. patent application Ser. No. 10/315,061 entitled "Microprocessor Controlled Jump Starter System With Polarity Protection," commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety. The jump starter circuit of the present invention may include a polarity protection circuit (not shown) **that can be electrically coupled to the depleted battery and to the internal battery 308**. The polarity protection circuit can **prevent current flow between the batteries unless a proper polarity connection is achieved**, i.e. the positive terminal of the internal battery is connected to the positive terminal of the depleted battery and the negative terminal of the internal battery is connected to the negative terminal of the depleted battery. The above-mentioned **U.S. patent application Ser. No. 10/315,061 describes a polarity protection circuit** that may be used to implement this aspect of the described embodiment."); ¶20 ("Both the jump starter 304 and the high frequency charger 306 may be coupled to the function selector switch 110. The function selector switch 110 may be either a manually operated or an automatoically operated [sic]. The function selector switch 110 that is automatically operated may be controlled by the microprocessor controller 312 or other suitable controller. The function selector switch 110 may be used to selectively connect the jumper cables to the output of the jump starter 304 and the output of the high frequency charger 306. Thus, both the jump starter 304 and the high frequency charger 306 use the same set of jumper cables 316.") **U.S. 2007/0285049 to Krieger** ¶16 ("For example, a booster apparatus as described in U.S. patent application Ser. No. 10/315,061, which is incorporated herein by reference, may be provided.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei**

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		¶29 ("The external smart battery detection system 6 includes a red power source clip and a black power source clip for connecting with an external battery, a **relay** switchable between an ON state and an OFF state according to a detection signal …"); ¶30 ("When the red and black power source clips are respectively connected to the positive and negative electrodes of the external battery, if the connection is correct, a feedback voltage displayed by the voltage identifying system is positive, otherwise the feedback voltage is negative. The positive feedback voltage ranges from value a of 6 to 24 V to value b of 9 to 30 V, and a is smaller than b. If the connection is reverse, the **relay does not work**, and the high current outputting circuit 7 may be cut off."); ¶31 ("In this invention, when the feedback voltage ranges from value a to value b and is of a positive value, the coil of the **relay receives a voltage signal so that its contact is closed** and **its output terminal is coupled to the high current outputting circuit 7**, and the emergency power source starts to power an external device with a high current."); ¶35 ("…a negative electrode of D5 is connected with the other terminal of the coil of the relay, a terminal of a normally open contact of the relay, a terminal of R22, and a positive electrode of BT1, the other terminal of R22 is connected to a terminal of C11, the other terminal of C11 is connected with a terminal of the normally open contact of the relay and a positive electrode of BT2..")

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Claim No.	Claim	Printed Publications
		 Figure 2 **U.S. 2005/0116688 to Yin** ¶26 ("The power source **provides electric power via the first diode D1 to the first relay JD1**, thereby **energizing the first relay JD1** and connecting the rechargeable battery B with the vehicle's battery to start the vehicle."); ¶27 ("After starting the vehicle, the operator removes the battery clamps from the vehicle's battery. The two parts 11, 12 of the positive battery clamp 1 will be instantly separated and this will **cause the first relay JD1 to be in an off state** and even if the two parts 11, 12 contact each other again, the first relay JD1 will remain in an off state and short circuit will not occur in the rechargeable battery B and so the rechargeable battery B will not burnt out.")

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		U.S. 2014/0368155 to Chen ¶7 ("The first switch unit is electrically connected to the battery unit and the vehicle battery. The second switch unit is electrically connected to the battery unit, the first switch unit and the vehicle battery. The third switch unit is electrically connected to the battery unit, the first switch unit and the vehicle battery. The fourth switch unit is electrically connected to the battery unit, the second switch unit, the third switch unit and the vehicle battery."); ¶18 ("The smart vehicle rescue battery apparatus 10 includes a battery unit 102, a first switch unit 104, a second switch unit 106, a third switch unit 108, a fourth switch unit 110, a control unit 112, a voltage polarity detection unit 114 and a charging unit 116.") **U.S. 2015/0137740 to Allos** ¶27 ("During the boost function, component 15 is also energized, closing internal contacts and transferring 12V power from C14 to C21, for the purpose of energizing contactor 17 N.C.to break open internal contacts that will disconnect circuit C20 from C16. **Component 17 acts as an isolator between the boost function and charging function of the MCS**. It is also energized during reverse polarity conditions."); ¶41 ("Current flows through the meter to circuit C20 and then to component 17 contactor N.C. **When component 17 is de-energized, current flows through it from circuit C20 to circuit C16 and then to component 18 to the vehicle battery**."); ¶42 ("**Component 17 acts as an isolator between charging and boost cycles**. As such, the same is de-energized during a charging cycle of the mobile charging system, and energized during jump start or "boost" function and during reverse polarity detection condition. During the charging cycle of the mobile charging system, the voltage output will vary between 13.8 to 14.3 volts, depending on the condition of the vehicle discharged battery."); ¶50 ("Component 15 may be de-energized during a reverse polarity condition and may act as an interrupt during boost cycle. When circuit C21 has +12 Volts it will **energize component 17** (Normally Closed) Contactor resulting in a circuit **break between circuit C16**

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		vehicle battery and circuit C20 that controls the mobile charging system output, thus providing protection to amp meter 8 and fuse box 4 and other internal mobile charging system components. In addition, it also prevents the mobile charging system boost and charge functions from causing electrical damage to the weak or discharged vehicle battery and electrical system by isolating the same from the mobile charging system internal power source."); *see also* U.S. Provisional Patent Application 61/903,779 at 3, 5. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶6 ("… the **automobile start control module** conducts the power supply or the power outage for the load module through the microcontroller …"); ¶11 ("As a further solution of the present disclosure that: the automobile start control module is the electronic switch."); ¶ 23 ("Refer to FIG. 1, a novel automobile charger comprises a direct current power supply, wherein the positive pole of the direct current power supply is connected with one end or lead of the DC to DC module, one end of the battery voltage detection module and one end of the load module simultaneously, while the negative pole of the direct current voltage is connected with the other end of the DC to DC module, one end of the microcontroller, one end of the **automobile start control module** and the other end of the battery voltage detection module simultaneously. A third end of the DC to DC module is connected with the other end of the microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the **automobile start control module** and one end of the load detection module respectively, wherein the other end of the load detection module is connected with the third end of the **automobile start control module** and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶24 ("a Drive port of the **automobile start control module** is connected with the automobile engine and one end of a resistor R14 simultaneously, wherein the other end of the resistor R14 is grounded."); ¶25 ("the **automobile start control module** conducts the power supply or the power outage for the load module

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		through the microcontroller"); ¶26 ("The microcontroller in the present disclosure determines whether the automobile storage battery is connected with the automobile engine through the load detection module, wherein the **automobile start control model** [sic] is **automatically activated and the battery starts to supply power to the load module** when the load is correctly connected; the **automobile start control model** [sic] is **automatically deactivated and the battery stops supplying power to the load module** when assuming that the load is not connected or the positive and negative polarities are reversely connected. In the standby mode, the microcontroller closes all outputs when the battery voltage is lower than 9V, and recovers the normal operation only when the battery voltage is larger than 10V; the automobile engine will generate the normal voltage to recharge the battery after the automobile starts, whereas the **automobile start control module** is deactivated immediately once the recharging voltage is larger than the voltage before that battery starts the power supply, to protect the battery from damages caused by charging with the normal voltage; the automobile start control module is the electronic switch, which can prevent the load from being reversely connected and recharging of the normal voltage, thus protecting the battery and prolonging lifespan."); ¶27 ("The automobile engine will generate abnormal voltage to recharge the direct current power supply after the automobile starts, and the **automobile start control module** is deactivated immediately once the recharging voltage is larger than the voltage before the direct current power supply starts the power supply, to protect the direct current power supply from damages caused by charging with normal voltage charge.") **U.S. 2006/0220610 to Solberg** ¶23 ("A control module 104 coupled to an output of charging system 100 and the **second switch 130 controls the states of the second, third, and fourth switches 130, 132, and 134**. With or without input and output isolation (e.g., such as through an opt-coupler), the control module 104 monitors an output of the charging system 100 and compares it against a fixed or a programmable voltage level or voltage range. When the voltage equals or rises above the voltage level or falls within the

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		voltage range, the control module 104 **activates the second switch 130** that couples one or more of the boost modules 108 and 110 to the outputs of the charging system 100. When the control module 104 detects a reverse polarity, the **second switch 130 is deactivated** effectively shutting down the charging system 100."); ¶29 ("The output of the charging system 200 is monitored by a voltage and/or current monitoring circuit within the controller 204. Voltage and/or current monitored at the output interface 212 are compared against a fixed or programmed reference. When the output exceeds the reference, **a control signal activates the second, third, and fourth relays 224, 228, and 230**. When a reverse polarity connection is detected, the control signal does not flow from the controller 204, which **deactivates the second relay 224** and shuts down the charging system 200. Analog gauges, digital, or light emitting diode displays 302 (as shown in FIG. 3) may provide a reverse polarity warning. A speaker or piezoelectric elements 302 may provide an audible warning to the user of a reverse polarity connection.") The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶¶30; U.S. 2006/0176011 to Lui, e.g., at ¶40; U.S. 2001/0025618 to Kelling, e.g., at ¶17; U.S. 2004/0150373 to Chan, e.g., at ¶¶12; U.S. 2006/0244412 to Bonzer, e.g., at ¶21-22; U.S. 6,759,833 to Chen, e.g., at 1:34-43; U.S. 5,194,799 to Tomantschger, e.g., at 6:37-55; U.S. 2014/0210399 to Urschel, e.g., at ¶40; U.S. 3,638,108 to Channing, e.g., at 6:35-46; U.S. 2013/0162029 to Reichow, e.g., at ¶24; U.S. 6,650,086 Chang; e.g., at 4:41-62; U.S. 2002/0041174 to Purkey, e.g., at ¶21; U.S. 6,344,733 to Crass, e.g., at 2:42-58; U.S. 5,281,904 to Tomkins, e.g., at 3:26-38
1[F]	a microcontroller configured to receive input signals from said vehicle isolation sensor and said reverse polarity sensor, and to provide an output signal to said power switch, such that said power switch is turned on to cause said internal power supply	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **<u>WO 2012/080996 A1 to Tracey et al.</u>** 6:23-26 ("An integrated circuit IC1 is connected via a resistor R2 to the positive lead 103 and is connected to the negative lead 105 via reverse polarity indicator (LED1). Also, a manual contact switch 115 (SW1) is connected on one side to the

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	to be connected to said output port in response to signals from said sensors indicating the presence of a vehicle battery at said output port and proper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs, and is not turned on when signals from said sensors indicate either the absence of a vehicle battery at said output port or improper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs.	positive lead 3, and on the other to a Zener diode ZD1 , a resistor Rl , in turn linked with a bank of MOSFET switches Ql , Q2, and Q3."); 7:13-20: ("To activate the jump-starter system it must be connected to a vehicle battery by means of the positive and negative jaws 56 linked to the conductors 104 and 106. The activation switch 1 15 (SW1) is then briefly depressed. This switch may be located at any convenient location of the housing Current flows from the battery (BAT) via ZD1 and Rl to the gates of International Rectifier IRF 1324s MOSFETS (or alternates) Ql , Q2 and Q3 via their respective gate resistors R4, R5 and R6. Capacitor CI is also charged. Once a Vgs of 10V is applied to the MOSFETS Ql , Q2, and Q3 they begin conducting from drain to source with a very low ON state resistance, typically about 0.00033 Ohms for three parallel connected parts."); 8:22-26 ("Secondly, current from the vehicle battery flows via the resistor R2, reverse polarity indicator LED1 and the input side of the semiconductor photo-relay type TLP222 (IC1) thus illuminating LED1 and the input photo LED in IC1 . Even if the vehicle battery is severely discharged, the current requirement of IC1 is very small and will in most cases be less than 5 mA.") **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶12 [2:45-46] ("In a further embodiment, the battery booster device may also comprise a **microprocessor**. The **microprocessor** can be used as part of a polarity protection circuit."); ¶43 [8:40-44] ("Referring now to FIG. 5, an example of a microprocessor controlled jump starter system according to an embodiment of the invention is described. The **microprocessor 60 can be programmed to perform essentially all of the control functions needed for operation of the jump starter**."); ¶44 [8:48-53] ("By way of a feedback circuit or other means, the microprocessor 60 can monitor the voltage and/or current being supplied to the depleted battery 11 from the booster battery 2, the voltage and/or current of the battery 11 and can detect short circuits or other faults, as described in more de tail [sic] below."); ¶45 [8:59-9:10] ("In this embodiment, **microprocessor 60 is used to control the switch 12**. Opto-isolator 16 is coupled to clamps 8, 10 via resistor 62 such that LED 26 is forward biased when a correct polarity connection between the

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		boosting battery 2 and the depleted battery 11 is made. When forward biased, LED 26 turns on phototransistor 22. The collector 23 of the phototransistor 22 is coupled to a supply voltage via internal circuitry in the microprocessor 60. When the phototransistor 22 is on, a first signal of a first voltage is present at the collector 23 and is sensed by the microprocessor 60. When the phototransistor 22 is off, a second signal of a second voltage is present at the collector 23 and is sensed by the microprocessor 60. The **microprocessor 60 provides output signals to activate the switch 12** into a conducting state when it receives the first signal and provides an output signal to deactivate the switch 12 into a non-conducting state when it receives the second signal. Additionally, the **microprocessor can deactivate switch 12** to terminate the jump starting process when a fault is detected."); ¶46 [9:11-26] ("The output signals from the **microprocessor 60** to control switch 12 are provided to control electrodes 14 a-14 d of transistors 12 a-12 d, as shown in FIG. 5. The control electrodes 14 a-14 d of the transistors are electrically connected to the microprocessor 60 via a level translator 68. Microprocessors normally run on low voltages, e.g., 5 volts. A low voltage power supply is provided to the **microprocessor 60** from battery 2 via a voltage regulator 70. The low voltage output signals from the **microprocessor 60** should be translated to higher voltages before being supplied to the transistors 12 a-12 d. The level translator 68 translates the output voltage of the **microprocessor 60** to the higher levels that are needed to operate transistors 12 a-12 d. Accordingly, the output signals from the **microprocessor 60** are used by the level translator 68 to generate control signals for the control electrodes of the FETs."); ¶47 [9:27-32] ("If the polarity connections of clamps 8, 10 to the depleted battery 11 are not correct, the switch 12 remains off. The display 64 may be controlled by the microprocessor 60 to display a message indicating reverse polarity. The microprocessor 60 may additionally activate an alarm such as buzzer 72 in response to the incorrect polarity connection."); ¶48 [9:33-42] ("**Microprocessor 60 can be programmed to detect if clamps 8, 10 are connected to a battery or have been disconnected**. To perform the detection, the microprocessor 60 deactivates the switch 12 into a non-conducting state. Via the feedback circuit or other means, the microprocessor detects whether clamps 8,10 are connected to a battery. If no battery is present, the switch 12 is placed in a non-

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		conducting state, that is, all the FETs 12 a-12 d are placed in a non-conducting state. If a battery is present, the jump starting process continues.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶57 ("The embodiment shown in FIG. 4 includes a **microprocessor** that controls many of the functions of the battery charger."); ¶58 ("In this embodiment, a **microprocessor 50 is coupled to switches 22, 24**, which may, for example, comprise FETS, and to the high frequency transformer portion 8."); ¶64 ("A polarity detection circuit detects the polarity of the connection of clamps 60, 61 and provides a signal to the microprocessor 50. In response to the signal from polarity detection circuit, the **microprocessor controls the operation of the battery charger to supply power to the battery 21 or indicate an incorrect polarity accordingly**."); ¶65 ("When the phototransistor 65 is turned on, it provides a logic high signal to a pin a4 of the **microprocessor 50**. The logic high signal indicates to the microprocessor 50 that a correct polarity connection has been made. Connecting clamp 60 to the negative terminal of battery 21 reverse biases the LED 63, and no signal is provided to the **microprocessor 50**."); ¶66 ("In response to the logic high signal, the **microprocessor 50 outputs a control signal to a control circuit for completing the connection between the battery charger and the battery 21**. Here, the control circuit includes a transistor 72 coupled between one of the clamps 60, 61 and the charger circuit. Transistor 72 acts as a switch to connect battery 21 to the charger circuit. Only when switch 72 is closed will transistor 69 complete the connection between the battery charger and the battery 21. The opening and closing of transistor 72 is controlled via transistors 69 and 70. **A control electrode of transistor 69 receives the control signal from the microprocessor**. When the control signal is received, transistor 69 turns on, which, in turn, turns on transistor 70. Current flow through transistor 70 activates a control electrode for transistor 72 and turns transistor 72 on, completing the circuit between the charger circuit and battery 21. **Only when the control signal is provided to transistor 69 is it possible for transistor 72 to be turned on.**"); ¶67 ("Once a correct polarity connection has been established, the transistor 72 may remain on even after clamps

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		60, 61 are disconnected from the battery 21. The disconnected clamps are thus still powered-up. Therefore, a **means for detecting the presence of a battery** at the clamps may be provided. The **microprocessor 50 can be programmed to detect when the clamps 60, 61 have been disconnected and, in response, turn transistor 72 off**. A voltage divider comprised of resistors 74 and 76 is provided for this purpose. The voltage divider divides the voltage across the clamps 60, 61 and provides a portion of this voltage to the microprocessor 50. When the clamps are disconnected from the battery 21, the voltage across the clamps 60, 61 will greatly increase. The voltage provided by the voltage divider will also increase in a corresponding manner. When the voltage provided to the **microprocessor 50** exceeds a selected amount, for example, 18 volts, the **microprocessor 50 detects that the clamps 60, 61 have been disconnected and immediately turns off transistors 69 and 70, which turns off transistor 72**. Various resistors, such as resistor 78, may also be included in the circuit."); ¶68 ("The presence of a current flowing through the clamps 60, 61 may indicate whether the clamps 60, 61 are connected to a battery. A current flows through the clamps when they are connected to a battery and no current should flow through the clamps when they are not connected to a battery. The **microprocessor 50 is adapted to detect the current flowing through the clamps 60, 61**. When no current is detected, the microprocessor 50 detects that the clamps 60, 61 have been disconnected and immediately turns off transistors 69 and 70, which turns off transistor 72.") **U.S. 2004/0239290 to Krieger** ¶16 ("An example of a high-frequency charger that may be used to implement the present invention is described in **U.S. patent application Ser. No. 10/270,391**, entitled "A High Frequency Battery Charger and Method of Operating Same," commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety.") (incorporating U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger, e.g., at ¶57 ("The embodiment shown in FIG. 4 includes a **microprocessor** that controls many of the functions of the battery charger."); ¶58; ¶64; ¶65; ¶66; ¶67; ¶68); ¶17 ("A **microprocessor**,

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		described below, may be used to control the charging process.") (quoted above); ¶18 ("**An example of a jump starter that may be used to implement the present invention is described in U.S. patent application Ser. No. 10/315,061 entitled "Microprocessor Controlled Jump Starter System With Polarity Protection,"** commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety. The jump starter circuit of the present invention may include a polarity protection circuit (not shown) that can be electrically coupled to the depleted battery and to the internal battery 308. The polarity protection circuit can prevent current flow between the batteries unless a proper polarity connection is achieved, i.e. the positive terminal of the internal battery is connected to the positive terminal of the depleted battery and the negative terminal of the internal battery is connected to the negative terminal of the depleted battery. The above-mentioned **U.S. patent application Ser. No. 10/315,061** describes a polarity protection circuit that may be used to implement this aspect of the described embodiment.") (incorporating U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger, e.g., at ¶12 [2:45-46] ("In a further embodiment, the battery booster device may also comprise a **microprocessor**. The **microprocessor** can be used as part of a polarity protection circuit."); ¶43; ¶44; ¶45; ¶46; ¶47; ¶48) (quoted above) **U.S. 2007/0285049 to Krieger** ¶14 ("Additionally, the battery 20 may provide power for a controller 14, such as a **microprocessor or other circuitry**, which may be used to **control the operation of the various components** described below that may be provided in the jump starter."); ¶16 ("For example, a booster apparatus as described in U.S. patent application Ser. No. 10/315,061, which is incorporated herein by reference, may be provided.") (incorporating U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger, e.g., at ¶12 [2:45-46] ("In a further embodiment, the battery booster device may also comprise a **microprocessor**. The **microprocessor** can be used as part of a polarity protection circuit."); ¶43; ¶44; ¶45; ¶46; ¶47; ¶48) (quoted above)

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		U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei ¶19 ("a MCU controller chip J1"); ¶26 ("The output terminals of the battery pack are further connected to a multipath DC-DC voltage regulator circuit and a LED driving circuit 12, each path of the DC-DC voltage regulator circuit is connected to a **MCU controller circuit 14** …"); ¶30 ("When the red and black power source clips are respectively connected to the positive and negative electrodes of the external battery, if the connection is correct, a feedback voltage displayed by the voltage identifying system is positive, otherwise the feedback voltage is negative. The positive feedback voltage ranges from value a of 6 to 24 V to value b of 9 to 30 V, and a is smaller than b. If the connection is reverse, the relay does not work, and the high current outputting circuit 7 may be cut off. If the external smart battery detection system 6 fails, to further ensure the safety of the emergency power source, in the circuit of the emergency power source of the invention, a disposable or recoverable fuse 5 is provided and is connected between the output terminals of the battery pack 4 and the external smart battery detection system 6."); ¶31 ("In this invention, when the feedback voltage ranges from value a to value b and is of a positive value, the coil of the relay receives a voltage signal so that its contact is closed and its output terminal is coupled to the high current outputting circuit 7, and the emergency power source starts to power an external device with a high current. At this time, the current identifying system detects the current flowing through the high current outputting circuit 7. If the current is lower than value c, which ranges from 0.1 A to 10 A, the voltage signal across the coil of the relay disappears, the contact is then open, thus its output terminal is disconnected from the high current outputting circuit 7 to stop powering the external device with the high current."); ¶36 ("When the emergency power source is disconnected from the external rechargeable battery, or the current is smaller than the preset current value, R15 and R16 in the circuit 62 of the current identifying system provide a detection signal to U3. Then U3 sends an output signal to the MCU controller chip according to the detection signal, **based on which the MCU controller chip may determine the ON or OFF state of the circuit to make proper instructions**. When the preset voltage value is 8.1V and the output voltage value is smaller than the preset value,

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		R7 and R8 of the circuit 61 of the voltage identifying system may provide a detection signal to U2, and U2 may send an output signal to terminal IN1 according to the detection signal. Then the **MCU controller chip further controls the control switch Q2** in the circuit 63 of the relay according to the signal from terminal IN1. When the output voltage is bigger than a preset value, which may be 12.6V in the invention, R9 and R10 of the circuit 61 of the voltage identifying system may provide a detection signal to U2, and U2 may send a signal according to the detection signal to control the control switch Q3 in the circuit 63 of the relay. In this invention, the circuit 61 of the voltage identifying system and the circuit 62 of the current identifying system co-operate to provide the signal to the MCU controller chip. **With the determination of the MCU controller chip, the switches Q1, Q2 and Q3 in the circuit 63 of the replay can be controlled to achieve charging and protecting**.") **U.S. 2005/0116688 to Yin** ¶24 ("High current relays and **polarity detecting circuit** are used in the present invention. In normal situations, the battery clamps have no electricity and this prevents short circuit of the battery clamps. When the battery clamps are connected to the vehicle's battery, **the polarity detecting circuit will detect the polarity automatically and if the polarity is correct, the circuit will allow the first relay JD1 to conduct electricity and thus connect the circuit of the rechargeable battery B and the vehicle's battery** to start the vehicle. If the polarity is detected to be reversely connected, the circuit will maintain the first relay JD1 in an off state and the rechargeable battery B and the vehicle's battery are not connected and so the vehicle's battery will not be burnt out owing to the reverse polarity connection."); ¶25 ("When the battery clamps are not connected with the vehicle's battery, the first relay JD1 has no voltage and is in an off state and the battery clamps have no electricity. This can prevent danger caused by short circuit of the battery clamps."); ¶26 ("When the battery clamps and the vehicle's battery are connected with the correct polarity, **the second diode D2 is reversely biased**, the second relay JD2 is in an off state, the light L1 does not flash and the buzzer BU does not sound. The

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		power source provides electric power via the first diode D1 to the first relay JD1, thereby energizing the first relay JD1 and connecting the rechargeable battery B with the vehicle's battery to start the vehicle."); ¶28 ("When the two battery clamps are reversely connected to the two terminals of vehicle's battery, **the first diode D1 is in a reversed close state** in the circuit of the first relay JD1 and so the **first relay JD1 remains in an off state**, which leads to the disconnection of the rechargeable battery B and the vehicle's battery, thereby eliminating the risks of incurring high current and sparks. Simultaneously, the vehicle's battery provides power to the second relay JD2 and the buzzer BU via **the second diode D2, thereby energizing the second relay JD2 and making the buzzer BU to sound**. The rechargeable battery B provides power to the flash light circuit making the light L1 to flash.") **U.S. 2014/0368155 to Chen** ¶7 ("The **control unit** is electrically connected to the first switch unit, the second switch unit, the third switch unit and the fourth switch unit. The voltage polarity detection unit is electrically connected to the first switch unit, the second switch unit, the third switch unit, the fourth switch unit, the vehicle battery and the control unit. The **voltage polarity detection unit** is configured to detect the voltage polarity of the vehicle battery and **inform the control unit**. The **control unit** is configured to **turn on the first switch unit and the fourth switch unit and turn off the second switch unit and the third switch unit**, when the polarity of a contact connecting the first switch unit, the third switch unit and the vehicle battery is judged to be a positive pole and when the polarity of a contact connecting the second switch unit, the fourth switch unit and the vehicle battery is judged to be a negative pole. The control unit is configured to **turn on the second switch unit and the third switch unit** and **turn off the first switch unit and the fourth switch unit**, when the polarity of the contact connecting the first switch unit, the third switch unit and the vehicle battery is judged to be the negative pole and when the polarity of the contact connecting the second switch unit, the fourth switch unit and the vehicle battery is judged to be the positive pole."); ¶13 ("Moreover, the control unit is, for examples but not limited to, a microprocessor, a **microcontroller**, or a

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		control circuit having an integrated circuit and electronic components."); ¶19 ("The **control unit 112** is electrically connected to the first switch unit 104, the second switch unit 106, the third switch unit 108, the fourth switch unit 110 and the voltage polarity detection unit 114. The voltage polarity detection unit 114 is electrically connected to the first switch unit 104, the second switch unit 106, the third switch unit 108, the fourth switch unit 110, the vehicle battery 20 and **the control unit 112**."); ¶20 ("The voltage polarity detection unit 114 is configured to detect the voltage polarity of the vehicle battery 20 and **inform the control unit 112**."); ¶21 ("The control unit 112 is configured to **turn on the first switch unit 104 and the fourth switch unit 110** and **turn off the second switch unit 106 and the third switch unit 108**, when the polarity of a contact connecting the first switch unit 104, the third switch unit 108 and the vehicle battery 20 is judged to be a positive pole and when the polarity of a contact connecting the second switch unit 106, the fourth switch unit 110 and the vehicle battery 20 is judged to be a negative pole."); ¶22 ("The control unit 112 is configured to **turn on the second switch unit 106 and the third switch unit 108** and **turn off the first switch unit 104 and the fourth switch unit 110**, when the polarity of the contact connecting the first switch unit 104, the third switch unit 108 and the vehicle battery 20 is judged to be the negative pole and when the polarity of the contact connecting the second switch unit 106, the fourth switch unit 110 and the vehicle battery 20 is judged to be the positive pole."); ¶23 ("The control unit 112 is, for examples but not limited to, a microprocessor, a **microcontroller**, or a control circuit having an integrated circuit and electronic components.") **U.S. 2015/0137740 to Allos** ¶11 ("In particular, it is noted that variations in values of voltages and currents may be employed in given implementations, and that certain circuit components may be combined in various ways or implemented with different circuitry, including **microprocessors**. Accordingly, equivalent circuit configurations are also intended to be encompassed by the scope of present principles."); ¶22 ("When the mobile charging system is correctly connected to a vehicle with a discharged battery, the

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		green warning light 10 will illuminate, indicating proper connection. Component 18 with circuit C16 will have positive voltage and component 19 with circuit C1 will have negative voltage. C16 and C1 circuits are monitored by component 20 (forward polarity sense circuit), and this component includes three resistors with ratio values biased for low voltage detection. When circuit C16 voltage value is 2 or more volts more positive than circuit C1, the operational amplifier L2722 will conduct and switch its output circuit C25 to 12V positive to energize component 21 (Relay 3). When relay 3 N.O. (normally open) contacts are closed, 12V power from circuit C14 will connect with circuit C24 to turn green light on in component 10, indicating the correct and safe hook-up of the mobile charging system."); ¶41 ("Current flows through the meter to circuit C20 and then to component 17 contactor N.C. When component 17 is de-energized, current flows through it from circuit C20 to circuit C16 and then to component 18 to the vehicle battery."); ¶48 ("Once the reverse polarity sense circuit detects reverse polarity, it will conduct current and switch output circuit C23 to positive 12 volts **energizing component 14 relay 1 that will result in the enabling of the reverse polarity protection feature** of the mobile charging system, and the disabling of the boost cycle power source to component 11."); ¶49 ("**When component 14 is energized, normally open relay 1 contacts will close**, connecting circuit C14 (+12V source) with circuit C18 that feeds component 10 (polarity indicator) red warning light and buzzer in the instrument panel to warn the technician of the incorrect connection of the mobile charging system to the vehicle battery. Circuit C18 also feeds component 15 (Normally Closed) relay 2 contacts that connect to circuit C21."); ¶50 ("**Component 15 may be de-energized during a reverse polarity condition and may act as an interrupt during boost cycle**. When circuit C21 has +12 Volts it will energize component 17 (Normally Closed) Contactor **resulting in a circuit break between circuit C16 vehicle battery and circuit C20 that controls the mobile charging system output**, thus providing protection to amp meter 8 and fuse box 4 and other internal mobile charging system components. In addition, it also prevents the mobile charging system boost and charge functions from causing electrical damage to the weak or discharged vehicle battery and electrical system by

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		isolating the same from the mobile charging system internal power source."); *see also* U.S. Provisional Patent Application 61/903,779 at 2, 4-5. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶6 ("As a further solution of the present disclosure that: the DC to DC module provides a stable voltage for the **microcontroller** which **collects relevant data to conduct the corresponding control**. The battery voltage detection module conducts the measurement of the batter[y] voltage, the automobile start control module conducts the power supply or the power outage for the load module through the **microcontroller**, and the load detection module which comprises the automobile storage battery or the automobile engine detects whether the load module is correctly connected."); ¶10 ("As a further solution of the present disclosure that: in the standby mode, the **microcontroller closes all outputs** when the voltage of the direct current power supply is lower than that of the state being able to supply power and then recovers when it is higher than that of the state being able to supply power."); ¶ 23 ("Refer to FIG. 1, a novel automobile charger comprises a direct current power supply, wherein the positive pole of the direct current power supply is connected with one end or lead of the DC to DC module, one end of the battery voltage detection module and one end of the load module simultaneously, while the negative pole of the direct current voltage is connected with the other end of the DC to DC module, one end of the **microcontroller**, one end of the automobile start control module and the other end of the battery voltage detection module simultaneously. A third end of the DC to DC module is connected with the other end of the **microcontroller**, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the load detection module respectively, wherein the other end of the load detection module is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶25 ("The DC to DC module in the present disclosure provides

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		the stable voltage for the **microcontroller which collects relevant data** to conduct the corresponding control. The battery voltage detection module conducts the measurement of the batter voltage, and the **automobile start control module conducts the power supply or the power outage for the load module through the microcontroller**, wherein the load detection module detects whether the load module is correctly connected."); ¶26 ("**The microcontroller in the present disclosure determines whether the automobile storage battery is connected** with the automobile engine through the load detection module, wherein the **automobile start control model** [sic] is **automatically activated and the battery starts to supply power to the load module** when the load is correctly connected; the **automobile start control model** [sic] is **automatically deactivated and the battery stops supplying power to the load module** when assuming that the load is not connected or the positive and negative polarities are reversely connected. In the standby mode, the **microcontroller closes all outputs** when the battery voltage is lower than 9V, and recovers the normal operation only when the battery voltage is larger than 10V; the automobile engine will generate the normal voltage to recharge the battery after the automobile starts, whereas the automobile start control module is deactivated immediately once the recharging voltage is larger than the voltage before that battery starts the power supply, to protect the battery from damages caused by charging with the normal voltage; the automobile start control module is the electronic switch, which can prevent the load from being reversely connected and recharging of the normal voltage, thus protecting the battery and prolonging lifespan.") **U.S. 2006/0220610 to Solberg** ¶23 ("**A control module 104** coupled to an output of charging system 100 and the second switch 130 controls the states of the second, third, and fourth switches 130, 132, and 134. With or without input and output isolation (e.g., such as through an opt-coupler), the **control module 104 monitors an output of the charging system 100** and compares it against a fixed or a programmable voltage level or voltage range. When the voltage equals or rises above the voltage level or falls within the

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		voltage range, the **control module 104 activates the second switch 130** that couples one or more of the boost modules 108 and 110 to the outputs of the charging system 100. When the control module 104 detects a reverse polarity, **the second switch 130 is deactivated effectively shutting down the charging system 100**."); ¶29 ("The output of the charging system 200 is monitored by a voltage and/or current monitoring circuit within the **controller 204**. Voltage and/or current monitored at the output interface 212 are compared against a fixed or programmed reference. When the output exceeds the reference, **a control signal activates the second, third, and fourth relays 224, 228, and 230**. When a reverse polarity connection is detected, **the control signal does not flow from the controller 204, which deactivates the second relay 224 and shuts down the charging system 200**. Analog gauges, digital, or light emitting diode displays 302 (as shown in FIG. 3) may provide a reverse polarity warning. A speaker or piezoelectric elements 302 may provide an audible warning to the user of a reverse polarity connection.") The following references also disclose, teach, or suggest this element: U.S. 2006/0176011 to Lui, e.g., at ¶21; U.S. 2004/0150373 to Chan, e.g., at ¶¶17-21; U.S. 2006/0244412 to Bonzer, e.g., at ¶21-22; U.S. 2014/0210399 to Urschel, e.g., at ¶39; WO 2012/036556 to Eidsvig, e.g., at 3:25-26; 5:8-10; U.S. 2013/0162029 to Reichow, e.g., at ¶22-24; U.S. 6,650,086 Chang; e.g., at 3:9-15; U.S. 2002/0041174 to Purkey, e.g., at ¶57-61; U.S. 6,344,733 to Crass, e.g., at 2:42-3:37
2	The apparatus of claim 1, wherein said internal power supply comprises a lithium ion battery	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **<u>WO 2012/080996 A1 to Tracey et al.</u>** Abstract ("The on-board starter battery (15, 26) may comprise a **lithium iron phosphate battery**."); 2:13-14 ("In one embodiment, the on-board starter battery means comprises a lithium iron phosphate battery."); 5:12-15 ("In the invention there is an on-board starter battery which comprises a plurality of interconnected batteries 15 which may be of the **lithium iron phosphate type**. The battery cells

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		can be of either cylindrical, prismatic or pouch type. The voltage is between 3.2 and 3.7 V nominal and of **lithium iron chemistry**."); 5:33-6:3 ("The jump starter 50 comprises a first clip 51 and a second clip 52 interconnected by a power cable 53. The first clip 51 has a housing 55 for a battery of sufficient capacity to provide the full starting power, in this embodiment of the **lithium iron phosphate type**. Also, the first clip 51 comprises a pair of jaws 56 having finger grips 57 for pressing together for opening and closing."); 6:11-12 ("The jump starter 50 involves use of close-proximity high-power batteries of the **lithium iron phosphate type**."); 9:32-34 ("In a still further embodiment, referring to Fig. 12, a 4-cell **Lithium iron battery** is connected to a positive jump-starter clamp by means of a number of parallel connected positive thermal coefficient (PTC) type resettable fuses."); Claim 2 ("A jump starter as claimed in claim 1 , wherein the on-board starter battery means (1 , 26) comprises a **lithium iron phosphate battery**.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶8 [1:67-2:1] ("The battery may comprise a **lithium iron phosphate** battery cell or a **lithium cobalt oxide** battery cell."); ¶35 5:12-27 ("In an embodiment of the present invention, the battery cell 42 is a **lithium iron phosphate** cell. In an additional embodiment, the battery cell 42 is a **lithium cobalt oxide** cell. Preferably, the output of the ignition output port's voltage is higher than about 13.6V. The voltage of the vehicle battery is generally less than about 13.6V and the output voltage of the ignition output port 46 is higher than 13.6V. The voltage differential can effectively prevent voltage reverse charging from the vehicle battery to the device 10 upon vehicle ignition start; thereby preventing reverse charging of the battery cell 42. Thus, the voltage differential protects the battery cell 42 and extends the life of the battery module 16. **Lithium iron phosphate and lithium cobalt oxide battery cells** have a large discharge capacity and may provide an output voltage higher than about 13.6V."); **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei**

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		¶8 ("In certain embodiments, the battery pack consists of **lithium-ion batteries** connected in series or parallel, each battery having a positive electrode made of lithium iron phosphate, lithium cobalt oxide, nickel cobalt manganese ternary lithium or lithium manganate and a negative electrode made of artificial or natural graphite …"); ¶20 ("The emergency power source of the present invention uses **lithium-ion batteries** as its battery pack, which have characteristics of light weight, small size, durability, high instantaneous discharging current and rechargeability, which can meet the demand of high current for starting a vehicle."); ¶26 ("Furthermore, the battery pack 4 consists of **lithium-ion batteries** connected in series or parallel, each having a positive electrode made of lithium iron phosphate, lithium cobalt oxide, nickel cobalt manganese ternary lithium or lithium manganate and a negative electrode made of artificial or natural graphite."); ¶27 ("The emergency power source uses lithium-ion batteries as its battery pack, which has the characteristics of light weight, small size, durability, high instantaneous discharge current and rechargeability, which is capable of supplying a high current for starting a vehicle.") **U.S. 2015/0137740 to Allos** ¶9 ("Coupled to the housing may be a **rechargeable source of energy 105**, which is in many cases a **plurality of battery cells** which may be charged, e.g., from a wall or other outlet source."); ¶16 ("The batteries may be lead acid, absorption glass mat (AGM), lithium ion, or the equivalent …"); *see also* U.S. Provisional Patent Application 61/903,779 at 1-2. The following references also disclose, teach, or suggest this element: U.S. 2014/0210399 to Urschel, e.g., at ¶57
3	The apparatus of claim 2, wherein said lithium ion battery comprises a battery pack of multiple lithium ion batteries.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **WO 2012/080996 A1 to Tracey et al.**

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		2:16-17 ("In one embodiment, there is a plurality of on-board starter batteries along the interconnection means."); 2:19-20 ("In one embodiment, the on-board starter battery means comprises a plurality of separate batteries which are electrically interconnected."); 5:12-13 ("In the invention there is an on-board starter battery which comprises a plurality of interconnected batteries 15 which may be of the lithium iron phosphate type."); 5:29-30 ("In this embodiment there are two batteries 26 housed within each handle 25, and finger- gripping features 27 are provided to aid user operation."); **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶34 ("In an embodiment, the battery module 16 includes battery cells 42, a battery circuit board 44, an ignition output port 46, and a connecting ribbon cable 48. The battery cell 42 may have a multi-cell structure. In an embodiment of the present invention, the battery cell 42 has four battery cells.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶8 ("In certain embodiments, the battery pack consists of **lithium-ion batteries connected in series or parallel**, each battery having a positive electrode made of lithium iron phosphate, lithium cobalt oxide, nickel cobalt manganese ternary lithium or lithium manganate and a negative electrode made of artificial or natural graphite …"); ¶26 ("Furthermore, the battery pack 4 consists of **lithium-ion batteries connected in series or parallel**, each having a positive electrode made of lithium iron phosphate, lithium cobalt oxide, nickel cobalt manganese ternary lithium or lithium manganate and a negative electrode made of artificial or natural graphite.") **U.S. 2015/0137740 to Allos** ¶9 ("Coupled to the housing may be a **rechargeable source of energy 105**, which is in many cases a **plurality of battery cells** which may be charged, e.g., from a wall

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		or other outlet source."); ¶16 ("The batteries may be lead acid, absorption glass mat (AGM), lithium ion, or the equivalent …"); *see also* U.S. Provisional Patent Application 61/903,779 at 1-2. The following references also disclose, teach, or suggest this element: U.S. 2014/0210399 to Urschel, e.g., at ¶57
9	The apparatus of claim 1, further comprising a voltage regulator configured to convert output voltage of said internal power supply to a voltage level appropriate to provide operating power to internal components of the apparatus.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶46 [9:16-26] ("A low voltage power supply is provided to the microprocessor 60 from battery 2 via a voltage regulator 70. The low voltage output signals from the microprocessor 60 should be translated to higher voltages before being supplied to the transistors 12 a-12 d. The level translator 68 translates the output voltage of the microprocessor 60 to the higher levels that are needed to operate transistors 12 a-12 d. Accordingly, the output signals from the microprocessor 60 are used by the level translator 68 to generate control signals for the control electrodes of the FETs."); ¶52 [10:27-29] ("Voltage regulator 70 is coupled to the boosting battery 2 and the depleted battery 11 for detecting their charge levels."); ¶53 [10:30-43] ("In order to measure the charge level of the boosting battery 2, clamps 8, 10 should be disconnected from the depleted battery 11. The voltage regulator then produces a voltage proportional to the voltage of the boosting battery 2, and which is within the operating range of the microprocessor 60. The microprocessor 60 is programmed to detect when the voltage of the boosting battery 2 falls below a predetermined level, for example, about 80% of its rated value. The buzzer 72 or other device can then be activated to indicate to the operator that the charge of the boosting battery 2 is low and that it should be recharged. The booster system may be plugged into a standard 110/220-volt electrical outlet via a standard wall charger 82 to recharge the boosting battery 2."); ¶54 [10:44-54] ("In order to measure the voltage of the depleted battery 11, switch 12 between the boosting battery 2 and the depleted battery 11 should be in a non-conducting state. Microprocessor 60 can be controlled via operator input

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		from input device 66 to place switch 12 in a non-conducting state. Clamps 8, 10 are then connected to the depleted battery 11. The voltage regulator produces a voltage proportional to the voltage of the depleted battery 11. The microprocessor 60 receives this signal from the voltage regulator 70 and determines and displays the voltage of the depleted battery 11 on display 64.") **U.S. 2007/0285049 to Krieger** ¶14 ("In one embodiment, **a voltage regulator** optionally included may convert DC input power, for example from the battery 20, into a USB compatible 5V/500 mA DC power output. The **voltage regulator** may be a component of the power inverter 60. A charging port 19 for mobile telephones or other portable devices may also be provided. Additionally, the battery 20 may **provide power for a controller 14**, such as a microprocessor or other circuitry, which may be used to control the operation of the various components described below that may be provided in the jump starter.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶42 ("In an embodiment, the discharge module 54 includes a constant current and constant voltage output circuit 66, a discharge module over-discharge protection circuit 68, and a discharge module power test circuit 70. The constant current and constant voltage output circuit 66 is coupled to the USB output module 36, so that the first USB interface 38 and the second USB interface 40 maintain a constant charging current and constant voltage.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶11 ("In certain embodiments, the DC-DC **voltage regulator circuit** includes a DC-DC 19V boost circuit having an output voltage of 19V, a DC-DC 12V output circuit having an output voltage of 12V, and a DC-DC 5V buck circuit having an output voltage of 5V."); ¶18 ("… a three-terminal **voltage regulator circuit U1** whose model is 7805 …"); ¶20 ("The battery pack of the emergency power source is also

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		connected to the **voltage regulator circuit** for outputting a variety of voltage levels …"); ¶26 ("The DC-DC **voltage regulator circuit** includes a DC-DC 19V boost circuit 11 of an output voltage of 19V, a DC-DC 12V output circuit 10 of an output voltage of 12V, and a DC-DC 5V buck circuit 9 of an output voltage of 5V."); ¶27 ("The battery pack of the emergency power source is also connected to the **voltage regulator circuit** for outputting a variety of voltage levels, and by connecting the output terminal of the respective path of the voltage regulator circuit to the MCU controller circuit, various outdoor power demands of mobile phones, computers, digital cameras, car playing pumps, car refrigerators, car cleaners, etc. can be satisfied."); ¶34 ("…a three-terminal **voltage regulator circuit U1** whose model is a 7805 …") **U.S. 2015/0137740 to Allos** ¶31 ("The mobile charging system may contain in one implementation **five primary components used to regulate the output voltage and current** to properly recharge a discharged vehicle battery, and these are components 3 a, 3 b, 5, 6 and 7. Components 3 a and 3 b are as noted above, e.g., switching regulator DC to DC converters. In one specific implementation the same are identical in model and part numbers, with the same electrical characteristics and specifications. Because of their configuration, they share the same inputs and outputs and are connected (wired) in parallel; therefore, the shared output current will max out at 40 amperes."); *see also* U.S. Provisional Patent Application 61/903,779 at 3. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶6 ("As a further solution of the present disclosure that: the **DC to DC module provides a stable voltage** for the microcontroller which collects relevant data to conduct the corresponding control."); ¶24 ("Refer to FIG. 2, the **DC to DC module** comprises a diode D1, a resistor R1, capacitor C1, a HT7530 voltage stabilizing tube, capacitors C2 and C3, wherein the positive pole of the diode D1 is connected with the positive pole of the battery, the negative pole of the diode D1 is connected

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		with one end of the capacitor C1 and an IN port of the HT7530 voltage stabilizing tube simultaneously through the resistor R1, and an OUT port of the HT7530 voltage stabilizing tube is connected with one end of the capacitor C2, one end of the capacitor C3 and a VDD port of the microcontroller U2, while the other end of the capacitor C1, the other end of the capacitor C2 and the other end of the capacitor C3 as well as a GND port of the HT7530 voltage stabilizing tube are grounded and connected with the negative pole of the battery simultaneously …"); ¶25 ("The **DC to DC module** in the present disclosure **provides the stable voltage** for the microcontroller which collects relevant data to conduct the corresponding control.") **U.S. 2006/0220610 to Solberg** ¶25 ("In other charging systems, a **current monitoring and limiting circuit** within the control module 104 may deactivate the second switch 130 to protect the user and charging system 100 against high current and/or **voltage** conditions."); ¶31 ("In other charging systems, a current and/or **voltage monitoring and limiting circuit** within the control module 104 may deactivate the second relay 224 to protect the user and charging system 200 against high current and/or **voltage** conditions.") The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶46; U.S. 3,638,108 to Channing, e.g., at 7:34-36; U.S. 2002/0041174 to Purkey, e.g., at ¶11-12, 58, 61, Fig. 6
10	The apparatus of claim 1, further comprising a USB output port configured to provide charging power from said internal power supply to a USB-chargeable device.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶42 ("The discharge module 54 is connected to the USB (Universal Serial Bus) output module 36. In an embodiment, the discharge module 54 includes a constant current and constant voltage output circuit 66, a discharge module over-discharge protection circuit 68, and a discharge module power test circuit 70. The constant current and constant voltage output circuit 66 is coupled to the USB output module

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		36, so that the first USB interface 38 and the second USB interface 40 maintain a constant charging current and constant voltage."); ¶43 ("The discharge module over-discharge protection circuit 68 is used when the battery module 16 is supplying energy via the USB output module 36. The discharge module over-discharge protection circuit 68 prevents damage to the battery module and an external device charging via the USB output module 36 when the battery module's power output is below a predetermined threshold.") **U.S. 2007/0285049 to Krieger** ¶14 ("Several different types of DC power outlets may be provided. For example, **USB port 18** may be provided on the housing 10. The **USB port 18** may be used to provide a USB power supply. In one embodiment, a voltage regulator optionally included may convert DC input power, for example from the battery 20, into a USB compatible 5V/500 mA DC power output.") **U.S. 2013/0099736 to Roberts** ¶35 ("A USB port 114 allows for an external device 116 to be powered and/or charged by the battery charger if the external device 116 includes a USB compatible charging device 118. When inserted into the USB port 114, which is coupled to the auxiliary USB power supply 52 of FIG. 2, the USB charging device 118 conveys power from the USB port 114 to the external device 116. This allows a user to charge the vehicle battery 12 while simultaneously powering and/or charging a mobile telephone, hand-held computer, or any other external device. In a presently contemplated embodiment, the USB port 114 may convey electrical power rated up to approximately ten watts to the external device 116 (the power required to charge certain cellular, wireless or hand-held devices) through the USB charging device 118.") The following references also disclose, teach, or suggest this element: U.S. 2012/0025766 to Reade, e.g., at ¶25

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11	The apparatus of claim 1, further comprising a USB charging port configured to provide charging power from an external power source to said internal power supply.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0239290 to Krieger** ¶17 ("In addition to the AC input plug 204, the apparatus may also have a DC input 302. The DC input 302 is coupled to the jump starter circuit 304, and can charge the internal battery 308 of the jump starter circuit 304 directly. The internal battery 308 can also be charged by the high frequency charger 306. A microprocessor, described below, may be used to control the charging process.") **U.S. 2015/0054336 [issued as U.S. 9,506,446] to Xinfang** ¶32 ("The charging port 34 may be an AC or DC charging port and is connectable to an external charging circuit adaptor for charging the battery module 16.") **U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula** ¶33 ("As described below (FIG. 10) the detection of the input source is automatic and governed by processor logic. When an input cable is used to connect either to an AC, DC or **USB**/Firewire source, the processor senses the type of power it receives and automatically converts that power to the type necessary to charge the portable unit that has been selected by the user based on the plug or bridge selected or by the power requirements of the portable unit that are selected by the user via the control panel."); ¶39 ("The MPC can automatically select which way to charge its internal rechargeable battery when either connected to an AC, DC, **USB**/Firewire, solar or hand crank method of charging its internal battery.") **U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong** ¶39 ("As can be seen from FIG. 2, the energy harvesting circuit also includes a USB charger port or connector 24 for providing a connection to an external source of

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		voltage (preferably, about 5 volts DC), to charge the internal second storage device 18, which as will be explained is preferably a lithium polymer battery, using a lap top computer or other device connectable to the USB charger connector 24. The USB charger connector 24 has its +5 volt input pin connected to the connection between the output of the first stage DC-to-DC converter circuit 20 and the input of the second stage DC-to-DC converter circuit 22."); ¶40 ("The second stage DC-to-DC converter circuit 22 acts as a low drop out, step down voltage converter/regulator to convert the 4.5 volts from the first stage DC-to-DC converter circuit 20 (or the 5 volt DC signal provided on the USB charger connector 24 from an external source) to a 3.7 volt DC signal on the output of the second DC-to-DC converter circuit 22. This output voltage of the second stage DC-to-DC converter circuit 22 is provided to the positive side of a lithium polymer battery 18 forming part of the energy harvesting circuit, the negative side of the battery being preferably grounded. Preferably, the lithium polymer battery is a 3.7 volt, 1.5 amp battery which is used as a second storage device 18 which is charged by the rectified and DC-converted voltage generated by the energy harvesting circuit from the RF signal received by the antenna 2, or by an external DC power source connected to the USB charger connector 24." **<u>USB Implementers Forum, Inc.</u>** §1.4.8. ("A Portable Device is considered to be any USB or OTG device that is capable of operating from its own battery, and is also capable of drawing current from USB for purposes of operating and/or charging its battery.") The following references also disclose, teach, or suggest this element: U.S. 2015/0137740 to Allos at ¶9; EP 0 616 409 to Herbert at ¶32; U.S. 2004/0130298 (issued as US 7,345,450) Krieger at ¶53; U.S. 2007/0285049 to Krieger at ¶15; U.S. 2001/0025618(issued as US 6,679,212) to Kelling at ¶¶22-24; U.S. 2012/0025766 (issued as US 9,153,978) to Reade at ¶79; U.S. 2006/0244412 to Bonzer at ¶23; U.S. 5,194,799 to Tomantschger at 7:10-25; U.S. 2014/0210399 to Urschel at ¶¶27, 34-35; U.S. 2002/0041174 (issued as US 6,426,606) to Purkey at

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		Abstract, ¶26; U.S. 5,281,904 Tomkins at 5:18-22; U.S. 2015/0054336 [issued as U.S. 9,506,446] to Xinfang at ¶¶30-32; U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei at ¶¶5, 20
12	The apparatus of claim 1, further comprising a flashlight circuit configured to provide a source of light to a user.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0239290 to Krieger** ¶23 ("The DC output 108 can be used to provide power to the built in air compressor 206, a **removable light 314** or any other type of accessory."); ¶24 ("The motorist can further inflate a tire, and **illuminate an area with the removable light**. The jump starter/charger of the present invention also allows the motorist to use AC appliances anywhere."). **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶2 ("The present invention relates to mobile power technology and, more particularly, to a mobile power bank capable of charging electronic devices, jump starting an ignition system of a vehicle with a weak or dead battery, and operating as a **flashlight**."); ¶6 ("The present invention according to an embodiment provides a mobile power bank, vehicle ignition system jump starter, and a **flashlight**."); ¶26 ("The mobile power bank 10 functions as a mobile power bank, vehicle battery jump starter, and a flashlight."); ¶29 ("The second plate 24 may be provided with a master control button 26 and a **flashlight 28**. The **flashlight 28** and the master control button 26 may be positioned on opposite surfaces of the second plate 24. Preferably, the **flashlight 28** is placed adjacent to an edge of the base cover 20."); ¶44 ("The lighting module 56 is connected to the **flashlight 28**. In an embodiment, the lighting module 56 includes a lighting module over-discharge protection circuit 72 and a lighting module power test circuit 74. The lighting module over-discharge protection circuit 72 limits discharge of the battery module 16 to the flashlight 28 when the battery power output to the flashlight is below a predetermined threshold to protect the battery module and the flashlight. The lighting module power test

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		circuit 74 detects the battery module's power levels during illumination of the flashlight 28.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶8 ("… the MCU controller circuit is further connected to a smart LED electric quantity display system for displaying the electric quantity of the emergency power source, an output terminal of the LED driving circuit is connected to a LED lighting lamp …"); ¶20 ("The LED lighting lamp may provide outdoor lighting."); ¶26 ("the MCU controller circuit 14 is further connected to a smart LED electric quantity display system 8 for displaying the electric quantity of the emergency power source, an output terminal of the LED driving circuit 12 is connected to a LED lighting lamp 13"); ¶27 ("The LED lighting lamp may provide outdoor lighting.") **U.S. 2005/0116688 to Yin** ¶5 ("… a flash light circuit …"); ¶20 ("… a flash light circuit …"); ¶28 ("The rechargeable battery B provides power to the flash light circuit making the light L1 to flash.") **U.S. 2013/0099736 to Roberts** ¶33 ("FIG. 5 shows the LED 100 on the positive terminal clamp 16 in action. A user grasping the positive terminal clamp 16 depresses the switch 102 (covered by the user's hand) to activate the LED 100, illuminating a "+" marking (or other indicia) on the positive terminal 20 of the battery 12 in an otherwise dark region under the hood of a car. Applying the LED 100 to the positive terminal clamp 16 may be advantageous because the positive terminal clamp 16 is typically secured to the positive terminal 20 before the negative terminal clamp 18 is secured to the negative terminal 22 in order to make the connections necessary for charging a vehicle battery 10. In addition, disposing the LED 100 on the positive terminal clamp 16 adds a distinction to the positive terminal clamp 16, making it less likely to be

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		mistaken for the negative terminal clamp 18."); ¶34 ("A close up view of the positive terminal clamp 16 with the LED 100 illuminated is illustrated in FIG. 6. The LED 100 shines light from an outside edge of the clamp so that the illumination may not be obscured by the teeth 104 used to clamp directly onto the positive terminal 20. Positioning the LED 100 near the tip of the clamp allows a light path 106 to reach farther in the direction of the clamp tip than if it were positioned closer to the gripped region of the clamp.") The following references also disclose, teach, or suggest this element: U.S. 2004/0239290 to Krieger, e.g., at ¶23-24; U.S. 2006/0244412 to Bonzer, e.g., at ¶¶23-25; 5,194,799 to Tomantschger, e.g., at 4:17-26
13	The apparatus of claim 12, wherein said source of light is at least one LED.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶8 ("… the MCU controller circuit is further connected to a smart LED electric quantity display system for displaying the electric quantity of the emergency power source, an output terminal of the LED driving circuit is connected to a LED lighting lamp …"); ¶20 ("The LED lighting lamp may provide outdoor lighting."); ¶26 ("the MCU controller circuit 14 is further connected to a smart LED electric quantity display system 8 for displaying the electric quantity of the emergency power source, an output terminal of the LED driving circuit 12 is connected to a LED lighting lamp 13"); ¶27 ("The LED lighting lamp may provide outdoor lighting.") **U.S. 2013/0099736 to Roberts** ¶33 ("FIG. 5 shows the LED 100 on the positive terminal clamp 16 in action. A user grasping the positive terminal clamp 16 depresses the switch 102 (covered by the user's hand) to activate the LED 100, illuminating a "+" marking (or other indicia) on the positive terminal 20 of the battery 12 in an otherwise dark region under the hood of a car. Applying the LED 100 to the positive terminal clamp 16 may be

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		advantageous because the positive terminal clamp 16 is typically secured to the positive terminal 20 before the negative terminal clamp 18 is secured to the negative terminal 22 in order to make the connections necessary for charging a vehicle battery 10. In addition, disposing the LED 100 on the positive terminal clamp 16 adds a distinction to the positive terminal clamp 16, making it less likely to be mistaken for the negative terminal clamp 18."); ¶34 ("A close up view of the positive terminal clamp 16 with the LED 100 illuminated is illustrated in FIG. 6. The LED 100 shines light from an outside edge of the clamp so that the illumination may not be obscured by the teeth 104 used to clamp directly onto the positive terminal 20. Positioning the LED 100 near the tip of the clamp allows a light path 106 to reach farther in the direction of the clamp tip than if it were positioned closer to the gripped region of the clamp.") The following references also disclose, teach, or suggest this element: U.S. 2006/0244412 to Bonzer, e.g., at ¶24
15	The apparatus of claim 1, further comprising a plurality of visual indicators configured to display remaining capacity status of said internal power supply.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶53 [10:30-43] ("In order to measure the charge level of the boosting battery 2, clamps 8, 10 should be disconnected from the depleted battery 11. The voltage regulator then produces a voltage proportional to the voltage of the boosting battery 2, and which is within the operating range of the microprocessor 60. The microprocessor 60 is programmed to detect when the voltage of the boosting battery 2 falls below a predetermined level, for example, about 80% of its rated value. The buzzer 72 or other device can then be activated to indicate to the operator that the charge of the boosting battery 2 is low and that it should be recharged. The booster system may be plugged into a standard 110/220-volt electrical outlet via a standard wall charger 82 to recharge the boosting battery 2.") **U.S. 2007/0285049 to Krieger**

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		¶24 ("An on/off switch 58 may control the operation of the jump starter. A **set of indicator lights 64** may be provided to show **the status of the internal battery 20** or portable batteries being charged. The controller 14 may monitor the various components of the jump starter and show results on **a display**. The display may include, for example, a linear meter, a digital read out or a bar graph which may allow a user to monitor the operation of the jump starter, such as **the status on the internal battery**, the battery in a vehicle being jump started, or the portable batteries. **A battery gauge** such as a linear meter for a digital read out or a bar graph may be provided to display to the user **the status of the internal and/or the external battery** being charged. The **gauge** or read out may be provided on a front surface of the housing.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶31 ("The LED **indicator module 32** may include a plurality of LED's. In an embodiment, the LED indicator module 32 has five LED's in the control circuit board 14, to indicate the available power and the charging status of the battery module 16."); ¶46 ("When the mobile power bank 10 is connected to an external power source for charging the battery module 16 via the charging port 34 and is in a charged state, the power test circuit 64 detects the battery capacity of the battery module 16 and activates the LED indicator module 32 for a battery charging indicator."); ¶47 ("For example, when the power test circuit 64 detects battery voltage of the battery module 16 is lower than about 10.8V, the control module 58 may control the LED indicator module 32 to stop all LED's from lighting up. When the detected battery voltage is greater than about 12.6V, the control module 58 may control the LED indicator module 32 so that one LED is lit and another LED is flashing. When the detected battery voltage is greater than about 13V, the control module 58 may control the LED indicator module 32 so that two LED's are lit and another LED is flashing."); ¶48 ("When the battery voltage is greater than about 13.2V, the control module 58 may control the LED indicator module 32 so that three LED's are lit and another LED is flashing. When the battery voltage is greater

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		than about 13.3V, the control module 58 may control the LED indicator module 32 so that four LED's are lit and another LED is flashing. When the battery voltage is equal to or greater than about 13.4V, the control module 58 may control the LED indicator module 32 so that all five LED are lit. As will be understood by one of skill in the art, the number of LED's controlled by the LED module 32 and battery charge indications may be varied."); ¶50 ("If the discharge module power test circuit 70 indicates there is no power load when the battery voltage of the battery module 16 is lower than about 10.8V, then the control module 58 may control the LED module 32 so that one LED is flashing; when the detected battery voltage is greater than about 12.6V, the control module can control the LED module so that one LED is lit; when the detected battery voltage is greater than about 13V, the control module may control the LED module so that two LED's are lit; when the detected battery voltage is greater than about 13.2V, the control module may control the LED module so that three LED's are lit; when the detected battery voltage is greater than about 13.3V, the control module may control the LED module so that four LED's are lit; when the detected battery voltage is equal to or greater than about 13.4V, the control module can control the LED module so that all five LED's are lit."); ¶51 ("If the master control button 26 is activated, and the control module 58 detects that the a power load is connected (for example, if a greater than 50 A power load current is detected, then a power load is considered to be connected), then the control module 58 may turn on the discharge module power test circuit 70 and the LED indicator module 32 to activate the discharged battery indicator. Specifically, when the detected voltage of the battery module 16 is equal to or lower than about 10.8V, the control module 58 may control the LED module 32 so that one LED is flashing; when the detected battery voltage is greater than about 12.6V, the control module can control the LED module 32 so that one LED is lit; when the detected battery voltage is greater than about 13V, the control module may control the LED module 32 so that two LED's are lit; when the detected battery voltage is greater than about 13.2V, the control module can control the LED module 32 so that three LED's are lit; when the detected battery voltage is greater than about 13.3V, the control module may control the LED module 32 so that four LEDs are lit; when the detected battery voltage is equal to or greater than about 13.4V, the control module

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		can control the LED module 32 so that all five LED's are lit."); ¶52 ("As will be understood by one of skill in the art, the power bank system 10 may have a plurality of LED indicator modules. For example, there may be a first LED indicator module for indicating battery charge level and a second LED indicator module for indicating power output level. The plurality of LED indicator modules may be controlled by the control module 58 or by separate modules, such as the power charging module 52 and the discharge module 54.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶8 ("… the MCU controller circuit is further connected to a smart LED electric quantity display system for displaying the electric quantity of the emergency power source …"); ¶26 ("… the MCU controller circuit 14 is further connected to a smart LED electric quantity display system 8 for displaying the electric quantity of the emergency power source …"); ¶27 ("Moreover, by a smart LED electric quantity display system 8, the power usage status of the battery pack 4 in the emergency power source can be detected in real time.") **U.S. 2015/0137740 to Allos** ¶17 ("When the 36 VDC battery pack is fully charged, charger 1 may be configured to automatically shut off and a green light may illuminate on **battery fuel gauge 9** when the test switch 20 is pressed, indicating that the mobile charging system is ready to be used."); *see also* U.S. Provisional Patent Application 61/903,779 at 2, 6-7. The following references also disclose, teach, or suggest this element: U.S. 2004/0239290 to Krieger, e.g., at ¶15; U.S. 2012/0025766 to Reade, e.g., at ¶95; U.S. 2006/0244412 to Bonzer, e.g., at ¶25; U.S. 2014/0210399 to Urschel, e.g., at ¶33; WO 2012/036556 to Eidsvig, e.g., at 7:5-14; U.S. 2002/0041174 to Purkey, e.g., at ¶59; U.S. 6,344,733 to Crass, e.g., at 3:16-22

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17	The apparatus of claim 1, further comprising a visual indicator configured to warn a user when a vehicle battery is connected with reverse polarity.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **WO 2012/080996 A1 to Tracey et al.** 6:23-24 ("An integrated circuit IC1 is connected via a resistor R2 to the positive lead 103 and is connected to the negative lead 105 via **reverse polarity indicator (LED1)**."); 8:22-25 ("Secondly, current from the vehicle battery flows via the resistor R2, reverse polarity indicator LED1 and the input side of the semiconductor photo-relay type TLP222 (IC1) thus illuminating LED1 and the input photo LED in IC1."); 10:1-4 ("A warning light emitting diode LED1 and its associated series limiting resistor are connected in parallel with the PTC devices. During normal engine starting operation the PTC devices are cold and exhibit a low resistance thus permitting normal current flow. As there is little voltage drop across the devices in this state, LED1 is extinguished."); 10:6-11 ("Should any of the following fault conditions occur: clamp short circuit, reverse connection to vehicle or incorrect voltage selection, then a larger than normal current flow will result causing the PTC devices to rapidly warm up and exhibit a high resistance thus limiting current flow to a very low level and preventing damage to the jump starter unit or the flat battery. As most of the battery (BAT1) voltage will now be developed across the PTC devices, LED1 is illuminated thus informing the user that a fault condition has occurred.") **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶38 [7:34-36] ("The indicator 40 may provide a visual or audio indication to a user that a proper polarity connection has or has not been established. The indicator 40 illustrated in FIG. 4 includes a resistor 41 and an LED 42."); ¶39 [7:53-57] ("If the alligator clamps 8, 10 are connected to depleted battery 11 with an incorrect polarity, LED 42 is forward biased and is illuminated indicating an incorrect connection.")

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		U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei ¶10 ("In certain embodiments, when the red and black power source clips are respectively connected to the positive and negative electrodes of the external battery, if the connection is correct, a feedback voltage displayed by the voltage identifying system is positive, otherwise the feedback voltage is negative …"); ¶30 ("When the red and black power source clips are respectively connected to the positive and negative electrodes of the external battery, if the connection is correct, a feedback voltage displayed by the voltage identifying system is positive, otherwise the feedback voltage is negative.") **U.S. 2005/0116688 to Yin** ¶5 ("… a flash light circuit …"); ¶20 ("… a flash light circuit …"); ¶28 ("**When the two battery clamps are reversely connected to the two terminals of vehicle's battery**, the first diode D1 is in a reversed close state in the circuit of the first relay JD1 and so the first relay JD1 remains in an off state, which leads to the disconnection of the rechargeable battery B and the vehicle's battery, thereby eliminating the risks of incurring high current and sparks. Simultaneously, the vehicle's battery provides power to the second relay JD2 and the buzzer BU via the second diode D2, thereby energizing the second relay JD2 and making the buzzer BU to sound. **The rechargeable battery B provides power to the flash light circuit making the light L1 to flash**.") **U.S. 2015/0137740 to Allos** ¶5 ("The mobile charging system may include an indicator, e.g., **a green light indicator**, to alert the operator when the system is interfaced correctly to the vehicle."); ¶22 ("When the mobile charging system is correctly connected to a vehicle with a discharged battery, the **green warning light 10 will illuminate**, indicating proper connection. … When relay 3 N.O. (normally open) contacts are closed, 12V power from circuit C14 will connect with circuit C24 to **turn green**

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		light on in component 10, indicating the correct and safe hook-up of the mobile charging system."); ¶49 ("When component 14 is energized, normally open relay 1 contacts will close, connecting circuit C14 (+12V source) with circuit C18 that feeds component 10 (polarity indicator) **red warning light and buzzer** in the instrument panel to warn the technician of the incorrect connection of the mobile charging system to the vehicle battery. Circuit C18 also feeds component 15 (Normally Closed) relay 2 contacts that connect to circuit C21."); *see also* U.S. Provisional Patent Application 61/903,779 at 1, 2, 5, 7. **U.S. 2006/0220610 to Solberg** ¶23 ("A **display** and a device that converts electric signals into sound may warn a user of a reverse polarity connection."); ¶29 ("Analog gauges, digital, or **light emitting diode displays 302** (as shown in FIG. 3) may provide a reverse polarity warning.") The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶37; U.S. 2004/0239290 to Krieger, e.g., at ¶15; U.S. 2003/0141845 to Krieger, e.g., at ¶64; U.S. 2001/0025618 to Kelling, e.g., at ¶17; U.S. 2014/0084844 to Weflen, e.g., at ¶15; U.S. 5,194,799 to Tomantschger, e.g., at 4:7-16; U.S. 2014/0210399 to Urschel, e.g., at ¶33; U.S. 3,638,108 to Channing, e.g., at 3:57-71; 5:63-71
19	The apparatus of claim 1, further comprising a manual override switch configured to activate a manual override mode to enable a user to connect jump start power to said output port when said vehicle battery isolation sensor is unable to detect presence of a vehicle battery.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **WO 2012/080996 A1 to Tracey et al.** 3:13-17 ("In one embodiment, a gate of the switch is connected to the positive lead by a user-activated switch. In one embodiment, the user-activated switch is of the type for momentary closing. In one embodiment, the user-activated switch is connected to the gate via a diode, preferably a Zener diode. In one embodiment, the switch is solid state and is reverse biased to prevent current flow if a system to

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		which the clamps are connected attempts to return charge."); 6:24-26 ("Also, a manual contact switch 115 (SW1) is connected on one side to the positive lead 3, and on the other to a Zener diode ZD1, a resistor Rl, in turn linked with a bank of MOSFET switches Ql, Q2, and Q3."); 7:8-11 ("The battery 102 positive terminal is also connected to the momentary action single pole normally open switch SW1 1 15. This switch, the Zener diode ZD1 , the resistor Rl and Metal Oxide Semiconductor Field Effect Transistors (MOSFETS) Ql to Q3 comprise the power-switching and over-discharge elements."); 7:13-15 ("To activate the jump-starter system it must be connected to a vehicle battery by means of the positive and negative jaws 56 linked to the conductors 104 and 106. The **activation switch 115** (SW1) is then briefly depressed."); 9:4-5 ("Unlike other jump starter protection circuits that require a vehicle battery to be present for correct operation, this jump starter circuit 100 can operate with a completely dead battery or none at all. However in this case, reverse polarity detection is not available.") **U.S. 2007/0285049 to Krieger** ¶24 ("An **on/off switch 58** may control the operation of the jump starter.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶11 ("In an embodiment, the circuit board further comprises a master control button and the housing further comprises a button cap positioned adjacent the master control button such that operation of the button cap causes operation of the master control button."); ¶29 ("The second plate 24 may be provided with a master control button 26 and a flashlight 28. The flashlight 28 and the master control button 26 may be positioned on opposite surfaces of the second plate 24. Preferably, the flashlight 28 is placed adjacent to an edge of the base cover 20. In an embodiment, the master control button 26 is operable in a direction parallel to the second plate 24. The upper cover 18 is provided with a button cap 30 in the corresponding position of the master control button 26. The button cap 30 may be operated by a user to press the master control button 26.")

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		U.S. 2015/0137740 to Allos ¶24 ("The jump-start and boost functions can be activated with, e.g., a two-minute timer switch 11. The **switch dial** can be rotated manually clockwise and set up to a maximum time of 2 minutes (and thus other times are also possible).") **U.S. 2006/0220610 to Solberg** ¶38 ("An operator may couple one or more of the boost modules to the vehicle's battery or electrical system by activating **a mechanical or electromechanical switch**. When the switch is activated, the charging system couples the boost modules to the vehicle's battery or electric system for a predetermined period of time at act 614. If additional charging is needed, the operator may re-couple one or both of the boost modules to the vehicle's battery or charging system by re-activating switch.") The following references also disclose, teach, or suggest this element: U.S. 2004/0239290 to Krieger, e.g., at ¶14; U.S. 3,590,357 to Reid, e.g., at 4:38-49; U.S. 5,194,799 to Tomantschger, e.g., at 3:3-12; U.S. 3,638,108 to Channing, e.g., at 3:32-45; U.S. 2013/0162029 to Reichow, e.g., at ¶24; U.S. 6,650,086 Chang; e.g., at 4:63-5:9; U.S. 2002/0041174 to Purkey, e.g., at ¶60

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Exhibit 2. Prior Art Products

DTC is currently investigating the dates of conception and reduction to practice of such Public Prior Art and when such Public Prior Art was first known or used by others. There were dozens of portable jump starters on the market prior to the priority date of the '015 patent, and others launched in the United States at approximately the same time as the '015 patent. DTC is still investigating these prior art products and intends to seek third-party discovery as appropriate during the course of this litigation. Additionally, the Court's claim construction may cause additional prior art products to be invalidating. In the course of their investigation, DTC may identify additional prior art documents describing these products and systems that may also anticipate and/or render obvious the one or more Asserted Claims of the patents-in-suit as invalidating printed publications. DTC accordingly reserves the right to modify, amend, or supplement these contentions with those products, as well as other prior art references, upon further investigation.

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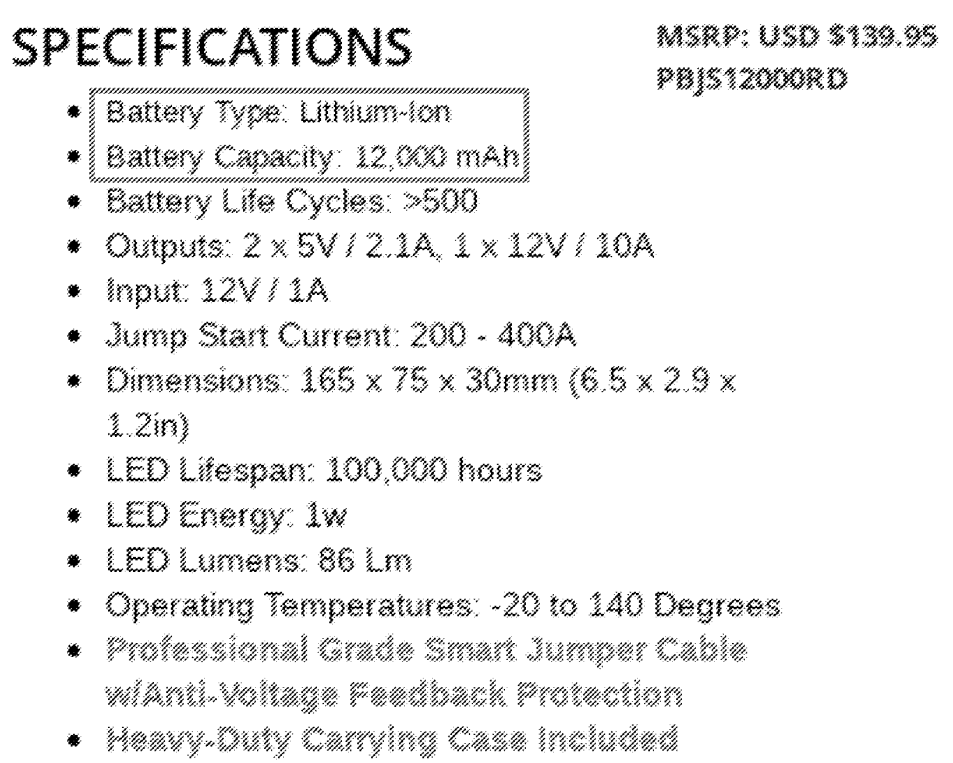
Claim No.	Claim	Prior Art Products
1	Apparatus for jump starting a vehicle engine, comprising:	**Gryphon Mobile Electronics Power All**  DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

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	Antigravity Batteries Micro-Start DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63 **Black & Decker Electromate 400**	

Claim No.	Claim	Prior Art Products
	an internal power supply;	**Gryphon Mobile Electronics Power All**

Claim No.	Claim	Prior Art Products

Claim No.	Claim	Prior Art Products
		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

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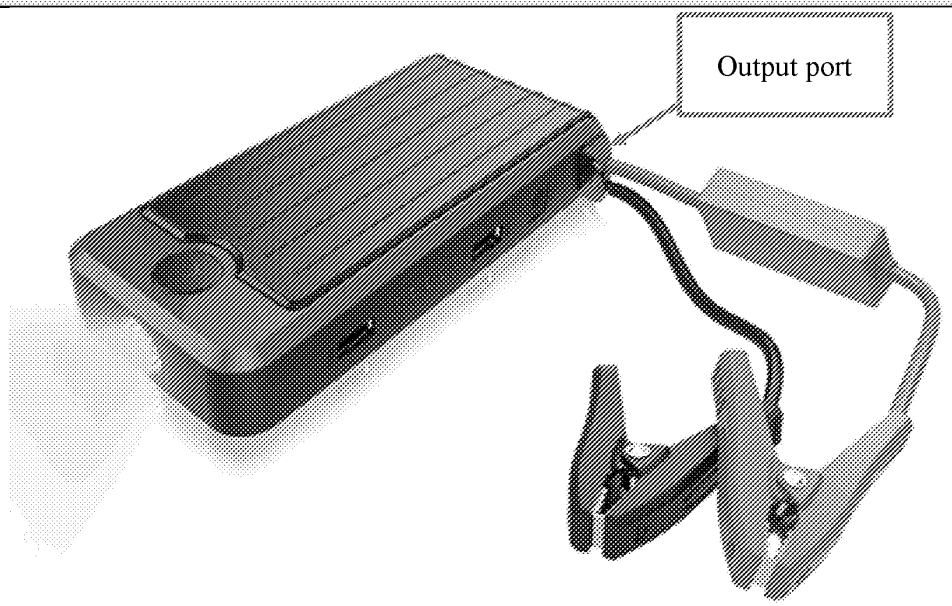
Antigravity Batteries Micro-Start

The Micro-Start PPS (Personal Power Supply) is the world's smallest Jump Starter and Personal Power Supply (only 6" x 2-7/8" x 1"). The built-in Extreme Power Lithium battery can hold a charge for up to a year and not only will it jump-start any car, truck, motorcycle or powersports vehicle multiple times, but also provides hours of backup power to all of your electronic devices. Weighing less than a pound (14 oz.) and small enough to fit in your pocket, you can take it with you anywhere and remain confident that you will be able to start your vehicle, make that important call, or power your child's PSP on that long trip in the car. It even has a built in flashlight with S.O.S patterns built in! Whatever you do, don't get stuck without back up power again...

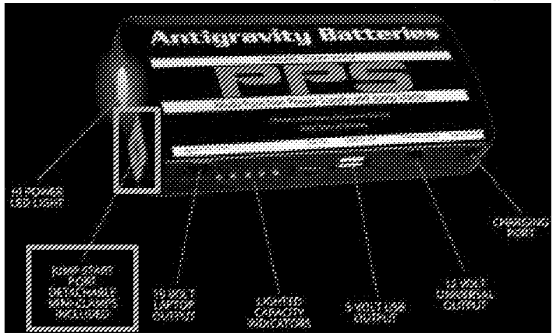
Claim No.	Claim	Prior Art Products
		DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63 **Black & Decker Electromate 400** 

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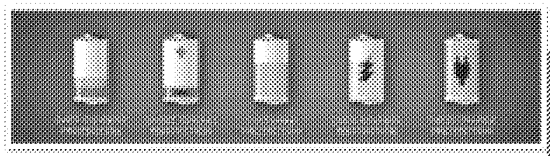
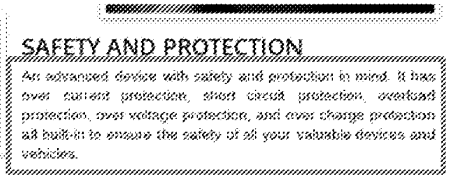
Claim No.	Claim	Prior Art Products
		Technical Details Brand: BLACK+DECKER Model: VEC026BD Item Weight: 25 pounds Product Dimensions: 16 x 8 x 12 inches California residents: Click here for Proposition 65 warning Item model number: VEC026BD Batteries: 1 12V batteries required. (included) Discontinued by manufacturer: Yes Manufacturer Part Number: VEC026BD
	an output port having positive and negative polarity outputs;	**Gryphon Mobile Electronics Power All**

Claim No.	Claim	Prior Art Products
		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

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Claim No.	Claim	Prior Art Products
		Antigravity Batteries Micro-Start   DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63

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Claim No.	Claim	Prior Art Products
	a vehicle battery isolation sensor connected in circuit with said positive and negative polarity outputs, configured to detect presence of a vehicle battery connected between said positive and negative polarity outputs;	**Gryphon Mobile Electronics Power All**    DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

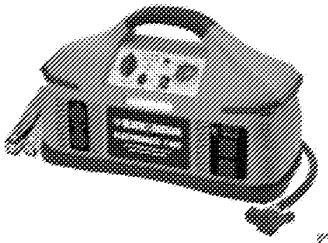
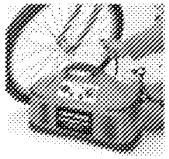
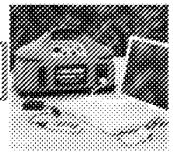
DELTRAN EX1002
IPR2024-01219

Claim No.	Claim	Prior Art Products
		Antigravity Batteries Micro-Start  DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63 "7. It has built-in over-charge and over-discharge protections for long battery life" (DELTRAN0000548, DELTRAN0000551, DELTRAN0000554)
	a reverse polarity sensor connected in circuit with said positive and negative polarity outputs, configured to detect polarity of a vehicle battery connected between said positive and negative polarity outputs and to provide an output signal indicating whether positive and	**Black & Decker Electromate 400**

DELTRAN EX1002
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Claim No.	Claim	Prior Art Products
	negative terminals of said vehicle battery are properly connected with said positive and negative polarity outputs of said output port;	 179 ratings 17 answered questions Currently unavailable. We don't know when or if this item will be back in stock. • 450 amps instantly jump-starts without the need of another vehicle • Built-in ultra-bright LED work light for emergency roadside assistance • Exclusive built-in 120 volt AC charger for use with ordinary household extension cord for recharging • Reverse hook-up warning alarm to prevent damage to vehicle or electronics • One year warranty

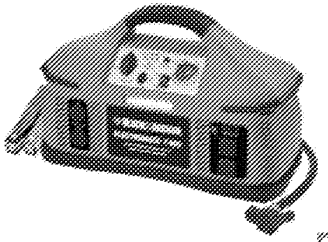
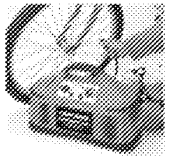
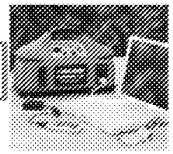
DELTRAN EX1002
IPR2024-01219

Claim No.	Claim	Prior Art Products
		The Black & Decker Electromate 400 Portable Power Station/Jump Starter/Compressor has 400 instant amps to start your car in the unlikely event that your battery goes dead. You can never count on finding someone to jump-start your car, even if you have a set of jumper cables. The Power Station/Jump-Starter/Compressor will alleviate this problem by giving you the power you need to do it yourself. **Ideal for Roadside Emergencies** When your car loses power, the Electromate 400 has enough power to both jump-start your vehicle and run emergency appliances such as portable lights, radios, cell phones, and small tools. The Electromate 400 is also ideal for non-emergency situations like tailgating parties, camping, power outages, and any other situation where no wall outlet is available. It comes equipped with one 120V AC power outlet and one 12V DC outlet, allowing you to charge and operate more than one appliance at once. **Inflates Tires, Sports Equipment, and More** There's also a built-in air compressor that allows you to inflate bicycle tires, sports equipment, and pool toys, but this compressor is also powerful enough to pump up the tires on your vehicle. **Other Features** The Electromate 400 also comes equipped with a built-in, ultra-bright LED work light for emergency roadside assistance and an exclusive, built-in 12V- a keyless on/off power safety switch, reverse hook-up warning alarm in case the jump-start cables are attached to the wrong terminals, vehicle **Rechargeable** This unit recharges easily from any household AC outlet or DC automobile cigarette-plug style outlet, so that it will be ready the next time you need it. **Warranty** Black & Decker offers a full 2-year warranty.  *Black & Decker's Electromate 400 is a powerful and compact tool to restart your vehicle. View larger.*  *The Electromate 400 comes equipped with an air compressor.*  *Power small appliances with the 120V AC and 12V DC outlets.*
	a power switch connected between said internal power supply and said output port; and	**Black & Decker Electromate 400**

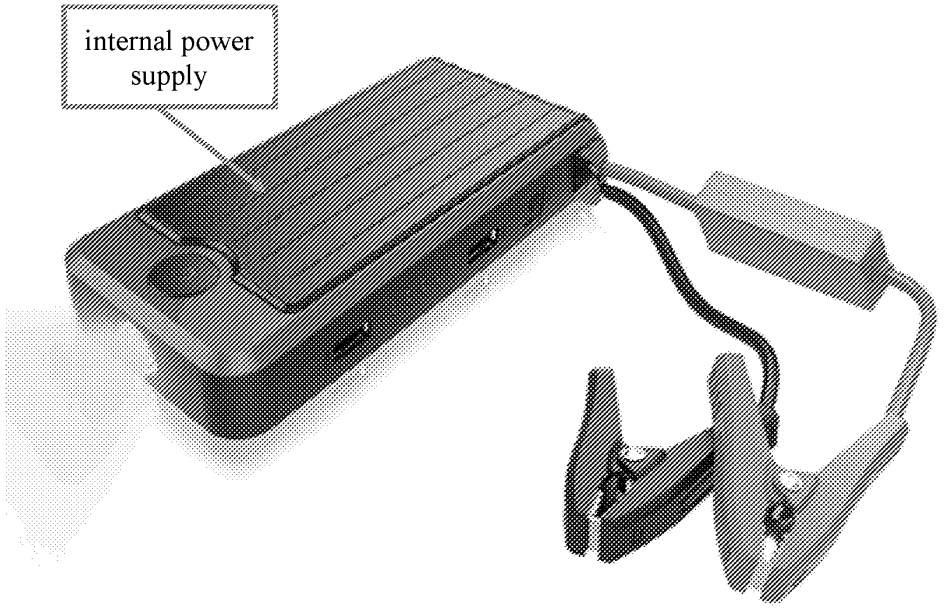
DELTRAN EX1002
IPR2024-01219

Claim No.	Claim	Prior Art Products
		 179 ratings | 17 answered questions Currently unavailable. We don't know when or if this item will be back in stock. • 450 amps instantly jump-starts without the need of another vehicle • Built-in ultra-bright LED work light for emergency roadside assistance • Exclusive built-in 120 volt AC charger for use with ordinary household extension cord for recharging • Reverse hook-up warning alarm to prevent damage to vehicle or electronics • One year warranty

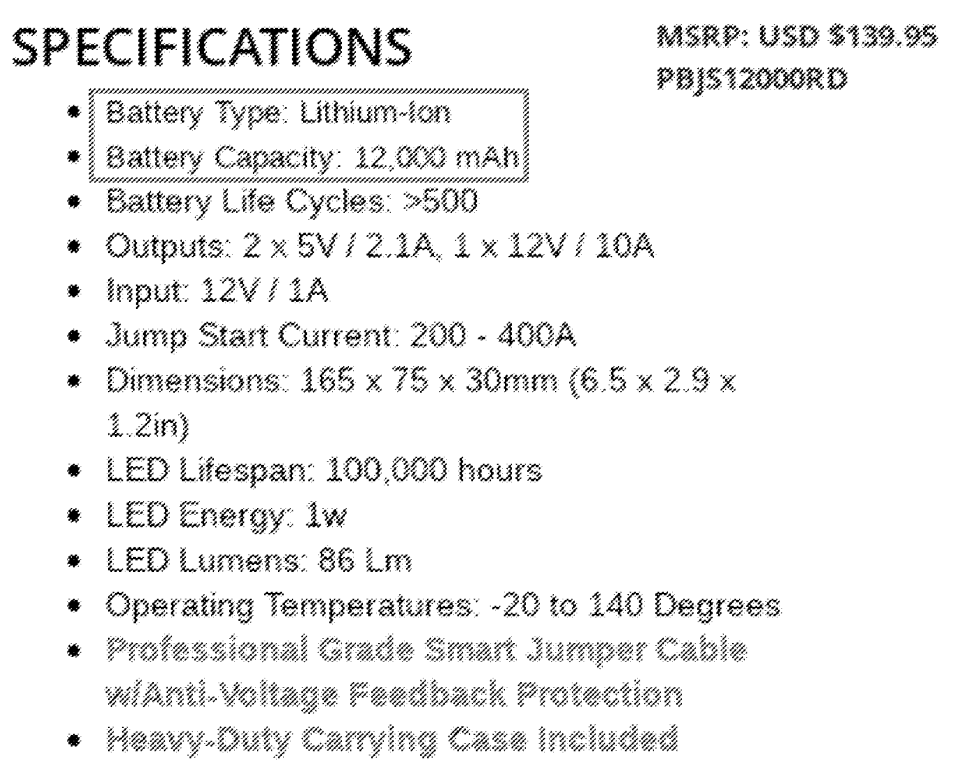
DELTRAN EX1002
IPR2024-01219

Claim No.	Claim	Prior Art Products
		The Black & Decker Electromate 400 Portable Power Station/Jump Starter/Compressor has ASE instant amps to start your car in the unlikely event that your battery goes dead. You can never count on finding someone to jump-start your car, even if you have a set of jumper cables. The Power Station/Jump-Starter/Compressor will alleviate this problem by giving you the power you need to do it yourself.  Black & Decker's Electromate 400 is a powerful and compact tool to restart your vehicle. View larger. **Ideal for Roadside Emergencies** When your car loses power, the Electromate 400 has enough power to both jump-start your vehicle and run emergency appliances such as portable lights, radios, cell phones, and small tools. The Electromate 400 is also ideal for non-emergency situations, like tailgating parties, camping, power outages, and any other situation where no wall outlet is available. It comes equipped with one 120V AC power outlet and one 12V DC outlet, allowing you to charge and operate more than one appliance at once. **Inflates Tires, Sports Equipment, and More** There's also a built-in air compressor that allows you to inflate bicycle tires, sports equipment, and pool toys, but this compressor is also powerful enough to pump up the tires on your vehicle. **Other Features** The Electromate 400 also comes equipped with a built-in, ultra-bright LED work light for emergency roadside assistance and an exclusive, built-in 12V- a keyless on/off power safety switch, reverse hook-up warning alarm in case the jump-start cables are attached to the wrong terminals, vehicle **Rechargeable** This unit recharges easily from any household AC outlet or DC automobile cigarette-plug style outlet, so that it will be ready the next time you need it. **Warranty** Black & Decker offers a full 2-year warranty.  The Electromate 400 comes equipped with an air compressor.  Power small appliances with the 120V AC and 12V DC outlets.
	a microcontroller configured to receive input signals from said vehicle isolation sensor and said reverse polarity sensor, and to provide an output signal to said power switch, such that said power switch is turned on to cause said internal power supply to be connected to said output port in response to signals from said sensors indicating the presence of a vehicle battery at said output port and proper polarity connection of positive and negative terminals of said vehicle battery with said positive	

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Claim No.	Claim	Prior Art Products
	and negative polarity outputs, and is not turned on when signals from said sensors indicate either the absence of a vehicle battery at said output port or improper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs.	
2	The apparatus of claim 1, wherein said internal power supply comprises a lithium ion battery	**Gryphon Mobile Electronics Power All** 

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Claim No.	Claim	Prior Art Products
		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

DELTRAN EX1002
IPR2024-01219

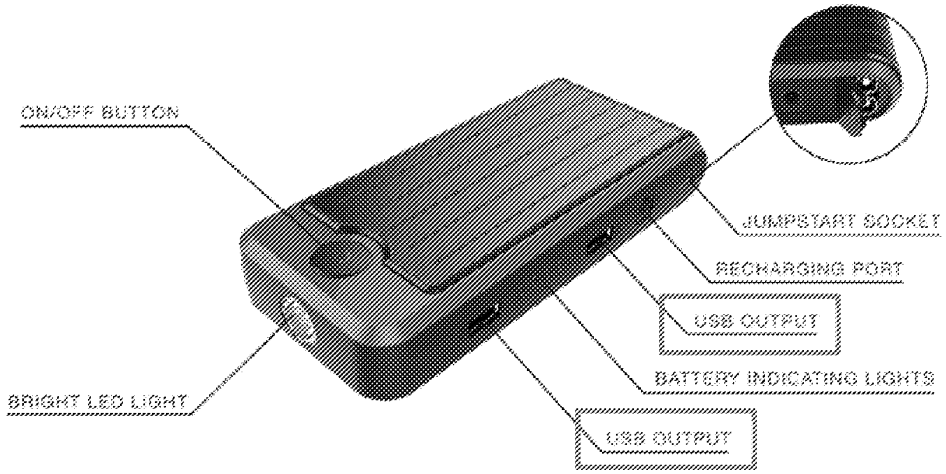
Antigravity Batteries Micro-Start

The Micro-Start PPS (Personal Power Supply) is the world's smallest Jump Starter and Personal Power Supply (only 6" x 2-7/8" x 1"). The built-in Extreme Power Lithium battery can hold a charge for up to a year and not only will it jump-start any car, truck, motorcycle or powersports vehicle multiple times, but also provides hours of backup power to all of your electronic devices. Weighing less than a pound (14 oz.) and small enough to fit in your pocket, you can take it with you anywhere and remain confident that you will be able to start your vehicle, make that important call, or power your child's PSP on that long trip in the car. It even has a built in flashlight with S.O.S patterns built in! Whatever you do, don't get stuck without back up power again...

Claim No.	Claim	Prior Art Products
		DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63
3	The apparatus of claim 2, wherein said lithium ion battery comprises a battery pack of multiple lithium ion batteries.	
9	The apparatus of claim 1, further comprising a voltage regulator configured to convert output voltage of said internal power supply to a voltage level appropriate to provide operating power to internal components of the apparatus.	
10	The apparatus of claim 1, further comprising a USB output port configured to provide charging power from said internal power supply to a USB-chargeable device.	**Gryphon Mobile Electronics Power All**

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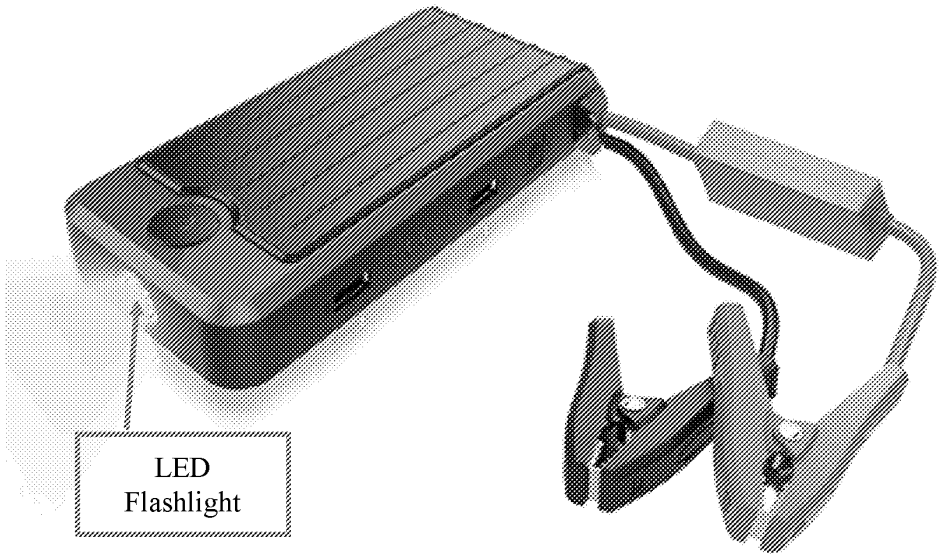
Claim No.	Claim	Prior Art Products

Claim No.	Claim	Prior Art Products
		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

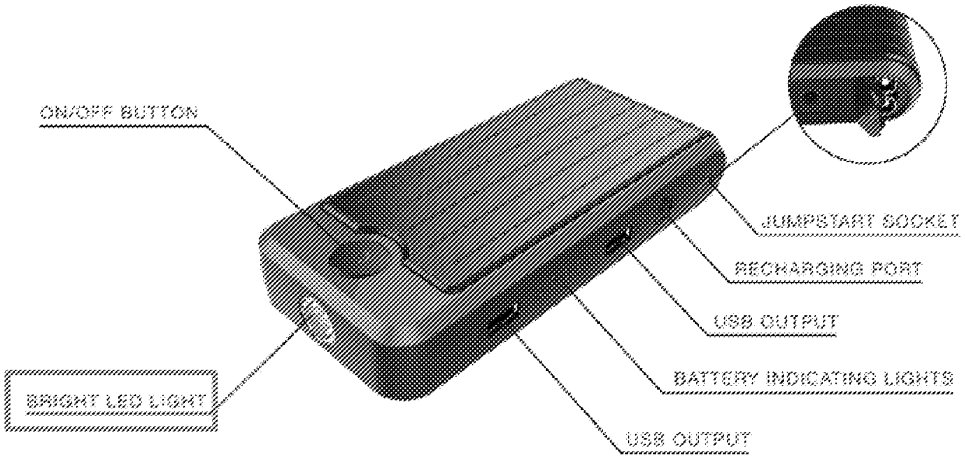
DELTRAN EX1002
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Antigravity Batteries Micro-Start

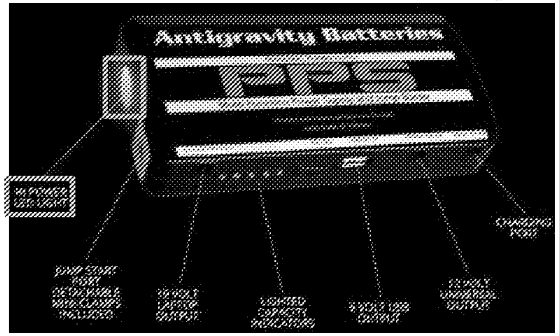
DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63

Claim No.	Claim	Prior Art Products
11	The apparatus of claim 1, further comprising a USB charging port configured to provide charging power from an external power source to said internal power supply.	
12	The apparatus of claim 1, further comprising a flashlight circuit configured to provide a source of light to a user.	**Gryphon Mobile Electronics Power All** 

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Claim No.	Claim	Prior Art Products
		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

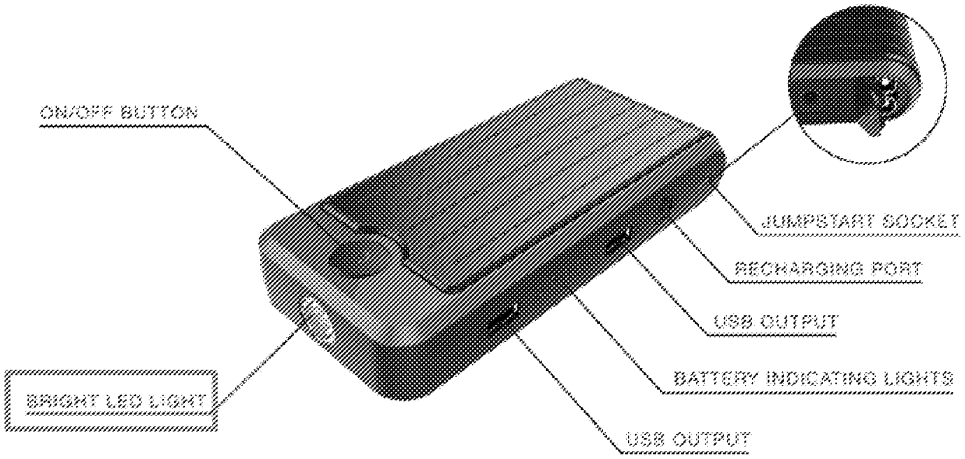
DELTRAN EX1002
IPR2024-01219
Page 3953 of 6315

Claim No.	Claim	Prior Art Products
		Antigravity Batteries Micro-Start   DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63

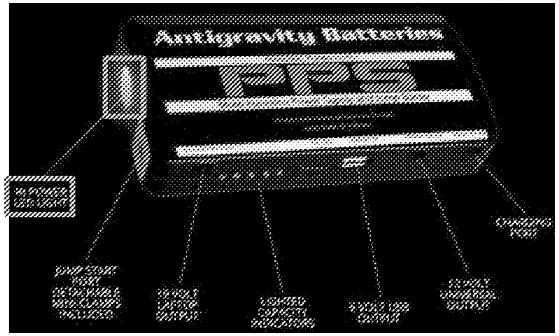
DELTRAN EX1002
IPR2024-01219

Claim No.	Claim	Prior Art Products
13	The apparatus of claim 12, wherein said source of light is at least one LED.	**Gryphon Mobile Electronics Power All**

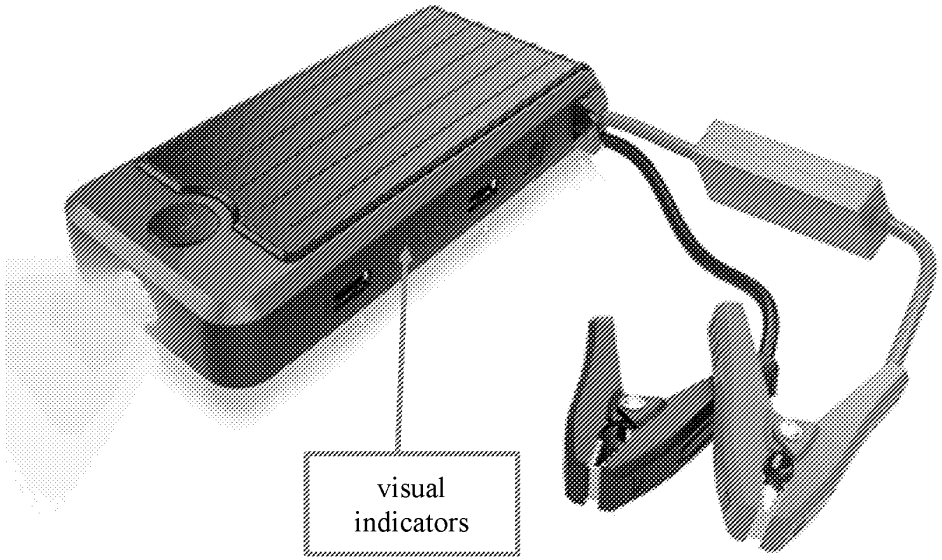
DELTRAN EX1002
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Claim No.	Claim	Prior Art Products
		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

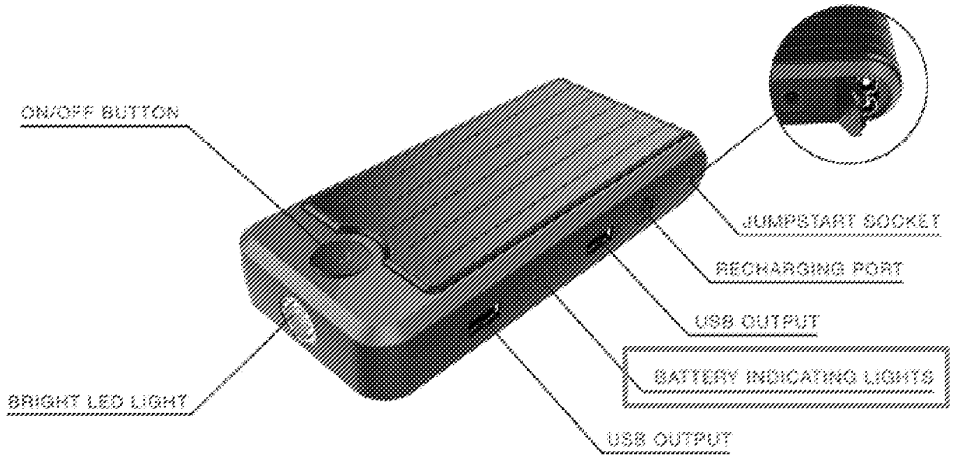
DELTRAN EX1002
IPR2024-01219

Claim No.	Claim	Prior Art Products
		Antigravity Batteries Micro-Start   DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63

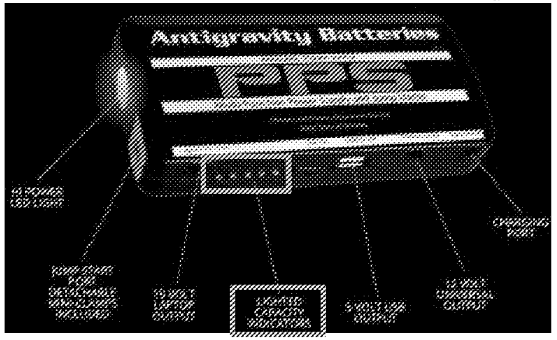
DELTRAN EX1002
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Claim No.	Claim	Prior Art Products
15	The apparatus of claim 1, further comprising a plurality of visual indicators configured to display remaining capacity status of said internal power supply.	**Gryphon Mobile Electronics Power All** 

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Claim No.	Claim	Prior Art Products
		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

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Claim No.	Claim	Prior Art Products
		Antigravity Batteries Micro-Start   DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63

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Claim No.	Claim	Prior Art Products
17	The apparatus of claim 1, further comprising a visual indicator configured to warn a user when a vehicle battery is connected with reverse polarity.	
19	The apparatus of claim 1, further comprising a manual override switch configured to activate a manual override mode to enable a user to connect jump start power to said output port when said vehicle battery isolation sensor is unable to detect presence of a vehicle battery.	

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Espacenet

CA105457S BATTERY

Applicants: SYMBOL TECHNOLOGIES INC [US]

Inventors:

Classifications:

Priorities: US18603903F 2003-07-08

Application: CA105457S·2003-12-30

Publication: CA105457S·2005-06-21

Published as: **AU157289S**; CA105457S;**USD488436S**

BATTERY

Abstract

The design is features of shape, configuration, pattern and ornament of the battery as shown in the drawings in solid lines.Drawings of the design are included.Figure 1 is a perspective view of the top, front and right side of the design;Figure 2 is a perspective view of the top, back and right side thereof;Figure 3 is a top view thereof;Figure 4 is a bottom view thereof;Figure 5 is a right side view, the left side being a mirror image;Figure 6 is a front view thereof; andFigure 7 is a back view thereof.

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Espacenet

CA118796S MOBILE POWER SOURCE

Applicants: XANTREX INT

Inventors:

Classifications:

Priorities: CA118796F 2006-12-22

Application: CA118796S·2006-12-22

Publication: CA118796S·2008-01-15

Published as: CA118796S

MOBILE POWER SOURCE

Abstract

The Design consists of the features of shape and configuration of the MOBILE POWER SOURCE shown in the drawings. The portions shown by stippled lines are part of the article but do not form part of the design.Drawings of the Design are included, in which:Figure 1 is a perspective view of a MOBILE POWER SOURCE according to our new design;Figure 2 is a front elevational view of the MOBILE POWER SOURCE of Figure 1;Figure 3 is a rear elevational view of the MOBILE POWER SOURCE of Figure 1;Figure 4 is a top plan view of the MOBILE POWER SOURCE of Figure 1;Figure 5 is a bottom view of the MOBILE POWER SOURCE of Figure 1;Figure 6 is a left hand side elevational view of the MOBILE POWER SOURCE of Figure 1.Figure 7 is a right hand side elevational view of the MOBILE POWER SOURCE of Figure 1;

DELTRAN EX1002
IPR2024-01219

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

THE NOCO COMPANY, INC., Plaintiff, v. **SHENZHEN LIANFA TONG TECHNOLOGY CO., LTD., *et al.*,** Defendants.	**Civil Action No. 1:19-cv-01855** **Judge Christopher A. Boyko** **JURY TRIAL DEMANDED**

DEFENDANTS' INVALIDITY AND UNENFORCEABILITY CONTENTIONS

Pursuant to L.P.R. 3-5, Defendants Shenzhen Lianfa Tong Technology Co., Ltd., Shenzhen Mediatek Tong Technology Co., Ltd., and Shenzhen Bi Te Yi Technology Co., Ltd. (collectively "Defendants") provide the following invalidity and unenforceability contentions with respect to U.S. Patent No. 9,007,015 (the "'015 Patent).

L.P.R. 3-5(a)

Defendants identify the follow prior art references which anticipate and/or render obvious claims 1-3, 8-15, 17, 19, and 20 of the '015 Patent:

U.S. Patent No. 7,345,450 to Krieger ("Krieger"), issued March 18, 2008.
U.S. Patent Application Publication No. US 2004/0130298 ("Krieger")
U.S. Patent No. 9,506,446 to Xinfang ("Xinfang"), issued November 29, 2016.
U.S. Patent No. 6,426,606 to Purkey ("Purkey"), issued July 30, 2002.
U.S. Patent No. 8,072,900 to Brown ("Brown"), issued December 13, 2011.
U.S. Patent No. 9,525,297 to Wang ("Wang'), issued December 20, 2011.
U.S. Patent No. 5,650,974 to Yoshimura ("Yoshimura") issued July 22, 1997.
Chinese Patent No. 202696190 to Zhang (Chinese language version) ("Zhang")
Chinese Patent No. 202696190 to Zhang (English language version) ("Zhang CN")
Certification of Translation for Chinese Patent No. 202696190 to Zhang
U.S. Patent Application Publication No. 2009/0174362 ("Richardson I")
U.S. Patent Application Publication No. 2013/0154543 ("Richardson II")
USB Battery Charging Specification Version 1.2 ("USB Charging Spec.")

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U.S. Patent No. 5,496,658 to Hein ("Hein")
U.S. Patent No. 3,085,187 to Godshalk ("Godshalk")
U.S. Patent No. 3,105,183 to Hysler ("Hysler")
U.S. Patent No. 3,267,452 to Wolf ("Wolf")
U.S. Patent No. 5,793,185 to Prelec ("Prelec")
E-flite EC Connector Assembly Instructions 2008 ("EC Connector Instructions")
U.S. Patent No. 7,095,339 to Peng ("Peng")
Datasheet for LM7805 Voltage Regulator from Fairchild Semiconductor ("LM7805 Datasheet (2008)")
U.S. Patent No. 6,424,158 ("Klang")
U.S. Patent No. 9,954,391 ("Lei")
U.S. Patent No. 5,319,298 ("Wanzong")
WO Publication No. 2010/129723 to Baxter ("Baxter")
Carku Product Brochure for the Epower-20 jump starter product ("Epower-20 brochure")
Carku Product Brochure for the Epower-21 jump starter product ("Epower-21 brochure")
U.S. Patent No. 8,172,603 ("Richardet")
MC78XX/LM78XX/MC78XXA 3-Terminal 1A Positive Voltage Regulator from Fairchild Semiconductor Corporation 2001 ("LM7805 Datasheet")
Patent Owner The NOCO Company's Preliminary Response in the Dongguan IPR
Memorandum Opinion and Order of United States District Court Judge Pamela A. Barker construing the disputed terms of claims 1, 9 and 19 of the '015 patent issued in *The NOCO Co. v. SmarTech Products, Inc.*, Case No. 1:18-cv-2780 (N.D. Ohio April 16, 2020) ("SmarTech Order")
The NOCO Company's Amended Complaint in *The NOCO Company, Inc. v. Shenzhen Lianfa Tong Technology Co., Ltd., et al.*, Case No. 1:19-cv-01855 (N.D. Ohio April 2, 2020 ("Dkt. No. 19")
Declaration of Yingchun Wan ("Dec. of Wan")
Declaration of Dr. David Hartup ("Dec. of Hartup")
Declaration of James L. Kirtley Jr., Ph.D. ("Dec. of Kirtley")
Special Master Report On Proposed Claim Construction For U.S. Patent No. 9,007,015 issued in *NOCO Co. v. Shenzhen Dika Na'Er E-Commerce Co.*, Case No.1:17CV2282 (N.D. Ohio Jun. 28, 2018) accepted and adopted by United States District Court Judge Christopher A. Boyko, 2019 WL 1723358 ("Shenzhen Dika Order")

L.P.R. 3-5(b)

As per L.P.R. 3-5(b), Defendants identify the following claims as being anticipated and/or rendered obvious by the prior art cited herein, the grounds for which are cited fully in the accompanying exhibits. Claims 1-3, 9-15, and 17 are rendered obvious under 35. U.S.C. § 103 by Krieger in view of Xinfang. *See* Ex. A. Claims 19 and 20 are rendered obvious under 35. U.S.C. § 103 by Krieger in view of Xinfang and Purkey. *See* Ex. B. Claims 1-3, 9-15, 17, 19, and 20 are

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rendered obvious under 35 U.S.C. § 103 by Purkey in view of Xinfang. *See* Ex. C. Claims 1-3, and 10-15 are rendered obvious under 35 U.S.C. § 103 by Brown in view of Wang and Xinfang. *See* Ex. D. Claims 1, 9, and 17 are obvious under 35 U.S.C. § 103 by Krieger in view of Yoshimura. *See* Ex. E. Claims 1-3, 9-15, and 17 are rendered obvious under 35 U.S.C. § 103 by Krieger in view of Xinfang and in view of Yoshimura. *See* Ex. F. Claims 1, 8-9, 17, and 19-20 are anticipated under 35 U.S.C. § 102 by Zhang. *See* Ex. G. Claims 2-3, 10, and 12-15 are rendered obvious under 35 U.S.C. § 103 by Zhang in view of Xinfang. *See* Ex. H. Claim 11 is rendered obvious under 35 U.S.C. § 103 by Zhang in view of the USB charging specification. *See* Ex. I. Claims 1, 8, 9, 17, and 19 are anticipated by Richardson I under 35 U.S.C. § 102. *See* Ex. J. Claims 2, 3, 10, and 12-15 are rendered obvious under 35 U.S.C. § 103 by Richardson I in view of Xinfang. *See* Ex. K. Claims 2, 3, and 12-14 are rendered obvious under 35 U.S.C. § 103 by Richardson II in view of Lei. *See* Ex. L. Claims 10-13 are rendered obvious under 35 U.S.C. § 103 by Richardson II in view of the Epower-20 and/or the Epower-21 brochures. *See* Ex. M. Claims 1 and 17are anticipated under 35 U.S.C. § 103 by Klang. *See* Ex N.

L.P.R. 3-5(c)

As per L.P.R. 3-5(c), Defendants hereby produce the attached charts marked Exhibits A – N.

L.P.R. 3-5(d)

Defendants state that claim 3 is invalid as indefinite under 35 U.S.C. § 112(b). In addition, claim 1-3, 8-15, 17, 19, and 20 are invalid under 35 U.S.C. § 112(a) as they all fail to meet the written description and enablement requirement. More specifically, the reverse polarity sensor circuitry disclosed in the '015 Patent is erroneous and will not enable a person of ordinary skill in the art to practice the disclosed inventions. For example, due to the presence of diode D8, the

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optocoupler LED 11 of the reverse sensor 10 will provide a "1" or high output signal to the MCU 1 even if the car battery 72 is connected to the handheld booster device with reverse polarity.

L.P.R. 3-5(e)

Defendants do not assert that the '015 Patent is unenforceable at this time. However, Defendants reserve the right to assert such should any facts come to light during the course of discovery.

L.P.R. 3-6(a)

Defendants have produced documents bates labeled MTEK – 000001 through MTEK - 001020.

L.P.R. 3-6(b)

Defendants state that they currently have no documents relevant to L.P.R. 3-5(e).

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Dated: September 18, 2020

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Shenzhen Mediatek Tong Technology Co., Ltd., and
Shenzhen Bi Te Yi Technology Co., Ltd.

CERTIFICATE OF SERVICE

I hereby certify that all counsels of record are being served today with a copy of this document via electronic mail.

September 18, 2020 */s/ Timothy Wang*
Timothy Wang

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Claim No. HP-2020-000018

IN THE HIGH COURT OF JUSTICE
BUSINESS AND PROPERTY COURTS OF ENGLAND AND WALES
INTELLECTUAL PROPERTY LIST (ChD)
PATENTS COURT

BETWEEN:

SHENZHEN CARKU TECHNOLOGY CO., LTD

(a company incorporated under the laws of the People's Republic of China)

Claimant

- and -

THE NOCO COMPANY

(a company incorporated under the laws of Ohio, United States of America)

Defendant

GROUNDS OF INVALIDITY

---

1. The following are the Grounds of Invalidity of GB Patent 2,527,858 ("GB '858") referred to in the Particulars of Claim.

Lack of novelty

2. The invention so far as claimed in at least claim 1 of GB'858 is not a patentable invention in that it was not new having regard to the matter forming the state of the art at the priority date thereof.

PARTICULARS

Hereunder the Claimant relies on the following as forming part of the state of the art:

(a) CN 103066662 A, published on 24 April 2013 ("**Carku CN**");

(b) U.S. Patent Application Publication No. US 2004/0130298, published on 8 July 2004 ("**Krieger**"); and

(c) U.S. Patent Application Publication No. 2013/0154543, published on 20 June 2013 ("**Richardson**").

Lack of inventive step

3. The invention so far as claimed in each and every claim of GB'858 is not a patentable invention in that it was obvious and did not involve an inventive step having regard to the matter forming the state of the art at the priority date thereof.

PARTICULARS

Hereunder the Claimant relies on the following as forming part of the state of the art:

(a) Carku CN;

(b) Krieger;

(c) Richardson; and

(d) Prior use of the Carku E-Power 21 device ("**Carku E-Power 21**").

PARTICULARS

a. The matter made available to the public through this prior use included:

i. the information evident from the use or inspection of the Carku E-Power 21 (a sample Carku E-Power 21 device is available for inspection at the offices of the Claimant's solicitors),

ii. the information set out in the user manual for the Carku E-Power 21 (a copy is provided at Annex 1 hereto),

iii. the information set out in the specification sheet for the Carku E-Power 21 (a copy is provided at Annex 2 hereto), and

iv. the information set out in the Claimant's E-catalogue dated 22 April 2014, which included the Carku E-Power 21 (a copy is provided at Annex 3 hereto).

b. The matter was made available at least:

i. to attendees of the 115th 2014 Canton Import and Export Fair in Guangzhou, China taking place from 15 to 5 May 2014 (the "**Canton Fair**"), each of whom had an opportunity to inspect the Carku E-Power 21 and the manuals for that device (photographs of the Claimant's booth at the 115th 2014 Canton Fair are provided at Annex 4),

ii. to Edelbert Lenz GmbH & Co. KG (an Austrian distributor for Carku Products), who received photographs and a quotation sheet by email in respect of Carku's E-Power 21 (Annex 5 hereto) on 7 March 2014,

iii. to Kaz Corp of Japan (kaz-corp.com), which ordered [101] Carku E-Power 21 units after the Canton Fair and received copies of the user manuals and specification sheet for the device by email from the Claimant on 21 April 2014 (Annex 6 hereto), and

iv. to Krautli (Schweiz) AG, a representative of which visited the Claimant's exhibition at the Canton Fair, and which received the E-Catalogue by email from the Claimant on 24 April 2014 (Annex 7 hereto).

c. The use occurred from April 2014 to July 2014.

(e) U.S. Patent No. 6,424,158 ("**Klang**");

(d) U.S. Patent No. 8,172,603 ("**Richardet**"); and

(e) common general knowledge.

POWELL GILBERT LLP

STATEMENT OF TRUTH

The Claimant believes that the facts stated in these Grounds of Invalidity are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

I am authorised by the Claimant to sign this Statement.

Signed .....

Full Name **Ari Pekka Laakkonen**
Position Partner, Powell Gilbert LLP, Claimant's solicitors

Served this ~~20th~~ 21st day of May 2020 by Powell Gilbert LLP of 85 Fleet Street, London, EC4Y 1AE, Solicitors for the Claimant.

Ref: SHE3.1/APL/CKW

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IN THE HIGH COURT OF JUSTICE **HP-2020-000022**
BUSINESS AND PROPERTY COURTS OF ENGLAND AND WALES
INTELLECTUAL PROPERTY LIST (ChD)
PATENTS COURT

B E T W E E N :

THE NOCO COMPANY
(a company incorporated under the laws of Ohio, United States of America)
Claimant

and

RING AUTOMOTIVE LIMITED
Defendant

Annex A to the Grounds of Invalidity

PROJECTA

2 x 22 AMP HOUR HIGH PERFORMANCE

JUMPSTARTER



P/No.s HP2012, HP2200

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IMPORTANT SAFETY INFORMATION

Please read this manual thoroughly before use and store in a safe place for future reference.

WARNINGS

Risk of explosive gas. Working in the vicinity of a lead-acid battery can be dangerous. Batteries release explosive gases during normal operation, charging and while jumpstarting a battery. Before using this jumpstarter, read and follow the instructions carefully. Follow all manufacturer's instructions and warnings of the vehicle's battery and other equipment being used.

Jumpstart lead-acid batteries only. Do not use to jumpstart dry-cell batteries commonly found in household appliances. These batteries may burst and cause injury and/or property damage.

Do not smoke, use matches, use a cigarette lighter, or allow a spark or flame near the battery.

Do not allow metal to come in contact with the battery posts. It may spark or short-circuit the battery and cause an explosion.

Always wear eye protection when operating the jumpstarter

Remove rings, bracelets, necklaces and watches when working with a lead-acid battery.

Contains a sealed non-spillable lead acid battery and must be disposed of properly.

Ensure correct polarity when connecting to vehicle.

Do not submerge jumpstarter in water.

IMPORTANT CHARGING INFORMATION

Charge jumpstarter prior to first use, this may take up to 24 hours.

Fully recharge the jumpstarter after every use and follow charging instructions.

When jumpstarter is not in use ensure jumpstarter is always on charge.

Do not allow jumpstarter to become very flat. If the jumpstarter's battery is below 12.6V in 12V mode or below 25.2V in 24V mode, ensure the jumpstarter is charged immediately.

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FEATURES

ENGINE STARTING CAPABILITIES

HP2012

The HP2012 is suitable for starting 12V vehicles.
12V: Petrol vehicles up to 6 litres and diesel vehicles up to 4.5 litres

HP2200

The HP2200 is suitable for starting both 12V and 24V vehicles.
12V: Petrol vehicles up to 6 litres and diesel vehicles up to 4.5 litres
24V: Petrol & Diesel vehicles up to 7 litres in capacity.

TOTAL SAFEGUARD PROTECTION

POLARITY & SURGE PROTECTION

Prevents sparking from accidental reverse connection, as well as protecting your vehicle from spikes in voltage levels.

CRANKING PROTECTION

Prevents your jumpstarter batteries from being over discharged often caused by over cranking.

DISCHARGE PROTECTION

Discharge protection disconnects power to all 12V accessories when the battery voltage reaches low levels.

UNDER & OVER VOLTAGE PROTECTION

The jumpstarter will deactivate and sound an alarm if connected to a battery of a different voltage to the setting of the jumpstarter, preventing reverse charge and damage to the jumpstarter battery. This feature will also disconnect the jumpstarter if the vehicles alternator is malfunctioning with high voltage.

LCD DIGITAL DISPLAY

The jumpstarter is fitted with an LCD digital display that displays the batteries state of charge, battery voltage mode, correct connection and other warning messages during operation.

HEAVY-DUTY FULLY INSULATED LEADS

Long 1.6m leads allow easy connection to the vehicles battery while the jumpstarter is on the ground. Quality cable ensures optimal performance.

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HIGH PERFORMANCE BATTERY
High quality AGM battery delivers instant starting power to vehicles. Maintenance free and fully sealed battery ensures convenience and safety.

240V AND 12V RECHARGING
4A adaptor allows recharging from a 240 Volt AC outlet.
The DC lead allows charging from either the 12V or 24V accessory socket.

5 STAGE AUTOMATIC CHARGE CONTROL
Both the HP2012 and HP2200 feature in-built 5 stage charge control that delivers a complete and thorough charge to the jumpstarter batteries in both 240VAC and 12/24VDC charge modes. 5 stage charging gives your jumpstarter batteries longer life, better performance and can be left connected permanently without risk of overcharging.

REVERSE POLARITY PROTECTION & ALARM
Prevents sparking from accidental reverse connection. The alarm sounds when the jumpstarter clamps are connected incorrectly.

SURGE PROTECTED
The HP2012/HP2200 features built in surge protection so you can safely jump start vehicles with EFI and computer management systems.

PORTABLE POWER
The accessory socket & heavy duty accessory sockets can be used to power 12 Volt DC appliances such as camping lights, radios, MP3 players and computers.

INBUILT L.E.D WORK LIGHT
An inbuilt L.E.D work light provides illumination for safer, more convenient operation at night.

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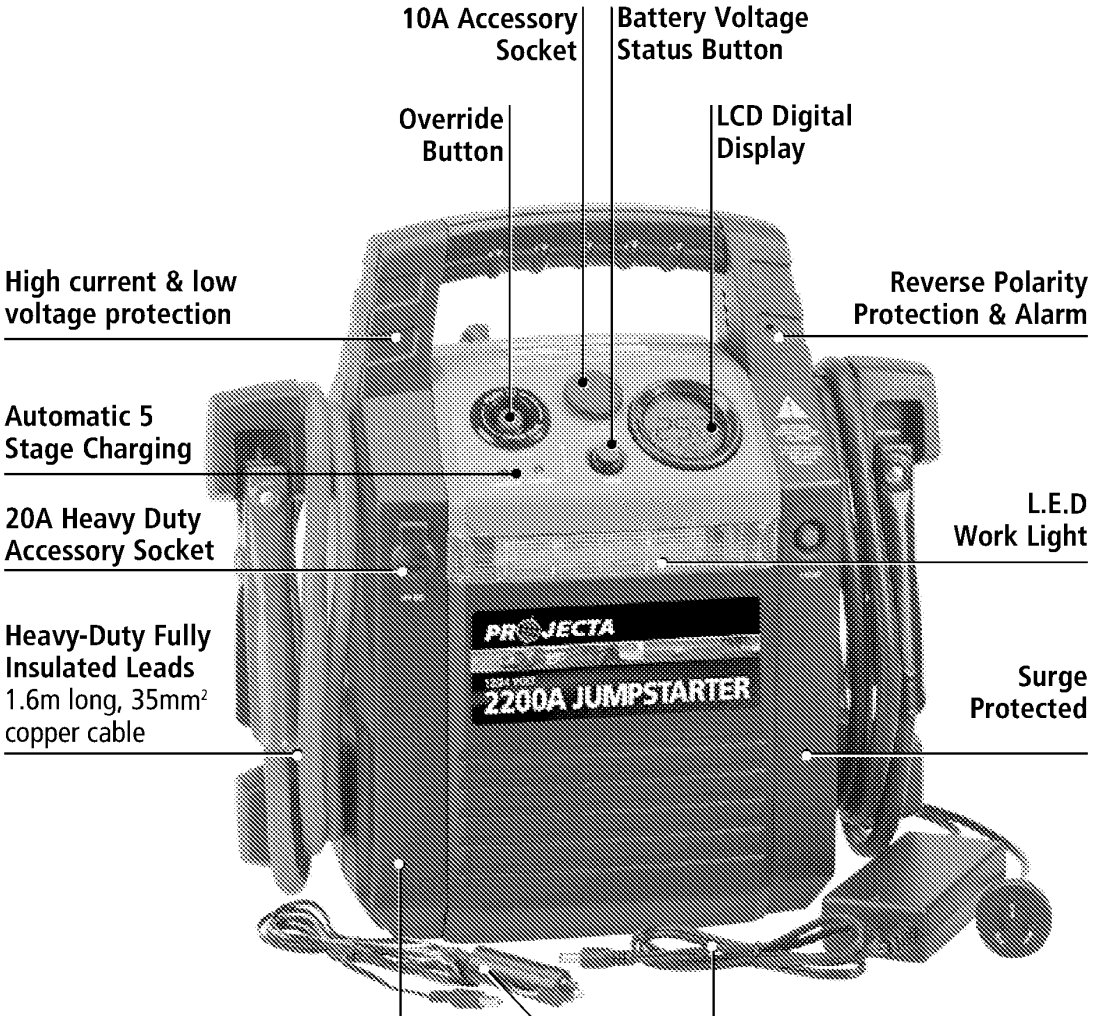
SPECIFICATIONS

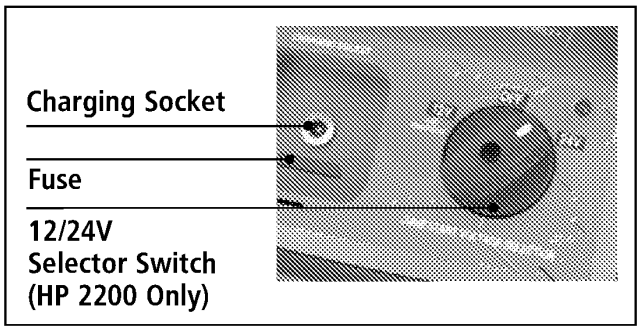
Part No.	HP2012	HP2200
Battery		
Battery Capacity	2 x 12V 22Ah AGM	2 x 12V 22Ah AGM
Battery Short Circuit Current	2000A	2200A at 12V,1100A at 24V
Clamp Output	600A	640A at 12V, 500A at 24V
12V DC Power outlets		
Accessory Socket	10A	10A
Heavy Duty Accessory Socket	20A	20A
Protection	20A overload, 11.0V LVD (25A ATS Fuse)	20A overload, 11.0V LVD (25A ATS Fuse)
Jumpstarter Leads		
Length	1.6 meters	1.6 meters
Cable	35mm2	35mm2
Polarity Protection	MCU controlled solenoid	MCU controlled solenoid
Overload Protection	MCU controlled solenoid	MCU controlled solenoid
Recharging		
240V	4A	4A
DC Charging	12V–24V 4A	12V–24V 4A
Control	Automatic 5 Stage	Automatic 5 Stage
Jumpstart connection voltages		
12V Mode	1.2V–15.0V	1.2V–15.0V
24V Mode	N/A	15.1V–30V
Override	0V–1.2V	0V–1.2V
LCD Display		
Jumpstart Mode	12V	12V & 24V
Jumpstarter Battery Voltage	Battery test button	Battery test button
L.E.D Charge Indication		
Blue	Charging	Charging
Green	Fully Charged	Fully Charged
Dimensions & Weight		
Height	370mm	370mm
Width	390mm	390mm
Depth	200mm	200mm
Weight	16.3Kg	17.5Kg

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PRODUCT OVERVIEW

Image of HP2200 (HP2012 not shown)





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VEHICLE JUMPSTARTING INSTRUCTIONS

NOTE: Instructions for negatively earthed vehicles only

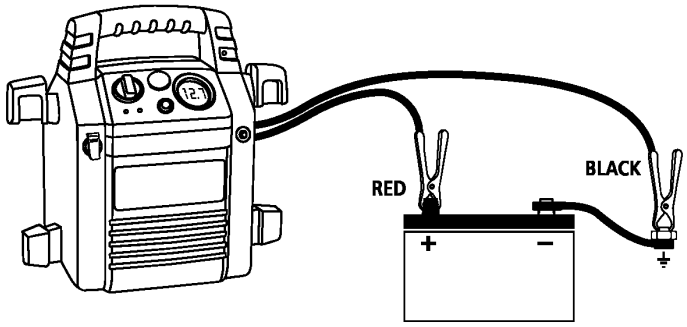
1. Insert supplied fuse into fuse holder below charging socket.
2. Your jumpstarter should be charged for 24 hours prior to first use and as soon as possible after each use.
3. Before making any connections, check the jumpstarter battery status by pressing the red INTERNAL BATTERY STATUS button. The jumpstarter's battery voltage should be above 12.6V in 12V mode and above 25.2V in 24V mode.
4. Turn your vehicle's ignition OFF before connecting the jumpstarter's clamps to your vehicle.

5a. To operate the HP2012 rotate the switch at the back of the unit to ON AND CHARGING. The HP2012 will jumpstart 12V vehicles only.

5b. If operating the HP2200 select the required voltage to suit the vehicle by rotating the switch on the back of the jumpstarter to 12V AND CHARGING or 24V.

6. Connect the Red Positive (+) clamp to the positive (+) terminal of the battery in the vehicle and the Black Negative (-) clamp to any non-moving metal part of the engine block. DO NOT CONNECT TO FUEL LINE. Always double check that you have the proper connections.

   If the jumpstarter fails to start your vehicle refer to the LCD screen for any error it may indicate & check that the clamps are correctly connected with good contact. If the vehicle's battery is below 1.2V ensure all connections are correct and then press the OVER RIDE button to manually engage the jumpstarter.
7. Turn the vehicle's ignition to ON and start the vehicle. After the engine has started, rotate the power switch to the OFF position.
8. Disconnect the Black clamp and then the Red clamp
9. Recharge the jumpstarter.



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UNDERSTANDING YOUR JUMPSTARTER

STATUS	SCREEN DISPLAY	SCREEN ILLUMINATION
Incorrect Battery Voltage	ERR / v24.0* (Scrolling Display) *Example only: Display shows actual battery voltage.	Screen flashing
Reverse Connection	- OR + (+/- Alternating) REV / CON (Scrolling Display)	Screen flashing
Low Battery Voltage **12V Mode:** less than 12.0V **24V Mode:** less than 24.0V	LO / BAT (Scrolling Display)	ON
Low Battery Voltage **Switched Off:** less than 11.5V	LO / BAT (Scrolling Display)	OFF
Input Charge Voltage Above 30.0V	OVL	Screen flashing
Jumpstarter Over Temperature	OL	Screen flashing
Accessories Current Overload	ACC / OL (Scrolling Display)	Screen flashing
Accessories Low Voltage Disconnect (LVD)	ACC / LVO (Scrolling Display)	OFF
Battery Charging Bulk Timed Out	BAT / ERR (Scrolling Display)	Screen flashing
Positive (Red) Clamp Connected	- OR +	ON
Negative (Black) Clamp Connected	- OK +	ON
Jumpstarter Connected	- OK +	ON
Internal Battery Voltage (Battery Status Button)	v 12.8 MODE 12 v	ON
Jumpstarter Mode (When switched to 12V)	MODE 12 v	OFF
Jumpstarter Mode (When switched to 24V, HP2200 only)	MODE 24 v	OFF

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ALARM	REMEDY
Beeping Intermittently	Check voltage of battery being jumpstarted. Ensure the jumpstarter voltage is switched to the same voltage as the vehicle being jumpstarted
Constantly On	Check the jumpstarter clamps are connected correctly to the battery
Beeping Intermittently	Recharge jumpstarter
Beeping Intermittently	Recharge jumpstarter **OR** to override/cancel warning hold the BATTERY STATUS button while the jumpstarter is switched to the off position
OFF	Check input charge voltage is below 30V
OFF	Allow jumpstarter temperature to cool down
Beeping Intermittently	Check current draw of appliance being used
OFF	Recharge jumpstarter or press Override button
OFF	Disconnect any appliance connected to the jumpstarter. If no load is connected to the jumpstarter the batteries may be faulty and require replacing
OFF	No action required
OFF	No action required
OFF	No action required
OFF	No action required
OFF	No action required
OFF	No action required

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CHARGING WITH AC ADAPTOR

IMPORTANT: DO NOT POWER ANY APPLIANCE FROM THE JUMPSTARTER WHILE IT IS BEING CHARGED USING THE AC CHARGER.

1. To charge, rotate the switch on the back of the unit to ON AND CHARGING (HP2012) or 12V AND CHARGING (HP2200).
2. Plug the output end of the AC charger into the charging socket (back of jumpstarter) and connect the charger to a 240VAC outlet and turn ON.
3. The CHARGING LED will illuminate blue when charging & the FULL LED will illuminate solid green when the jumpstarter is fully charged. The jumpstarter will automatically stop charging and the jumpstarter will initiate maintenance charge mode keeping the battery fully charged and ready for use without the risk of overcharging.

   Charging time: 15 hours if the battery is completely flat.

WHEN TO CHARGE

Your jumpstarter is shipped fully charged, however, an extended period of time may elapse in shipment or storage before the jumpstarter is purchased. Therefore you should charge the jumpstarter before using it for the first time. It is recommended to charge fully after each use. If the jumpstarter is not being used, it is recommended to leave the jumpstarter permanently on charge ensuring the battery is always maintained fully charged and ready for use.

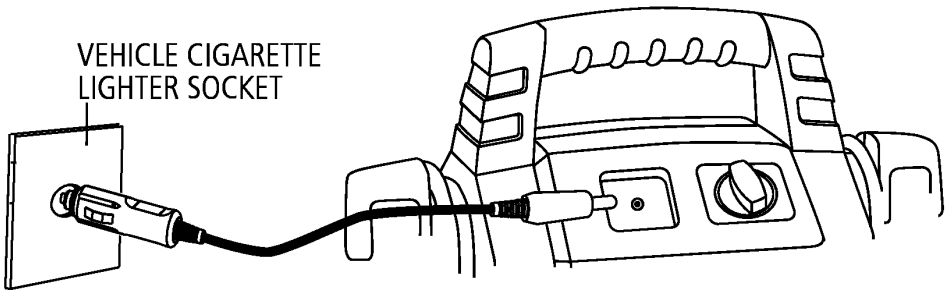
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CHARGING WITH 12V DC

Your Jumpstarter can be recharged from a 12V DC socket. A single-ended accessory plug and lead is included for recharging while driving.

1. To charge, rotate the switch on the back of the unit to ON AND CHARGING (HP2012) and 12V AND CHARGING (HP2200).
2. Connect the 12V charging lead to your vehicles cigarette lighter socket and to the jumpstarter's charging socket.
3. Start the car. The vehicle's alternator will charge both the jumpstarter and the vehicle battery at the same time. The CHARGING LED will illuminate blue while charging and the FULL LED will illuminate solid green when fully charged. The jumpstarter's charge control will automatically stop charging and initiate maintenance mode keeping the battery fully charged and ready for use without risk of overcharging. Once the vehicle is turned off the jumpstarter will stop charging.

   Note: Appliances can be run from the jumpstarter during DC charging, for example a fridge or light.



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L.E.D CHARGE INDICATORS

Your jumpstarter unit features two coloured L.E.D's that illuminate various signals to indicate different stages of charging.

L.E.D	L.E.D SIGNAL & STAGES OF CHARGING				
	Bulk	Absorption	Analysis	Recondition	Float
Charging (Blue)	Solid On ———	Solid On ———	Off	Flashing - - - - -	Off
Charged (Green)	Off	Flashing - - - - -	Flashing - - - - -	Flashing - - - - -	Solid On ———

5 STAGES OF CHARGING:

BULK (CONSTANT CURRENT)

The bulk stage reduces charging time by charging the battery at the maximum rate (constant current) to a set voltage, at which point the battery is approximately 80% charged.

ABSORPTION (CONSTANT VOLTAGE)

The absorption stage charges the battery to 100% by adjusting the charge rate allowing the battery to absorb more power.

ANALYSIS

The analysis mode tests the battery to ensure that it has taken the charge; if the battery passes the test the charger will proceed to the float stage, but if the battery fails the test, the charger will apply a recondition charge to try to return the battery to full charge.

RECONDITION

If after charging, the battery is unable to hold the charge the battery reconditioning function is initiated automatically. This is most likely to take place on batteries that have been deeply discharged, prior to charging.

FLOAT

The float stage maintains the battery at 100% charge without overcharging or damaging the battery. This means the charger can be left connected to the battery indefinitely.

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USING THE PROJECTA HP2012/HP2200 JUMPSTARTER AS A POWER SUPPLY

These jumpstarter's utilise 2 x 22Ah AGM batteries and can be used as a power supply by connecting a cigarette lighter or accessory plug into the 12V DC socket at the front of the jumpstarter.
It is recommended to check the battery capacity before running accessories.

Below is a list of approximate run times for various appliances.

Appliance	Estimated power consumption (Watts)	Estimated time* (Hours)
Car phones, fluorescent lights	4	77
Radios, depth finders	9	54
Fridges (portable compressor style)	14	39
Camcorders, portable TVs	15	31
Electrical tools, bilge pumps	24	18
Cooler/warmers, spotlights	48	8
Air compressors, car vacuum cleaners	80	4

*Estimated time is based on a fully charged jumpstarter

IMPORTANT: OVER CURRENT & LOW VOLTAGE PROTECTION

Over Current Protection: If the power demand on the jumpstarter exceeds 20 Amps an alarm will sound & the power to the appliance will be automatically disconnected. Check the current draw of the appliance connected to the jumpstarter is not greater than 20A.

Low Voltage Protection: If the jumpstarter's battery voltage falls below 11V while running an appliance, the appliance will be automatically disconnected. It is recommended to recharge the jumpstarter immediately. Once the battery voltage reaches 13V the appliance will automatically reconnect.
Note: As a result of the appliance being disconnected the jumpstarter batteries may increase in voltage slightly above 11V. In circumstances where it is essential to keep the appliance running the OVER RIDE button can be pressed allowing you to continue powering the appliance for a short period of time before the 11V disconnect point is reached again.

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CHECKING BATTERY CAPACITY

The jumpstarter is equipped with a LCD DIGITAL DISPLAY. When the BATTERY VOLTAGE STATUS button is pressed the display will indicate the battery voltage level.

To check the battery capacity :

Step 1 Disconnect any appliance and accessories that might be running from the jumpstarter, as this will effect the reading. Ensure the jumpstarter is not being charged.

Step 2 Press the battery voltage button and read the LED voltage display (displayed as volts).

Step 3 Refer to the table below for the conversion of volts to battery capacity as a percentage.

Battery Capacity	Battery voltage reading (12V)	Battery voltage reading (24V)
100%	12.6 Volt or greater	25.2 Volt
75%	12.4 Volt	24.8 Volt
50%	12.2 Volt	24.4 Volt
25%	12.0 Volt	24.0 Volt
0%	11.0 Volt	22.0 Volt

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FREQUENTLY ASKED QUESTIONS

Q. How do I work out how long my appliance will run from the Jumpstarter

A. When the jumpstarter is fully charged the battery will be able to provide 44 Amp hours of 12V power. If you have an appliance that uses 2.5 Amps and you use it for one hour, you have just used 2.5 Amp hours.

For example:-
The jumpstarter is powered by 2 x 22Ah (44Ah) batteries and you are powering a small TV drawing approximately 2.5 Amps

Equation: 44 Amp hours ÷ 2.5 Amps = 17.6 Hours (18 hours)

Q. How can I improve the charging time when charging from my vehicle?

A. Disconnect any appliances connected to the jumpstarter. Car cigarette lighter sockets are usually connected to the battery with small (light) cable. If your jumpstarter is taking longer than 11–13 hours to recharge, the cable between the vehicle's battery and cigarette lighter socket may require upgrading.

Q. When I use the 12 Volt DC sockets the appliance does not work?

A. Check to make sure the appliance does not exceed the rated current of the socket used.

Accessory Socket:	Max 10A
Heavy Duty Accessory Socket:	Max 20A
Maximum Combined Load:	20A

If the load on your jumpstart exceeds 20A the jumpstarter will disengage the power accessories. To restart the jumpstarter and continue powering your appliance press the OVER RIDE button on the front of the jumpstarter.

Q. When I connect the jumpstarter up to the battery the alarm is going off?

A. The jumpstarter is designed to give off an alarm in the following circumstances.

1. If the positive and negative clamps are touching each other.
2. Reverse connection i.e. positive clamp connected to negative terminal or negative clamp connected to positive terminal.
3. If the jumpstarter voltage is different to the vehicle's voltage.
4. Over temperature protection, jumpstarter has reached high operating temperature's. Cease operation of the jumpstarter for 10 minutes to allow the unit to cool down before resuming operation.
5. The battery is very flat & jumpstarter may need recharging.

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Q. Why didn't my jumpstarter start my vehicle?

A. There could be a number of reasons why the jumpstarter did not start your vehicle.

Check the following:

1. Ensure the jumpstarter battery is fully charged. Press the INTERNAL BATTERY STATUS button to check the condition of the battery (state of charge). Refer to page 13 ("Checking Battery Capacity") for further information.
2. Ensure you have followed the correct operating procedure. Refer to page 7 ("Vehicle Jumpstarting Instructions").
3. Ensure the correct voltage is selected on the jumpstarter for the type of vehicle being jumpstarted, 12V mode for 12V vehicles & 24V mode for 24V vehicles (HP2200 Only).
4. The vehicle's battery may be below 1.2V, the minimum start voltage for the jumpstarter. Ensure all connections are correct, then press the OVER RIDE button, to manually activate the jumpstarter. Refer to page 7 ("Vehicle Jumpstarting Instructions, Step 5") for further information.
5. Ensure the vehicle being jumpstarted does not require more than:

   HP2012: 600 Amps Clamp Output

   HP2200: 640 Amps Clamp Output at 12V OR
   500 Amps Clamp Output at 24V.

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NOTES

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WARRANTY STATEMENT

Brown & Watson International Pty Ltd ("BWI") of 1500 Ferntree Gully Road, Knoxfield, Vic., telephone (03) 9730 6000, fax (03) 9730 6050, warrants that all products described in its current catalogue will under normal use and service be free of failures in material and workmanship for a period of one (1) year from the date of the original purchase by the customer as marked on the invoice. This warranty does not cover ordinary wear and tear, abuse, alteration of products or damage caused by the purchaser.

To make a warranty claim the consumer must deliver the product at their cost to the original place of purchase or to any other place which may be nominated by either BWI or the retailer from where the product was bought in order that the warranty assessment may be performed. The consumer must also deliver the original invoice evidencing the date and place of purchase together with an explanation in writing as to the nature of the claim.

In the event that the claim is determined to be for a minor failure of the product then BWI reserves the right to repair or replace it at its discretion. In the event that a major failure is determined the consumer will be entitled to a replacement or a refund as well as compensation for any other reasonably foreseeable loss or damage.

This warranty is in addition to any other rights or remedies that the consumer may have under State or Federal legislation.

IMPORTANT NOTE

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

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AO 120 (Rev. 08/10)

TO:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Southern District of Ohio, Eastern Division at Columbus on the following

☐ Trademarks or ✔ Patents . (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:20-cv-1356	March 13, 2020	Southern District of Ohio, Eastern Division at Columbus

PLAINTIFF	DEFENDANT
The NOCO Company, Inc.	Nekteck, Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,007,015	April 14, 2015	The NOCO Company
2			
3			
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
RICHARD W. NAGEL	Kristen Keppler	March 16, 2020

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO:	Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Southern District of Ohio on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
2:20-cv-1358	3/13/2020	for the Southern District of Ohio

PLAINTIFF	DEFENDANT
The Noco Company, Inc.	Medcursor, Inc.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,007,015	4/14/2015	The Noco Company, Inc.
2			
3			
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
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In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE
Richard W. Nagel	s/ Eric Weitz	3/16/2020

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

UNITED STATES
PATENT AND TRADEMARK OFFICE
P.O. Box 1450
Alexandria, VA 22313 - 1450
www.uspto.gov

ELECTRONIC ACKNOWLEDGEMENT RECEIPT

APPLICATION #	RECEIPT DATE / TIME	ATTORNEY DOCKET #
16/819,831	**05/02/2022 11:36:38 AM ET**	**054985-000055-US-02-01**

Title of Invention

PORTABLE VEHICLE BATTERY JUMP START APPARATUS WITH SAFETY PROTECTION

Application Information

APPLICATION TYPE	Utility - Nonprovisional Application under 35 USC 111(a)	PATENT #	-
CONFIRMATION #	1630	FILED BY	Lisa Elliott
PATENT CENTER #	60647347	FILING DATE	03/16/2020
CUSTOMER #	20230	FIRST NAMED INVENTOR	Jonathan Lewis NOOK
CORRESPONDENCE ADDRESS	-	AUTHORIZED BY	William Klima

Documents

TOTAL DOCUMENTS: 95

DOCUMENT	PAGES	DESCRIPTION	SIZE (KB)
2022_05_02_RFOA.pdf	20	Amendment Submitted/Entered with Filing of Continued Prosecution Application (CPA)/Request for Continued Examination(RCE)	133 KB
IDS__2022-05-02__054985-000055-US-02-01___pt1.pdf	12	Information Disclosure Statement (IDS) Form (SB08)	1559 KB
IDS__2022-05-02__054985-000055-US-02-01___pt2.pdf	14	Information Disclosure Statement (IDS) Form (SB08)	1313 KB
IDS__2022-05-02__054985-000055-US-02-01___pt3.pdf	9	Information Disclosure Statement (IDS) Form (SB08)	1449 KB

[Shenzhen Dika] 2019-09-23 Amended Final Invalidity Contentions.pdf	5	Non Patent Literature	154 KB
[Shenzhen Lianfa] 2020-09-18 - Invalidity Contentions - Cover Pleading-.pdf	5	Non Patent Literature	193 KB
01----NPL - 05-K_14325938-2021-03-23.pdf	1	Non Patent Literature	32 KB
[TII Trading] 2020-06-11 Initial Invalidity Contentions.pdf	8	Non Patent Literature	267 KB
[Shenzhen Carku] 2020.05.19 Grounds of Invalidity.pdf	3	Non Patent Literature	1279 KB
02----NPL - 05-L_14325938-2021-03-23.pdf	1	Non Patent Literature	31 KB
04-----NPL - 05-O_14325938-2021-03-23.pdf	1	Non Patent Literature	31 KB
05----NPL - 05-P_14325938-2021-03-29.pdf	1	Non Patent Literature	31 KB
06----NPL - 05-Q_14325938-2021-03-23.pdf	1	Non Patent Literature	31 KB
[NOCO v Ring] Annex A to the Grounds of Invalidity.pdf	21	Non Patent Literature	2191 KB
[Canadian Tire] 20200804 Statement of Defence and Counterclaim T-343-20.pdf	17	Non Patent Literature	2242 KB
07-----NPL - 05-R_14325938-2021-03-23.pdf	1	Non Patent Literature	31 KB

08----NPL - 05-S_14325938-2021-03-29.pdf	1	Non Patent Literature	31 KB
09----NPL - 05-T_14325938-2021-03-23.pdf	1	Non Patent Literature	31 KB
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11----NPL - 05-W_14325938-2021-03-23.pdf	1	Non Patent Literature	83 KB
12----NPL - 07_Notice_of_Opposition_21-02-2020_SPBI-0002148174.pdf	1	Non Patent Literature	55 KB
03----NPL - 05-N_14325938-2021-03-23.pdf	70	Non Patent Literature	2890 KB
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14-----NPL - 08_Notice_of_Opposition_07-08-2020_SMBM-0002305223.pdf	1	Non Patent Literature	53 KB
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16----NPL - 10-A_D21.pdf	20	Non Patent Literature	981 KB
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30-----12-A_D5 This Portable USB Charger Battery Pack Can Also Jump Start Your .pdf	3	Non Patent Literature	839 KB
31-----NPL - Clore Response to Complaint and Notice of Investigation.pdf	164	Non Patent Literature	1149 KB
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15----NPL - 9_PAT_1020141149971_0076_Eingang_Einspruch.pdf	43	Non Patent Literature	15058 KB
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36----NPL - Winplus Response to Amended Complaintx.pdf	123	Non Patent Literature	4361 KB
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Digest

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[Canadian Tire] 20200804 Statement of Defence and Counterclaim T-343-20.pdf	08E47B4A386F3AF0B19D4F29F7B3AD2206516A3797DAC9960245FB8DE60269F8BD51C45783B550448F061CA755428CDBE17 72E54A673E47D9F58142F55CE7EE0
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24----NPL - 24_NocoVRing-GroundsInvalidity-3rdAugust2020.pdf	58D36D67CAA1D0FD97EFAF5980864EFBD99F5C6FBE582B2B00276BEC97338B301979FA16622DFA8D4DF3F2B6C0DCB430E8178E635FCA63B7A24F5F6BBD91783D
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30-----12-A_D5 This Portable USB Charger Battery Pack Can Also Jump Start Your .pdf	55E7B54D3C199828F48C1BD3117AB7FD53B015135B18F9B493EB7589ED06539442FBFDAE9F315D9DACD68B0376E11F2B2D0B416D0A6BA969A1B0EA62BB8CF0C8

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34----NPL - Best Buys Response to the Complaintx.pdf	EF9682560C2F972FA5BD9C37957A4F6FB6EA33092C25BC128 3F2C8CC4D81D190A12CC0D2539CEE561A68B0C72E5916EC5 01DC9EF8610B180576485D3FFE19DCD
32----NPL - Deltran USA LLCs Response to NOCOs Amended Complaint and Notice of.pdf	E407B15DC001959F0DCB5B4343B35CA662B373718F0F715F41 B37A4BC90F511418EFE6B3A959EBEF86847EC096195E272C1 CB45D3CFD15E1BD4A016941C23128
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41----NPL - Halo and ZAGG Response to Complaint and Notice of Investigation.pdf	DD4C03A6EB35756C7C93F8D1352269C837698A505B3807A30F8371A9575EB67F2FBD42FE41E7A40093A7DF9F8F13BCD7EA32D1092368715A7B710C798D7008D9
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39----NPL - CONFIDENTIAL Walmart Response to NOCO Complaint.pdf	2F685090B0F9CA6A4009DE9A7D3E8010333BC2F1BDFCD6D5321BF918BCA4C4B97FA0A127618C29361A454A7CB8828DF7CDDB1C5753C5F27E28DC58B0C2122700
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This Acknowledgement Receipt evidences receipt on the noted date by the USPTO of the indicated documents, characterized by the applicant, and including page counts, where applicable. It serves as evidence of receipt similar to a Post Card, as described in MPEP 503.

New Applications Under 35 U.S.C. 111

If a new application is being filed and the application includes the necessary components for filing date (see 37 CFR 1.53(b)-(d) and MPEP 506), a Filing Receipt (37 CFR 1.54) will be issued in due course and the date shown on this Acknowledgement Receipt will establish the filing date of the application

National Stage of an International Application under 35 U.S.C. 371

If a timely submission to enter the national stage of an international application is compliant with the conditions of 35 U.S.C. 371 and other applicable requirements a Form PCT/DO/EO/903 indicating acceptance of the application as a national stage submission under 35 U.S.C. 371 will be issued in addition to the Filing Receipt, in due course.

New International Application Filed with the USPTO as a Receiving Office

If a new international application is being filed and the international application includes the necessary components for an

international filing date (see PCT Article 11 and MPEP 1810), a Notification of the International Application Number and of the International Filing Date (Form PCT/RO/105) will be issued in due course, subject to prescriptions concerning national security, and the date shown on this Acknowledgement Receipt will establish the international filing date of the application.

Espacenet

CA145036S BATTERY

Applicants: TECHTRONIC OUTDOOR PROD TECH

Inventors:

Classifications:

Priorities: CA145036F 2012-03-30

Application: CA145036S·2012-03-30

Publication: CA145036S·2013-02-11

Published as: CA145036S

BATTERY

Abstract

The design consists of the shape and configuration of the BATTERY as shown in the drawings.Representations of the design are shown in the figures wherein:Fig. 1 is a front perspective view of a battery; andFig. 2 is a front view of the battery shown in Fig. 1.The stippled lines in the drawings do not form part of the present design.

DELTRAN EX1002
IPR2024-01219

Espacenet

JP2015115979A VEHICULAR AUXILIARY POWER FEEDER

Applicants: ASIA BRIGHT IND HONG KONG CO LTD,SFJ CORP

Inventors: TODA AKIRA

Classifications:
IPC ***B60R16/03; H02H7/18; H02J7/00;***

Priorities: JP2013254061A 2013-12-09

Application: JP2015115979A·2013-12-09

Publication: JP2015115979A·2015-06-22

Published as: JP2015115979A

VEHICULAR AUXILIARY POWER FEEDER

Abstract

PROBLEM TO BE SOLVED: To shorten reaction time of disconnecting a current of a protective circuit in a vehicular auxiliary power feeder.SOLUTION: In a control circuit part 4, when a first detection part 1b detects that a vehicular auxiliary power feeder 100 has approached the abnormal state, the gate voltage of a first MOSFET 1a is controlled to disconnect a current path between an input terminal 20 and a lithium ion storage battery 2 using the first MOSFET 1a, and when a second detection part 3b detects that the vehicular auxiliary power feeder 100 has approached the abnormal state, the gate voltage of a second MOSFET 3a is controlled to disconnect the current path between the lithium ion storage battery 2 and an output terminal 31 using the second MOSFET 3a.

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(51)Int.Cl.			F I			テーマコード（参考）
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H02H	7/18	(2006.01)	H02H	7/18		5G503
B60R	16/03	(2006.01)	B60R	16/02	670V	

審査請求 未請求　請求項の数 3　OL　（全 14 頁）

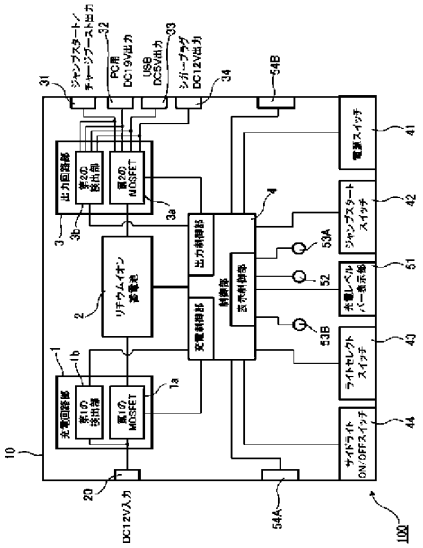
(21)出願番号　特願2013-254061 (P2013-254061)
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(71)出願人　505468956
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千葉県浦安市千鳥１２－１

最終頁に続く

(54)【発明の名称】車両用補助給電装置

(57)【要約】
【課題】車両用補助給電装置の保護回路の電流切断の反応時間を短縮する。
【解決手段】制御回路部４は、第１の検出部１ｂにより、車両用補助給電装置１００が異常状態に近づいたと検出された場合、第１のＭＯＳＦＥＴ１ａのゲート電圧を制御して、第１のＭＯＳＦＥＴ１ａにより、入力端子２０とリチウムイオン蓄電池２との間の電流経路を遮断し、第２の検出部３ｂにより、車両用補助給電装置１００が異常状態に近づいたと検出された場合、第２のＭＯＳＦＥＴ３ａのゲート電圧を制御して、第２のＭＯＳＦＥＴ３ａにより、リチウムイオン蓄電池２と出力端子３１との間の電流経路を遮断する。
【選択図】図３



DELTRAN EX1002
IPR2024-01219

【特許請求の範囲】
【請求項１】
車両の車載バッテリが上がった場合に、ブースタケーブルを介して該車載バッテリに電力を供給し、該車両のエンジンを始動させるジャンプスタートを行うジャンプスタータとしての機能を少なくとも有する車両用補助給電装置であって、
筐体と、
上記筐体の側壁に設置され、充電用ケーブルが外部接続される入力端子と、
上記筐体内に設置され、上記入力端子に内部接続された充電回路部と、
上記筐体内に設置され、上記充電回路部に内部接続されたリチウムイオン蓄電池と、
上記筐体内に設置され、上記リチウムイオン蓄電池に内部接続された出力回路部と、
上記筐体内に設置され、上記充電回路部及び上記出力回路部の動作を制御する制御回路部と、
上記筐体の側壁に設置され、上記出力回路部に内部接続されており、上記ブースタケーブルが外部接続されるジャンプスタート用の出力端子とを備え、
上記充電回路部は、上記入力端子と上記リチウムイオン蓄電池との間の電流経路に直列接続され、該電流経路を導通又は遮断する第１のＭＯＳＦＥＴと、上記入力端子と上記制御回路部との間に接続され、当該車両用補助給電装置の異常を検出する第１の検出部とを有し、
上記出力回路部は、上記リチウムイオン蓄電池と上記出力端子との間の電流経路に直列接続され、該電流経路を導通又は遮断する第２のＭＯＳＦＥＴと、上記出力端子と上記制御回路部との間に接続され、当該車両用補助給電装置の異常を検出する第２の検出部とを有し、
上記制御回路部は、上記第１の検出部により、当該車両用補助給電装置が異常状態に近づいたと検出された場合、上記第１のＭＯＳＦＥＴのゲート電圧を制御して、該第１のＭＯＳＦＥＴにより、上記入力端子と上記リチウムイオン蓄電池との間の電流経路を遮断し、上記第２の検出部により、当該車両用補助給電装置が異常状態に近づいたと検出された場合、上記第２のＭＯＳＦＥＴのゲート電圧を制御して、該第２のＭＯＳＦＥＴにより、上記リチウムイオン蓄電池と上記出力端子との間の電流経路を遮断することを特徴とする車両用補助給電装置。
【請求項２】
上記制御回路部は、上記第１の検出部により、過電流の状態に近づいたと検出された場合、上記第１のＭＯＳＦＥＴのゲート電圧を制御して、該第１のＭＯＳＦＥＴにより、上記入力端子と上記リチウムイオン蓄電池との間の電流経路を０．８秒以下で遮断し、上記第２の検出部により、過電流の状態に近づいたと検出された場合、上記第２のＭＯＳＦＥＴのゲート電圧を制御して、該第２のＭＯＳＦＥＴにより、上記リチウムイオン蓄電池と上記出力端子との間の電流経路を０．８秒以下で遮断することを特徴とする請求項１に記載の車両用補助給電装置。
【請求項３】
上記制御回路部は、上記第１の検出部により、過充電及び過電流の状態に近づいたと検出された場合、上記第１のＭＯＳＦＥＴのゲート電圧を制御して、該第１のＭＯＳＦＥＴにより、上記入力端子と上記リチウムイオン蓄電池との間の電流経路を遮断し、上記第２の検出部により、過電流及び過放電の状態に近づいたと検出された場合、上記第２のＭＯＳＦＥＴのゲート電圧を制御して、該第２のＭＯＳＦＥＴにより、上記リチウムイオン蓄電池と上記出力端子との間の電流経路を遮断することを特徴とする請求項１又は２に記載の車両用補助給電装置。
【発明の詳細な説明】
【技術分野】
【０００１】
本発明は、車両の車載バッテリが上がった場合に、ブースタケーブルを介して車載バッテリに電力を供給し、車両のエンジンを始動させるジャンプスタートを行うジャンプスタ

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ータとしての機能を少なくとも有する車両用補助給電装置に関する。
【背景技術】
【０００２】
従来から、車両用補助給電装置（ジャンプスタータ）は、例えば路上等において、消費電気量の増加等により、車両に搭載された車載バッテリが放電気味となり、バッテリ容量が不足して電圧が低下して、電装品が作動しなくなった場合（所謂、バッテリ上がりの場合）に、ブースタケーブルを介して車載バッテリに電力を供給することにより、車両のエンジンを始動させるジャンプスタートが行われている（例えば、特許文献１，２参照）。
【０００３】
更に、車両用補助給電装置は、ジャンプスタータとしての機能を有することに加え、ノートＰＣ、携帯電話、携帯音楽プレーヤ等の外部機器に給電するポータブル電源としての機能を有するものもある。
【０００４】
また、このような従来の車両用補助給電装置は、リレー回路等で構成された保護回路が内蔵され、このリレー回路等で構成された保護回路により、過充電、過電流、逆接続及び過放電等の異常状態となることが防止されている。
【０００５】
例えば、車両用補助給電装置によりブースタケーブルを介して車載バッテリに電力が供給されてジャンプスタートが行われた車両は、エンジンが起動されるのに伴い、車両の発電機が起動されると、車両の発電機から車両用補助給電装置に向けて大きな電流（過電流）が供給される。車両用補助給電装置は、検出部によりその過電流が検出されると、リレー回路等で構成された保護回路によって、電流経路を遮断（電流切断）して、その過電流をシャットダウン（カットオフ）する。
【０００６】
そして、車両用補助給電装置は、より確実に過電流等をシャットダウン（カットオフ）するために、より一層電流切断の反応時間を短縮することが求められている。
【先行技術文献】
【特許文献】
【０００７】
【特許文献１】実用新案登録第３１８５０２７号公報
【特許文献２】意匠登録第１４５９７３１号公報
【発明の概要】
【発明が解決しようとする課題】
【０００８】
本発明は、以上のような問題点に鑑みてなされたものであり、従来よりも、電流切断の反応時間の短縮が可能な車両用補助給電装置を提供することを目的とする。
【課題を解決するための手段】
【０００９】
本発明に係る車両用補助給電装置は、車両の車載バッテリが上がった場合に、ブースタケーブルを介して該車載バッテリに電力を供給し、該車両のエンジンを始動させるジャンプスタートを行うジャンプスタータとしての機能を少なくとも有する車両用補助給電装置である。そして、本発明に係る車両用補助給電装置は、筐体と、上記筐体の側壁に設置され、充電用ケーブルが外部接続される入力端子と、上記筐体内に設置され、上記入力端子に内部接続された充電回路部と、上記筐体内に設置され、上記充電回路部に内部接続されたリチウムイオン蓄電池と、上記筐体内に設置され、上記リチウムイオン蓄電池に内部接続された出力回路部と、上記筐体内に設置され、上記充電回路部及び上記出力回路部の動作を制御する制御回路部と、上記筐体の側壁に設置され、上記出力回路部に内部接続されており、上記ブースタケーブルが外部接続されるジャンプスタート用の出力端子とを備える。更に、上記充電回路部は、上記入力端子と上記リチウムイオン蓄電池との間の電流経路に直列接続され、該電流経路を導通又は遮断する第１のＭＯＳＦＥＴと、上記入力端子

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と上記制御回路部との間に接続され、当該車両用補助給電装置の異常を検出する第１の検出部とを有し、上記出力回路部は、上記リチウムイオン蓄電池と上記出力端子との間の電流経路に直列接続され、該電流経路を導通又は遮断する第２のＭＯＳＦＥＴと、上記出力端子と上記制御回路部との間に接続され、当該車両用補助給電装置の異常を検出する第２の検出部とを有する。更に、上記制御回路部は、上記第１の検出部により、当該車両用補助給電装置が異常状態に近づいたと検出された場合、上記第１のＭＯＳＦＥＴのゲート電圧を制御して、該第１のＭＯＳＦＥＴにより、上記入力端子と上記リチウムイオン蓄電池との間の電流経路を遮断し、上記第２の検出部により、当該車両用補助給電装置が異常状態に近づいたと検出された場合、上記第２のＭＯＳＦＥＴのゲート電圧を制御して、該第２のＭＯＳＦＥＴにより、上記リチウムイオン蓄電池と上記出力端子との間の電流経路を遮断する。

【発明の効果】

【００１０】

本発明は、車両の車載バッテリが上がった場合に、ブースタケーブルを介して車載バッテリに電力を供給し、車両のエンジンを始動させるジャンプスタートを行うジャンプスタータとしての機能を少なくとも有する車両用補助給電装置において、過充電、過電流、逆接続及び過放電等の異常状態に陥らないように保護するための保護回路として、従来用いられているリレー回路の代わりに、ＭＯＳＦＥＴを用いることにより、保護回路としてリレー回路を用いていた従来よりも、電流切断の反応時間を短縮することができる。したがって、本発明は、保護回路としてリレー回路を用いていた従来よりも、迅速に電流切断を行うことができ、確実に、車両用補助給電装置が過充電、過電流、逆接続及び過放電等の異常状態となることを防止することができる。

【図面の簡単な説明】

【００１１】

【図１】本発明を適用した車両用補助給電装置を示した前方側左斜め上方から見た斜視図である。

【図２】車両用補助給電装置を示した前方側右斜め上方から見た斜視図である。

【図３】車両用補助給電装置の構成要素の電気的な接続状態を示したブロック図である。

【図４】第１のＤＣ出力端子にブースタケーブルを介してジャンプスタートさせる自動車の車載バッテリを接続した状態の車両用補助給電装置を示した斜視図である。

【発明を実施するための形態】

【００１２】

以下、本発明を適用した車両用補助給電装置について、図面を参照しながら詳細に説明する。なお、本発明は、以下の例に限定されるものではなく、本発明の要旨を逸脱しない範囲で任意に変更可能である。

【００１３】

本発明を適用した車両用補助給電装置１００は、例えば路上等において、消費電気量の増加等により、車両に搭載されたバッテリ２００が放電気味となりバッテリ容量が不足して電圧が低下し、電装品が作動しなくなった場合（所謂、バッテリ上がりの場合）に、ブースタケーブルを介して電力を供給することによりエンジンを始動させてジャンプスタートを行うジャンプスタータとしての機能を有する。更に、車両用補助給電装置１００は、例えば、３０００ｃｃまでのガソリン乗用車に対応する１２Ｖ／４．５Ａｈの容量、ガソリン乗用車全般及び３５００ｃｃまでのディーゼル車に対応する１２Ｖ／９．０Ａｈの容量、又は、１３０００ｃｃまでのディーゼル車に対応可能な２４Ｖ／９Ａｈの容量を有する。更に、車両用補助給電装置１００は、ジャンプスタータとしての機能を有することに加え、ノートＰＣ、携帯電話、携帯音楽プレーヤ等の外部機器に給電するポータブル電源としての機能も有する。

【００１４】

具体的に、車両用補助給電装置１００は、図１及び図２に示すように、薄型箱状の筐体１０を備えている。更に、筐体１０の内部には、図３に示すように、充電回路部１、リチ

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ウムイオン蓄電池２、出力回路部３及び制御回路部４が内蔵されている。なお、リチウムイオン蓄電池２は、１個のリチウムイオン蓄電池で構成されるようにしても良く、複数個のリチウムイオン蓄電池が直列接続されて構成されるようにしても良い。

【００１５】

更に、筐体１０は、３０００ｃｃまでのガソリン乗用車に対応する１２Ｖ／４．５Ａｈの容量を有する場合、例えば、４５ｍｍ×１９０ｍｍ×１３５ｍｍ（高さ×幅×奥行き）の大きさで、重さ８００ｇ程度に形成され、ガソリン乗用車全般及び３５００ｃｃまでのディーゼル車に対応する１２Ｖ／９．０Ａｈの容量を有する場合、例えば、４５ｍｍ×１９０ｍｍ×１６０ｍｍ（高さ×幅×奥行き）の大きさで、重さ１２２０ｇ程度に形成され、１３０００ｃｃまでのディーゼル車に対応する２４Ｖ／９．０Ａｈの容量を有する場合、例えば、６８ｍｍ×１９６ｍｍ×２２８ｍｍ（高さ×幅×奥行き）の大きさで、重さ１９００ｇ程度に形成される。

【００１６】

更に、車両用補助給電装置１００では、図１に示すように、家庭用電源や自動車のバッテリから例えば１２Ｖの電源供給を受けるためのＤＣ入力端子２０が筐体１０の左側面壁１１に設置されている。

【００１７】

ＤＣ入力端子２０は、充電用の給電ケーブルがＤＣプラグを介して外部接続されるＤＣジャックからなる。

【００１８】

更に、ＤＣ入力端子２０には、図３に示すように充電回路部１が内部接続されている。充電回路部１には、リチウムイオン蓄電池２が内部接続されている。また、リチウムイオン蓄電池２には、出力回路部３が内部接続されている。更に、充電回路部１及び出力回路部３には、制御回路部４が内部接続されている。

【００１９】

また、車両用補助給電装置１００は、図３に示すように、例えば、出力回路部３に内部接続されたジャンプスタート用の第１のＤＣ出力端子３１、ＰＣ電源用の第２のＤＣ出力端子３２、ＵＳＢ電源用の第３のＤＣ出力端子３３及びメモリバックアップ電源用の第４のＤＣ出力端子３４を備える。

【００２０】

第１のＤＣ出力端子３１は、ブースタケーブルがプラグを介して外部接続されるジャックからなる。

【００２１】

第２のＤＣ出力端子３２は、ＰＣ電源ケーブルがプラグを介して外部接続されるジャックからなる。

【００２２】

第３のＤＣ出力端子３３は、ＵＳＢケーブルがＵＳＢプラグを介して外部接続されるＵＳＢソケットからなる。

【００２３】

第４のＤＣ出力端子３４は、外部電源ケーブルがシガープラグを介して外部接続されるシガーソケットからなる。

【００２４】

ジャンプスタート用の第１のＤＣ出力端子３１及びＰＣ電源用の第２のＤＣ出力端子３２は、図２に示すように、筐体１０の右側面壁１２に設置されている。また、図１に示すように、ＵＳＢ電源用の第３のＤＣ出力端子３３は、筐体１０の正面壁１３に設置されている。更に、メモリバックアップ電源用の第４のＤＣ出力端子３４は、筐体１０の左側面壁１１に設置されている。

【００２５】

また、車両用補助給電装置１００は、図３に示すように、制御回路部４に内部接続された電源スイッチ４１、ジャンプスタートスイッチ４２、ライトセレクトスイッチ４３及び

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サイドライト・オン／オフ・スイッチ４４を備える。電源スイッチ４１、ジャンプスタートスイッチ４２、ライトセレクトスイッチ４３及びサイドライト・オン／オフ・スイッチ４４は、図１に示すように、筐体１０の正面壁１３に設置されている。

【００２６】

更に、車両用補助給電装置１００は、図３に示すように、制御回路部４に内部接続された充電量表示部５１、バッテリロー表示灯５２、一対の非常用警告灯５３Ａ，５３Ｂ及び一対の側面照明灯５４Ａ，５４Ｂを備える。

【００２７】

充電量表示部５１及び一対の非常用警告灯５３Ａ，５３Ｂは、図１に示すように、筐体１０の正面壁１３に設置されている。

【００２８】

充電量表示部５１は、直線状に配置された発光色の異なる複数（例えば、赤・橙・黄・緑の４色）のＬＥＤにより構成されている。更に、充電量表示部５１は、制御回路部４により制御されて、充電量をバー表示する機能を果たすばかりでなく、緑点灯によりパワーランプとして機能し、また、黄点灯によりジャンプスタートランプとして機能する。また、一対の非常用警告灯５３Ａ，５３Ｂは、赤色ＬＥＤと白色ＬＥＤからなり、制御回路部４により制御されて、交互に点滅することにより非常用警告灯として機能する。

【００２９】

また、バッテリロー表示灯５２は、図１に示すように、筐体１０の左側面壁１１に設置されている。

【００３０】

更に、バッテリロー表示灯５２は、赤色ＬＥＤからなり、制御回路部４により常時監視されているリチウムイオン蓄電池２の電圧が所定値まで低下すると、制御回路部４により制御されて、点滅状態或いは点灯状態となり、過放電状態であることを警告するバッテリロー表示灯として機能する。

【００３１】

また、一対の側面照明灯５４Ａ，５４Ｂ、図１及び図２に示すように、筐体１０の左側面壁１１と右側面壁１２とに設置されている。

【００３２】

一対の側面照明灯５４Ａ，５４Ｂは、それぞれ直線状に配置された複数の白色ＬＥＤにより構成されている。

【００３３】

充電回路部１は、筐体１０内に設置され、図３に示すように、ＤＣ入力端子２０とリチウムイオン蓄電池２との間の電流経路に直列接続された第１のＭＯＳＦＥＴ（Metal Oxide Semiconductor Field Effect Transistor）１ａと、ＤＣ入力端子２０と制御回路部４との間に接続され、車両用補助給電装置１００の異常を検出する第１の検出部１ｂとを有する。この第１のＭＯＳＦＥＴ１ａは、制御回路部４でゲート電圧が制御されることにより、ＤＣ入力端子２０とリチウムイオン蓄電池２との間の電流経路の導通と遮断とが制御される。

【００３４】

そして、制御回路部４は、例えば、第１の検出部１ｂにより、リチウムイオン蓄電池２のいずれかが過充電の状態に近づいたと検出された場合、第１のＭＯＳＦＥＴ１ａのゲート電圧を制御して、第１のＭＯＳＦＥＴ１ａにより、ＤＣ入力端子２０とリチウムイオン蓄電池２との間の電流経路を迅速に遮断して、車両用補助給電装置１００が過充電となることを防止する。

【００３５】

すなわち、第１のＭＯＳＦＥＴ１ａは、車両用補助給電装置１００において、車両用補助給電装置１００が過充電等の異常状態に陥らないように保護するための保護回路として用いられている。なお、第１のＭＯＳＦＥＴ１ａは、車両用補助給電装置１００において、車両用補助給電装置１００が過充電等の異常状態に陥らないように保護する保護回路と

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して用いられることに限定されるものではなく、過電流、逆接続及び過熱等、車両用補助給電装置１００がその他の異常状態に陥らないように保護するための保護回路として用いられるようにしても良い。

【００３６】

出力回路部３は、筐体１０内に設置され、図３に示すように、リチウムイオン蓄電池２と第１～第４のＤＣ出力端子３１，３２，３３，３４との間の電流経路に直列接続された第２のＭＯＳＦＥＴ３ａと、第１～第４のＤＣ出力端子３１，３２，３３，３４と制御回路部４との間に接続され、車両用補助給電装置１００の異常を検出する第２の検出部３ｂとを有する。この第２のＭＯＳＦＥＴ３ａは、制御回路部４でゲート電圧が制御されることにより、リチウムイオン蓄電池２と第１～第４のＤＣ出力端子３１，３２，３３，３４との間の電流経路の導通と遮断とが制御される。なお、第２のＭＯＳＦＥＴ３ａは、リチウムイオン蓄電池２と各第１～第４のＤＣ出力端子３１，３２，３３，３４との間にそれぞれ設けられるようにしても良い。更に、第２の検出部３ｂは、各第１～第４のＤＣ出力端子３１，３２，３３，３４と制御回路部４との間にそれぞれ設けられるようにしても良い。

【００３７】

そして、制御回路部４は、例えば、第２の検出部３ｂにより、異常な大電流が車両用補助給電装置１００から放電された又は車両のエンジンの起動に伴う発電機の起動により許容範囲を超えた電流が車両用補助給電装置１００に流れ込む等の過電流の状態に近づいたと検出された場合、第２のＭＯＳＦＥＴ３ａにより、リチウムイオン蓄電池２と第１～第４のＤＣ出力端子３１，３２，３３，３４との間の電流経路を迅速に遮断して、車両用補助給電装置１００が過電流となることを防止する。

【００３８】

更に、制御回路部４は、例えば、第２の検出部３ｂにより、ブースタケーブル１２０のプラス端子とマイナス端子とを間違えて逆に接続する逆接続と検出された場合、第２のＭＯＳＦＥＴ３ａにより、リチウムイオン蓄電池２と第１～第４のＤＣ出力端子３１，３２，３３，３４との間の電流経路を迅速に遮断して、車両用補助給電装置１００が逆接続により故障等することを防止する。

【００３９】

更に、制御回路部４は、例えば、第２の検出部３ｂにより、過放電の状態に近づいたと検出された場合、第２のＭＯＳＦＥＴ３ａにより、リチウムイオン蓄電池２と第１～第４のＤＣ出力端子３１，３２，３３，３４との間の電流経路を迅速に遮断して、車両用補助給電装置１００が過放電となることを防止する。

【００４０】

すなわち、第２のＭＯＳＦＥＴ３ａは、車両用補助給電装置１００において、車両用補助給電装置１００が過電流、逆接続及び過放電等の異常状態に陥らないように保護するための保護回路として用いられている。なお、第２のＭＯＳＦＥＴ３ａは、車両用補助給電装置１００において、車両用補助給電装置１００が過電流、逆接続及び過放電等の異常状態に陥らないように保護する保護回路として用いられることに限定されるものではなく、過熱等、車両用補助給電装置１００がその他の異常状態に陥らないように保護するための保護回路として用いられるようにしても良い。

【００４１】

制御回路部４は、筐体１０内に設置され、例えばマイクロコンピュータからなり、充電回路部１の動作を制御する充電制御部、出力回路部３の動作を制御する出力制御部、充電量表示部５１等の動作を制御する表示制御部として機能する。そして、制御回路部４は、内部接続された充電回路部１及び出力回路部３の動作を次のように制御する。

【００４２】

制御回路部４は、ＤＣ入力端子２０に、家庭用電源から充電用の１２Ｖの電源供給するためのＡＣアダプタケーブル又は自動車バッテリから例えば１２Ｖの電源供給を供給するためのシガープラグケーブルが外部接続され、家庭用電源又は自動車バッテリから充電用

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の電源が供給されることにより、ＤＣ入力端子２０に所定電圧値以上の電圧が印加されたことを検出すると、充電モードの制御を行う。

【００４３】

この充電モードの制御において、制御回路部４は、充電回路部１の動作を制御して、充電回路部１を介してリチウムイオン蓄電池２を充電し、リチウムイオン蓄電池２が満充電まで充電されると、第１のＭＯＳＦＥＴ１ａのゲート電圧を制御して、ＤＣ入力端子２０とリチウムイオン蓄電池２との間の電流経路を迅速に遮断して、充電を終了させる。更に、制御回路部４は、充電制御中に、第１の検出部１ｂにより、リチウムイオン蓄電池２のいずれかが過充電の状態に近づいたと検出された場合、第１のＭＯＳＦＥＴ１ａのゲート電圧を制御して、第１のＭＯＳＦＥＴ１ａにより、ＤＣ入力端子２０とリチウムイオン蓄電池２との間の電流経路を迅速に遮断して、車両用補助給電装置１００が過充電となることを防止する。

【００４４】

また、制御回路部４は、充電制御中に、出力回路部３の動作を制御して、出力回路部３から外部への電源供給を禁止する。

【００４５】

更に、制御回路部４は、充電制御中に、充電量表示部５１の動作を制御して、充電量表示部５１を制御して充電量をバー表示する。

【００４６】

充電量表示部５１は、制御回路部４により動作が制御されて、未充電状態から、バッテリ残量２０％以下を示す赤色点滅状態、バッテリ残量２０％から３０％を示す赤色点灯状態、バッテリ残量３０％から４０％を示す橙色点灯状態、バッテリ残量４０％から７０％を示す黄色点灯状態、バッテリ残量７０％から１００％を示す緑色点灯状態へと、満充電状態まで充電が進むに従って、点灯状態が順次変化する。

【００４７】

以上のような構成を有する車両用補助給電装置１００は、リチウムイオン蓄電池２を充電した状態で、可搬型ジャンプスタータとして使用されると共に、屋外で電気機器を使用するためにポータブル電源装置として使用される。

【００４８】

具体的に、車両用補助給電装置１００は、次のようにしてジャンプスタータとして使用される。

【００４９】

先ず、車両用補助給電装置１００をジャンプスタータとして使用する場合、当該車両用補助給電装置１００の電源スイッチ４１がＯＦＦの状態で、図４に示すように、ジャンプスタート用のブースタケーブル１２０が、ユーザにより第１のＤＣ出力端子３１に接続されると共に、車載バッテリ２００の電極端子に接続される。

【００５０】

これにより、ユーザは、充電量表示部５１の複数のＬＥＤが全て消灯していることで、電源スイッチ４１がＯＦＦの状態であることを確認することができる。

【００５１】

次に、ユーザが電源スイッチ４１を押して電源ＯＮにすると、車両用補助給電装置１００の制御回路部４は、電源ＯＮを検知して充電量表示部５１の動作を制御し、充電量表示部５１を緑色点灯状態とする。充電量表示部５１は、緑色点灯により電源ＯＮを表示するパワーランプとして機能する。

【００５２】

そして、電源ＯＮ状態でユーザがジャンプスタートスイッチ４２を押してジャンプスタートすると、車両用補助給電装置１００の制御回路部４は、ジャンプスタートスイッチ４２の短時間操作によるジャンプスタートを検知して、ジャンプスタートモードの制御を行う。

【００５３】

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ジャンプスタートモードの制御において、制御回路部４は、ジャンプスタート用の第１のＤＣ出力端子３１にブースタケーブル１２０を介してジャンプスタートさせる自動車の車載バッテリ２００の電圧を正常に検知できた場合に、出力回路部３の動作を制御し、リチウムイオン蓄電池２をジャンプスタート用の電源として出力回路部３を介してジャンプスタート用の第１のＤＣ出力端子３１に接続するとともに、充電量表示部５１の動作を制御し、充電量表示部５１を黄色点灯状態とする。充電量表示部５１は、黄色点灯によりジャンプスタートを表示するジャンプスタートランプとして機能する。このジャンプスタートモードでは、充電量表示部５１は、緑色点灯により電源ＯＮを表示するとともに黄色点灯によりジャンプスタートを表示している。

【００５４】

このジャンプスタートモードの状態で、ユーザは、車両用補助給電装置１００が接続されている車載バッテリ２００を搭載した自動車のエンジンを始動させるジャンプスタートを行うことができる。

【００５５】

更に、制御回路部４は、ジャンプスタートモード中（電力供給中）において、第２の検出部３ｂにより、過電流及び過放電の状態に近づいたと検出された場合、第２のＭＯＳＦＥＴ３ａのゲート電圧を制御して、第２のＭＯＳＦＥＴ３ａにより、リチウムイオン蓄電池２と第１～第４のＤＣ出力端子３１，３２，３３，３４との間の電流経路を迅速に遮断して、車両用補助給電装置１００が過電流、逆接続及び過放電等となることを防止する。

【００５６】

なお、この際、制御回路部４は、第２のＭＯＳＦＥＴ３ａがリチウムイオン蓄電池２と各第１～第４のＤＣ出力端子３１，３２，３３，３４との間にそれぞれ設けられている場合、第２のＭＯＳＦＥＴ３ａにより、リチウムイオン蓄電池２と第１のＤＣ出力端子３１との間の電流経路だけを迅速に遮断するようにしても良い。

【００５７】

また、制御回路部４は、電源ＯＮ状態でユーザがジャンプスタートスイッチ４２を長時間操作すなわち例えば５秒以上長押しすると、チャージブーストモードの制御状態となり、リチウムイオン蓄電池２に充電されている電気を１度に放出するように、出力回路部３の動作を制御する。このチャージブーストモードの制御状態では、充電量表示部５１の動作を制御し、充電量表示部５１を黄色点灯状態とする。すなわち、充電量表示部５１は、黄色点灯によりチャージブーストモードを表示するチャージブーストモードとして機能する。このチャージブーストモードは、車載バッテリ２００が深放電状状態になっている場合に使用される。

【００５８】

また、車両用補助給電装置１００は、ジャンプスタート用の第１のＤＣ出力端子３１の他に、屋外で電気機器を使用するための外部接続用の第２～第４のＤＣ出力端子３２，３３，３４を備えているので、次のようにポータブル電源として使用することができる。

【００５９】

具体的に、制御回路部４は、第２のＤＣ出力端子３２にＰＣ電源ケーブルが外部接続され、ＰＣ電源ケーブルを介してＰＣが外部接続された状態で、ユーザが電源スイッチ４１を押して電源ＯＮにすると、電源ＯＮを検知して充電量表示部５１の動作を制御し、充電量表示部５１を緑色点灯状態として電源ＯＮを表示するとともに、出力回路部３の動作を制御して、ＤＣ１９ＶのＰＣ駆動用の電源を第２のＤＣ出力端子３２からＰＣ電源ケーブルを介してＰＣに供給する。

【００６０】

また、制御回路部４は、第３のＤＣ出力端子３３にＵＳＢケーブルが外部接続され、ＵＳＢ電源ケーブルを介してＵＳＢ機器が外部接続された状態で、ユーザが電源スイッチ４１を押して電源ＯＮにすると、電源ＯＮを検知して充電量表示部５１の動作を制御し、充電量表示部５１を緑色点灯状態として電源ＯＮを表示するとともに、出力回路部３の動作を制御して、ＤＣ５ＶのＵＳＢ駆動用の電源を第３のＤＣ出力端子３３からＵＳＢ電源ケ

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ーブルを介してＵＳＢ機器に供給する。

【００６１】

また、制御回路部４は、第４のＤＣ出力端子３４に第１のシガープラグケーブル又は第２のシガープラグケーブルが外部接続され、シガープラグケーブルを介して外部機器が外部接続された状態で、ユーザが電源スイッチ４１を押して電源ＯＮにすると、電源ＯＮを検知して充電量表示部５１の動作を制御し、充電量表示部５１を緑色点灯状態として電源ＯＮを表示するとともに、出力回路部３の動作を制御して、ＤＣ１２Ｖの外部機器駆動用の電源を第４のＤＣ出力端子３２からシガープラグケーブルを介して外部機器に供給する。

【００６２】

すなわち、車両用補助給電装置１００は、第４のＤＣ出力端子３４に外部接続される第１のシガーケーブルを介して車載対応の電気機器を駆動するポータブル電源として機能する。

【００６３】

また、車両用補助給電装置１００は、第４のＤＣ出力端子３４に外部接続される第２のシガーケーブルを介してＯＢＤ（On-Board Diagnostic system）システムに対応した車両のメモリバックアップ用のポータブル電源として機能する。

【００６４】

ここで、ＯＢＤ（On-Board Diagnostic system）システムは、自動車に搭載されるコンピュータが行う自己故障診断機能であって、使用過程にある自動車の排出ガス浄化装置の機能点検を容易にしている。ＯＢＤ２では、その点検コネクタや通信プロトコル、故障診断コード等が標準化されている。

【００６５】

ＯＢＤ（On-Board Diagnostic system）システムを搭載した車両では、各種診断履歴情報がメモリに保存されており、搭載バッテリ２００を交換する際に、メモリ上の情報を喪失することのないように、メモリにバックアップ電源を供給しておく必要がある。

【００６６】

すなわち、車両用補助給電装置１００は、ジャンプスタータとしての機能を有し、しかも、バッテリ駆動型のノートＰＣやその付帯機器などの情報機器、シガーソケットに接続して利用可能な車載対応の電気機器、携帯電話やＵＳＢで給電可能な携帯音楽プレーヤ等の使用を可能にするポータブル電源としての機能を有し、さらに、ＯＢＤ（On-Board Diagnostic system）システムに対応した車両のメモリバックアップ用のポータブル電源として機能する小型軽量で携帯性に優れ、使い勝手のよい車両用補助給電装置１００となっている。

【００６７】

更に、制御回路部４は、上述したようにポータブル電源として使用している際にも、第２の検出部３ｂにより、過電流及び過放電の状態に近づいたと検出された場合、第２のＭＯＳＦＥＴ３ａのゲート電圧を制御して、第２のＭＯＳＦＥＴ３ａにより、リチウムイオン蓄電池２と第１～第４のＤＣ出力端子３１，３２，３３，３４との間の電流経路を迅速に遮断して、車両用補助給電装置１００が過電流、逆接続及び過放電等となることを防止する。

【００６８】

なお、この際、制御回路部４は、第２のＭＯＳＦＥＴ３ａがリチウムイオン蓄電池２と各第１～第４のＤＣ出力端子３１，３２，３３，３４との間にそれぞれ設けられている場合、リチウムイオン蓄電池２と各第１～第４のＤＣ出力端子３１，３２，３３，３４との間の電流経路のうち、第２の検出部３ｂにより、過電流及び過放電の状態に近づいたと検出された電流経路だけを、第２のＭＯＳＦＥＴ３ａにより、迅速に遮断するようにしても良い。

【００６９】

更に、車両用補助給電装置１００は、上述の如きジャンプスタータやポータブル電源と

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して機能するばかりでなく、非常時に使用する警告表示灯や照明灯として機能する。

【００７０】

すなわち、制御回路部４は、電源ＯＮの状態でライトセレクトスイッチ４３が押されたことを検知して、充電量表示部５１及び一対の非常用警告灯５３Ａ，５３Ｂを次のように制御する。

【００７１】

制御回路部４は、ライトセレクトスイッチ４３が１回押されたことを検知すると、非常用警告灯５３Ａとして備えられた赤色ＬＥＤを非常灯として点灯させ、ライトセレクトスイッチ４３が２回押されたことを検知すると、非常用警告灯５３Ｂとして備えられた白色ＬＥＤを点灯させ正面ライトとして機能させ、ライトセレクトスイッチ４３が３回押されたことを検知すると、一対の非常用警告灯５３Ａ，５３Ｂを交互に、すなわち、赤白交互に点滅させ、そして、ライトセレクトスイッチ４３が４回押されたことを検知すると、一対の非常用警告灯５３Ａ，５３Ｂを消灯させる。また、制御回路部４は、ライトセレクトスイッチ４３が３秒以上長押されたことを検知すると、充電量表示部５１を駆動して、車載バッテリ２００の充電量に応じた点灯状態とする。

【００７２】

また、制御回路部４は、サイドライト・オン／オフ・スイッチ４４の押圧操作に応じて一対の側面照明灯５４Ａ，５４Ｂの動作を制御し、サイドライト・オン／オフ・スイッチ４４が押されたことを検知すると、一対の側面照明灯５４Ａ，５４Ｂを点灯させ、サイドライト・オン／オフ・スイッチ４４が再度押されたことを検知すると一対の側面照明灯５４Ａ，５４Ｂを消灯させる。

【００７３】

以上のように、本発明を適用した車両用補助給電装置１００は、車両の車載バッテリ２００が上がった場合に、車載バッテリ２００に電気的に接続されたブースタケーブルを介して車載バッテリ２００に電力を供給し、車両のエンジンを始動させてジャンプスタートを行うジャンプスータとしての機能を少なくとも有する車両用補助給電装置において、過充電、過電流、逆接続及び過放電等の異常状態に陥らないように保護するための保護回路として、従来用いられていたリレー回路の代わりに、第１のＭＯＳＦＥＴ１ａ及び第２のＭＯＳＦＥＴ３ａを用いている。

【００７４】

そして、本発明を適用した車両用補助給電装置１００の制御回路部４は、第１の検出部１ｂにより、リチウムイオン蓄電池２のいずれかが過充電及び過電流等の異常状態に近づいたと検出された場合、第１のＭＯＳＦＥＴ１ａのゲート電圧を制御して、第１のＭＯＳＦＥＴ１ａにより、ＤＣ入力端子２０とリチウムイオン蓄電池２との間の電流経路を迅速に遮断することで、車両用補助給電装置１００が過充電、過電流及び逆接続等の異常状態となることを防止することができる。

【００７５】

更に、本発明を適用した車両用補助給電装置１００の制御回路部４は、第２の検出部３ｂにより、過電流及び過放電等の異常状態に近づいたと検出された場合、第２のＭＯＳＦＥＴ３ａのゲート電圧を制御して、第２のＭＯＳＦＥＴ３ａにより、リチウムイオン蓄電池２と第１～第４のＤＣ出力端子３１，３２，３３，３４との間の電流経路を迅速に遮断することで、車両用補助給電装置１００が過電流、逆接続及び過放電等の異常状態となることを防止することができる。

【００７６】

更に、本発明を適用した車両用補助給電装置１００は、上述したように、従来用いられていたリレー回路の代わりに、第１のＭＯＳＦＥＴ１ａ及び第２のＭＯＳＦＥＴ３ａを用いることにより、保護回路としてリレー回路を用いていた従来よりも、電流切断の反応時間を短縮することができる。具体的には、保護回路としてリレー回路を用いていた従来の車両用補助給電装置の電流切断の反応時間が、約０．８秒程度であったのに対して、本発明を適用した車両用補助給電装置１００の電流切断の反応時間は、０．８秒以下であり、

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例えば、０．００１秒程度である。したがって、本発明を適用した車両用補助給電装置１００は、保護回路としてリレー回路を用いていた従来よりも、迅速に電流切断を行うことができ、確実に、過充電、過電流、逆接続及び過放電等の異常状態となることを防止することができる。

【００７７】

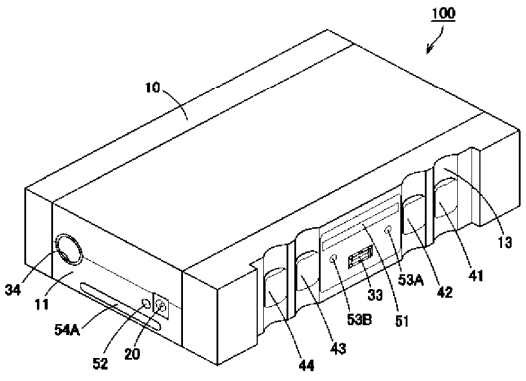
更に、本発明を適用した車両用補助給電装置１００は、上述したように、保護回路として、リレー回路の代わりに、第１のＭＯＳＦＥＴ１ａ及び第２のＭＯＳＦＥＴ３ａを用いることにより、保護回路としてリレー回路を用いていた従来よりも、回路部（筐体１０）の面積（体積）を小さくすることができ、全体的に小型化することができる。

【符号の説明】

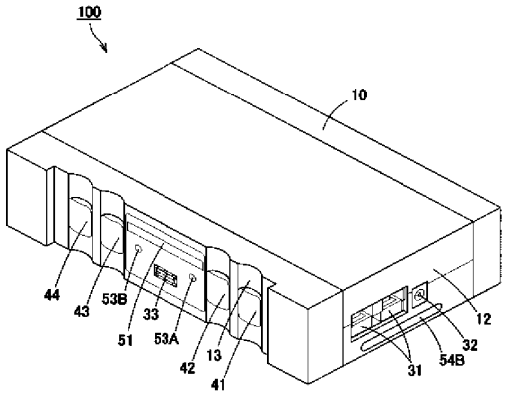
【００７８】

１　充電回路部、１ａ　第１のＭＯＳＦＥＴ、１ｂ　第１の検出部、２　リチウムイオン蓄電池、３　出力回路部、３ａ　第２のＭＯＳＦＥＴ、３ｂ　第２の検出部、４　制御回路部、１０　筐体、１１　左側面壁、１２　右側面壁、１３　正面壁、２０　ＤＣ入力端子、３１　第１のＤＣ出力端子、３２　第２のＤＣ出力端子、３３　第３のＤＣ出力端子、３４　第４のＤＣ出力端子、４１　電源スイッチ、４２　ジャンプスタートスイッチ、４３　ライトセレクトスイッチ、４４　サイドライト・オン／オフ・スイッチ、５１　充電量表示部、５２　バッテリロー表示灯、５３Ａ，５３Ｂ　非常用警告灯、５４Ａ，５４Ｂ　側面照明灯、１００　車両用補助給電装置、１２０　ブースタケーブル、２００　車載バッテリ

【図１】

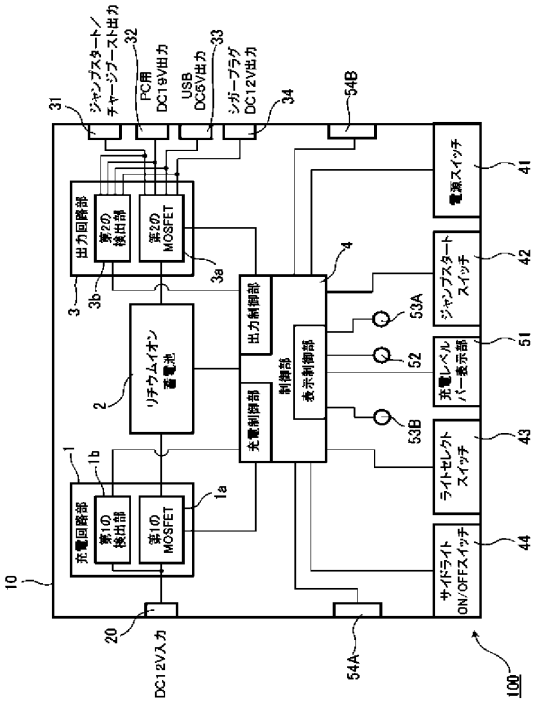


【図２】

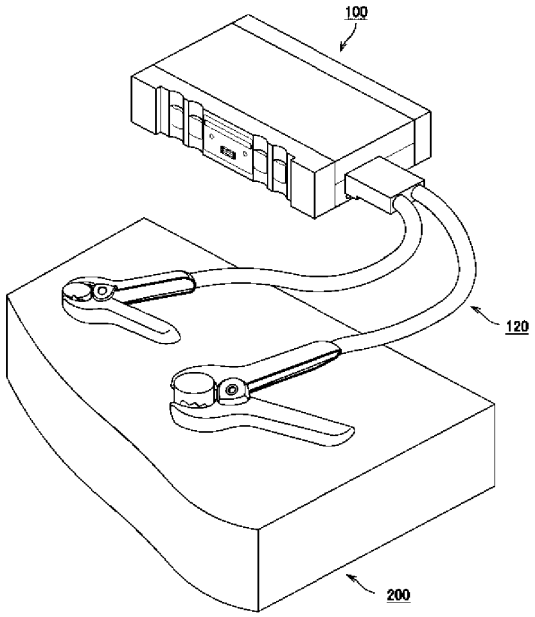


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【図３】


ジャンプスタート／チャージアウト出力
32
PC用 DC19V出力
33
USB DC5V出力
シガープラグ DC12V出力
34
54B
31
出力回路部
第2の検出部
第2の MOSFET
3
3b
3a
4
出力制御部
充電制御部
表示制御部
53A
52
53B
2
リチウムイオン蓄電池
1
1b
1a
充電回路部
第1の検出部
第1の MOSFET
10
20
DC12V入力
54A
100
電源スイッチ
41
ジャンプスタートスイッチ
42
充電レベルバー表示部
51
ライトセレクトスイッチ
43
サイドライト ON/OFFスイッチ
44

【図４】


100
120
200

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Espacenet

CN203504235U Multifunctional emergency starting power supply for car

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Multifunctional emergency starting power supply for car

Abstract

The utility model relates to the technical field of mobile power supplies, and particularly relates to a multifunctional emergency starting power supply for a car. The multifunctional emergency starting power supply for a car comprises a shell formed by an upper cover and a lower shell; the shell is internally provided with a battery pack and a main control board; the battery pack is connected with a car starting connector; the battery pack comprises a plurality of batteries, and the plurality of batteries are stacked vertically and coated by a heat insulation tape; and the main control board comprises a plurality of coils, and a protection shell covers the coils. According to the multifunctional emergency starting power supply for the car, a plurality of high-power discharge lithium polymer battery plates are coated via the high temperature-resisting heat insulation tape to form an integral battery pack, thereby facilitating water-proof, dust-proof and expansion-proof treatment on the battery pack; dust can be prevented from gathering on the coils due to the protection shell, thereby ensuring operation performances of the coil; as the main control board is connected with rich charging interfaces, equipment such as a cell phone, a tablet personal computer, a notebook computer and a car-mounted refrigerator can be charged, and an emergency output function is formed to serve as the starting power supply for the car; and the structure is simple and practicability is strong.

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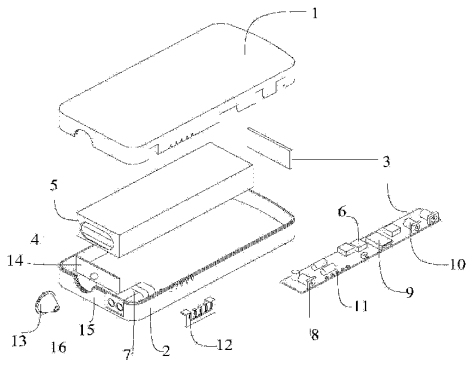
权利要求书1页 说明书2页 附图1页

(54)实用新型名称

一种多功能汽车应急启动电源

(57)摘要

本实用新型涉及移动电源技术领域，尤其是一种多功能汽车应急启动电源。它包括由上盖和下壳形成的壳体，壳体内设置有电池组和主控板，电池组连接有汽车启动连接件；电池组包括若干个电池，若干个电池上下叠置后通过隔热胶条包覆；主控板包括若干个线圈，线圈上罩设有防护壳。本实用新型通过耐高温的隔热胶条将若干个高倍放电的锂电聚合物电池板进行包覆从而形成整体式的电池组，有利于电池组的防水防尘以及防膨胀处理；同时，利用防护壳可防止线圈积灰，保证了线圈的工作性能；主控板则连接了丰富的充电接口，可为手机、平板电脑、笔记本电脑、车载冰箱等设备充电，并形成了应急输出功能以作为汽车的启动电源使用；其结构简单，具有很强的实用性。



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1. 一种多功能汽车应急启动电源，它包括由上盖和下壳形成的壳体，所述壳体内设置有电池组和主控板，所述电池组连接主控板，其特征在于：所述电池组连接有受控于主控板的汽车启动连接件；所述电池组包括若干个电池，若干个所述电池上下叠置后通过隔热胶条包覆；所述主控板包括若干个线圈，所述线圈上罩设有防护壳。

2. 如权利要求 1 所述的一种多功能汽车应急启动电源，其特征在于：所述电池为锂电聚合物电池板。

3. 如权利要求 2 所述的一种多功能汽车应急启动电源，其特征在于：所述主控板连接并控制有 19V/3.5A 充电口、5V/2A 充电口、12V/2A 充电口和若干个电量指示灯，所述 19V/3.5A 充电口、5V/2A 充电口和 12V/2A 充电口均设置在壳体的一侧面上，所述壳体的下壳上对应于电量指示灯的位置设置有灯槽，所述灯槽内设置有第一灯罩。

4. 如权利要求 3 所述的一种多功能汽车应急启动电源，其特征在于：所述主控板还连接有照明灯组件，所述照明灯组件包括透镜灯罩和与主控板电连的灯控板，所述灯控板上设置有灯珠，所述透镜灯罩上设置有用于容置灯珠的凹槽。

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一种多功能汽车应急启动电源

技术领域

[0001] 本实用新型涉及移动电源技术领域，尤其是一种多功能汽车应急启动电源。

背景技术

[0002] 随着科学技术的不断发展，各式各样的电子产品很受欢迎，比如手机、平板电脑、数码相机等，极大的改善了人们的生活水平，市场上出现了各种专用的移动电源为电子产品充电，使用十分方便；同时，也针对汽车以及其他电子设备的启动或充电需求对移动电源进行了功能融合，形成了汽车应急启动电源。

[0003] 然而，随着移动电源应用范围的扩大，其使用环境及使用条件也出现了多样的变化，由于现有的移动电源或汽车应急启动电源仍然存在功能相对单一、结构设计不合理等问题，进而导致其使用不便、防水防尘效果差；因此有必要对现有的移动电源或汽车应急启动电源进行结构及功能改进，以满足人们现实的需求。

实用新型内容

[0004] 针对上述现有技术中存在的不足，本实用新型的目的在于提供一种结构简单、防水防尘效果显著、功能丰富、使用方便的多功能汽车应急启动电源。

[0005] 为了实现上述目的，本实用新型采用如下技术方案：

[0006] 一种多功能汽车应急启动电源，它包括由上盖和下壳形成的壳体，所述壳体内设置有电池组和主控板，所述电池组连接主控板，所述电池组连接有受控于主控板的汽车启动连接件；所述电池组包括若干个电池，若干个所述电池上下叠置后通过隔热胶条包覆；所述主控板包括若干个线圈，所述线圈上罩设有防护壳。

[0007] 优选地，所述电池为锂电聚合物电池板。

[0008] 优选地，所述主控板连接并控制有19V/3.5A充电口、5V/2A充电口、12V/2A充电口和若干个电量指示灯，所述19V/3.5A充电口、5V/2A充电口和12V/2A充电口均设置在壳体的一侧面上，所述壳体的下壳上对应于电量指示灯的位置设置有灯槽，所述灯槽内设置有第一灯罩。

[0009] 优选地，所述主控板还连接有照明灯组件，所述照明灯组件包括透镜灯罩和与主控板电连的灯控板，所述灯控板上设置有灯珠，所述透镜灯罩上设置有用于容置灯珠的凹槽。

[0010] 由于采用了上述方案，本实用新型通过耐高温的隔热胶条将若干个高倍放电的锂电聚合物电池板进行包覆从而形成整体式的电池组，有利于电池组的防水防尘以及防膨胀处理；同时，利用防护壳罩设主控板上的线圈，防止线圈积灰，保证了线圈的工作性能；另外，主控板连接了丰富的充电接口，可为手机、平板电脑、笔记本电脑、车载冰箱等设备充电，并形成了应急输出功能以作为汽车的启动电源使用；其结构简单、实用性强。

附图说明

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[0011] 图 1 为本实用新型实施例的分解结构示意图。

具体实施方式

[0012] 以下结合附图对本实用新型的实施例进行详细说明，但是本实用新型可以由权利要求限定和覆盖的多种不同方式实施。

[0013] 如图 1 所示，本实用新型提供的一种多功能汽车应急启动电源，它包括由上盖 1 和下壳 2 组装形成的壳体，在壳体内设置有电池组和主控板 3，电池组连接主控板 3；其中，电池组包括若干个电池 4，本实施例的电池 4 采用由高倍放电的锂电聚合物电池板以代替传统移动电源内的圆柱电芯，若干个电池 4 上下叠置后通过隔热胶条 5 包覆，以此形成整体式电池组，利于电池组的更换、拆装以及电池的防尘、防水和防膨胀处理；由于主控板 3 包括若干个容易积灰的线圈（图中未示出），故为保证线圈的工作性能同时防止线圈积灰、触水，在线圈上罩设有防护壳 6；而电池组还连接有受控于主控板 3 的汽车启动连接件 7，以此实现移动电源的应急输出功能，使其能够作为汽车启动电源使用并完成多次启动。

[0014] 为丰富移动电源的功能，拓宽适用范围，主控板 3 连接并控制有用于为笔记本电脑等电子产品进行充电的 19V/3.5A 充电口 8、用于为手机、数码相机、PSP、平板电脑和汽车导航等设备进行充电的 5V/2A 充电口 9、用于为车载冰箱等设备进行充电的 12V/2A 充电口 10 和若干个并排设置的电量指示灯 11；其中，19V/3.5A 充电口 8、5V/2A 充电口 9 和 12V/2A 充电口 10 均设置在壳体的一侧面上，在壳体的下壳 2 上对应于电量指示灯 11 的位置设置有灯槽（图中未示出），在灯槽内设置有第一灯罩 12，以利用第一灯罩 12 实现电量指示灯 11 的连续性变化而不是单个点的显示。

[0015] 另外，主控板 3 还连接有照明灯组件，以使移动电源可以提供长时间、高亮度的照明，照明灯组件包括透镜灯罩 13 和与主控板 3 电连的灯控板 14，在灯控板 14 上设置有灯珠 15，在透镜灯罩 13 上设置有用于容置灯珠 15 的凹槽 16，而透镜灯罩 13 则嵌合在壳体侧面的对应插槽内。

[0016] 本实施例的移动电源极大的丰富了传统移动电源的功能，可为众多电子设备以及汽车提供电源，鉴于移动电源使用环境及使用条件的多变性，在保证其高效工作性能的基础上，通过结构的细化设置，实现移动电源的防水、防尘等效果，其结构简单、具有很强的实用性和市场推广价值。

[0017] 以上所述仅为本实用新型的优选实施例，并非因此限制本实用新型的专利范围，凡是利用本实用新型说明书及附图内容所作的等效结构或等效流程变换，或直接或间接运用在其他相关的技术领域，均同理包括在本实用新型的专利保护范围内。

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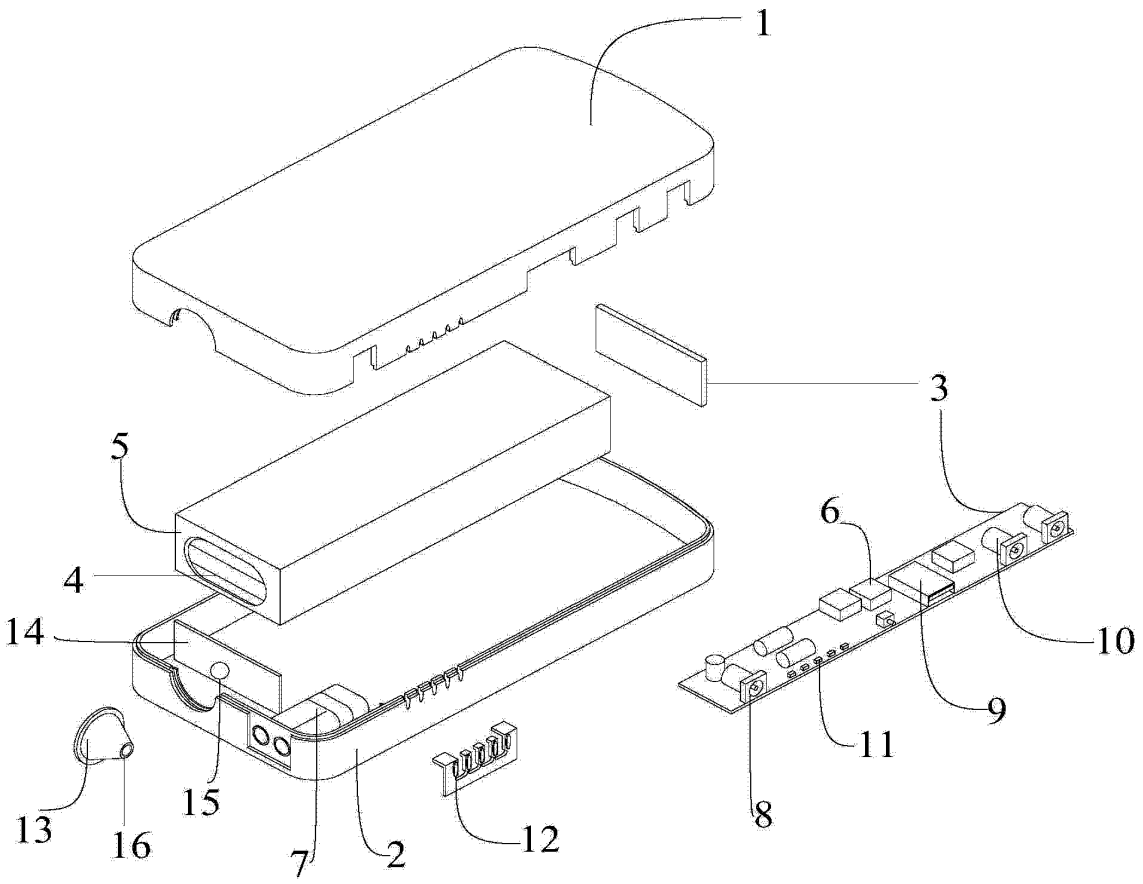


图 1

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Battery Charging Specification

Revision 1.2

December 7, 2010

EXHIBIT 1009

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Revision History

Revision	Date	Author	Description
BC1.0	Mar 8, 2007	Terry Remple	First release
BC1.1	April 15, 2009	Terry Remple	Major updates to all sections. Added Data Contact Detect protocol, and Accessory Charger Adapter.
BC1.2	Oct 5, 2010	Terry Remple Adam Burns	Following items indicate changes from BC1.1 to BC1.2. References below to Section, Figures and Tables refer to BC1.2, unless BC1.1 is specifically indicated. 1. Allow DCPs to output more than 1.5A. Allows Portable Devices (PDs) with switch mode chargers to draw more power. Section 4.4.1. 2. Increase minimum CDP current to 1.5A. Without change, PDs had to draw less than 500mA, to avoid CDP shutdown. Table 5-2. 3. Indicate that I_{CDP} max and I_{DCP} max limits of 5A come from USB 2.0, and are safety limits. Table 5-2 note 1. 4. Allow PDs to draw up to 1.5A during HS chirp and traffic. Remove previous limits of 560mA and 900mA which was based on HS common mode ranges. Section 3.5. 5. Require CDPs to support 1.5A during HS chirp and traffic. Affects CDP common mode range. Section 3.5. 6. Reduce maximum PD current from 1.8A to 1.5A, to avoid shutdown when attached to CDP. Table 5-2. 7. Rename Docking Station to ACA-Dock, to avoid confusion with other types of Docking Stations. 8. Require ACA-Dock to differentiate itself from an ACA, by enabling V_{DM_SRC} during no activity. Section 3.2.4.4. 9. Allow CDP to leave V_{DM_SRC} enabled while peripheral not connected. Section 3.2.4.2. 10. Remove I_{CHG_SHTDWN}. This was a recommended max output current for Charging Ports with VBUS grounded. BC1.1 Section 4.1. 11. Require V_{DP_SRC} to not pull D+ below 2.2V when D+ is being pulled to V_{DP_UP} through R_{DP_UP}. Require V_{DM_SRC} to not pull D- below 2.2V when D- is being pulled high. Required for ACA-Dock support. Table 5-1 notes 1 and 2.

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			12. Make DCD current source optional for PDs. Section 3.2.3. 13. Make DCD timeout required for PDs. Section 3.2.3. 14. Make Secondary Detection optional for PDs. Section 4.6.2. 15. Make Good Battery Algorithm required behavior for PDs. Section 3.2.4. 16. Remove resistive detection. BC1.1 Section 3.9. 17. Change PD Required Operating Range to include 4.5V at 500mA. Figure 4-3. 18. Allow any downstream port to act as a DCP. Section 4.1.3. 19. Require PDs to enable V_{DP_SRC} or R_{DP_PU} when charging from a DCP. Section 3.3.2. 20. Allow chargers to renegotiate current with PD by dropping and reasserting VBUS. Section 4.1.3. 21. Require PDs to discharge their own VBUS input after VBUS drops to support charger port renegotiation request. Section 4.6.3. 22. Allow PDs to disconnect and repeat Charger Detection multiple times while attached, with specified timing. Section 4.6.3. 23. Reduce DCP input impedance between D+, D- to VBUS and ground from 1MΩ to 300kΩ. Section 4.4.3. 24. Require CDPs to recover after over-current condition. Section 4.2.2. 25. Allow greater DCP undershoot for large load current steps, to enable low quiescent current chargers required by Europe. Section 4.4.2. 26. Define ACAs and ACA-Docks as types of Charging Ports. Section 1.4.5. 27. Use session valid voltage range defined in EH and OTG Supplement rev 2.0. Section 3.2.2. 28. Only devices that can operate stand-alone from internal battery power are allowed to use the Dead Battery Provision. Section 2.2. 29. Allow compound PDs to draw I_{SUSP} plus an

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			additional I_{SUSP} for each downstream port. Section 2.1. 30. Remove requirement for vendors to provide typical and maximum connect time for products having a Dead or Weak Battery for compliance testing. Section 2. 31. Remove references to no battery from Dead Battery Provision. Section 2. 32. Require PD using Dead Battery Provision to enable V_{DP_SRC} from $T_{DBP\_ATT\_VDPSRC}$ after attach to $T_{DBP\_VDPSRC\_CON}$ before connect. Section 2.2. 33. Added DBP – Configured Clause, which allows PD with Dead Battery to draw I_{CFG_MAX} for $T_{DBP\_FUL\_FNCTN}$ without having to pass USBCV. Section 2.3. 34. Note constraints when trying to charge from an OTG A-device. Section 1.6. 35. Change I_{DP_SINK} and I_{DM_SINK} range from 50-150uA to 25-175uA to ease PHY design. Table 5-2 note 1. 36. Allow USB 3.0 devices to implement BC charger detection protocols, and to use USB 3.0 ranges for I_{UNIT} and I_{CFG_MAX}. Section 1.7. 37. Rename previous ACA to Micro ACA, and define the Standard ACA. Section 6. 38. Add caps to OTG and Accessory Ports on ACA to support Attach Detection Protocol (ADP). Figure 6-3. 39. Change ACA ID resistance tolerances from 5% to 1% to ease PHY design. Table 5-3. 40. Remove requirements on ACA switching time($T_{ACA\_ID\_VBUS}$) to ease ACA design. BC1.1 Section 6.5. 41. Add state diagram for PDs attached to ACA. Section 6.2.7. 42. Require PDs to limit current from ACA such that VBUS remains above V_{ACA_OPR}. Section 6.2.2. 43. Change minimum ACA operating voltage (V_{ACA_OPR}) from 3.0V to 4.1V. Table 5-1. 44. Remove requirement that ACA VBUS resistances ($R_{ACA\_CHG\_DIS}$) be greater than 10k when VBUS_CHG is greater than 6.5V. PDs are

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			responsible for protecting themselves against higher voltages on VBUS. BC1.1 Section 6.7. 45. Require ACAs to continue providing power to OTG device from Charging Port, even if ground offsets or USB reset cause D- to go below V_{DAT_REF}. Section 6.2.6. 46. Change charger shutdown recovery time (T_{SHTDWN_REC}) from 2 seconds to 2 minutes. Table 5-5. 47. Indicate that ACA-Dock is required to pull D+ to V_{DP_UP} with R_{DP_UP} when VBUS is asserted. Section 3.2.4.4. 48. Remove statements regarding devices with multiple receptacles. Covered in Multiple Receptacle white paper at http://www.usb.org/developers/docs/. 49. Improve readability by adding and updating drawings, re-structuring sections, and clarifying text.

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Acronyms

ACA	Accessory Charger Adapter
CDP	Charging Downstream Port
DBP	Dead Battery Provision
DCD	Data Contact Detect
DCP	Dedicated Charging Port
FS	Full Speed
HS	High-Speed
LS	Low-Speed
OTG	On-The-Go
PC	Personal Computer
PD	Portable Device
PHY	Physical Layer Interface for High-Speed USB
PS2	Personal System 2
SDP	Standard Downstream Port
SRP	Session Request Protocol
TPL	Targeted Peripheral List
USB	Universal Serial Bus
USBCV	USB Command Verifier
USB-IF	USB Implementers Forum
VBUS	Voltage line of the USB interface

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1. Introduction

1.1 Scope

The Battery Charging Working Group is chartered with creating specifications that define limits as well as detection, control and reporting mechanisms to permit devices to draw current in excess of the USB 2.0 specification for charging and/or powering up from dedicated chargers, hosts, hubs and charging downstream ports. These mechanisms are backward compatible with USB 2.0 compliant hosts and peripherals.

1.2 Background

The USB ports on personal computers are convenient places for Portable Devices (PDs) to draw current for charging their batteries. This convenience has led to the creation of USB Chargers that simply expose a USB standard-A receptacle. This allows PDs to use the same USB cable to charge from either a PC or from a USB Charger.

If a PD is attached to a USB host or hub, then the USB 2.0 specification requires that after connecting, a PD must draw less than:

- 2.5 mA average if the bus is suspended
- 100 mA if bus is not suspended and not configured
- 500 mA if bus is not suspended and configured for 500 mA

If a PD is attached to a Charging Port, (i.e. CDP, DCP, ACA-Dock or ACA), then it is allowed to draw I_{DEV_CHG} without having to be configured or follow the rules of suspend.

In order for a PD to determine how much current it is allowed to draw from an upstream USB port, there need to be mechanisms that allow the PD to distinguish between a Standard Downstream Port and a Charging Port. This specification defines just such mechanisms.

Since PDs can be attached to USB chargers from various manufacturers, it is important that all provide an acceptable user experience. This specification defines the requirements for a compliant USB charger, which is referred to in this spec as a USB Charger.

If a PD has a Dead or Weak Battery, then the Connect Timing Engineering Change Notice (ECN) issued by the USB-IF on the USB 2.0 spec allows that device to draw up to I_{UNIT} while attached but not connected. The conditions associated with this ECN are contained in Section 2 of this specification, and are referred to as the Dead Battery Provision (DBP).

1.3 Reference Documents

The following specifications contain information relevant to the Battery Charging Specification.

- OTG and Embedded Host Supplement, Revision 2.0
- USB 2.0 Specification
- USB 3.0 Specification

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1.4 Definitions of Terms

This section contains definitions for some of the terms used in this specification.

1.4.1 Accessory Charger Adaptor

An Accessory Charger Adaptor (ACA) is an adaptor which allows a single USB port to be attached to both a charger and another device at the same time.

The following terminology is used when referring to an ACA:

- ACA-A An ACA with ID resistance of R_{ID_A}
- ACA-B An ACA with ID resistance of R_{ID_B}
- ACA-C An ACA with ID resistance of R_{ID_C}

See Section 6 for details on an ACA.

1.4.2 ACA-Dock

An ACA-Dock is a docking station that has one upstream port, and zero or more downstream ports. The upstream port can be attached to a PD, and is capable of sourcing I_{CDP} to the PD. An ACA-Dock signals it is an ACA-Dock to the PD by enabling V_{DM_SRC} during USB idle, and by pulling ID to ground through a resistance of R_{ID_A}. See Section 3.2.4.4 for more details.

1.4.3 Attach versus Connect

This specification makes a distinction between the words "attach" and "connect". A downstream device is considered to be attached to an upstream port when there is a physical cable between the two.

A downstream device is considered to be connected to an upstream port when it is attached to the upstream port, and when the downstream device has pulled either the D+ or D- data line high through a 1.5 kΩ resistor, in order to enter Low-Speed, Full-Speed or High-Speed signaling.

1.4.4 Charging Downstream Port

A Charging Downstream Port (CDP) is a downstream port on a device that complies with the USB 2.0 definition of a host or a hub, except that it shall support the Charging Downstream Port features specified herein.

A CDP shall output a voltage of V_{DM_SRC} on its D- line when it senses a voltage greater than V_{DAT_REF} but less than V_{LGC} on its D+ line when not connected to a peripheral. A CDP shall not output a voltage of V_{DM_SRC} on its D- line from the time that the peripheral is connected, to the time that the peripheral is disconnected.

1.4.5 Charging Port

A Charging Port is a DCP, CDP, ACA-Dock or ACA.

1.4.6 Dead Battery Threshold

The Dead Battery Threshold is defined as the maximum charge level of a battery such that below this threshold, a device is assured of not being able to power up successfully.

A Dead Battery is defined as one that is below the Dead Battery Threshold.

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1.4.7 Dedicated Charging Port

A Dedicated Charging Port (DCP) is a downstream port on a device that outputs power through a USB connector, but is not capable of enumerating a downstream device. A DCP shall source I_{DCP} at an average voltage of V_{CHG}.

A DCP shall short the D+ line to the D- line.

1.4.8 Downstream Port

In this specification, a Downstream Port refers to either a Standard Downstream Port or a Charging Downstream Port.

1.4.9 Micro ACA

A Micro ACA is an ACA with a Micro-AB receptacle on the Accessory Port.

1.4.10 Portable Device

A PD as used in this specification is a device which is compliant with this specification and the USB 2.0 specification, and can draw charging current from USB.

1.4.11 Rated Current

The Rated Current of a Charging Port is the amount of current that a Charging Port can output and still maintain a VBUS voltage of V_{CHG}. The Rated Current of a DCP is required to be within I_{DCP}, and the rated current of a CDP or ACA-Dock is required to be within I_{CDP}.

1.4.12 Standard ACA

A Standard ACA is an ACA with a Standard-A receptacle on the Accessory Port.

1.4.13 Standard Downstream Port

In this specification, a Standard Downstream Port (SDP) refers to a downstream port on a device that complies with the USB 2.0 definition of a host or hub. An SDP expects a downstream device with a good battery to draw less than 2.5 mA average when unconnected or suspended, up to 100 mA maximum when connected and not configured and not suspended, and up to 500 mA maximum if so configured and not suspended. A downstream device can be enumerated when it is connected to an SDP.

An SDP pulls the D+ and D- lines to ground through two 15 kΩ (typical) resistors.

An SDP may have the ability to sense when a PD is driving the D+ line to V_{DP_SRC}, and then manage its power states accordingly. PDs are required to drive D+ to V_{DP_SRC} whenever they draw more than I_{SUSP} while attached but not connected, as described in the Dead Battery Provision.

1.4.14 USB Charger

A USB Charger is a device with a DCP, such as a wall adapter or car power adapter.

1.4.15 Weak Battery Threshold

The Weak Battery Threshold is defined as the minimum charge level of a battery such that above this threshold, a device is assured of being able to power up successfully.

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A Weak Battery is defined as one that is above the Dead Battery Threshold and below the Weak Battery Threshold. A device with a Weak Battery may or may not be able to power up a device successfully.
A Good Battery is defined as one that is above the Weak Battery Threshold.

1.5 Parameter Values

Parameter names are used throughout this specification instead of parameter values. All parameter values are found in Section 5.

1.6 OTG Considerations

A PD with a Dead Battery cannot differentiate between a PC and an OTG A-device. Thus, a PD will treat both the same.

If an OTG A-device is connected to a PD with a dead battery, then the OTG A-device is under no obligation to provide any more current than it normally would to any device on its Targeted Peripheral List (TPL).

An OTG A-device is allowed to stop driving VBUS after a time of TA_WAIT_BCON (See OTG 2.0 Specification for value) while waiting for the B-device to connect. Thus, a PD with a Dead Battery may not have time for significant charging when attached to an OTG A-device, if it does not connect.

1.7 Super Speed Considerations

SuperSpeed ports defined in USB 3.0 are allowed to implement the charger detection mechanisms defined in this spec. When a PD detects it is attached to a SuperSpeed port, then ICFG_MAX changes to 900mA, and IUNIT changes to 150mA.

2. Dead Battery Provision

2.1 Background

The USB 2.0 specification allows a downstream device to draw a suspend current of up to ISUSP from a SDP when the device is not connected or when the bus is suspended. If the bus is not suspended and the device is configured, then USB 2.0 allows a device to draw up to ICFG_MAX, depending on the configuration the host enables.

This limit of only ISUSP when not connected can be problematic for PDs with a Dead Battery or a Weak Battery. Some PDs require more than IUNIT for several seconds just to power up. Thus, PDs with Dead Batteries or Weak Batteries may not be able to power up when attached to an SDP if they can only draw ISUSP when not connected.

USB 2.0 allows a PD that is a compound device to draw ISUSP for each downstream port while attached but not connected or during suspend.

2.2 DBP – Unconfigured Clause

A PD with a Dead or Weak Battery is allowed to draw IUNIT from a Downstream Port using the DBP while not configured, providing it behaves as follows:

- Reduces current to ISUSP after timeout
  - If PD is not ready to connect and be enumerated within TSVLD_CON_WKB after attach, then it shall reduce its current to ISUSP

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- Enables VDP_SRC when attached but not connected
  - PD shall enable VDP_SRC within TDBP_ATT_VDPSRC of attach
  - PD shall connect within TDBP_VDPSRC_CON of disabling VDP_SRC

- Uses current to power up and enumerate, or reach Weak Battery Threshold and enumerate, as soon as possible
  - PD shall not use the DBP current to perform unrelated tasks, such as:
    - Charging beyond the Weak Battery Threshold
    - Making a phone call
    - Playing a song, video or game
    - Establishing a wireless connection
  - Only devices that can operate stand-alone from internal battery power are allowed to use the DBP.

- Passes inrush test
  - PD with Dead or Weak Battery shall pass USB-IF compliance inrush test

The unconfigured state includes the time that the PD is attached and not connected, and the time that the PD is connected and not configured. A PD enters the configured state by receiving a SET_CONFIGURATION command from the host.

2.3 DBP – Configured Clause

A PD with a Dead or Weak Battery is allowed to draw its configured current, (which can be up to ICFG_MAX), from a Standard Downstream Port using the Dead Battery Provision (DBP) while configured, and not have to pass USBCV tests, providing it behaves as follows:

- Responds to received tokens
  - PD shall respond to any tokens addressed to it, with either a NAK or any other valid USB response

- Responds to USB reset
  - Upon receipt of USB reset, a PD shall reduce its current to IUNIT. PD is allowed to disconnect upon receiving a reset. While disconnected, PD is allowed to use the DBP – Unconfigured Clause.

- Responds to USB suspend
  - Upon receipt of USB suspend, PD shall either remain connected, and reduce its current to ISUSP, or it shall disconnect. While disconnected, the PD is allowed to use the DBP – Unconfigured Clause.

- Provides full USB functionality after timeout, or disconnects
  - After a time of TDBP_FUL_FNCTN from attach, a PD shall either remain connected and be able to pass USBCV, or it shall disconnect. While disconnected, the PD is allowed to use the DBP – Unconfigured Clause.

- Uses current to reach Weak Battery Threshold and provide full USB functionality as soon as possible
  - PD shall not use the DBP current to perform unrelated tasks, such as:
    - Charging beyond the Weak Battery Threshold
    - Making a phone call
    - Playing a song, video or game
    - Establishing a wireless connection

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- Provides full USB functionality upon reaching Weak Battery Threshold
  - PD shall provide full USB functionality upon reaching Weak Battery Threshold if this occurs before TDBP_FUL_FNCTN after attach.

- PD informs user within TDBP_INFORM of attach that it is charging and not available for other functions

3. Charging Port Detection

3.1 Overview

Figure 3-1 shows several examples of a PD attached to an SDP or Charging Port.

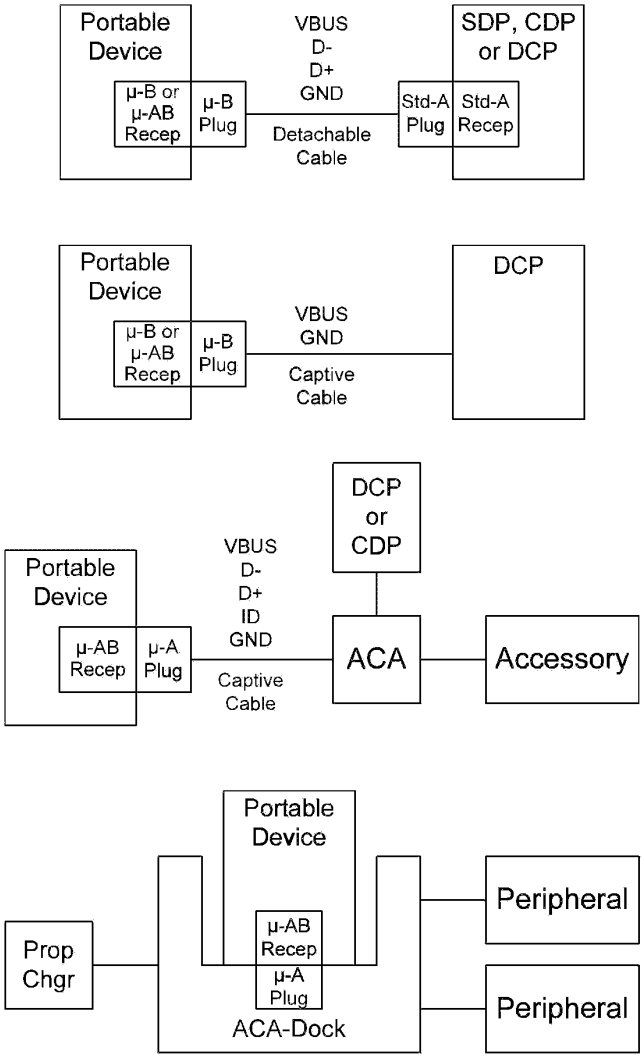


Figure 3-1 System Overview

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In the first example, a Std-A to Micro-B cable is used to attach a PD to an SDP, CDP or DCP. In the second example, a DCP has a captive cable. This cable does not have wires for D+ or D-, but instead shorts the D+ and D- pins at the Micro-B plug.

In the third example, an ACA is required to have a captive cable that attaches to the Portable Device, and this cable is required to have wires for D+, D- and ID. The ACA is also required to have a port that can be attached to a DCP or CDP. The cabling for this port is described in Section 6.2.1.

In the fourth example, an ACA-Dock does not have a cable at all, but instead has a captive Micro-A plug. An ACA-Dock receives power from a Proprietary Charger, that is attached to the ACA-Dock through a proprietary cable.

3.2 Charger Detection Hardware

This section briefly describes the hardware used to do charger detection. The following sections provide more details of its operation.

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3.2.1 Overview

Figure 3-2 shows the charger detection hardware for a PD.

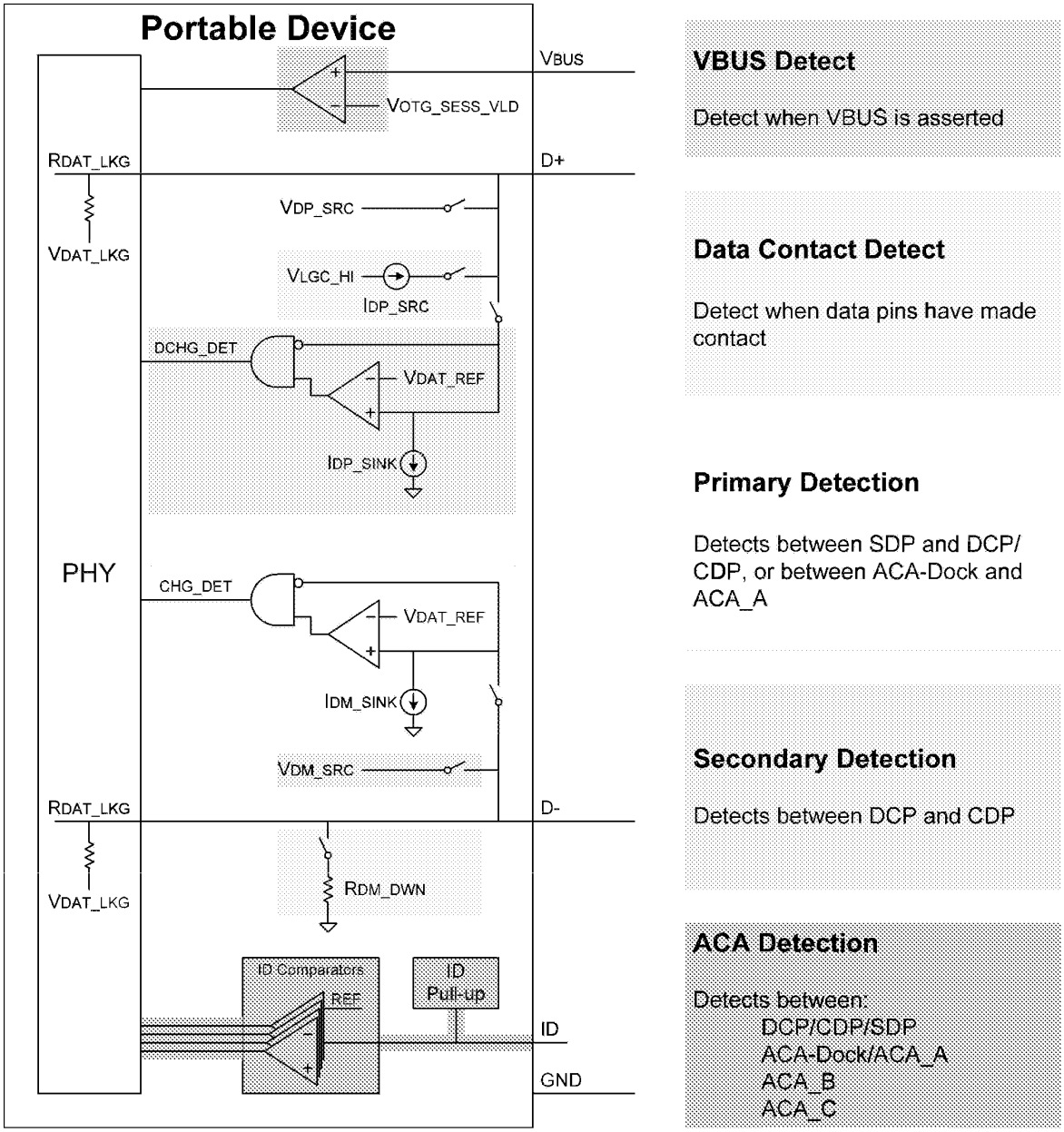


Figure 3-2 Charger Detection Hardware

3.2.2 VBUS Detect

Each PD shall have a session valid comparator that detects when VBUS is greater than its internal session valid threshold. Its internal session valid threshold shall be within VOTG_SESS_VLD.

3.2.3 Data Contact Detect

3.2.3.1 Overview

Data Contact Detect (DCD) uses a current source, IDP_SRC, to detect when the data pins have made contact during an attach event. A PD is not required to implement DCD. If a PD does not implement DCD, then it shall wait a time of TDCD_TIMEOUT min after the attach event before starting Primary Detection.

DCD is able to detect data pin contact whenever a PD is attached to an SDP or CDP. The primary benefit of DCD is that it allows a PD to start Primary Detection as soon as the data pins have made contact, and then connect, without having to wait for a timer to expire. As per the USB Connect Timing ECN, a powered up USB device is required to connect to a USB host within TSVLD_CON_PWD of the attach event.

DCD is also able to detect data pin contact for most cases of a PD attached to a DCP or ACA. Cases where DCD may not work include:

- DCP with too much leakage current
- ACA with charger and FS or HS B-device on Accessory Port
- ACA-Dock
- PS2 port that pulls D+ high
- Proprietary chargers that pull D+ high

Since DCD does not work in all cases, a PD is required to proceed to Primary Detection within TDCD_TIMEOUT max after the attach event if pin contact has not been detected on the D+ or ID pins. See Section 3.3.2.

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3.2.3.2 Problem Description

USB plugs and receptacles are designed such that when the plug is inserted into the receptacle, the power pins make contact before the data pins make contact. This is illustrated in Figure 3-3.

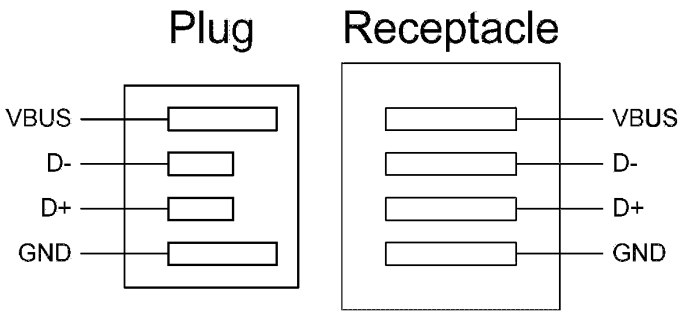


Figure 3-3 Data Pin Offset

As a result, when a PD is attached to an upstream port, the PD will detect VBUS before the data pins have made contact. The time between power pins and data pins making contact depends on how fast the plug is inserted into the receptacle. Delays of more than two hundred milliseconds have been observed.

The way that a PD distinguishes between a Charging Port and an SDP is to look at the data lines. If the PD does Primary Detection before the data pins have made contact, then the Primary Detection protocol is such that the PD will determine that it is attached to an SDP.

If a PD is attached to a DCP, and incorrectly determines that it is attached to an SDP, then the PD would draw ISUSP while waiting to be enumerated. Since a DCP will not enumerate the PD, the PD will not be able to charge.

3.2.3.3 Data Contact Detect, Not Attached

Figure 3-4 shows the case where the PD is not attached to a remote device.

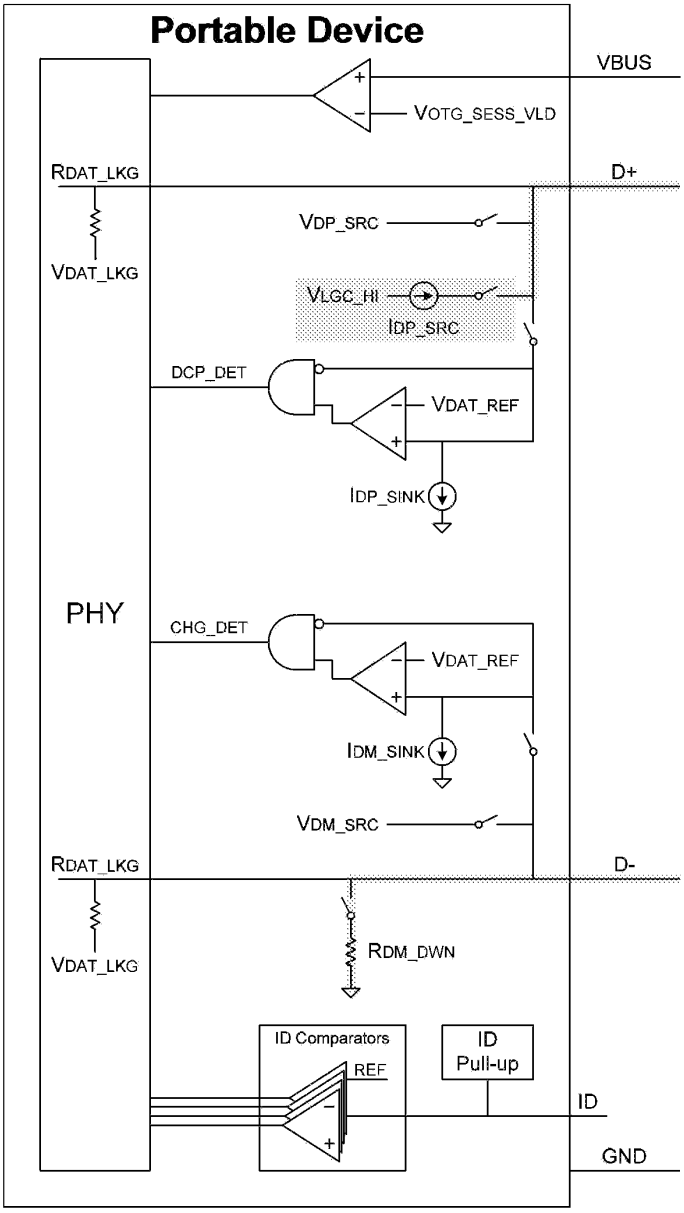


Figure 3-4 Data Contact Detect, Not Attached

The protocol for Data Contact Detect is as follows:

- PD detects VBUS asserted
- PD turns on IDP_SRC and the D- pull-down resistor
- PD waits for D+ line to be low for a time of TDCD_DBNC
- PD turns off IDP_SRC and D- pull-down resistor

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When nothing is attached to the PD, the D+ line stays high. The minimum value of I_{DP_SRC} is such that it is able to hold D+ at V_{LGC_HI} for worst case leakages in the PD due to R_{DAT_LKG} and V_{DAT_LKG}.

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3.2.3.4 Data Contact Detect, Standard Downstream Port

Figure 3-5 shows the case where the PD is attached to an SDP.

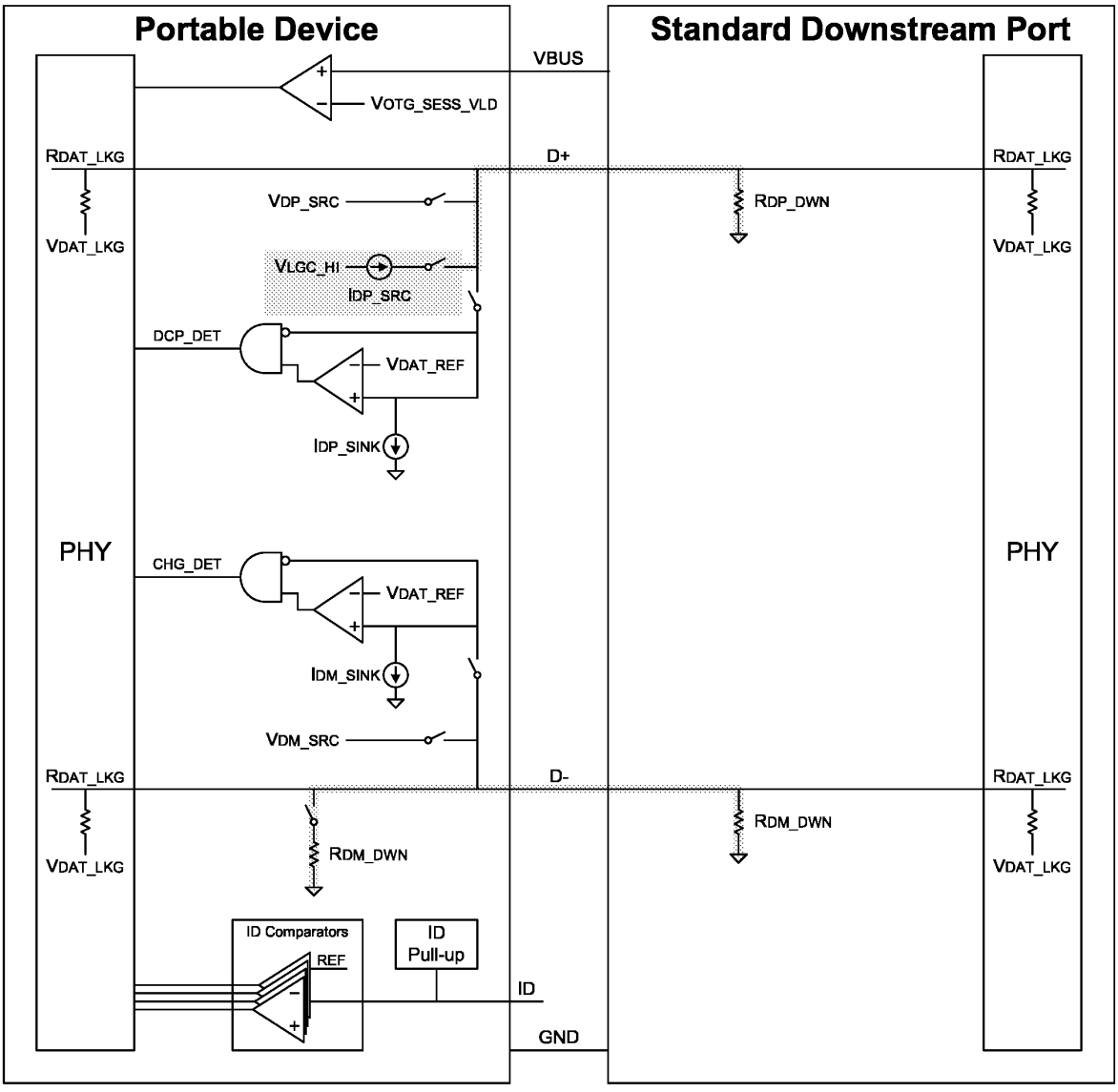


Figure 3-5 Data Contact Detect, Standard Downstream Port

When the PD is attached to an SDP, the D+ line is pulled low by R_{DP_DWN} in the SDP. The maximum value of I_{DP_SRC} is such that R_{DP_DWN} pulls D+ to V_{LGC_LOW} for worst values of R_{DAT_LKG}, V_{DAT_LKG} and R_{DP_DWN}.

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3.2.4 Primary Detection

Primary Detection is used to distinguish between an SDP and different types of Charging Ports. A PD is required to implement Primary Detection.

3.2.4.1 Primary Detection, DCP

Figure 3-6 shows how Primary Detection works when a PD is attached to a DCP.

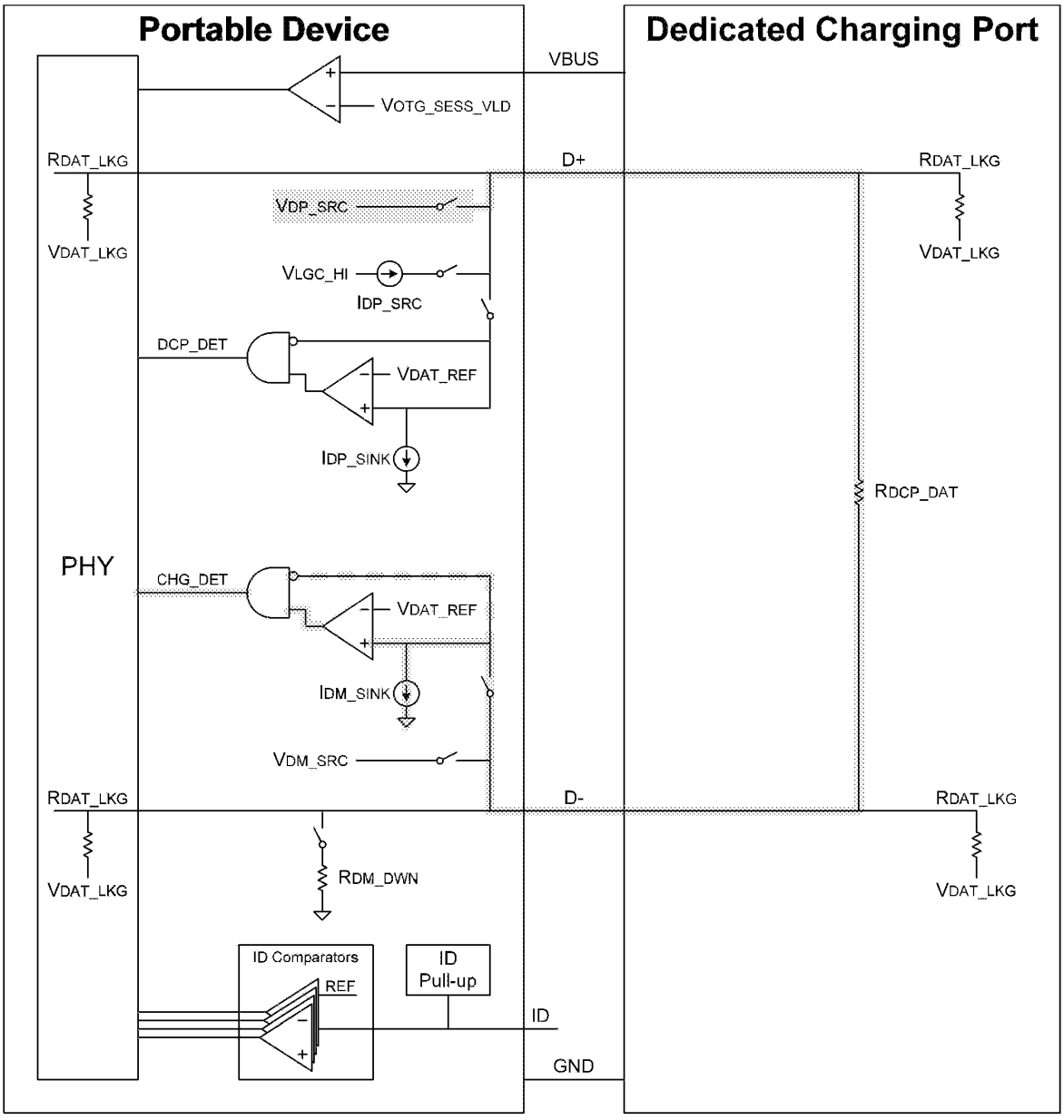


Figure 3-6 Primary Detection, DCP

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During Primary Detection the PD shall turn on V_{DP_SRC} and I_{DM_SINK}. Since a DCP is required to short D+ to D- through a resistance of R_{DCP_DAT}, the PD will detect a voltage on D- that is close to V_{DP_SRC}.

A PD shall compare the voltage on D- with V_{DAT_REF}. If D- is greater than V_{DAT_REF}, then the PD is allowed to detect that it is attached to either a DCP or CDP. A PD is optionally allowed to compare D- with V_{LGC} as well, and only determine that it is attached to a DCP or CDP if D- is greater than V_{DAT_REF}, but less than V_{LGC}. The reason for this option is as follows.

PS2 ports pull D+/- high. If a PD is attached to a PS2 port, and the PD only checks for D- greater than V_{DAT_REF}, then a PD attached to a PS2 port would determine that it is attached to a DCP or CDP and proceed to draw I_{DEV_CHG}. This much current could potentially damage a PS2 port. By only determining it is attached to DCP or CDP if D- is less than V_{LGC}, the PD can avoid causing damage to a PS2 port.

On the other hand, some proprietary chargers also pull D+/- high. If a PD is attached to one of these chargers, and it determined it was not attached to a charger because D- was greater than V_{LGC}, then the PD would determine that it was attached to an SDP, and only be able to draw I_{SUSP}.

The choice of whether or not to compare D- to V_{LGC} depends on whether the PD is more likely to be attached to a PS2 port, or to a proprietary charger.

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3.2.4.2 Primary Detection, CDP

Figure 3-7 shows how Primary Detection works when a PD is attached to a CDP.

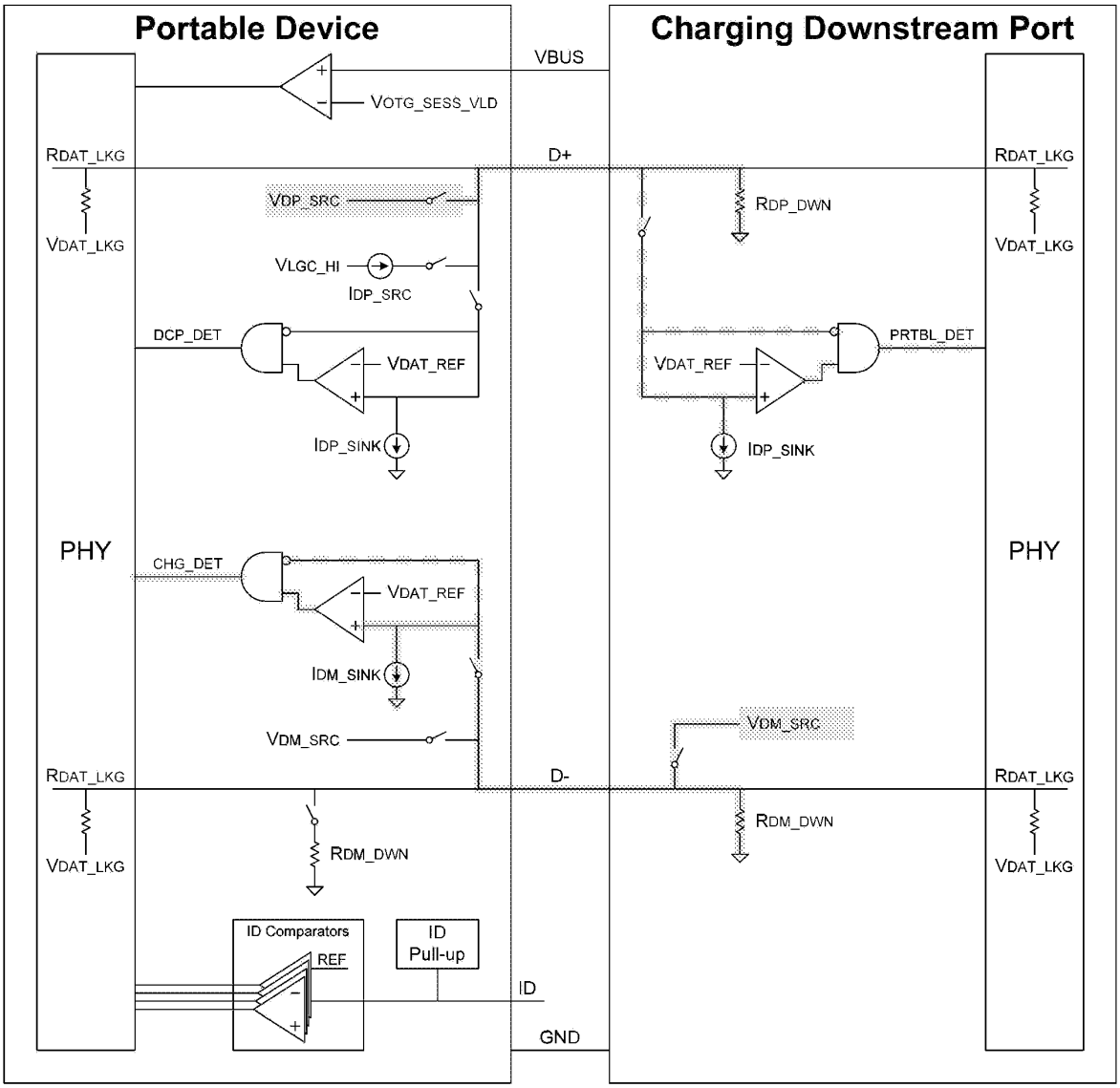


Figure 3-7 Primary Detection, CDP

A CDP is required to behave in either one of two ways when a remote device is not connected to it. The first way that a CDP is allowed to behave is to enable VDM_SRC within TCP_VDM_EN of a disconnect, and then disable VDM_SRC within TCP_VDM_DIS of a connect. When using this option, a CDP is not required to enable IDP_SINK, or to compare D+ to VDAT_REF.

The second way a CDP is allowed to behave is to compare D+ with VDAT_REF and VLGC. When D+ is greater than VDAT_REF and less than VLGC, the CDP shall enable VDM_SRC. When D+ is less than VDAT_REF

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or greater than V_{LGC}, the CDP shall disable V_{DM_SRC}. Note that a CDP is required to compare D+ to V_{LGC}, in order to disable V_{DM_SRC} when the PD connects. See Section 3.4.2 for timing.

During Primary Detection the PD shall turn on V_{DP_SRC} and I_{DM_SINK}. A PD shall compare the voltage on D- with V_{DAT_REF}. If D- is greater than V_{DAT_REF}, then the PD is allowed to determine that it is attached to either a DCP or CDP. A PD is optionally allowed to compare D- with V_{LGC} as well, and only determine that it is attached to a DCP or CDP if D- is greater than V_{DAT_REF}, but less than V_{LGC}. See Section 3.2.4.1 for more details.

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3.2.4.3 Primary Detection, SDP

Figure 3-8 shows how Primary Detection works when a PD is attached to an SDP.

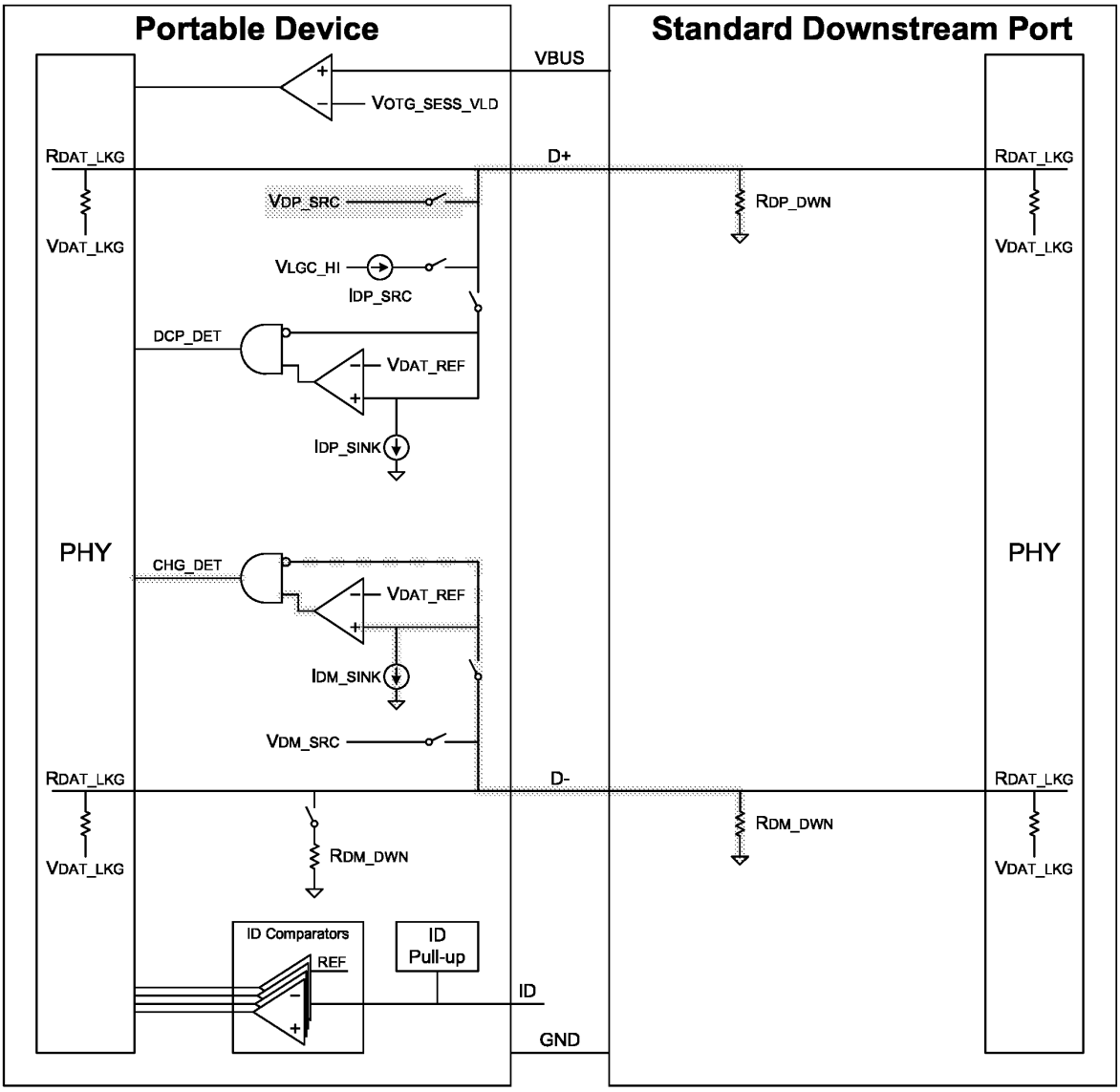


Figure 3-8 Primary Detection, SDP

During Primary Detection the PD shall turn on VDP_SRC and IDM_SINK. When a voltage of VDP_SRC is applied to D+, an SDP will continue pulling D- low through RDM_DWN.

A PD shall compare the voltage on D- with VDAT_REF. If D- is less than VDAT_REF, then the PD is allowed to determine that it is attached to an SDP. A PD is optionally allowed to compare D- with VLGC as well, and determine that it is attached to an SDP if D- is greater than VLGC. See Section 3.2.4.1 for more details.

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3.2.4.4 Primary Detection, ACA-Dock

Figure 3-9 shows how Primary Detection works when a PD that supports ACA Detection is attached to an ACA-Dock.

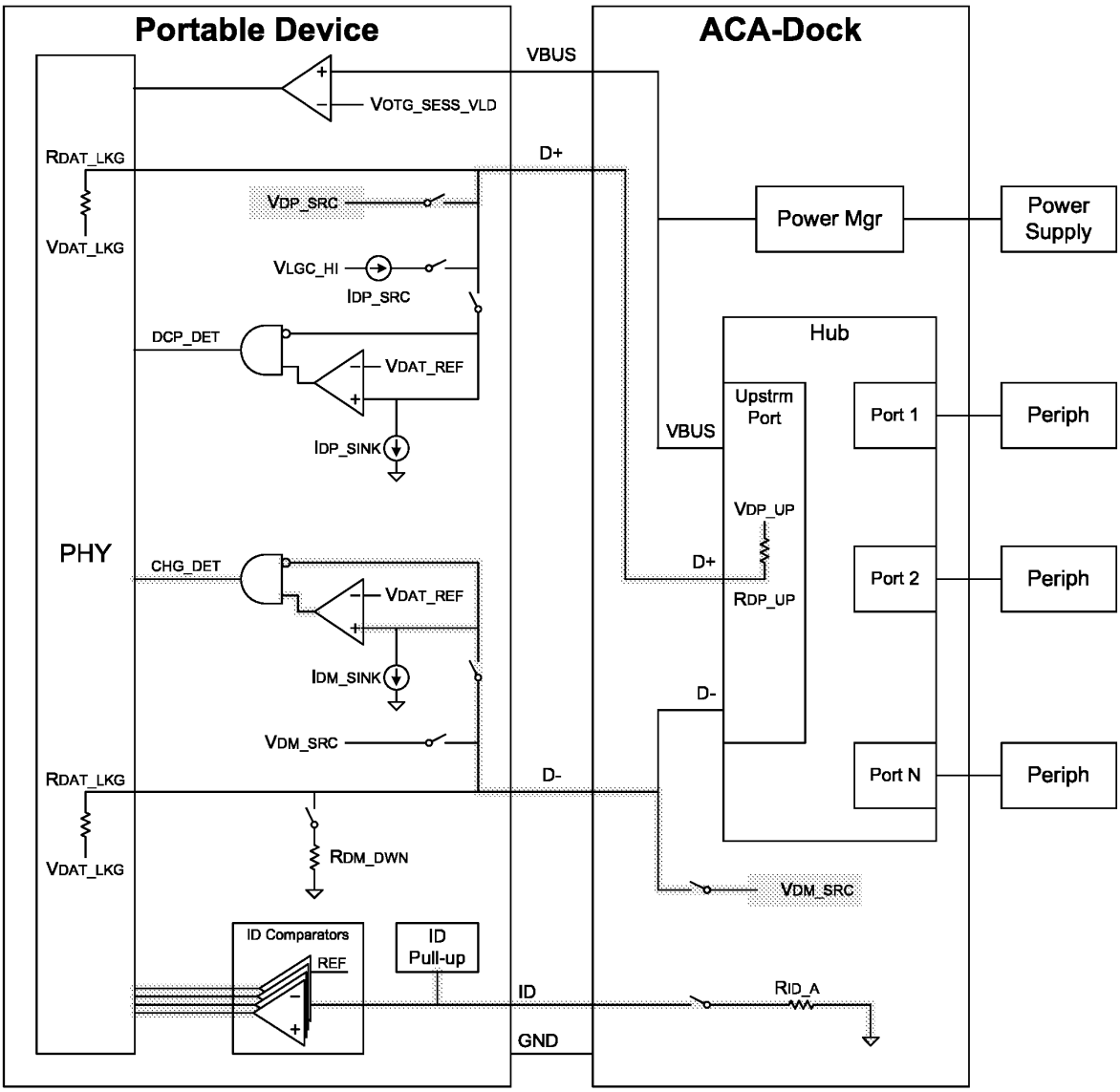


Figure 3-9 Primary Detection, ACA-Dock

An ACA-Dock is a docking station that has one upstream port, and zero or more downstream ports. The upstream port can be attached to a PD, and is capable of sourcing IDP to the PD.

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When an ACA-Dock is powered, but nothing is attached to its upstream port, it is required to bias the pins on its upstream port as follows:

- VBUS V_{CHG}
- D+ V_{DP_UP}
- D- V_{DM_SRC}
- ID R_{ID_A}
- GND GND

The VBUS pin is at V_{CHG} because the ACA-Dock is ready to provide power to a PD. The ACA_Dock is required to pull D+ to V_{DP_UP} through R_{DP_UP} because the VBUS pin is greater than $V_{OTG\_SESS\_VLD}$.

An ACA-Dock is required to enable V_{DM_SRC} whenever D+/- have been inactive (at idle J state) for a time of $T_{CP\_VDM\_EN}$. An ACA-Dock is required to disable V_{DM_SRC} within $T_{CP\_VDM\_DIS}$ of any activity on D+/-.

An ACA-Dock is required to present an impedance to ground on ID of R_{ID_A} whenever it is powered. It is required to present an impedance to ground on ID of R_{ID_FLOAT} when it is not powered.

When a PD that supports ACA detects the following conditions, it shall determine that it is attached to an ACA-Dock:

- VBUS > $V_{OTG\_SESS\_VLD}$
- D+ at V_{LGC_HI}
- V_{DAT_REF} < D- < V_{LGC}
- ID at R_{ID_A}

Note that a PD attached to an ACA-Dock is required to compare D- with V_{LGC}. If a PD were attached to an ACA that had a LS peripheral on its Accessory Port, then the ID pin of the PD would be pulled to ground through R_{ID_A}, and the D- pin would be at V_{LGC_HI} instead of V_{DM_SRC}. In order to distinguish between an ACA with a LS device and an ACA-Dock, the PD is required to detect if D- is above or below V_{LGC}.

The V_{DP_SRC} in the PD shall be such that D+ remains at a logic high while the ACA-Dock is pulling D+ to V_{DP_UP} through R_{DP_UP}. The reason for this is so that the ACA-Dock does not detect activity on D+, which could cause it to turn off its V_{DM_SRC} before the PD completes its Primary Detection.

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3.2.4.5 Primary Detection, Micro ACA

Figure 3-10 shows how Primary Detection works when a PD that supports ACA Detection is attached to a Micro ACA.

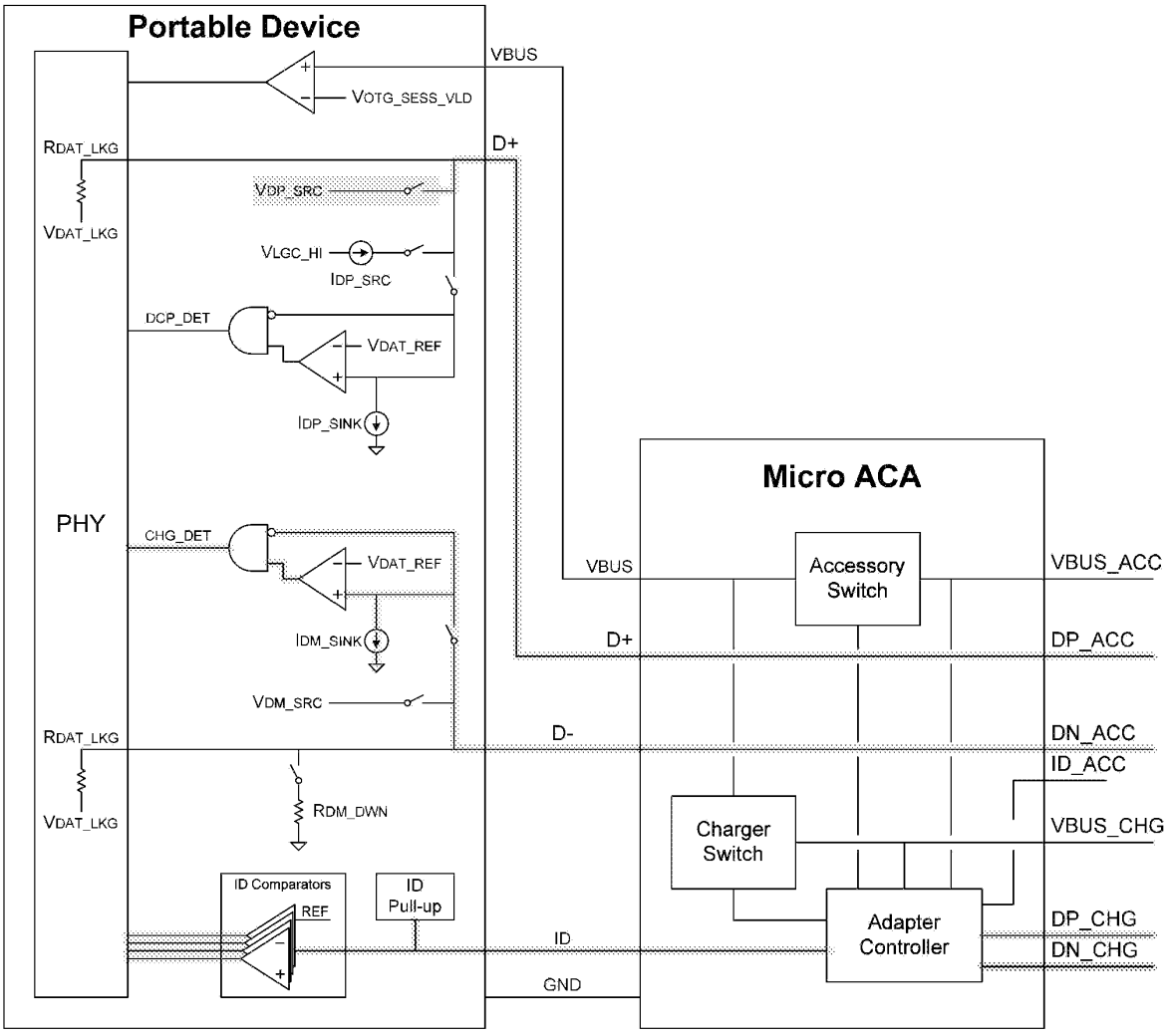


Figure 3-10 Primary Detection, ACA

A PD that supports ACA Detection is required to monitor the resistance on the ID pin whenever VBUS is greater than VOTG_SESS_VLD. If the ID resistance is RID_B or RID_C, then the PD knows that it is attached to an ACA. If the ID resistance is RID_A, then the PD could be attached to either an ACA with a B-device on its Accessory Port, or to an ACA-Dock.

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In order to distinguish between an ACA with an B-device, and an ACA-Dock, the PD shall compare the voltage on D- with V_{DAT_REF} and V_{LGC} to detect what it is attached to as follows:

- D- < V_{DAT_REF} ACA with FS B-device on Accessory Port
- V_{DAT_REF} < D- < V_{LGC} ACA-Dock
- V_{LGC} < D- ACA with LS B-device on Accessory Port

The PD shall do the above detection on D- after attach, and before connect, as shown in the Good Battery Algorithm.

After doing Primary Detection, a PD that supports ACA Detection shall continue to monitor the ID line. If this resistance changes, the PD shall respond according to the state machine defined in Section 6.2.7.

An ACA is required to do a form of Primary Detection over the DP_CHG and DN_CHG lines to detect if a Charging Port is attached to the ACA Charger Port. This detection is done with the lines highlighted in yellow, and is described in Section 6.2.6.

3.2.5 Secondary Detection

Secondary Detection can be used to distinguish between a DCP and a CDP. PDs that are not ready to be enumerated within $T_{SVLD\_CON\_PWD}$ of detecting VBUS are required to implement Secondary Detection. PDs that are ready to be enumerated are allowed to bypass Secondary Detection. See Section 3.3.2 on Good Battery Algorithm.

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3.2.5.1 Secondary Detection, DCP

Figure 3-11 shows how Secondary Detection works when a PD is attached to a DCP.

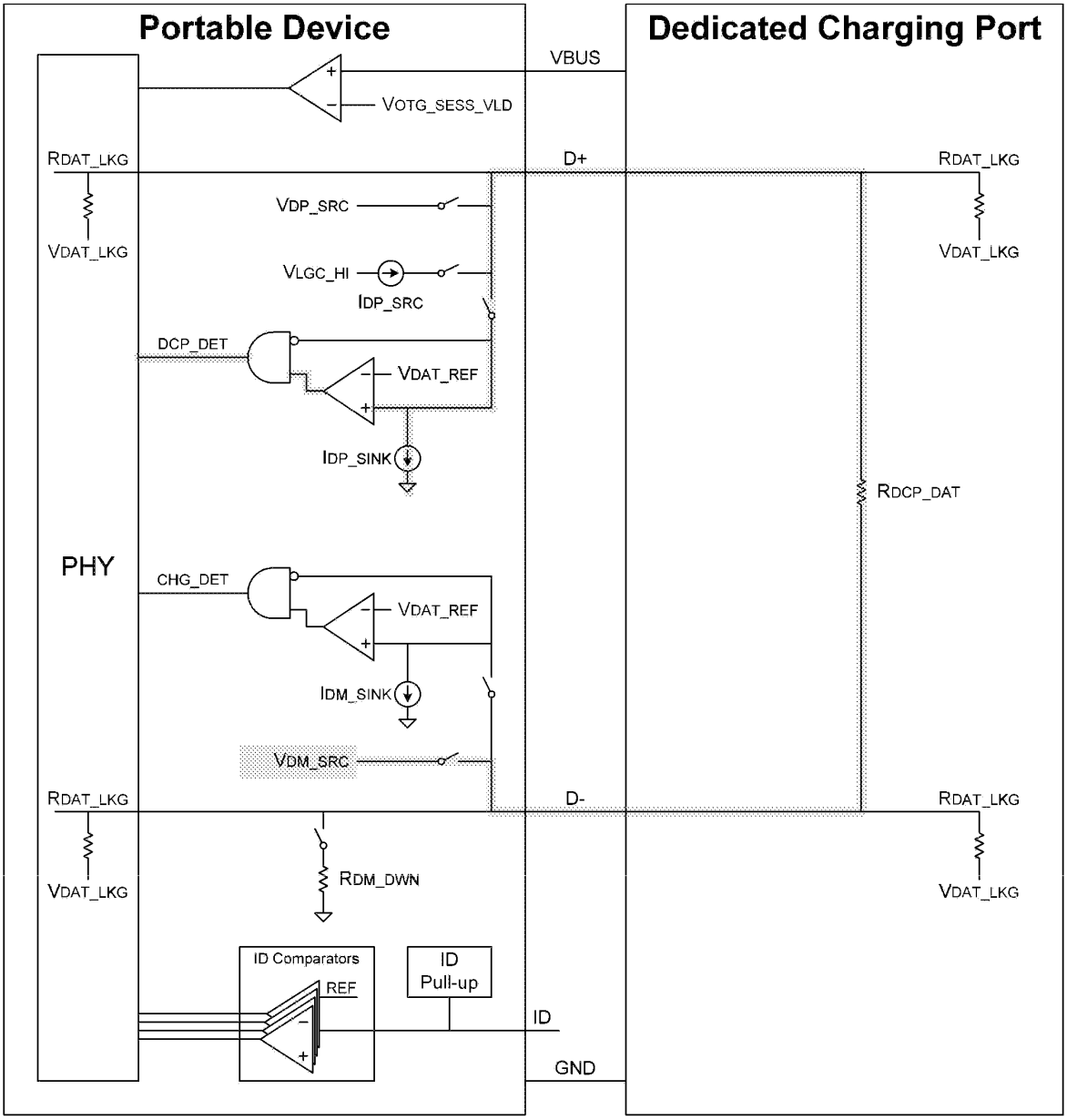


Figure 3-11 Secondary Detection, DCP

During Secondary Detection, a PD shall output VDM_SRC on D-, turn on IDP_SINK, and compare the voltage on D+ to VDAT_REF. Since a DCP is required to short D+ to D- through a resistance of RDCP_DAT, the voltage on D+ will be close to VDM_SRC, which is above VDAT_REF.

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If a PD detects that D+ is greater than VDAT_REF, it knows that it is attached to a DCP. It is then required to enable VDP_SRC or pull D+ to VDP_UP through RDP_UP, as defined in the Good Battery Algorithm in Section 3.3.2.

A PD is not required to compare D+ to VLGC during Secondary Detection.

3.2.5.2 Secondary Detection, CDP

Figure 3-12 shows how Secondary Detection works when a PD is attached to a CDP.

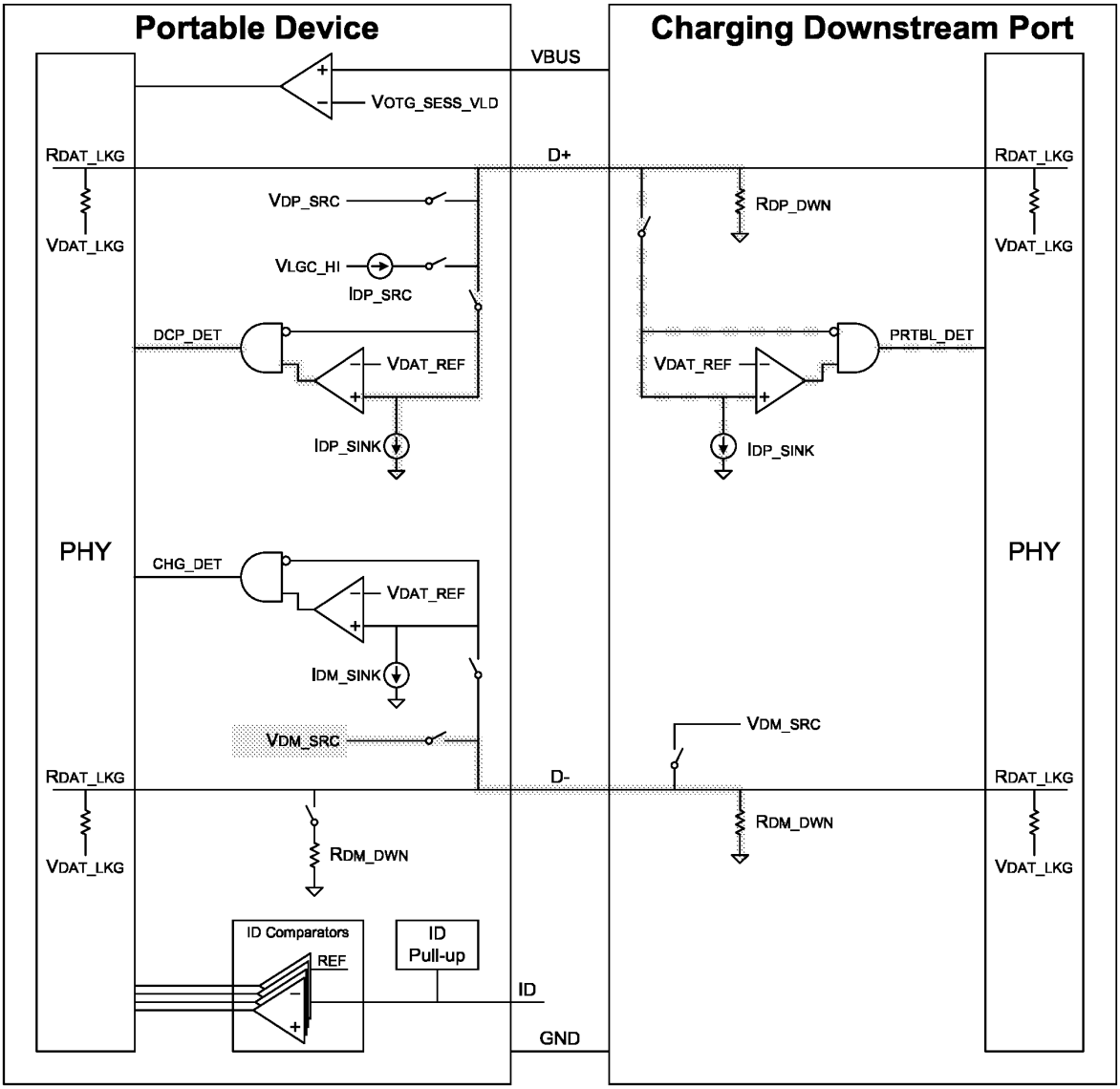


Figure 3-12 Secondary Detection, CDP

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During Secondary Detection, a PD shall output V_{DM_SRC} on D-, turn on I_{DP_SINK}, and compare the voltage on D+ to V_{DAT_REF}. Since a CDP does not short D+ to D-, the voltage on D+ will be close to ground, which is below V_{DAT_REF}.

If a PD detects that D+ is less than V_{DAT_REF}, it knows that it is attached to a CDP. It is then required to turn off V_{DP_SRC} and V_{DM_SRC}, as shown in the Good Battery Algorithm in Section 3.3.2, and is allowed to draw I_{DEV_CHG}.

A PD is not required to compare D+ to V_{LGC} during Secondary Detection.

3.2.6 ACA Detection

ACA Detection allows a PD to detect when it is attached to an ACA, and to detect what type of device is attached to the ACA Accessory Port. See Section 6 for a description of the ACA.

A PD is not required to support ACA Detection. Only PDs that have a Micro-AB receptacle can support ACA Detection, since the ACA OTG Port has a captive cable terminating in a Micro-A plug.

PDs that support ACA Detection are required to implement the Good Battery Algorithm defined in Section 3.3.2.

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Figure 3-13 shows how ACA Detection works when a PD is attached to a Micro ACA.

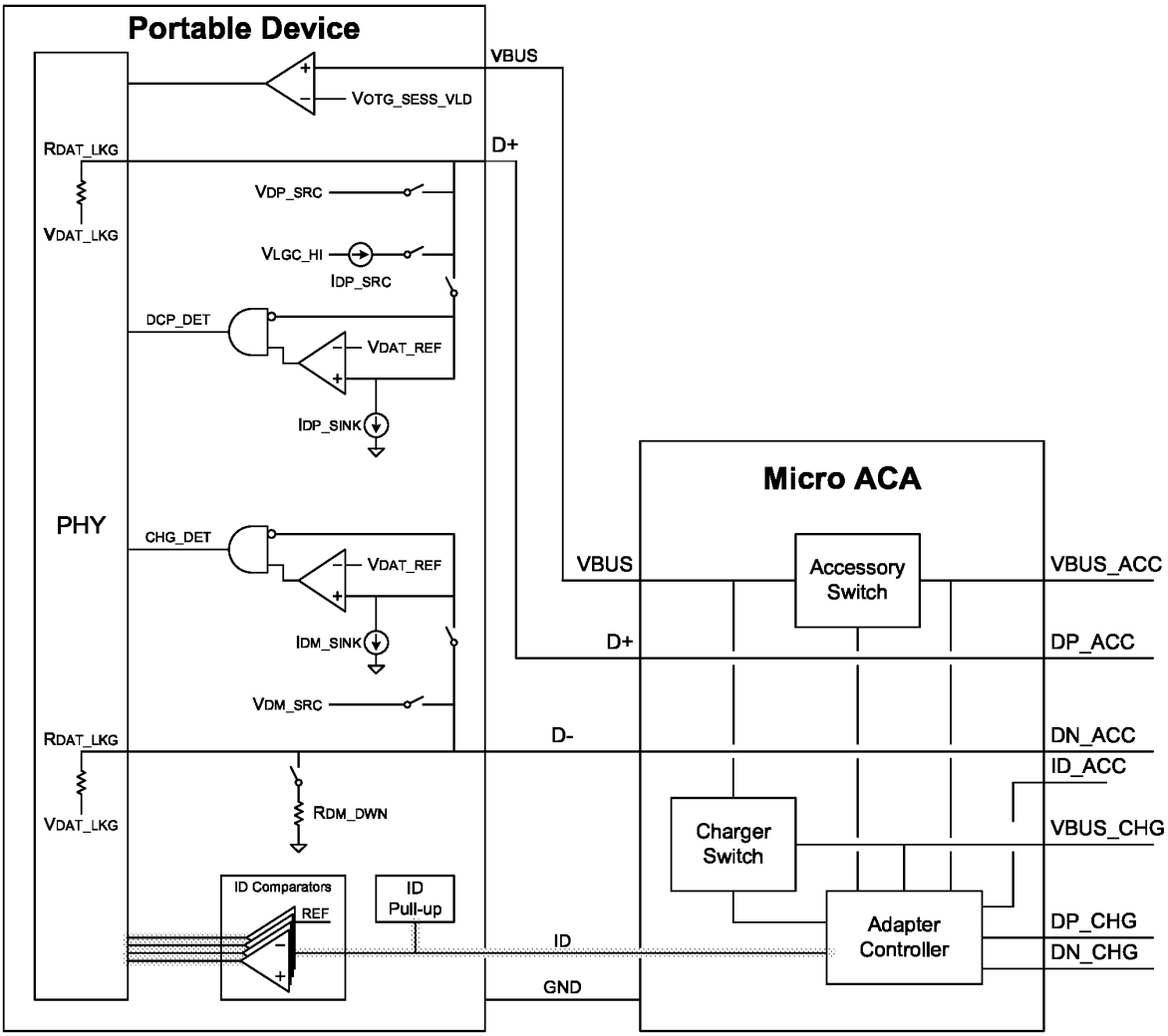


Figure 3-13 ACA Detection

A PD detects the presence of an ACA by sensing the resistance on the ID pin. There are five different resistance values that shall be detected during ACA Detection, namely: R_{ID_GND}, R_{ID_C}, R_{ID_B}, R_{ID_A} and R_{ID_FLOAT}. PDs that support ACA Detection shall monitor the ID resistance during the entire time that VBUS is asserted, and respond according to the PD State Machine in Section 6.2.7.

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3.3 Charger Detection Algorithms

3.3.1 Weak Battery Algorithm

Figure 3-14 shows an example charger detection algorithm for a PD with a Weak Battery. Other algorithms are allowed, providing they comply with the DBP.

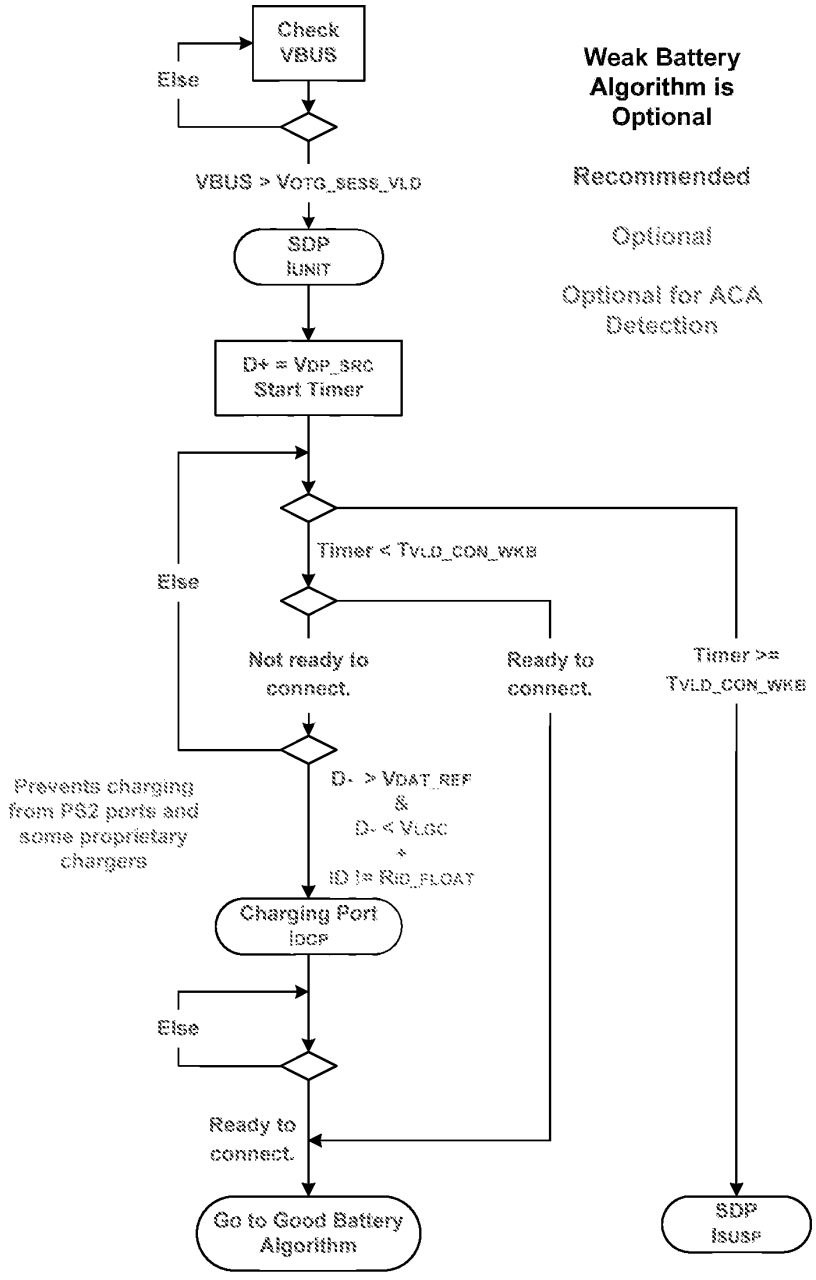


Figure 3-14 Weak Battery Algorithm

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A PD is required to have internal voltage thresholds that lie within $V_{OTG\_SESS\_VLD}$, V_{DAT_REF} and V_{LGC}. In the above algorithm, a PD compares VBUS, D+ and D- with its internal thresholds. It does not compare VBUS, D+ and D- with the min or max value of $V_{OTG\_SESS\_VLD}$, V_{DAT_REF} or V_{LGC}.

In the above example, a PD with a Weak Battery detects VBUS greater than $V_{OTG\_SESS\_VLD}$, and applies a voltage of V_{DP_SRC} on the D+ pin. If the voltage on D- is greater than its V_{DAT_REF}, or if the ID pin is not floating, the PD is allowed to draw I_{DEV_CHG}. Else the PD is allowed to draw I_{UNIT}.

The V_{LGC} term shown in magenta could be added to prevent a PD from charging from PS2 ports and some proprietary chargers.

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3.3.2 Good Battery Algorithm

Figure 3-15 shows the charger detection algorithm that a PD with a Good Battery is required to implement.

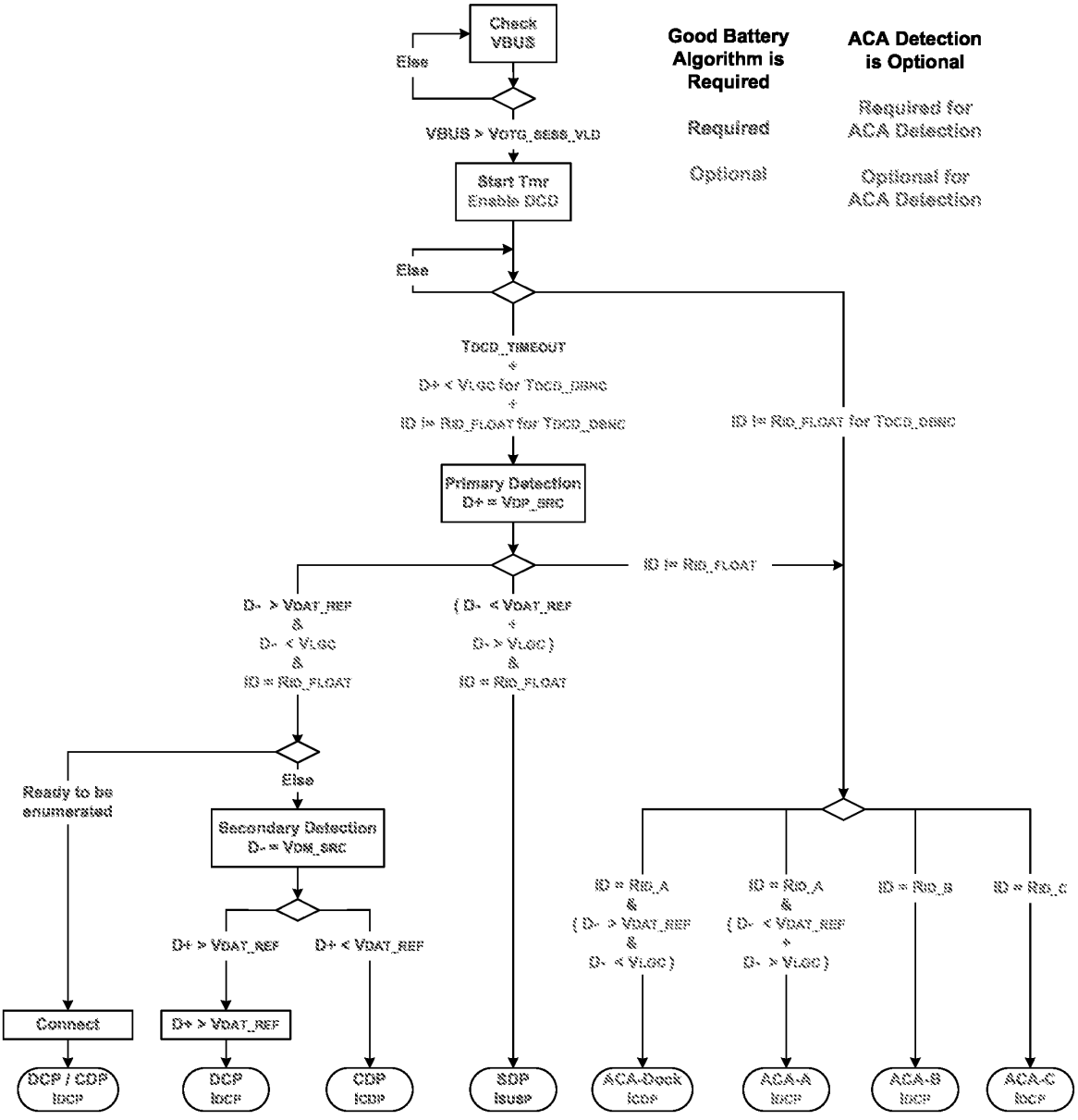


Figure 3-15 Good Battery Algorithm

A PD shall implement the Good Battery Algorithm when attached to an SDP or Charging Port. A PD is allowed to include additional branches for detecting devices or ports other than an SDP or Charging Port. Any such branches shall not cause additional activity on D+/- and/or ID that would interfere or be confused with the next expected event when the PD is attached to an SDP or Charging Port. Branches are also allowed after any final step in detection, and these branches may include additional activity on D+/- and/or ID, except that when a PD is attached to a DCP, it shall maintain D+ greater than VDAT_REF while VBUS is asserted.

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Upon detecting VBUS greater than its $V_{OTG\_SESS\_VLD}$ threshold, a PD shall start a timer with a timeout value of $T_{DCD\_TIMEOUT}$. A PD that supports DCD is allowed to enable its I_{DP_SRC} and monitor for D+ being at V_{LGC_LOW} for T_{DCD_DBNC}. A PD that supports ACA Detection is allowed to monitor for ID not floating for T_{DCD_DBNC}. If the DCD timer expires before the D+ or ID conditions are detected, the PD shall proceed to Primary Detection.

If a PD detects that ID is not floating for a time of T_{DCD_DBNC}, then it is allowed to proceed directly to one of the ACA states, without having to do Primary Detection and without having to assert V_{DP_SRC}.

During Primary Detection, a PD shall enable V_{DP_SRC}, and compare D- with V_{DAT_REF}. A PD may optionally compare D- with V_{LGC} to avoid damaging a PS2 port. See Section 3.2.4.1. A PD that supports ACA Detection is required to detect the resistance on the ID line.

If a PD Detects that it is attached to either a DCP or CDP during Primary Detection, and it is ready to be enumerated, then it is allowed to take the branch where it connects. If a PD is not ready to be enumerated, then it is required to do Secondary Detection.

During Secondary Detection, the PD shall disable V_{DP_SRC}, enable V_{DM_SRC} and compare D+ with V_{DAT_REF}. If D+ is greater than V_{DAT_REF}, then the PD is attached to a DCP. The PD shall disable V_{DM_SRC}, and either enable V_{DP_SRC} or pull D+ to V_{DP_UP} through R_{DP_UP}.

If D+ is less than V_{DAT_REF}, then the PD is attached to a CDP. The PD shall disable V_{DM_SRC}, and leave both D+ and D- low until it is ready to connect and be enumerated.

A PD that is attached to a DCP shall either enable V_{DP_SRC} or pull D+ high within $T_{SVLD\_CON\_PWD}$ of attach.

A PD that supports ACA Detection is required to monitor the resistance on the ID line. If a resistance of R_{ID_A} is detected, then the PD shall compare D- with both V_{DAT_REF} and V_{LGC}, to determine if it is attached to an ACA-Dock or an ACA-A. See Section 3.2.4.4 for more details.

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3.4 Charger Detection Timing

3.4.1 Data Contact Detect Timing

To initiate Data Contact Detect, the PD shall enable I_{DP_SRC} and either I_{DM_SINK} or R_{DM_DWN}. When the PD detects that the D+ line has been low for a time of T_{DCD_DBNC}, then the PD knows that the data pins have made contact.

Figure 3-16 shows the timing associated with Data Contact Detect (DCD) when pins make contact after DCD starts.

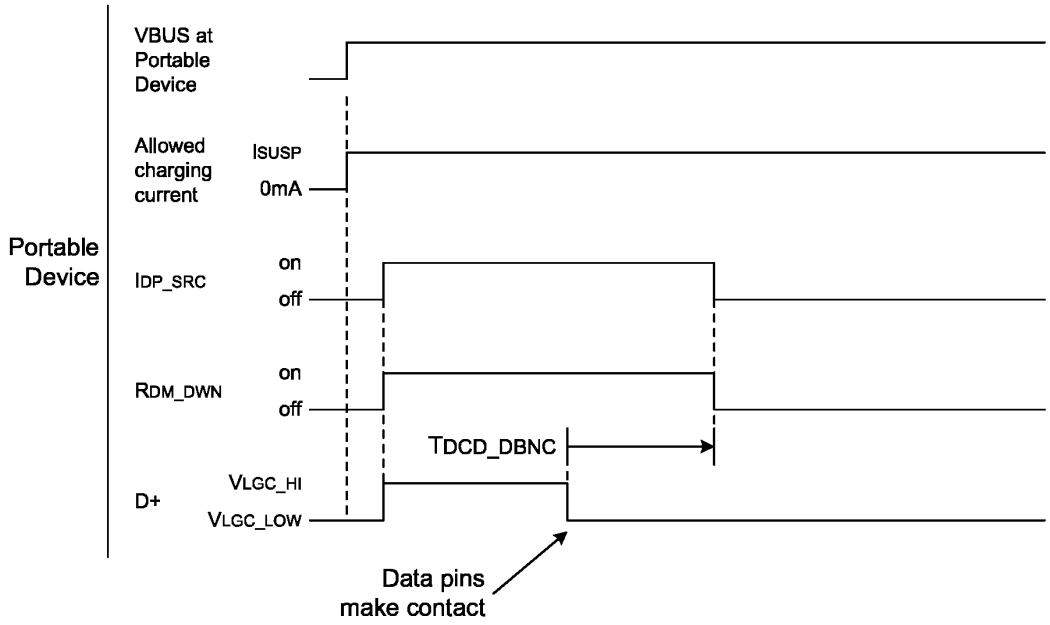


Figure 3-16 DCD Timing, Contact After Start

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Figure 3-17 shows the timing associated with Data Contact Detect when pins have made contact before DCD starts.

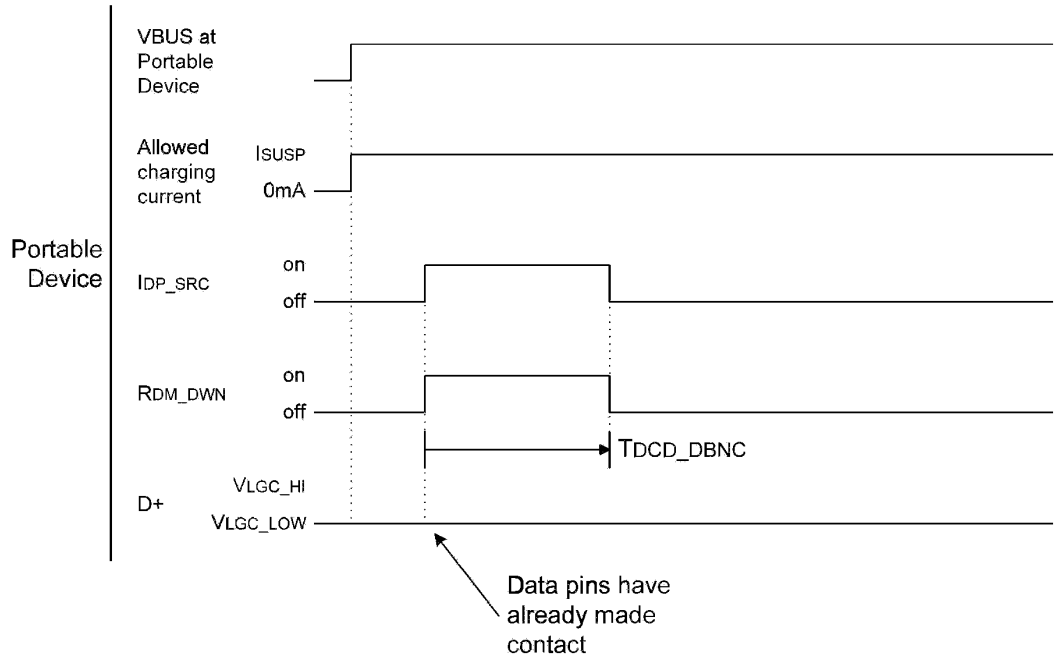


Figure 3-17 DCD Timing, Contact Before Start

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Figure 3-18 shows the timing associated with Data Contact Detect when contact is not detected.

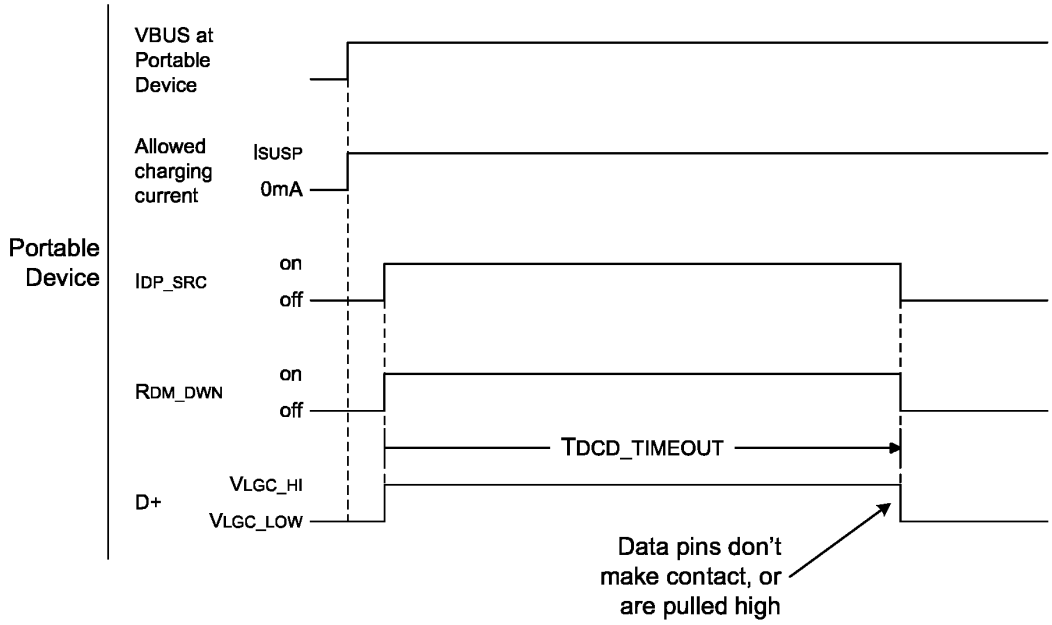


Figure 3-18 DCD Timing, No Contact

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3.4.2 Detection Timing, CDP

Figure 3-19 shows the timing associated with Primary and Secondary Detection when a PD is attached to a CDP, for the case where the CDP compares D+ to V_{DAT_REF} and V_{LGC}, and enables V_{DM_SRC} accordingly. A CDP is also allowed to leave V_{DM_SRC} enabled while a remote device is not connected. See Section 3.2.4.2 for more details.

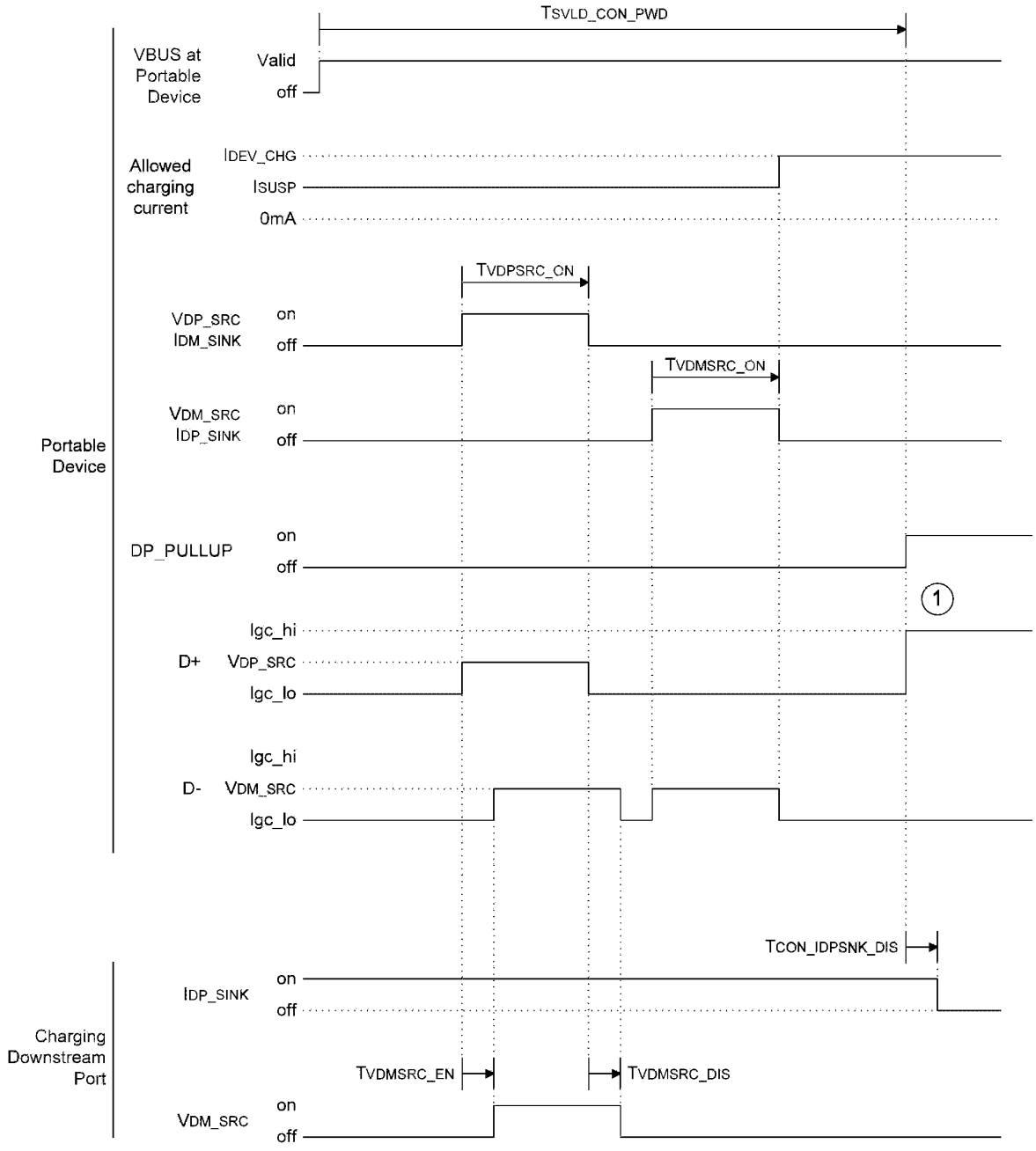


Figure 3-19 Detection Timing, CDP

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Notes:
1) The timing for a LS PD is the same as shown above, except that a LS PD will pull D- high, instead of D+.

Figure 3-19 shows the Primary and Secondary Detection timing for a PD attached to a CDP. During Primary Detection, the PD turns on V_{DP_SRC} and I_{DM_SINK}. The CDP is required to have V_{DM_SRC} on D- within a time of T_{VDMSRC_EN} from when D+ is above V_{DAT_REF}. After a time of T_{VDPSRC_ON}, the PD is allowed to check the status of the D- line. If D- is above V_{DAT_REF} (and optionally below V_{LGC}, see Section 3.2.4.1) then the PD is attached to a Charging Port, and is allowed to draw I_{DEV_CHG}.

In order to do Secondary Detection, the PD is required to disable V_{DP_SRC} and I_{DM_SNK}, and enable V_{DM_SRC} and I_{DP_SINK}. After a time of T_{VDMSRC_ON}, the PD is allowed to check the status of the D+ line. Since a CDP does not source a voltage on D+, D+ is below V_{DAT_REF} and the PD is attached to a CDP.

If the PD was powered up at the time VBUS was detected, then it shall connect within a time of $T_{SVLD\_CON\_PWD}$. The CDP shall disable I_{DP_SINK} within $T_{CON\_IDPSNK\_DIS}$ of detecting the connect.

3.5 Ground Current and Noise Margins

As shown in Figure 7-47 of the USB 2.0 specification, a current of 100 mA through the ground wire of a USB cable can result in a voltage difference of 25 mV between the host ground and the device ground. This ground difference has the effect of reducing noise margins for both signaling and charger detection.

The maximum current that a PD is allowed to draw from a CDP is I_{DEV_CHG}. A PD that draws more than I_{CFG_MAX} from a CDP is required to support LS, FS, HS and chirp signaling when the local ground is V_{GND_OFFSET} max higher than the remote ground. A host port that grants the CDP handshake is required to support LS, FS, HS and chirp signaling when the local ground is V_{GND_OFFSET} max lower than the remote ground.

When the ground offset is V_{GND_OFFSET} max, the PD and CDP are required to have a greater common mode range than what is called out in USB 2.0.

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4. Charging Port and Portable Device Requirements

This section describes the requirements for the following:

- Charging Downstream Port (CDP)
- ACA-Dock
- Dedicated Charging Port (DCP)
- Accessory Charger Adapter (ACA)
- Portable Device (PD)

4.1 Charging Port Requirements

The following requirements apply to all types of Charging Ports, including CDP, ACA-Dock, DCP and ACA.

4.1.1 Overshoot

The output voltage of a Charging Port shall not exceed V_{CHG_OVRSHT} for any step change in load current, nor when the Charging Port is powered on or off.

4.1.2 Maximum Current

The output current of a Charging Port shall not exceed I_{CDP} max under any condition.

4.1.3 Detection Renegotiation

A downstream port is allowed to act as an SDP, CDP or DCP, and to change between these roles. In order to force an attached PD to repeat the charging detection procedure, a downstream port is required to:

- stop driving VBUS
- allow VBUS to drop to less than V_{BUS_LKG}
- wait for a time of T_{VBUS_REAPP}
- start driving VBUS

4.1.4 Shutdown Operation

If the current drawn by a PD causes a Charging Port to go outside of its Required Operating Range, then the Charging Port is allowed to shut down. All types of shut down are allowed outside the Required Operating Range of a Charging Port, including:

- Turning off VBUS
- Constant current limiting
- Foldback current limiting

4.1.5 Failure Voltage

The output voltage of a Charging Port shall remain within V_{CHG_FAIL} for any single point failure in the Charging Port.

4.1.6 Multiple Ports

For a device with multiple Charging Ports, each Charging Port shall stay within its Required Operating Range regardless of the operation of the other Charging Ports.

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4.2 Charging Downstream Port

The following requirements apply to a CDP.

4.2.1 Required Operating Range

A CDP shall output a voltage of V_{CHG} for all currents less than I_{CDP} min. The voltage on VBUS is averaged over a time of T_{VBUS_AVG}. For load currents greater than I_{CDP} min, a CDP is allowed to shut down. Once in shutdown, the requirements in Section 4.1.4 apply.

Figure 4-1 shows several example load curves for a CDP. Load curves are required to cross the line at I_{CDP} min within a voltage range of V_{CHG}. Load curves that cross the line at V_{CHG} min for currents less than I_{CDP} min are not allowed.

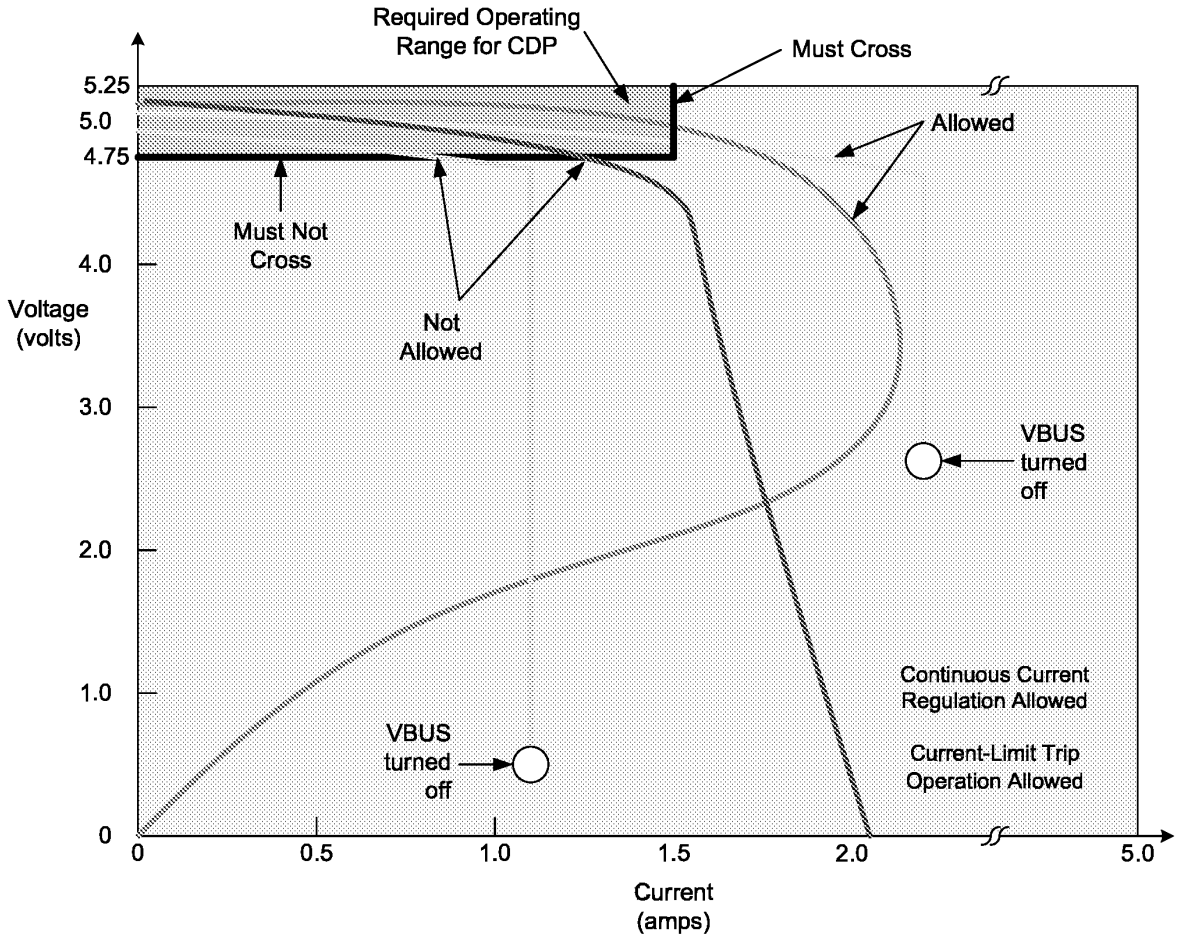


Figure 4-1 CDP Required Operating Range

4.2.2 Shutdown Operation

If a CDP goes into shutdown during a current overload condition, it shall recover and output a voltage of V_{CHG} within a time of T_{SHTDWN_REC} when the current overload condition has been removed.

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4.2.3 Undershoot

The output voltage of a CDP shall be within V_{CHG_UNDSHT} for any step change in load currents that are less than I_{CDP} min.

4.2.4 Detection Signaling

A CDP is required to behave in either one of two ways when a remote device is not connected to it. The first way that a CDP is allowed to behave is to enable V_{DM_SRC} within $T_{CP\_VDM\_EN}$ of a disconnect, and then disable V_{DM_SRC} within $T_{CP\_VDM\_DIS}$ of a connect. When using this option, a CDP is not required to enable I_{DP_SINK}, or to compare D+ to V_{DAT_REF}.

The second way a CDP is allowed to behave is to compare D+ with V_{DAT_REF} and V_{LGC}. When D+ is greater than V_{DAT_REF} and less than V_{LGC}, the CDP shall enable V_{DM_SRC}. When D+ is less than V_{DAT_REF} or greater than V_{LGC}, the CDP shall disable V_{DM_SRC}. See Section 3.4.2 for timing.

4.2.5 Connector

A CDP shall have a Standard-A receptacle.

4.3 ACA-Dock

The following requirements apply to the upstream port of an ACA-Dock.

4.3.1 Required Operating Range

An ACA-Dock shall have the same Required Operating Range as a CDP.

4.3.2 Undershoot

An ACA-Dock shall comply with the same undershoot requirements as a CDP.

4.3.3 Detection Signaling

When a PD is attached to an ACA-Dock, the PD acts as host while drawing current from VBUS. This is similar to the case where a PD is attached to an ACA with a peripheral on the Accessory Port.

To inform the PD that it should act as host and draw current, both the ACA-Dock and the ACA are required to pull the ID pin to ground through a resistance of R_{ID_A}.

An ACA-Dock is required to provide I_{CDP} to the PD, whereas an ACA is required to provide I_{DCP}, and this must be shared between the PD and whatever is on the Accessory Port. To inform the PD that it is attached to an ACA-Dock as opposed to an ACA, the ACA-Dock shall output a voltage of V_{DM_SRC} on D- as follows:

- ACA-Dock shall start outputting V_{DM_SRC} if D+/- are at idle J for a time of $T_{CP\_VDM\_EN}$
- ACA-Dock shall stop outputting V_{DM_SRC} within $T_{CP\_VDM\_DIS}$ of any USB activity on D+/-

4.3.4 Connector

An ACA-Dock shall have a Micro-A plug that can be mated to the Micro-AB receptacle of a PD.

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4.4 Dedicated Charging Port

The following requirements apply to a DCP.

4.4.1 Required Operating Range

A DCP shall output a voltage of V_{CHG} for all currents less than I_{DCP} min. The voltage on VBUS is averaged over a time of T_{VBUS_AVG}.

A DCP shall not shut down if the load current is less than I_{DEV_CHG} and the load voltage is greater than $V_{DCP\_SHTDOWN}$. A DCP is allowed to shut down for load currents greater than I_{DEV_CHG} max, or for load voltages less than V_{DCP_SHTDWN}. Once in shutdown, the requirements in Section 4.1.4 apply.

Figure 4-2 shows several example load curves. DCP load curves are required to cross the constant current line at I_{DEV_CHG} max, or the constant voltage line at V_{DCP_SHTDWN}. A DCP is not allowed to shut down in the Required Operating Range.

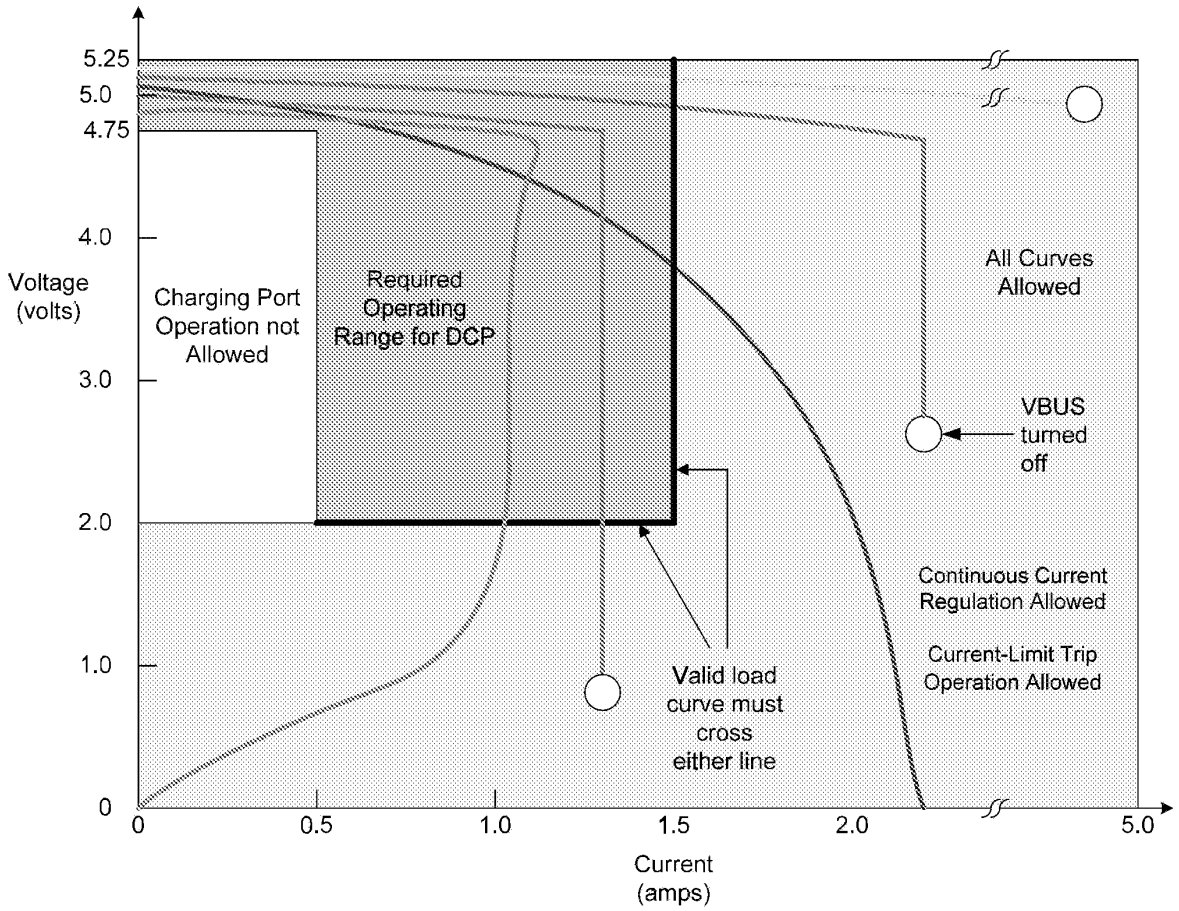


Figure 4-2 DCP Required Operating Range

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4.4.2 Undershoot

For step changes in load current from I_{DCP_LOW} to I_{DCP_MID}, or from I_{DCP_MID} to I_{DCP_HI}, the undershoot voltage of a DCP shall be V_{CHG_UNDSHT}. DCPs are required to meet this requirement for load steps from mid to hi that occur $T_{DCP\_LD\_STP}$ after the transition from low to mid. The duration of the undershoot shall be T_{DCP_UNDSHT}.

For step changes in load current from I_{DCP_LOW} to I_{DCP_HI}, the output voltage of a DCP is allowed to drop to the load voltage of the attached PD for a time of T_{DCP_UNDSHT}. After this time, the output voltage of a DCP shall be at V_{CHG} for load currents less than I_{DCP} min.

4.4.3 Detection Signaling

A DCP shall have an impedance between D+ and D- of R_{DCP_DAT}.

The leakage current on the D+/- pins of a DCP shall be less than or equal to the leakage current that would occur from two resistances of R_{DAT_LKG} tied to a voltage of V_{DAT_LKG}. See Figure 3-6.

The capacitance between the D+/- pins and ground of a DCP shall be C_{DCP_PWR}.

4.4.4 Connector

A DCP shall have a Standard-A receptacle, or a captive cable terminated with a Micro-B plug.

4.5 Accessory Charger Adapter

The following requirements apply to an ACA with a DCP or CDP on its Charger Port.

4.5.1 Required Operating Range

The Required Operating Range for the OTG Port of an ACA is affected by the following factors:

- Device on Charger Port (DCP or CDP)
- Current drawn from Accessory Port
- $R_{ACA\_CHG\_OTG}$
- V_{ACA_OPR}

The current available on the OTG Port is determined by how much current is supplied to the Charger Port, and how much current is being drawn from the Accessory Port. The voltage available on the OTG Port is determined by the voltage at the Charger Port, the current being drawn from the OTG and Accessory Ports, and $R_{ACA\_CHG\_OTG}$. ACA operation is only required if for Charger Port voltages in the range of V_{ACA_OPR}.

4.5.2 Undershoot

An ACA with a DCP or CDP on its Charger Port shall comply with the same undershoot requirements as a DCP.

4.5.3 Detection Signaling

An ACA shall pull the ID pin of the OTG port to ground through one of the following resistances, as specified in Section 6:

- R_{ID_GND}, R_{ID_C}, R_{ID_B}, R_{ID_A}, R_{ID_FLOAT}

An ACA shall connect the data pins of the OTG Port directly to the data pins of the Accessory Port.

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4.5.4 Connector

An ACA shall have a captive cable terminated with a Micro-A plug on its OTG Port.

4.6 Portable Device

The following requirements apply to a PD.

4.6.1 Allowed Operating Range

A PD shall not draw more than I_{DEV_CHG} max from a Charging Port. A PD shall not pull the output voltage of a Charging Port below V_{DCP_SHTDWN} max. Figure 4-3 shows the Allowed Operating Range for a PD.

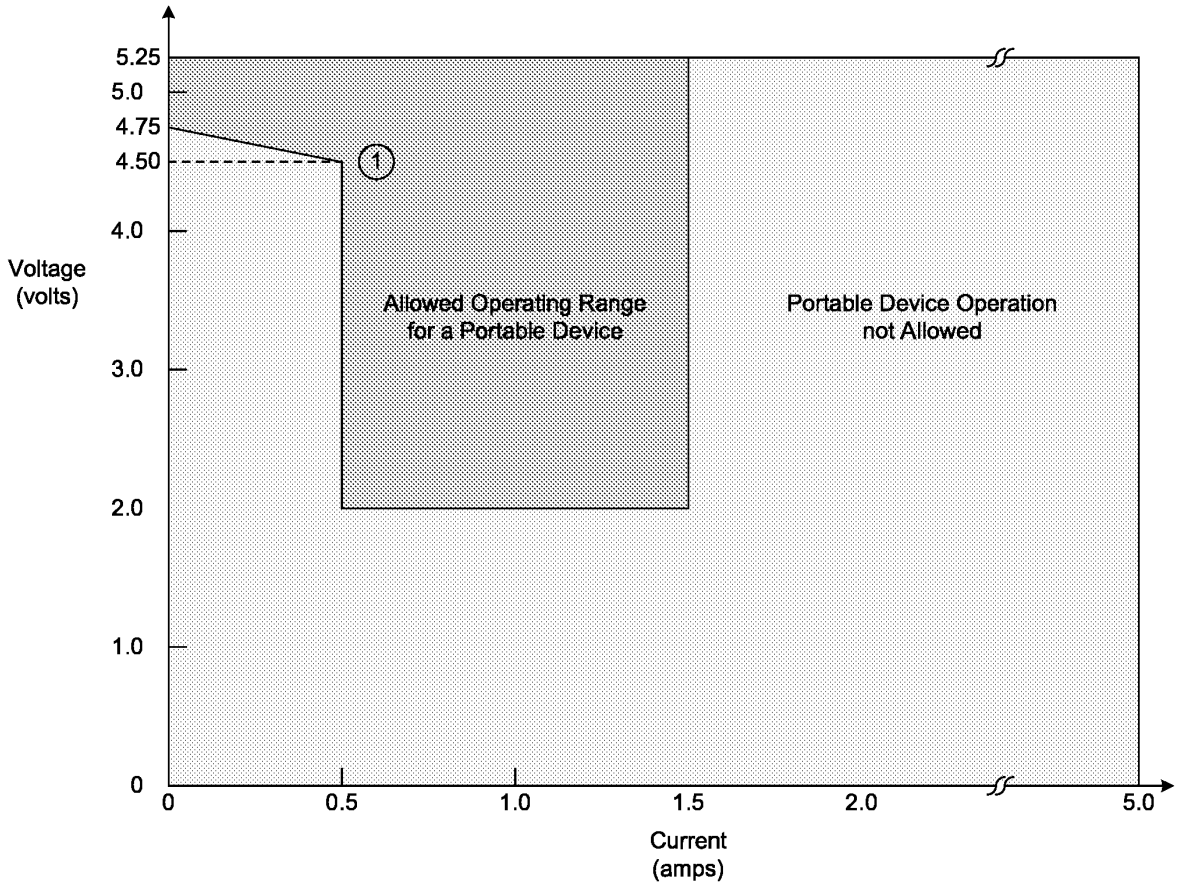


Figure 4-3 Portable Device Allowed Operating Range

Notes:

1) As per USB 2.0 section 7.2.2, the voltage on VBUS can drop from 4.75V at the upstream port down to 4.5V at the downstream port, due to resistive losses in the cable and connectors.

4.6.2 Detection Signaling

All PDs shall implement the following detection features:

- DCD timer ($T_{DCD\_TIMEOUT}$)

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- Primary Detection
  - To detect between DCP, CDP and SDP
  - Compare D- to V_{DAT_REF} during Primary Detection

PDs are allowed, but not required, to implement the following detection features:

- DCD, using I_{DP_SRC}
- Compare D- to V_{LGC} during Primary Detection
- Secondary Detection
- ACA Detection

4.6.3 Detection Renegotiation

To restart the charger detection procedure, a downstream port is allowed to remove and then re-assert power on VBUS. See Section 4.1.3. In order to detect this drop in VBUS, a PD shall discharge VBUS to less than V_{BUS_LKG} within T_{VLD_VLKG} whenever VBUS is removed.

A PD is allowed to disconnect and repeat the charger detection process multiple times while attached. The PD is required to wait for a time of at least $T_{CP\_VDM\_EN}$ max between disconnecting and restarting the charger detection process.

4.6.4 Connector

A PD that mates with an ACA-Dock or ACA shall have a Micro-AB receptacle.

5. Parameter Values

This section lists the values of parameters defined in this specification.

Table 5-1 Voltages

Parameter	Symbol	Conditions	Min	Max	Units	Ref
ACA operating voltage	V_{ACA_OPR}		4.1	6.0	V	6.2.6
VBUS Leakage Voltage	V_{BUS_LKG}			0.7	V	4.1.3
Charging Port Output Voltage	V_{CHG}		4.75	5.25	V	4
Charging Port Failure Voltage	V_{CHG_FAIL}		-0.3	9.0	V	4.1.5
Charging Port Overshoot Voltage	V_{CHG_OVRSHT}			6.0	V	4.1.1
Charging Port Undershoot Voltage	V_{CHG_UNDSHT}		4.1		V	4.2.2
Data Line Leakage Voltage	V_{DAT_LKG}		0	3.6	V	3.2.3
Data Detect Voltage	V_{DAT_REF}		0.25	0.4	V	3.2
Data Sink Voltage	V_{DAT_SINK}			0.15	V	3.4.2
DCP Shut Down Voltage	V_{DCP_SHTDWN}			2.0	V	4.4.1
D- Source Voltage	V_{DM_SRC}	Note 1	0.5	0.7	V	3.2
D+ Source Voltage	V_{DP_SRC}	Note 2	0.5	0.7	V	3.2
D+ pull-up Voltage	V_{DP_UP}		3.0	3.6	V	3.2.4.4
Ground offset voltage between Host and PD	V_{GND_OFFSET}			375	mV	3.5
Logic Threshold	V_{LGC}		0.8	2.0	V	3.2.3
Logic High	V_{LGC_HI}		2.0	3.6	V	3.2.3
Logic Low	V_{LGC_LOW}		0	0.8	V	3.2.3
OTG Session Valid Voltage	$V_{OTG\_SESS\_VLD}$		0.8	4.0	V	3.1

Notes:

1) V_{DM_SRC} shall be able to source at least 250uA when D- is between 0.5V and 0.7V. V_{DM_SRC} shall not pull D- below 2.2V when D- is pulled to V_{DP_UP} through R_{DP_UP}.

2) V_{DP_SRC} shall be able to source at least 250uA when D+ is between 0.5V and 0.7V. V_{DP_SRC} shall not pull D+ below 2.2V when D+ is pulled to V_{DP_UP} through R_{DP_UP}.

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Table 5-2 Currents

Parameter	Symbol	Conditions	Min	Max	Units	Ref
Charging Downstream Port Rated Current	I_{CDP}	Note 1	1.5	5.0	A	4.2
Maximum Configured Current when connected to a SDP	I_{CFG_MAX}	Note 2		500	mA	2.1
Dedicated Charging Port Rated Current	I_{DCP}	Note 1	0.5	5.0	A	4.4.1
DCP current, low range	I_{DCP_LOW}			30	mA	4.4.2
DCP current, middle range	I_{DCP_MID}		30	100	mA	4.4.2
DCP current, high range	I_{DCP_HI}		100		mA	4.4.2
Allowed PD Current Draw from Charging Port	I_{DEV_CHG}			1.5	A	4.6
D- Sink Current	I_{DM_SINK}	Note 3	25	175	µA	3.2
D+ Sink Current	I_{DP_SINK}	Note 3	25	175	µA	3.2
Data Contact Detect Current Source	I_{DP_SRC}		7	13	uA	3.2.3
Leakage current on ID_OTG pin from contamination	$I_{ID\_LKG\_CONT}$		-1	1	µA	6.2.6
Suspend current	I_{SUSP}	Averaged over 1sec		2.5	mA	2.1
Unit load current	I_{UNIT}	Note 4		100	mA	2.1

Notes

1) The maximum current is for safety reasons, as per USB 2.0 section 7.2.1.2.1.

2) If a PD is attached to a SuperSpeed port, then I_{CFG_MAX} is 900mA.

3) For source currents less than I_{DP_SINK} min, the D+ current sink is required to pull the D+ voltage to V_{DAT_SINK}. For D+ voltages less than V_{LGC} max, the D+ current sink shall not sink more than I_{DP_SINK} max. The same requirements apply to I_{DM_SINK} and D-.

4) I_{UNIT} is averaged over 250ms. If a PD is attached to a SuperSpeed port, the I_{UNIT} is 150mA.

Table 5-3 Resistances

Parameter	Symbol	Conditions	Min	Max	Units	Ref
Charger to Accessory port	$R_{ACA\_CHG\_ACC}$	Note 1		400	mΩ	6.2.6
OTG to Accessory port	$R_{ACA\_OTG\_ACC}$	Note 1		200	mΩ	6.2.6
Charger to OTG port	$R_{ACA\_CHG\_OTG}$	Note 1		200	mΩ	6.2.6
Data line leakage resistance	R_{DAT_LKG}		300		kΩ	4.4.3
Dedicated Charging Port resistance across D+/-	R_{DCP_DAT}			200	Ω	4.4.3
D- Pull-down resistance	R_{DM_DWN}		14.25	24.8	kΩ	3.2
D+ Pull-down resistance	R_{DP_DWN}		14.25	24.8	kΩ	3.2
D+ Pull-up resistance	R_{DP_UP}		900	1575	Ω	3.2.4.4
ACA ID pull-down, OTG device as A-device	R_{ID_A}	Note 1,2,4	122	126	kΩ	6.2.4
ACA ID pull-down, OTG device as B-device, can't connect	R_{ID_B}	Note 1,2,4	67	69	kΩ	6.2.4
ACA ID pull-down, OTG device as B-device, can connect	R_{ID_C}	Note 1,2,4	36	37	kΩ	6.2.4
ACA ID pull-down when ID_OTG pin is floating	R_{ID_FLOAT}	Note 2,3	220		kΩ	6.2.4
ACA ID pull-down when ID_OTG pin is grounded	R_{ID_GND}	Note 2,3		1	kΩ	6.2.4
OTG to ACA ground resistance	$R_{OTG\_ACA\_GND}$			100	mΩ	6.2.6

Notes

1) The ACA shall meet this parameter requirement when VBUS_CHG is at V_{ACA_OPR}.

2) The ACA shall meet this parameter requirement when its ID_OTG pin is at V_{DAT_LKG}. When detecting these resistances, an OTG device shall allow for an additional leakage current of $I_{ID\_LKG\_CONT}$ due to contamination.

3) The ACA shall meet this parameter requirement when its VBUS_CHG pin is at V_{BUS_LKG}.

4) Nominal values for these resistors are R_{ID_A} = 124k, R_{ID_B} = 68k and R_{ID_C} = 36.5k

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Table 5-4 Capacitances

Parameter	Symbol	Conditions	Min	Max	Units	Ref
Dedicated Charging Port capacitance from D+ or D- to VBUS or GND	C_{DCP_PWR}			1	nF	4.4.3
Micro ACA Capacitance from VBUS to GND	C_{MACA_VBUS}		1	2	uF	6.2.3
Standard ACA Capacitance from VBUS to GND	C_{SACA_VBUS}		10	100	nF	6.3.2

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Table 5-5 Times

Parameter	Symbol	Conditions	Min	Max	Units	Ref
Connect to D+ sink disable	TCON_IDPSNK_DIS			10	ms	3.4
Time for Charging Port to remove VDM_SRC on D-	TCP_VDM_DIS			10	ms	3.2.4.2
Time for Charging Port to assert VDM_SRC on D-	TCP_VDM_EN			200	ms	3.2.4.2
Attach to VDP_SRC enable during DBP	TDBP_ATT_VDPSRC			1	sec	2.2
Attach to full USB functionality for configured PD under DBP	TDBP_FUL_FNCTN			15	min	2.3
Attach to PD informing user it is charging	TDBP_INFORM			1	min	2.3
VDP_SRC disable to connect during DBP	TDBP_VDPSRC_CON			1	sec	2.2
Data contact detect debounce	TDCD_DBNC		10		ms	3.4.1
DCD Timeout	TDCD_TIMEOUT		300	900	ms	3.2.3.1
DCP recovery time between load steps	TDCP_LD_STP		20		ms	4.4.2
DCP undershoot voltage time	TDCP_UNDSHT			10	ms	4.4.2
Charger shut down recover time	TSHTDWN_REC			2	min	4.2.2
Session valid to connect time for powered up peripheral	TSVLD_CON_PWD			1	sec	3.2.3.1
Session valid to connect for PD with Dead or Weak Battery	TSVLD_CON_WKB			45	min	2.2
VBUS voltage averaging time	TVBUS_AVG			250	ms	4.2.1
Time for VBUS to be reapplied	TVBUS_REAPP	VBUS less than VBUS_LKG	100		ms	4.1.3
D- voltage source disable time	TVDMSRC_DIS			20	ms	3.4
D- voltage source enable time	TVDMSRC_EN			20	ms	3.4
D+ voltage source on time	TVDPSRC_ON		40		ms	3.4
D- voltage source on time	TVDMSRC_ON		40		ms	3.4
Time for VBUS to decay to VBUS_LKG	TVLD_VLKG	Time from VBUS not driven		500	ms	4.6.3

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6. Accessory Charger Adapter

6.1 Introduction

As PDs get smaller, it becomes more desirable for the PD to only have one external connector. If the only connector a device has is a USB connector, then a problem arises when the user wants to attach the device to a charger at the same time as it is already attached to something else.

For example, consider a user in a car with a cell phone that is attached to a headset. If the phone battery goes low, the user would like to charge the phone, and at the same time continue to talk through the headset. If the phone has only one connector, it is not possible to attach both a headset and a charger to the phone through the same connector.

Another example would be as follows. Consider a PD that has a single connector, which can also act as a handheld PC. When such a device is put into an ACA-Dock, it would act as a host to various USB peripherals, such as a hub, keyboard, mouse, printer, etc. However, while in the ACA-Dock, the device should also be able to charge at the same time.

The purpose of this section is to describe a method that allows a single USB port to be attached to both a charger and another device at the same time. This method makes use of an Accessory Charger Adapter (ACA), as shown in Figure 6-1.

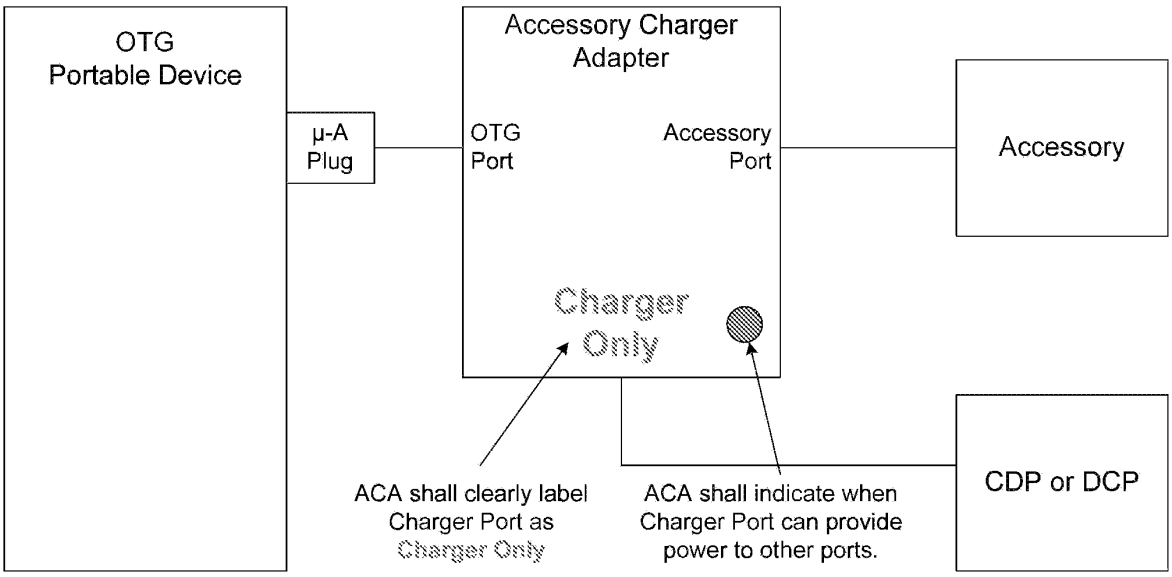


Figure 6-1 Accessory Charger Adapter

An ACA has the following three ports:

- OTG Port
- Accessory Port
- Charger Port

The OTG Port shall have a captive cable that terminates with a Mircro-A plug. Only OTG devices (ie those with a Micro-AB receptacle) can be attached to the OTG Port.

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Accessories attached to the Accessory Port can communicate with the OTG device using normal USB signaling.

The Charger Port allows the ACA to be attached to a Charging Port. Power from the Charger Port is available to both the OTG device and the accessory. An ACA is required to label the Charger Port as Charger Only. The reason for this is that the ACA does not support USB communication between the OTG Port and the Charger Port. The Charger Port is only used for power. An ACA is also required to provide an indicator that shows when the Charger Port is able to provide power to the OTG and Accessory Ports.

There are two types of ACAs:

- Micro ACA
- Standard ACA

A Micro ACA has a Micro-AB receptacle on the Accessory Port, and can be attached to either an A-device or B-device. A Standard ACA has a Standard-A receptacle on the Accessory Port, and can only be attached to a B-device.

6.2 Micro ACA

6.2.1 Micro ACA Ports

Figure 6-2 shows the ports of a Micro ACA.

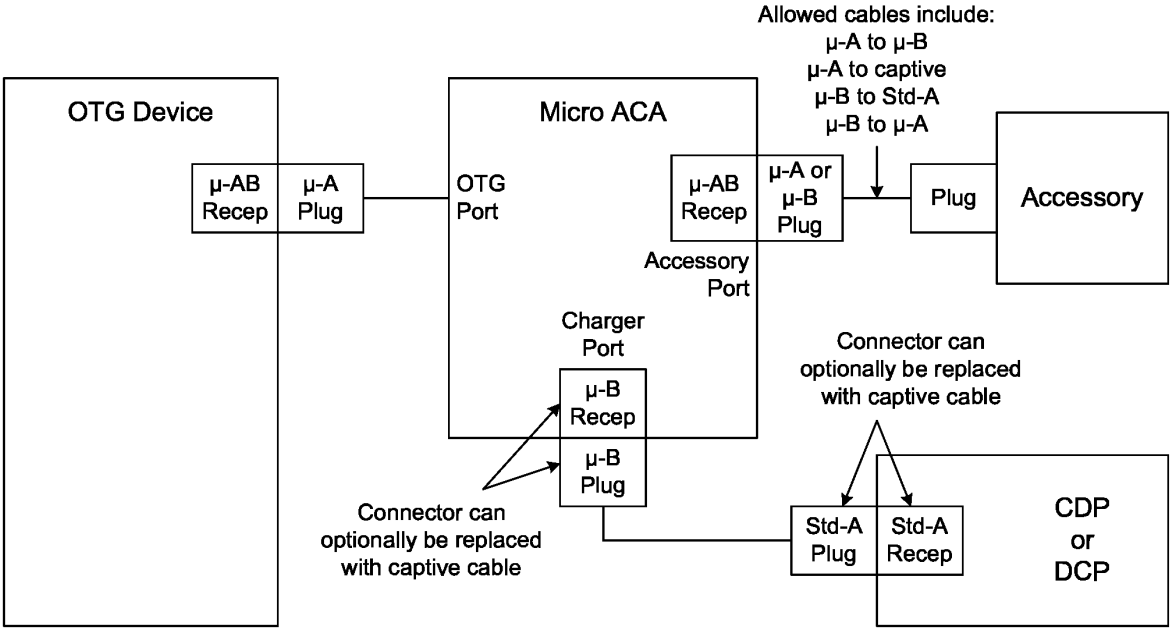


Figure 6-2 Micro ACA Ports

Various cables can be uses to attach the Accessory Port of a Micro ACA to an accessory, including:

- Micro-A to Micro-B
- Micro-A to captive
- Micro-B to Standard-A
- Micro-B to Micro-A

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A Micro ACA shall have one of the following mechanical interfaces for its Charger Port:

- Micro-B receptacle
- Captive cable terminating in a Standard-A plug
- Captive cable terminating in a charger

6.2.2 Micro ACA Connectivity Options

Table 6-1 shows the different combinations of devices that can be attached to each Micro ACA port, and provides comments on their operation.

Table 6-1 Micro ACA Connectivity Options

OTG Port	Charger Port	Accessory Port	HNP Support	SRP Support	OTG Dev Charges From	Accessory Draws Current From
nothing	Charging Port	B-dev	-	-	-	Charger Port
nothing	Charging Port	A-dev	-	-	-	-
OTG dev	nothing	B-dev	yes	yes	-	OTG Port
OTG dev	nothing	A-dev	yes	yes	Accessory Port	-
OTG dev	nothing	charger	-	-	Accessory Port	-
OTG dev	PC, OTG dev	nothing	-	-	-	-
OTG dev	PC, OTG dev	B-dev	yes	yes	-	OTG Port
OTG dev	PC, OTG dev	A-dev	yes	yes	Accessory Port	-
OTG dev	PC, OTG dev	charger	-	-	Accessory Port	-
OTG dev	Charging Port	nothing	-	-	Charger Port	-
OTG dev	Charging Port	B-dev	yes	no	Charger Port	Charger Port
OTG dev	Charging Port	A-dev	yes	yes	Charger Port	-
OTG dev	Charging Port	charger	-	-	Charger Port	-

An ACA does not allow data communication through the Charger Port. The ACA only allows charging from the Charger Port when a Charging Port is attached. It does not allow charging from the Charger Port whenever an SDP or an OTG device is attached.

In the case where both an OTG device and a B-device are charging from the Charger Port, it is not necessary to support SRP, since VBUS is already asserted at both the OTG Port and Accessory Port.

The OTG device is required to limit the current it draws from the ACA such that VBUS_OTG remains above V_{ACA_OPR} min.

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6.2.3 Micro ACA Architecture

Figure 6-3 shows the architecture of a Micro ACA.

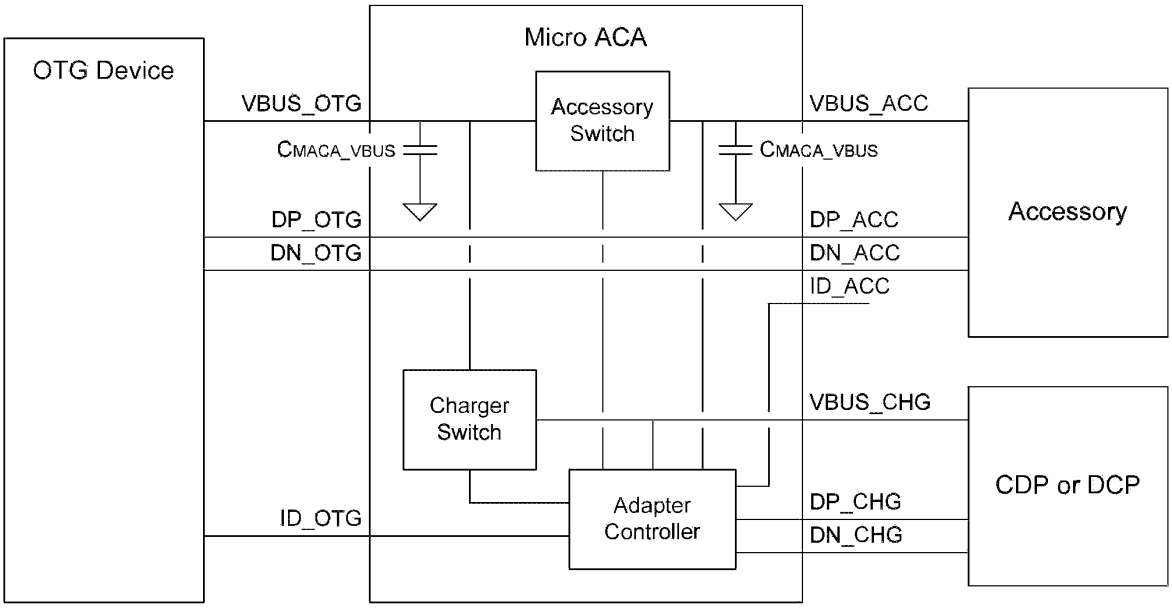


Figure 6-3 Micro ACA Architecture

The Accessory Switch allows current to flow between VBUS_OTG and VBUS_ACC. The Charger Switch allows current to flow from VBUS_CHG and VBUS_OTG. The Adapter Controller performs several functions. These functions include:

- sensing the state of the ID_ACC pin, (grounded or floating)
- outputting a state onto the ID_OTG pin, (R_{ID_GND}, R_{ID_A}, R_{ID_B}, R_{ID_C} or R_{ID_FLOAT})
- using the DP_CHG and DN_CHG pins to detect if a Charging Port is attached to the Charger Port
- sensing the voltage on the VBUS_ACC pin
- controlling the Charger and Accessory Switches

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6.2.4 Micro ACA Modes of Operation

The operation of the Micro ACA is shown in Table 6-2, and is described below. The table assumes that an OTG device is always attached to the OTG Port.

Table 6-2 Micro ACA Modes of Operation

Row	Charger Port	Accessory Port	VBUS_ ACC In	ID_ACC	Charger Switch	Access Switch	ID_OTG	OTG Device
					Note 1	Note 1		
1	not Chrg Port	nothing	low	float	open	closed	RID_FLOAT	B-dev
2	not Chrg Port	B-device	low	ground	open	closed	RID_GND	A-dev
3	not Chrg Port	A-dev off	low	float	open	closed	RID_FLOAT	B-dev
4	not Chrg Port	A-dev on	high	float	open	closed	RID_FLOAT	B-dev
5	Charging Port	nothing	low	float	closed	open	RID_B	B-dev
6	Charging Port	B-device	low	ground	closed	closed	RID_A	A-dev
7	Charging Port	A-dev off	low	float	closed	open	RID_B	B-dev
8	Charging Port	A-dev on	high	float	closed	open	RID_C	B-dev

Notes
1) Open refers to the high impedance state of the switch. Closed refers to the low impedance state of the switch.

In rows 5 and 7, a Charging Port is attached to the Micro ACA Charger Port, and either nothing is attached to the Accessory Port, or an A-device that is not asserting VBUS is attached to the Accessory Port. The ID resistance of RID_B indicates to the OTG device that it is allowed to charge, and that it is allowed to initiate SRP. The OTG device is not allowed to connect, (that is, leave DP_OTG asserted). The reason for this is that if an A-device is on the Accessory Port and is not asserting VBUS, then the USB spec requires the data lines remain at a logic low.

In row 8, a Charging Port is attached to the Micro ACA Charger Port, and an A-device that is asserting VBUS is attached to the Accessory Port. The ID resistance of RID_C indicates to the OTG device that it is allowed to charge, and that it is allowed to connect. However, it is not allowed to do SRP, since the A-device is already asserting VBUS.

In row 6, a Charging Port is attached to the Micro ACA Charger Port, and a B-device is attached to the Accessory Port. The ID resistance of RID_A indicates to the OTG device that it is allowed to charge, and that it should default to acting as host.

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6.2.5 Implications of not Supporting Micro ACA Detection

The OTG supplement only defines the floating and ground states on the ID pin. The floating state is any impedance greater than 1M, and the ground state is any impedance less than 10Ω. Since the R_{ID_A}, R_{ID_B} and R_{ID_C} resistances are between the floating and ground resistance values, an OTG device that does not support ACA detection could intepret any of these values as either floating or ground.

If an OTG device interpreted the R_{ID_A} resistance as floating, then:
- it would not be aware of the opportunity to draw I_{DEV_CHG} from VBUS
- it would default to peripheral, when it should default to host

If an OTG device interpreted the R_{ID_B} resistance as grounded, then:
- it would try to drive VBUS_OTG at the same time as the ACA was driving VBUS_OTG
- it would default to host, when it should default to peripheral

If an OTG device interpreted the R_{ID_B} resistance as floating, then:
- it would not be aware of the opportunity to draw up to I_{DEV_CHG} from VBUS
- it would not be aware of the opportunity to do SRP
- it would be required to connect, and potentially violate the USB back-drive voltage spec

If an OTG device interpreted the R_{ID_C} resistance as grounded, then:
- it would try to drive VBUS_OTG at the same time as the ACA was driving VBUS_OTG
- it would default to host, when it should default to peripheral

If an OTG device interpreted the R_{ID_C} resistance as floating, then:
- it would not be aware of the opportunity to draw up to I_{DEV_CHG} from VBUS

6.2.6 Micro ACA Requirements

A Micro ACA Charger Port shall draw less than I_{SUSP} when anything other than a Charging Port is attached to it.

A Micro ACA shall draw less than I_{SUSP} when a Charging Port is attached to the ACA Charger Port and nothing is attached to the OTG Port or Accessory Port.

The resistance between the VBUS_CHG and VBUS_OTG pins of an ACA shall be $R_{ACA\_CHG\_OTG}$ when the Charger Switch is closed in Table 6-2, and the voltage on VBUS_CHG is at V_{ACA_OPR}.

The resistance between the VBUS_CHG and VBUS_ACC pins of an ACA shall be $R_{ACA\_CHG\_ACC}$ when the Accessory Switch is closed in Table 6-2, and the voltage on VBUS_CHG is at V_{ACA_OPR}.

The resistance between the VBUS_OTG and VBUS_ACC pins of an ACA shall be $R_{ACA\_OTG\_ACC}$ when the Accessory Switch is closed in Table 6-2, and the voltage on VBUS_OTG is at V_{ACA_OPR}.

The resistance between the internal ground of the Micro ACA and the ground pin of a Micro-AB receptacle attached to the OTG port of an ACA shall be $R_{OTG\_ACA\_GND}$. This requirement limits the difference between OTG and ACA ground under conditions of high charging current. This in turn allows the OTG device to reliably detect the ACA ID resistance under conditions of high charging current.

When a Micro ACA detects VBUS_CHG asserted, it shall output V_{DP_SRC} on DP_CHG. If the ACA detects DN_CHG greater than V_{DAT_REF}, then it is allowed to close its Charger Switch for as long as VBUS_CHG remains above$V_{OTG_SESS_VLD}$. Note that this could result in the ACA drawing more than I_{CFG_MAX} from a PS2 port.

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If the Charger Port was attached to a CDP, then it's possible that DN_CHG may go below V_{DAT_REF} of the ACA due to charging currents causing the CDP ground to be lower than the ACA ground. It's also possible that the CDP could issue a USB reset. The ACA shall ignore either of these effects, and continue to leave its Charger Switch closed. When VBUS_CHG goes below $V_{OTG\_SESS\_VLD}$, then the ACA is required to again check for VDN_CHG being greater than V_{DAT_REF}, before opening the Charger Switch.

The Micro ACA is required to have a capacitance of C_{MACA_VBUS} on both the VBUS_OTG and VBUS_ACC pins. The reason for this is so that attached devices which support the Attach Detection Protocol (ADP) defined in OTG 2.0 can detect when they are attached to an ACA.

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6.2.7 Portable Device State Diagram

Figure 6-4 shows the state diagram for a PD attached to an SDP, CDP, DCP, Micro ACA, ACA-Dock or B-device.

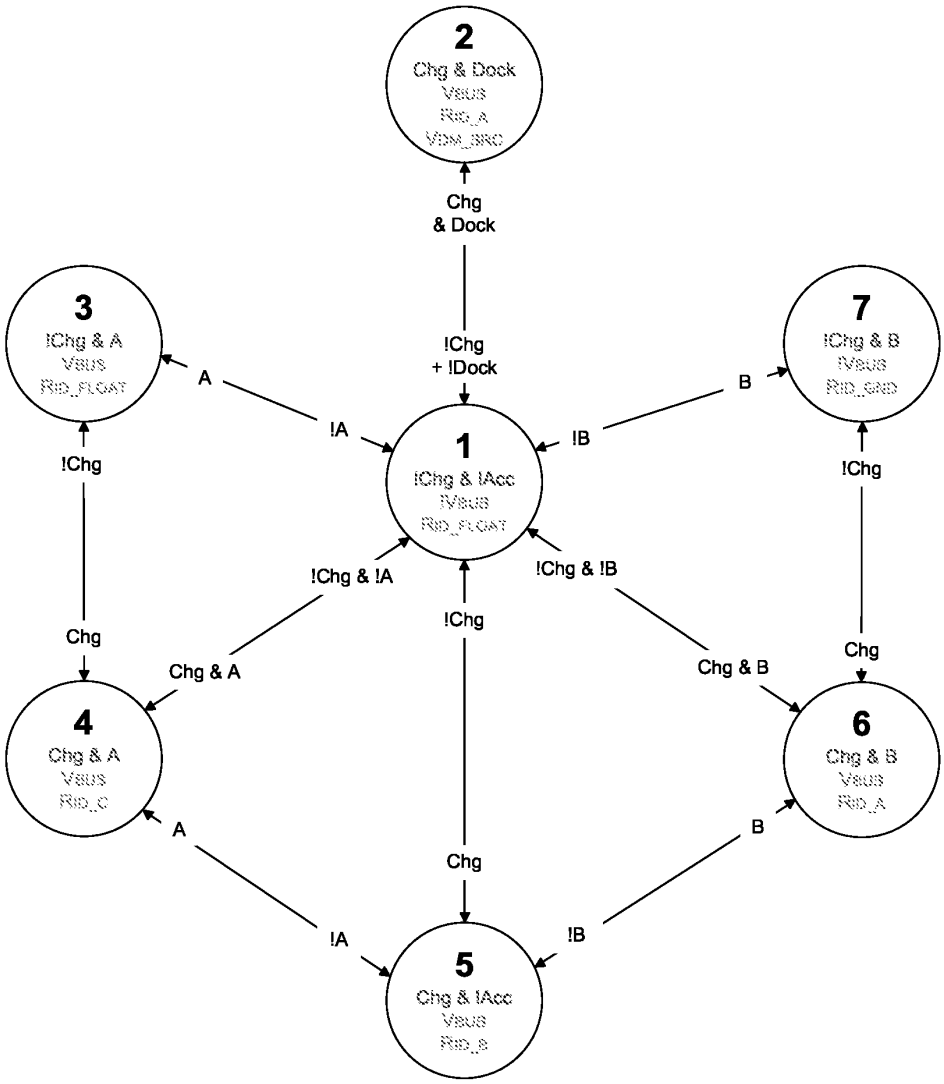


Figure 6-4 Portable Device State Diagram

Each bubble represents a state of the PD. The first row in each bubble is the state number.

The first term in the second row indicates whether the attached device is acting like a Charging Port. The second term in the second row indicates what would be attached to the Accessory Port of the ACA, if the PD is attached to an ACA. The third row indicates whether or not the attached device is driving the PD VBUS pin. The fourth row indicates what resistance the attached device is applying to the PD ID pin. In state 2, the fifth row indicates that the ACA-Dock is outputting a voltage of V_{DM_SRC} to the D- pin of the PD.

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In state 1, the PD detects that it is not attached to anything, or that it is attached to something that is not driving VBUS or pulling ID low.

In state 2, the PD is attached to an ACA-Dock that is driving VBUS. If the PD is removed from the ACA-Dock, or if the ACA-Dock stops providing VBUS, the PD transitions to state 1. An ACA-Dock is required to let its ID pin float if it is not driving VBUS. If the ACA-Dock were to ground the ID pin while it was not driving VBUS, then the PD would incorrectly transition to state 7, where it would attempt to drive VBUS into the ACA-Dock.

In state 3, the PD is attached directly to an A-device, or to an ACA that has an A-device on its Accessory Port. In either case, the PD is drawing current from the A-device, and not from the ACA Charger Port. This is why the second row has the term !Chg. If the A-device presents itself to the PD as a CDP, then the PD can draw I_{DEV_CHG} from the A-device.

In state 4, the PD is attached to an ACA that has a charger on its Charger Port, and an A-device on its Accessory Port. Detaching the PD from the ACA causes the PD to transition to state 1.

In state 5, the PD is attached to an ACA that has a charger on its Charger Port, and does not have an accessory on its Accessory Port.

In state 6, the PD is attached to an ACA that has a charger on its Charger Port, and a B-device on its Accessory Port. Detaching the PD from the ACA causes the PD to transition to state 1.

In state 7, the PD is attached to a B-device, or to an ACA that has a B-device on its Accessory Port. This is the only state in which the PD is required to output power on VBUS. In states 2 to 6, the PD is able to draw power from VBUS.

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6.3 Standard ACA

6.3.1 Standard ACA Ports

Figure 6-5 shows the ports of a Standard ACA.

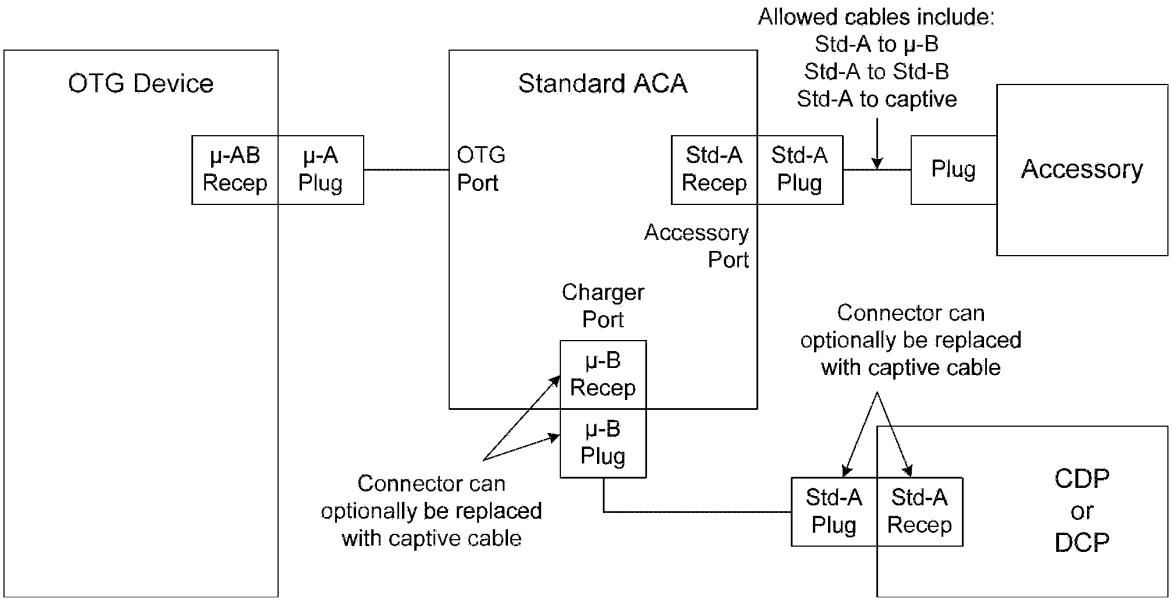


Figure 6-5 Standard ACA Ports

Various cables can be uses to attach the Accessory Port of a Standard ACA to an accessory, including:

- Standard-A to Micro-B
- Standard-A to Standard-B
- Standard-A to captive

A Standard ACA shall have one of the following mechanical interfaces for its Charger Port:

- Micro-B receptacle
- Captive cable terminating in a Standard-A plug
- Captive cable terminating in a charger

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Table 6-3 Standard ACA Connectivity Options

OTG Port	Charger Port	Accessory Port	HNP Support	SRP Support	OTG Dev Charges From	Accessory Draws Current From
nothing	Charging Port	B-dev	-	-	-	Charger Port
OTG dev	nothing	B-dev	yes	yes	-	OTG Port
OTG dev	PC, OTG dev	nothing	-	-	-	-
OTG dev	PC, OTG dev	B-dev	yes	yes	-	OTG Port
OTG dev	Charging Port	nothing	-	-	Charger Port	-
OTG dev	Charging Port	B-dev	yes	no	Charger Port	Charger Port

An ACA does not allow data communication through the Charger Port. The ACA only allows charging from the Charger Port when a Charging Port is attached. It does not allow charging from the Charger Port whenever an SDP or an OTG device is attached.

In the case where both an OTG device and a B-device are charging from the Charger Port, it is not necessary to support SRP, since VBUS is already asserted at both the OTG Port and Accessory Port.

The OTG device is required to limit the current it draws from the ACA such that VBUS_OTG remains above V_{ACA_OPR} min.

6.3.2 Standard ACA Architecture

Figure 6-6 shows the architecture of a Standard ACA.

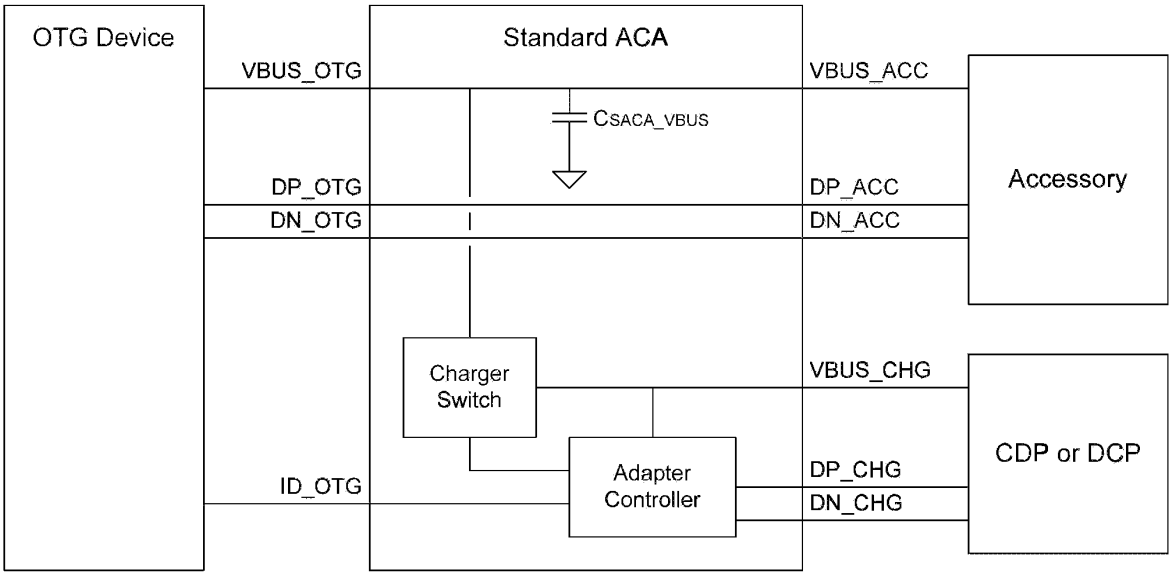


Figure 6-6 Standard ACA Architecture

The Charger Switch allows current to flow from VBUS_CHG and VBUS_OTG. Note that unlike the Micro ACA, the Standard ACA does not have an Accessory Switch.

The Standard ACA is required to have a capacitance of C_{SACA_VBUS} on the VBUS_OTG or VBUS_ACC pins. The reason for this is as follows.

The Accessory Port does not have an ID pin, since it uses a Standard-A receptacle. Thus, the Standard ACA cannot detect when a plug has been inserted into the Accessory Port, and therefore it cannot inform the OTG Device of such an attach event. If a Charging Port were attached to the ACA Charger Port, then the accessory would connect, and the OTG device could detect the connect event. If a Charging Port were not attached to the ACA Charger Port, then the OTG Device would either have to leave VBUS asserted, or it would have to do ADP. In order to allow ADP to work, the combined capacitance on the VBUS_OTG and VBUS_ACC pins needs to be C_{SACA_VBUS}.

The Adapter Controller performs several functions. These functions include:

- outputting a state onto the ID_OTG pin, (R_{ID_GND}, R_{ID_A})
- using the DP_CHG and DN_CHG pins to detect if a Charging Port is attached to the Charger Port
- controlling the Charger Switch

6.3.3 Standard ACA Modes of Operation

The operation of the Standard ACA is shown inTable 6-4, and is described below. The table assumes that an OTG device is always attached to the OTG Port.

Table 6-4 Standard ACA Modes of Operation

Row	Charger Port	Accessory Port	Charger Switch	ID_OTG	OTG Device
			Note 1		
1	non-charger	nothing	open	R_{ID_GND}	A-dev
2	non-charger	B-device	open	R_{ID_GND}	A-dev
3	charger	nothing	closed	R_{ID_A}	A-dev
4	charger	B-device	closed	R_{ID_A}	A-dev

Notes
1) Open refers to the high impedance state of the switch. Closed refers to the low impedance state of the switch.

When a PD is attached to a Standard ACA, the ID_OTG pin is either at R_{ID_GND} or at R_{ID_A}, and the PD is always acting as an A-device.

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6.3.4 Implications of not Supporting Standard ACA Detection

The OTG supplement only defines the floating and ground states on the ID pin. The floating state is any impedance greater than 1M, and the ground state is any impedance less than 10Ω. Since the R_{ID_A} is between the floating and ground resistance values, an OTG device that does not support ACA detection could intepret this value as either floating or ground.

If an OTG device interpreted the R_{ID_A} resistance as floating, then:

- it would not be aware of the opportunity to draw I_{DEV_CHG} from VBUS
- it would default to peripheral, when it should default to host

6.3.5 Standard ACA Requirements

A Standard ACA Charger Port shall draw less than I_{SUSP} when anything other than a Charging Port is attached to it.

A Standard ACA Accessory Port shall draw less than I_{SUSP} when a Charging Port is attached to the ACA Charger Port and nothing is attached to the OTG Port or Accessory Port.

The resistance between VBUS_CHG, and either VBUS_OTG or VBUS_ACC of a Standard ACA shall be $R_{ACA\_CHG\_OTG}$ when the Charger Switch is closed in Table 6-4, and the voltage on VBUS_CHG is at V_{ACA_OPR}.

The resistance between the internal ground of the Standard ACA and the ground pin of a Micro-AB receptacle attached to the OTG port of an ACA shall be $R_{OTG\_ACA\_GND}$. This requirement limits the difference between OTG and ACA ground under conditions of high charging current. This in turn allows the OTG device to reliably detect the ACA ID resistance under conditions of high charging current.

When a Standard ACA detects VBUS_CHG asserted, it shall output V_{DP_SRC} on DP_CHG. If the ACA detects DN_CHG greater than V_{DAT_REF}, then it shall close its Charger Switch for as long as VBUS_CHG remains above $V_{OTG\_SESS\_VLD}$. Note that this could result in the ACA drawing more than I_{CFG_MAX} from a PS2 port.

If the Charger Port was attached to a CDP, then it's possible that DN_CHG may go below V_{DAT_REF} of the ACA due to charging currents causing the CDP ground to be lower than the ACA ground. It's also possible that the CDP could issue a USB reset. The ACA shall ignore either of these effects, and continue to leave its Charger Switch closed. When VBUS_CHG goes below$V_{OTG_SESS_VLD}$, then the ACA is required to again check for VDN_CHG being greater than V_{DAT_REF}, before opening the Charger Switch.

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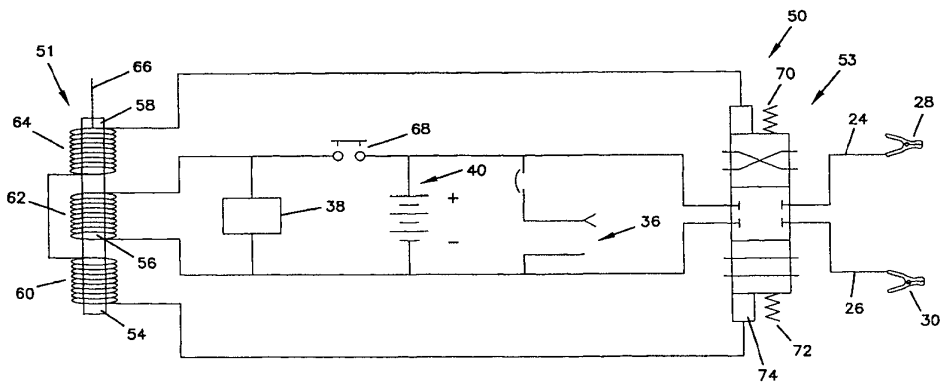
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(54) Title: PORTABLE BATTERY CHARGER INCLUDING AUTO–POLARITY SWITCH



(57) Abstract

A portable hand–carrying auto–polarity battery booster apparatus includes a power storage device which is capable of providing power to an electrical system such as a battery. For example, the portable apparatus can be used to jump start a vehicle with a dead battery. The apparatus is compact in size which encloses the power storage device, the at least four connecting cables, and many other electrical circuits in a compact housing. The portable apparatus also includes an auto–polarity switch in the housing which ensures a proper polarity connection between the power storage device of the apparatus and the electrical system.

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PORTABLE BATTERY CHARGER INCLUDING AUTO-POLARITY SWITCH

Field of the Invention

This invention relates generally to portable charging systems, and more specifically to portable charging systems including an auto-polarity switch for providing a proper polarity connection in charging batteries or jump starting an automobile which has a discharged battery.

Background of the Invention

Most automobiles or other devices powered by an internal combustion engine, such as watercraft, etc., rely at least in part on a battery as part of its power source. For example, an automobile needs a battery to start the engine operating (the engine must be spun up to speed externally before they can operate). Once the engine is operating or running, the battery is charged by a generator connected to the engine. The battery is usually able to store enough charge for the periods that the engine is not running in order to start the engine when needed.

There are many things that will cause a battery to lose its charge, such as leaving the lights on or playing the radio after the engine is turned off, or a short circuit in the battery which drains the battery. When there is not enough charge in the battery, the engine cannot be started, i.e. the battery is discharged. As a result, the battery must be recharged or boosted by another power source. Very often another vehicle is brought to the vicinity of the vehicle with the discharged battery to jump start the vehicle. Another solution was proposed by U.S. Patent 5,589,292 which provides a portable booster battery to recharge the discharged battery.

One concern in using a portable battery such as the portable booster battery disclosed U.S. Patent No. 5,589,292 to charge batteries that have been discharged is making sure that proper polarity between the portable battery and the battery to be charged is proper. It is imperative to connect the portable battery and the battery to be charged with proper polarity, i.e. positive to positive terminal connections and negative to negative terminal connections. Failure to do so will rapidly drain the portable battery and further cause serious damage to either or both electrical systems

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that the two batteries are used in. However, it is often difficult to determine which battery terminal is positive and which is negative because of the accumulation of dirt or lack of lighting.

The polarity problem has been solved by a variety of methods in the battery jumper cable arrangement environment, such as the technique disclosed in U.S. Patent No. 4,400,658. There is a need for a portable battery charging system that has the polarity problem solved. Such a portable charging system would need to provide a charge or boost to another battery regardless of the charging terminals of the battery to be charged to which the positive or negative terminals of the portable charging system are connected. Such a system would eliminate the problems and dangers associated with incorrect charging battery to discharged battery terminal connections.

Summary of the Invention

The present invention relates to a portable battery with an auto-polarity switch for providing a proper polarity connection in charging a battery of a device, such as an automobile, i.e. jump starting an automobile, etc.

The present invention provides for a portable, auto-polarity battery booster apparatus. The portable apparatus in accordance with the present invention includes a power storage device, such as a battery, which is capable of providing power to an electrical system such as another battery. The portable apparatus can also be used in many other power supply applications or battery charging applications. For example, it can be used to jump start a vehicle with a dead battery. The apparatus can also be recharged by an outside power source. Further, the portable apparatus ensures a proper polarity connection between the power storage device of the apparatus and the electrical system.

Brief Description of the Drawings

Referring to the drawings wherein like numerals represent like parts throughout the several views:

FIGURE 1 is a schematic view of a general embodiment of the auto-polarity battery booster apparatus;

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FIGURE 2 is a front view of a portable, auto-polarity battery booster apparatus in accordance with the present invention;

FIGURE 3 is a back view of the battery booster apparatus of FIGURE 2;

FIGURE 4 is a top view of the battery booster apparatus of FIGURE 2;

FIGURE 5 is a bottom view of the battery booster apparatus of FIGURE 2;

FIGURE 6 is a plane view of the inside of the battery booster apparatus of FIGURE 2;

FIGURE 7 is a schematic view of a specific embodiment of the auto-polarity battery booster apparatus;

FIGURE 8 is a plane view of one embodiment of an auto-polarity switch of the battery booster apparatus;

FIGURE 9 is a perspective view of the auto-polarity switch;

FIGURE 10 is an exploded view of the auto-polarity switch;

FIGURE 11 is a front view of the auto-polarity switch; and

FIGURE 12 is a cross-sectional view of the auto-polarity switch along line A-A of FIGURE 11.

General Description

In one embodiment constructed according to the principles of the present invention, a portable battery booster apparatus for boosting an electrical system with a first terminal and a second terminal, comprises a battery having a first terminal and a second terminal, a housing enclosing the battery and the first and second terminals of the battery, an automatic switch having a first pair of contacts and a second pair of contacts, the switch being enclosed in the housing, a first cable with a first end connected to the first terminal of the battery and a second end selectively connected to a first contact of the first pair of contacts of the switch, the first cable being enclosed in the housing, a second cable with a first end connected to the second terminal of the battery and a second end selectively connected to a second contact of the first pair of contacts of the switch, the second cable being enclosed in the housing, a third cable with a first end connected to a first contact of the second pair of contacts of the switch, the first end of the third cable being partially enclosed in the housing, a fourth cable with a first end connected to a second contact of the second pair of contacts of the switch, the first end of the fourth cable being partially

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enclosed in the housing, a first clamp connecting to a second end of the third cable, the first clamp being detachably mounted onto a first side of outside of the housing, a second clamp connecting to a second end of the fourth cable, the second clamp being detachably mounted onto a second side of the outside of the housing, and wherein when the electrical system is boosted by the battery booster apparatus, the first clamp and the second clamp connect to the first terminal and the second terminal of the electrical system, respectively, such that the first and second terminals of the battery are electrically connected to the first and second terminals of the electrical system, the switch switches connections between the first pair of contacts and the second pair of the contacts to ensure that the first terminal of the battery and the first terminal of the electrical system have the same polarity, and the second terminal of the battery and the second terminal of the electrical system have the same polarity.

In one aspect of the invention, the apparatus may also include an ON/OFF switch. The ON/OFF switch is connected between the battery and the switch. When the ON/OFF switch is off, the switch is in a neutral, non-contacting position, and the first pair of contacts are not electrically connected with the second pair of contacts. When the ON/OFF switch is on, the electrical system is boosted by the battery.

In another aspect of the invention, in a first embodiment the auto-polarity switch comprises three coils which are wound around two cores and a plunger, respectively. The plunger is moved to a first contacting position when the first terminals of the battery and the electrical system have the same polarity and the second terminals of the battery and the electrical system have the same polarity. The plunger is moved to a second contacting position when the first terminals of the battery and the electrical system have the opposite polarity and the second terminals of the battery and the electrical system have the opposite polarity. In one embodiment, the switch is a double pole double throw switch.

In the first embodiment of the switch in accordance with the invention, the coil assembly has a bobbin shape with two dividers for separating the first, second, and third coils from each other. In addition, the switch may include an enclosure for enclosing the coil assembly. The plunger extends from the enclosure and connects to a double pole double throw switch.

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In the first embodiment of the switch in accordance with the present invention, the first pair of contacts are arranged and configured to be a pair of bottom switch contacts and a pair of top switch contacts. When the plunger is in the first contacting position, the bottom switch contacts are connected to the second pair of contacts, and when the plunger is in the second contacting position, the top switch contacts are connected to the second pair of contacts.

In a second embodiment, the auto-polarity switch includes a polarity sensing circuit, and a reversing relay operated by the sensing circuit. The sensing circuit includes a full wave rectifier electrically connected to a differential amplifier circuit which is electrically connected to external cables having clamps electrically connected thereto, which are to be removably attached to the battery to be charged. The full wave rectifier provides a positive voltage to the polarity sensing circuit regardless of the polarity connection of the clamps to the source to be charged. The differential amplifier circuit is electrically connected to a first relay coil and a second relay coil which are electrically connected to the relay control circuit and cause selective activation of movable contacts in the relay to so that the reversing relay acts as a switch in switching the connections between a first pair of contacts and a second pair of the contacts to ensure that a first terminal of the battery and a first terminal of the electrical system have the same polarity, and a second terminal of the battery and a second terminal of the electrical system have the same polarity.

In other embodiments, such as the embodiment shown in Figure 1, the auto-polarity switch may be an electromechanical type, or an electronic type comprised of solid state devices or microprocessor type, all of which would include a type of change-over switch 50. In such other embodiments the auto-polarity switch 50 would include a polarity detector comprised of a electric differential type, a processing circuit and two sets of pairs of electrical transmission conducting wires terminals. The switch would be installed between the portable charger battery 50 and the external charging source connection cables 24 and 26 to provide for switching between two pair of contacts connected to a pair of electrical transmission conducting wires terminals 28 and 30.

It will be appreciated that other types of suitable auto-polarity switches can be used without departing from the present invention. The examples of the other

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types of switches, but not limited to these examples, are solid-state switches or other electro-mechanical switching devices. It will be also appreciated that other conventional polarity detection/protection devices, or automatic polarity sensing battery charger devices can be used without departing from the present invention.

In another aspect of the invention, the housing includes switch retention grooves for retaining the switch in one side of the housing. The housing also includes cable retention grooves for retaining the first, second, third, and fourth cables to the housing. Further, the housing includes battery retention grooves for retaining the battery to the housing.

In yet another aspect of the invention, the apparatus includes a first holster for receiving and covering the first clamp and a second holster for receiving and covering the second clamp. In one embodiment, the first and second holsters are attached to the outside of the housing. Further, the first and second holsters are pivotably connected to the housing.

In an additional aspect of the present invention, a plurality of accessories can be included to provide additional features and advantages of the invention. For example, a display can be included to display a level of charge remaining in the battery. A cigarette lighter female receptacle member can also be added to provide power to an electrical system which is equipped with a male cigarette lighter plug. Further, a male cigarette lighter plug member can be added to the present invention to provide it with the ability to connect the battery in the housing to a power source outside the housing to recharge the battery. Furthermore, a handle can be included to carry the battery booster apparatus such that the housing and the handle form a portable box unit.

While the invention will be described with respect to a preferred embodiment configuration and with respect to particular components, it will be understood that the invention is not to be construed as limited by such configurations or components. Further, while the preferred embodiment of the invention will be described in relation to boosting or recharging a vehicle or automobile battery, it will be understood that the scope of the invention is not to be limited by this environment in which the preferred embodiment is described herein.

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These and various other advantages and features which characterize the invention are pointed out with particularity in the claims annexed hereto and forming a part hereof. However, for a better understanding of the invention, its advantages and objectives obtained by its use, reference should be had to the drawings which form a further part hereof and to the accompanying descriptive matter, in which there is illustrated and described a preferred embodiment to the invention.

Detailed Description of the Preferred Embodiment

The present invention provides for a portable, auto-polarity battery booster apparatus. The portable apparatus in accordance with the present invention includes a power storage device which is capable of providing power to an electrical system such as a battery. The portable apparatus can also be used in many other power supply applications or battery charging applications. For example, it can be used to jump start a vehicle with a dead battery. The apparatus can also be recharged by an outside power source. Further, the portable apparatus ensures a proper polarity connection between the power storage device of the apparatus and the electrical system.

In the following description of the exemplary embodiment, reference is made to the accompanying drawings which form a part hereof, and in which is shown by way of illustration the specific embodiment in which the invention may be practiced. It is to be understood that other embodiments may be utilized when structural and other changes may be made without departing from the scope of the present invention.

Turning now to Figures 1-4, there is illustrated front, back, top, and bottom views of a preferred battery booster apparatus designated by the reference numeral 20. The apparatus 20 includes a housing 22 preferably made out of plastic. Electrical cables 24,26 extend out of the housing 22 and are retained along outside grooves 25,27 of the housing 22. Extra outside grooves 25', 27' can be arranged to wrap long cables and/or for aesthetic purposes. One end of each cable 24,26 is connected to a clamp 28,30 (best seen in Figure 6), respectively. Each of the cables 24,26 is connected to either the positive terminal or the negative terminal of a power storage device, such as a battery 40 (best seen in Figure 5), in the housing 22.

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Accordingly, one of the clamps can be called positive clamp (marked as "+" in Figures 3 and 4), and the other one can be called negative clamp (marked as "-" in Figures 3 and 4). As it will be discussed later, since the apparatus 20 has an auto-polarity switch 50 (best seen in Figures 5 and 6), it does not matter which clamp is positive and which is negative when the clamps are in use.

The clamps 28,30 are preferably received and covered by holsters 32,34, respectively, and are removably clamped to a bit within the holster. The holsters 28,30 help avoiding accidental electrical contacts between the clamps and adjacent items. A cigarette lighter receptacle member 36 can also be included in the apparatus 20 to provide power to electrical systems such as cell-phones, lighting, etc. A charge status display 38 can also be included in the apparatus 20 to display the level of charge remaining in the power storage device, such as the battery 40 (best seen in Figure 5), in the housing 22. The display 38 can be arranged and configured preferably in a plurality of LED lights to show a series of charge status. It will be appreciated that other suitable display means can be used to indicate the charge status within the scope of the invention. Further, a handle 42 can be molded into the housing 22 to allow easy carrying of the apparatus 20 to the vicinity of the dead battery. It will be appreciated that other types of handles can be used within the principles of the invention. For example, an extra handle piece can be attached to the housing, etc.

Figure 5 shows the internal details of the housing 22 (opened from the back side by removing the mounting screws 21). The battery 40 has a positive terminal 44 and a negative terminal 46. An electrical cable 48 is connected to the positive terminal 44 at one end of the cable 48. The other end of the cable 48 is connected to the auto-polarity switch 50. An electrical cable 52 is connected to the negative terminal 46 at one end of the cable 52. The other end of the cable 52 is connected to the switch 50. Also, it can be seen that the cable 24 extends from outside of the housing 22 to inside of the housing and is retained in the grooves of the housing. The other end of the cable 24 connects to the switch 50. Similarly, the cable 26 extends from outside of the housing 22 to inside of the housing and is retained in the grooves of the housing. The other end of the cable 26 connects to the switch 50. The details of the cigarette lighter receptacle member 38 and the display 38 are

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preferably shown in Figure 5. It will be appreciated that other suitable arrangements of the cigarette lighter receptacle member 36 and the display 38 can be used without departing from the principles of the invention.

Figure 6 illustrates a schematic, functional view of the battery booster apparatus 20. The apparatus 20 has the auto-polarity switch 50 interfacing with the battery 40. The switch 50 preferably includes a coil assembly 51 and a switching assembly 53. The coil assembly 51 has three coils 60, 62, 64 wound around three core members 54, 56, 58, wherein the central core member 56 is a plunger, respectively. The three coils 60, 62 64, the outside cores 54, 58 and the central core (plunger) 56 are disposed along a longitudinal axis 66. The plunger 56 is placed between the outside cores 54, 58. The coil windings and three core assembly makes up two solenoids, a center solenoid 63 comprised of core member 56 and windings 62 wound around the central core member 56 and an outside solenoid 65, 67, comprised of outside core members 54 and 58 and windings 60 and 64 would around the outside core members 54, 56. The outside coil windings 60 and 64 of the outside solenoid are each wound with an equivalent number of turns. The center coil windings 62 of the central solenoid are wound with two times as many turns as either of outside coil windings 60, 64. Further, the windings of the first outside coil member 60 are opposite to the windings of the second outside coil member 64. The windings of the central coil 62 can be in the same direction as the windings of the first outside coil member 60 or in the same as the winding of the second outside coil member 64.

Accordingly, when the internal battery energizes the center coil windings 62, an electrical current flows through the center coil windings 62 (i.e. an ON/OFF switch 68 is closed) and the plunger 56 which is preferably comprised of a ferrous metal becomes magnetized. When there is no current flowing through the external coil windings 60 and 64 and the battery has energized the center coil windings 62, plunger 56 and switch contacts are held at a neutral position. This is because the center coil windings 62 is centered over the plunger 56 and there is no magnetic force being applied to the plunger 56 by either member of the outside solenoid 65, 67. Outside coil windings 60 and 64 are connected in series and wound in opposite directions. The ends of outside coil windings 60 and 64 that are not connected in

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series are electrically connected to cables 24 and 26 and clamps 28 and 30. When the external clamps 28 and 30 are connected to the power source to be charged, current flows through the outside coil windings 60 and 64, causing outside core members 54 and 58 to be magnetized. The magnetization of outside core members 54 and 58 creates a force pulling or pushing central core member 56, depending on the polarity connection of clamps 28 and 30 to the power source to be charged, and the direction of the turns in coil windings 60, 62 and 64. When the outside coil windings 60 and 64 and the central coil winding 64 are all energized, current flowing through the outside coil windings 64 can either flow in the same direction as the current through the central coil windings 62 or in the opposite direction and current flowing through the outside coil windings 60 can either flow in the same direction as the current through central coil windings 62 or in the opposite direction. When current is flowing through the central coil windings 62 in a clockwise direction and through the outside coil windings 64 in a clockwise direction, it is flowing through outside coil windings 60 in a counter clockwise direction. Or, when current is flowing through central coil windings 62 in a clockwise direction and through the outside coil windings 64 in a counter clockwise direction, it is flowing through the outside coil windings 60 in a clockwise direction. The direction of current flowing through outside coil windings 60 and 64 depends on the polarity connection of clamps 28 and 30 to the power source to be charged.

Assuming that current is flowing through central coil windings 62 in a clockwise direction and through the outside coil windings 64 in a clockwise direction, it is flowing through outside coil windings 60 in a counter clockwise direction. Accordingly, the magnetic field in core 54 is opposite the magnetic field within central core 56. The opposing magnetic forces causes the magnetic field in core 54 to negate half the magnetic force in the central core 56. The magnetic field generated by core 58 is in the same direction as that within central core 56 and adds its magnetic energy to core 54, causing full coil strength to be centered in the direction of core 58. This causes the central core 56 to be pulled in the direction of outside core 58.

When the central core 56 is pulled in the direction of outside core 58, the two cores 56 and 58 are very close but do not touch. This is because if either the outside

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coils 60 and 64 or central coil 62 are no longer energized, by way of removing clamps 28 and 30 from the power source to be charged or opening switch 68, the air space provides the central core 56 with the positioning necessary to return back to its neutral position. The same would also be true when the central core 56 is pulled in the direction of core 54. The two cores 54 and 56 are very close, but do not touch. The air space between the two cores 54 and 56 provides the central core 56 with the positioning necessary to return back to its neutral position.

A switch rod 74 is mounted on one end of the plunger 56 (best seen in Figure 9). The plunger 56 is held between the two cores 60,64 by two springs 70,72. The springs 70,72 are shown schematically in Figure 6. In one preferred embodiment, the springs 70,72 are attached to the switch rod 74, and the switch rod 74 is disposed proximate the center of the switch assembly 53. In this case, since the pulling forces are equal, the springs keep the plunger centered, i.e. the switch 50 is in a neutral, non-contacting position. To preserve the charges stored in the battery 40, the ON/OFF switch 68 is normally open.

Figures 7-11 illustrate details of the switch assembly 53. The coils 60, 62, 64 are wound around outside core members 54 and 58 and central core member 56. The coils 60 and 62 are separated by a divider 78. An insulating member 80 is mounted on the divider 78 to help insulate the magnetic fields generated by each of the coils 60, 62. Similarly, the coils 62 and 64 are separated by a divider 82. An insulating member 84 is mounted on the divider 82 to help insulate the magnetic fields generated by each of the coils 62, 64.

As shown in Figures 7 and 11, the switch rod 74 is mounted in the plunger 56 at one end, extends through a center bore 86 of the core 58, is mounted on a bottom switch plate 88 which links a pair of bottom switch contacts 90,92, is attached to the two springs 70,72 (only spring 72 is shown in Figure 9), and is mounted on a top switch plate 94 which links a pair of top switch contacts 96,98. The coils, the plunger, and the cores are preferably disposed in an enclosure 100 with a cover 102. The bottom switch plate 88, the bottom switch contacts 90,92, the springs 70,72, the top switch plate 94, and the top switch contacts 96,98 are retained in an enclosure 104. The enclosure 104 has a pair of top slots 106,108 and a pair of bottom slots (not shown). A pair of top bus bars or terminals 110,112 are inserted in

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the top slots 106,108 and retained by the enclosure 104. A pair of bottom bus bars or terminals 114,116 are inserted in the bottom slots and retained by the enclosure 104.

In one embodiment, the terminal 110 is electrically connected to the positive terminal of the internal power storage device or the battery 40 via the cable 48 as shown in Figure 5. The terminal 116 is electrically connected to the negative terminal of the internal power storage device or the battery 40 via the cable 52 as shown in Figure 5. The terminals 112 and 114 are electrically connected to the terminals of the external power source, e.g. a dead battery, via the cable 24 and the cable 26 and via the clamps 28,30, respectively. It is generally required that a proper polarity be established between the external power source and the internal power source, i.e. the positive terminals are electrically connected to each other, and the negative terminals are electrically connected to each other. In the present invention, the switch 50 connects the terminals with proper polarity in an automatic fashion. First, it is assumed that the positive terminal of the external power source is connected to the bus bar or terminal 112 and the negative terminal of the external power source is connected to the bus bar or terminal 114. When the ON/OFF switch 68 is closed, the plunger 62 is attracted toward the core 64 and repelled from the core 60. This action translates the movement of the switch rod 74 toward the enclosure 104. Accordingly, the spring 70 is compressed (not shown), and the spring 72 is expanded. Thus, the bottom contact 90 is connected between the top bus bar 110 and the top bus bar 112, i.e. the positive terminals of the internal and external power source devices are electrically connected. Meanwhile, the bottom contact 92 is connected between the bottom bus bar 114 and the bottom bus bar 116, i.e. the negative terminals of the internal and external power source devices are electrically connected.

Similarly, if the negative terminal of the external power source is connected to the bus bar or terminal 112 and the positive terminal of the external power source is connected to the bus bar or terminal 114, when the ON/OFF switch 68 is closed, the plunger 62 is attracted toward the core 60 and repelled from the core 64. This action translates the movement of the switch rod 74 toward the enclosure 100. Accordingly, the spring 70 is expanded (not shown), and the spring 72 is

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compressed. Thus, the top contact 96 is connected between the top bus bar 110 and the bottom bus bar 114, i.e. still the positive terminals of the internal and external power source devices are electrically connected. Meanwhile, the top contact 98 is connected between the top bus bar 112 and the bottom bus bar 116, i.e. still the negative terminals of the internal and external power source devices are electrically connected.

It will be appreciated that the arrangement of the bottom switch contacts 90,92, the top switch contacts 96,98, the top bus bars 110,112, and the bottom bus bars 114,116 can be varied within the scope and spirit of the invention. It will also be appreciated that connection arrangement of the positive and negative terminals of the internal power storage source or battery 40 can be varied within the scope and spirit of the invention. For example, the positive terminal of the internal battery 40 can be connected to the top bus bar 112, and the negative terminal of the internal battery 40 can be connected to the bottom bar 114, etc. It will be appreciated by a person skilled in the art that the connection arrangement can be varied as long as the positive and negative terminals of the internal power source are disposed in a diagonal position.

Therefore, even if a user applies the clamps to the wrong terminal connections, i.e. negative to positive or positive to negative between the external and the internal power sources, the switch 50 automatically switches to a proper polarity.

Further, as shown in Figures 7-11, the switch 50 is arranged and configured in such a manner that the switch 50 is able to fit in the housing 22. The housing 22 provides inside grooves to retain the switch 50 as well as many other components, such as cables, cigarette lighter wires, and the display wires, etc.

It will be appreciated that other types of suitable switches can be used without departing from the present invention. The examples of the other types of switches, but not limited to these examples, are solid-state switches, other electro-mechanical switching devices. It will be also appreciated that other conventional polarity detection/protection devices, or automatic polarity sensing battery charger devices can be used without departing from the present invention.

While a particular embodiment of the invention has been described with respect to its application for providing power to a battery, such as jump starting a

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vehicle, etc., it will be understood by those of skill in the art that the invention is not limited by such application or embodiment for the particular components disclosed and described herein. It will be appreciated by those skilled in the art that other circuit configurations that embody the principles of this invention and other applications therefor can be configured within the spirit and intent of this invention. The circuit configuration described herein is provided as only one example of an embodiment that incorporates and practices the principles of this invention. Other modifications and alterations are well within the knowledge of those skilled in the art and are to be included within the broad scope of the appended claims.

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WE CLAIM:

1. A portable battery booster apparatus for boosting an electrical system with a first terminal and a second terminal, comprising:

a) a battery having a first terminal and a second terminal;

b) a housing enclosing the battery and the first and second terminals of the battery;

c) a switch having a first pair of contacts and a second pair of contacts, the switch being enclosed in the housing;

d) a first cable with a first end connected to the first terminal of the battery and a second end selectively connected to a first contact of the first pair of contacts of the switch, the first cable being enclosed in the housing;

e) a second cable with a first end connected to the second terminal of the battery and a second end selectivley connected to a second contact of the first pair of contacts of the switch, the second cable being enclosed in the housing;

f) a third cable with a first end connected to a first contact of the second pair of contacts of the switch, the first end of the third cable being partially enclosed in the housing;

g) a fourth cable with a first end connected to a second contact of the second pair of contacts of the switch, the first end of the fourth cable being partially enclosed in the housing;

h) a first clamp connecting to a second end of the third cable, the first clamp being detachably mounted onto a first side of outside of the housing;

i) a second clamp connecting to a second end of the fourth cable, the second clamp being detachably mounted onto a second side of the outside of the housing; and

j) wherein when the electrical system is boosted by the battery booster apparatus, the first clamp and the second clamp connect to the first terminal and the second terminal of the electrical system,

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respectively, such that the first and second terminals of the battery are electrically connected to the first and second terminals of the electrical system, the switch switches connections between the first pair of contacts and the second pair of the contacts to ensure that the first terminal of the battery and the first terminal of the electrical system have the same polarity, and the second terminal of the battery and the second terminal of the electrical system have the same polarity.

2. The apparatus of claim 1, further comprising an ON/OFF switch connected between the battery and the switch, wherein when the ON/OFF switch is off, the switch is in a neutral, non-contacting position, the first pair of contacts are not electrically communicated with the second pair of contacts, when the ON/OFF switch is on, the electrical system is boosted by the battery.

3. The apparatus of claim 1, wherein the electrical system is another battery.

4. The apparatus of claim 1, wherein the switch comprises:

a coil assembly having a longitudinal axis, the coil assembly including:

a first coil, disposed around outside of the coil assembly, winding around a first core which is disposed inside of the coil assembly;

a second coil, disposed around outside of the coil assembly, winding around a second core which is disposed inside the coil assembly; and

a third coil, disposed around outside of the coil assembly and between the first coil and the second coil, winding around a plunger, the plunger being movable along the longitudinal axis between the first and second cores;

wherein the plunger is moved to a first contacting position when the first terminals of the battery and the electrical system have the same polarity and the second terminals of the battery and the electrical system have the same polarity, the plunger is moved to a second contacting position when the first terminals of the battery and the electrical system have the opposite polarity and the second terminals of the battery and the electrical system have the opposite polarity.

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5. The apparatus of claim 4, wherein the switch is arranged and configured by a double pole double throw switch.

6. The apparatus of claim 4, further comprising an ON/OFF switch connected between the battery and the switch, wherein when the ON/OFF switch is off, the switch is in a neutral, non-contacting position, the first pair of contacts are not electrically communicated with the second pair of contacts, when the ON/OFF switch is on, the electrical system is boosted by the battery, the ON/OFF switch is operated outside of the housing.

7. The apparatus of claim 6, wherein the switch is arranged and configured by a double pole double throw switch.

8. The apparatus of claim 7, wherein the first pair of contacts are arranged and configured to be a pair of bottom switch contacts and a pair of top switch contacts, wherein when the plunger is in the first contacting position, the bottom switch contacts are connected to the second pair of contacts, and when the plunger is in the second contacting position, the top switch contacts are connected to the second pair of contacts.

9. The apparatus of claim 1, further comprising switch retention grooves for retaining the switch in one side of the housing.

10. The apparatus of claim 9, further comprising cable retention grooves for retaining the first, second, third, and fourth cables to the housing.

11. The apparatus of claim 10, further comprising battery retention grooves for retaining the battery to the housing.

12. The apparatus of claim 1, further comprising a first holster for receiving and covering the first clamp and a second holster for receiving and covering the second

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clamp, wherein the first and second holsters are attached to the outside of the housing.

13. The apparatus of claim 12, wherein the first and second holsters are pivotably connected to the housing.

14. The apparatus of claim 4, wherein the coil assembly has a bobbin shape with two dividers for separating the first, second, and third coils from each other.

15. The apparatus of claim 14, further comprising an enclosure for enclosing the coil assembly, wherein the plunger extends from the enclosure and connects to a double pole double throw switch.

16. The apparatus of claim 1, further comprising a display for displaying a level of charge remaining in the battery.

17. The apparatus of claim 1, further comprising a cigarette lighter receptacle member disposed on the housing and electrically connected to the battery, the receptacle member providing power to an electrical system which equips with a cigarette lighter plug.

18. The apparatus of claim 1, further comprising a cigarette lighter plug member extending from the housing and electrically connected to the battery, the plug member being connectable to a power source outside the housing to recharge the battery inside the housing.

19. The apparatus of claim 1, further comprising a handle for carrying the battery booster apparatus, wherein the housing and the handle form a portable box unit.

20. A portable, auto-polarity battery booster apparatus for boosting an electrical system with a positive terminal and a negative terminal, comprising:

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a) a power storage device having a positive terminal and a negative terminal;

b) a housing enclosing the power storage device and the positive and negative terminals of the power storage device;

c) an auto-polarity switch enclosed in the housing for connecting between the power storage device and the electrical system;

d) a first cable with one end connected to the positive terminal of the power storage device and another end selectively connected to the switch, the first cable being enclosed in the housing;

e) a second cable with one end connected to the negative terminal of the power storage device and another end selectively connected to the switch, the second cable being enclosed in the housing;

f) a third cable with one end connected to the switch;

g) a fourth cable with one end connected to the switch;

h) a first clamp connecting to another end of the third cable and disposed outside of the housing;

i) a second clamp connecting to another end of the fourth cable and disposed outside of the housing; and

j) wherein when the positive and negative terminals of the electrical system are electrically connected to the first and second clamps, respectively, the switch switches to a first contacting position to ensure the positive terminal of the battery is electrically connected to the positive terminal of the electrical system, and the negative terminal of the battery is electrically connected to the negative terminal of the electrical system.

21. A portable, auto-polarity battery booster apparatus for boosting an electrical system with a positive terminal and a negative terminal, comprising:

a) a housing;

b) a battery, the battery having charges to provide power to the electrical system, the battery having a positive terminal and a negative terminal, the battery being enclosed in the housing;

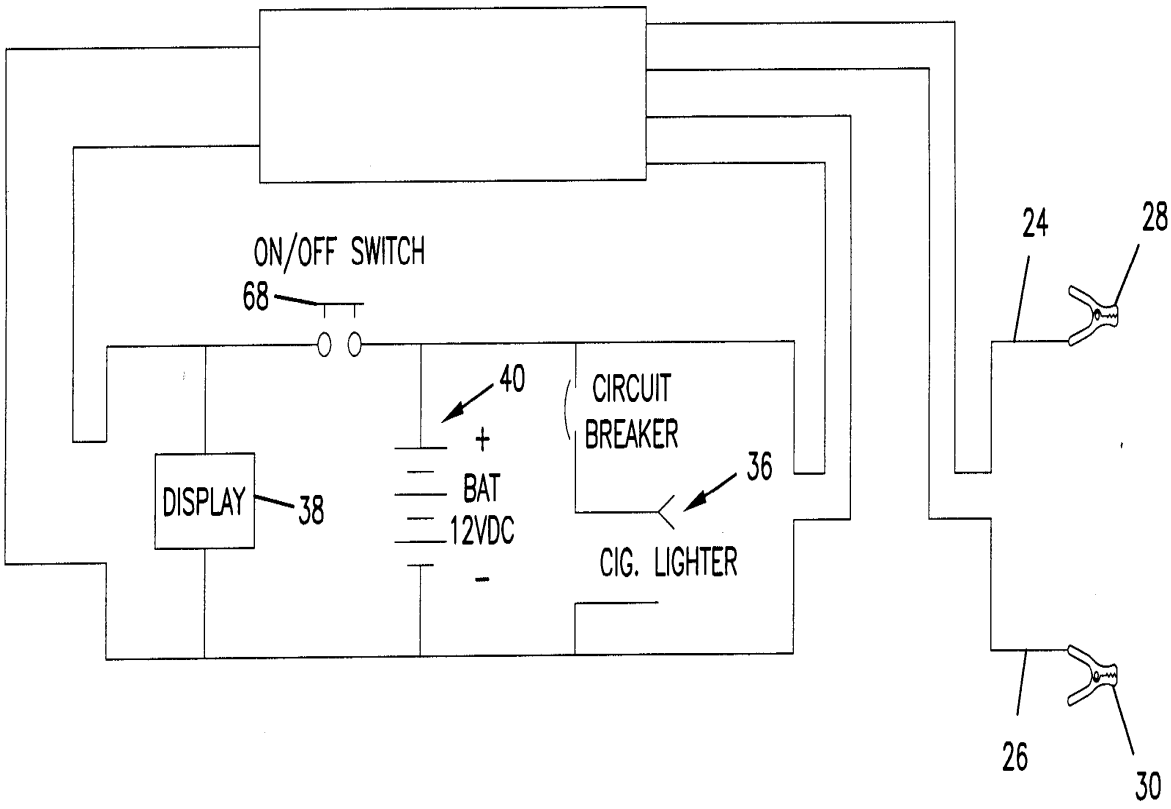
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c) a plurality of connecting members, the connecting members electrically connecting between the terminals of the battery and the terminals of the electrical system, the plurality of connecting members being enclosed in the housing, two of the plurality of connecting members being partially extended from the housing; and

d) a switch, the switch being arranged and configured to electrically connect between the battery and the electrical system, the switch being enclosed in the housing, the switch automatically switching between a first connecting position and a second connecting position to ensure that the positive terminal of the electrical system is electrically connected to the positive terminal of the battery and that the negative terminal of the electrical system is electrically connected to the negative terminal of the battery.

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FIG. 1



SUBSTITUTE SHEET (RULE 26)

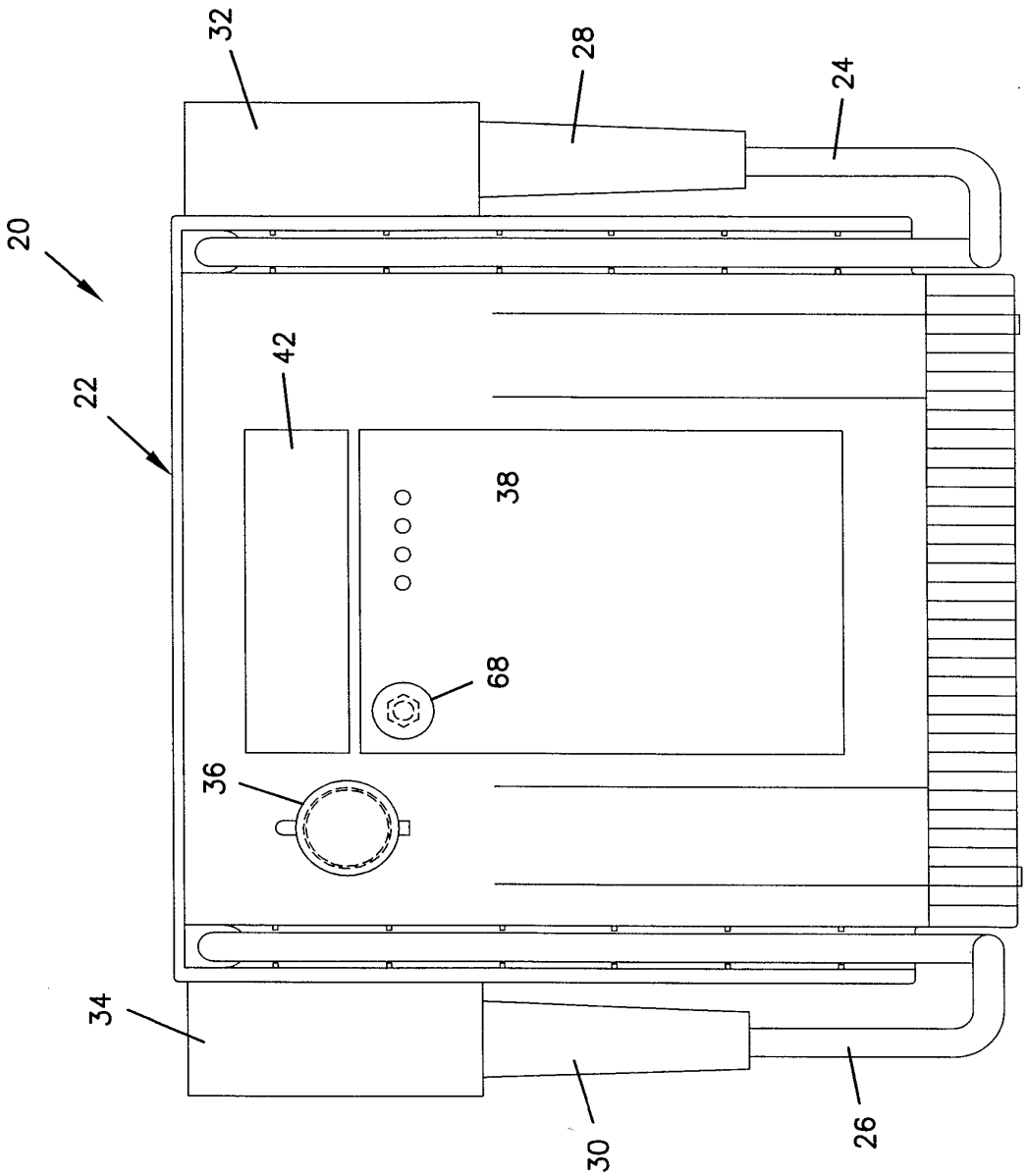


FIG. 2

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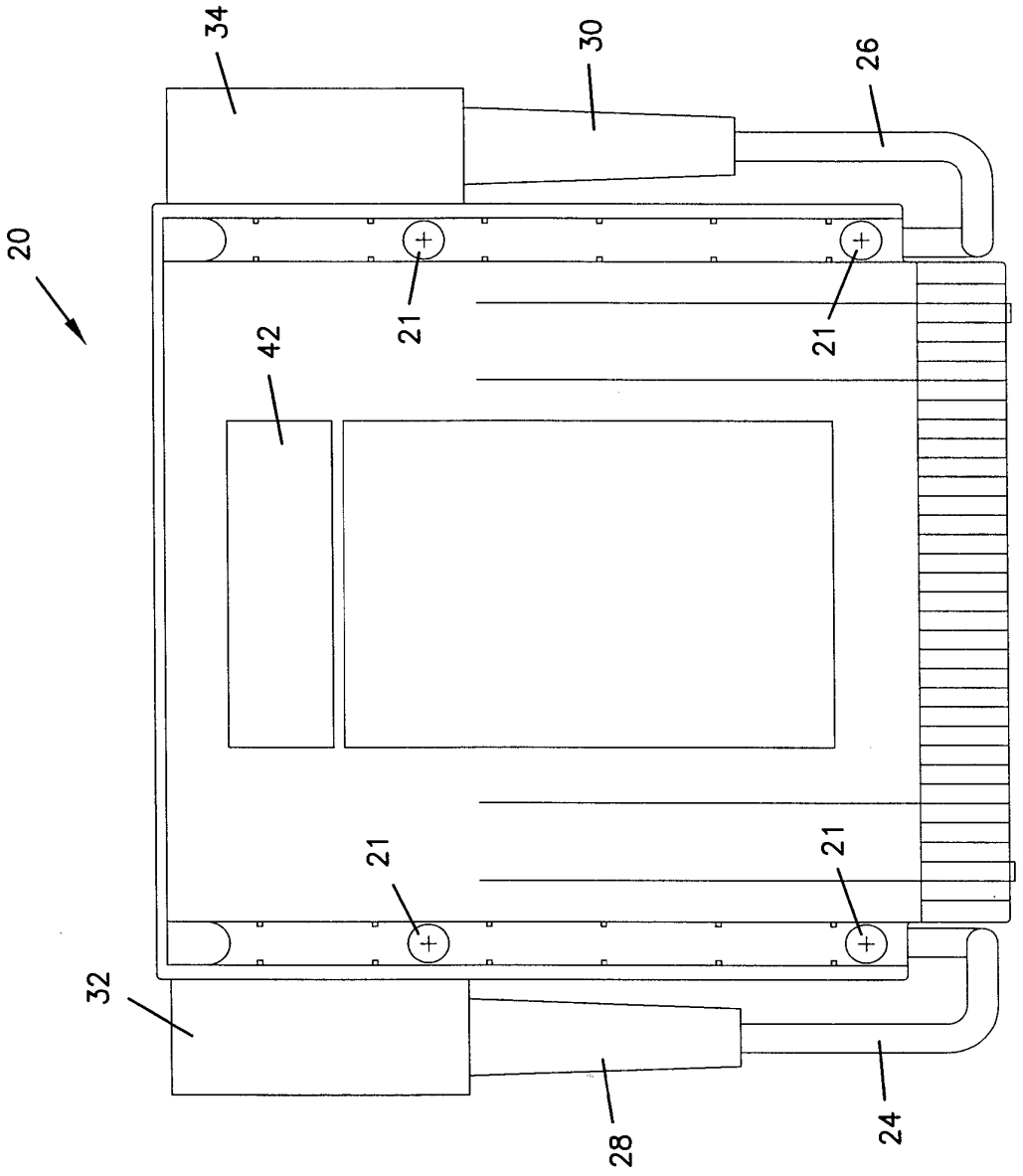


FIG. 3

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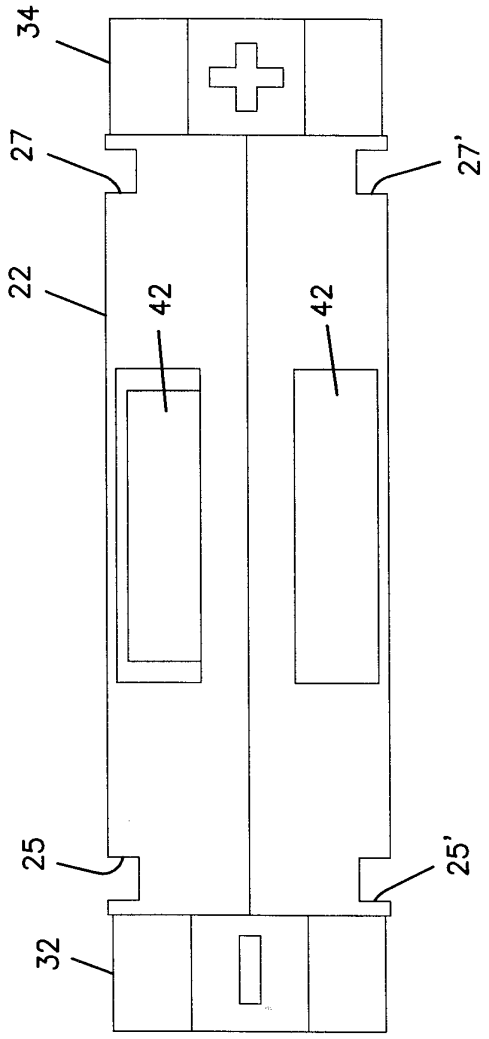


FIG. 4

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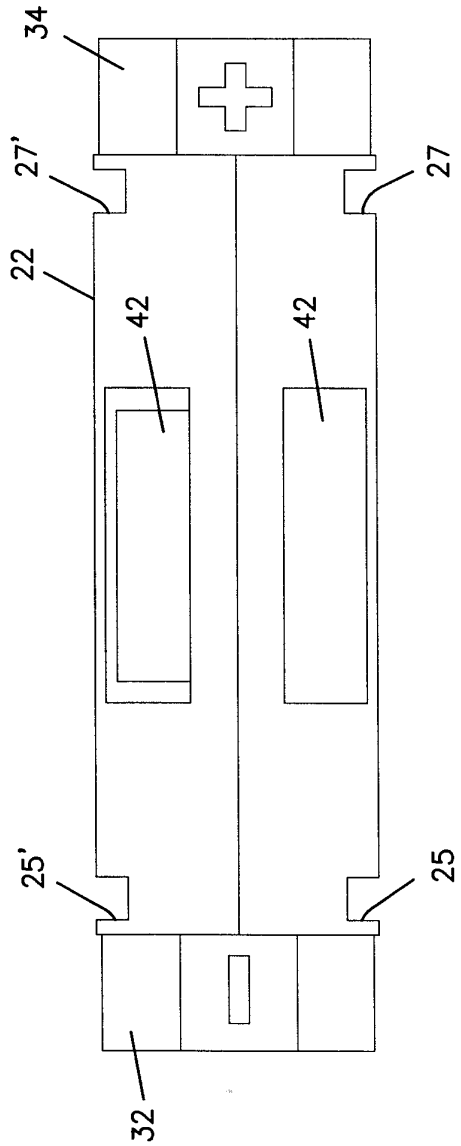


FIG. 5

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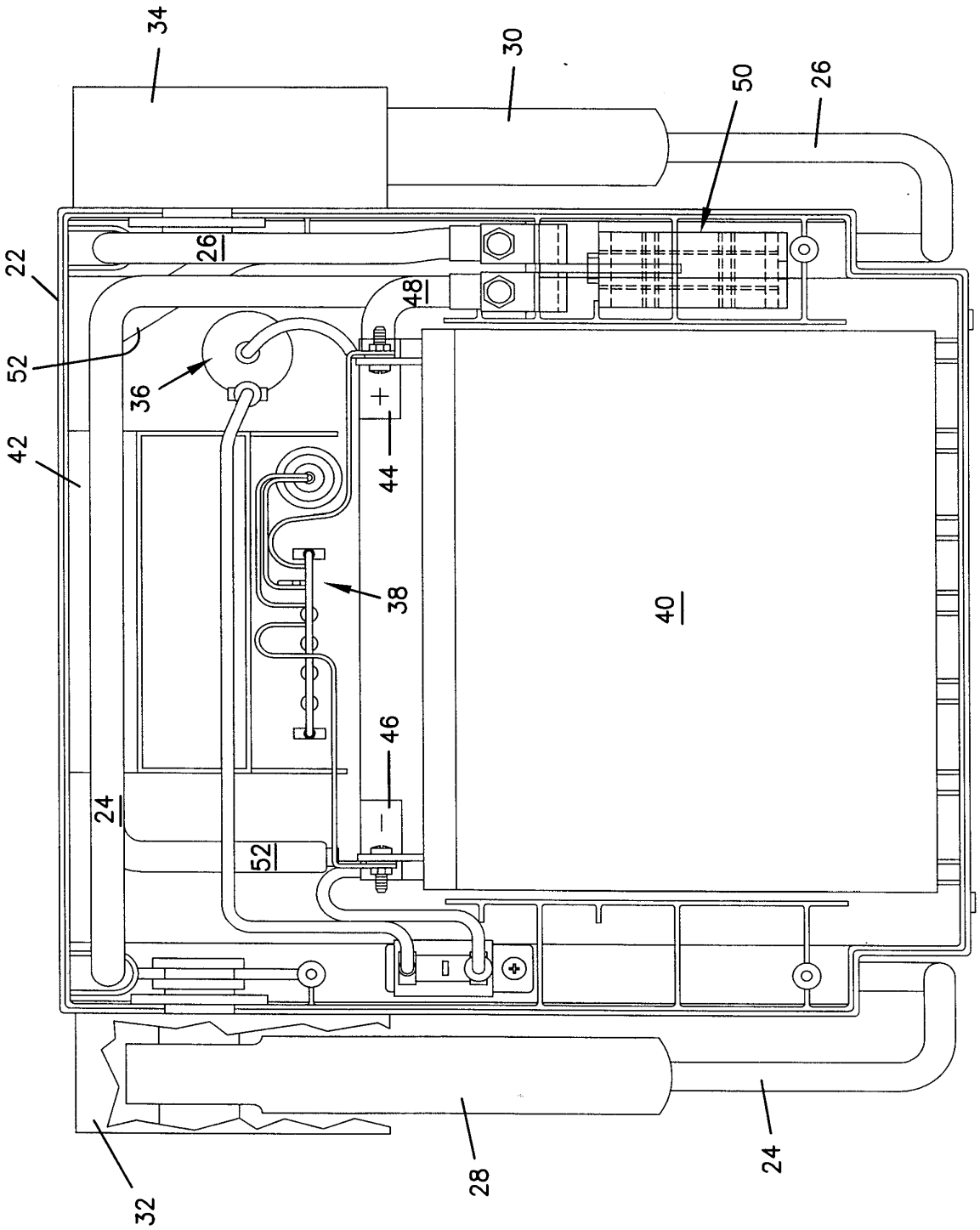


FIG. 6

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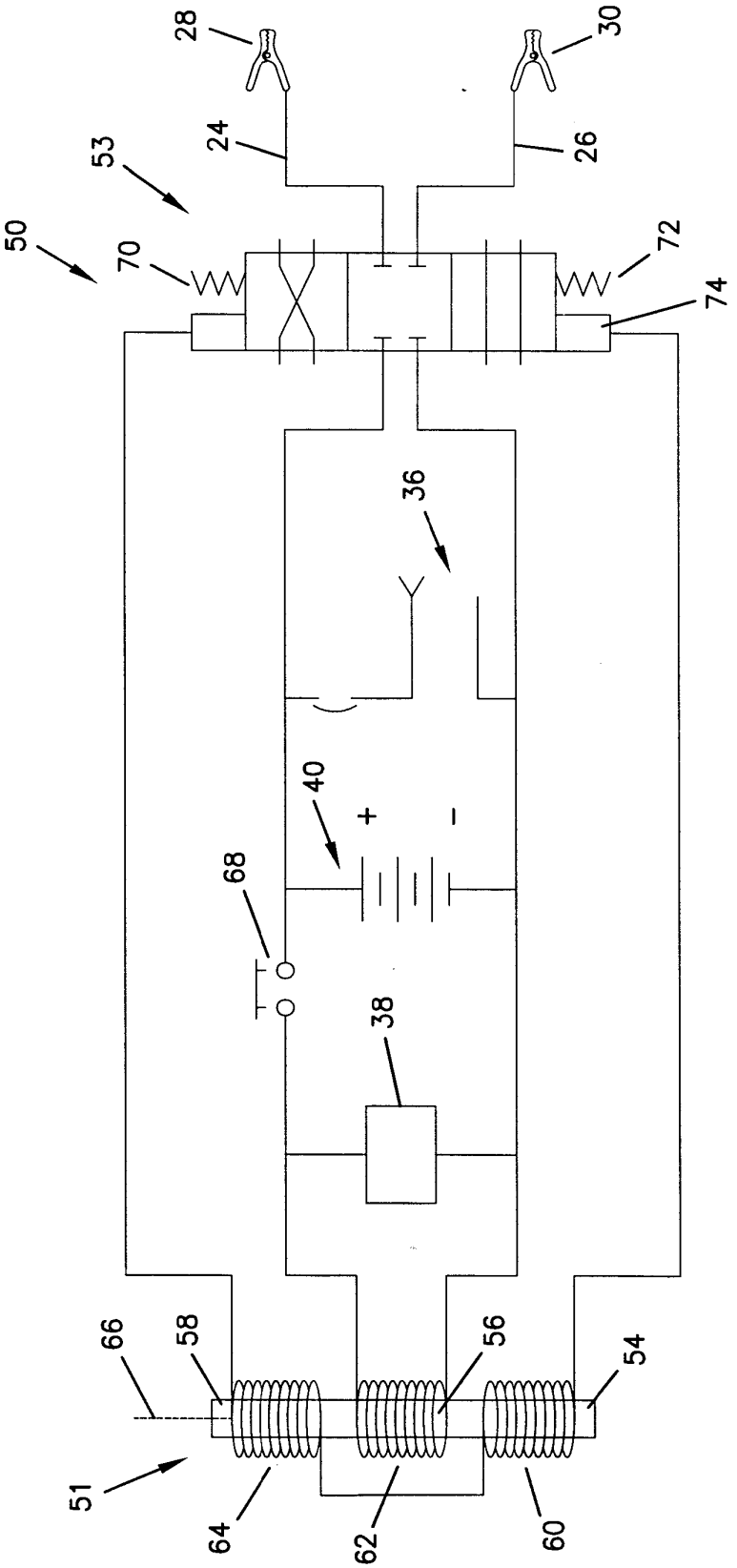


FIG. 7

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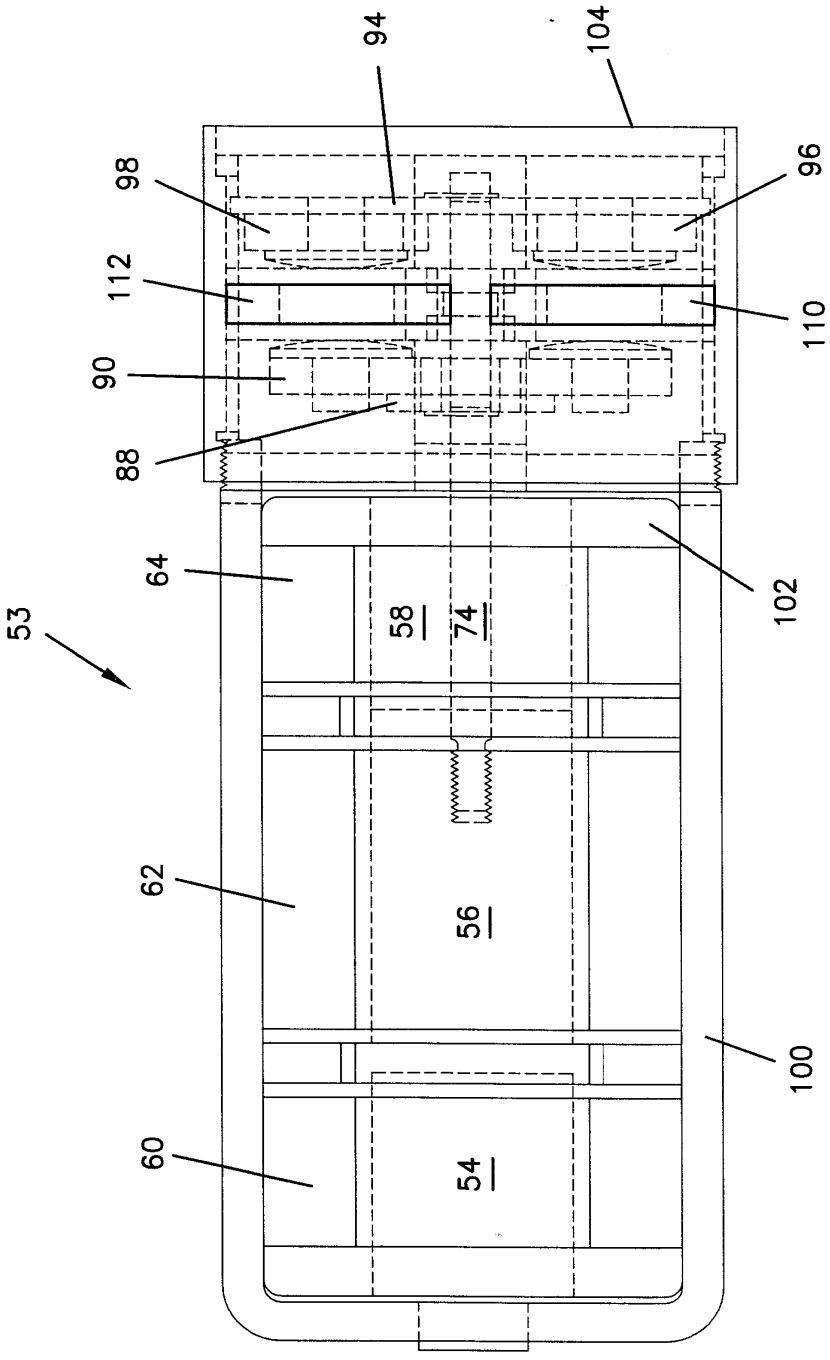


FIG. 8

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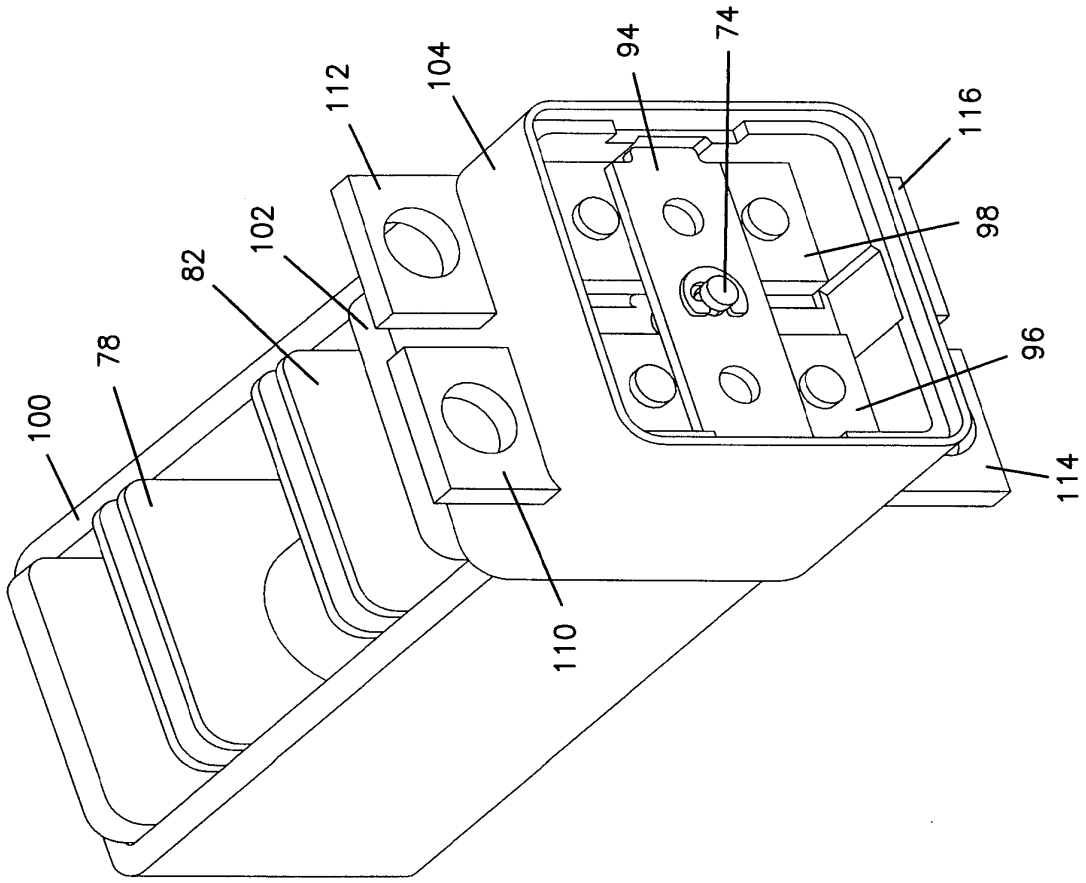


FIG. 9

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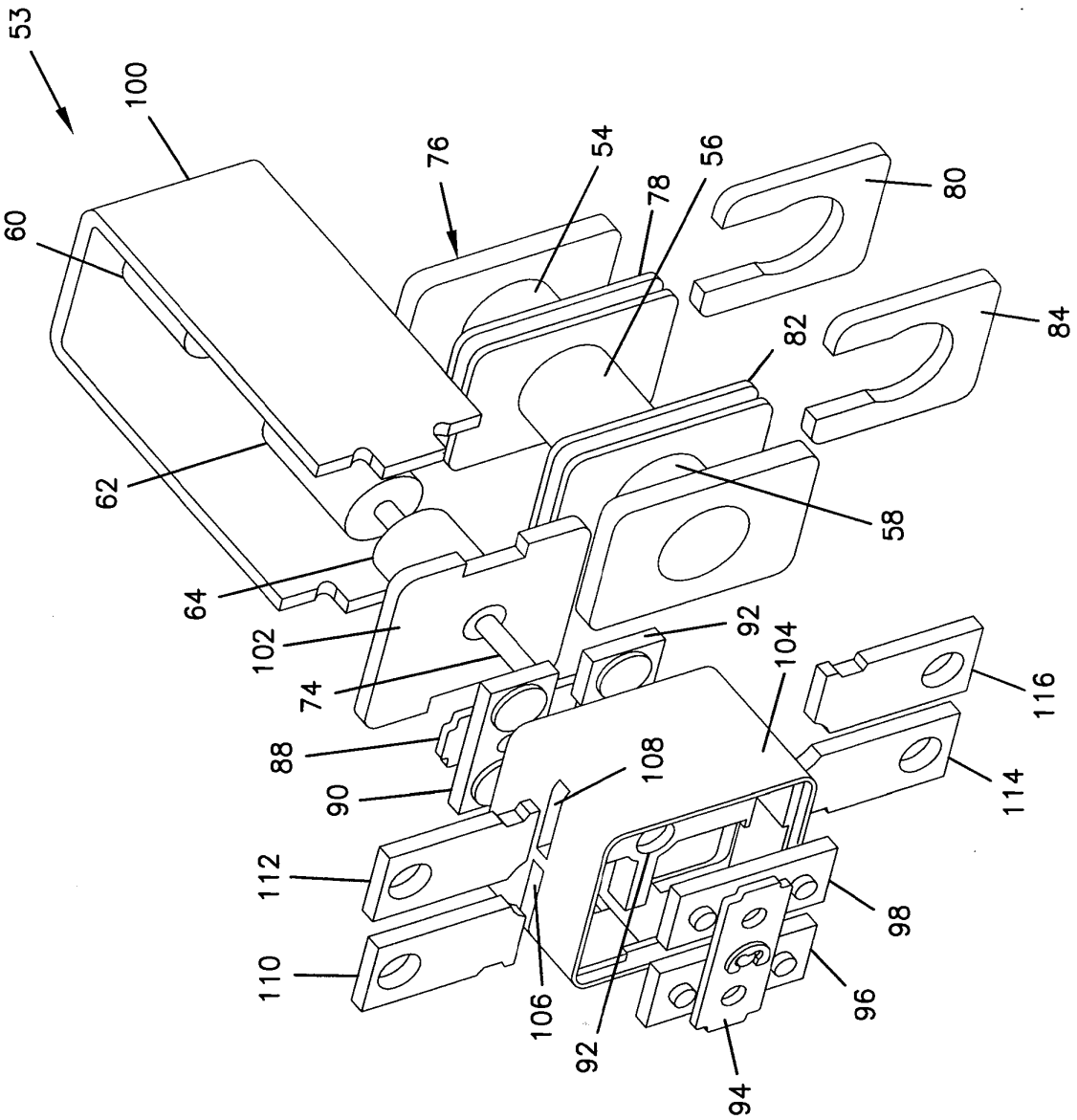


FIG. 10

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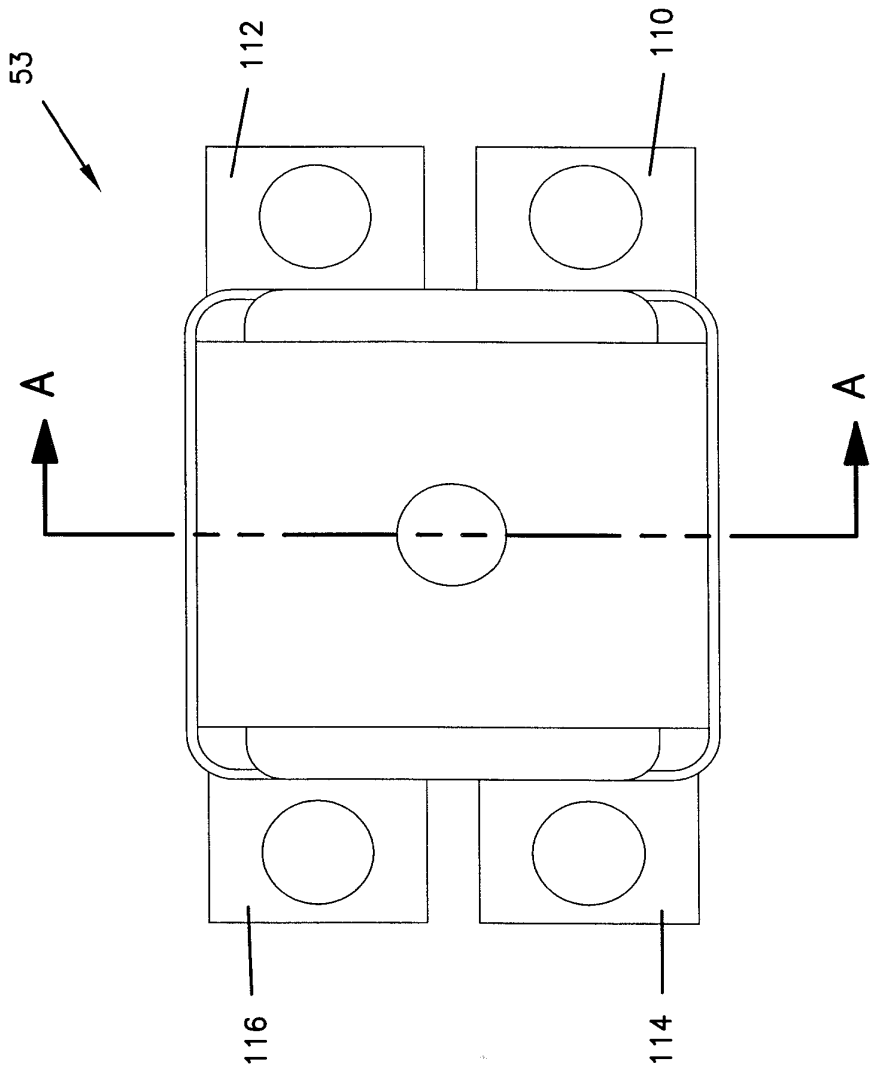


FIG. 11

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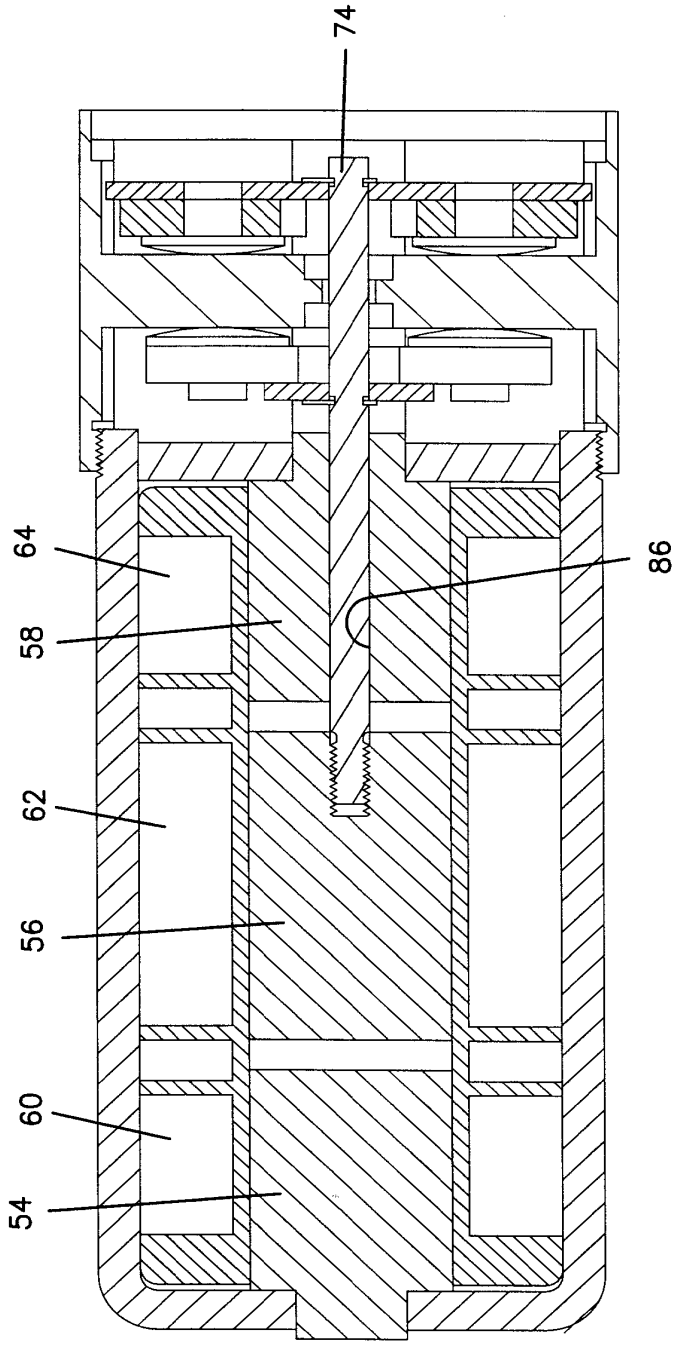


FIG. 12

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INTERNATIONAL SEARCH REPORT

Inte. ial Application No
PCT/US 99/21926

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H02J7/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H02J

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 667 141 A (STEELE LEONARD B) 19 May 1987 (1987-05-19) the whole document	1-7,12, 16,20,21
Y	WO 98 01928 A (SMITH JERRY R) 15 January 1998 (1998-01-15) the whole document	1-7,16, 20,21
A		8,14,15
Y	US 5 589 292 A (ROZON LUC) 31 December 1996 (1996-12-31) cited in the application the whole document	1,12
A	US 5 083 076 A (SCOTT CLYDE A) 21 January 1992 (1992-01-21) the whole document	1-21

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 January 2000	28/01/2000

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Moyle, J

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Form PCT/ISA/210 (second sheet) (July 1992)

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INTERNATIONAL SEARCH REPORT

Inte nal Application No
PCT/US 99/21926

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5 767 661 A (WILLIAMS CARLOS) 16 June 1998 (1998-06-16) the whole document	1-21

1

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte nal Application No
PCT/US 99/21926

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4667141 A	19-05-1987	NONE	
WO 9801928 A	15-01-1998	AU 3800397 A	02-02-1998
US 5589292 A	31-12-1996	CA 2109166 A	26-04-1995
		AU 709769 B	09-09-1999
		AU 6997198 A	30-07-1998
		AU 694452 B	23-07-1998
		AU 7851194 A	22-05-1995
		CA 2175074 A	04-05-1995
		WO 9512221 A	04-05-1995
		DE 9422177 U	12-11-1998
		DE 69415922 D	25-02-1999
		DE 69415922 T	01-07-1999
		EP 0651456 A	03-05-1995
		EP 0911902 A	28-04-1999
		JP 9507604 T	29-07-1997
US 5083076 A	21-01-1992	NONE	
US 5767661 A	16-06-1998	NONE	

Form PCT/ISA/210 (patent family annex) (July 1992)

AUSTRALIA

Patents Act

IN THE MATTER of Australian Patent Application No. 2019201559 in the name of The NOCO Company

- and –

Opposition thereto by Brown & Watson International Pty Ltd

DECLARATION

I, Cory Seligman of 50 Duke Street, Abbotsford, Victoria, 3067 make the following declaration:

1. I am the owner of my own electronic engineering design consultancy.

2. From 1993 to 1998 I studied for a Bachelor of Engineering and a Bachelor of Computer Science at the University of Melbourne.

3. After completion of my Bachelor degrees, I undertook a Masters of Engineering Science (Research) at Monash University. The research for my Masters was related to the application of haptic feedback to a virtual reality laparoscopic surgery simulator.

4. While undertaking and for a number of years after I completed my Masters, I also worked as a research assistant, mainly in the area of electronic hospital and biomedical equipment and in particular maintenance forecasting for such equipment.

5. In 2007 I commenced working with Grey Innovation as a Design Engineer. In that role I was engaged in a wide range of engineering design projects, particularly electronic biomedical equipment. These projects included a tinnitus treatment device, a test harness for eye surgery instruments, a nebulizer for drug delivery and a guitar pedal.

6. I ceased working with Grey Innovation in about 2010 and commenced working as a freelance design consultant, which I continue to do now. In 2011, while continuing my own consultancy practice, I also commenced working with Planet Innovation. Again, I was engaged in a wide range of engineering design projects, including electronic biomedical equipment. I also worked on design relating to general consumer goods and

research projects. These projects included a pathology machine for automated cell culture, a virtual fence cow collar and a motorized golf buggy controller.

My Instructions

7. Initially, I was asked by Phillips Ormonde Fitzpatrick to describe in greater detail a design project I worked on relating to a motorized golf buggy controller and my awareness and understanding of the operation of jump starter devices. After providing those comments, I was then provided with the following documents:

   (a) United States Patent Publication 20040130298;

   (b) an English language translation of Chinese Patent Utility Model Patent CN202696190;

   (c) United States Patent Publication 20140077755; and

   (d) United States Patent Publication 20130154543.

   and asked to describe my understanding of the jump starter devices disclosed in those documents.

8. After providing my understanding of the matters described in the above documents, I was provided with a copy of the specification for Australian Patent Application AU2019201559 ("AU'559") and asked to comment on the disclosure of this document and to compare what is claimed in AU'559 with the disclosure in the documents referred to above. In performing the above tasks, I have been asked to confine my comments to information known to me prior to July 2014.

9. I was also provided with a copy of the specification for Australian Patent Application 2016269555 and asked to comment on the disclosure of this document and to compare what is claimed in AU'559 with the claims of that document.

Motorized golf buggy controller

10. As mentioned above, one of the design projects worked on in about 2016 while with Planet Innovation was a motorized golf buggy controller. The client had been selling a range of motorized golf buggies for some time however supply issues as well as concerns about reliability had led to a need to improve the design, particularly of the controller.

11. The motorized golf buggy included a motor for driving the wheels of the buggy, a battery for powering the motor, a user interface for operating the motor including a user held

remote control and a controller. The user interface incorporated in the buggy included an LCD which displayed information to the user include the on/off status of the buggy, speed, meters travelled and the remaining battery capacity. In addition to the remaining battery capacity, the user display also included warning indicators if the battery voltage was too low to safely operate the buggy or if the battery voltage was too high, indicating that the wrong type of battery had been connected to the buggy. Such an indicator was required because the range of motorized golf buggies included offered for sale by the client included 24, 18 and 12 V models and there was the possibility that a user might attempt to connect a battery intended for one model to a different model buggy. One model of the buggy included a USB port so that the buggy remote could be connected via a cable to allow recharging of the remote from the buggy battery. It was possible to charge other electronic devices from this USB port.

12. The motor and controller of the buggy were hardwired into the buggy frame while the battery was removably connected to the buggy when in use via a connector. This removable connection of the battery allowed removal of the battery from the buggy when not in use to allow the battery to be charged remotely from the buggy. The battery used in the buggy had originally been a lead acid chemistry battery. However the versions of the buggy I was asked to redesign had for some time included lithium chemistry batteries. Lithium chemistry batteries have a number of advantages over lead acid chemistry batteries in an application such as the motorised golf buggy I worked on. Firstly, a lithium battery is substantially lighter than an equivalent lead acid battery. In an application where the user removes the battery from the buggy for charging, a lighter, easier to carry battery is a significant advantage. Lithium batteries also have a greater energy density compared to a lead acid battery and so can be not only lighter but also smaller in size. As smaller lighter battery can be more easily incorporated into a product design. In many applications a lithium battery will also have a longer lifespan compared to a lead acid battery.

13. The connector between the battery and the buggy was designed as a plug which could only be inserted in a single orientation so that a user was not able to connect the battery to the buggy incorrectly. Despite this design, some uses were still able to make an improper connection between the battery and the buggy which on occasion caused a failure to occur.

14. One of the elements of the design task I undertook was to try and improve the consumer protection features of the buggy to prevent failures in the event of improper use. Although a designer will seek to ensure that a product cannot readily be operated in a way that is unsafe for a user of the device of the device itself, in practice some users will

operate the device in an unintended manner. Accordingly, when designing consumer electronics, particularly those involving large batteries, an important consideration is incorporating consumer protection features. Such features are designed to protect the user and the device against consequences of unintended operation.

15. Examples of consumer protections which I sought to include in motorized golf buggy controller were short circuit protection, reverse polarity protection, overrun protection, overheating protection. Such protections could be implemented in a number of ways but might typically involve the use of fuses, measuring device runtime, measuring battery temperature or incorporating a positive temperature coefficient cut out device. The reverse polarity protection for the connection between the battery and the buggy was implemented using solid state switches known as mosfets arranged in series with the power supply to act as soft start mechanism. This arrangement included a reverse diode which would cause a fuse within the battery itself to fail in the event of a reverse polarity connection being made.

Jump starters

16. I am familiar with the electronic product known as a jumpstarter which involves a means of storing electrical energy which can be used to start a motor vehicle if the internal battery of the vehicle loses charge.

17. At its most basic, a jumpstarter requires a battery, a fuse and a mechanism for transferring the electrical energy from the jumpstarter battery to the vehicle battery, for example a pair of leads with alligator clips.

18. I would expect that the device would have a switch to open and close an electrical connection between the internal battery and the output leads. Such a switch could be in the form of an electro-mechanical relay such as a solenoid however by July 2014 I expect that a solid state switch such as a MOSFET switch would more likely be used. By July 2014, a MOSFET switch would likely have been less expensive than an equivalent relay as well as being smaller and lighter.

19. By 2014, I would expect that the jumpstarter would include a lithium chemistry battery rather than lead acid. As discussed above in relation to the motorized golf buggy project, a lithium battery is substantially lighter than an equivalent lead acid battery. Lithium batteries also have a greater energy density and so can be not only lighter but also smaller in size and therefore more easily incorporated into a product design. In the context of a jumpstarted intended for a consumer market, I consider that the lighter smaller jumpstarter would be preferable.

20. The output leads from the jumpstarter could be fixed or could be separate cables that connect to an output on the jumpstarter. If a separate cable was used, mechanically I would expect to use plug in leads that can only be inserted one way to avoid incorrect operation. I would also expect the plug to be designed with no exposed contacts and to be waterproof. The output of the jumpstarter would likely have a flexible panel or door to protect the socket and have some form of guard against fingers or tools like a screwdriver from being inserted into the socket. A connection known as an Anderson plug is widely used in many electrical applications, particularly in devices used in the 4X4/camping community and would be suitable in a jumpstarter application.

21. Typically, in addition to the basic requirements discussed above, a jumpstarter would be designed to include a range of other features to provide various functions to a user of the device and also to protect a user of the device and the device itself against dangers posed by unintended operation.

22. Additional features which I consider would likely be included in a jumpstarter, particularly for example one intended for the consumer market, include some form of visual indicator such as a display panel to provide information to a user, an alternate output to allow the jumpstarter battery to be used to charge other devices and some form of emergency flashlight powered by the battery.

23. I would expect the visual indicator to be able to convey a range of information to a user including that the device is turned on, its status such as whether it is being charged or is providing power to a vehicle battery, the level of charge for the jumpstarter battery and whether a fault condition had been detected and the nature of the fault. The device may also provide more detailed information such as the voltage and current while it is operating. The visual indicator could be implemented in a relatively simple manner using a number of lights such as LEDs or could include an LCD panel able to display more detailed information.

24. Given the prevalence of electronic consumer devices which require charging, I would expect that a jumpstarter would include an output which allowed its battery to be used to charge such devices. A common output which could be used for this purpose would be a USB output port which would enable the connection of the jumpstarter battery to a variety of electronic devices via a USB cable. An alternative would be a cigarette lighter type output although I would expect such an output to be less common by 2014.

25. As the jumpstarter may been to be used in an emergency situation, it may be advantageous for it to include a flashlight to provide illumination for a user attempting to

jumpstart a flat battery. A light included as part of the jumpstarter could also act as an emergency beacon and for example have a flashing mode.

26. I would also expect a jumpstarter to have a range of consumer protections included in its design. I would expect the jumpstarter to have protections against a short circuit which may occur for example of the output leads came into contact with each other. I would expect the jumpstarter to have protection against a reverse polarity connection in case a user incorrectly connected the output leads to the vehicle battery. I would expect the jumpstarter to have overcurrent protection in case it was used to jumpstart a large vehicle engine, duty cycle protection for circumstances where there are multiple failed attempts to jumpstart, overtemperature protection for the battery, overvoltage protection to prevent the jumpstarter from being overcharged, undervoltage protection so that the jumpstarter battery is not overdischarged. If the jumpstarter included lithium chemistry battery cells, to include battery balancing as part of the charging process to individual cells are not over or undercharged.

27. Most of the features discussed above could be implemented in a jumpstarter using hardware alone. However, in a device having more complex user features and protections, I expect that the device would include a microcontroller to implement that functionality. The microcontroller would be programmed to receive a variety of inputs about the status of the jumpstarter and could provide outputs for the purpose of controlling the operation of the jumpstarter as well as providing information to the user.

CN202696190 (Zhang 1)

28. I have been provided with a copy of what I am advised is an English language translation of Chinese Patent Utility Model Patent CN202696190 (“Zhang 1”) and been asked to provide my comments in relation to the matters disclosed in that document. Annexed hereto and marked **Annexure CS-1.** is a copy of Zhang 1.

29. Zhang 1 relates to a jumpstarter with a built-in voice prompt function. I understand the invention described in Zhang 1 to be the addition of voice based audio outputs to an existing jumpstarter device to give a user a verbal indication of the status of the device.

30. Under the heading “Background Technology” there is a discussion of potential problems which might arise as a result of misoperation of a jumpstarter without appropriate protection which may cause damage to the device or harm to a user. It is said that while existing devices include limited operation guidance via audio visual indicators these may be unclear and not allow a user to accurately diagnose a fault condition. It is said that

providing voice prompts facilitates a more direct and clearer operation process for the user.

31. Beginning at paragraph [0005] there is a general description of the features of a jumpstarter. The device is said to include a battery pack which is connected, via a switch and a DC contactor, to an output power clip. The device also includes a CPU which is said to be connected to an audio system.

32. As described at paragraph [0006], the CPU is also connected to sampling and drive control circuit which is connected to the switch, DC contactor and output power clip. The battery pack is connected to a charging port via a power supply control circuit, both of which are also connected to the CPU. The CPU is also connected to a display circuit which includes an "LED Nixie tube" and LED indicator lights of different colours. I note that a Nixie tube is a cathode based glow discharge display device popular in the 50's and 60's used to display characters, principally numbers. I understand the reference to an "LED Nixie tube" in the context of Zhang 1 to be a reference to an LED display. Finally, the sampling and driver control circuit is connected to the force start button.

33. Except for the voice prompt function, I consider that this general description of a jumpstarter device is essentially the same as the device I discussed above.

34. Beginning at paragraph [0019] there is a description of a specific embodiment of a jumpstarter by reference to the circuit diagrams shown in figures 2 to 5. The main functions of the jumpstarter are set out in paragraphs [0021] to [0030]. These functions include, a low voltage alarm, undervoltage shutdown protection, correct connection identification, reverse polarity shutdown protection, incorrect voltage shutdown protection, overcurrent shutdown protection, short circuit shutdown protection and a forced start function.

35. The jumpstarter includes an internal battery pack, which in addition to providing power for jumpstarting operations, powers the microcontroller and circuits of the device itself via a voltage regulator. At paragraphs [0045] to [0048] there is a description of the operation of the device after initial powering on of the microcontroller. If the microcontroller detects that the output voltage of the battery pack is too low, indicating it is depleted and requires charging, a prompt is provided to the user and the electrical outputs from the device are shut down. In paragraph [0048] there is a description of the charging process which includes visual indications of the charging process being ongoing and separately completed.

36. In paragraph [0050] there is a description of the operation of the device when output clips are correctly connected to the vehicle battery terminals. When such a connection is made, circuit IC5 which includes an optocoupler, sends a correct connection signal to the microcontroller, indicating that the output power clip is connected correctly and reliably. The microcontroller outputs a high level to the control circuit of the DC contactor to switch it on and connect the battery pack to the output clips. The microcontroller also outputs a signal to the voice chip to retrieve the correct connection and conduction voice prompt as well as causing the 12 V indicator light and the correct connection LED indicator light to be lit. The LED Nixie tube automatically displays the integrated voltage value after the internal and external batteries are connected.

37. In paragraph [0051] there is a description of the operation of the device when output clips are incorrectly connected to the vehicle battery terminals. When such a connection is made circuit IC6 which includes an optocoupler, sends a reverse connection signal to the microcontroller. The microcontroller detects that the external battery is connected in reverse polarity. The DC contactor will maintain its disconnected state. The microcontroller outputs a signal to the voice chip to retrieve the reverse connection voice prompt as well as causing the 12 V light and the reverse connection alarm indicator light LED7 to be lit. The LED Nixie tube automatically flashes a reverse connection error code "Er1".

38. As described in paragraphs [0051] and [0052] of Zhang 1, the embodiment of the jumpstarter described and illustrated in figures 2 to 5 includes two oppositely biased optocouplers. When the device is not connected to a battery, both optocouplers will be in a low output state. When the device is correctly connected to a battery having at least some voltage potential, the optocoupler of circuit IC5 will change to a high output state providing a signal to the microcontroller of correct connection. The optocoupler of circuit IC6 will remain in a low output state. When the device is incorrectly connected to a battery having at least some voltage potential, the optocoupler of circuit IC6 will change to a high output state providing a signal to the microcontroller of an incorrect reverse polarity connection. The optocoupler of circuit IC5 will remain in a low output state.

39. In paragraph [0058] there is a description of a force start operation. This enables the device to be used to jumpstart a vehicle battery having essentially no voltage.

US2014/0077755 (Zhang 2)

40. I have been provided with a copy of Unites States Patent Publication US2014/0077755 ("Zhang 2") and been asked to provide my comments in relation to the matters disclosed in that document. Annexed hereto and marked **Annexure CS-2.** is a copy of Zhang 2.

41. Zhang 2 is titled “Emergency power supply starting system for a lithium battery with automatic preheating function” and relates to a jumpstarter with such a preheating function. I understand the invention described in Zhang 2 to be the addition of heating source to an existing jumpstarter device to provide for automatic heating of the device’s battery in low temperature conditions.

42. Under the heading “Background Technology” there is a discussion of the reduction of discharge performance of lithium batteries at low temperatures. In the context of a jumpstarter, this problem is said to be exacerbated by lower temperatures also increasing the starting current requirement for an automobile. It is said that from a use perspective, it would be advantageous to use some of the energy stored in the device battery to preheat that battery and restore is efficiency.

43. Beginning at paragraph [0005] there is a general description of the features of a jumpstarter which includes a lithium battery pack, an output control module, an output module, a working power supply control module, a CPU master control module, an operation panel display function module, a heater control module, a heater module, an information sampling module and a charging module.

44. The heater module is disposed on the outside of the lithium battery pack, heating the lithium battery under the control of heater control module which receives information from the CPU master control module.

45. The working power control module detects usage state, and controls switching on and switching off of power as well as providing standard working power supply and sampling reference power supply for the CPU master control module.

46. The output control module, connected with the lithium battery pack, controls Switching on and Switching off the power supply of the lithium battery pack for an external device.

47. The information sampling module collects voltage of the lithium battery pack, external connection status, real time status during the charging process, operation information and real-time temperature information of the lithium battery pack and conditions the signals for sampling by the analogue inputs of the CPU master control module. The CPU master control module receives information from the sampling module and executes processes including estimating real-time residual capacity of lithium battery pack and when abnormal battery voltage change occurs, sending alarm information or compulsory Switching off instructions, estimating and distinguishing the connection status of a connected external battery apparatus and sending a corresponding instruction or compulsory Switching off message when an error occurs, estimating temperature of the

lithium battery pack, and on condition of anomaly of battery temperature, raising an alarm or driving the heater control module to start heating and to adjust power of heating and total heating time with reference to the residual capacity of the lithium battery pack.

48. The operation panel display function module serves as the input and output window between machine information and user and submits the user operation information through operation buttons and then displays the processed information from the CPU master control module.

49. Except for the battery heating function, I consider that this general description of a jumpstarter device is essentially the same as the device I discussed above.

50. From paragraph [0034] there is set out a more detailed description of the invention.

51. In paragraph [0045], it is said that the lithium battery pack comprises several individual lithium batteries combined together by means of series connection or a combination of series and parallel connection.

52. In paragraph [0047], it is said that the output module, comprises output wires, an output connecting port, and/or a positive, or a negative port clip, and functions mainly to establish a fast connection between the battery and an external electric device by means of the output system.

53. In paragraph [0065], it is said that if ports “V1' is inversely connected with an external clip, the external reverse connection signal will be transferred through IC5 into an inner positive signal, which will be transmitted to the input port of diode D1. Circuit IC5, shown in figure 4 is similar the reverse polarity circuit described in Zhang 1 and includes an optocoupler. As described in paragraph [0068], if the positive electrode clip of the device is connected to the negative electrode of the external vehicle battery, and the negative electrode clip is connected to the positive electrode of the external battery, the voltage of the external battery is current transferred into an optical signal by IC5 and D5, and turned back into an electric signal by IC5. The electric signal is divided in two, with one part initiating working power to the CPU while the other acts as an information input into the CPU to be processed. Paragraph [0068] also refers to the USB output and charging control circuit shown in figure 6.

54. In paragraph [0069], it is said that in the sampling circuit, “CH/A” serves as a sample of the charging current intensity, “V2 as a sample of the working status of the inner battery and “external BAT+” as a sample of correctness of the external battery polarity of output clip. It is said that “CH+” acts as a sample of the input Voltage of the charger to judge whether there is charging Voltage input and if so, the corresponding charging indicating

circuit will be powered on to transmit real-time charging status to the user by an LED. It is further said that “inner BAT" samples the electric quantity of the internal battery with the power supply and “BSB-VCC connected to the same terminal so that the real-time residual capacity of the battery is indicated with LED lights of various colours.

55. In paragraph [0071], it is said that LED1 and LED4 serve as indications of the connection status of the jumpstarter with the external battery. When it is connected correctly, LED4 (greenlight) will light up while when the external connection is in reverse, LED1 will fast blink (0.25 son/0.25 s off) and beep with a continuous alarm. Further, if the voltage of the external battery is incorrect, LED1 will slowly blink (1 son/1s off) and beep with a continuous alarm to indicate a misconnection of the inner and external batteries.

56. In paragraph [0072], it is said that LED2, LED5 and LED6 serve as indications of battery electric quantity and further that a rolling flicker of these lights indicates for charging. If the battery voltage is lower than 11.5V, the LED2 (red light) will light up, when higher than 11.5V but less than 12.5V, LED6 (yellow light) will light up and when higher than 12.5V but lower than 15.5V, LED5 (green light) will light up. If the voltage is higher than 15.5V, LED5 will blink along with a continuous audio alarm. When the charger is connected and the battery is charging, LED2, LED5 and LED6 will automatically light in a rolling cycle, which indicates that it is being charged. When the charging of battery is complete, LED2, LED5 and LED6 will be constantly lit indicating that the battery is fully charged.

57. In paragraph [0073], it is said that LED3 serves as an indicator of the battery temperature. When battery temperature is over 60° C., LED3 (red light) will light up and sound an alarm continuously, when the battery temperature is too low, the machine will heat the battery automatically after the system is powered on, and LED3 will flicker (0.5 son/0.5 s off), which indicates that the battery temperature is too low and the machine is in the heating process. When the heating process complete or the battery temperature is in the normal range, LED3 goes off automatically.

US2004/0130298 (Krieger)

58. I have been provided with a copy of United States Patent Publication 20040130298 (“Krieger”) and been asked to provide my comments in relation to the matters disclosed in that document. Annexed hereto and marked **Annexure CS-3.** is a copy of Krieger.

59. Krieger is titled “Microprocessor controlled booster apparatus with polarity protection” and relates to a device for jumpstarting an automotive vehicle with a depleted battery.

60. Under the heading summary of the invention, Krieger commences with a discussion of a polarity protection circuit comprised of solid-state devices. The polarity protection circuit is electrically connected to the battery to be charged referred to as a depleted battery and to a boosting battery. The polarity protection circuit prevents current flow between the batteries unless proper polarity is achieved.

61. As described in paragraph [0012], the device can include a microprocessor as part of the polarity protection circuit, with the microprocessor also performing other detection and control functions within the device. Paragraph [0020], indicates that one such control function which may be performed by the microprocessor is measurement of the voltage at the clamps of the device when attached to a depleted battery. If no voltage is detected at the clamps, a bad battery fault is indicated while if a voltage is detected, the device proceeds with a jumpstarting operation.

62. From paragraph [0028] of Krieger, there is a detailed description of embodiments of the invention. Figure 1 shows a jumpstarter device which includes a polarity protection circuit and a boosting battery with positive and negative terminals coupled to a pair of alligator clamps for connection to a depleted battery. The boosting battery is connected to the clamps by a wire or battery cable.

63. As described at paragraph [0030] the device includes a switch having a number of solid state devices in the form of field effect transistors (FETs) connected in parallel which are maintained in an off or non-conducting state when there is no voltage at the clamps, to prevent current flow from the boosting battery to the depleted battery.

64. From paragraph [0030] there is a discussion of how the polarity sensing circuit is controls the activation of the FET switch. The polarity sensing circuit includes an opto-coupler connected to the positive terminal of the boosting battery. As described in paragraphs [0033] and [0034] of Krieger, when the clamps of the jumpstarter are connected to a depleted battery with the correct polarity, the LED is properly biased. When the LED emits light, the phototransistor of the opto-coupler switches on and current flows to the control electrodes of the FETs placing them in a conductive state. With the FET switch turned on, the circuit between the boosting battery and the depleted battery is complete.

65. On the other hand, when the clamps of the jumpstarter are connected to a depleted battery with the incorrect polarity, the LED of the opto-coupler is reverse biased. Without light from the LED, the phototransistor is in a non-conductive state and the control electrodes of the FETs remain off. No current can flow from the boosting battery to the depleted battery while the FETs are in this non-conductive state.

66. As described in paragraph [0035] of Krieger, after a correct polarity connection is made, the depleted battery is charged, or the automotive vehicle jumpstarted. Following this operation, the clamps will be disconnected by the user. Once the clamps are disconnected, the opto-coupler is no longer forward biased and in the absence of current flow turn the FETs are switched off. The boosting circuit is returned to a non-conductive state and a short circuit by contact between the clamps or a subsequent reverse polarity connection is avoided.

67. The jumpstarter described by reference to figure 1 has an opto-isolator directly acting to switch on the FETs. Another embodiment of the invention described by reference to figure 5 includes a microprocessor. From paragraph [0043] there is a discussion of the microprocessor being programmed to perform various control functions. The inclusion of a microcontroller also means that the jumpstarter can include a display and an input device to enable an operator to receive information from and input information into the microprocessor. The microprocessor can monitor the voltage or current being supplied to the depleted battery, the voltage or current of the depleted battery and can detect short circuits or other faults.

68. Paragraphs [0045] to [0047] of Krieger describe how in such an embodiment, the microprocessor is used to control the FET switch. Rather than controlling the FETs directly, the opto-coupler provides input signals to the microprocessor to indicate whether there is a correct or reverse polarity connection between the clamps and the depleted battery. If the signal received from the opto-coupler indicates a correct polarity connection, the microprocessor provides an output signal to activate the FET switch into a conducting state. If the clamps are connected to a depleted battery with an incorrect polarity the switch will remain off. The microprocessor may cause an error message to be displayed to a user and activate an audible alarm.

69. In paragraph [0048] it is noted that the microprocessor can be programmed to detect if the clamps are connected to a battery or have been disconnected. With the switch deactivated and in a non-conducting state, the microprocessor detects whether the clamps are connected to a battery. If not, then the switch will remain in a non-conductive state. This check is performed once every second and is said to be transparent to the operation of the device.

70. As described in paragraph [0054], the jumpstarter can also be used to determine the voltage of a depleted battery. The clamps are be connected to a depleted battery with the switch in a non-conductive state. A voltage regulator then produces a voltage signal proportional to the voltage of the depleted battery. The voltage signal is used by the microprocessor to determine and display the depleted battery voltage.

71. From paragraph [0055] of Krieger, there is a description of the microprocessor being programmed to detect a battery which is either bad or which has a voltage too low to be jump started. When the clamps are connected to a battery with a very low voltage it is effectively as if the clamps are not connected to anything. The microprocessor does not detect any voltage at the clamps and if an attempt to jump start the vehicle is made, a fault condition is displayed to the user. The same type of fault condition will also arise if there is no battery connected to the clamps and an attempt to jump start is made.

72. Paragraph [0066] indicates that the jumpstarter's display can output to the user information available to the microprocessor which can include results of the self-test, the status or condition of the internal battery and the depleted battery and a reverse polarity connection warning.

US2013/0154543 (Richardson)

73. I have been provided with a copy of United States Patent Publication 20130154543 ("Richardson") and been asked to provide my comments in relation to the matters disclosed in that document. Annexed hereto and marked **Annexure CS-4.** is a copy of Richardson.

74. Richardson is titled "Method and apparatus for providing supplemental power to an engine" and relates to a device which can be used to jump start a vehicle with a depleted battery. Paragraph [0007] states that the invention monitors the voltage of the vehicle battery to determine if a proper connection has been made and to provide fault monitoring. The system will only operate if a proper polarity connection is detected. Other safety protections including open or short circuit and clamp disconnection are included in the device.

75. As described in paragraph [0014], the jump starter of Richardson has a programmable microprocessor which receives inputs and produces informational and control outputs. Figure 1 illustrates a functional block diagram of the microcontroller, with inputs from a reverse voltage sensor, vehicle voltage sensor, battery temperature sensor, automatic/manual mode push button. Figure 1 also shows outputs including control signals and data to be shown on an LCD display, reverse voltage LED, auto/manual mode LED, fault LED and an Annunciator (audible alarm).

76. Paragraph [0016] of Richardson states that the device includes a battery voltage sensor to monitor the voltage level of the jump starter batteries, a reverse voltage sensor to monitor the polarity of the jumper cables and a vehicle voltage sensor to monitor the voltage of the vehicle battery. Further, paragraph [0017] states that the device also

includes a battery temperature sensor to monitor the temperature of the jump starter's batteries to detect overheating and automatic and manual pushbutton inputs to accept user input to select a mode of operation.

77. Paragraph [0020] indicates that microprocessor outputs include providing data to an LCD to display user instructions, error messages and real time sensor data during operation of the device. A reverse voltage LED will be illuminated if the microprocessor determines that a reverse voltage jumper cable connection is detected by the reverse voltage sensor. The mode of operation selected by a user will be displayed by the respective auto and manual mode LEDs.

78. As described in paragraph [0021], a relay control output from the microprocessor operates a contact relay. When the jump starter operation has been successfully initiated, the relay is closed and the jumpstarter battery is connected to the depleted vehicle battery. Once the jump starting process is completed or if a fault condition is detected, the relay will be opened to disconnect the batteries.

79. Figures 2A to 2D of Richardson show schematic circuit diagrams while figures 3 to 8 set out processing flow charts describing the operation of the jump starter. As described in paragraph [0022] when the device is initially powered on, the microprocessor initialized the hardware components and performs a series of self-tests including all the sensors. An error message is displayed to the user and system operation halted if any fault is detected. Paragraph [0023] states that after the self-test operations have been completed, the main processing loop begin. An interrupt service routine continues to monitor the input sensor values and user input buttons.

80. As described a paragraph [0027], if the system does not detect a battery charging voltage once the jumper cables have been connected to the vehicle battery, the reverse polarity sensor will measure the voltage. If the measured voltage indicates that a reverse polarity connection has been made, an error flag is set. Further, an error message is displayed on the LCD and the reverse voltage LED is illuminated. Further jump starter operation is ignored until the reverse polarity condition is corrected.

81. Paragraphs [0028] to [0032] of Richardson describe the microprocessor performing other system tests using the sensors previously described to determine the state of charge of the jumpstarter battery, the temperature of the battery and other potential faults.

82. From paragraph [0033] there is a description of the function of the automatic and manual push buttons. Selection of either of these two buttons will cause the system to compare

the user selected voltage with the voltage of the vehicle to determine if the selection is within the correct range. If the measure voltage is outside the predetermined allowable range, a fault condition will be displayed to the user and further operation of the device prohibited until the voltage selection is corrected.

83. Paragraph [0035] of Richardson states that after the voltage selection voltage is found to be correct and if the automatic push button was selected, a 90 second countdown time is started. The timer is displayed on the LCD. During the countdown period, the user can try to jump start the vehicle. A “Jumps Starter On” message is displayed, and the Auto Mode LED is on. The system monitors the jumpstarter during this period. If a fault condition is detected, microprocessor will cause the contact relay to open to disconnect the jumpstarter battery from the clamps. The LCD will display a message indicating that a fault has occurred, and any action that should be taken by the user. For example, the contact relay will be opened and error message is displayed if the battery temperature exceeds a maximum limit.

Australian Patent Application AU2019201559

84. I have been provided with a copy of AU’559 and been asked to provide my comments in relation to the matters disclosed in that document. I have also been asked to compare the claims of AU’559 with the documents discussed above. Annexed hereto and marked **Annexure CS-5.** is a copy of AU’559.

85. At page 1 of AU’559 there is a discussion of the background to the invention including reference to what are said to be two problems with known devices;

    i. The jumper terminals or cable clamps could be inadvertently brought into contact with each other causing a short circuit; and

    ii. The terminals could be connected with the incorrect polarity.

86. As I discussed above, I consider these potential problems to be self-evident in the context of a jumpstarter device. I consider that any competent engineer designing a jumpstarter in July 2014 would recognize the potential for a short circuit and reverse polarity connection and would take steps to design protections against such events. Further, in light of the documents discussed above, I consider that each these issues had been resolved by others before July.

87. At paragraphs [0004] to [0012] of AU’559, there is a discussion of various patent documents which are said to described jumpstarter devices or jumper cables which

address one or both of these problems. I am unsurprised that these issues have been addressed by numerous other designers.

88. Paragraph [0013] of AU'559 it is claimed that previous attempts to solve the problems noted above suffer from shortcomings either in complexity, cost or potential for malfunction leaving a need for further improvements in vehicle jump start devices. I understand that the invention of AU'559 is intended to make such improvements.

89. Paragraph [0014] of AU'559 describes what is said to be an aspect of the invention, being an apparatus for jump starting a vehicle having a depleted or discharged vehicle battery with positive and negative polarity terminals, the device having the following features:

1.1. a power supply;

1.2. a positive polarity vehicle battery terminal connector;

1.3. a negative polarity vehicle battery terminal connector;

1.4. a vehicle battery isolation sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the vehicle battery isolation sensor configured to detect a presence of the vehicle battery when connected between the positive and negative polarity vehicle battery terminal connectors;

1.5. a reverse polarity sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the reverse polarity sensor configured to detect a polarity of the vehicle battery connected between the positive and negative polarity vehicle battery terminal connectors and to provide an output signal indicating that the positive and negative polarity terminals of the vehicle battery are properly connected to the positive and negative polarity vehicle battery connectors;

1.6. a power switch connected between the power supply and the positive and negative polarity vehicle battery terminal connectors; and

1.7. a microcontroller;

1.7.1. configured to receive input signals from the vehicle isolation sensor and the reverse polarity sensor,

1.7.2. the microcontroller is configured to provide an activating output signal to turn on the power switch to cause the power supply to be connected to

the positive and negative polarity vehicle battery connectors in response to the microcontroller receiving input signals simultaneously from the sensors indicating both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors, and

1.7.3. the microcontroller is configured to provide a deactivating output signal to turn off the power switch to cause the power supply to be disconnected from the positive and negative polarity vehicle battery connectors in response to the microcontroller receiving input signals from the sensors indicating the absence of the vehicle battery connected to the positive and negative polarity vehicle battery connectors and/or improper polarity connection of the positive and negative polarity terminals of the vehicle battery to the positive and negative polarity vehicle battery connectors.

90. Paragraph [0014a] of AU'559 describes what is said to be another aspect of the invention, being an apparatus for jump starting a vehicle having a depleted or discharged vehicle battery with positive and negative polarity terminals, the device having the following features:

2.1 a power supply;

2.2 a positive polarity vehicle battery terminal connector;

2.3 a negative polarity vehicle battery terminal connector;

2.4 a vehicle battery isolation sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the vehicle battery isolation sensor configured to detect a presence of the vehicle battery when connected between the positive and negative polarity vehicle battery terminal connectors;

2.5 a reverse polarity sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the reverse polarity sensor configured to detect a polarity of the vehicle battery connected between the positive and negative polarity vehicle battery terminal connectors and to provide an output signal indicating that the positive and negative polarity terminals of the

vehicle battery are properly connected to the positive and negative polarity vehicle battery connectors;

2.6 a power switch connected between the power supply and the positive and negative polarity vehicle battery terminal connectors; and

2.7 a microcontroller;

2.7.1 configured to receive input signals from the vehicle isolation sensor and said reverse polarity sensor,

2.7.2 the microcontroller configured to control operation of the power switch,

2.7.3 wherein the microcontroller is configured to turn on the power switch when receiving input signals from the vehicle isolation sensor and reverse polarity sensor indicating both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors, and

2.7.4 wherein the microcontroller is configured to turn off the power switch when receiving input signals from the sensors indicating the absence of the vehicle battery connected to the positive and negative polarity vehicle battery connectors and/or improper polarity connection of the positive and negative polarity terminals of the vehicle battery to the positive and negative polarity vehicle battery connectors.

91. In both the apparatus described in paragraph [0014] and [0014a] of AU'559 there is a power switch connected between the power supply and the positive and negative polarity vehicle battery terminal connectors. In the apparatus described in paragraph [0014], "the microcontroller is configured to provide an activating output signal to turn on the power switch to cause the power supply to be connected to the positive and negative polarity vehicle battery connectors". However, in the apparatus described in paragraph [0014a], the microcontroller is merely configured to turn on the power switch without any description of what if any effect results from that switch being turned on. It might be inferred that turning on the power switch results in the power supply being connected to the positive and negative polarity vehicle battery connectors, but this is not made clear.

92. Paragraph [0014b] of AU'559 describes what is said to be a further aspect of the invention, being an apparatus for jump starting a vehicle having a depleted or

discharged vehicle battery with positive and negative polarity terminals, the device having the following features:

3.1 a power supply;

3.2 a positive polarity vehicle battery terminal connector;

3.3 a negative polarity vehicle battery terminal connector;

3.4 a vehicle battery isolation sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the vehicle battery isolation sensor configured to detect a presence of the vehicle battery when connected between the positive and negative polarity vehicle battery terminal connectors;

3.5 a reverse polarity sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the reverse polarity sensor configured to detect a polarity of the vehicle battery connected between the positive and negative polarity vehicle battery terminal connectors and to provide an output signal indicating that the positive and negative polarity terminals of the vehicle battery are properly connected to the positive and negative polarity vehicle battery connectors;

3.6 a power switch connected between the power supply and the positive and negative polarity vehicle battery terminal connectors; and

3.7 a microcontroller;

3.7.1 configured to receive input signals from the vehicle isolation sensor and the reverse polarity sensor,

3.7.2 the microcontroller is configured to turn on the power switch to cause the power supply to be connected to the positive and negative polarity vehicle battery connectors in response to the microcontroller receiving input signals simultaneously from the sensors indicating both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors, and

3.7.3 the microcontroller is configured to turn off the power switch to cause the power supply to be disconnected from the positive and negative polarity vehicle battery connectors in response to the microcontroller receiving input signals from the sensors indicating the absence of the vehicle

battery connected to the positive and negative polarity vehicle battery connectors and/or improper polarity connection of the positive and negative polarity terminals of the vehicle battery to the positive and negative polarity vehicle battery connectors.

93. The apparatus described in paragraphs [0014] and [0014b] of AU'559 appear to me to be identical except that the former states that the microcontroller provides an activating/deactivating output signal to turn on/off the power switch, while the later states that the microcontroller turns on/off the power switch. It is not apparent to me how the microcontroller of the apparatus described in paragraph [0014b] could turn on/off the power switch without providing something which would be considered an activating/deactivating output signal. Accordingly, I do not understand there to be any practical distinction between the two apparatus.

94. The apparatus described in each of paragraphs [0014], [0014a] and [0014b] appear to me to be typical jumpstarters controlled by a microprocessor and having well known safety features including the ability to detect the presence of a battery and the polarity of the device's connection to that battery. This information is then used by the microprocessor to determine whether it is safe to commence a jump starting operation. It is not apparent to me that jumpstarters having the features described in these paragraphs will provide an improvement over known devices with respect to any of complexity, cost or potential for malfunction. There is nothing about the apparatus described in any of paragraphs [0014], [0014a] and [0014b] which will inherently result in lower complexity or cost. While the devices described do include features directed to reducing potential for malfunction, these are not different to the features already included in other known devices.

95. Paragraph [0014c] also describes an apparatus for jump starting a vehicle engine although this is not described as an aspect of the invention.

96. Paragraph [0015] of AU'559 indicates that in an embodiment of the invention, the internal power supply is a lithium ion battery pack. I note that none of the aspects of the invention described in paragraphs [0014], [0014a] and [0014b] are defined as having an internal power supply. From a technical perspective, I consider it unlikely that a jumpstarter device would have an external power source such as a means for connecting to mains power which would significantly limit the usefulness of the device and require very different hardware. I also note that for the reasons I discuss above, the use of lithium ion batteries was well-known by July 2014 and would be considered a suitable source of power for a jump starter of the type described as a matter of routine.

97. Paragraph [0016] of AU'559 indicates that a jumper cable device may also be provided, having a plug which can be plugged into an output port. I note that none of the aspects of the invention described in paragraphs [0014], [0014a] and [0014b] are defined as having an output port.

98. From paragraph [0022] of AU'559 there is a detailed description of the invention which refers to various figures including a functional block diagram and circuit diagrams. The device includes a lithium ion battery pack, a programmable microprocessor, reverse polarity and battery isolation sensors based on optocouplers and a FET switch circuit controlled by the microprocessor.

99. Paragraph [0026] refers to further features of the jump starter including the provision of a flashlight function and a manual override button to enable jumpstarting of a completely depleted battery. I consider these features to be standard design elements of existing jumpstarters.

100. Paragraph [0027] describes the use of USB ports for charging the internal battery and for using the battery to charge other electronic devices. By July 2014, I consider that USB ports were a routine design option for a device such as a jumpstarter.

101. From paragraph [0028] of AU'559 there is a description of the operation of the jumpstarter by reference to circuit diagrams. This includes a discussion of the reverse polarity sensor and the vehicle battery isolation sensor which include opto-couplers. The use of optocouplers as described and illustrated in the diagrams of AU'559 is very similar to the implementation of these features in Zhang 1 discussed above. The reverse battery sensor 10 includes opto-coupler connected such that if the battery 72 is connected to the terminals of the device with the correct polarity, the optocoupler LED 11 will not conduct current, and is therefore turned off, providing a "1" or high output signal to the MCU. The car battery isolation sensor 12 comprises an opto-coupler connected such that if the battery 72 is connected to the terminals of the device with the correct polarity, the optocoupler LED 11A will conduct current, and is therefore turned on, providing a "0" or low output signal to the MCU, indicating the presence of a battery across the jumper output terminals of the device.

102. If the car battery 72 is connected to the device with reverse polarity, the optocoupler LED 11 of the reverse sensor 10 will conduct current, providing a "0" or low signal to microcontroller unit 1. If no battery is connected to the handheld booster device, the optocoupler LED 11A of the isolation sensor 12 will not conduct current, and is therefore turned off, providing a "1" or high output signal to the MCU, indicating the absence of any battery connected to the device.

103. As in Zhang 1, the isolation sensor of AU'559 provides a positive indication of a correctly connected battery while the reverse polarity sensor provides a positive indication of an incorrectly connected battery. If the device is correctly connected to a battery, the reverse polarity sensor will provide a high output signal. If the device is not connected to any battery at all, or is connected to completely depleted battery, the reverse polarity sensor will also provide a high output signal. Accordingly, while the reverse polarity sensor is able to provide a positive indication of an incorrectly connected battery, it is not in and of itself able to provide a positive indication of a correctly connected battery.

104. Paragraphs [0031] and [0032] of AU'559 discuss measuring the battery pack voltage and temperature to damage to electronic components and adding safety to the design. I consider such safety measures to be well known and understood and would be included in an electronic device such as a jump starter as a matter of routine.

105. Paragraph [0039] of AU'559 refers to Figure 3 which depicts a device according to the invention and which as shown includes a power on switch, various LED indicators, USB ports and an output port.

106. Paragraph [0040] of AU'559 refers to a jumper cable device depicted in figure 4, which can be connected to the output port of the device shown in figure 3. The jumper cable device has a plug at one end for connecting to the output port and a pair of clamps at the opposite end. The jumper cable device described in paragraph [0040] by reference to figure 4 appears to be the only option identified in the specification of AU'559 for connecting the device to an external vehicle battery.

107. From page 14 of AU'559 there are set out 30 claims which are said to define the invention. Claims 1 to 3 are in the same terms as the summaries of the invention referred to above.

108. Subject to the issue discussed below, I consider that the device described in Zhang 1 has each of the features of claim 1. Claim 1 defines that the reverse polarity sensor provides an output signal indicating that the positive and negative polarity terminals of the vehicle battery are properly connected and that the microcontroller provides an activating output signal in response to receiving input an signal from the reverse polarity sensors indicating a proper polarity connection. As discussed above, the device described in AU'559 by reference to the drawing figures includes a reverse polarity sensor which provides a positive indication of an incorrectly connected battery. It is not in and of itself able to provide a positive indication of a correctly connected battery. Accordingly, the device described in AU'559 does not include a reverse polarity sensor which can provide an output signal indicating that the positive and negative polarity

terminals of the vehicle battery are properly connected as defined in claim 1. Similarly, Zhang 1 has a reverse polarity sensor which provides a positive indication of an incorrectly connected battery but does not in and of itself provide a positive indication of a correctly connected battery. I consider that Claim 1 defines a reverse polarity sensor which can provide a signal to the microcontroller which in and of itself indicates a correct polarity connection. Understood in this way, neither the device described in AU'559 nor in Zhang 1 would have such a reverse polarity sensor. If, despite its wording, claim 1 is understood in a way that means the device described in AU'559 has all of the features of claim 1, then I consider the device described in Zhang 1 would also have all of those features.

109. The reverse polarity sensor described in Zhang 2 functions in relevantly the same manner as that described in Zhang 1. Accordingly, subject to the issue discussed above in relation to the reverse polarity sensor as defined in claim 1, I consider that the device described in Zhang 2 has each of the features of claim 1.

110. Subject to the issue discussed above in relation to the reverse polarity sensor as defined in claim 1, I consider that the devices described in Zhang 1 and Zhang 2 have each of the features of claims 2 and 3.

111. Claim 4 defines an apparatus having a separate isolation sensor. I understand this to mean that the sensor is separate to the reverse polarity sensor such that they are implemented by discrete circuits. I consider that the devices described in Zhang 1 and Zhang 2 have each of the features of claim 4. Both Zhang 1 and Zhang 2 have discrete circuits which act as an isolation sensor separately to the circuit which acts as a reverse polarity sensor.

112. Claim 5 defines an apparatus having an isolation sensor which detects presence or absence of the vehicle battery prior to any initial connection. To the extent that claims 1 to 3 refer to a "connection" it is between the apparatus and the vehicle battery. It does not make sense that the isolation sensor could detect the presence of a vehicle battery before the apparatus is connected to such a battery. It is possible that claim 5 is referring to a connection between the power supply of the apparatus and the vehicle battery via the power switch. If so, I consider that the devices described in Zhang 1 and Zhang 2 have each of the features of claim 5. Both Zhang 1 and Zhang 2 have an isolation sensor which operates prior to connection between the battery of the device and the vehicle battery via a power switch.

113. Claim 6 defines an apparatus in which the positive and negative polarity vehicle battery terminal connectors are clamps. I consider that the devices described in Zhang 1 and

Zhang 2 have each of the features of claim 6. Both Zhang 1 and Zhang 2 describe output power clips.

114. Claim 7 defines an apparatus in which the positive and negative polarity vehicle battery terminal connectors include cables. I consider that the devices described in Zhang 1 and Zhang 2 have each of the features of claim 7. Both Zhang 1 and Zhang 2 describe output power clips having wires.

115. Claim 8 defines an apparatus having an output port having positive and negative polarity outputs, the output port being configured to connect with a single removable plug, the single plug being connected to the positive and negative polarity cables. I consider that the device described in Zhang 2 has each of the features of claim 8. Zhang 2 describes an output connecting port.

116. Claim 9 defines an apparatus in which the power supply is a lithium ion battery. I consider that the device described in Zhang 2 has each of the features of claim 9. Zhang 2 describes a device having a lithium battery pack.

117. Claim 10 defines an apparatus in which the power supply is a battery pack of multiple lithium ion batteries. I consider that the device described in Zhang 2 has each of the features of claim 10. Zhang 2 describes a device having a lithium battery pack which comprises several individual lithium batteries combined together by means of series connection or a combination of series and parallel connection.

118. Claim 11 defines an apparatus in which the power switch comprises a number of FETs in parallel. The devices described in Zhang 1 and Zhang 2 have a power switch in the form of a DC contactor which I understand to be a relay. I consider that by July 2014, it would have been routine to use FETs rather than a relay in a high current device such as a jumpstarter. By that time, FETs would have been less expensive than an equivalent relay as well as being smaller and lighter. I also note that as described in Krieger, FETs had been used in such devices for at least 10 years by that time.

119. Claim 12 defines an apparatus in which the vehicle isolation sensor and reverse polarity sensor comprise optically coupled isolator phototransistors. I consider that the device described in Zhang 1 has each of the features of claim 12. Zhang 1 describes a device having a vehicle isolation sensor and a reverse polarity sensor implemented by circuits, IC5 and IC6, employing opto-couplers.

120. Claim 13 defines an apparatus having a plurality of power diodes coupled between the positive and negative polarity vehicle battery terminal connectors and the power supply to prevent back-charging of the power supply from an electrical system connected to the

positive and negative polarity vehicle battery terminal connectors. This appears to relate to the diode power module illustrated in figure 2B-1. As shown in that figure, the diode module is connected between the positive terminal of the lithium battery and the terminal connector which connects to the positive terminal of the vehicle battery. In such a configuration, the diodes can prevent back-charging. However, in claim 13, it is said that the diodes are coupled between, on the one hand the positive and negative polarity vehicle battery terminal connectors and on the other hand, the power supply. Such a configuration would not work.

121. Claim 14 defines an apparatus having a temperature sensor configured to detect temperature of the power supply and to provide a temperature signal to the microcontroller. I consider that the device described in Zhang 2 has each of the features of claim 14. Zhang 2 describes a device having a thermistor on the surface of the battery housing. The thermistor provides a signal to the CPU which represents the real time temperature, so that the temperature state of the battery can be judged to be normal, too high or too low respectively.

122. Claim 15 defines an apparatus having a voltage measurement circuit configured to measure output voltage of the power supply and to provide a voltage measurement signal to the microcontroller. I consider that the devices described in Zhang 1 and Zhang 2 have each of the features of claim 15. Both Zhang 1 and Zhang 2 describe measurement of the output voltage of the internal battery and the use of that measurement by the CPU.

123. Claim 16 defines an apparatus having a voltage regulator. I consider that the devices described in Zhang 1 and Zhang 2 have each of the features of claim 16. Both Zhang 1 and Zhang 2 describe a voltage regulator which converts the internal battery voltage to 5V for use in powering the CPU.

124. Claim 17 defines an apparatus having a USB output port configured to provide charging power from the power supply to a USB-chargeable device. I consider that the device described in Zhang 2 has each of the features of claim 17. Zhang 2 describes a device having a USB output and charging control circuit.

125. Claim 18 defines an apparatus having a USB charging port configured to provide charging power from an external power source to the power supply. I consider that the device described in Zhang 2 has each of the features of claim 18. Zhang 2 describes a device having a USB output and charging control circuit.

126. Claims 19 to 21 define an apparatus having a flashlight circuit configured to provide a source of light to a user, wherein the source of light is at least one LED, and wherein the microcontroller is configured to control the at least one LED to provide a visual alarm indicating an emergency situation. While each of Zhang 1 and Zhang 2 describe various LED indicators lights, neither describes a flashlight circuit. As discussed above, I consider the inclusion of a flashlight in a consumer product such as a jumpstarter would be a desirable feature, including to act as an emergency beacon. Implementing such a circuit using LED lights would involve well know technology and would be routine to design.

127. Claim 22 defines an apparatus having a plurality of visual indicators configured to display remaining capacity status of the power supply. I consider that the device described in Zhang 2 has each of the features of claim 22. Zhang 2 describes a device in which the real-time residual capacity of the battery is indicated with LED lights of various colours.

128. Claim 23 defines an apparatus in which the plurality of visual indicators comprises a plurality of LEDs providing output light of different colours. I consider that the device described in Zhang 2 has each of the features of claim 23. Zhang 2 describes a device in which one of three LEDs output red, yellow or green light to indicate the battery charge level.

129. Claim 24 defines an apparatus having a visual indicator configured to warn a user when a vehicle battery is connected with reverse polarity. I consider that the device described in Zhang 1 has each of the features of claim 24. Zhang 1 describes a device having a reverse connection alarm indicator light LED7.

130. Claim 25 defines an apparatus having separate visual indicators configured to display the power on status of the apparatus, and the jump start boost power status of power supplied to the positive and negative polarity vehicle battery terminal connectors. I understand the device as define in claim 25 has discrete visual indicators to show that the device is turned on and that the power switch is turned on to connect the power supply to the terminal connectors. I consider that the device described in Zhang 1 has each of the features of claim 25. Zhang 1 describes a device in which one of indicator lights LED3 or LED4 is lit when the device is switched on. When the device is correctly connected to an external battery, the power switch closes and correct connection LED indicator light is lit. Also, the LED Nixie tube automatically displays the integrated voltage value after the internal and external batteries are connected in parallel.

131. Claim 26 defines an apparatus having manual override switch configured to activate a manual override mode to enable a user to connect jump start power to charge the vehicle battery when the vehicle battery isolation sensor is unable to detect presence of the vehicle battery. I consider that the device described in Zhang 1 has each of the features of claim 26. Zhang 1 describes a device having a force start output function for when there is no external battery voltage input or the input voltage signal is too low.

132. Claim 27 defines an apparatus in which the microcontroller is configured to detect actuation of the manual override switch for at least a predetermined period of time before activation of the manual override mode. I consider that the device described in Zhang 1 has each of the features of claim 27. Zhang 1 describes a device having a force start button which needs to be pressed and held for 10s.

133. Claim 28 defines an apparatus having a jumper cable device including a plug configured to plug into an output port of the apparatus, a pair of battery cables integrated with the plug at one respective end thereof and being configured to be connected to terminals of the vehicle battery at another respective end thereof. I consider that the device described in Zhang 2 has each of the features of claim 28. Zhang 2 describes an output module having output wires, an output connecting port, and/or a positive, or a negative port clip.

134. Claim 29 defines an apparatus having a jumper cable device with a pair of ring terminals configured to respectively connect the pair of battery cables at another end thereof with either the positive and negative polarity vehicle battery terminals or the positive or negative polarity battery clamps. I consider the use of ring terminals as part of a jumper cable device to be well known and well understood technology which could be implemented as a matter of routine.

135. Claim 30 defines an apparatus in which the output port and the plug are dimensioned so that the plug will fit into the output port only in one specific orientation. I consider the use of such an output port and plug as part of a jumper cable device to be well known and well understood technology which could be implemented as a matter of routine. As discussed above, single orientation plugs such as Anderson plugs have been well known for many years.

Australian Patent Application 2016269555

136. I have been provided with a copy of Australian Patent Application 2016269555 ("AU'555") and been asked to provide my comments in relation to the matters disclosed in that document. I have also been asked to compare the claims of AU'555 with the claims of AU'559. Annexed hereto and marked **Annexure CS-6.** is a copy of AU'555.

137. Except for the summary of the invention at page 5 of AU'555, the matters described in pages 1 to 13 of that document appear to me to be essentially the same as AU'559. The aspect of the invention set out in paragraph [0014] of AU'555 appears to be the same as the apparatus described in paragraph [0014c] of AU'559. Claim 1 of AU'555 is in the same terms.

138. The apparatus defined in claim 1 of AU'555 differs in a number of respects to that defined in claim 1 of AU'559. Claim 1 of AU'555 defined an apparatus having an internal power supply while claim 1 of AU'559 defines an apparatus having a power supply. As noted above, I consider it unlikely that a jumpstarter device would have an external power source such as a means for connecting to mains power which would significantly limit the usefulness of the device and require very different hardware.

139. Claim 1 of AU'555 defined an apparatus having an output port having positive and negative polarity outputs, while claim 1 of AU'559 defines an apparatus having a positive polarity vehicle battery terminal connector and a negative polarity vehicle battery terminal connector. I understand the term port to describe a connector or socket into which something else is plugged, as it is used in the context of a USB port or printer port. I understand that the output port referred to in claim 1 of AU'555 to be such a connector or socket into which detachable output leads of the type illustrated in the drawing figures are plugged in. I would not understand a jumpstarter device having fixed leads to have an output port as defined in claim 1 of AU'555. The positive and negative polarity vehicle battery terminal connectors described in claim 1 of AU'559 could be detachable output leads of the type illustrated in the drawing figures or fixed leads.

140. The apparatus defined in claim 1 of AU'555 differs to that defined in claim 2 and 3 of AU'559 in the same ways. Further, in the apparatus defined in claim 2 of AU'559, the microcontroller is configured to turn on the power switch without any description of what if any effect results from that switch being turned on. In claim 1 of AU'555, the microcontroller configured to provide an output signal to the power switch, such that the power switch is turned on to cause the internal power supply to be connected to the output port.

141. I make this declaration conscientiously believing that the statements in this declaration are true in every particular.

DECLARANT: .....

DECLARED AT: .....

DATED: .....

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AUSTRALIA
Patents Act

IN THE MATTER of Australian Patent Application No. 2019201559 in the name of The NOCO Company

- and –

Opposition thereto by Brown & Watson International Pty Ltd

ANNEXURE

This is the Annexure marked **CS-1** produced and shown to Cory Seligman at the time of signing his Declaration.

(19) State Intellectual Property Office of the People's Republic of China

(12) Utility Model Patent

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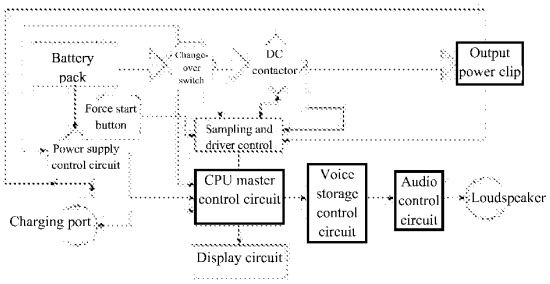
Claims 1 Page Specification 7 Pages Drawings 4 Pages

(54) Name of Utility Model

A smart jump starter with a built-in voice prompt function

(57) Abstract

The present utility model discloses a smart jump starter with a built-in voice prompt function, which comprises a battery pack. The power supply terminal of the battery pack is connected to a change-over switch, and the change-over switch is connected to an output power clip through a direct current (DC) contactor. It further comprises a CPU master control circuit, where the output terminal of this CPU master control circuit is connected to an audio playing system. The input terminal of the CPU master control circuit is connected to a sampling and driver control circuit. This sampling and driver control circuit is connected to the change-over switch, DC contactor and output power clip. The battery pack is connected to the charging port through the power supply control circuit, and the power supply control circuit and charging port is connected to the CPU master control circuit. The output power clip and change-over switch are connected respectively to the power supply control circuit. The output terminal of the CPU master control circuit is also connected to the display circuit. The sampling and driver control circuit is connected to the force start button. This jump starter can transmit relevant operational information to the user in a timely and accurate manner under different operating environments.



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EXHIBIT 1006

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1. A smart jump starter with a built-in voice prompt function, which comprises a battery pack. The power supply terminal of this battery pack is connected to a change-over switch and the change-over switch is connected to an output power clip through a DC contactor, wherein

It further comprises a CPU master control circuit, where the output terminal of this CPU master control circuit is connected to an audio playing system;

The input terminal of the said CPU master control circuit is connected to a sampling and driver control circuit. This sampling and driver control circuit is connected to the change-over switch, DC contactor and output power clip;

The said battery pack is connected to the charging port through the power supply control circuit, and the power supply control circuit and charging port are connected to the CPU master control circuit;

The said output power clip and change-over switch are respectively connected to the power supply control circuit;

The output terminal of the said CPU master control circuit is also connected to the display circuit;

The said sampling and driver control circuit is connected to the force start button.

2. The said smart jump starter with a built-in voice prompt function as claimed in Claim 1, wherein, the said audio playing system comprises a voice storage control circuit. The input terminal of this voice storage control circuit is connected to the CPU master control circuit and its output terminal is connected to the audio control circuit. The audio control circuit is connected to the loudspeaker.

3. The said smart jump starter with a built-in voice prompt function as claimed in Claim 1, wherein the said display circuit comprises a LED Nixie tube display and LED indicator lights of different colors.

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A smart jump starter with a built-in voice prompt function

Technical Field

[0001] The present utility model involves a jump starter, particularly involving a smart jump starter with a built-in voice prompt function.

Background Technology

[0002] Under different operating environments, it is difficult to correctly operate 12 V/24 V change over to the jump starter 100% of the time by manual operation alone. Without any protection and prompts, any form of misoperation can cause permanent damage to the product, and in serious cases can even lead to battery explosion, which endangers the personal and property safety of the user. Although some of the existing products have operational guidance instructions and some simple audio and visual alarm functions, the content of the operation prompt may be damaged or unclear due to the use of a simple buzzer alarm and wear and tear. This results in the lack of necessary safety instructions in jump starters, and also brings confusion to the user at the same time, as the user is unable find the cause in time after a problem occurs. If necessary voice prompts and photoelectric indicators are added simultaneously to each of the user's operations, this reduces the impact of different environments on the user, and also informs the user of the real-time operation status in a timely manner. This prevents the occurrence of errors more effectively, and facilitates a more direct and clearer operation process for the user. Therefore, it is necessary to optimize the structure of existing jump starters.

Content of Utility Model

[0003] The objective of the present utility model is to provide a smart jump starter with a built-in voice prompt function which uses voice prompts regarding the user's current operation to reduce misoperations. This ensures that the safety of the jump starter is protected during operation, and prolongs its service life.

[0004] The technical solution adopted by the present utility model for solving its technical issues is,

[0005] A smart jump starter with a built-in voice prompt function, which comprises a battery pack. The power supply terminal of this battery pack is connected to a change-over switch and the change-over switch is connected to an output power clip through a DC contactor. It further comprises a CPU master control circuit, where the output terminal of this CPU master control circuit is connected to an audio playing system. This audio playing system comprises a voice storage control circuit. The input terminal of this voice storage control circuit is connected to the CPU master control circuit and its output terminal is connected to the audio control circuit. The audio control circuit is connected to the loudspeaker;

[0006] The input terminal of the said CPU master control circuit is connected to a sampling and driver control circuit. This sampling and driver control circuit is connected to the change-over switch, DC contactor and output power clip. The said battery pack is connected to the charging port through the power supply control circuit, and the power supply control circuit and charging port are connected to the CPU master control circuit. The said output power clip and change-over switch are respectively connected to the power supply control circuit. The output terminal of the said CPU master control circuit is also connected to the display circuit. This display circuit comprises a LED Nixie tube display and LED indicator lights of different colors. The said sampling and driver control circuit is connected to the force start button.

[0007] The advantages of the present utility model are: this jump starter can carry out safety protection regarding gear position selection, correct connection, incorrect connection, undervoltage or overvoltage, etc. At the same time, the corresponding voice prompt and photoelectric indicators are added to the safety prompts regarding selection of charging gear position, low battery voltage warning, output overcurrent protection, clip output short circuit protection, manual force start and other areas. The jump starter is able to transmit relevant operation information to the user promptly and accurately under different operating environments, and enables the user to obtain operational information through sound, light and other different types of prompting methods. This allows the user to understand the real-time operation situation and the cause of usage errors more intuitively. Thus, the user can better carry out the next operation, or take prompt and effective correction measures to ensure the personal safety of the user, making the whole product more user-friendly and intelligent.

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Description of Drawings

[0008] Figure 1 is the circuit diagram of the jump starter proposed by the present utility model;

[0009] Figure 2 is the diagram of the power supply control circuit;

[0010] Figure 3 is the circuit diagram of the CPU master control circuit and the LED Nixie tube display;

[0011] Figure 4 is the diagram of the voice storage and audio control circuit;

[0012] Figure 5 is the circuit diagram of the sampling and driver control circuit.

Specific Embodiment Methods

[0013] In order to make the technical means, creative characteristics, goal and efficacy of the present utility model easier and clearer to understand, the present utility model shall be further elaborated below using the figures and specific embodiments.

[0014] As shown in Figure 1, the present utility model proposes a smart jump starter with a built-in voice prompt function, which comprises a battery pack. The power supply terminal of this battery pack is connected to a change-over switch and the change-over switch is connected to an output power clip through a DC contactor. It further comprises a CPU master control circuit, where the output terminal of this CPU master control circuit is connected to an audio playing system. This audio playing system comprises a voice storage control circuit. The input terminal of this voice storage control circuit is connected to the CPU master control circuit and its output terminal is connected to the audio control circuit. The audio control circuit is connected to the loudspeaker;

[0015] The input terminal of the said CPU master control circuit is connected to a sampling and driver control circuit. This sampling and driver control circuit is connected to the change-over switch, DC contactor and output power clip. The said battery pack is connected to the charging port through the power supply control circuit, and the power supply control circuit and charging port are connected to the CPU master control circuit. The said output power clip and change-over switch are respectively connected to the power supply control circuit. The output terminal of the said CPU master control circuit is also connected to the display circuit. This display circuit comprises a LED Nixie tube display and LED indicator lights of different colors. The said sampling and driver control circuit is connected to the force start button.

[0016] At present, there are two types of automobile batteries, namely 12 V and 24 V. In the circuit design, the default is a 12 V DC battery within 0 V DC ~ 15.5 V DC; and the default is a 24 V DC battery within 15.5 ~ 30.0 V DC. The change-over switch realizes the parallel connection or series connection of the two batteries, so as to realize the functions of two voltage outputs from a single machine. At the same time, two small linkage switches are embedded on the change-over switch. The linkage switch maintains synchronization with the 12 V gear and the 24 V gear, namely, when the change-over switch is set to the 12 V or the 24 V gear, the linkage switch will also close synchronously. When the switch is at the OFF gear, the linkage switch is also automatically disconnected, ad this is used to determine the input or disconnection of the external connection signal, etc.

[0017] This jump starter utilizes a high-power DC contactor as an automatic control electronic switch and it controls the on and off states through a circuit. At the same time, the voltage drop at the two terminals of the DC contactor is determined after circuit pull-in, which is one of the conditions to determine whether the output power clip has short-circuited.

[0018] The jump starter is respectively sampled from key points such as the two terminals of the battery pack, the small teeth of the power clip, the output end of the change-over switch, the two terminals of the DC contactor, the charging port, the internal voltage test reset switch and the force start button and sent to the CPU master control circuit for processing and determination. The corresponding pulse signal is sent to the voice storage control circuit after the user's operation information has been obtained from the sampling. The pre-saved voice content is retrieved, and the corresponding voice message is then emitted from the loudspeaker after the power of the audio control circuit is amplified. This jump starter can carry out safety protection regarding gear position selection, correct connection, incorrect connection, undervoltage or overvoltage, etc. At the same time, the corresponding voice prompt and photoelectric indicators are added to the safety prompts regarding selection of charging gear position, low battery voltage warning, output overcurrent protection, power clip output short circuit protection, manual force start and other areas. The voice is clear, loud and has a standard pronunciation, and the voice effective transmission distance is more than 5 meters in a noise environment of 40 dB. In addition to the standard English prompt, there are two other language types provided for the voice prompts, namely French and Spanish. The user can switch freely between the languages by a simple press of a button, thereby improving the universality of the product.

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[0019] In one embodiment, the circuit structure of this jump starter is shown in Figure 2, Figure 3, Figure 4 and Figure 5. In the present embodiment, the main key devices used in the said jump starter are: ICl-7805 three-terminal integrated voltage regulator, IC2-MC96F32Q microcontroller, IC3-BLA4208 voice storage integrated chip, IC4-TDA2822 integrated audio power amplifier, LS1-full-band loudspeaker 2W/8 ohm, LED-LG5631AH seven-segment display, IC5 (IC6)-PC817 optical coupler, IC7-LM358 integrated operational amplifier, high-power DC contactor, heavy current change-over switch (for 12/24 V gear switching), linkage switch, force start button and output anode and cathode power clips.

[0020] In this embodiment, the main functions realized by this jump starter are:

[0021] 1. Automatic identification and prompt of the 12 V/24 V gear position when the change-over switch of the jump starter is operated. Corresponding voice prompt of the gear position and lighting up of LED3/LED4 indicator;

[0022] 2. Automatic alarm prompt when the jump starter's battery is at low battery voltage. When the battery voltage is lower than $8.0 \leq U < 10.0$ V, the voice alarm prompt is automatically emitted;

[0023] 3. Automatic shutdown protection and prompt when the battery of the jump starter has an undervoltage. When the battery voltage is consistently lower than 8 V, the output loop of the jump starter's power clip is disconnected automatically. At the same time, the voice prompt for low voltage shutdown protection is emitted;

[0024] 4. Correct connection and conducting prompt for output power clip. The circuit automatically pulls in and conducts when the power clip is connected correctly, emits a voice prompt and lights up the LED4 light;

[0025] 5. Shutdown protection and prompt when the output power clip is connected erroneously in reverse polarity. When the polarity of the output current clamp is connected in reverse, shutdown protection will be initiated by the DC contactor. At the same time, a corresponding voice prompt message is emitted and the reverse connection indicator LED7 light will light up. Simultaneously, an error code "Er1" message will flash on the Nixie tube;

[0026] 6. Shutdown protection and prompt when the output power clip is connected to the wrong voltage, that is, there is a voltage mismatch between internal and external battery connections. It generally refers to a docking error between 12 V and 24 V batteries, or the connection of the 24 V battery to an external battery with a voltage higher than 30.0 V. A connection error voice prompt message will be emitted by the jump starter automatically, and the connection error indicator LED6 light will light up. At the same time, an error code "Er2" indicator will flash on the Nixie tube;

[0027] 7. Shutdown protection and prompt when the output power clip is overloaded. When there is an overcurrent at the output power clip, it is automatically disconnected and protected. A corresponding voice prompt message will be emitted by the jump starter and the overload protection code "P1" message will flash on the Nixie tube;

[0028] 8. Shutdown protection and prompt when there is a short circuit of the output power clip. Under pull-in and conduction, when the output power clip short circuits again, shutdown protection kicks in automatically for protection. At the same time, a corresponding voice prompt message will be emitted and the short circuit protection code "P2" message will flash on the Nixie tube;

[0029] 9. Charging gear position prompt and charging state indicator. The change-over jump starter can only be charged using the 12 V gear, that is, the batteries should be connected in parallel before charging them together. This is to ensure that the charging voltage between the two batteries is balanced. That is to say that after including the charger, if the change-over switch is not at the 12 V gear, an automatic voice prompt message will be emitted by the jump starter. At the same time, the charging indicator light will not light up until the correct gear is selected. When charging, the indicator light LED2 will light up. When the charging is complete, LED1 will light up;

[0030] 10. Force start output function. When there is no external battery voltage input or the input voltage signal is too low, and the jump starter is unable to activate automatic identification, it can be manually determined. After the voltage is connected correctly and reliably, press the force start button to facilitate the jump starter to forcefully activate pull-in and conduction. After pressing the force start button, an automatic security warning voice message will be emitted by the jump starter. At the same time, a countdown timer "10-9-8-.....0" message prompt will be displayed on the Nixie tube for the user, to remind the user to take note of the polarity of the external load and safe working voltage. The button needs to be pressed and held for 10 s, before automatic pull-in is activated by the jump starter. This ensures that the user has sufficient time to re-verify the safety of the connection.

[0031] In this embodiment, the voice content stored in the voice memory control circuit is as follows (using the English version as an example):

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[0032] A. 12 V
[0033] B. 24 V
[0034] C. Low voltage, recharging recommended
[0035] D. Power is connected
[0036] E. Wrong Voltage
[0037] F. Wrong Polarity
[0038] G. Recharging ON, Turn the switch at back to 12 V
[0039] H. charge immediately
[0040] I. Overload
[0041] J. Short Circuit
[0042] The specific work process is as follows:
[0043] 1. When the change-over switch changes from OFF gear to 12 V or 24 V gear position, the change-over switch sends the voltage of the battery pack connected in parallel or in series to the input terminal of the DC contactor. At the same time, the "OUT+" terminal has a high level (OUT+ sampling point is actually connected to the input terminal of the DC contactor, the "BAT/External" is connected to the output terminal of the DC contactor), and after the voltage is limited by the diode D1, the current-limiting resistor R1 and the Zener diode DW1, the switch tube Q1 is driven by the resistor R2 to activate pull-in and conduction of the relay JK1. The voltage of battery BAT+ passes through diode D4 and is added into the input terminal of the three-terminal integrated voltage regulator 7805 so that the three pins can provide a stable output of 5 V DC voltage to supply power to the CPU and other circuits;
[0044] When the external power clip is connected correctly and the voltage is greater than 1.5 V, after the voltage passes through diode D6 at the "BAT/External" terminal, it is similarly added to the base electrode of switch tube Q1 to facilitate pull-in and conduction of the relay. This in turn allows 7805 to enter a normal working condition. Similarly, when the charging port "CH+" is plugged into the power supply, 7805 also enters a normal working condition.
[0045] 2. After the microcontroller is powered on and operating, the first step is to detect if the change-over switch has been switched on. When the voltage < 15.5 V DC is detected at the "OUT+" terminal, compare the voltage with the voltage obtained at the anode "BAT1+" terminal of the single battery. When the voltage of the two reference points is basically the same, the CPU's default setting of the change-over switch is the 12 V gear position. Conversely, when this point's voltage is $\geq$ 15.5 V and is relatively different from the voltage value at the "BAT1+" terminal, the CPU's default setting of the change-over switch is the 24 V gear position. After confirming the gear position, the microcontroller outputs a high level from the P52 port or the P53 port, and drives the corresponding gear position indicator light LED3 or LED4 to be lit. At the same time, a pulse signal is output from the P21 port or the P23 port to drive the voice chip, and the corresponding voice message is retrieved and reported to the user through a power amplifier, loudspeaker and other devices;
[0046] When the microcontroller detects that the voltage at "OUT+" is too low, and the voltage of the 12 V gear is lower than 10.0 V DC (the voltage of 24 V gear is lower than 20.0 V DC), the automatic jump starter default is that the battery is depleted. It is no longer suitable to be used and should be recharged in time. The P16 pin of the microcontroller will automatically and repeatedly output a pulse signal to the voice memory chip to retrieve a low voltage alarm voice prompt. This low voltage message will be reported to the user in a timely manner through the loudspeaker. At the same time, automatic shutdown of all loads will kick off, that is, the output from the cigarette lighter and DC contactor will be turned off;
[0047] When the microcontroller detects that the voltage at "OUT+" is 0 V, and at the same time detects a certain positive voltage at the "OUT+/External" terminal, this indicates that the change-over switch of the jump starter is not switched on, and that the user has correctly connected the output power clip to the external battery. At this point, the jump starter's default is that the user wants to test the external battery voltage through the digital display voltage meter of JS. That is, the microcontroller will automatically display the actual voltage value read from the "OUT+/External" terminal through the Nixie tube;
[0048] When the microcontroller detects that the voltage at "OUT+" is 0 V, and at the same time detects a voltage connected to the charger at the "CH+" terminal, this indicates that the change-over switch of the jump starter is not switched on, and only the charger has been connected. At this point, the microcontroller will automatically output a pulse signal to the voice memory chip, to retrieve the charging gear position limit voice prompt to tell the user to set the change-over switch at the 12 V gear when charging. In the event that the change-over switch is set at other gear positions, the microcontroller will automatically and repeatedly output the trigger signal, until the user sets the change-over switch to the correct 12 V gear position. When the jump starter enters a normal charging state, the microcontroller is used to determine the voltage drop at resistor R31 through the detection of a sample. When the charging current is

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lower than 300 mA, the voltage drop on this resistor is 0.03 V, which indicates that charging is completed. Otherwise, this indicates that charging is still taking place. When the LED2 light is lit, it indicates that charging is still taking place. When the LED1 light is lit, it indicates that charging is completed.

[0049] 3. Start, its working principles are as follows:

[0050] 3.1. Correct 12 V gear connection, conduction and prompt: set the change-over switch at the 12 V gear. When the microcontroller detects that the voltage at "OUT+" and "BAT1+" is within the range of the 12 V gear, the jump starter automatically reports the 12 V gear position voice prompt. At the same time, the voltage at the two terminals of the 12 V battery is sampled in two ways, where one way is connected to the input terminal of the DC contactor, so that the microcontroller can detect the effective voltage value within the range of the 12 V gear at the "BAT+/External" point. The other way is sampled using the small teeth of the power clip. The internal conductor wire of the power clip wire is connected to the "J1" port of the control board, and after the correct connection signal is converted by R5, D8 and IC5, the external correct connection signal "RIGHT-Ctrl" is transmitted to the P13 port of the microcontroller. The microcontroller determines that the jump starter has been changed over to the 12 V gear, and at the same time, the power clip is connected correctly and reliably. At this time, the microcontroller once again outputs a high level to the control circuit of the DC contactor for it to carry out pull-in and conduction. It also transmits a pulse signal to the voice chip to retrieve the correct connection and conduction voice prompt, to report the correct connection message to the user in a timely manner; other indicators: the 12 V gear position indicator light is lit; the corresponding correct connection LED indicator light is lit; the Nixie tube automatically displays the integrated voltage value after the internal and external batteries are connected in parallel.

[0051] 3.2. 12 V gear reverse polarity connection protection and prompt: set the change-over switch at the 12 V gear. The corresponding gear position detection and content of the prompt are as above. At the same time, the voltage at the two terminals of the external 12 V (or 24 V) battery is sampled using the small teeth of the power clip. The internal conductor wire of the power clip is connected to the "J1" port of the control board, and after the reverse connection signal is converted by D9, IC6 and R5, the external reverse connection signal "Reverse-Ctrl" is transmitted to the P12 port of the microcontroller. The microcontroller determines that the jump starter has been changed over to the 12 V gear, and at the same time, detects that the external battery is connected in reverse polarity. At this time, the DC contactor will maintain its disconnected state, and continuously transmit a pulse signal to the voice chip to retrieve the reverse connection voice prompt, to report the reverse connection message to the user in a timely manner; other indicators: the 12 V gear position indicator light is lit; the reverse connection alarm indicator light LED7 is lit; the Nixie tube automatically flashes a reverse connection error code "Er1".

[0052] 3.3. 12 V gear external connection overvoltage error protection and prompt: set the change-over switch to the 12 V gear. The corresponding detection and content of the prompt are as above. At the same time, the power clip connects the voltage from both terminals of the external battery to the output terminal of the DC contactor, so that the microcontroller detects that the connected battery voltage has exceeded the safe range of "12 V" at the "BAT+/External" point. The microcontroller's directly default is that the external battery voltage and the gear position selected by the jump starter are incompatible. The DC contactor maintains its disconnected state for protection and continuously transmits a pulse signal to the voice chip to retrieve the voltage error connection voice prompt, to report the incorrect connection information to the user in a timely manner; other indicators: the 12 V gear position indicator light is lit; the voltage incorrect connection alarm indicator light LED6 is lit; the Nixie tube automatically flashes a reverse connection error code "Er2".

[0053] 3.4. 24 V gear correct connection conduction and prompt: set the change-over switch to the 24 V gear. When the microcontroller detects that the voltage at "OUT+" and "BAT1+" points is relatively high, it should belong to the 24 V gear position. The jump starter automatically emits the 24 V gear voice prompt. At the same time, the voltage at the two terminals of the 24 V battery is sampled in two ways, where one way if connected to the output terminal of the DC contactor, so that the microcontroller can detect the effective voltage value within the range of 24 V at the "BAT+/External" point. The other way is sampled using the small teeth of the power clip. The internal conductor wire of the power clip wire is connected to the "J1" port of the control board and after the correct connection signal is converted by R5, D8 and IC5, the external correct connection signal "RIGHT-Ctrl" is transmitted to the P13 port of the microcontroller. The microcontroller determines that the jump starter has been changed over to the 24 V gear, and at the same time, the power clip is connected correctly and reliably. At this time, the microcontroller once again outputs a high level to the control circuit of the DC contactor for it to carry out pull-in and conduction. It also transmits a pulse signal to the voice chip to retrieve the correct connection and conduction voice prompt, to report the correct connection message to the user in a timely manner; other indicators: the 24 V gear shift indicator light is lit; the corresponding correct connection LED indicator light is lit; the Nixie tube automatically displays the integrated voltage value after the internal and external batteries are connected in parallel.

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[0054] 3.5. 24 V gear reverse polarity protection and prompt: set the change-over switch to the 24 V gear. The corresponding gear position detection and content of the prompt are as above. At the same time, the voltage at the two terminals of the external 24 V (or 12 V) battery is sampled using the small teeth of the power clip. The internal conductor wire of the power clip wire is connected to the "J1" port of the control board and after the reverse connection signal is converted by R5, D9 and IC5, the external reverse connection signal "Reverse-Ctrl" is transmitted to the P12 port of the microcontroller. The microcontroller determines that the jump starter has been changed over to the 24 V gear, and at the same time, detects that the external battery is connected in reverse polarity. At this time, the DC contactor will maintain its disconnected state, and continuously transmit a pulse signal to the voice chip to retrieve the reverse connection voice prompt, to report the reverse connection information to the user in a timely manner; other indicators: the 24 V gear position indicator light is lit; the reverse connection alarm indicator light LED7 is lit; the Nixie tube automatically flashes a reverse connection error code "Er1".

[0055] 3.6. 24 V gear external connection undervoltage (or overvoltage, when exceeding 30.0 V) error protection and prompt: set the change-over switch to the 24 V gear. The corresponding gear position detection and content of the prompt are as above. At the same time, the power clip connects the voltage from both terminals of the external battery to the output terminal of the DC contactor, so that the microcontroller detects that the connected battery voltage has exceeded the safe range of "24 V" at the "BAT+/External" point. If the external voltage is lower than 15.5 V or higher than 30.0 V, the microcontroller's direct default is that the external battery voltage and the gear position selected by the jump starter are incompatible. The DC contactor maintains its disconnected state for protection and transmits a pulse signal to the voice chip to retrieve the voltage error connection voice prompt, to report the incorrect connection information to the user in a timely manner; other indicators: the 24 V gear shift indicator light is lit; the voltage error connection alarm indicator light LED6 is lit; the Nixie tube automatically flashes a reverse connection error code "Er2".

[0056] 4. Start automatic shutdown protection upon overload: the moment the jump starter is started, a heavy current is generated in the entire starting system. The jump starter reads the voltage drop between the large teeth of the black power clip and the cathode of the internal battery by sampling the small teeth of the black power clip. The internal signal is sent to the "J1" port through the small teeth of the black power clip and the internal signal wire, and the overcurrent signal " OVERLOAD-TEST " is sent to the P11 port of the microcontroller after being amplified by D0, IC7 and other circuits. When this voltage value is consistently higher than a certain set value for a certain time (test the resistance between the large teeth of the black power clip and the cathode terminal of the battery in advance, refer to the reference voltage value of overcurrent protection calculated by referring to the maximum discharge capacity of the jump starter battery), the jump starter's default is that there has been an overload in the external connection. When the maximum range that can be tolerated but the entire system is exceeded, the microcontroller cuts off the control signal of the DC contactor, so that the DC contactor forcefully turns off output. At the same time, the microcontroller retrieves the corresponding overcurrent protection voice prompt message to report the information to the user in a timely manner; other indicators: the Nixie tube display flashes the overcurrent protection code "P1".

[0057] 5. Automatic shutdown protection upon power clip output short-circuit: When the power clip of the jump starter short-circuits after pull-in and conduction, a heavy current is generated in the entire starting system. Similarly, the jump starter reads the voltage drop between the large teeth of the black power clip and the cathode of the internal battery by sampling from the small teeth of the black power clip. The internal signal is sent to the "J1" port through the small teeth of the black power clip and the internal signal wire, and the overcurrent signal "OVERLOAD-TEST" is sent to the P11 port of the microcontroller after being amplified by D0, IC7 and other circuits. At the same time, the microcontroller determines the voltage difference between the two terminal points "OUT+" and "BAT/External" of the DC contactor. When these two voltage values are consistently higher than a certain set value for a certain time, the jump starter's default is that there has been an short circuit fault in the external power clip connection. The microcontroller will cut off the control signal of the DC contactor, so that the DC contactor can forcefully turn off output. At the same time, the microcontroller retrieves the corresponding short circuit protection voice prompt information to report the message to the user in a timely manner; other indicators: the Nixie tube display flashes the overcurrent protection code "P2".

[0058] 6. Force start output: when the external battery voltage is too low or there is no battery, the user can first turn on the change-over switch to the required voltage gear position (at this point, the gear position detection and prompt content are the same as above). Following which, connect the anode and cathode power clips to the anode and cathode of the input power supply of the load respectively. Ensure that the large and small teeth of the power clip are simultaneously and reliably connected, and verify that the voltage gear position of the power supply required by the load and that selected by the jump starter change-over switch are consistent. Press and hold the force start button to force start and short circuit the "J3" port. After division of voltage and sampling of the internal 5 V power supply through resistors R15 and R16, it is sent to the P25 port of the microcontroller. The microcontroller will start a

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countdown automatically, and retrieve the force start safety voice prompt from the voice chip. After pressing and holding for 10 seconds, the microcontroller will automatically send out a connection command for the DC contactor to forcefully commence pull-in and conduction. When connection abnormalities (such as reverse connection, high voltage misconnection) occur before the jump starter commences automatic pull-in (within 10 seconds), the microcontroller will automatically determine that the force start operation is invalid. This will resume after troubleshooting to ensure the user's operational safety; other indicators: after pressing this switch, within 10 seconds, the Nixie tube will flash "10-second countdown timer". After pull-in and conduction, the jump starter will transmit a correct connection voice prompt, and the correct connection indicator light LED5 will light up simultaneously.

[0059] 7. Working principles of voice control circuit: firstly, store all the functional voices in the voice memory chip in PCM compression mode. The BLA4208 chip from the BLA series is selected for the voice chip and the total voice message length supported by this chip is 42 seconds. Up to 30 different segments of voice content can be stored and the reading of the voice is controlled by a total of 8 separate trigger pins through S1-S8. At the same time, the triggering of different combinations of different pins are also supported, enabling them to support the need to trigger 30 voice segments. Then, each segment of voice content is retrieved arbitrarily by CPU control, and the voice signal is output by the 8th pin. After amplification through the audio amplifier IC4, the loudspeaker SL1 is driven directly to transmit the sound. The voice trigger signal is effective on a high level, and every time the microcontroller sends a pulse trigger signal, the voice chip will automatically retrieve the corresponding voice content for broadcast. When the trigger is a sustained high level, the chip automatically will broadcast the same voice content repeatedly.

[0060] 8. Working principles of sampling circuit and control circuit: as shown in Figure 5, J1 is the sampling signal input terminal of the small teeth of the anode and cathode power clips. When the external connection is correct, the voltage is converted by the resistors R5, D8 and IC5, and the AD signal is sent to the P31 port of the microcontroller, as the basis for determining whether the external power clip is correctly connected or has been disconnected. When the polarity of the external battery voltage is reverse, the microcontroller is unable to read the negative voltage of the "BAT/External" terminal directly. Through conversion by J1, D9, IC6, R5, the reverse connection signal is sent to the P12 port of the microcontroller as the basis for determining the reverse polarity connection of the external power clip. In the event of load overcurrent in the output power clip wire, the heavy current will produce a certain voltage drop on the cathode power clip wire. This voltage will be retrieved and sent to the D0, R11 and IC7 through the small teeth of the cathode power clip and amplified, and then sent to the P11 pin of the microcontroller for determination. When it is detected that the voltage is continuously greater than a set value within 1 second, the microcontroller's default is that the external load is too heavy and immediately disconnects the DC contactor to carry out protection. Similarly, when the voltage value is detected to be higher than another set value in that moment, and at the same time, the voltage drop detected from both terminals of the DC contactor is also larger than a set value, the jump starter's automatically default is a short circuit phenomenon of the output power clip and immediately turns off the DC contactor for protection;

[0061] J5 is the charging power supply access terminal. J6 is the input terminal for internal output voltage detection and external voltage detection, and is also the sampling point of the voltage drop at the two terminals of the DC contactor. J7 is the port of the DC contactor's control coil; of which the cigarette lighter output control circuit comprises the main components R25, R26, Q2, JK2, and RT1. The buzzer alarm control circuit comprises the main components R29, R30 and Q3. The DC contactor control circuit comprises the main components R27, R28 and Q3. The charging power supply sampling and charging current sampling circuit, which is used to determine the access of the charger and the detection of the charging status comprises the main components R17, R18, R31, C25 and C21. The internal and external battery voltage sampling circuit and the change-over switch gear position determination sampling circuit comprises the main components R19, R20, R21, R22, R23, R24, C22, C23 and C20. The digital display control circuit comprises the main components LED, Q5, Q6, Q7, etc.

[0062] The basic principles, main characteristics and the advantages of the present utility model are as shown and described above. The technical personnel of the industry should understand that the present utility model is not limited to the aforementioned embodiments. The aforementioned embodiments and Specifications only describe the principles of the present utility model. There can still be variations and modifications without departing from the spirit and scope of this utility model, and these variations and modifications are all within the scope of protection of the present utility model. The scope of protection of the Claims of the present utility model shall be within the scope of protection defined in the attached Claims and its equivalents.

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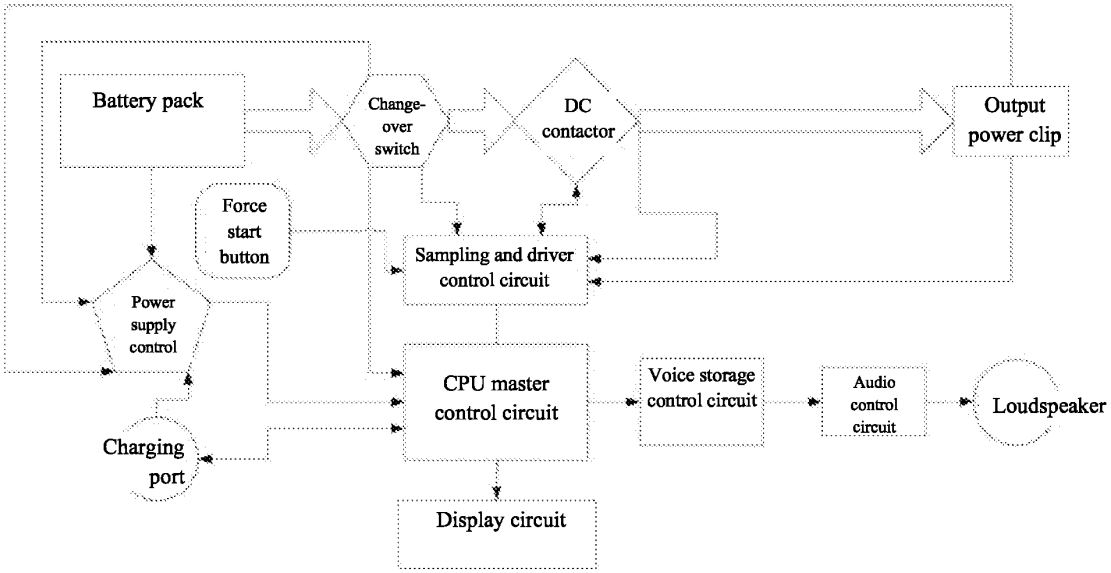


Figure 1

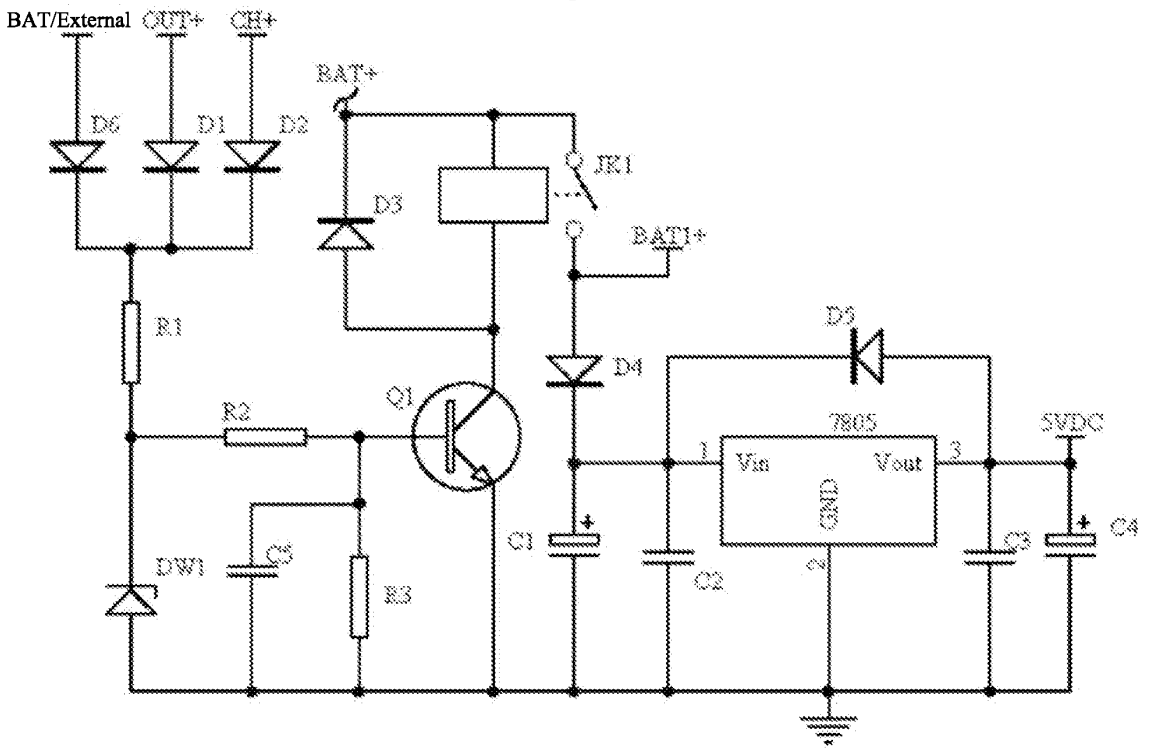


Figure 2

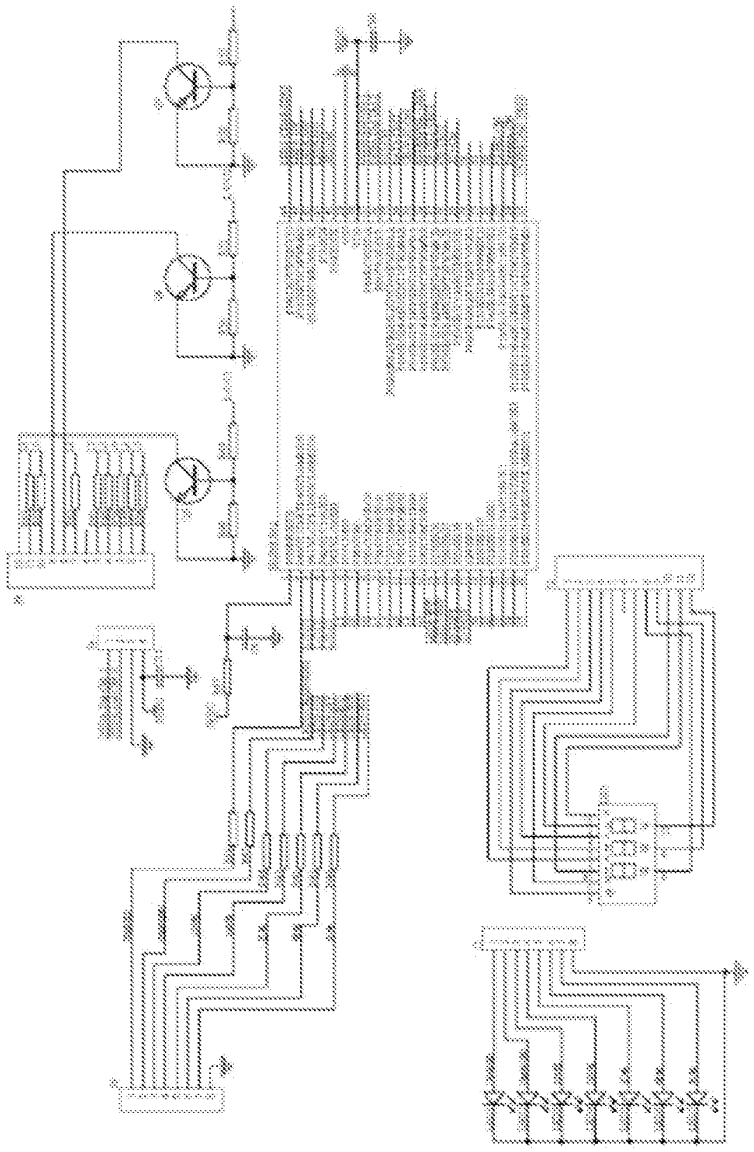


Figure 3

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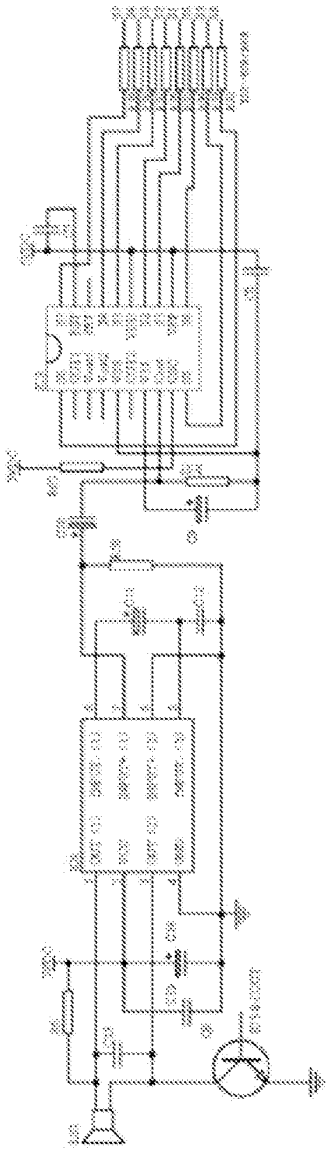


Figure 4

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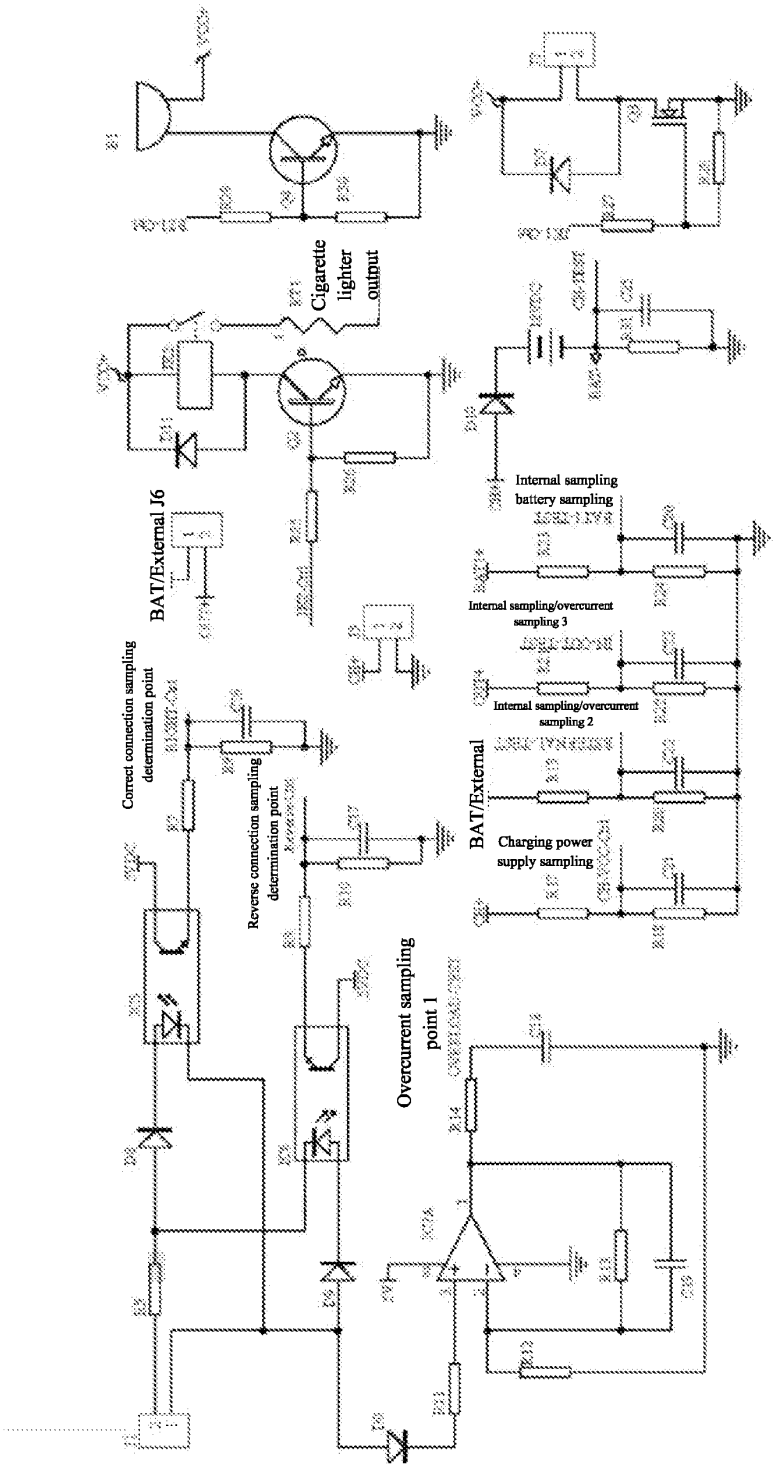

Cigarette lighter output
BAT/External J6
Internal sampling battery sampling
Internal sampling/overcurrent sampling 3
Internal sampling/overcurrent sampling 2
BAT/External
Charging power supply sampling
Correct connection sampling determination point
Reverse connection sampling determination point
Overcurrent sampling point 1

Figure 5

AUSTRALIA
Patents Act

IN THE MATTER of Australian Patent Application No. 2019201559 in the name of The NOCO Company

- and –

Opposition thereto by Brown & Watson International Pty Ltd

ANNEXURE

This is the Annexure marked **CS-2** produced and shown to Cory Seligman at the time of signing his Declaration.

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Zhang et al.

(54) **EMERGENCY POWER SUPPLY STARTING SYSTEM FOR A LITHIUM BATTERY WITH AUTOMATIC PREHEATING FUNCTION**

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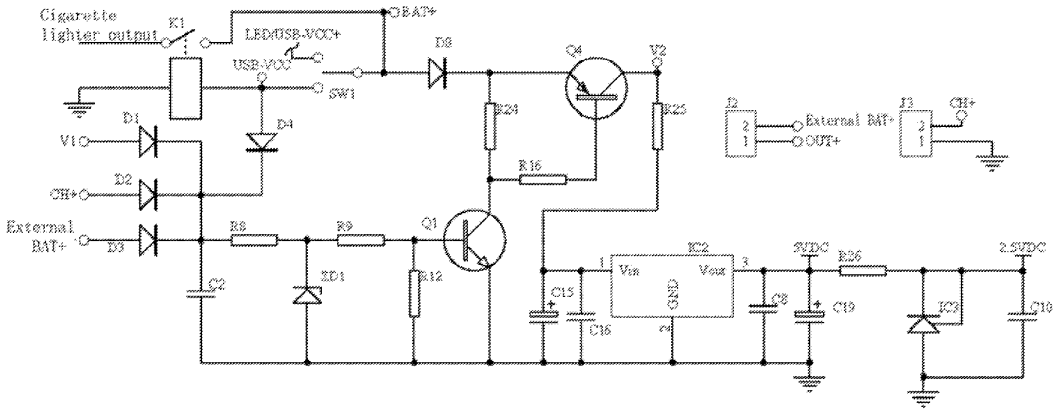
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H02J 7/00 (2006.01)

(52) **U.S. Cl.**
CPC ***H02J 7/0029*** (2013.01)
USPC **320/107**

(57) **ABSTRACT**

An emergency power supply starting system a lithium battery with automatic preheating function, including a lithium battery pack, an output control module, an output module, a working power supply control module, a CPU master control module, an operation panel display function module, a heater control module, a heater module, an information sampling module and a charging module is disclosed. The CPU master control module, monitoring the real-time temperature, residual capacity and user operation status of the lithium battery pack, cuts off all output functions and charges the lithium battery (power supply is resumed only after charging) if the battery voltage is too low; if the voltage is normal but battery temperature is too low, the heater control module will start the heater module to initiate the heating process driven with the low current from the lithium battery and the latter is ready for use after the lithium battery temperature returns to normal. The invention arranges a heating source for heating the lithium battery the invention to realize automatic heating for the lithium battery and therefore, normal usage is possible in low temperature condition.



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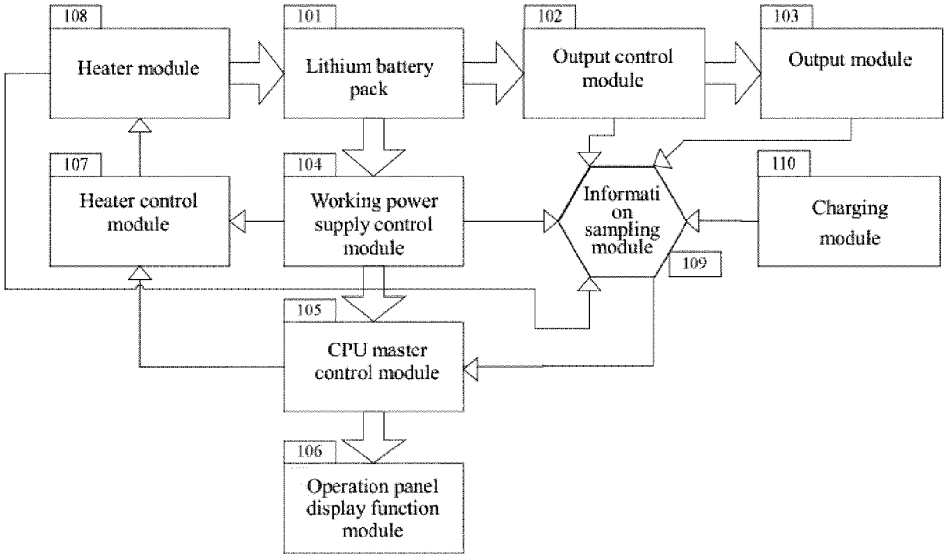

108
Heater module
101
Lithium battery pack
102
Output control module
103
Output module
107
Heater control module
104
Working power supply control module
Informati on sampling module
109
110
Charging module
105
CPU master control module
106
Operation panel display function module

Fig. 1

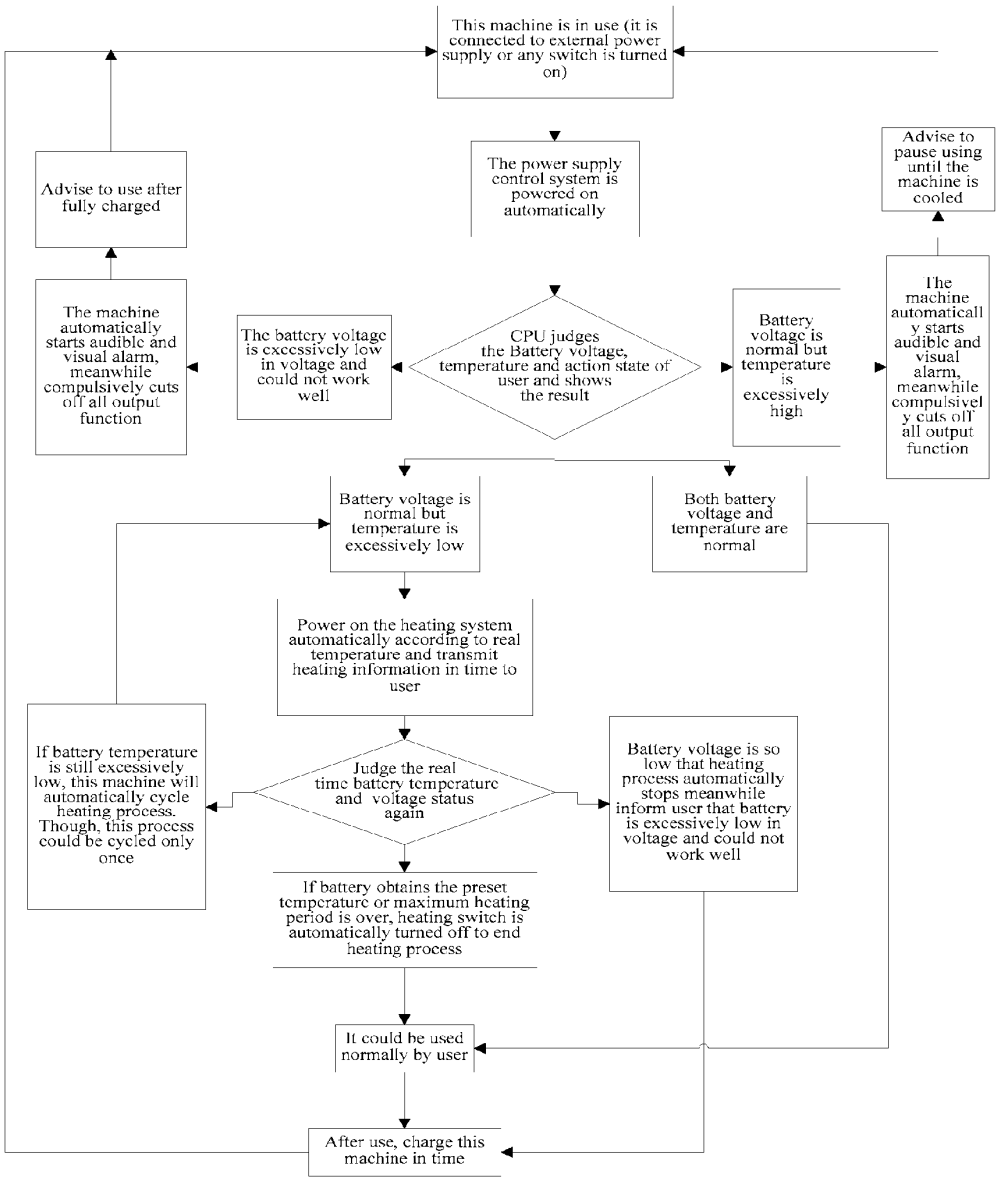

This machine is in use (it is connected to external power supply or any switch is turned on)
The power supply control system is powered on automatically
Advise to use after fully charged
Advise to pause using until the machine is cooled
The machine automatically starts audible and visual alarm, meanwhile compulsively cuts off all output function
The battery voltage is excessively low in voltage and could not work well
CPU judges the Battery voltage, temperature and action state of user and shows the result
Battery voltage is normal but temperature is excessively high
The machine automatically starts audible and visual alarm, meanwhile compulsively cuts off all output function
Battery voltage is normal but temperature is excessively low
Both battery voltage and temperature are normal
Power on the heating system automatically according to real temperature and transmit heating information in time to user
If battery temperature is still excessively low, this machine will automatically cycle heating process. Though, this process could be cycled only once
Judge the real time battery temperature and voltage status again
Battery voltage is so low that heating process automatically stops meanwhile inform user that battery is excessively low in voltage and could not work well
If battery obtains the preset temperature or maximum heating period is over, heating switch is automatically turned off to end heating process
It could be used normally by user
After use, charge this machine in time

Fig. 2

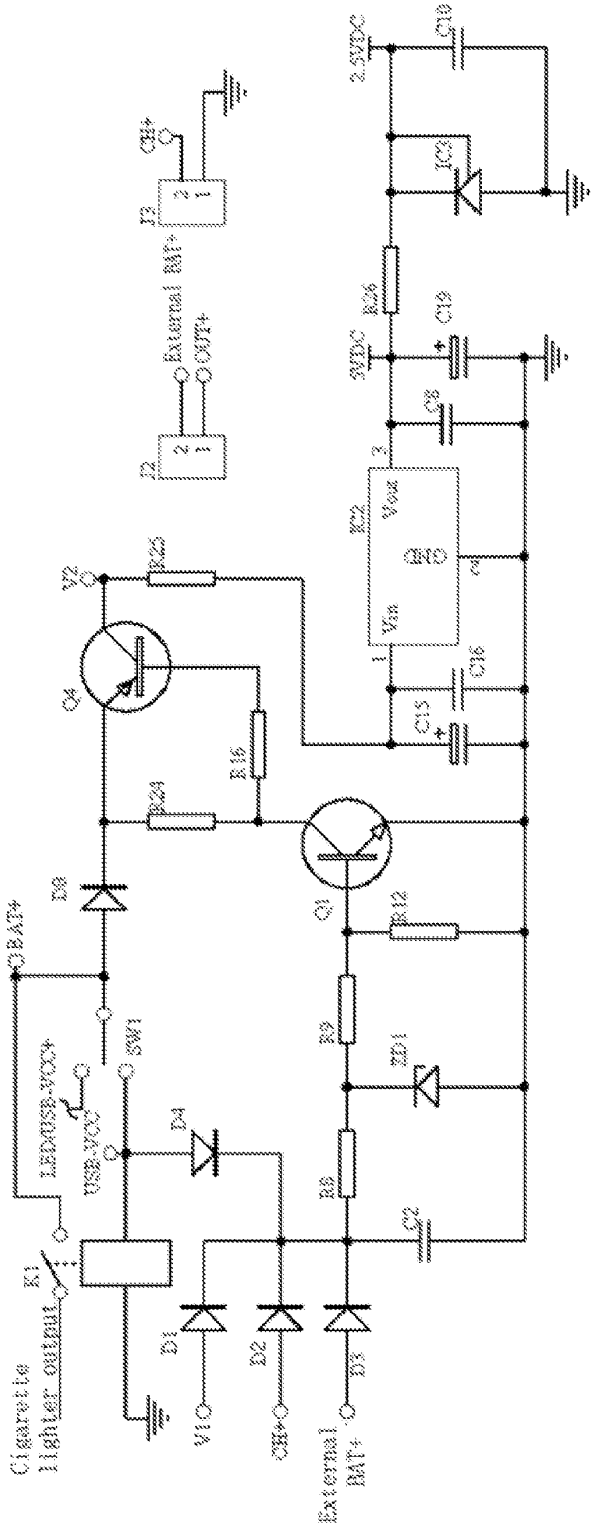

2.5VDC
C10
IC3
CB+
J3
External BAT+
OUT+
J2
R26
C19
VDC
C8
IC2
Vout
GND
Vin
C16
C15
R23
Q4
R16
R24
D6
BAT+
SW1
LEDUSB_VCC
USB_VCC
D4
K1
Cigarette lighter output
D1
V1
D2
CB+
D3
External BAT+
Q1
R12
R9
ZD1
R8
C2

Fig. 3

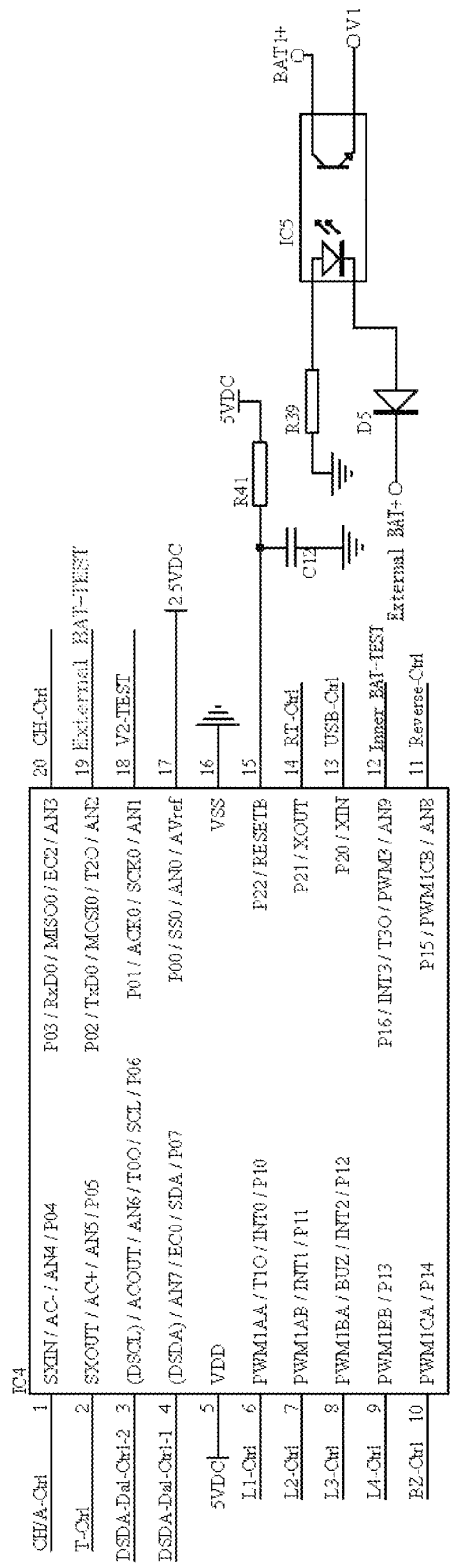

IC4
CHA-Ctrl
T-Ctrl
DSDA-Dat-Ctrl-2
DSDA-Dat-Ctrl-1
5VDC
L1-Ctrl
L2-Ctrl
L3-Ctrl
L4-Ctrl
E2-Ctrl
SXIN / AC- / AN4 / P04
SXOUT / AC+ / AN5 / P05
(DSCL) / ACOUT / AN6 / T0O / SCL / P06
(DSDA) / AN7 / EC0 / SDA / P07
VDD
PWM1AA / T1C / INT0 / P10
PWM1AB / INT1 / P11
PWM1BA / BUZ / INT2 / P12
PWM1BB / P13
PWM1CA / P14
P03 / RxD0 / MISO0 / EC2 / AN3
P02 / TxD0 / MOSI0 / T2O / AN2
P01 / ACK0 / SCK0 / AN1
P00 / SS0 / AN0 / AVref
VSS
P22 / RESETB
P21 / XOUT
P20 / XIN
P16 / INT3 / T3O / PWM2 / AN9
P15 / PWM1CB / AN8
1
2
3
4
5
6
7
8
9
10
20
19
18
17
16
15
14
13
12
11
CH-Ctrl
External BAT-TEST
V2-TEST
2.5VDC
R41
5VDC
C13
R39
IC5
D5
External BAT+
Inner BAT-TEST
RT-Ctrl
USB-Ctrl
Reverse-Ctrl
BAT1+
O
OV1

Fig. 4

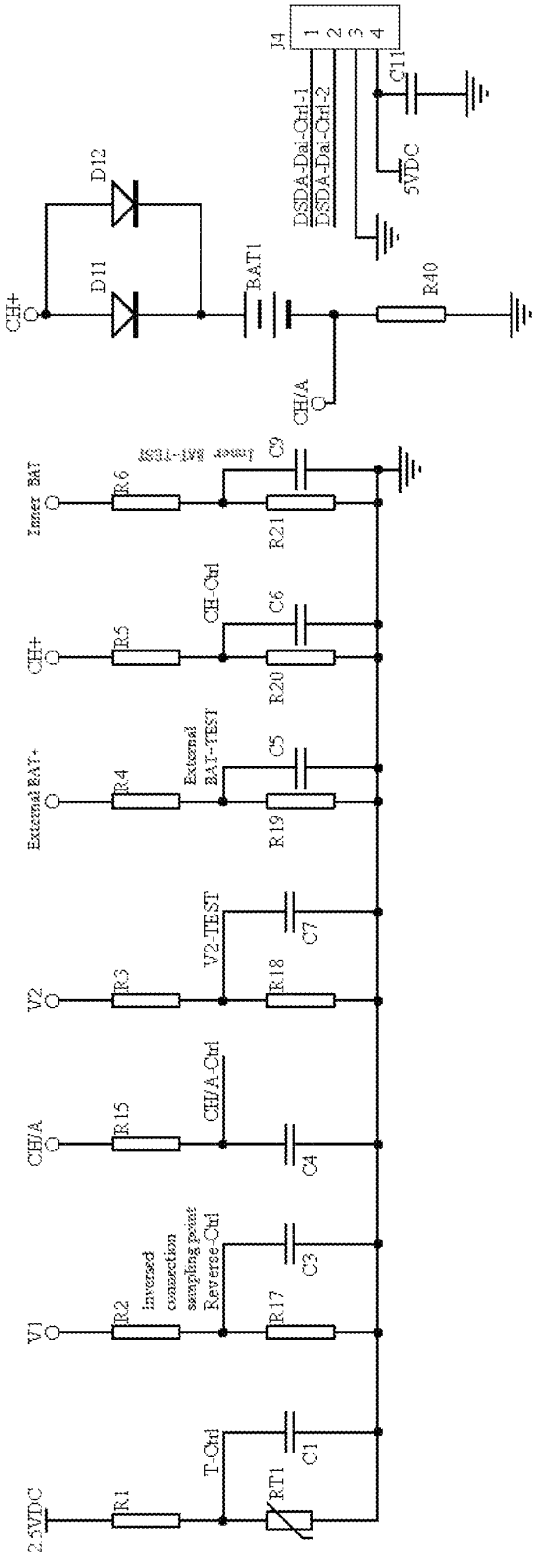

J4
1
2
3
4
DSDA-Dai-Ctrl-1
DSDA-Dai-Ctrl-2
C11
5VDC
D12
D11
BAT1
R40
CH+
CH/A
C9
R6
Inner BAT
R21
CH-Ctrl
C6
R5
CH+
R20
External BAT-TEST
C5
R4
External BAT+
R19
V2-TEST
C7
R3
V2
R18
CH/A-Ctrl
R15
CH/A
C4
inversed connection sampling point
Reverse-Ctrl
C3
R2
V1
R17
T-Ctrl
C1
RT1
R1
2.5VDC

Fig. 5

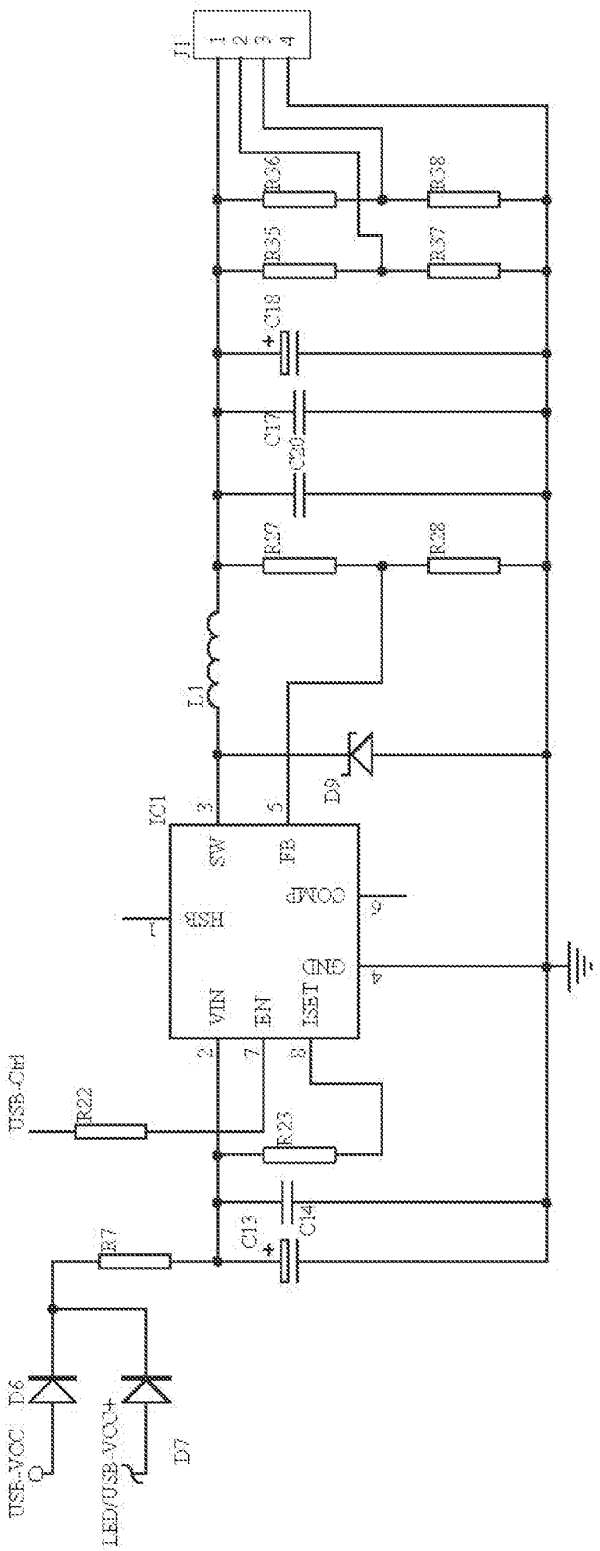

J1
R36
R38
R35
R37
C18
C17
C20
R27
R28
L1
D9
IC1
SW
FB
HSB
COMP
GND
VIN
EN
SST
USB-Chg
R22
R23
C13
C14
R7
D6
D7
USB-VCC
LED/USB-VCC+

Fig. 6

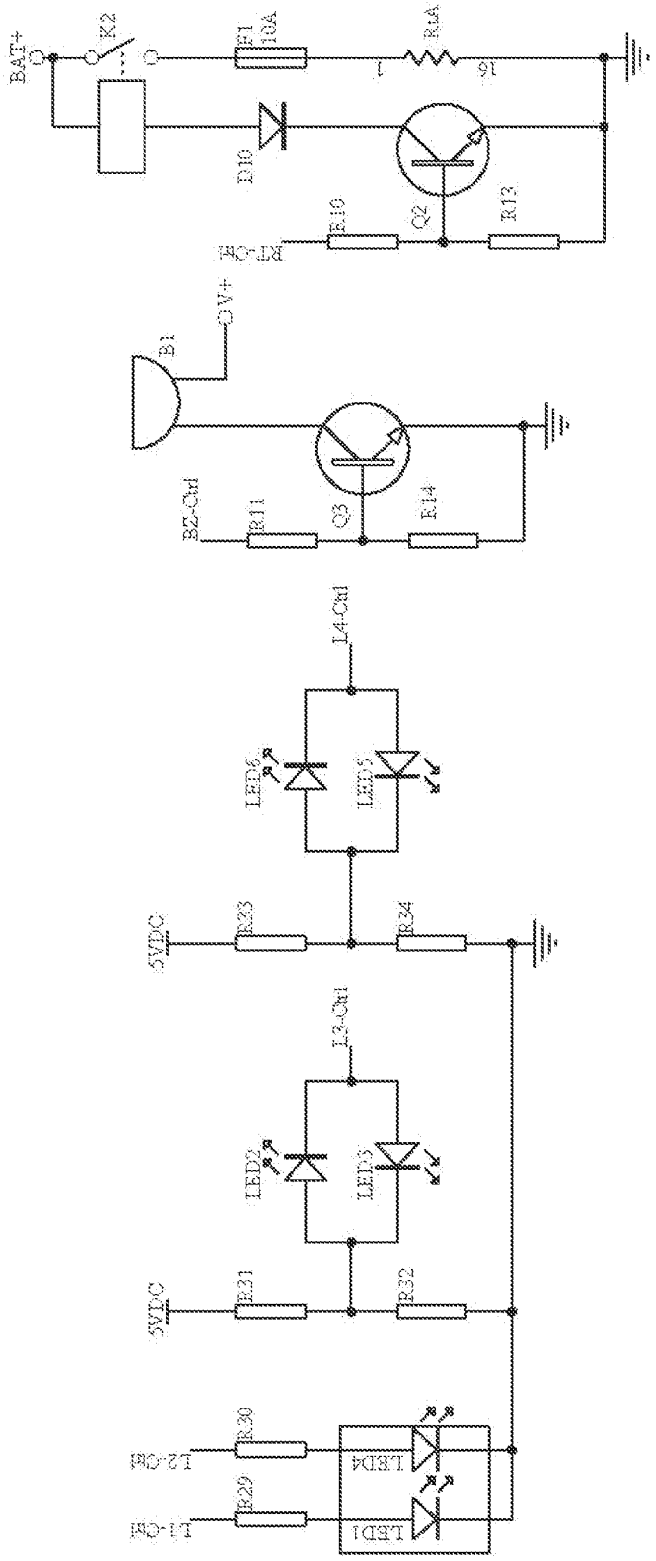

BAT+
K2
F1
10A
R1A
D10
Q2
R12
R16
BT-Ctrl
5V+
B1
BZ-Ctrl
R11
Q3
R14
L4-Ctrl
LED6
LED5
5VDC
R23
R24
L3-Ctrl
LED2
LED3
R21
R22
R30
L2-Ctrl
LSD4
R29
L1-Ctrl
LSD1

Fig. 7

EMERGENCY POWER SUPPLY STARTING SYSTEM FOR A LITHIUM BATTERY WITH AUTOMATIC PREHEATING FUNCTION

CROSS-REFERENCE TO RELATED PATENT APPLICATIONS

[0001] This application claims priority to and the benefit of China P.R. Priority Application 201210352888.6, filed Sep. 20, 2012 including the specification, drawings, claims and abstract, is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The invention is related to technology in the emergency power supply field, particularly to an emergency power supply starting system for a lithium battery with automatic preheating function.

BACKGROUND OF THE INVENTION

[0003] As a successful example of new energy resources, the lithium battery is applied extensively in a plurality of fields. However, due to its stringent demand on temperature conditions it is hard to discharge normal large current in both high and low temperature environments. Discharge performance of a lithium battery falls with decreasing temperature and its discharge performance at low temperature is far from that at room temperature. Generally, its discharging performance at −20° C. is 10%-20% of that at room temperature, and the percentage drastically drops to only 2% at about −30° C. What is worse, the required starting current for common starter of automobile increases as environmental temperature falls. The main environmental condition of an emergency power supply starting product is of low temperature or ultralow temperature, due to its properties, which limits the development of a lithium battery on emergency start-up power. From a user's perspective, it is worthwhile to transfer part of its own energy of the battery into heat energy in a certain process and heat the battery up, which would restore the capacity of the battery of its large current electro-discharge. Take the 8 AH mechanical lithium battery with discharge ratio of 80° C. for example, its discharge current at room temperature is 640 A/5 s/pause of 3 min and it could afford 10 cycles of such a discharge. Thus, its discharge performance is only as weak as about 64 A at a temperature of −20° C., which is not enough to start an automobile. However, if 1 AH or 1.5 AH of it is used to transfer into heat energy for the exchange of the temperature increase of the battery, an ideal discharge performance would be obtained. In spite of some energy loss, the discharge performance is enhanced. Basically, the discharge performance in unit time of such batteries of various capacitance remains the same at the same voltage and same discharge ratio, differing only in discharge time and number of cycles. Thus, this mode of automatic preheat could make up for the innate disadvantage of poor discharge performance of lithium battery at low temperature.

SUMMARY OF THE INVENTION

[0004] The purpose of the invention is to offer an emergency power supply starting system for a lithium battery with automatic preheating function to overcome the disadvantage of poor discharge performance of the lithium battery at low temperature and to improve the startup capability of the lithium battery at low temperature.

[0005] The invention is realized with the following technical scheme: the invention includes a lithium battery pack, an output control module, an output module, a working power supply control module, a CPU master control module, an operation panel display function module, a heater control module, a heater module, an information sampling module and a charging module, in which the heater module is disposed on the outside of the lithium battery pack, heating the lithium battery under the control of heater control module, the heater control module, receiving information from the CPU master control module, controls switching on and off of working power supply in the heater module and carries out compulsory power off protection for the heater module on condition of abnormal over current or over-temperature, the working power control module detects usage state, and controls switching on and switching off of power as well as to provide standard working power supply and sampling reference power supply for the CPU master control module, the output control module, connected with the lithium battery pack, controls switching on and switching off the power supply of the lithium battery pack for an external device, the output module, connected with and the under control of the output control module supplies electric power of the lithium battery pack to the external electric device. The information sampling module, connected with the output control module, output module, charging module, working power supply control module, and heater module, respectively collects voltage of the lithium battery pack, external connection status, real-time status in charging process, operation information and real-time temperature information of the lithium battery pack, and transfers the collected information into uniform analog quantity, which is transmitted in time to the CPU master control module. The CPU master control module receives information from the sampling module and executes: processes including estimating real-time residual capacity of lithium battery pack and when abnormal battery voltage change occurs, sending alarm information or compulsory switching off instruction in time, estimating and distinguishing the connection status of a connected external battery apparatus and sending a corresponding instruction or compulsory switching off message when an error occurs, estimating temperature of the lithium battery pack, and on condition of anomaly of battery temperature, raising an alarm or driving the heater control module to start heating and to adjust power of heating and total heating time with reference to the residual capacity of the lithium battery pack, and the charging module is employed to charge the lithium battery pack. The operation panel display function module serves as the input and output window between machine information and user, and submits the user operation information through operation buttons and then displays the processed information from the CPU master control module.

[0006] Preferably, the lithium battery pack comprises several individual lithium batteries combined together by means of series connection or combination of series and parallel connection, is employed to provide power supply to an external electric device and provides a working power supply to all the modules in the system.

[0007] Preferably, the output control module is a large-current-controlling switch and controls the master switch for an outside power supply.

[0008] Preferably, the output module, is an output connecting port, a positive, or a negative port clip, and is employed to fast transmit electric power to an external electric device.

[0009] Preferably, the working power supply control module, comprises a power supply electronic switching circuit, a voltage switching control circuit and a reference voltage switching circuit, wherein the power supply electronic

switching circuit transfers all operation information to electric signal and automatically turns on the master control circuit switch of the circuit working power supply to transmit voltage of the power supply to voltage switching control circuit by means of a power supply electronic switch, which the power supply electronic switch transfers the battery voltage into working power supply stable enough for CPU master control module, and in the mean time provides working power to voltage switching circuit and takes advantage of voltage switching circuit to provide a reference voltage source with more accuracy as datum reference point of the CPU master control module and provides a working power supply for a temperature measuring and sampling circuit.

[0010] Preferably, the CPU master control module is composed of a single-chip and related peripheral circuits.

[0011] Preferably, the operation panel display function module comprises a button switch, a digital display module, an LED indicator light and an audio alarm, wherein the button switch provides an input window of user operation, transforms all the operation information of a user, together with information from the information sampling module, into an electric signal, and transfers the information to the CPU master control module, the CPU master control module processes the information and obtains an outcome, and outputs the outcome as a message displayed by the digital display module, as a signal displayed by the LED indicator light, or as an alarm signal of the audio alarm.

[0012] Preferably, the heater control module comprises an electronic switch, a fuse wire and a temperature controller, wherein the electronic switch receives instruction from the CPU master control module, and provides power turning on and off for the heater module; the fuse wire and the temperature controller provide double protection to the heater module in operation by turning-off when an abnormal over current or over-temperature occurs in the heater module or the CPU master control module is out of control.

[0013] Preferably, the heater module comprises a heater, a heat conduction insulating strip, a temperature fuse wire and a temperature detector, wherein the heater serves as a heat source of the lithium battery pack and transforms electric energy of the lithium battery pack into heat energy through a low current of the lithium battery pack. The heat conduction insulating strip electrically isolates the heater and the lithium battery pack, and in the meantime transmits heat energy evenly to the lithium battery pack. The temperature fuse wire is connected to the heater, and self-runs to turn off power on an abnormally high temperature. The temperature detector is employed to measure the real-time surface temperature of the lithium battery pack, and coordinates with the information sampling module to transform the surface temperature of the CPU master control module into an electric signal, and the electric signal is transmitted to the CPU master control module in real time.

Detailed Working Principles of the Invention

[0014] 1. Lithium battery at low temperature could discharge low current in short time, though not large current. Thus, the invention takes advantage of the low current to drive the external heater module, which then increases the temperature of the lithium battery;

[0015] 2. Heating resistor disc with good stability, connected to positive and negative electrodes of the battery by means of electronic switch, is employed in the external heater and laid out on the surface of each battery in accordance with the shape of the battery. As the low current from the battery goes through the heating resistor disc, it is transferred quickly into heat energy, which heats the surface of the lithium battery through direct conduction. Then the entire temperature is raised back in a short span, so the lithium battery will be at a relative high temperature, and its high discharge capacity restored.

Working Process of the Invention:

[0016] Before the lithium battery starts running, the real-time temperature, residual capacity and user operation status of the lithium battery pack are measured by the CPU master control module and different operations are carried out respectively according to the conditions below.

[0017] If voltage is normal but battery temperature is too high, the equipment of the invention will trigger an alarm, and in the mean time compulsorily cut off all input and output functions until the battery is cooled.

[0018] If the voltage of the battery is too low, all output function will be compulsorily turned off and restarted after battery charging.

[0019] If the voltage is normal but the battery temperature is too low, the heater control module will start the heater module to carry out a heating process with driving of low current from the lithium battery and recover temperature of lithium battery for normal use of consumer.

Compared with Prior Technology, the Invention Enjoys the Following Advantages:

[0020] 1. The invention could automatically measure real-time temperature and residual capacity and adjust the heating status for lithium according to information detected, which means whether it needs heating or the heating time on different condition.

[0021] 2. The maximum of heating temperature could be set in the invention to make sure the lithium battery could obtain ideal temperature after the heat process.

[0022] 3. The maximum of preheating time could be set in the invention to increase heat safety factor of product.

[0023] 4. The invention could automatically adjust the rate of power and time of preheating according to different environment and different battery capacity.

[0024] 5. The invention could realize man-machine interaction by transmission of real-time temperature and preheat information to a user through an operation panel.

[0025] 6. The invention has multiple safety protection and could automatically adjust heating power according to battery temperature, improve heat energy utilization and shorten the preheat latency time. Thus, the operation by a user gets safer, more convenient and more stable.

[0026] Above all, the invention has been installed with a heat source for lithium battery heating, cooperating with the control circuit, to automatically heat the lithium battery so that the emergency starting power supply could be used normally in low temperature condition.

DESCRIPTION OF THE ATTACHED DRAWINGS

[0027] FIG. **1** is the system chart of the invention;

[0028] FIG. **2** is the working process flow diagram corresponding to the system of the invention;

[0029] FIG. **3** is an electric schematic diagram of the working power supply control module circuit in the system of the invention;

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[0030] FIG. **4** is an electric schematic diagram of the CPU master control module circuit in the system of the invention;

[0031] FIG. **5** is an electric schematic diagram of the temperature sampling circuit in the system of the invention;

[0032] FIG. **6** is an electric schematic diagram of a USB output and charging control circuit in the system of the invention; and

[0033] FIG. **7** is an electric schematic diagram of the heating control circuit in the system of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0034] The following description of the embodiment is offered with attached drawings and the embodiment below is intended to implement according to the technical scheme of the invention, with detailed execution method and operation processes, but is not to limit the protection scope of the invention.

[0035] As shown in FIG. **1**, the embodiment comprises: lithium battery pack **101**, output control module **102**, output module **103**, working power supply control module **104**, CPU master control module **105**, operation panel display function module **106**, heater control module **107**, heater module **108**, information sampling module **109** and charging module **110**, in which:

[0036] The heater module is disposed on the outside of the lithium battery pack, heating the lithium battery under the control of heater control module.

[0037] The heater control module, receiving information from the CPU master control module, controls switching on and off of working power supply in the heater module and carries out compulsory power off protection for the heater module on condition in the event of abnormal over current or over-temperature.

[0038] The working power control module detects usage state, controls switching on and off of power as well as provide standard working power supply and sampling reference power supply for the CPU master control module.

[0039] The output control module, connected with the lithium battery pack, controls the switch of power supply of the lithium battery pack for external device.

[0040] The output module, connected with and under control of output control module, supplies electric power of lithium to the external electric device.

[0041] The information sampling module, connected with the output control module, output module, charging module, working power supply control module, and heater module, respectively collects information including the voltage of the lithium hattery pack, external connection status, real-time status in charging process, operation information and real-time temperature information of the lithium battery pack, and transfers the collected information into uniform analog quantity, which is transmitted in time to the CPU master control module;

[0042] The CPU master control module receives information from the sampling module and executes steps including estimating real-time residual capacity of lithium battery pack and when abnormal battery voltage change occurs, sending alarm information or compulsory switching off instruction in time, estimating and distinguishing the connection status of a connected external battery apparatus and sending a corresponding instruction or compulsory switching off message when an error occurs, estimating the temperature of the lithium battery pack, and on condition of anomaly of battery temperature, raising an alarm or driving the heater control module to start heating and to adjust the power of heating and total heating time with reference to the residual capacity of the lithium battery pack.

[0043] The charging module is employed to charge the lithium battery pack.

[0044] The operation panel display function module serves as the input and output window between machine information and the user, submits the user operation information through operation buttons and then displays the processed information from the CPU master control module.

[0045] In one embodiment, the lithium battery pack comprises several individual lithium batteries combined together by means of a series connection or combination of series and parallel connection, has functions 1. to provide power supply to an external electric device; and 2. to provide working power supply to the inner control circuit;

[0046] In one embodiment, the output control module, comprises a large-current-controlling switch and output wires, and controls for the master switch for the outside power supply.

[0047] In one embodiment, the output module, comprises output wires, an output connecting port, and/or a positive, or a negative port clip, and functions mainly to establish a fast connection between the battery and an external electric device by means of the output system.

[0048] In one embodiment, the working power supply control module comprises a power supply electronic switching circuit, a voltage switching control circuit and a reference voltage switching circuit, wherein the power supply electronic switching circuit transfers all operation information to an electric signal and automatically turns on the master control circuit switch of the circuit working power supply to transmit voltage of the power supply to the voltage switching control circuit by means of the power supply electronic switch, the voltage switching control circuit transfers the battery voltage into stable working power supply required of the CPU master control module, and in the mean time provides working power to the reference voltage switching circuit, and by means of the latter provides a reference voltage source with more accuracy to serve as a reference point for the CPU master control module and a working power supply for the temperature measuring and sampling circuit.

[0049] In one embodiment, the CPU master control module is composed of a single-chip and related peripheral circuits.

[0050] In one embodiment, the operation panel display function module comprises a button switch, a digital display module, an LED indicator light and an audio alarm. The button switch provides an input window of user operation, transforms all the operation information of a user together with information from the information sampling module into an electric signal, and transfers the information to the CPU master control module. The CPU master control module processes the information and obtains an outcome, and outputs the outcome as a message displayed by the digital display module, as a signal displayed by the LED indicator light, or as an alarm signal of the audio alarm.

[0051] In one embodiment, the heater control module comprises an electronic switch, a fuse wire and a temperature controller, wherein the electronic switch receives instruction from the CPU master control module, and provides power turning on and off for the heater module; the fuse wire and the temperature controller provide double working protection to the heater module by turning-off when an abnormal over current or over-temperature occurs in the heater module or the CPU master control module is out of control.

[0052] In one embodiment, the heater module, being a core component of the system, comprises a heater, a heat conduction insulating strip, a temperature fuse wire and a temperature detector, wherein the heater serves as a heat source of the lithium battery pack and transforms electric energy of the lithium battery pack into heat energy through a low current of the lithium battery pack. The heat conduction insulating strip electrically isolates the heater and the lithium battery pack, and in the meantime transmits heat energy evenly to the lithium battery pack. The temperature fuse wire is connected to the heater, and self-runs to turn off power on an abnormally high temperature. The temperature detector is employed to measure the real-time surface temperature of the lithium battery pack, and coordinates with the information sampling module to transform the surface temperature of the CPU master control module into an electric signal, and the electric signal is transmitted to the CPU master control module in real time.

[0053] As shown in FIG. **2**, the working process of the invention is described below:

[0054] Before the lithium battery starts running, the real-time temperature, residual capacity and user operation status of the lithium battery pack are measured by the CPU master control module and different operations are carried out respectively according to the conditions below:

[0055] If the voltage is normal but battery temperature is excessive, the equipment of the invention will give off an alarm, and in the mean time compulsorily cut off all input and output functions until it is cooled;

[0056] If the voltage of battery is too low, all output function will be compulsorily turned off and restarted after battery charging;

[0057] If the voltage is normal but battery temperature is too low, the heater control module will start the heater module to carry out a heating process by driving low current from the lithium battery and recover the temperature of lithium battery for normal use by the consumer.

[0058] As shown in FIG. **2**, the detailed working process of the embodiment is described below:

[0059] Before the lithium battery starts running, the real-time temperature, residual capacity and user operation status of the lithium battery pack are measured by the CPU master control module and different operations are carried out respectively according to the conditions below:

[0060] If the voltage is normal but battery temperature is too high, the equipment of the invention will give off an alarm, and in the mean time compulsorily cut off all input and output functions until it is cooled;

[0061] If the voltage of battery is too low, all output function will be compulsorily turned off and restarted after battery charging;

[0062] If the voltage is normal but battery temperature is too low, heater control module will start the heater module to carry out a heating process by driving low current from the lithium battery and recover the temperature of the lithium battery for normal use of consumer.

[0063] As shown in FIGS. **3-7**, the fundamental diagram of the circuit corresponding to the embodiment is described below:

[0064] FIG. **3** shows a circuit diagram of the power supply control circuit. When switch SW**1** is changed from OFF position to USB-VCC position, voltage of positive port BAT+ will pass the switch, be limited by diode D**4**, current-limiting resistance R**8** and voltage-regulator diode ZD**1** and then pass current-limiting resistance R**9** to drive switch tube Q**1** so as to completely allow current flow in Q**1**. Thus, the Q**4** base electrode could obtain reversal bias voltage and the Q**4** switch tube completely allow current to flow; voltage of positive port BAT+, passing through diode D**8**, Q**4** and R**25**, enters into the input end of the three-port integrated voltage stabilizer 7805 so that port **3** provides stable 5 VDC voltage power to the CPU and other circuits. The 5 VDC voltage passes through current-limiting resistance R**26** and enters into IC**3**, so that IC**3** could provide stable 2.5V power to CPU and temperature detecting circuit as a reference voltage source.

[0065] When any port of "V1", "CH+", "external VCC" and so on is powered on, 7805 then will turn into normal working status. Among these ports, if "V1" is inversely connected with an external clip, the external reverse connection signal will be transferred through IC**5** into an inner positive signal, which will be transmitted to the input port of diode D**1**.

[0066] As is shown in FIG. **4**, a diagram of the master control circuit, after the CPU is powered on, it will automatically detect the AD variation of all signal input ports, which is then calculated and processed to drive the corresponding opto-acoustic alarm control circuit and the heater switch control circuit.

[0067] As is shown in FIG. **5**, a circuit diagram for battery temperature sampling, the battery temperature sampling resistance composes R**1** and RT**1**, wherein RT**1** is an NTC high-precision thermistor, processed and disposed on the surface of the battery housing. After the CPU is powered on, different voltage drop is generated by RT**1** in accordance with different resistance value responding to the battery surface temperature, and a corresponding electric signal enters into the port **11** of the single-chip. The signal processed by the single-chip represents the real time temperature, so that the temperature state of the battery could be judged to be normal, too high or too low respectively. If over-temperature occurs, an opto-acoustic alarm will ring in time; if the battery temperature is too low, an alarm will be set by flickering of the LED and the battery is heated according to the actual temperature; when heating time is over or it has reached the preset temperature, the heating process will automatically stop, and in the mean time the flickering of the LED as an alarm will go off to show the end of heating and start of a standby mode.

[0068] The inversed connected alarm signal sampling circuit is composed of IC**5**, R**39**, D**5** and R**2**, R**17** as well as C**3**. Its specific working process is described as below: the large current switch is positioned at OFF, the positive electrode clip of the machine is connected to the negative electrode of the external battery, and the negative electrode clip of the machine is connected to the positive electrode of the external battery. Then, the voltage of the external battery is current-limited by R**39**, and then transferred into an optical signal by IC**5** and D**5**, and turned back into an electric signal by IC**5**. The electric signal is divided by port**3** of IC**5** into two parts, one of which is transmitted into the power supply control circuit to start the working power supply and the other one is connected to R**2**, R**17**, C**3** and so on, so that the signal is input into the single-chip to be processed. The circuit diagram of the USB output and charging control is shown in FIG. **6**.

[0069] In the sampling circuit, the "CH/A" serves as a sample of the charging current intensity; "V2" as a sample of the working status of the inner battery; the "external BAT+" as a sample of correctness of the external battery polarity of output clip, and in the mean time as a sample of misconnection of the external battery (for example, a machine of 12V is

connected to both ends of battery of 24V, which indicates misconnection of the inner and external batteries); the "CH+" as a sample of the input voltage of the charger to judge whether there is charging voltage input. If there is, the corresponding charging indicating circuit will be powered on to transmit real-time charging status to the user by an LED; the "inner BAT"" as sampling site of the electric quantity of the inner battery. The power supply and "BSB-VCC" is connected to the same terminal and the real-time residual capacity of the battery is indicated with LED lights of various colors.

[0070] After switch SW**1** is turned on, the power supply control chip IC **1** is powered on and connected to the USB port through the peripheral sampling, voltage reduction, voltage stabilization, filtration circuits, and so on. Meanwhile, the CPU is powered on and starts to function. If voltage of the inner battery is lower than the set value, the 11 port of single-chip will output a low current, so that IC**1** will cut off output. Thus, the function of USB to automatically cut off on condition of low voltage is realized.

[0071] FIG. **7** shows a diagram of the heating control circuit and the heating circuit, wherein, LED**1** and LED**4** serve as indications of connection status of the machine with the external device. When it is connected correctly, LED**4** (green light) will light up; when the external connection is in reverse, LED**1** will fast blink (0.25 s on/0.25 s off) and beep with a continuous alarm. If voltage of the external battery is incorrect, LED**1** will slowly blink (1 s on/1 s off) and beep with a continuous alarm to indicate a misconnection of the inner and external batteries.

[0072] LED**2**, LED**5** and LED**6** serve as indications of battery electric quantity and rolling flicker indications for charging. When the battery voltage is lower than 11.5V, the LED**2** (red light) will light up; when it is higher than 11.5V but less than 12.5V, LED**6** (yellow light) will light up; when it is higher than 12.5V but lower than 15.5V, LED**5** (green light) will light up; when it is higher than 15.5V, LED**5** will fast blink and beep with a continuous alarm. When the charger is connected and the battery is in charging status, LED**2**, LED**5** and LED**6** will automatically light in rolling cycle, which indicates that it is being charged. When the charging of battery is over, LED**2**, LED**5** and LED**6** will be all in constant light-up status, which indicates that the battery is fully charged.

[0073] LED**3** serves as an indicator of the battery temperature. When battery temperature is over 60° C., LED**3** (red light) will light up and sound an alarm continuously; when battery temperature is too low, the machine will heat the battery automatically after the system is powered on, and in the mean time LED**3** will flicker (0.5 s on/0.5 s off), which indicates that the battery temperature is too low and the machine is in the heating process. When the heating process is over or battery temperature is in the normal range, LED**3** goes off automatically.

[0074] The sound alarm circuit is composed of the beeper B**1**, the control switch tube Q**3** and the resistors R**11**, R**14**. The battery heating system is composed of an electrical relay K**2**, a resettable fuse RF**1**, a heating resistor disc RtA, a protection diode D**10**, a switch tube Q**2** and resistors R**10**, R**13**. When the single-chip decides that battery temperature is too low and the battery needs heating, the 13 port of the single-chip will output a high level current to drive the switch Q**2** to be powered on, so that the electrical relay K**2** is in pull-in break-over status and the heating resistor disc obtains working power supply. Thus, the objective to heat the lithium battery is realized.

[0075] In one embodiment, the specific standards of control is described as below:

[0076] 1. The system automatically adjusts the total heating time and pause recovery time according to the real time condition of battery. Corresponding to different battery temperatures, the heating time could be 3 min, 5 min or 10 min. If battery temperature is −5° C.~−10° C., the total heating time should be 3 min; if −10° C.~−20° C., it is 5 min; if less than −20° C., it is 10 min, and in the mean time, there is two heating cycles per min (it means a cycle includes heating of 27 s and pause of 3 s). Thus, the battery could be quickly heated up, and in the mean time is protected timely and has time for automatic recovery;

[0077] 2. Relevant parameter setting of the heating system: upper limit of battery temperature (60° C.), upper limit of maximum heating temperature (20° C.), heating start temperature point (−5° C.), continuous heating up time 27 s (subject to the real-time voltage of the battery), pause period 3 s, longest heating up time 3 min, 5 min and 10 min (automatically adjusted according to the actual battery temperature);

[0078] In one embodiment, the heating resistor chip could serve as a heat source for the battery, as well as in the role of increasing the thermal dissipation area of the battery surface to help cooling the battery.

[0079] One embodiment fully takes advantage of the energy of the battery itself to realize automatic detection of the battery voltage, temperature and a series of actions such as heating, cutting off and so on at ultralow temperature, and the capacity of the battery to output large current at ultralow temperature.

[0080] The fundamental mechanism, main characters and advantages of the invention are described and shown above. A person of the art should be aware that the invention is not limited by the embodiment above. Contents described in the above embodiment and specifications are intended to illustrate mechanisms of the invention. Various changes and modifications may be made to the embodiment without departing from the spirit and scope of the invention, which are all included in the scope of protection of the invention. The scope of the invention is to be limited only by the appended claims and its equivalents.

1. An emergency power supply starting system for a lithium battery with automatic preheating function, comprising a lithium battery, an output control module, an output module, a working power supply control module, a CPU master control module, an operation panel display function module, a heater control module, a heater module, an information sampling module and a charging module, wherein:

the heater module is disposed on the outside of the lithium battery for heating the lithium battery under the control of the heater control module;

the heater control module, receives information from the CPU master control module, to control switching on and switching off of a working power supply in the heater module and implements compulsory power off protection for the heater module when abnormal over current or over-temperature occurs;

the working power control module detects usage status, controls switching on and switching off of power and

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provides standard working power supply and sampling reference power supply for the CPU master control module;

the output control module is connected with the lithium battery, and controls the switching on and switching off of the power supply of the lithium battery for an external device;

the output module is connected with and under control of the output control module, and supplies electric power of the lithium battery to an external electric device;

the information sampling module is connected with the output control module, the output module, the charging module, the working power supply control module, the heater module, and respectively collects voltage of the lithium battery, external connection status, real-time status in charging process, user operation information and real-time temperature information of the lithium battery, and transfers the collected information into uniform analog quantity, which is transmitted in time to the CPU master control module;

the CPU master control module receives information from the sampling module and executes estimating real-time residual capacity of the lithium battery and when abnormal battery voltage change occurs, sending alarm information or compulsory switching off instruction in time, estimating and distinguishing the connection status of a connected external battery apparatus and sending a corresponding instruction or a compulsory switching off message when an error occurs, estimating temperature of the lithium battery, and on condition of anomaly of battery temperature, raising an alarm or driving the heater control module to start heating, and adjusting power of heating and total heating time with reference to the residual capacity of the lithium battery;

the charging module is employed to charge the lithium battery; and

the operation panel display function module serves as the input and output window between machine information and a user, and submits the user operation information by means of operation buttons and then displays the processed information from the CPU master control module.

2. An emergency power supply starting system for a lithium battery with automatic preheating function according to claim **1**, wherein the lithium battery comprises a plurality of individual lithium batteries combined together by means of at least one of a series connection or a combination of series and parallel connections, and is employed to provide power supply to an external electric device and to provide working power supply to all the modules in the system.

3. An emergency power supply starting system for a lithium battery with automatic preheating function according to claim **1**, wherein the output control module is a large-current-controlling switch and controls the master switch for the outside power supply.

4. An emergency power supply starting system for a lithium battery with automatic preheating function according to claim **1**, wherein the output module comprises an output connecting port, a positive, or a negative port clip, and is employed to fast transmit electric power to an external electric device.

5. An emergency power supply starting system for a lithium battery with automatic preheating function according to claim **1**, wherein the working power supply control module comprises a power supply electronic switching circuit, a voltage switching control circuit and a reference voltage switching circuit, wherein the power supply electronic switching circuit transfers all user operation information to electric signal and automatically turns on the master control circuit switch of the circuit working power supply to transmit voltage of power supply to voltage switching control circuit by means of the power supply electronic switch, the power supply electronic switch transfers the battery voltage into working power supply stable enough for the CPU master control module, and in the meantime provides working power to the voltage switching circuit and the voltage switching circuit provides a reference voltage source with more accuracy as data reference point of the CPU master control module and provides a working power supply for a temperature measuring and sampling circuit.

6. An emergency power supply starting system for a lithium battery with automatic preheating function according to claim **1**, wherein the operation panel display function module comprises a button switch, a digital display module, an LED indicator light and an audio alarm, wherein the button switch provides an input window of user operation, transforms all the user operation information, together with information from the information sampling module, into electric signal, and transfers the information to the CPU master control module, the CPU master control module processes the information and obtains an outcome, and outputs the outcome as at least one of a message displayed by the digital display module, a signal displayed by the LED indicator light, or an alarm signal of the audio alarm.

7. An emergency power supply starting system for a lithium battery with automatic preheating function according to claim **1**, wherein the heater control module comprises an electronic switch, a fuse wire and a temperature controller, wherein the electronic switch receives instruction from the CPU master control module, and provides power turning on and off for the heater module; the fuse wire and the temperature controller provide double protection to the heater module in operation by turning-off when at least one of an abnormal over current or over-temperature occurs in the heater module or the CPU master control module is out of control.

8. An emergency power supply starting system for a lithium battery pack with automatic preheating function according to claim **1**, characterized in that wherein the heater module comprises a heater, a heat conduction insulating strip, a temperature fuse wire and a temperature detector, wherein the heater serves as a heat source of the lithium battery pack and transforms electric energy of the lithium battery pack into heat energy through a low current of the lithium battery pack, the heat conduction insulating strip electrically isolates the heater and the lithium battery pack, and in the meantime transmits heat energy evenly to the lithium battery pack, the temperature fuse wire is connected to the heater, and self-runs to turn off power on an abnormally high temperatures, the temperature detector is employed to measure the real-time surface temperature of the lithium battery pack, and coordinates with the information sampling module to transform the surface temperature of the CPU master control module into an electric signal, and the electric signal is transmitted to the CPU master control module in real time.

* * * * *

AUSTRALIA
Patents Act

IN THE MATTER of Australian Patent Application No. 2019201559 in the name of The NOCO Company

- and –

Opposition thereto by Brown & Watson International Pty Ltd

ANNEXURE

This is the Annexure marked **CS-3** produced and shown to Cory Seligman at the time of signing his Declaration.

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Krieger et al. (43) **Pub. Date: Jul. 8, 2004**

(54) **MICROPROCESSOR CONTROLLED BOOSTER APPARATUS WITH POLARITY PROTECTION**

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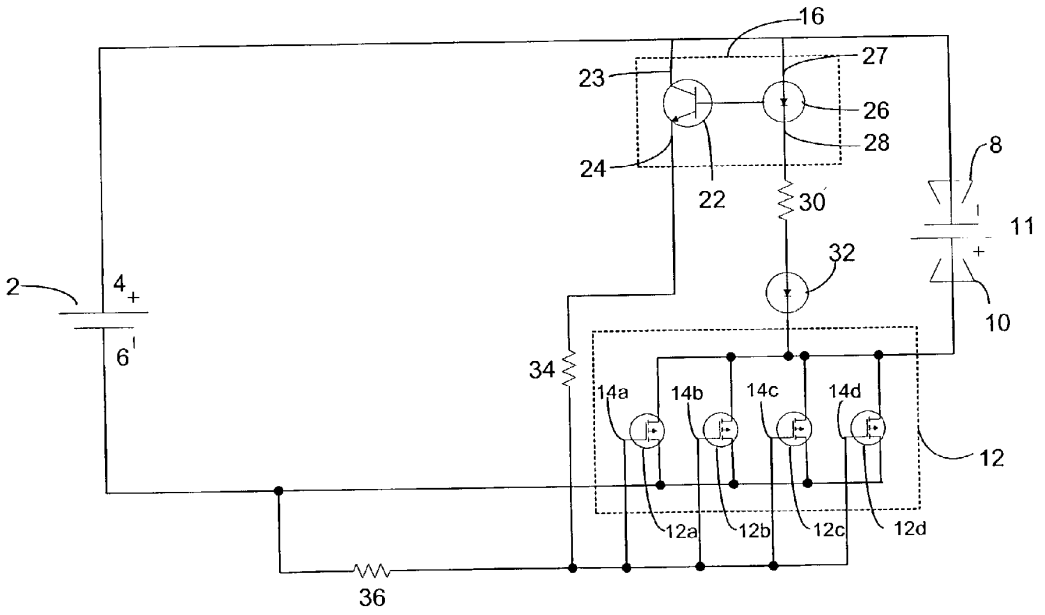
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(51) **Int. Cl.**[7] **H02J 7/04**

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(57) **ABSTRACT**

A polarity protection circuit for a battery booster device is provided. According to an exemplary embodiment, the polarity protection circuit is comprised of solid-state devices. Preferably no mechanical or electro-mechanical devices, such as solenoids are included in the polarity protection circuit. The polarity protection circuit is electrically connected to the battery to be charged and to the boosting battery. The polarity protection circuit prevents current flow between the batteries unless proper polarity is achieved.



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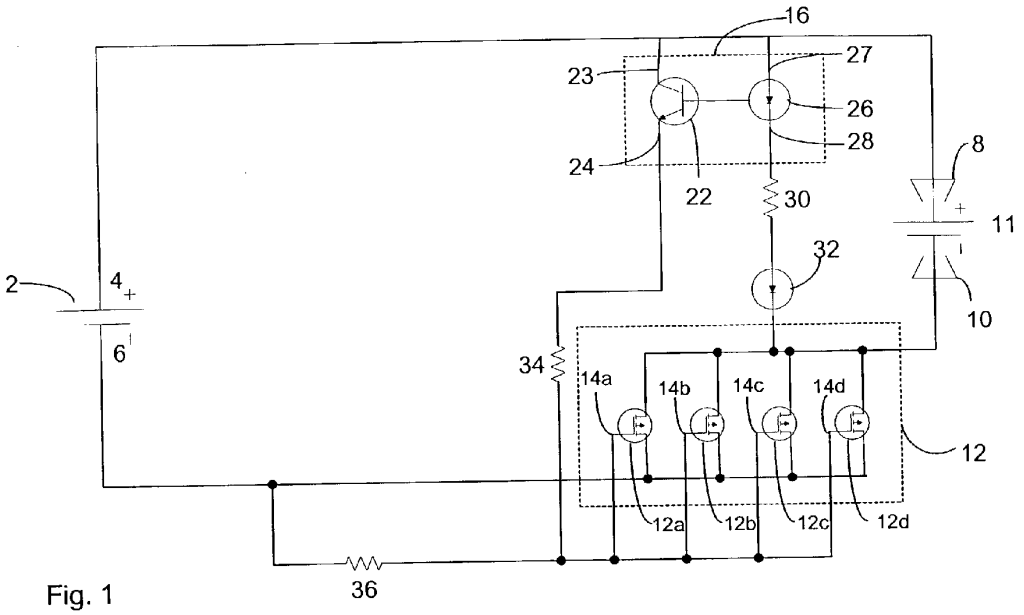

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Fig. 1

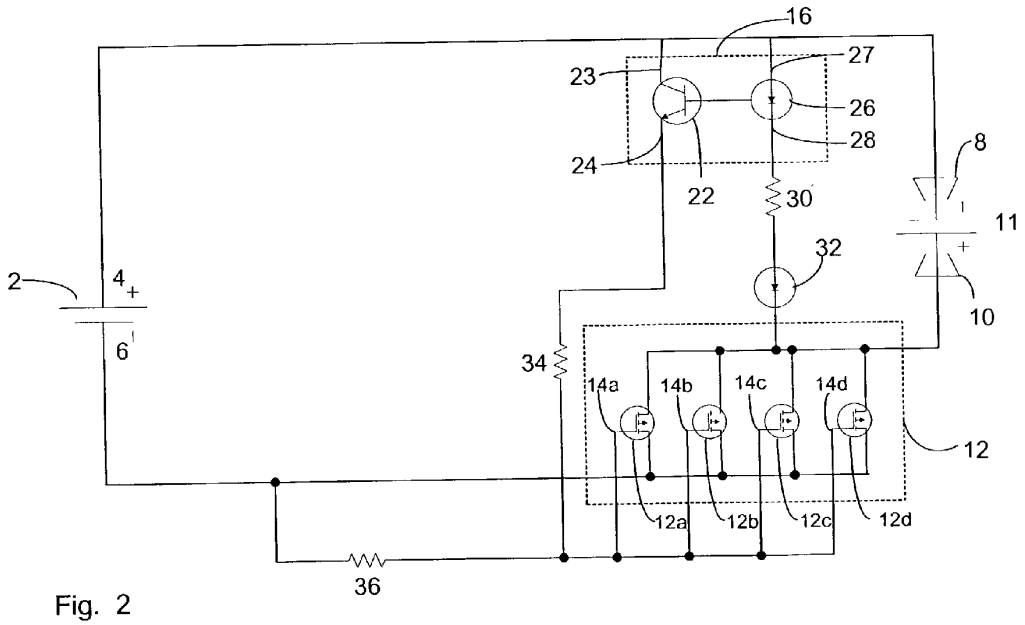

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Fig. 2

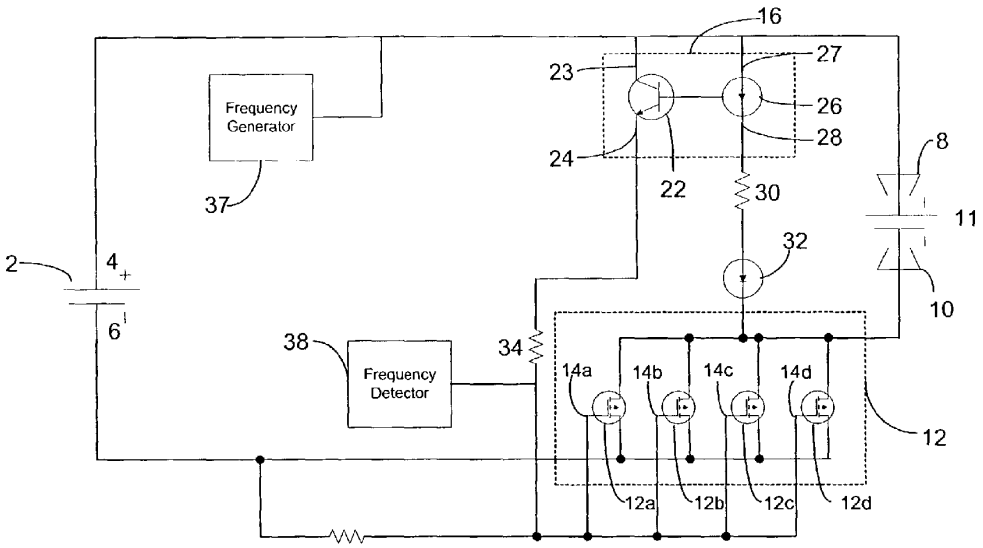

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Frequency Generator
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Fig. 3

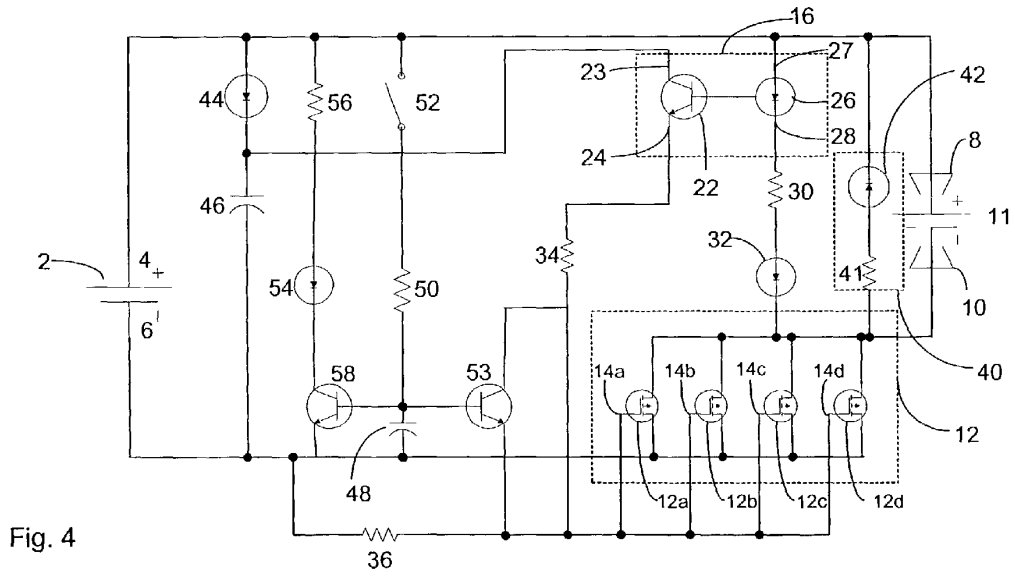

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Fig. 4

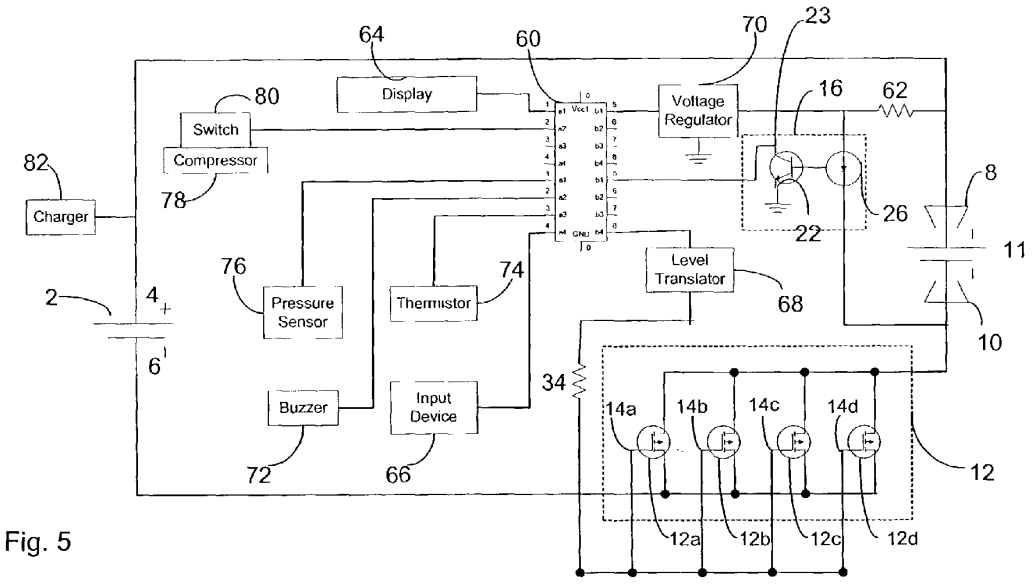

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Voltage Regulator
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Switch
Compressor
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Charger
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Level Translator
68
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4
Pressure Sensor
Thermistor
10
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Buzzer
Input Device
14a
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12a
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Fig. 5

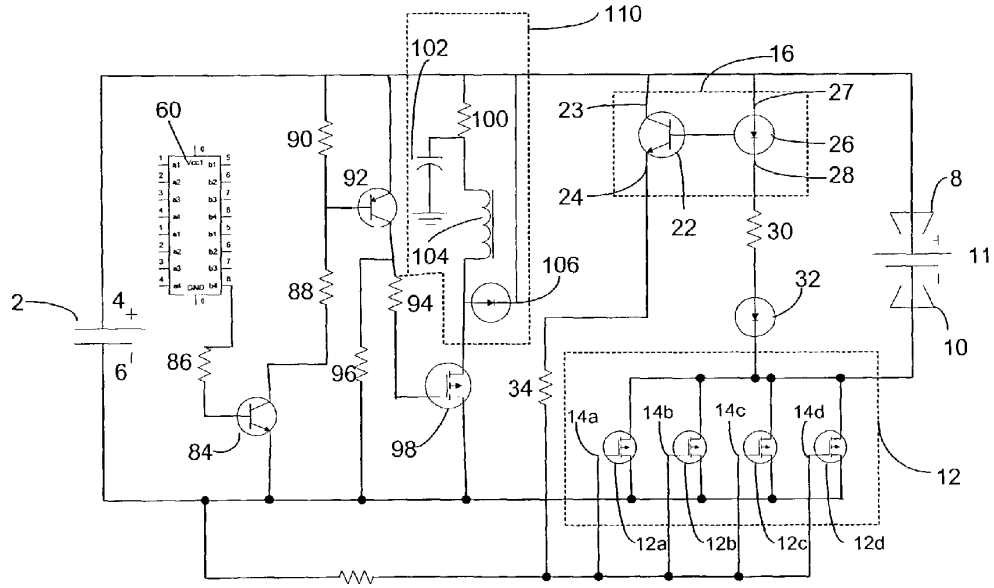

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Fig. 6

MICROPROCESSOR CONTROLLED BOOSTER APPARATUS WITH POLARITY PROTECTION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority from U.S. Provisional Application Ser. Nos. 60/357,146 filed Feb. 19, 2002 and 60/369,839 filed Apr. 5, 2002, the contents of both of which are incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to a booster device used for boosting a depleted battery and in particular to microprocessor control of the booster apparatus and a polarity protection circuit.

BACKGROUND OF THE INVENTION

[0003] It is well known that when an engine of an automobile is not able to be started due to insufficient electric power, a battery of the automobile can be jump started by power from a battery of another automobile or from a battery in a booster device to thereby start the engine.

[0004] To boost the battery of the automobile which is of insufficient electric power by power from another battery, the two batteries must be connected through a pair of electric wires. For example, the positive terminal of the depleted battery should be connected to the positive terminal of the boosting battery. The negative terminals of the two batteries should be connected in a corresponding manner.

[0005] Making this connection, however, can be very dangerous if the batteries are connected incorrectly. A battery has a small internal resistance, and there is a voltage difference between a battery with sufficient electric power and a battery with insufficient electric power. Current will thus flow between the two batteries as soon as a connection is made. When the two batteries are connected correctly, which means that terminals of corresponding polarities are connected respectively as described above, a large current passes through the electric wires. When the two batteries are connected erroneously, a current which passes through the electric wires is 10 to 20 times larger than the current existing on the electric wires when the batteries are correctly connected. Additionally, incorrect connection may result in one or both of the batteries being short-circuited. Under such conditions, one or both of the batteries may be damaged, and in some cases, an explosion, fire and damage to the vehicle or to a person may result.

[0006] Thus, there is a need for a device, which can be used to ensure that the connection of the two batteries is made correctly and in a safe manner. The device should minimize any risk resulting from incorrect connection between the two batteries and from a short-circuit of one or both of the batteries.

[0007] The failure of an engine of an automobile to start due to insufficient electric power, in addition to being due to a battery with insufficient power, may also be due to a bad alternator that has failed to replenish the charge on an otherwise good battery. With a bad alternator, even if the battery is replaced, the new battery does not accumulate electric charge, and its charge is soon drained out again. A bad alternate r needs to be replaced in order to prevent recurring low battery problems. Detecting a bad alternator, however, is not an easy task to an inexperienced person.

[0008] Also, other simple tasks such as checking the air pressure of a tire, checking for freon gas leakage, and inflating a tire to a proper pressure can often be difficult to those without the necessary experience and know-how. It would also be convenient to know the state of the charge of the jump starter battery itself, as well as the state of charge the depleted battery before and after a jump start.

[0009] There is therefore a need for a self-contained jump starter system that can be used as a jump starter, tester, and diagnostic system for a vehicle to assist in performing vehicle diagnostics and minor vehicle repairs. There is also a need for a portable, self-contained jump starter system of the above type that is rugged, has a minimum number of components, is user friendly to people who are not experienced with automobiles, provides self-testing and vehicle diagnostics, and is relatively inexpensive so as to be affordable by a large number of consumers.

SUMMARY OF THE INVENTION

[0010] A polarity protection circuit is provided. According to an exemplary embodiment, the polarity protection circuit is comprised of solid-state devices. Preferably no mechanical or electro-mechanical devices, such as solenoids are included in the polarity protection circuit. The polarity protection circuit is electrically connected to the battery to be charged (depleted battery) and to a boosting battery or other power source. The polarity protection circuit prevents current flow between the batteries unless proper polarity is achieved. The polarity protection circuit is described below in the context of a battery booster device, but it can be used in conjunction with any charging or boosting device.

[0011] Typically, a battery booster device comprises a pair of cables connected at one end to a built-in battery or other power source arranged in a portable box. The other ends of the cables are connected to a pair of alligator clamps. The built-in battery provides a DC power source for boosting a depleted battery. When the clamps are connected to the depleted battery, current flows from the built-in battery of the battery booster device to the depleted battery. As mention above, a polarity protection circuit is provided in the booster device and prevents current flow between the batteries unless a proper polarity connection between the two batteries is achieved.

[0012] In a further embodiment, the battery booster device may also comprise a microprocessor. The microprocessor can be used as part of a polarity protection circuit. It may also perform additional detection and control functions, such as detecting a bad alternator, detecting a freon leak, and detecting low tire pressure and controlling an air compressor to address the low tire pressure. In connection with this, the booster device may further include a display and/or other notification devices, such as a visual or audio indicator.

[0013] In another embodiment of the invention, a polarity detection circuit is provided. The circuit comprises: cables for connecting a boosting battery to a depleted battery; a polarity sensing circuit coupled to the boosting battery for providing an enable signal when a correct polarity connection is made between the boosting battery and the depleted battery; and a solid state switch coupled to the polarity

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sensing circuit, the solid state switch permitting current flow between the boosting battery and the depleted battery when it receives the enabling signal.

[0014] In another exemplary embodiment, a booster apparatus is provided. The apparatus comprises: a boosting battery having a positive terminal and a negative terminal; a first cable coupled to the positive terminal of the boosting battery and having a clamp for connection to a terminal of a depleted battery; a second cable coupled to the negative terminal of the boosting battery and having a clamp for connection to another terminal of the depleted battery; a solid state switch arranged in series with one of the cables; a polarity sensing circuit coupled between the first cable and the second cable, the polarity sensing circuit providing an enable signal to place the solid state switch in a conducting state when a correct polarity connection is made between the boosting battery and the depleted battery.

[0015] In a further embodiment, a booster apparatus comprises: means for providing power; means for connecting the means for providing power to a depleted battery; means for detecting polarity of the connection between the means for providing power and the depleted battery and for generating an enable signal when correct polarity is detected; and at least one field-effect transistor (FET) having a control electrode and being coupled to the means for detecting polarity, the control electrode receiving the enable signal and turning the FET on to allow current flow between the means for providing power and the depleted battery.

[0016] In another embodiment, a jump starter system comprises: a boosting battery having positive and negative terminals; a pair a battery cables having first ends connected to the positive and negative terminals, respectively, of the boosting battery and second ends adapted for connection to positive and negative terminals of a depleted battery; a semiconductor switch connected electrically with one of the terminals of the boosting battery and the battery cable respectively connected thereto; a polarity sensing circuit coupled to the battery cables and producing a first signal only when the battery cables connect the positive terminal of the boosting battery to the positive terminal of the depleted battery and the negative terminal of the boosting battery to the negative terminal of the depleted battery; and a microprocessor coupled to the semiconductor switch and the polarity sensing circuit and being responsive to the first signal from the polarity sensing circuit for activating the semiconductor switch to enable a current flow between the boosting battery and the depleted battery.

[0017] In another embodiment, a computer-readable information storage medium for use with a computer controlling a jump starter system, comprising a first battery having positive and negative terminals, a pair a battery cables having first ends connected to the positive and negative terminals, respectively, of the first battery and second ends adapted for connection to positive and negative terminals of a depleted battery in a vehicle, the computer-readable information storage medium sto res computer-readable program code for causing the computer to perform the steps of: checking for a rapid rise in voltage after the vehicle has been started; indicating the alternator is working properly if the rapid rise in voltage is present; and indicating the alternator is not working properly if the rapid rise in voltage is not present.

[0018] In another embodiment, a computer-readable information storage medium for use with a computer controlling a jump starter system, comprising a first battery having positive and negative terminals, a pair a battery cables having first ends connected to the positive and negative terminals, respectively, of the first battery and second ends adapted for connection to positive and negative terminals of a depleted battery, the computer-readable information storage medium stores computer readable program code for causing the computer to perform the steps of: measuring a charge rate of the battery; determining an amount of time the battery has been receiving a current; measuring a voltage of the battery; and detecting an overtime fault if the charge rate is greater than a predetermined current, the battery has been receiving a current longer than a predetermined amount of time, and the voltage of the battery is greater than or equal to a predetermined voltage.

[0019] In another embodiment, a computer-readable information storage medium for use with a computer controlling a jump starter system, comprising a first battery having positive and negative terminals, a pair a battery cables having first ends connected to the positive and negative terminals, respectively, of the first battery and second ends adapted for connection to positive and negative terminals of a depleted battery, the computer-readable information storage medium stores computer-readable program code for causing the computer to perform the steps of: measuring a charge rate of the battery; determining an amount of time the battery has been receiving a current; measuring a voltage of the battery; and detecting a shorted cell battery fault if the charge rate is greater than a predetermined current, the battery has been receiving a current more a predetermined amount of time, and the voltage of the battery is less than or equal to a predetermined voltage.

[0020] In another embodiment, a computer-readable information storage medium for use with a computer controlling a jump starter system, comprising a first battery having positive and negative terminals, a pair a battery cables having first ends connected to the positive and negative terminals, respectively, of the first battery and second ends including clamps adapted for connection to positive and negative terminals of a depleted battery, the computer-readable information storage medium stores computer-readable program code for causing the computer to perform the steps of: measuring a voltage at the clamps; indicating a bad battery fault if no voltage is detected at the clamps; and proceeding with a jump starting operation if a voltage is detected at the clamps.

[0021] In another embodiment, a computer-readable information storage medium for use with a computer controlling jump starter system, comprising a first battery having positive and negative terminals, a pair a battery cables having first ends connected to the positive and negative terminals, respectively, of the first battery and second ends adapted for connection to positive and negative terminals of a depleted battery, the computer readable information storage medium stores computer-readable program code for causing the computer to perform the steps of: measuring a charge current of the battery; determining an amount of time the battery has been receiving current; measuring a voltage of the battery; and detecting an open cell battery fault if the charge current is less than a predetermined current, the battery has been

receiving current more a predetermined amount of time, and the voltage of the battery is greater than or equal to a predetermined voltage.

BRIEF DESCRIPTION OF THE FIGURES

[0022] **FIG. 1** is a circuit schematic that illustrates a polarity protection circuit according to a preferred embodiment of the invention;

[0023] **FIG. 2** is a circuit schematic that illustrates a polarity protection circuit according to another preferred embodiment of the invention;

[0024] **FIG. 3** is a circuit schematic that illustrates a polarity protection circuit according to another preferred embodiment of the invention;

[0025] **FIG. 4** is a circuit schematic that illustrates a polarity protection circuit according to another preferred embodiment of the invention;

[0026] **FIG. 5** is a circuit schematic that illustrates a microprocessor controlled booster system according to another embodiment of the invention; and

[0027] **FIG. 6** is a circuit schematic that illustrates a microprocessor controlled booster system according to another embodiment of the invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0028] **FIG. 1** illustrates a battery booster device including a polarity protection circuit according to an exemplary embodiment of the invention. A boosting battery **2** with a positive terminal **4** and a negative terminal **6** is provided in the booster device. The positive terminal **4** of the boosting battery **2** is coupled to one of a pair of alligator clamps **8**, **10** to be connected to a battery to be charged **11** (depleted battery) via a wire or battery cable. The negative terminal **6** of the boosting battery **2** is connected to the other of the alligator clamps **8**, **10** to be connected to the battery to be charged **11** via a wire or battery cable.

[0029] A switch **12** is coupled to one of the wires or battery cables to be connected to the depleted battery **11**. The switch **12** is activated to complete a boosting circuit between the boosting battery **2** and the depleted battery **11** only when a correct polarity connection between the batteries is attained. In the embodiment shown, the switch **12** is arranged between the negative terminal **6** of the boosting battery **2** and the alligator clamp **10** intended to be connected to the negative terminal of the depleted battery **11**. The switch **12** is thus a current handling device a nd part of the boosting circuit. Of course, other locations of the switch in the boosting circuit are possible.

[0030] The switch **12** is preferable a solid state device, such as a transistor, diode, field effect transistor (FET), etc. **FIG. 1** represents the switch **12** as a number FETs **12***a*-**12***d* connected in parallel with each other. The FETs **12***a*-**12***d* are preferably high power, very low on-resistance types. The number of FETs provided depends upon the current flow in the circuit and the type of FET used. Control electrodes **14***a*-**14***d* of the FETs **12***a*-**12***d* are electrically connected to the negative terminal **6** of the boosting battery through a resistor **36**. This arrangement maintains the FETs **12***a*-**12***d* in an off or non-conducting state when there is no voltage at the clamps, preventing current flow from the boosting battery **2** to clamps **8**, **10** and to the depleted battery **11**.

[0031] The switch **12** is activated by a polarity sensing circuit **16** to allow current flow from the boosting battery **2** to the depleted battery **11**. The polarity sensing circuit **16** is coupled to the boosting battery **2** and to the depleted battery **11** when the clamps **8**, **10** are connected to the depleted battery **11**. The polarity sensing circuit **16** senses the polarity of the connection between the boosting battery **2** and the depleted battery **11** and provides a signal indicating the state of the connection. The signal from the polarity sensing circuit **16** is provided to the switch **12**. When a proper polarity connection is signaled, the switch **12** completes the boosting circuit and permits current flow to the depleted battery **11**.

[0032] In the embodiment shown in **FIG. 1**, the polarity sensing circuit comprises an opto-isolator **16**. The opto-isolator **16** comprises a phototransistor **22** and a light emitting diode (LED) **26**. A collector **23** of the phototransistor **22** and an anode **27** of the LED **26** are electrically connected to the positive terminal **4** of the boosting battery **2**. The emitter **24** of the phototransistor **22** is electrically connected to control electrodes **14***a*-**14***d* of the FETs **12***a*-**12***d* comprising the switch **12** via resistor **34**. The cathode **28** of the LED **26** is electrically connected to one of the electrodes of the FETs **12***a*-**12***d* through resistor **30** and diode **32**. The other of the electrodes of the FETs **12***a*-**12***d* is electrically connected to the negative terminal **6** of the boosting battery **2**.

[0033] During operation of the battery booster device depicted in **FIG. 1**, the FETs **12***a*-**12***d* are initially held in a non-conducting state via resistor **36**. The opto-isolator **16** only turns on when it is properly biased as a result of a correct polarity connection being made between the boosting battery **2** and the depleted battery **11**. When the LED **26** is properly biased, phototransistor **22** in the opto-isolator **16** turns on. Current flow through phototransistor **22** biases the control electrodes of the FETs **12***a*-**12***d* into a conducting state, enabling current flow through the FETs **12***a*-**12***d* to the depleted battery **11**. More specifically, when the depleted battery **11** is properly connected to the boosting battery **2** as shown in **FIG. 1**, the LED **26** and diode **32** are forward biased. Current thus flows through these diodes and resistor **30**. Resistor **30** is provided to regulate the amount of current that flows through the opto-isolator **16**. The current flow through LED **26**, resistor **30** and diode **32** activates the phototransistor **22**, turning it on. When the phototransistor **22** is turned on, current flows through the phototransistor **22**, resistor **34** and to the control electrodes of the FETs **12***a*-**12***d*. The control electrodes of the FETs **12***a*-**12***d* are activated in response to this current, and the FETs **12***a*-**12***d* are turned on into a conducting state. The boosting circuit is now closed, and current can flow from the boosting battery **2** through the FETs **12***a*-**12***d* to the depleted battery **11**. The re is no need for any mechanical or electro-mechanical devices, as the FETs are the current handling devices.

[0034] When an improper polarity connection is made between the boosting battery **2** and the depleted battery **11**, as shown in **FIG. 2**, the LED **26** in the opto-isolator **16** and diode **32** are reversed biased. Diode **32** prevents current flow from the depleted battery **11** in a reverse direction. Thus, there is essentially no current flow through the LED **26**,

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diode **32** and resistor **30**. Consequently, the phototransistor **22** in the opto-isolator **16** is in a non-conducting state. In turn, the FETs **12***a*-**12***d* of the switch are in a non-conducting state, and there is essentially no current flow from the boosting battery **2** to the depleted battery **11**, preventing a potentially dangerous situation.

[0035] Once a proper polarity connection is made between the batteries, the depleted battery **11** is charged or the vehicle is jump started. The alligator clamps **8**, **10** are then disconnected from the battery to be charged **11**. When the clamps are disconnected, diode **26** is no longer forward biased and no current flows therethrough, turning the phototransistor **22** in the opto-isolator off, which in turn, turns the FETs **12***a*-**12***d* off. The boosting circuit is then, in effect, reset, preventing short-circuits or a reverse polarity connection being made after a proper polarity connection is made. In a further embodiment, described below in conjunction with **FIG. 3**, the battery booster device can be provided with a disable switch that interrupts the boosting circuit to ensure the safe disconnection of the clamps from the depleted battery **11** or a microprocessor or other circuitry can be programmed to detect when the depleted battery is disconnected.

[0036] Turning now to **FIG. 3**, another embodiment of the present invention is described. The embodiment shown in **FIG. 3** operates in a similar manner to the embodiment described above in regard to **FIG. 1**. **FIG. 3** differs from **FIG. 1** in that **FIG. 3** includes a frequency generator and a frequency detector. The frequency generator and frequency detector are used to detect disconnection of the clamps **8**, **10** from the depleted battery **11** or other interruption of the boosting circuit. The frequency generator **37** is adapted to inject a signal of a particular frequency into the boosting circuit. A frequency detector **38** is adapted to detect the frequency injected into the boosting circuit by the frequency generator **37**. The frequency generator **37** and frequency detector **38** are preferably arranged on opposite sides of depleted battery **11**. When the depleted battery **11** is connected with proper polarity, a path exists for the frequency injected by the frequency generator **37** to travel through the circuit. The frequency detector **38** detects the injected frequency, and the battery boosting process proceeds normally. When the clamps **8**, **10** are removed from the depleted battery **11** or the circuit is otherwise interrupted, current flow is stopped, and the frequency detector **38** no longer detects the frequency injected by the frequency generator **37**. The frequency detector is adapted to then turn FETs **12***a*-**12***d* to a non-conducting state, resetting the boosting circuit. This prevents short circuits or a reverse polarity connection being made after a proper polarity connection has been established.

[0037] **FIG. 4** illustrates another embodiment of the present invention. The embodiment shown in **FIG. 4** includes many of the same elements described above in connection with FIGS. **1**-**3**. These same elements are labeled with the same reference numbers in all the figures. The circuit shown in **FIG. 4** operates in a manner similar to that described above in regard to FIGS. **1**-**3**, and only the differences are described in detail below.

[0038] The embodiment of the invention shown in **FIG. 4** includes an indicator **40** for indicating when a proper polarity connection between booster battery **2** and depleted battery **11** is established. The indicator **40** may provide a visual or audio indication to a user that a proper polarity connection has or has not been established. The indicator **40** illustrated in **FIG. 4** includes a resistor **41** and an LED **42**. When the alligator clamps **8**, **10** are connected to the depleted battery **11**, the resistor **41** and LED **42** are connected across the terminals of the depleted battery **11**. If the alligator clamps **8**, **10** are connected to depleted battery **11** with an incorrect polarity, LED **42** is forward biased and is illuminated indicating an incorrect connection. However, essentially nothing else occurs in the boosting circuit. The opto-isolator **16** prevents any other current flow. For example, the LED **26** in the opto-isolator **16** and diode **32** are reversed biased, preventing current flow in a reverse direction. Thus, there is no current flow through these diodes and resistor **30**. Consequently, the phototransistor **22** in the opto-isolator **16** remains off. In turn the FETs **12***a*-**12***d* remain in a non-conducting state and there is no current flow from the boosting battery **2** to the depleted battery **11**.

[0039] If the alligator clamps **8**, **10** are connected to the depleted battery **11** with a proper polarity the LED **42** is reverse biased and is not illuminated. The opto-isolator **16** is turned on, and the boosting circuit is completed as described above in connection with **FIG. 1**.

[0040] In some instances during the jump-starting process, the voltage of the boosting battery **2** may drop to low levels, for example, 2 volts or lower. In such instances, the voltage of the boosting battery **2** may become insufficient to maintain the FETs **12***a*-**12***d* in a conducting state. Thus, a means for maintaining the FETs **12***a*-**12***d* in a conducting state is provided. In the embodiment shown in **FIG. 4**, this means comprises a diode **44** and a capacitor **46** arranged in series with each other and connected across the terminals **4**, **6** of the boosting battery **2**. An anode of diode **44** is coupled to the positive terminal **4** of the boosting battery **2**. The collector of the phototransistor **22** in the opto-isolator **16** is coupled between the diode **44** and the capacitor **46**. The combination of the diode **44** and the capacitor **46** provides a high level of gate voltage that is required to keep the FETs **12***a*-**12***d* in a conducting state even if the boosting battery's voltage decays to a low level.

[0041] The embodiment of **FIG. 4** also includes a means for interrupting the current flow to the depleted battery **11** after a proper polarity connection has been established. This means for interrupting allows for safe removal of the alligator clamps **8**, from the depleted battery **11**. The means for interrupting in the illustrated embodiment includes a combination of capacitor **48**, resistor **50**, switch **52** and transistor **53**. These elements are used to turn the FETs **12***a*-**12***d* into a non-conducting state to allow for safe removal of the alligator clamps **8**, **10**. For example, switch **52** is coupled to one of the cables attached to one of clamps **8**, **10**. Resistor **50** and capacitor **48** are coupled to the other of the cables and connected in series with switch **52**. Switch **52** may be a momentary switch that when depressed, charges capacitor **48** through resistor **50**. The charging of capacitor **48** turns transistor **53** into a conducting state. The current flow from phototransistor **22** in the opto-isolator **16** is thus short-circuited across the control electrodes of the FETs **12***a*-**12***d*, turning the FETs **12***a*-**12***d* into a non-conducting state. Thus, the connection between the two batteries **2**, **11** is open circuited and the alligator clamps **8**, **10** can be safely removed from depleted battery **11**.

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[0042] Further, an indicator for indicating it is safe to remove the alligator clamps from the depleted battery **11** may also be provided. In **FIG. 4**, the indicator includes LED **54**, resistor **56** and transistor **58** coupled in series between the cables. A control electrode of the transistor **58** is coupled to switch **52**. When switch **52** is depressed, transistor **58** is turned on by the current flow through the switch **52**. Current thus flows through the transistor **58** and resistor **56**, illuminating LED **54**. Illuminated LED **54** indicates it is safe to remove the alligator clamps **8**, **10** from the depleted battery **11**.

[0043] Referring now to **FIG. 5**, an example of a microprocessor controlled jump starter system according to an embodiment of the invention is described. The microprocessor **60** can be programmed to perform essentially all of the control functions needed for operation of the jump starter. A display **64** and an input device **66** may be coupled to the microprocessor **60** to enable an operator to receive information from and input information into the microprocessor **60**, respectively.

[0044] By way of a feedback circuit or other means, the microprocessor **60** can monitor the voltage and/or current being supplied to the depleted battery **11** from the booster battery **2**, the voltage and/or current of the battery **11** and can detect short circuits or other faults, as described in more de tail below. A resistive divider may be used to provide the voltage and current measurements to the microprocessor's A/D input. A visual or audio indication of the faults is given, for example on display **64**. A scrolling message describing the fault, a representative code, or other message may be displayed.

[0045] In this embodiment, microprocessor **60** is used to control the switch **12**. Opto-isolator **16** is coupled to clamps **8**, **10** via resistor **62** such that LED **26** is forward biased when a correct polarity connection between the boosting battery **2** and the depleted battery **11** is made. When forward biased, LED **26** turns on phototransistor **22**. The collector **23** of the phototransistor **22** is coupled to a supply voltage via internal circuitry in the microprocessor **60**. When the phototransistor **22** is on, a first signal of a first voltage is present at the collector **23** and is sensed by the microprocessor **60**. When the phototransistor **22** is off, a second signal of a second voltage is present at the collector **23** and is sensed by the microprocessor **60**. The microprocessor **60** provides output signals to activate the switch **12** into a conducting state when it receives the first signal and provides an output signal to deactivate the switch **12** into a non-conducting state when it receives the second signal. Additionally, the microprocessor can deactivate switch **12** to terminate the jump starting process when a fault is detected.

[0046] The output signals from the microprocessor **60** to control switch **12** are provided to control electrodes **14***a*-**14***d* of transistors **12***a*-**12***d*, as shown in **FIG. 5**. The control electrodes **14***a*-**14***d* of the transistors are electrically connected to the microprocessor **60** via a level translator **68**. Microprocessors normally run on low voltages, e.g., 5 volts. A low voltage power supply is provided to the microprocessor **60** from battery **2** via a voltage regulator **70**. The low voltage output signals from the microprocessor **60** should be translated to higher voltages before being supplied to the transistors **12***a*-**12***d*. The level translator **68** translates the output voltage of the microprocessor **60** to the higher levels that are needed to operate transistors **12***a*-**12***d*. Accordingly, the output signals from the microprocessor **60** are used by the level translator **68** to generate control signals for the control electrodes of the FETs.

[0047] If the polarity connections of clamps **8**, **10** to the depleted battery **11** are not correct, the switch **12** remains off. The display **64** may be controlled by the microprocessor **60** to display a message indicating reverse polarity. The microprocessor **60** may additionally activate an alarm such as buzzer **72** in response to the incorrect polarity connection.

[0048] Microprocessor **60** can be programmed to detect if clamps **8**, **10** are connected to a battery or have been disconnected. To perform the detection, the microprocessor **60** deactivates the switch **12** into a non-conducting state. Via the feedback circuit or other means, the microprocessor detects whether clamps **8**,**10** are connected to a battery. If no battery is present, the switch **12** is placed in a non-conducting state, that is, all the FETs **12***a*-**12***d* are placed in a non-conducting state. If a battery is present, the jump starting process continues. The check is preferably performed about once a second and takes less than a few thousandths of a second to complete. As such, the check is transparent to the operation of the jump starter. A comparator or operational amplifer can also be used to perform this check.

[0049] The microprocessor **60** may also be used to conduct a test of an alternator of a vehicle. When the alternator of a vehicle is working properly, the voltage level of the depleted battery **11** rises rapidly immediately after the battery is jump-started. The rapid rise in voltage can be detected by the microprocessor **60** based on the signals the microprocessor receives from opto-isolator circuit **16**. If a rapid rise in voltage is detected, a message that the alternator is working properly may be shown on display **64**. If no rapid rise in voltage is detected, then a message that the alternator may be malfunctioning can be shown on display **64**. The rapid rise in voltage may vary depending on how depleted the battery **11** is. The microprocessor is preferably programmed to account for this variance.

[0050] According to a further embodiment of the invention, the booster system may include a freon gas leakage sensor. The sensor **74** may comprise a thermistor for sensing temperature changes due to the extreme cold produced at the point of a freon leak. The sensor **74** may alternatively comprise a transducer, such as a pressure transducer, to sense the point of a freon leak, since freon is under a high pressure in the system and the point of a leak presents a high pressure zone. The sensor is coupled to the microprocessor **60**. The sensor generates an electrical signal upon detection of some physical change, e.g., a temperature or pressure change accompanying freon gas leakage. Upon receiving such a signal from the sensor **74**, the microprocessor **60** may cause a message indicating a leak to appear on the display **64**.

[0051] According to another embodiment of the invention, the booster system includes means for checking the inflation of the tires of the vehicle. An air pressure sensor **76** may be provided to measure the air pressure of the tires. The air pressure sensor **76** is coupled to an input of the microprocessor **60**. The microprocessor **60** receives an air pressure measurement from the air pressure sensor **76** and displays the air pressure to the operator via display **64**. Additionally,

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a built-in compressor **78** can be connected to the microprocessor **60** through a switch **80**. According to this embodiment of the invention, a desired pressure is selected via the input device **66**. The compressor **78** is then controlled by microprocessor **60** to inflate the tire to the selected a ir pressure. The compressor **78** is automatically deactivated by the microprocessor **60** when the desired pressure is attained.

[0052] According to yet another embodiment of the invention, the microprocessor **60** can be programmed to detect the charge levels of the boosting battery **2** and the depleted battery **11**. The detected charge levels can then be communicated to an operator via display **64**. Voltage regulator **70** is coupled to the boosting battery **2** and the depleted battery **11** for detecting their charge levels.

[0053] In order to measure the charge level of the boosting battery **2**, clamps **8**, **10** should be disconnected from the depleted battery **11**. The voltage regulator then produces a voltage proportional to the voltage of the boosting battery **2**, and which is within the operating range of the microprocessor **60**. The microprocessor **60** is programmed to detect when the voltage of the boosting battery **2** falls below a predetermined level, for example, about 80% of its rated value. The buzzer **72** or other device can then be activated to indicate to the operator that the charge of the boosting battery **2** is low and that it should be recharged. The booster system may be plugged into a standard 110/220-volt electrical outlet via a standard wall charger **82** to recharge the boosting battery **2**.

[0054] In order to measure the voltage of the depleted battery **11**, switch **12** between the boosting battery **2** and the depleted battery **11** should be in a non-conducting state. Microprocessor **60** can be controlled via operator input from input device **66** to place switch **12** in a non-conducting state. Clamps **8**, **10** are then connected to the depleted battery **11**. The voltage regulator produces a voltage proportional to the voltage of the depleted battery **11**. The microprocessor **60** receives this signal from the voltage regulator **70** and determines and displays the voltage of the depleted battery **11** on display **64**.

[0055] The microprocessor **60** can also be programmed to detect a bad battery or a battery whose voltage is too low to be jump started. Normally, even a dead battery has some voltage, usually about 3-5 volts. Occasionally, however, a battery does not have any voltage as it is so deeply depleted that the battery is totally dead. This type of battery cannot be immediately jump started, and sometimes it can not even be charged at all. When the clamps **8**, **10** are connected to this type of battery, it is as if the jump starter is not connected to anything. As the voltage of such a battery is extremely low, the microprocessor **60** does not detect any voltage at the clamps **8**, **10**. A fault is displayed if an attempt is made to jump start a vehicle with this type of battery.

[0056] This type of fault may also be detected if there is no battery connected to clamps **8**,**10** or a poor connection is made to the depleted battery **11** and the jump starter is activated. When the fault occurs, the microprocessor **60** can be programmed to terminate the jump starting process and to display a suggestion to a user that the battery be reconditioned before jump starting is attempted or to check if the clam ps **8**, **10** are properly connected to the battery **11**.

[0057] In another embodiment of the invention, the microprocessor **60** is programmed to determine the cold-cranking amps (CCA) available from the depleted battery **11**. CCA is the amount of power exerted by a battery when starting a vehicle on a cold day. The definition by Battery Council International (BCI) is the discharge load in amperes which a new fully charged battery at 0 degrees Farenheit can deliver for 30 seconds and maintain a voltage of 1.2 volts per cell or higher.

[0058] CCA is determined in the described embodiment by connecting a resistance in parallel with the battery **11**. The resistance should be connected for a short period of time so not to drain the battery. The voltage of the battery is determined when under the load of the resistance. The lower the voltage of the battery under the load is, the lower the CCA of the battery is. The microprocessor is programmed to correlate the measured voltage to a CCA value. The CCA value may then be displayed to the user.

[0059] If a battery has a shorted cell, it is unlikely that the battery voltage will increase as it is attempted to provide a charge to the battery and jump start the vehicle. However, a charge must be provided to the battery for some period of time before it can be determined if the battery has a shorted cell. The microprocessor **60** can be programmed to monitor the voltage, current, and time of charging to detect a shorted cell. If a charge rate of the battery is greater than a predetermined current, the battery has been charging more a predetermined amount of time, and the voltage of the battery is less than or equal to a predetermined voltage, a shorted cell is detected. For example, if the charge rate of the battery is greater than 2 amps, the battery has been charging for more than 1 hour, and the voltage of the battery is less than or equal to about 11 volts, the jump starting process is terminated, and a shorted cell fault is indicated to the user.

[0060] The process for detecting an open cell battery is similar to the process for detecting a shorted cell battery. An open cell battery has some voltage due to leakage between the open cell and its connectors. However, the open cell battery does not have the ability to either accept or deliver current. When the jump starter is connected to an open cell battery, the microprocessor detects a voltage at the clamps **8**, **10**, but when the jump starting process begins, no appreciable current is detected. If no current is detected after a predetermined period of time, for example five minutes, an open cell battery is detected, the jump starting process is ended, and the appropriate fault displayed.

[0061] Many vehicles have interface ports for providing basic engine diagnostic data. The jump starter system may further have an interface for downloading basic engine diagnostic data from an interface port of such vehicles. The jump starter system may additionally have a printer port for printing information for record keeping or analysis. Memory inside the microprocessor **60** can be used for storing data that is used for later review and analysis.

[0062] Further, the microprocessor **60** may run a self-test on the booster to determine whether all components of the booster system are running properly. Each component is turned on and off quickly to determine if any malfunctions exist. Results of the self-test may be displayed on the display **64**. Buzzer **72** or another alarm may be activated to indicate any malfunctions.

[0063] Also, the microprocessor **60** can be programmed to sound the buzzer **72** or other alarm when there is information

shown on the display **64** and when there is an error/fault condition, such as detection of a low charge level of the changing battery **2** or detection of a bad alternator.

[**0064**] In another embodiment, the microprocessor **60** controls a de-sulfating process. The electrode plates of lead-acid vehicle batteries collect sulfur deposits over time which eventually render the battery useless. However, by removing the sulfur deposits from the plates, such a battery can be rejuvenated, that is, re-conditioned. It is known that battery reconditioning can be achieved by applying periodic short current bursts (on the order of microseconds) from the boosting battery **2** to the depleted battery **11**. According to this embodiment of the invention, the microprocessor **60** is programmed to initiate the de-sulfating process through its control of the switch **12** and to display a "de-sulfating in progress" message on the display **64**. An exemplary embodiment of circuitry that may be used to perform the de-sulfating process is shown in **FIG. 6**.

[**0065**] **FIG. 6** includes many of the same components discussed above in regard to the preceding figures. In addition to those components, a transistor **84** is coupled to microprocessor **60** via resistor **86**. Microprocessor **60** outputs a signal to a control electrode of transistor **84**, turning transistor **84** on and off. When transistor **84** is turned on, current flows through resistors **88** and **90**, turning on transistor **92**. In turn, current flows through transistor **92**, and resistors **94** and **96**, turning on transistor **98**. Transistor **98** acts as a switch for activating a pulse generating circuit **110** that generates a pulsing current used to condition the battery **11**. When transistor **98** is in a conducting state, current flows through resistor **100**, capacitor **102**, inductor **104**, and diode **106**, which comprise the pulse generating circuit **110**, to generate a current pulse.

[**0066**] The display **64**, which may be, for example, a scrolling or flashing display, displays information available to the microprocessor **60** which may include, but which is not limited to, results of the self test, the status or condition (e.g., percent of charge) of the jump starter battery **2** as well as of the depleted **11**, a "Warning: Reverse Polarity" message if a polarity of connections of the jump starter system is not correct, a "Ready to Start" message when everything is properly connected, a "De-Sulfating in Progress" message when a de sulfating process is in progress, and various other diagnostics including, for example, detection of a bad alternator, desired and actual pressure readings from those jump starter systems that have air compressors and/or pressure sensors, and freon gas leakage readings for those jump starter systems that have freon gas leakage sensors.

[**0067**] In summary, the microprocessor can be programmed to control the polarity protection operation, performing of diagnostics of the vehicle battery and other systems, scanning of the display, various functions of the microprocessor initiated by operator input through the input device, conducting a de-sulfating process, activating the buzzer or other alarm, detection of freon leaks, basic engine diagnostics which may interface with the vehicle's interface port, re-charging the jump starter battery, and inflation of tires based on a stored value or on user input. The above listing of functions is intended to be exemplary and is not exhaustive of the types of functions that the microprocessor can control in the context of the jump starter system disclosed herein. The embodiments illustrated and discussed in this specification are intended only to teach those skilled in the art the best way known to the inventors to make and use the invention. Nothing in this specification should be considered as limiting the scope of the present invention. The above-described embodiments of the invention may be modified or varied, and elements added or omitted, without departing from the invention, as appreciated by those skilled in the art in light of the above teachings. It is therefore to be understood that, within the scope of the claims and their equivalents, the invention may be practiced otherwise than as specifically described.

We claim:

1. A polarity detection circuit, comprising:

cables for connecting a first battery to a depleted battery;

a polarity sensing circuit coupled to the first battery for providing an enable signal when a correct polarity connection is made between the first battery and the depleted battery; and

a solid state switch coupled to the polarity sensing circuit, the solid state switch permitting current flow between the first battery and the depleted battery when it receives the enable signal.

2. The polarity detection circuit of claim 1, further comprising:

a safety switch that when activated prevents the solid state switch from permitting current flow between the first battery and the depleted battery.

3. The polarity detection circuit of claim 1, wherein the polarity sensing circuit comprises an opto-isolator.

4. The polarity detection circuit of claim 1, wherein the polarity sensing circuit comprises an LED coupled to one of the cables, the diode being forward biased when a correct polarity connection is made between the first battery and the depleted battery; and

a phototransistor coupled to the diode, current flow through the forward biased LED turning on the phototransistor to provide the enable signal.

5. The polarity detection circuit of claim 1, wherein the solid state switch comprises at least one transistor.

6. The polarity detection circuit of claim 5, wherein the current from the first battery flows through the at least one transistor to the depleted battery.

7. The polarity detection circuit of claim 1, wherein the solid state switch comprises at least one FET having a control electrode, the control electrode receiving the enable signal to place the FET into a conducting state.

8. The polarity detection circuit of claim 7, wherein the FET is a part of a current path between the first battery and the depleted battery.

9. The polarity detection circuit of claim 1, further comprising a frequency generator coupled to one of the cables and injecting a signal of a predetermined frequency into that cable.

10. The polarity detection circuit of claim 9, further comprising a frequency detector coupled to the other one of the cables, the frequency detector preventing the solid state switch from permitting current flow between the first battery and the depleted battery when the frequency detector ceases to detect the signal of predetermined frequency injected by the frequency generator.

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11. A booster apparatus, comprising:

a first battery having a positive terminal and a negative terminal;

a first cable coupled to the positive terminal of the first battery and being provided with means for connecting to a terminal of a depleted battery;

a second cable coupled to the negative terminal of the first battery and being provided with means for connecting to another terminal of the depleted battery;

a solid state switch coupled in series with one of the cables and the first battery;

a polarity sensing circuit coupled between the first cable and the second cable, the polarity sensing circuit providing an enable signal to place the solid state switch in a conducting state when a correct polarity connection is made between the first battery and the depleted battery.

12. The booster apparatus of claim 11, wherein only a single cable is connected to each terminal of the depleted battery.

13. The booster apparatus of claim 11, wherein the solid state switch comprises a plurality of transistors connected in parallel with each other between one of the means for connecting and one of the terminals of the first battery.

14. The booster apparatus of claim 13, wherein the transistors are a part of a current path between the first battery and the depleted battery.

15. The booster apparatus of claim 11, further comprising:

a frequency generator coupled to one of the first and second cables and injecting a frequency into that cable; and

a frequency detector coupled to the other one of the first and second cables, the frequency detector opening the solid state switch when the frequency detector ceases to detect the frequency from the frequency generator.

16. The booster apparatus of claim 11, further comprising a microprocessor coupled to the solid state switch and the polarity sensing circuit and being responsive to the enable signal from the polarity sensing circuit to control the solid state switch to enable a current flow between the first battery and the depleted battery.

17. The booster apparatus of claim 16, wherein the depleted battery is intended for use in a vehicle.

18. The booster apparatus of claim 16, further comprising a display coupled to the microprocessor for displaying selected outputs of the microprocessor and an input device for accepting operator inputs to the microprocessor for controlling the jump starter system.

19. The booster apparatus of claim 16, further comprising at least one sensor connected to an input of the microprocessor for producing a signal representing a measured value.

20. The booster apparatus of claim 16, further comprising an audible alarm connected to an output of the microprocessor, wherein the microprocessor is connected to the first battery for automatically measuring the voltage of the first battery and producing a signal to activate the alarm when the voltage of the first battery is below a predetermined level.

21. The booster apparatus of claim 18, further comprising an air compressor controlled by an output of the microprocessor.

22. The booster apparatus of claim 21, wherein the microprocessor is programmed to accept a desired tire inflation pressure value input by an operator via the input device and to display the desired pressure on the display, the microprocessor automatically controlling the air compressor to inflate a tire to the desired pressure by comparing a measured pressure of the tire to the desired pressure until the desired pressure is attained.

23. The booster apparatus of claim 16, wherein the polarity sensing circuit comprises an opto-isolator.

24. The booster apparatus of claim 23, wherein the opto-isolator includes a uni-directional current conducting, light emitting component that only conducts current when the battery cables connect the positive terminal of the first battery to the positive terminal of the depleted battery and the negative terminal of the first battery to the negative terminal of the depleted battery.

25. The booster apparatus of claim 16, further comprising:

a safety switch opening the solid state switch to thus disable current flow between the first battery and the depleted battery.

26. The booster apparatus of claim 16, further comprising:

a high voltage providing circuit for keeping the solid state switch in a conducting state even if the voltage of the first battery decays to a low level.

27. The booster apparatus of claim 25, further comprising:

an indicator for indicating that the cables can be safely removed from the depleted battery.

28. The booster apparatus of claim 16, further comprising:

an indicator for indicating that a correct polarity connection is made between the first battery and the depleted battery.

29. The booster apparatus of claim 16, further comprising:

a measurement device for measuring the voltage of at least one of the first battery and the depleted battery.

30. The booster apparatus of claim 29, wherein the voltage is measured at least one of before the depleted battery is charged and after the depleted battery is charged.

31. The booster apparatus of claim 16, further comprising:

a de-sulfating circuit controlled by the microprocessor for de-sulfating a battery.

32. The booster apparatus of claim 16, further comprising means for detecting a voltage surge after the depleted battery is jump started.

33. The booster apparatus of claim 16, wherein the microprocessor is programmed to detect a voltage surge after the depleted battery is jump started.

34. A portable booster apparatus, comprising:

means for providing power;

means for connecting the means for providing power to a depleted battery;

means for detecting polarity of the connection between the means for providing power and the depleted battery and for generating an enable signal when a correct polarity is detected; and

at least one FET having a control electrode and being coupled to the means for detecting polarity, the control electrode receiving the enable signal and placing the FET into a conducting state to allow current flow between the means for providing power and the depleted battery.

35. The booster apparatus of claim 34, further comprising means for indicating a correct polarity connection to a user.

36. The booster apparatus of claim 35, wherein the means for indicating comprises a LED.

37. The booster apparatus of claim 34, further comprising means for interrupting current flow after a correct polarity connection has been established.

38. The booster apparatus of claim 37, further comprising at least one sensor connected to an input of the microprocessor for producing a measured signal representing the presence of the depleted battery at the means for connecting and wherein the means for interrupting comprises a microprocessor programmed to place the FET in a non-conducting state if no depleted battery is present.

39. The booster apparatus of claim 38, wherein the microprocessor is programmed to place the at least one FET in a non-conducting state, then check the measured signal about once every second, and place the at least one FET in a conducting state if a depleted battery is present.

40. The booster apparatus of claim 37, wherein the means for interrupting comprises a momentary switch adapted to short circuit the control electrode of the FET when depressed.

41. The booster apparatus of claim 37, further comprising an indicator for indicating when current flow has been interrupted.

42. The booster apparatus of claim 34, further comprising:

means for injecting a signal of a predetermined frequency into the means for connecting; and

means for detecting frequency coupled to the means for connecting on an opposite side of the depleted battery than the means for injecting, the means for detecting placing the FETs into a non-conducting state when the means for detecting ceases to detect the frequency from the means for injecting.

43. The booster apparatus of claim 34, wherein the means for detecting polarity comprises an opto-isolator.

44. A jump starter system, comprising:

a first battery having positive and negative terminals;

a pair a battery cables having first ends connected to the positive and negative terminals, respectively, of the first battery and second ends adapted for connection to positive and negative terminals of a depleted battery;

means for measuring a charge rate of the depleted battery;

means for determining an amount of time the depleted battery has been charging;

means for measuring a voltage of the depleted battery; and

means for detecting at least one of an overtime fault, a shorted cell battery fault, a bad battery fault, and an open cell battery fault based on at least one of the charge rate, amount of time and voltage of the depleted battery.

45. The charger claim 44, further comprising a display on which fault is visually indicated.

46. The charger of claim 44, wherein the means for detecting detects the overtime fault if the charge rate is greater than a predetermined current, the depleted battery has been charging longer than a predetermined amount of time, and the voltage of the depleted battery is greater than or equal to a predetermined voltage.

47. The charger claim 46, wherein the predetermined current is 2 amps, the predetermined time is 18 hours, and the predetermined voltage is 12 volts.

48. The charger of claim 44, wherein the means for detecting detects the shorted cell battery fault if the charge current is greater than a predetermined current, the depleted battery has been charging more a predetermined amount of time, and the voltage of the depleted battery is less than or equal to a predetermined voltage.

49. The charger claim 48, wherein the predetermined time is 1 hour, and the predetermined voltage is 11 volts.

50. The charger of claim 44, wherein the means for detecting detects the bad battery fault if no voltage is detected at the means for measuring.

51. The charger of claim 44, wherein the means for detecting detects the open cell battery fault if the charge current is less than a predetermined current, the depleted battery has been charging more a predetermined amount of time, and the voltage of the depleted battery is greater than or equal to a predetermined voltage.

52. A computer-readable information storage medium for use with a computer controlling a jump starter system, comprising a first battery having positive and negative terminals, a pair a battery cables having first ends connected to the positive and negative terminals, respectively, of the first battery and second ends adapted for connection to positive and negative terminals of a depleted battery, the computer-readable information storage medium storing computer-readable program code for causing the computer to perform the steps of:

measuring a charge rate of the depleted battery;

determining an amount of time the depleted battery has been charging;

measuring a voltage of the depleted battery; and

detecting at least one of an overtime fault, a shorted cell battery fault, a bad battery fault, an open cell battery fault, and an alternator fault based on at least one of the charge rate, amount of time and voltage of the battery.

53. The computer-readable information storage medium of claim 52 further comprising code for causing the computer to perform the step of visually indicating the fault on a display.

54. The computer-readable information storage medium of claim 52 further comprising code for causing the computer to perform the step of detecting the overtime fault if the charge rate is greater than a predetermined current, the depleted battery has been charging longer than a predetermined amount of time, and the voltage of the depleted battery is greater than or equal to a predetermined voltage.

55. The computer-readable information storage medium of claim 54, wherein the predetermined current is 2 amps, the predetermined time is 18 hours, and the predetermined voltage is 12 volts.

56. The computer-readable information storage medium of claim 52 further comprising code for causing the computer to perform the step of detecting the shorted cell battery fault if the charge current is greater than a predetermined current, the depleted battery has been charging more a

predetermined amount of time, and the voltage of the depleted battery is less than or equal to a predetermined voltage.

57. The computer-readable information storage medium of claim 56, wherein the predetermined time is 1 hour, and the predetermined voltage is 11 volts.

58. The computer-readable information storage medium of claim 52 further comprising code for causing the computer to perform the steps of:

indicating the bad battery fault if no voltage is detected at the second ends of the cables; and

proceeding with a charging operation if a voltage is detected at the second ends of the cables.

59. The computer-readable information storage medium of claim 52 further comprising code for causing the computer to perform the step of detecting the open cell battery fault if the charge current is less than a predetermined current, the depleted battery has been charging more a predetermined amount of time, and the voltage of the depleted battery is greater than or equal to a predetermined voltage.

60. The computer-readable information storage medium of claim further comprising code for causing the computer to perform steps of:

checking for a rapid rise in voltage after the vehicle has been started;

indicating the alternator is working properly if the rapid rise in voltage is present; and

indicating the alternator is not working properly if the rapid rise in voltage is not present.

* * * * *

AUSTRALIA
Patents Act

IN THE MATTER of Australian Patent Application No. 2019201559 in the name of The NOCO Company

- and –

Opposition thereto by Brown & Watson International Pty Ltd

ANNEXURE

This is the Annexure marked **CS-4** produced and shown to Cory Seligman at the time of signing his Declaration.

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(54) **METHOD AND APPARATUS FOR PROVIDING SUPPLEMENTAL POWER TO AN ENGINE**

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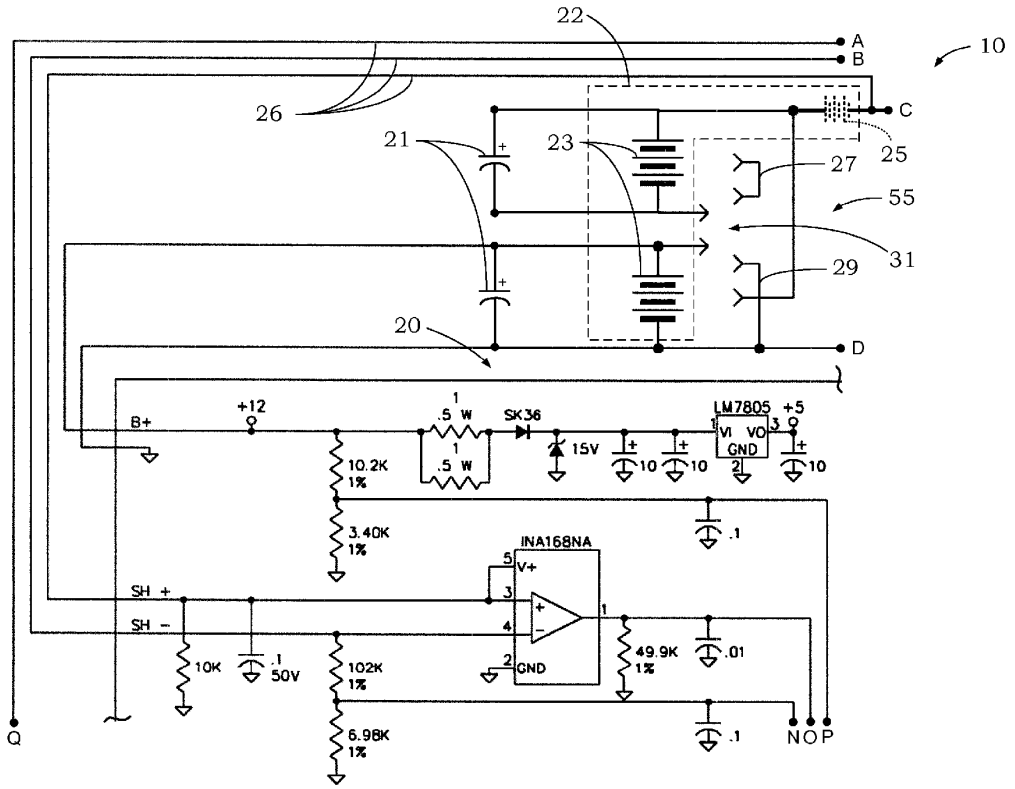
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CPC ***H02J 7/007*** (2013.01)
USPC **320/104**; 320/136; 320/134; 320/109

(57) **ABSTRACT**

A method and apparatus provides supplemental power to an engine. The method and apparatus includes a pair of conductive leads for connecting the supplemental power to an engine electrical system, one or more batteries connected in parallel with one or more capacitors, a relay connected to the conductive leads, a shunt cable connecting the batteries and capacitors to the relay and a processor for controlling the relay to selectively apply electrical power to the engine electrical system. The method and apparatus includes safety features to reduce the risk of injury to the operator and damage to the apparatus and/or engine electrical system.



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IPR2024-01219

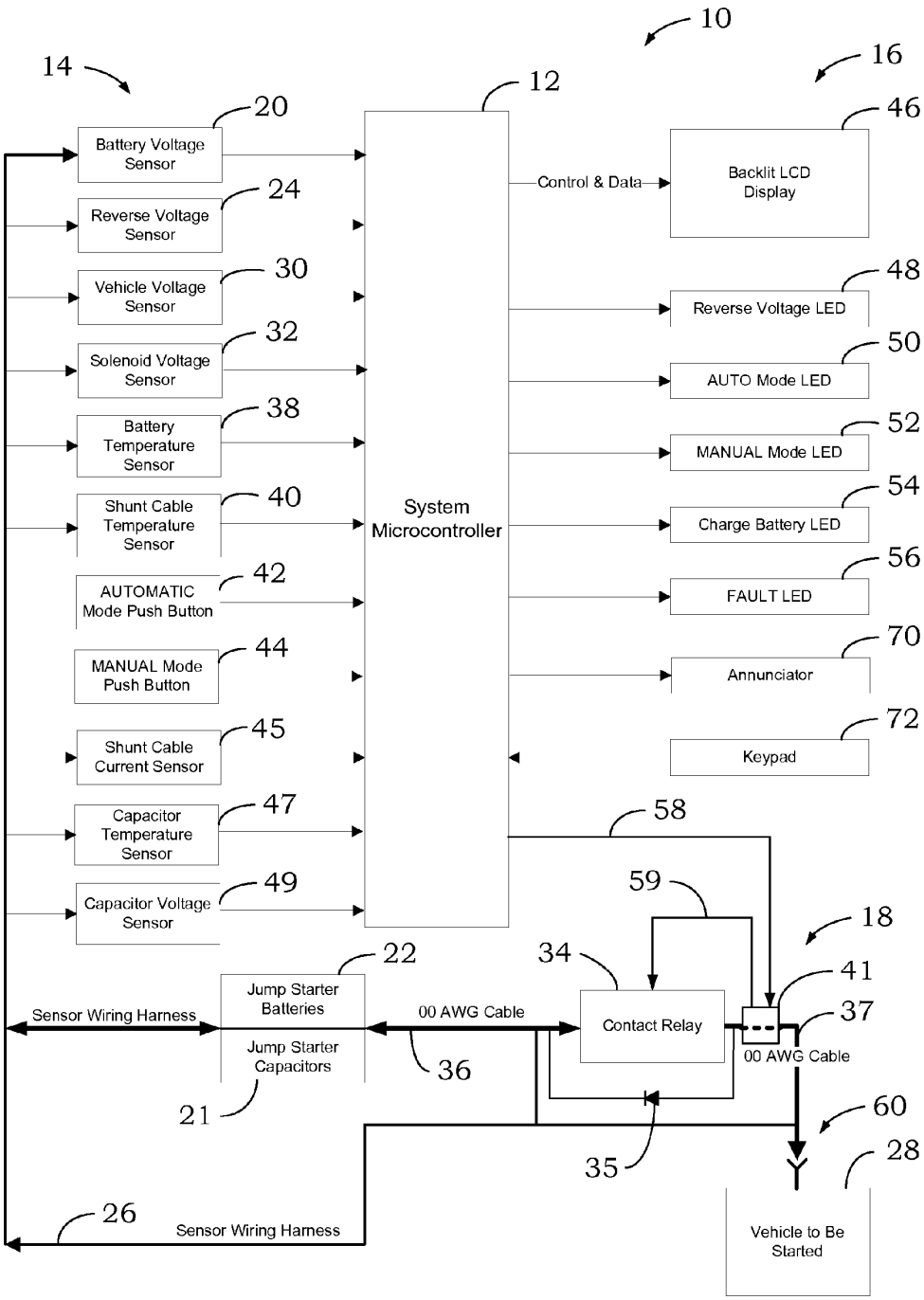

10
14
16
12
20
Battery Voltage Sensor
24
Reverse Voltage Sensor
30
Vehicle Voltage Sensor
32
Solenoid Voltage Sensor
38
Battery Temperature Sensor
40
Shunt Cable Temperature Sensor
42
AUTOMATIC Mode Push Button
44
MANUAL Mode Push Button
45
Shunt Cable Current Sensor
47
Capacitor Temperature Sensor
49
Capacitor Voltage Sensor
System Microcontroller
Control & Data
46
Backlit LCD Display
48
Reverse Voltage LED
50
AUTO Mode LED
52
MANUAL Mode LED
54
Charge Battery LED
56
FAULT LED
70
Annunciator
72
Keypad
58
59
18
22
34
41
37
Jump Starter Batteries
Jump Starter Capacitors
Sensor Wiring Harness
00 AWG Cable
Contact Relay
00 AWG Cable
36
21
35
60
28
26
Sensor Wiring Harness
Vehicle to Be Started

Fig. 1

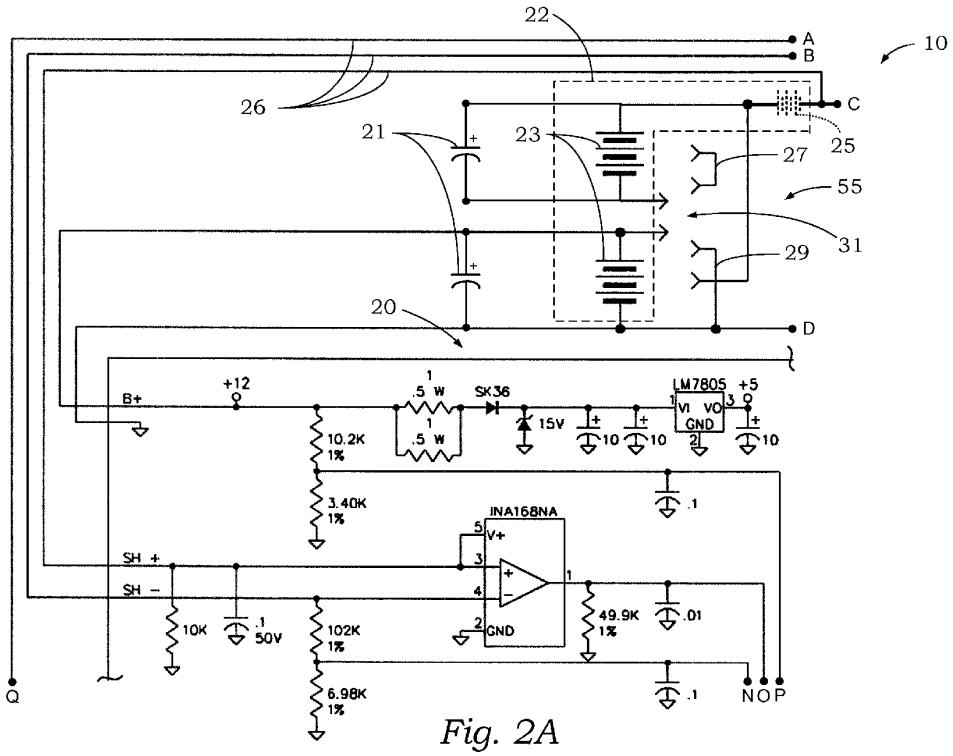

22
10
A
B
C
26
21
23
25
27
55
31
29
20
D
B+
+12
.5 W
SK36
15V
LM7805
+5
VI
VO
GND
10.2K
1%
3.40K
1%
.1
INA168NA
V+
SH +
SH –
10K
.1
50V
102K
1%
6.98K
1%
GND
49.9K
1%
.01
Q
N
O
P

Fig. 2A

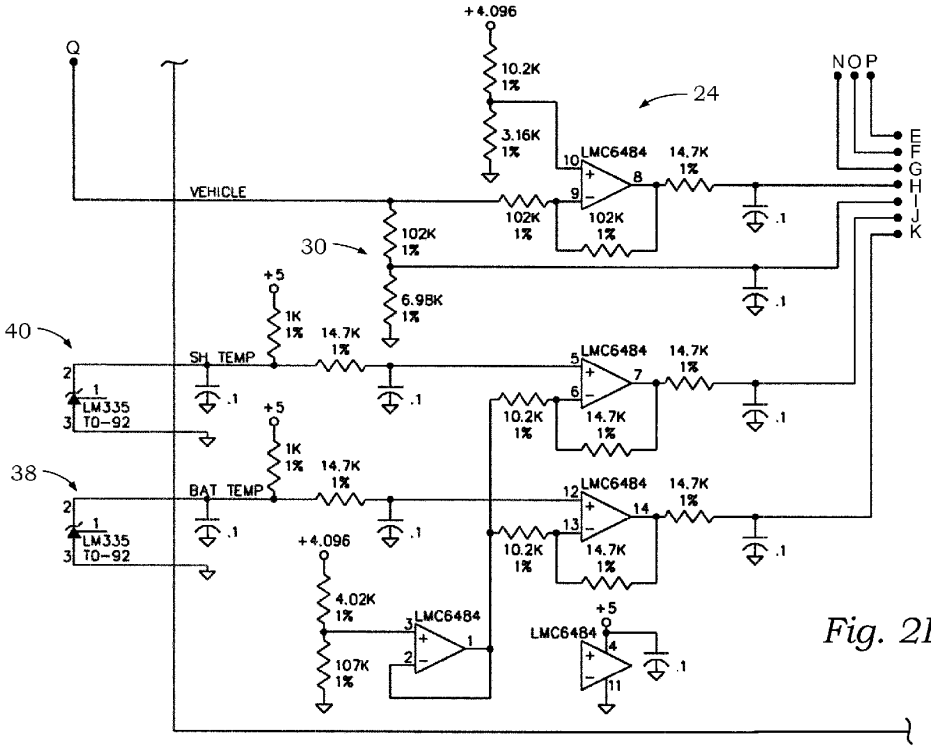

+4.096
10.2K 1%
3.16K 1%
24
LMC6484
14.7K 1%
NOP
E
F
G
H
I
J
K
Q
VEHICLE
102K 1%
102K 1%
102K 1%
30
6.98K 1%
.1
+5
1K 1%
14.7K 1%
40
SH TEMP
LM335 TO-92
38
BAT TEMP
4.02K 1%
107K 1%
LMC6484

Fig. 2B

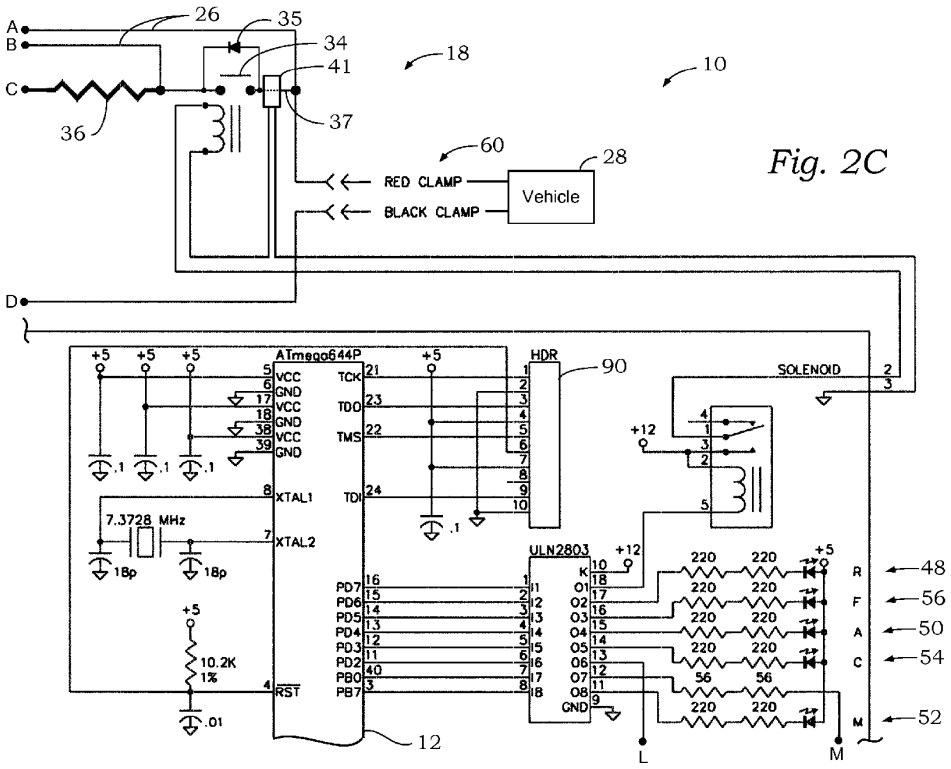

A
B
C
D
26
35
34
41
37
36
18
10
60
28
RED CLAMP
BLACK CLAMP
Vehicle
ATmega644P
HDR
90
SOLENOID
ULN2803
7.3728 MHz
10.2K
1%
.01
18p
12
48
56
50
54
52
L
M

Fig. 2C

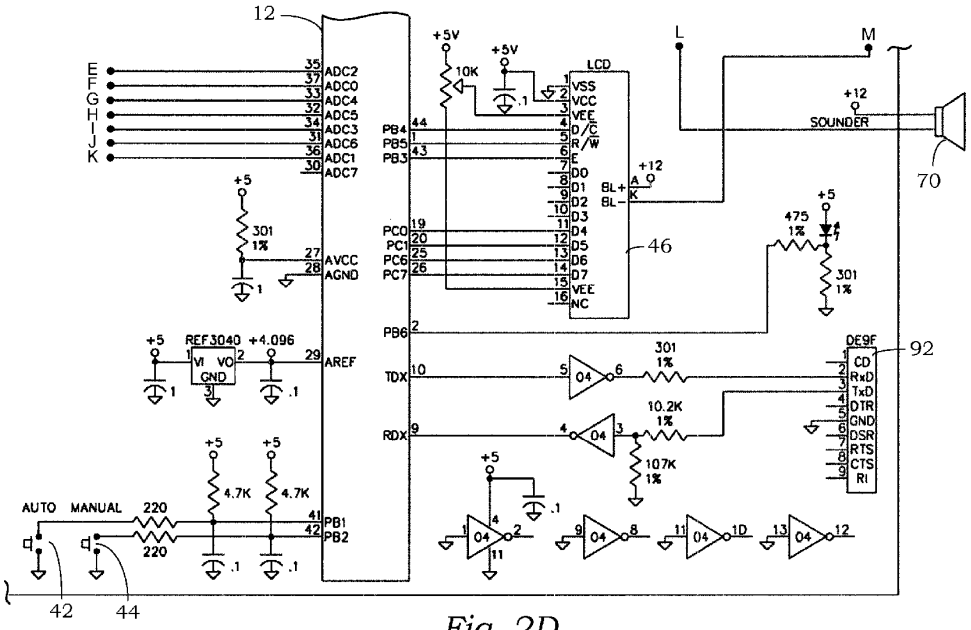

12
E
F
G
H
I
J
K
ADC2
ADC0
ADC4
ADC5
ADC3
ADC6
ADC1
ADC7
AVCC
AGND
AREF
PB4
PB5
PB3
PC0
PC1
PC6
PC7
PB6
TDX
RDX
PB1
PB2
+5V
10K
.1
LCD
VSS
VCC
VEE
D/C
R/W
E
D0
D1
D2
D3
D4
D5
D6
D7
VEE
NC
BL+
BL-
46
L
M
+12
SOUNDER
70
301
1%
475
1%
REF3040
+4.096
VI
VO
GND
04
10.2K
1%
107K
1%
DE9F
CD
RxD
TxD
DTR
GND
DSR
RTS
CTS
RI
92
4.7K
AUTO
MANUAL
220
42
44

Fig. 2D

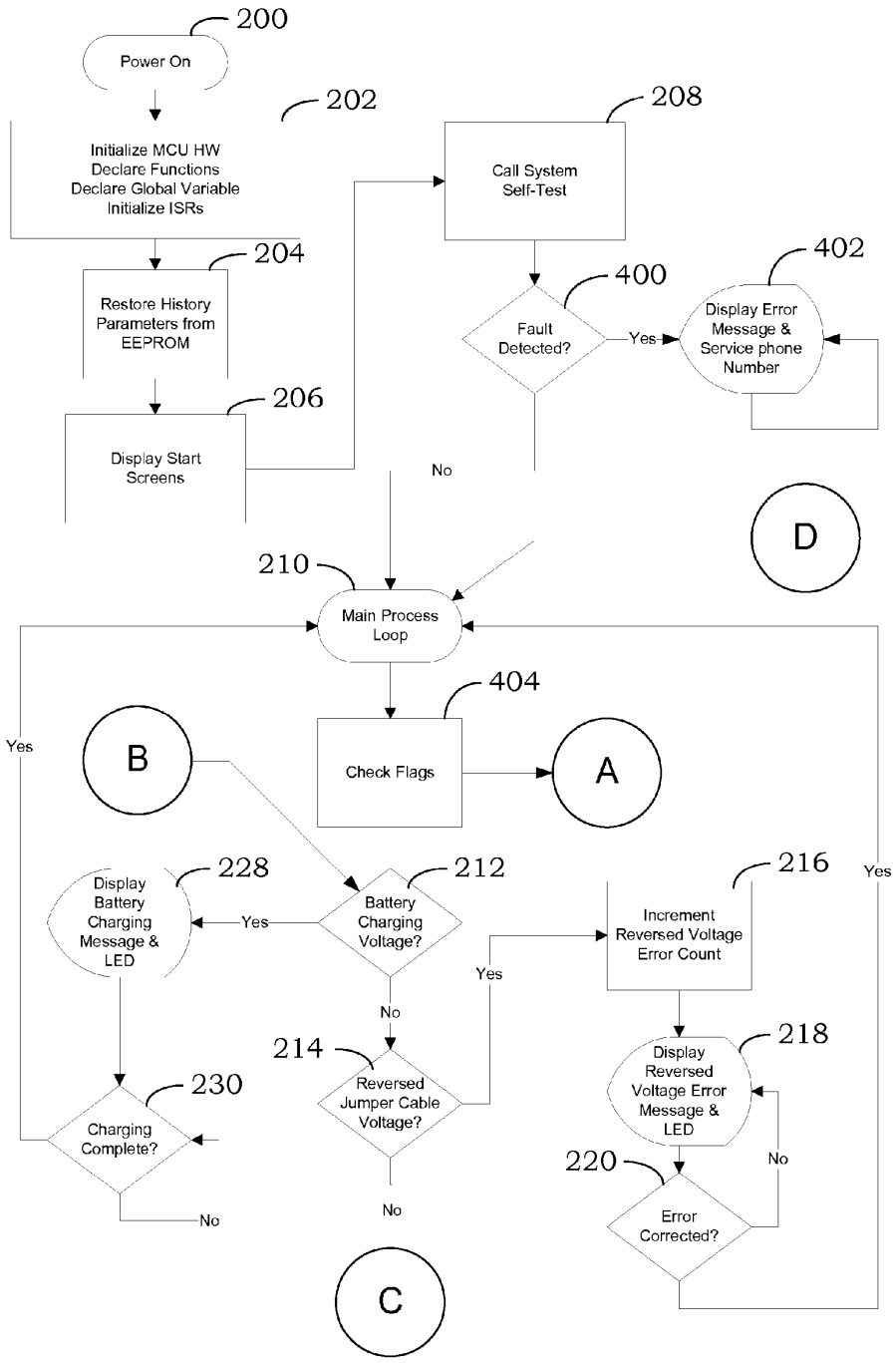

200
Power On
202
Initialize MCU HW
Declare Functions
Declare Global Variable
Initialize ISRs
204
Restore History
Parameters from
EEPROM
206
Display Start
Screens
208
Call System
Self-Test
400
Fault
Detected?
Yes
402
Display Error
Message &
Service phone
Number
No
D
210
Main Process
Loop
404
Check Flags
B
A
Yes
228
Display
Battery
Charging
Message &
LED
Yes
212
Battery
Charging
Voltage?
No
214
Reversed
Jumper Cable
Voltage?
No
Yes
216
Increment
Reversed Voltage
Error Count
Yes
218
Display
Reversed
Voltage Error
Message &
LED
No
220
Error
Corrected?
230
Charging
Complete?
No
C

Fig. 3

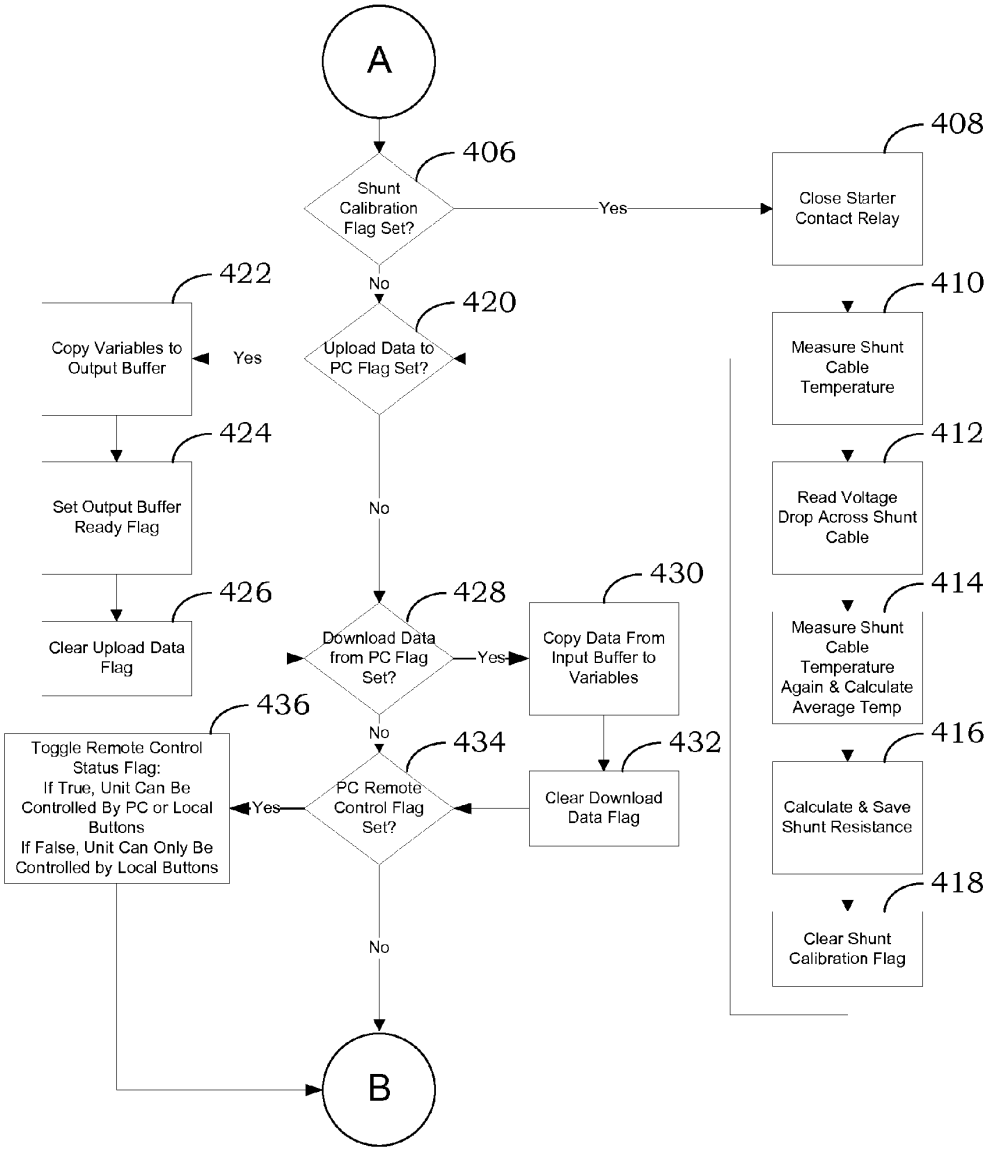

A
406
Shunt Calibration Flag Set?
Yes
408
Close Starter Contact Relay
No
422
Copy Variables to Output Buffer
Yes
420
Upload Data to PC Flag Set?
410
Measure Shunt Cable Temperature
424
Set Output Buffer Ready Flag
No
412
Read Voltage Drop Across Shunt Cable
426
Clear Upload Data Flag
428
Download Data from PC Flag Set?
Yes
430
Copy Data From Input Buffer to Variables
414
Measure Shunt Cable Temperature Again & Calculate Average Temp
No
436
Toggle Remote Control Status Flag:
If True, Unit Can Be Controlled By PC or Local Buttons
If False, Unit Can Only Be Controlled by Local Buttons
434
PC Remote Control Flag Set?
Yes
432
Clear Download Data Flag
416
Calculate & Save Shunt Resistance
418
Clear Shunt Calibration Flag
No
B

Fig. 4

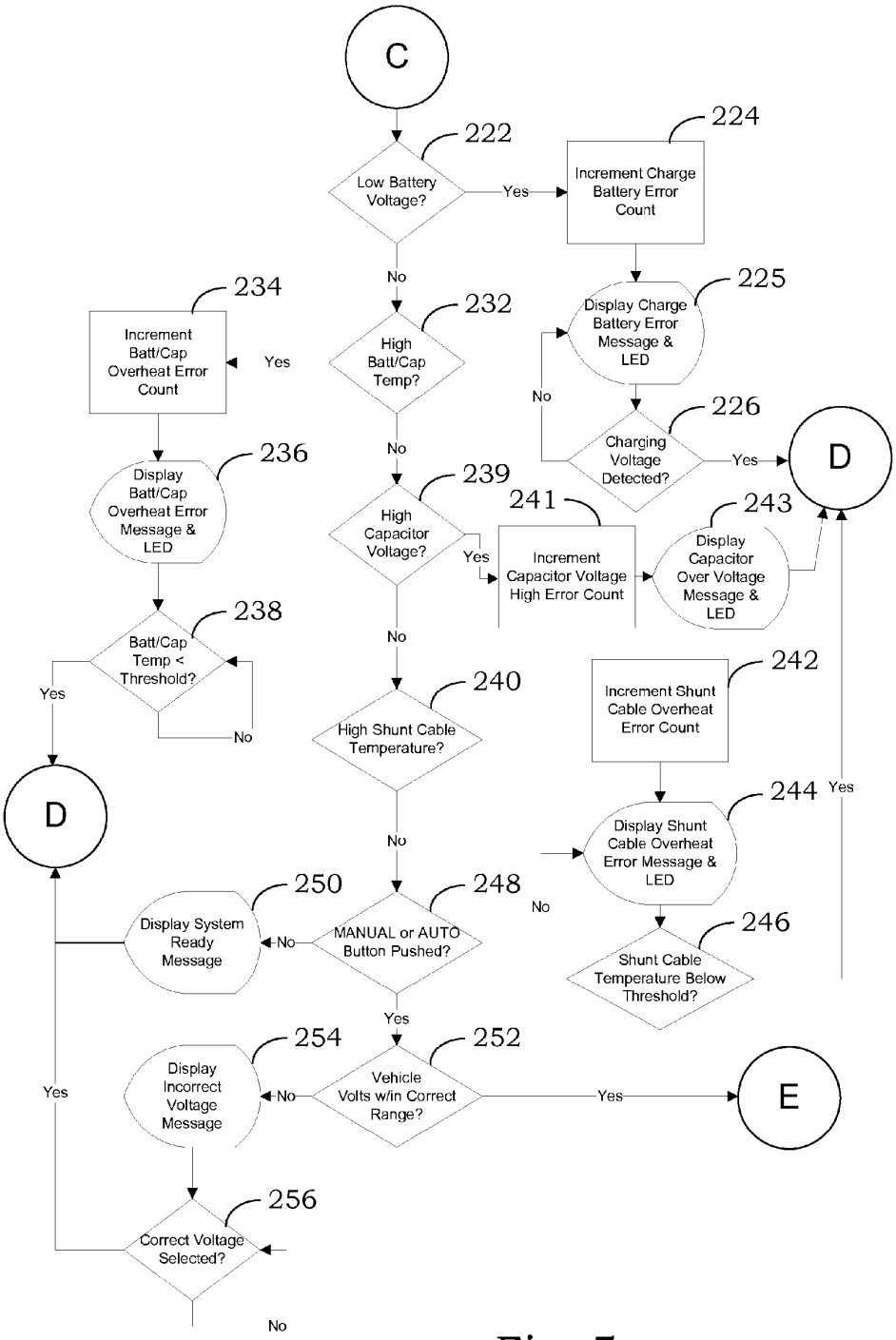

C
222
Low Battery Voltage?
Yes
224
Increment Charge Battery Error Count
No
225
Display Charge Battery Error Message & LED
232
High Batt/Cap Temp?
234
Increment Batt/Cap Overheat Error Count
Yes
No
226
Charging Voltage Detected?
Yes
D
236
Display Batt/Cap Overheat Error Message & LED
239
High Capacitor Voltage?
241
Increment Capacitor Voltage High Error Count
Yes
243
Display Capacitor Over Voltage Message & LED
238
Batt/Cap Temp < Threshold?
Yes
No
No
240
High Shunt Cable Temperature?
242
Increment Shunt Cable Overheat Error Count
D
244
Display Shunt Cable Overheat Error Message & LED
Yes
No
250
Display System Ready Message
No
248
MANUAL or AUTO Button Pushed?
246
Shunt Cable Temperature Below Threshold?
Yes
254
Display Incorrect Voltage Message
252
Vehicle Volts w/in Correct Range?
No
Yes
E
Yes
256
Correct Voltage Selected?
No

Fig. 5

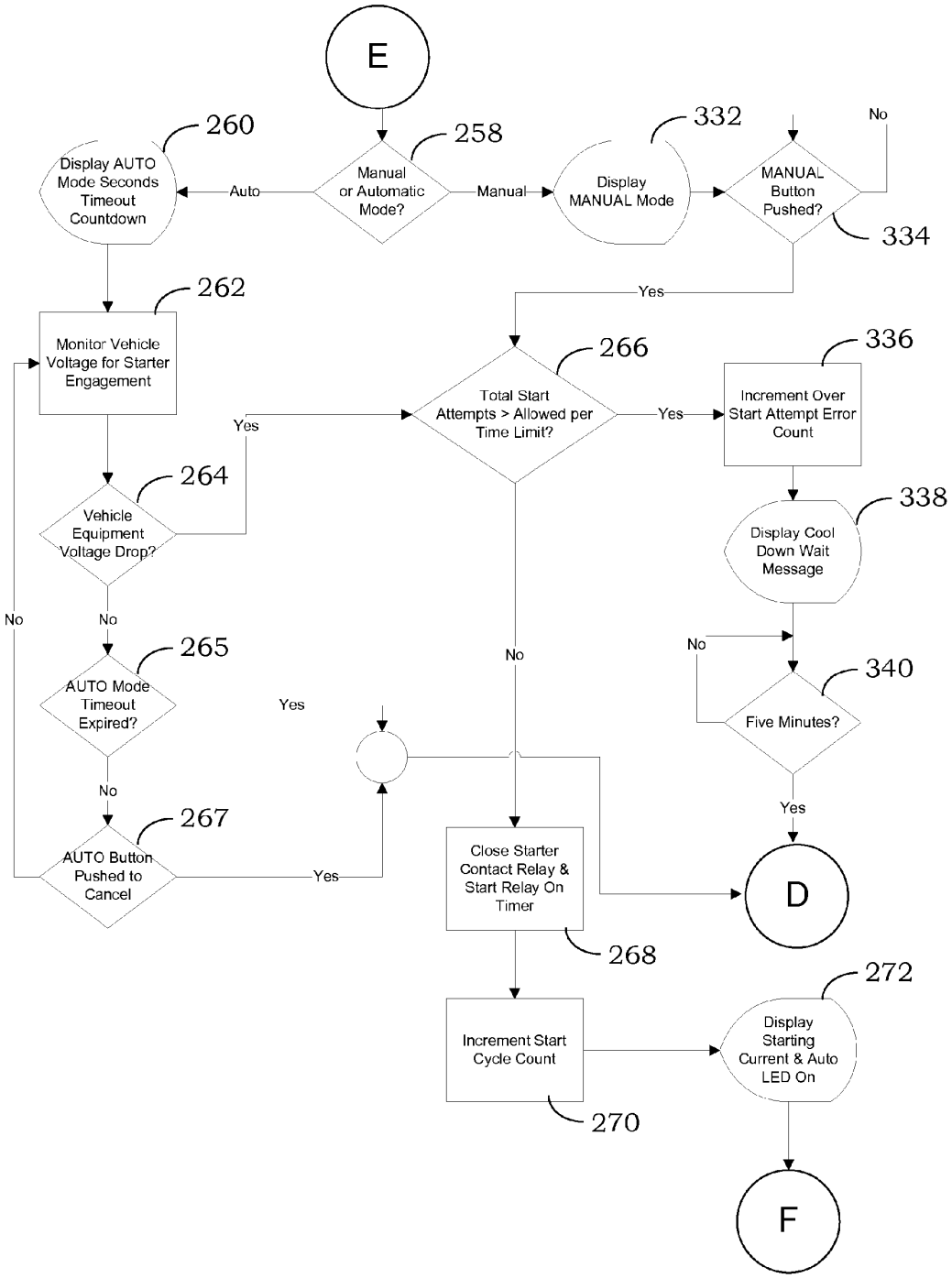

E
260
Display AUTO Mode Seconds Timeout Countdown
Auto
258
Manual or Automatic Mode?
Manual
332
Display MANUAL Mode
No
MANUAL Button Pushed?
334
Yes
262
Monitor Vehicle Voltage for Starter Engagement
266
Total Start Attempts > Allowed per Time Limit?
Yes
Yes
336
Increment Over Start Attempt Error Count
264
Vehicle Equipment Voltage Drop?
338
Display Cool Down Wait Message
No
No
No
265
AUTO Mode Timeout Expired?
Yes
No
340
Five Minutes?
No
Yes
267
AUTO Button Pushed to Cancel
Yes
Close Starter Contact Relay & Start Relay On Timer
D
268
272
Increment Start Cycle Count
Display Starting Current & Auto LED On
270
F

Fig. 6

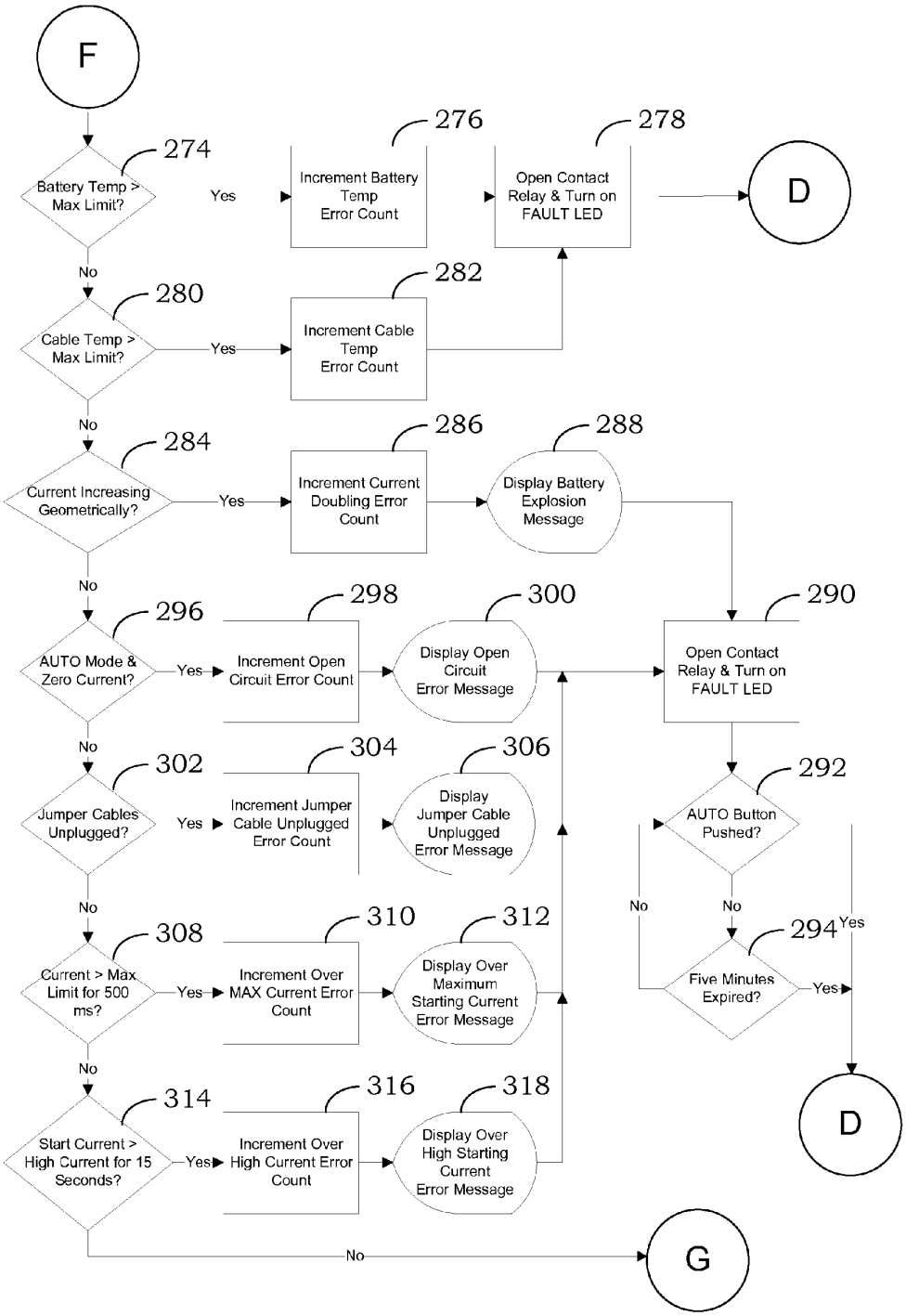

F
274
Battery Temp > Max Limit?
Yes
276
Increment Battery Temp Error Count
278
Open Contact Relay & Turn on FAULT LED
D
No
280
Cable Temp > Max Limit?
Yes
282
Increment Cable Temp Error Count
No
284
Current Increasing Geometrically?
Yes
286
Increment Current Doubling Error Count
288
Display Battery Explosion Message
No
296
AUTO Mode & Zero Current?
Yes
298
Increment Open Circuit Error Count
300
Display Open Circuit Error Message
290
Open Contact Relay & Turn on FAULT LED
No
302
Jumper Cables Unplugged?
Yes
304
Increment Jumper Cable Unplugged Error Count
306
Display Jumper Cable Unplugged Error Message
292
AUTO Button Pushed?
No
No
294
Five Minutes Expired?
Yes
Yes
D
No
308
Current > Max Limit for 500 ms?
Yes
310
Increment Over MAX Current Error Count
312
Display Over Maximum Starting Current Error Message
No
314
Start Current > High Current for 15 Seconds?
Yes
316
Increment Over High Current Error Count
318
Display Over High Starting Current Error Message
No
G

Fig. 7

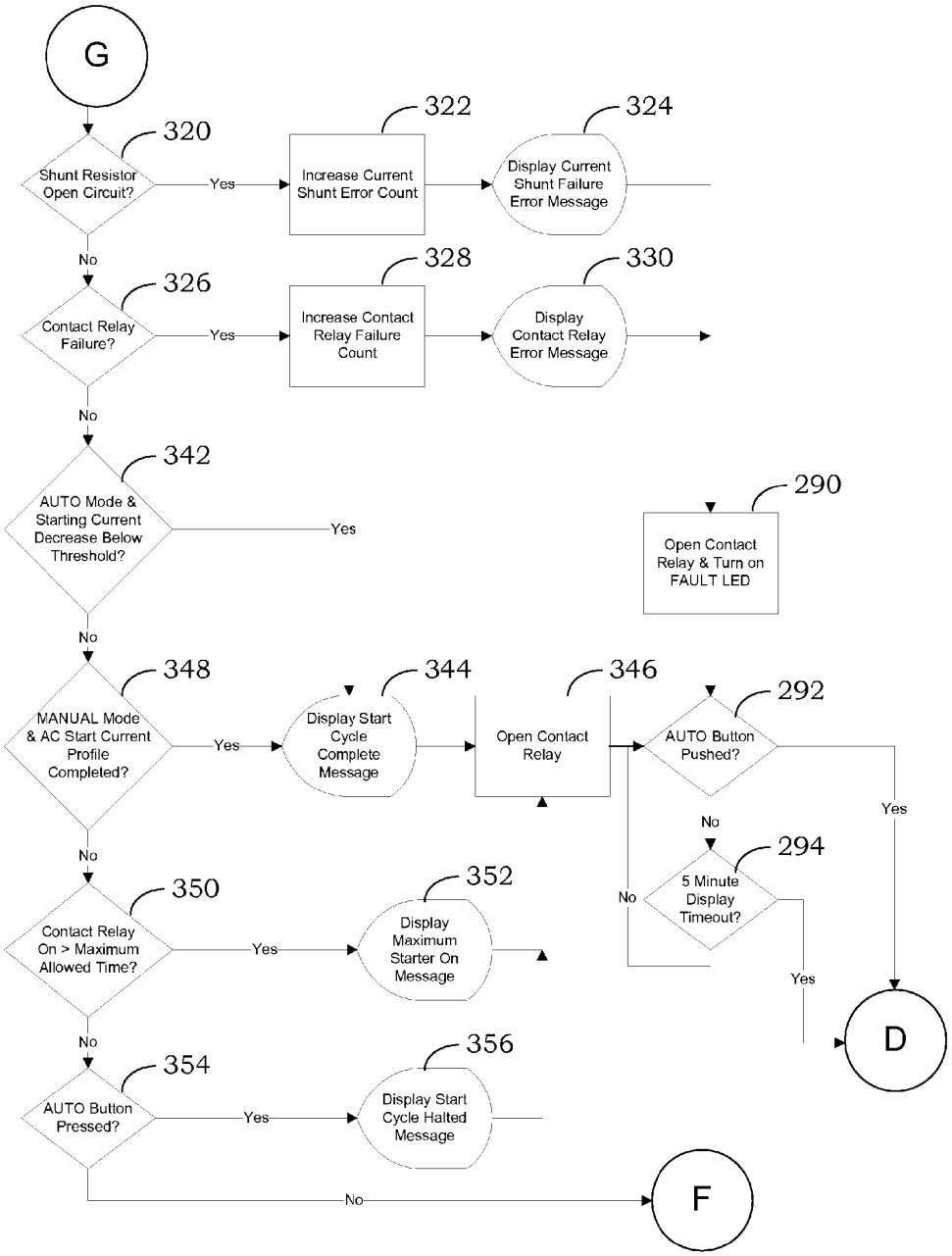

G
320
Shunt Resistor Open Circuit?
Yes
322
Increase Current Shunt Error Count
324
Display Current Shunt Failure Error Message
No
326
Contact Relay Failure?
Yes
328
Increase Contact Relay Failure Count
330
Display Contact Relay Error Message
No
342
AUTO Mode & Starting Current Decrease Below Threshold?
Yes
290
Open Contact Relay & Turn on FAULT LED
No
348
MANUAL Mode & AC Start Current Profile Completed?
Yes
344
Display Start Cycle Complete Message
346
Open Contact Relay
292
AUTO Button Pushed?
Yes
No
294
5 Minute Display Timeout?
No
Yes
D
No
350
Contact Relay On > Maximum Allowed Time?
Yes
352
Display Maximum Starter On Message
No
354
AUTO Button Pressed?
Yes
356
Display Start Cycle Halted Message
No
F

Fig. 8

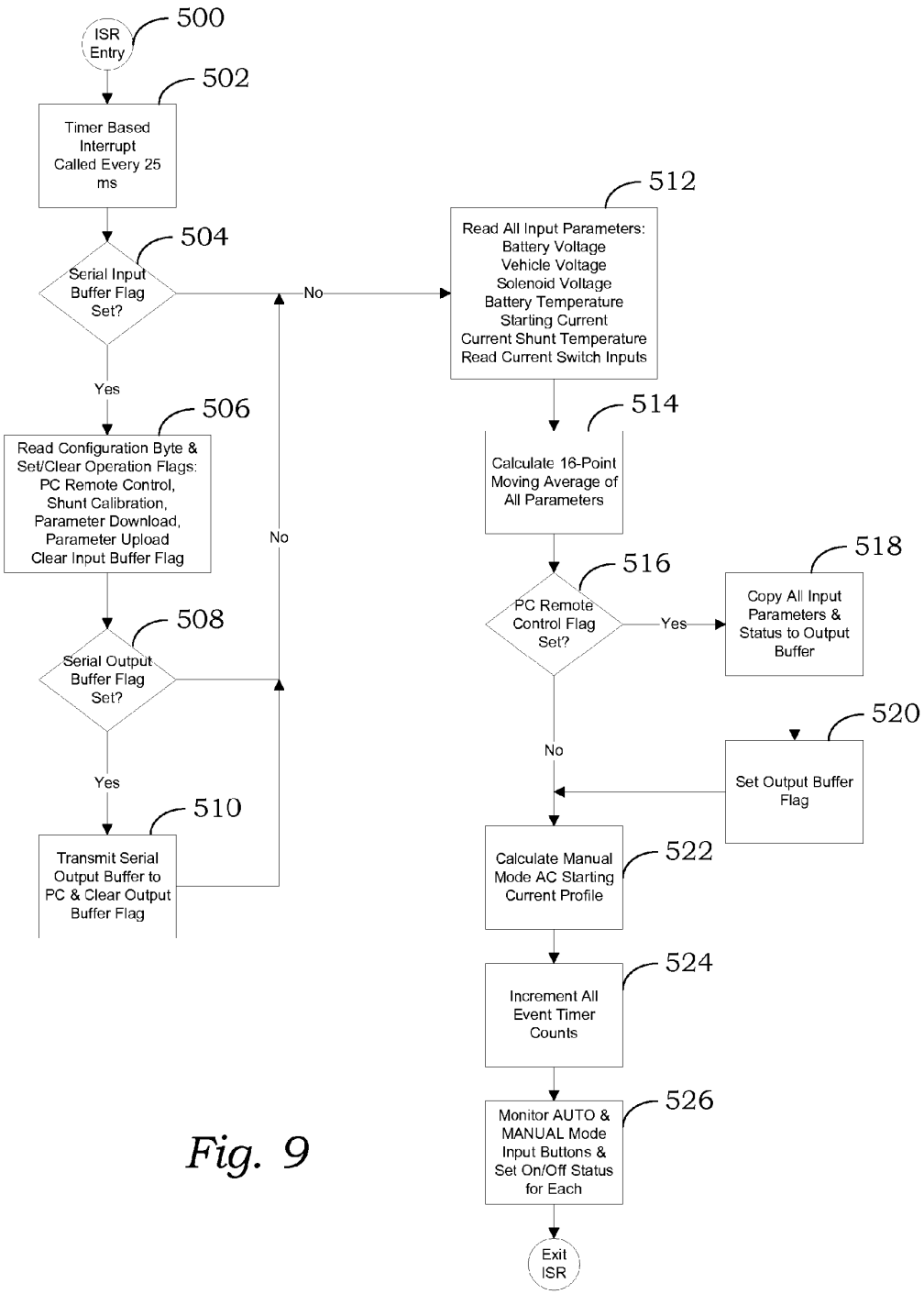

ISR Entry
500
Timer Based Interrupt Called Every 25 ms
502
Serial Input Buffer Flag Set?
504
No
Yes
Read All Input Parameters: Battery Voltage Vehicle Voltage Solenoid Voltage Battery Temperature Starting Current Current Shunt Temperature Read Current Switch Inputs
512
Read Configuration Byte & Set/Clear Operation Flags: PC Remote Control, Shunt Calibration, Parameter Download, Parameter Upload Clear Input Buffer Flag
506
Calculate 16-Point Moving Average of All Parameters
514
No
Serial Output Buffer Flag Set?
508
PC Remote Control Flag Set?
516
Yes
Copy All Input Parameters & Status to Output Buffer
518
Yes
No
Set Output Buffer Flag
520
Transmit Serial Output Buffer to PC & Clear Output Buffer Flag
510
Calculate Manual Mode AC Starting Current Profile
522
Increment All Event Timer Counts
524
Monitor AUTO & MANUAL Mode Input Buttons & Set On/Off Status for Each
526
Exit ISR

Fig. 9

US 2013/0154543 A1 Jun. 20, 2013

METHOD AND APPARATUS FOR PROVIDING SUPPLEMENTAL POWER TO AN ENGINE

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part of application Ser. No. 12/436,562, filed May 6, 2009, entitled METHOD AND APPARATUS FOR PROVIDING SUPPLEMENTAL POWER TO AN ENGINE, which is a continuation-in-part of application Ser. No. 12/330,875, filed Dec. 9, 2008, entitled METHOD AND APPARATUS FOR PROVIDING SUPPLEMENTAL POWER TO AN ENGINE, which claims the benefit of provisional patent application 61/018,715, filed Jan. 3, 2008. with the same title.

FIELD

[0002] The present invention relates to a portable power source for a motor vehicle and, more particularly, to a method and apparatus to provide supplemental power to start internal combustion and turbine engines.

BACKGROUND

[0003] Internal combustion and turbine engines require a power source to start. Commonly, this power source is in the form of a battery, which provides power to a starter motor, which in turn drives the engine. The crankshaft of the engine is rotated by the starter motor at a speed sufficient to start the engine. If the battery goes dead or otherwise lacks sufficient power for the starter motor to drive the engine, the engine won't start. Environmental factors, such as temperature, affect the output of the battery and power required to rotate the engine.

[0004] If the battery lacks sufficient power to start the engine, a supplemental power source is necessary to jump start the engine. Typically, jumper cables are used to connect the battery of one vehicle to the dead battery of another vehicle needing to be jumped. The batteries are connected in parallel using heavy cables (jumper cables) which are connected to the terminals of the batteries using conductive clamps.

[0005] Several potential problems arise from the use of conventional jumper cables. Batteries in motor vehicles are capable of producing from 2,500 to more than 45,000 watts of power. If the batteries are cross-connected or the clamps inadvertently contact each other when one end of the jumper cables is connected to a battery, sparking can occur resulting in damage to the battery, the electrical system of the vehicle, and injury to the user of the jumper cables. If the jumper cables are not properly connected, there is a potential for the batteries exploding and fire, which may result in injury to those in proximity to the vehicle being jumped. Furthermore, the user is not given any indication as to the reason the battery is dead, which may only cause additional problems when trying to jump start the dead battery.

SUMMARY

[0006] The present invention provides an apparatus and method for temporarily delivering supplemental power to the electrical system of a vehicle. The apparatus and method performs real-time monitoring of all system parameters to increase the safety and effectiveness of the unit's operation while providing additional parametric and diagnostic information obtained before, during and after the vehicle starting operation.

[0007] The present invention monitors the voltage of the battery of the vehicle to be jump started and the current delivered by the jump starter batteries and capacitors to determine if a proper connection has been established and to provide fault monitoring. For safety purposes, only if the proper polarity is detected can the system operate. The voltage is monitored to determine open circuit, disconnected conductive clamps, shunt cable fault, and solenoid fault conditions. The current through the shunt cable is monitored to determine if there is a battery explosion risk, and for excessive current conditions presenting an overheating condition, which may result in fire. The system includes one or more internal batteries and capacitors to provide the power to the battery of the vehicle to be jump started. Once the vehicle is started, the vehicle's electrical system may recharge the batteries and capacitors before the unit automatically electrically disconnects from the vehicle's battery.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] FIG. **1** is a functional block diagram of the portable power source of the present invention.

[0009] FIG. **2** (divided into FIGS. **2**A, **2**B, **2**C and **2**D) is a schematic of the portable power source, control circuit and sensors of the present invention.

[0010] FIGS. **3-8** are flow charts of the processing steps of the portable power source of the present invention.

[0011] FIG. **9** is a flow chart of the interrupt service routine of the system of the portable power source of the present invention.

DESCRIPTION

[0012] As required, detailed embodiments of the present invention are disclosed herein. However, it is to be understood that the disclosed embodiments are merely exemplary of the invention that may be embodied in various and alternative forms. The figures are not necessarily to scale; some features may be exaggerated or minimized to show details of particular components. Therefore, specific structural and functional details disclosed herein are not to be interpreted as limiting, but merely as a representative basis for the claims and/or as a representative basis for teaching one skilled in the art to variously employ the present invention.

[0013] Moreover, except where otherwise expressly indicated, all numerical quantities in this description and in the claims are to be understood as modified by the word "about" in describing the broader scope of this invention. Practice within the numerical limits stated is generally preferred. Also, unless expressly stated to the contrary, the description of a group or class of materials as suitable or preferred for a given purpose in connection with the invention implies that mixtures or combinations of any two or more members of the group or class may be equally suitable or preferred.

[0014] Referring initially to FIG. **1**, the portable supplemental power source (jump starter) of the present invention is generally indicated by reference numeral **10**. Jump starter **10** includes a programmable microprocessor **12** which receives inputs **14** and produces informational outputs **16** and control outputs **18**. Microprocessor **12** provides flexibility to the system **10** to allow updates to the functionality and system parameters without changing the hardware. In the preferred

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embodiment, an **8**-bit microprocessor with 64 k bytes of programmable flash memory is used to control the system **10**. One such microprocessor is the ATmega644P available from Atmel Corporation. The microprocessor **12** may be programmed via an internal connector **90**, or an external connector **92** (see FIG. **2**). It should be understood that other programming ports may be included are not limited to the two shown in the figure.

[0015] A capacitor voltage sensor **49** monitors the voltage level of one or more capacitor **21**. The capacitors **21** may include energy storage modules containing six or more ultracapacitor cells, for example. The capacitor modules **21** may be connected in series to obtain higher operating voltages or in parallel to provide additional energy storage. One such capacitor module is the Boostcap Energy Storage Module available from Maxwell Technologies, Inc.

[0016] A battery voltage sensor **20** monitors the voltage level of one or more jump starter batteries **22**. A reverse voltage sensor **24** monitors the polarity of the jumper cables on line **26** which are connected to the vehicle's electrical system **28**. A vehicle voltage sensor **30** monitors the voltage on line **37** (voltage of the vehicle). When the contacts are open, the solenoid voltage sensor **32** input to microprocessor **12** is used to measure the voltage of the jump starter capacitors **21** and batteries **22**, which may be configured for various jump starter voltages. When the contacts are closed, the voltage difference between the capacitors **21** and batteries **22**, and the contact relay **34** is used to measure the voltage drop across a temperature-and-resistance calibrated 00 AWG shunt cable **36** in order to calculate the current being delivered by the jump starter capacitors **21** and batteries **22** to the vehicle's electrical system **28**. Although the present invention is disclosed and described as temporarily connected to a vehicle, it should be understood that it is equally applicable to a stationary engine. Additionally, the connection method to the electrical system or batteries of the engine to be started is not important and may include conductive clamps, NATO connectors, or may be permanently hardwired to the system, for example.

[0017] A battery temperature sensor **38** monitors the temperature of the jump starter's batteries **22** to detect overheating due to excess current draw from the batteries during jump starting. A shunt cable temperature sensor **40** monitors the temperature of the 00 AWG shunt cable **36** in order to compensate for resistance changes of the shunt cable due to the high current passing through the shunt cable **36** and to detect overheating conditions. The unit **10** also includes automatic **42** and manual **44** pushbutton inputs to accept user input to select either automatic or manual operation.

[0018] The temperature of 00 AWG shunt cable **37** may also be monitored by a temperature sensor or thermal switch **41**. As long as the temperature of the cable **37** is below a predetermined limit, the input on line **58** is passed through sensor **41** to line **59** to enable the contact relay **34** as controlled by system microcontroller **12**. If the temperature of the cable **37** exceeds a predetermined limit, then the temperature sensor **41** presents an open circuit to control line **58** to disable contact relay **34** and not allow power to be applied to the vehicle **28**. It should be understood that the temperature sensor **41** may be coupled to cable **36**, **37** or any other cable that may become overheated. Additional temperature sensors may be used to provide additional protection of the system from overheating.

[0019] A capacitor temperature sensor **47** monitors the temperature of the jump starter capacitors **21** to detect overheating due to excess current draw from the capacitors during jump starting.

[0020] The microprocessor **12** includes several outputs **16** to provide information to the user and to control the application of power to the vehicle to be jump started. An LCD display **46** may be used to display user instructions, error messages, and real-time sensor data during operation of the jump starter **10**. A reverse voltage LED **48** is illuminated when the microprocessor **12** determines that a reverse voltage jumper cable voltage is detected by reverse voltage sensor **24**. An auto mode LED **50** is illuminated when the automatic mode pushbutton **42** is depressed. A manual mode LED **52** is illuminated when the manual mode pushbutton **44** is depressed. If the voltage level of the jump starter batteries **22** drop below a value of twenty percent of the normal level, a charge battery LED **54** is illuminated. The charge battery LED **54** remains illuminated until the batteries **22** are charged to a minimum state of charge such as fifty percent, for example. A fault LED **56** is turned on anytime the microprocessor **12** detects any operational, sensor or internal fault. An audible warning may also be provided **70**. The fault LED **56** remains illuminated until the fault condition is cleared.

[0021] A contact relay control output **58** operates the contact relay **34** through temperature sensor **41**. When the jump starter operation has been successfully initiated, the contact relay **34** is closed and the jump starter capacitors **21** and batteries **22** are connected to the starter system or batteries of the vehicle to be started **28**. The contact relay **34** is opened when a successful start cycle has been completed, a start fault has occurred or the operator interrupts the jump starter cycle. An optional key pad **72** may be included and used for entry of a passcode to operate the unit **10**, or to identify one or more users of the system which may be stored to track user operation. For example, if two different users operate the unit **10** and error conditions are recorded for one of the users, this information may be used to identify training issues that need to be addressed.

[0022] Referring to FIGS. **2**A, **2**B, **2**C, **2**D and **3**-**8**, when the jump starter **10** is initially powered on **200**, the microcontroller **12** initializes the hardware, reads all system parameters and variables, and initializes the interrupt service routine **202** (See FIG. **8**). All stored performance history is read from the onboard, non-volatile memory **204** and a start message is displayed **206** on the LCD display **46**. The history is saved for diagnostic, unit use and safety purposes. The microcontroller **12** then performs a system self-test operation **208** where the LCD **46**, all LEDs **48**, **50**, **52**, **54** and **56**, all sensors **20**, **24**, **30**, **32**, **38**, **40**, the push buttons **42** and **44**, and the system batteries **22** are tested and their status displayed **208** on the LCD **46**. If a fault is detected **400**, an error message is displayed **402** and system operation is halted.

[0023] Once the initialization and self-test operations are completed, the system starts into a main processing loop **210**. An interrupt service routine ("ISR") **500** (FIG. **9**) is also started which constantly monitors all input sensor values and user input buttons. The ISR **500** is periodically called by the microcontroller **502**. A check is made to determine if the serial input buffer flag is set **504**. If the flag is set **504**, then configuration information is read and flags set or cleared **506**. If the output flag is set **508**, the information is transmitted to an external PC and the output buffer flag is cleared **510**. Next, all input parameters are read **512**, and a moving average is

calculated for each parameter **514**. If the PC remote flag is set **516**, all parameters and statuses are copied to the output buffer **518** and the output buffer flag is set **520**. The manual mode AC starting current profile is calculated **522**, all event timer counts are incremented **524**, and the status of the automatic **42** and manual **44** pushbuttons is monitored and set **526**. All calculations, timer counts, and status indications (flags) are stored in the internal memory of the microprocessor **12**.

[0024] At the start of the main process loop **210**, the flags are checked **404** beginning with the shunt calibration flag **406**. If the shunt calibration flag is set **406**, the starter contact relay **34** is closed **408**. The temperature of the shunt cable is measured **410** and the voltage drop across the shunt cable is read **412**. The temperature of the shunt cable is measured a second time and averaged with the previous reading **414**. The shunt resistance is then calculated and saved **416** and the shunt calibration flag is cleared **418**.

[0025] Next, if the flag to upload data to an external PC is set **420**, the information is copied to the output buffer **422**, the output buffer ready flag is set **424**, and the upload data flag is cleared **426**. If the download data from PC flag is set **428**, data is copied from the input buffer **430**, and the download data flag is cleared **432**.

[0026] If the PC remote control flag is set **434**, the remote control status flag is toggled **436**. If the flag is true, the unit **10** can be controlled remotely by a PC or locally by the buttons. If the flag is false, the unit can only be controlled locally.

[0027] If the system does not detect a battery charging voltage **212**, once jumper cables **60** have been manually connected to the vehicle to be started **28**, the voltage is measured by the reverse voltage sensor **24** to determine if the cables have been properly connected to the vehicle **214**. If the voltage measured is significantly less than the voltage of the jump starter capacitors **21** and batteries **22**, then a reverse polarity connection of the jumper cables to the vehicle is determined and an error flag is set and the event saved in non-volatile memory **216**. A "Reverse Polarity" error message is displayed **218** on the LCD **46**, and the reverse voltage LED **48** is illuminated **216**. Any further jump starter action by the operator is ignored until the reverse polarity condition is corrected **220**, at which point processing returns to the start of the main processing loop **210**.

[0028] If the jumper cables **60** are not reverse connected **214**, then the state of charge of the capacitors **21** and batteries **22** is determined **222**. If the voltage level of the system batteries **22** measured by the voltage sensor **30** is equal to a state of charge of eighty percent or more below a fully charged voltage level **222**, an error flag is set and the event recorded in memory **224**. The charge battery LED **54** is illuminated and the LCD **46** displays a "Charge Battery" message **225**. The system stays in this condition, which prohibits any further jump starter action by the operator until a charging voltage is detected **226**, which is great enough to indicate that a battery charger (not shown) has been connected to the batteries **22**.

[0029] If the system has detected a battery charger voltage **212**, a "Battery Charging" message is displayed **228** on the LCD **46**, and the charge LED **54** is illuminated. The voltage profile of the battery **22** is monitored to determine if the charge is complete **230**. A completed charge is determined by monitoring the charging voltage rise to a threshold value then decrease by a predetermined percentage. This voltage peaking and subsequent fall-off is a characteristic of the battery chemistry indicating that the battery has reached its maximum charge capacity. Once the charging has reached a minimum charged level or is completed **230**, the processing returns to the beginning of the main processing loop **210**. The jump starter batteries **22** only need to reach a 50% charge in order for the system to attempt to start the vehicle.

[0030] If the battery or capacitor temperature measured by sensors **38** and **47** rises above a maximum safe threshold **232**, an error flag is set and the event recorded in non-volatile memory **234**. An error message "Battery Over Temperature" or "Capacitor Over Temperature" is displayed **236** on the LCD **46** and the Fault LED **56** is illuminated. The system prevents any further operation until the battery and/or capacitor temperature falls below a safe level **238**. Once a safe temperature is reached, processing returns to a ready state at the beginning of the main processing loop **210**.

[0031] If the voltage of one or more of the capacitors measured by the capacitor voltage sensor **49** exceeds a predetermined limit **239**, such as 2.8 volts, for example, an error flag is set and the event recorded in non-volatile memory **241**. An error message "Capacitor Over Voltage" is displayed **243** and the fault LED **56** is illuminated. Processing then returns to the main processing loop **210**.

[0032] If the temperature of the shunt cable **36** rises above a safe threshold temperature **240**, an error flag is set and the event recorded in memory **242**. An error message "Cable over Temperature" is displayed **244** on the LCD **46** and the Fault LED **56** is illuminated. The system prevents any further operation until the shunt cable temperature falls below a minimum safe temperature **246**. Once a safe temperature is reached, the system returns to a ready state at the beginning of the main processing loop **210**.

[0033] Next, the system checks the status of the automatic **42** and manual **44** push buttons. If neither button has been pushed **248**, a "Ready" message is displayed **250** on the LCD **46** and processing returns to the main processing loop **210**. When no error conditions are detected and no user inputs are being processed, the system remains in the ready mode, and displays a "Ready" text message on the LCD **46**. Other information such as the selected jump starter voltage, the percentage change of the batteries **22**, the temperature of the batteries, and the vehicle voltage, for example, may also be displayed on LCD **46**.

[0034] If one of the push buttons **42** or **44** has been selected, the system will compare the operator-configured starter voltage against the voltage of the vehicle to be started **28**. The jump starter **10** may be configured for 12, 18, 24, 30, 36, 42 or 48 volts, for example, using a selector jumper **55**. For example, if the batteries **23** are both 12-volt batteries, the system may be configured for 12- or 24-volt operation. For example, if jumper **27** is placed across terminals **31**, the 24-volt configuration may be selected. If jumper **29** is placed across terminals **31**, the 12-volt configuration may be selected. If the batteries **23** are 12-volt batteries and a battery **25** is a 6-volt battery, 18- or 30-volt configurations may be provided. For example, if jumper **27** is placed across terminals **31**, the 30-volt configuration may be selected. If jumper **29** is placed across terminals **31**, the 18-volt configuration may be selected. It should be understood that two or more batteries of the same or different voltage levels may be used to meet the voltage requirements of the vehicle to be started. If the difference between the voltage selected and the voltage measured is not within a predetermined range and tolerance **252**, a "Wrong Selector Volts" message is displayed **254** on the LCD **46** and further operation is prohibited until the

correct voltage is selected **256** at which point processing returns to the main processing loop **210**.

[0035] If the selected voltage is within the correct range **252**, then the system determines which button was selected **258**. If the Auto button **42** was pushed, a ninety-second count down timer is started and displayed **260** on the LCD **46**. During this time the system monitors the vehicle voltage **262**. If the system does not detect a voltage drop **264** within 90 seconds **265**, the automatic operation is cancelled and processing returns to the main processing loop **210**. The automatic operation may also be interrupted and canceled by pushing the auto button **267**. If the vehicle voltage drops by twenty percent or more from the initially measured voltage **264**, then the vehicle's starter motor is engaged and is trying to start the vehicle. If the maximum number of start attempts has not been exceeded **266**, the contact relay **34** is closed and the contact relay on timer is started **268**, connecting the jump starter's capacitors **21** and batteries **22** to the vehicle's starting system **28**. The start cycle counter is incremented **270**, a "Jump Starter On" message is displayed **272** along with the average current being drawn, and the Auto Mode LED **50** is illuminated. If the relay on timer expires indicating that the relay **34** has been closed for ninety seconds without a start complete event, the relay **34** is automatically opened hy the system to reduce the probability of overheating any component in the jump starter or vehicle.

[0036] The system monitors all input sensors **14** and the current status of the jump starter for possible fault conditions. Upon detection of any fault condition, the system will open the contact relay **34** (if closed), and display a message indicating that a fault has occurred, and what action, if any, should be taken by the operator.

[0037] If the battery temperature exceeds a maximum limit **274**, a battery temperature error count is incremented **276**. The contact relay **34** is opened, a "Battery Temp" error message and temperature is displayed **278** on the LCD **46** and the fault LED **56** is illuminated. Processing returns to the main processing loop **210**.

[0038] If the shunt cable temperature exceeds a maximum limit **280**, a cable temperature error count is incremented **282**. The contact relay **34** is opened, a "Cable Temp" error message and temperature is displayed **278** on the LCD **46** and the fault LED **56** is illuminated. Processing returns to the main processing loop **210**.

[0039] If the system detects a geometric rise in the starting current **284** during the first **16** seconds after the contact relay **34** is closed, a current doubling error count is incremented **286**, a "Battery Explosion" error message is displayed **288** on the LCD **46**, the contact relay **34** is opened and the fault LED **56** is illuminated **290**. The system may be returned to the ready mode if the Automatic button **42** is pressed by the operator **292**, or automatically after five minutes **294**.

[0040] If no current flow is detected by the system **296** indicating that there is an open circuit within the system, an open circuit error count is incremented **298**, an "Open Circuit" error message is displayed **300** on the LCD **46**, the contact relay **34** is opened and the fault LED **56** is illuminated **290**. The system may be returned to the ready mode if the Automatic button **42** is pressed by the operator **292**, or automatically after five minutes **294**.

[0041] If the system detects an increase in the difference between the measured jump starter battery voltage **20** and the voltage measured **30** across the contact relay **34** indicating that one of the jump starter cables has been disconnected **302** from the vehicle's battery or starter system **28** then a jumper cable unplugged error count is incremented **304**, a "Jumper Cable Unplugged" error message is displayed **306** on the LCD **46**, the contact relay **34** is opened and the fault LED **56** is illuminated **290**. The system may be returned to the ready mode if the Automatic button **42** is pressed by the operator **292**, or automatically after five minutes **294**.

[0042] During the jump starting process if the current measured across the shunt cable **36** is greater than a preset maximum current such as **1400** amps for a short period of time such as 500 ms **308**, the over max current error count is incremented **310**, an "Over MAX Starting Current" error message is displayed **312** on LCD **46**, the contact relay **34** is opened and the fault LED **56** is illuminated **290**. The current across the shunt cable **36** is also measured to determine if it exceeds a predetermined current such as 1000 amps for more than a predetermined period of time such as 15 seconds **314**. If this over current condition is determined, an over high current error count is incremented **316**, an "Over High Crank Amps" error message is displayed **318** on the LCD **46**, the contact relay **34** is opened and the fault LED **56** is illuminated **290**. The system may be returned to the ready mode if the Automatic button **42** is pressed by the operator **292**, or automatically after five minutes **294**.

[0043] If the system detects a decrease in the jump starter battery voltage **20**, but does not detect an appreciable current flow through the jump starter, a shunt cable **36** failure is indicated **320**. The shunt cable **36** is a precisely measured and calibrated 00 AWG wire, the temperature of which is monitored **40** and used to calculate the resistance across the length of the cable **36**.

[0044] The voltage drop across the cable **36** is also measured to calculate the current through the shunt cable **36** using Ohm's Law. If the shunt cable **36** fails, the system cannot reliably measure the starting current which would present a safety hazard.

[0045] If the system detects a shunt cable failure **320**, a current shunt error count is incremented **322**, a "Current Shunt Failure" error message is displayed **324** on the LCD **46**, the contact relay **34** is opened and the fault LED **56** is illuminated **290**. The system may be returned to the ready mode if the Automatic button **42** is pressed by the operator **292**, or automatically after five minutes **294**.

[0046] If the system detects a great difference between the vehicle's voltage **30** and the contact relay **34** voltage **326**, the contact relay **34** may have failed indicating an over high starter current condition. A contact relay failure count is incremented **328**, a "Contact Relay Error" message is displayed **330** on the LCD **46**, the contact relay **34** is opened and the fault LED **56** is illuminated **290**. The system may be returned to the ready mode if the Automatic button **42** is pressed by the operator **292**, or automatically after five minutes **294**.

[0047] If manual mode is selected **258**, "Manual" is displayed **332** on the LCD **46**, the system will prompt the operator to press the manual button **44** again. If the manual button **44** is pressed a second time **334**, then the system checks the number of start attempts **266**. If the maximum number of start attempts has been exceeded **266**, an over start attempt error count is incremented **336**, a "Cool Down Unit" message is displayed **338** on the LCD **46**, and the system waits for five minutes for the system to cool **340**. Once the cool down time has expired, processing returns to the main processing loop

210. If the total start attempts have not exceeded the limit **266**, the processing continues at block **268** as described above.

[0048] If in auto mode and the starting current decreases by 20% from the maximum measured current **342**, then the start cycle is complete. A decrease in the starting current indicates that the vehicle has started and its alternator is now generating its own current reducing the demand from the jump starter batteries **22**. If the starting current is below the threshold **342**, a "Start Cycle Complete" message is displayed **344** on LCD **46**, and the contact relay is opened **346**. This message remains displayed until the operator presses the Auto button **292**, or if there is no user activity for five minutes **294**, after which the system returns to the main processing loop **210**.

[0049] If in manual mode, the jump starter **10** may be used when the battery voltage of the vehicle is below **10** volts, or if the vehicle's battery is not connected. In the situation where the vehicle's battery is present but has a voltage of less than 10 volts, the jump starter will start to charge the vehicle's battery before any starting operation begins. If the vehicle's battery is extremely low or completely dead, once the contactor is closed, the jump starter's batteries will start to charge the batteries. The current will rise sharply and then start to decrease, but this does not indicate that a start attempt has been made or that the vehicle's starter motor has been cranked. The algorithm looks for this initial increase and then decrease in the delivered current and then waits for a minimum of three alternating current cycles indicating that the vehicle's starter has been engaged. Due to the compression/decompression cycles of the pistons, the starting current will rise and fall in a generally sinusoidal pattern. The algorithm looks for this so that it knows that the vehicle's starter motor has been activated. Once this alternating current cycle has been detected, if the current then decreases by approximately twenty percent and remains low, this indicates a start complete, the contactor is opened, the start complete message is displayed and then the system waits for the Auto button to be pushed or the 5 minute timeout.

[0050] If the vehicle's battery holds the charge, then the starting cycle in manual mode is the same as described above for automatic mode. If the battery does not hold the charge or if no battery is present, the system waits until the vehicle's starter motor is engaged. Once the vehicle's starter motor is engaged and the engine is turning over, the system **10** monitors the jump starter current flow. As the engine turns over the jump starter's current increases and decreases with the compression stroke of the engine's pistons. During a piston's compression cycle, the current from the jump starter's batteries **22** increases due to the increased power demand of the starter motor. During a piston's decompression cycle, the current flow decreases due to the decreased power demand of the starter motor. This current increase and decrease is generally sinusoidal which is recognized by the system.

[0051] Once the system has detected three more sinusoidal current flow cycles, the same 20% decrease threshold in current as set forth above for the automatic mode determination, may be used to determine when the vehicle's engine has started **348**. If the engine has started, the "Start Cycle Complete" message is displayed **344** on the LCD **46** and the contact relay opened **346**.

[0052] If the engine has not been started **348**, the system next checks the relay closed time. If the maximum time set for the contact relay to be closed has expired **350**, a "Maximum Starter On" message is displayed **352** on the LCD **46** and the contact relay is opened **346**.

[0053] If the contact relay closed time has not expired, the system checks for a cycle halt flag. Any cycle may be interrupted by the Auto button being pressed by the operator. If the Auto button is pressed **354**, a "Start Cycle Halted" message is displayed **356** on the LCD **46**, and the contact relay opened **346**.

[0054] At the completion of a start cycle the jump starter **10** has opened the contact relay **34** and the message "Start complete" is displayed **46**, and the starting current is displayed for diagnostic assessment of the vehicle's starting system. At this time the voltage of the vehicle **28** is monitored. Normal vehicle charging voltages fall within certain ranges for 12, 18, 24, 30, 36, 42 and 48 volts systems. The jump starter displays the running vehicle's voltage and makes an assessment to determine if the vehicle's generated voltage is actually great enough to charge the vehicle's battery. If the voltage is below a threshold for charging the vehicle's battery, the jump starter displays "Vehicle Not Charging" message and shows the measured voltage. If the vehicle's generated voltage is great enough to charge the vehicle's battery, the jump starter displays "Vehicle Charging" showing a working vehicle charging system and displays the vehicle charging voltage.

[0055] Referring to FIGS. **1** and **2**, a diode **35** may be connected across the contact **34** to charge the capacitors **21** and jump starter batteries **22** from the vehicle charging system **28**. The charging system of the vehicle may be used to charge the capacitors **21** and jump starter batteries **22**. Whenever the vehicle has a working charging system this will occur as long as the cables are connected to the vehicle. This allows the capacitors **21** and jump starter batteries **22** to be fully recharged in about 1 to 5 minutes and can therefore start many vehicles in a row without becoming discharged. Even in situations in which the jump starter batteries **22** may be discharged to an extent that they alone may not be able to provide the necessary power to start a vehicle, the capacitors **21** may be rapidly recharged to start many vehicles in a row. This is very useful when starting fleets of vehicles with dead batteries.

[0056] It is to be understood that while certain forms of this invention have been illustrated and described, it is not limited thereto, except in so far as such limitations are included in the following claims and allowable equivalents thereof.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A method for delivering supplemental power from a portable jump starter to an engine comprising the steps of:

positioning said portable jump starter proximate the engine;

temporarily manually connecting conductive leads from said portable jump starter to the electrical system of the engine;

automatically selecting a voltage output of one or more system batteries housed in said portable jump starter and one or more system capacitors housed in said portable jump starter,

verifying the polarity of the conductive leads;

providing an alert if said polarity is incorrect;

assessing the voltage level of said electrical system;

applying power from said system batteries and said system capacitors to said electrical system;

monitoring the current output of said system batteries and said system capacitors;

measuring one or more voltage levels to determine one or more fault conditions;

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examining the current through a shunt cable; and

electrically disconnecting said conductive leads from said electrical system when the engine starts.

2. The method of claim **1** including determining the temperature of said shunt cable.

3. The method of claim **2** wherein if said temperature reaches a predetermined limit, electrically disconnecting said conductive leads from said electrical system.

4. The method of claim **2** including calculating the resistance of said shunt cable.

5. The method of claim **4** including calibrating said shunt cable.

6. The method of claim **1** wherein said selecting step includes selecting a voltage from the group consisting of 12 volts, 18 volts, 24 volts, 30 volts, 36 volts, 42 volts and 48 volts.

7. The method of claim **6** wherein said voltage is 18 volts or 30 volts.

8. The method of claim **1** wherein said verifying step includes comparing the voltage level of said electrical system to the voltage level of said supplemental battery.

9. The method of claim **1** wherein said assessing step includes charging an engine battery connected to said electrical system if the voltage of said engine battery is below a predetermined level.

10. The method of claim **9** including the step of monitoring a charging voltage of said system batteries and said capacitors.

11. The method of claim **10** wherein when said charging voltage rises to a threshold value and then decreases by a predetermined percentage, charging of said engine battery is complete.

12. The method of claim **1** wherein said assessing step includes comparing the voltage level of said electrical system to a supplement power voltage setting, whereas if the difference between said electrical system voltage and said supplement power voltage setting is greater than a predetermined limit, indicating a fault condition.

13. The method of claim **1** wherein said applying step includes closing a relay.

14. The method of claim **1** wherein said applying step includes recording operational data.

15. The method of claim **1** wherein said applying step includes recording the number of start attempts.

16. The method of claim **13** wherein said applying step includes starting a timer.

17. The method of claim **16** wherein said applying step includes opening said relay upon expiration of said timer.

18. The method of claim **1** wherein said monitoring step includes monitoring the temperature of said system batteries.

19. The method of claim **18** wherein if a temperature limit is reached electrically disconnecting said conductive leads from said electrical system.

20. The method of claim **18** wherein if a temperature limit is reached electrically disconnecting said conductive leads from said electrical system to reduce the risk of fire.

21. The method of claim **1** wherein if said current through said shunt cable exceeds a first limit within a first period, electrically disconnecting said conductive leads from said electrical system.

22. The method of claim **21** wherein if said current through said shunt cable exceeds a second limit within a second period, electrically disconnecting said conductive leads from said electrical system.

23. The method of claim **1** wherein if said current through said shunt cable geometrically increases over a predetermined period, electrically disconnecting said conductive leads from said electrical system.

24. The method of claim **1** wherein said electrically disconnecting step includes opening a relay.

25. The method of claim **1** wherein said electrically disconnecting step includes recharging said system batteries and said system capacitors for a predetermined time before opening a relay to electrically disconnect said conductive leads from said electrical system.

26. A portable jump starter for delivering supplemental power to an engine comprising:

a pair of conductive leads for temporarily connecting the jump starter to an electrical system of the engine;

one or more jump starter batteries;

one or more jump starter capacitors connected in parallel to said one or more jump starter batteries;

a relay connected to said conductive leads;

a shunt cable connecting said jump starter batteries and said jump starter capacitors to said relay; and

a processor for controlling said relay to selectively apply electrical power from said jump starter batteries and said jump starter capacitors to said electrical system of the engine.

27. The jump starter of claim **26** further comprising a voltage sensor for measuring the voltage level of said one or more jump starter batteries and said one or more capacitors.

28. The jump starter of claim **26** further comprising a voltage sensor coupled to said one or more capacitors for detecting an over voltage condition of said one or more capacitors.

29. The jump starter of claim **26** further comprising a reverse voltage sensor for measuring the difference between the voltage level of said one or more jump starter batteries and said one or more capacitors and the voltage level of the electrical system.

30. The jump starter of claim **26** further comprising a relay voltage sensor for measuring the voltage across said relay.

31. The jump starter of claim **26** further comprising a battery temperature sensor for measuring the temperature of said one ore more jump starter batteries.

32. The jump starter of claim **26** further comprising a shunt cable temperature sensor for measuring the temperature of said shunt cable.

33. The jump starter of claim **26** further comprising a sensor for measuring the current through said shunt cable.

34. The jump starter of claim **26** further comprising a sensor for measuring the voltage across said shunt cable.

35. The jump starter of claim **26** further comprising a display coupled to said processor to provide instructions and status information about said jump starter.

36. The jump starter of claim **26** further comprising a plurality of indicators coupled to said processor to provide status information.

37. The jump starter of claim **26** further comprising a keypad coupled to said processor for providing input to said processor and controlling operational access to the jump starter.

38. The jump starter of claim **26** further comprising a thermal switch coupled to said shunt cable and electrically coupled to said relay, whereas if a temperature of said shunt cable exceeds a predetermined limit, said thermal switch

interrupts power to said relay thereby electrically disconnecting said conductive leads from said system batteries.

39. The jump starter of claim **26** further comprising a voltage output selector coupled to said one or more jump starter batteries and said one or more capacitors for selectively providing a voltage output of 12, 18, 24, 30, 36, 42 or 48 volts.

40. The jump starter of claim **26** further comprising a diode connected across said relay to permit charging of said one or more jump starter batteries and said one or more capacitors by said electrical system.

* * * * *

AUSTRALIA
Patents Act

IN THE MATTER of Australian Patent Application No. 2019201559 in the name of The NOCO Company

- and –

Opposition thereto by Brown & Watson International Pty Ltd

ANNEXURE

This is the Annexure marked **CS-5** produced and shown to Cory Seligman at the time of signing his Declaration.

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US 20040130298 A1
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ABSTRACT

A handheld device for jump starting a vehicle engine includes a rechargeable lithium ion battery pack (32) and a microcontroller (1). The lithium ion battery is coupled to a power output port of the device through a power switch circuit (15) actuated by the microcontroller. A vehicle battery isolation sensor (12) connected in circuit with positive and negative polarity outputs detects the presence of a vehicle battery (72) connected between the positive and negative polarity outputs. A reverse polarity sensor (10) connected in circuit with the positive and negative polarity outputs detects the polarity of a vehicle battery connected between the positive and negative polarity outputs, such that the microcontroller will enable power to be delivered from the lithium ion power pack to the output port only when a good battery is connected to the output port and only when the battery is connected with proper polarity of positive and negative terminals.

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PORTABLE VEHICLE BATTERY JUMP START APPARATUS WITH SAFETY PROTECTION

FIELD OF THE INVENTION

[0001] The present invention relates generally to apparatus for jump-starting a vehicle having a depleted or discharged battery.

BACKGROUND TO THE INVENTION

[0002] Prior art devices are known for jump-starting a vehicle, which provide either a pair of electrical connector cables that connect a fully-charged battery of another vehicle to the engine start circuit of the dead battery vehicle, or portable booster devices which include a fully-charged battery which can be connected in circuit with the vehicle's engine starter through a pair of cables.

[0003] Problems with the prior art arose when either the jumper terminals or clamps of the cables were inadvertently brought into contact with each other while the other ends were connected to a charged battery, or when the positive and negative terminals were connected to the opposite polarity terminals in the vehicle to be jumped, thereby causing a short circuit resulting in sparking and potential damage to batteries and/or bodily injury.

[0004] Various attempts to eliminate these problems have been made in the prior art. U.S. Patent No. 6,212,054 issued April 3, 2001, discloses a battery booster pack that is polarity sensitive and can detect proper and improper connections before providing a path for electric current flow. The device uses a set of LEDs connected to optical couplers oriented by a control circuit. The control circuit controls a solenoid assembly controlling the path of power current. The control circuit causes power current to flow through the solenoid assembly only if the points of contact of booster cable clamp connections have been properly made.

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[0005] U.S. Patent No. 6,632,103 issued October 14, 2003, discloses an adaptive booster cable connected with two pairs of clips, wherein the two pairs of clips are respectively attached to two batteries to transmit power from one battery to the other battery. The adaptive booster cable includes a polarity detecting unit connected to each clip, a switching unit and a current detecting unit both provided between the two pairs of clips. After the polarity of each clip is sensed by the polarity detecting unit, the switching unit generates a proper connection between the two batteries. Therefore, the positive and negative terminals of the two batteries are correctly connected based on the detected result of the polarity detecting unit.

[0006] U.S. Patent No. 8,493,021 issued July 23, 2013, discloses apparatus that monitors the voltage of the battery of a vehicle to be jump started and the current delivered by the jump starter batteries to determine if a proper connection has been established and to provide fault monitoring. Only if the proper polarity is detected can the system operate. The voltage is monitored to determine open circuit, disconnected conductive clamps, shunt cable fault, and solenoid fault conditions. The current through the shunt cable is monitored to determine if there is a battery explosion risk, and for excessive current conditions presenting an overheating condition, which may result in fire. The system includes an internal battery to provide the power to the battery of the vehicle to be jump started. Once the vehicle is started, the unit automatically electrically disconnects from the vehicle's battery.

[0007] U.S. Patent No. 5,189,359 issued February 23, 1993, discloses a jumper cable device having two bridge rectifiers for developing a reference voltage, a four-input decoder for determining which terminals are to be connected based on a comparison of the voltage at each of the four terminals to the reference voltage, and a pair of relays for effecting the correct connection depending on the determination of the decoder. No connection will be made unless only one terminal of each battery has a higher voltage than the reference voltage, indicating "positive" terminals, and one has a lower voltage than the reference voltage, indicating "negative" terminals, and that, therefore, the two

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high voltage terminals may be connected and the two lower voltage terminals may be connected. Current flows once the appropriate relay device is closed. The relay device is preferably a MOSFET combined with a series array of photodiodes that develop MOSFET gate-closing potential when the decoder output causes an LED to light.

[0008] U.S. Patent No. 5,795,182 issued August 18, 1998, discloses a polarity independent set of battery jumper cables for jumping a first battery to a second battery. The apparatus includes a relative polarity detector for detecting whether two batteries are configured cross or parallel. A three-position high current capacity crossbar pivot switch is responsive to the relative polarity detector for automatically connecting the plus terminals of the two batteries together and the minus terminals of the two batteries together regardless of whether the configuration detected is cross or parallel, and an undercurrent detector and a delay circuit for returning the device to its ready and unconnected state after the device has been disconnected from one of the batteries. The crossbar pivot switch includes two pairs of contacts, and a pivot arm that pivots about two separate points to ensure full electrical contact between the pairs of contacts. The invention can also be used to produce a battery charger that may be connected to a battery without regard to the polarity of the battery.

[0009] U.S. Patent No. 6,262,492 issued July 17, 2001, discloses a car battery jumper cable for accurately coupling an effective power source to a failed or not charged battery, which includes a relay switching circuit connected to the power source and the battery by two current conductor pairs. First and second voltage polarity recognition circuits are respectively connected to the power source and the battery by a respective voltage conductor pair to recognize the polarity of the power source and the battery. A logic recognition circuit produces a control signal subject to the polarity of the power source and the battery, and a driving circuit controlled by the control signal from the logic recognition circuit drives the relay switching circuit, enabling the two poles of the power source to be accurately coupled to the two poles of the battery.

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[0010] U.S. Patent No. 5,635,817 issued June 3, 1997, discloses a vehicle battery charging device that includes a control housing having cables including a current limiting device to prevent exceeding of a predetermined maximum charging current of about 40 to 60 amps. The control housing includes a polarity detecting device to verify the correct polarity of the connection of the terminals of the two batteries and to electrically disconnect the two batteries if there is an incorrect polarity.

[0011] U.S. Patent No. 8,199,024 issued June 12, 2012, discloses a safety circuit in a low-voltage connecting system that leaves the two low-voltage systems disconnected until it determines that it is safe to make a connection. When the safety circuit determines that no unsafe conditions exist and that it is safe to connect the two low-voltage systems, the safety circuit may connect the two systems by way of a "soft start" that provides a connection between the two systems over a period of time that reduces or prevents inductive voltage spikes on one or more of the low-voltage systems. When one of the low-voltage systems has a completely-discharged battery incorporated into it, a method is used for detection of proper polarity of the connections between the low-voltage systems. The polarity of the discharged battery is determined by passing one or more test currents through it and determining whether a corresponding voltage rise is observed.

[0012] U.S. Patent No. 5,793,185 issued August 11, 1998, discloses a hand-held jump starter having control components and circuits to prevent overcharging and incorrect connection to batteries.

[0013] While the prior art attempted solutions to the abovementioned problems as discussed above, each of the prior art solutions suffers from other shortcomings, either in complexity, cost or potential for malfunction. Accordingly, there exists a need in the art for further improvements to vehicle jump start devices.

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SUMMARY OF THE INVENTION

[0014] In accordance with an aspect of the invention there is provided an apparatus for jump starting a vehicle having a depleted or discharged vehicle battery with positive and negative polarity terminals, the apparatus comprising:

a power supply;

a positive polarity vehicle battery terminal connector;

a negative polarity vehicle battery terminal connector;

a vehicle battery isolation sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the vehicle battery isolation sensor configured to detect a presence of the vehicle battery when connected between the positive and negative polarity vehicle battery terminal connectors;

a reverse polarity sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the reverse polarity sensor configured to detect a polarity of the vehicle battery connected between the positive and negative polarity vehicle battery terminal connectors and to provide an output signal indicating that the positive and negative polarity terminals of the vehicle battery are properly connected to the positive and negative polarity vehicle battery connectors;

a power switch connected between the power supply and the positive and negative polarity vehicle battery terminal connectors; and

a microcontroller configured to receive input signals from the vehicle isolation sensor and the reverse polarity sensor, the microcontroller is configured to provide an activating output signal to turn on the power switch to cause the power supply to be connected to the positive and negative polarity vehicle battery connectors in response to the microcontroller receiving input signals simultaneously from the sensors indicating both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors, and the microcontroller is configured to provide a deactivating output signal to turn off the power switch to cause the power supply to be disconnected from the positive and negative polarity vehicle battery connectors in response to the microcontroller receiving input signals from the sensors indicating the absence of the vehicle battery connected to the positive and negative polarity vehicle

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battery connectors and/or improper polarity connection of the positive and negative polarity terminals of the vehicle battery to the positive and negative polarity vehicle battery connectors.

[0014a] In accordance with another aspect of the invention there is provided an apparatus for jump starting a vehicle having a depleted or discharged vehicle battery with positive and negative polarity terminals, the apparatus comprising:

a power supply;

a positive polarity vehicle battery terminal connector;

a negative polarity vehicle battery terminal connector;

a vehicle battery isolation sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the vehicle battery isolation sensor configured to detect a presence of the vehicle battery when connected between the positive and negative polarity vehicle battery terminal connectors;

a reverse polarity sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the reverse polarity sensor configured to detect a polarity of the vehicle battery connected between the positive and negative polarity vehicle battery terminal connectors and to provide an output signal indicating that the positive and negative polarity terminals of the vehicle battery are properly connected to the positive and negative polarity vehicle battery connectors;

a power switch connected between the power supply and the positive and negative polarity vehicle battery terminal connectors; and

a microcontroller configured to receive input signals from the vehicle isolation sensor and the reverse polarity sensor, the microcontroller configured to control operation of the power switch,

wherein the microcontroller is configured to turn on the power switch when receiving input signals from the vehicle isolation sensor and reverse polarity sensor indicating both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors, and

wherein the microcontroller is configured to turn off the power switch when receiving input signals from the sensors indicating the absence of the vehicle battery

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connected to the positive and negative polarity vehicle battery connectors and/or improper polarity connection of the positive and negative polarity terminals of the vehicle battery to the positive and negative polarity vehicle battery connectors.

[0014b] In accordance with a further aspect of the invention there is provided an apparatus for jump starting a vehicle having a depleted or discharged vehicle battery with positive and negative polarity terminals, the apparatus comprising:

a power supply;

a positive polarity vehicle battery terminal connector;

a negative polarity vehicle battery terminal connector;

a vehicle battery isolation sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the vehicle battery isolation sensor configured to detect a presence of the vehicle battery when connected between the positive and negative polarity vehicle battery terminal connectors;

a reverse polarity sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the reverse polarity sensor configured to detect a polarity of the vehicle battery connected between the positive and negative polarity vehicle battery terminal connectors and to provide an output signal indicating that the positive and negative polarity terminals of the vehicle battery are properly connected to the positive and negative polarity vehicle battery connectors;

a power switch connected between the power supply and the positive and negative polarity vehicle battery terminal connectors; and

a microcontroller configured to receive input signals from the vehicle isolation sensor and the reverse polarity sensor, the microcontroller is configured to turn on the power switch to cause the power supply to be connected to the positive and negative polarity vehicle battery connectors in response to the microcontroller receiving input signals simultaneously from the sensors indicating both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors, and the microcontroller is configured to turn off the power switch to prevent the power supply from being connected to the positive and negative polarity vehicle battery connectors in response to the microcontroller not receiving the input signals simultaneously from the

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sensors indicating both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors.

[0014c] Also described herein is an apparatus for jump starting a vehicle engine, comprising: an internal power supply; an output port having positive and negative polarity outputs; a vehicle battery isolation sensor connected in circuit with said positive and negative polarity outputs, configured to detect presence of a vehicle battery connected between said positive and negative polarity outputs; a reverse polarity sensor connected in circuit with said positive and negative polarity outputs, configured to detect polarity of a vehicle battery connected between said positive and negative polarity outputs and to provide an output signal indicating whether positive and negative terminals of said vehicle battery are properly connected with said positive and negative polarity outputs of said output port; a power switch connected between said internal power supply and said output port; and a microcontroller configured to receive input signals from said vehicle isolation sensor and said reverse polarity sensor, and to provide an output signal to said power switch, such that said power switch is turned on to cause said internal power supply to be connected to said output port in response to signals from said sensors indicating the presence of a vehicle battery at said output port and proper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs, and is not turned on when signals from said sensors indicate either the absence of a vehicle battery at said output port or improper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs.

[0015] In accordance with an embodiment of the invention, the internal power supply is a rechargeable lithium ion battery pack.

[0016] A jumper cable device may also be provided, having a plug configured to plug into said output port; a pair of cables integrated with the plug at one respective end thereof; said pair of cables being configured to be separately connected to terminals of a battery at another respective end thereof.

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[0017] Comprises/comprising and grammatical variations thereof when used in this specification are to be taken to specify the presence of stated features, integers, steps or components or groups thereof, but do not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] Fig. 1 is a functional block diagram of a handheld vehicle battery boost apparatus in accordance with one aspect of the present invention;

[0019] Figs. 2A – 2C are schematic circuit diagrams of an example embodiment of a handheld vehicle battery boost apparatus in accordance with an aspect of the invention;

[0020] Fig. 3 is a perspective view of a handheld jump starter booster device in accordance with one example embodiment of the invention; and

[0021] Fig. 4 is a plan view of a jumper cable usable with the handheld jump starter booster device in accordance with another aspect of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0022] FIG. 1 is a functional block diagram of a handheld battery booster according to one aspect of the invention. At the heart of the handheld battery booster is a lithium polymer battery pack 32, which stores sufficient energy to jump start a vehicle engine served by a conventional 12 volt lead-acid or valve regulated lead-acid battery. In one example embodiment, a high-surge lithium polymer battery pack includes three 3.7V, 2666 mAh lithium polymer batteries in a 3S1P configuration. The resulting battery pack provides 11.1V, 2666Ah (8000Ah at 3.7V, 29.6Wh). Continuous discharge current is 25C (or 200 amps), and burst discharge current is 50C (or 400 amps). The maximum charging current of the battery pack is 8000mA (8 amps).

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[0023] A programmable microcontroller unit (MCU) 1 receives various inputs and produces informational as well as control outputs. The programmable MCU 1 further provides flexibility to the system by allowing updates in functionality and system parameters, without requiring any change in hardware. According to one example embodiment, an 8 bit microcontroller with 2K x 15 bits of flash memory is used to control the system. One such microcontroller is the HT67F30, which is commercially available from Holtek Semiconductor Inc.

[0024] A car battery reverse sensor 10 monitors the polarity of the vehicle battery 72 when the handheld battery booster device is connected to the vehicle's electric system. As explained below, the booster device prevents the lithium battery pack from being connected to the vehicle battery 72 when the terminals of the battery 72 are connected to the wrong terminals of the booster device. A car battery isolation sensor 12 detects whether or not a vehicle battery 72 is connected to the booster device, and prevents the lithium battery pack from being connected to the output terminals of the booster device unless there is a good (e.g. chargeable) battery connected to the output terminals.

[0025] A smart switch FET circuit 15 electrically switches the handheld battery booster lithium battery to the vehicle's electric system only when the vehicle battery is determined by the MCU 1 to be present (in response to a detection signal provided by isolation sensor 12) and connected with the correct polarity (in response to a detection signal provided by reverse sensor 10). A lithium battery temperature sensor 20 monitors the temperature of the lithium battery pack 32 to detect overheating due to high ambient temperature conditions and overextended current draw during jump starting. A lithium battery voltage measurement circuit 24 monitors the voltage of the lithium battery pack 32 to prevent the voltage potential from rising too high during a charging operation and from dropping too low during a discharge operation.

[0026] Lithium battery back-charge protection diodes 28 prevent any charge current being delivered to the vehicle battery 72 from flowing back to the lithium battery pack 32 from the vehicle's electrical system. Flashlight LED circuit 36 is

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provided to furnish a flashlight function for enhancing light under a vehicle's hood in dark conditions, as well as providing SOS and strobe lighting functions for safety purposes when a vehicle may be disabled in a potentially dangerous location. Voltage regulator 42 provides regulation of internal operating voltage for the microcontroller and sensors. On/Off manual mode and flashlight switches 46 allow the user to control power-on for the handheld battery booster device, to control manual override operation if the vehicle has no battery, and to control the flashlight function. The manual button functions only when the booster device is powered on. This button allows the user to jump-start vehicles that have either a missing battery, or the battery voltage is so low that automatic detection by the MCU is not possible. When the user presses and holds the manual override button for a predetermined period time (such as three seconds) to prevent inadvertent actuation of the manual mode, the internal lithium ion battery power is switched to the vehicle battery connect port. The only exception to the manual override is if the car battery is connected in reverse. If the car battery is connected in reverse, the internal lithium battery power shall never be switched to the vehicle battery connect port.

[0027] USB charge circuit 52 converts power from any USB charger power source, to charge voltage and current for charging the lithium battery pack 32. USB output 56 provides a USB portable charger for charging smartphones, tablets, and other rechargeable electronic devices. Operation indicator LEDs 60 provide visual indication of lithium battery capacity status as well as an indication of smart switch activation status (indicating that power is being provided to the vehicle's electrical system).

[0028] Detailed operation of the handheld booster device will now be described with reference to the schematic diagrams of Figs. 2A-2C. As shown in Fig. 2A, the microcontroller unit 1 is the center of all inputs and outputs. The reverse battery sensor 10 comprises an optically coupled isolator phototransistor (4N27) connected to the terminals of vehicle battery 72 at input pins 1 and 2 with a diode D8 in the lead conductor of pin 1 (associated with the negative terminal CB-), such that if the battery 72 is connected to the terminals of the booster

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device with the correct polarity, the optocoupler LED 11 will not conduct current, and is therefore turned off, providing a "1" or high output signal to the MCU 1. The car battery isolation sensor 12 comprises an optically coupled isolator phototransistor (4N27) connected to the terminals of vehicle battery 72 at input pins 1 and 2 with a diode D7 in the lead conductor of pin 1 (associated with the positive terminal CB+), such that if the battery 72 is connected to the terminals of the booster device with the correct polarity, the optocoupler LED 11A will conduct current, and is therefore turned on, providing a "0" or low output signal to the MCU, indicating the presence of a battery across the jumper output terminals of the handheld booster device.

[0029] If the car battery 72 is connected to the handheld booster device with reverse polarity, the optocoupler LED 11 of the reverse sensor 10 will conduct current, providing a "0" or low signal to microcontroller unit 1. Further, if no battery is connected to the handheld booster device, the optocoupler LED 11A of the isolation sensor 12 will not conduct current, and is therefore turned off, providing a "1" or high output signal to the MCU, indicating the absence of any battery connected to the handheld booster device. Using these specific inputs, the microcontroller software of MCU 1 can determine when it is safe to turn on the smart switch FET 15, thereby connecting the lithium battery pack to the jumper terminals of the booster device. Consequently, if the car battery 72 either is not connected to the booster device at all, or is connected with reverse polarity, the MCU 1 can keep the smart switch FET 15 from being turned on, thus prevent sparking/short circuiting of the lithium battery pack.

[0030] As shown in Fig. 2B, the FET smart switch 15 is driven by an output of the microcontroller 1. The FET smart switch 15 includes three FETs (Q15, Q18, and Q19) in parallel, which spreads the distribution of power from the lithium battery pack over the FETs. When that microcontroller output is driven to a logic low, FETs 16 are all in a high resistance state, therefore not allowing current to flow from the internal lithium battery negative contact 17 to the car battery 72 negative contact. When the microcontroller output is driven to a logic high, the FETs 16 (Q15, Q18, and Q19) are in a low resistant state, allowing current to flow

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freely from the internal lithium battery pack negative contact 17 (LB-) to the car battery 72 negative contact (CB-). In this way, the microcontroller software controls the connection of the internal lithium battery pack 32 to the vehicle battery 72 for jumpstarting the car engine.

[0031] Referring back to Fig. 2A, the internal lithium battery pack voltage can be accurately measured using circuit 24 and one of the analog-to-digital inputs of the microcontroller 1. Circuit 24 is designed to sense when the main 3.3V regulator 42 voltage is on, and to turn on transistor 23 when the voltage of regulator 42 is on. When transistor 23 is conducting, it turns on FET 22, thereby providing positive contact (LB+) of the internal lithium battery a conductive path to voltage divider 21 allowing a lower voltage range to be brought to the microcontroller to be read. Using this input, the microcontroller software can determine if the lithium battery voltage is too low during discharge operation or too high during charge operation, and take appropriate action to prevent damage to electronic components.

[0032] Still referring to Fig. 2A, the temperature of the internal lithium battery pack 32 can be accurately measured by two negative temperature coefficient (NTC) devices 20. These are devices that reduce their resistance when their temperature rises. The circuit is a voltage divider that brings the result to two analog-to-digital (A/D) inputs on the microcontroller 1. The microcontroller software can then determine when the internal lithium battery is too hot to allow jumpstarting, adding safety to the design.

[0033] The main voltage regulator circuit 42 is designed to convert internal lithium battery voltage to a regulated 3.3 volts that is utilized by the microcontroller 1 as well as by other components of the booster device for internal operating power. Three lithium battery back charge protection diodes 28 (see Fig. 2B) are in place to allow current to flow only from the internal lithium battery pack 32 to the car battery 72, and not from the car battery to the internal lithium battery. In this way, if the car electrical system is charging from its alternator, it

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cannot back-charge (and thereby damage) the internal lithium battery, providing another level of safety.

[0034] The main power on switch 46 (Fig. 2A) is a combination that allows for double pole, double throw operation so that with one push, the product can be turned on if it is in the off state, or turned off if it is in the on state. This circuit also uses a microcontroller output 47 to "keep alive" the power when it is activated by the on switch. When the switch is pressed the microcontroller turns this output to a high logic level to keep power on when the switch is released. In this way, the microcontroller maintains control of when the power is turned off when the on/off switch is activated again or when the lithium battery voltage is getting too low. The microcontroller software also includes a timer that turns the power off after a predefined period of time, (such as, e.g. 8 hours) if not used.

[0035] The flashlight LED circuit 45 shown in Fig. 2B controls the operation of flashlight LEDs. Two outputs from the microcontroller 1 are dedicated to two separate LEDs. Thus, the LEDs can be independently software-controlled for strobe and SOS patterns, providing yet another safety feature to the booster device. LED indicators provide the feedback the operator needs to understand what is happening with the product. Four separate LEDs 61 (Fig. 2A) are controlled by corresponding individual outputs of microcontroller 1 to provide indication of the remaining capacity of the internal lithium battery. These LEDs are controlled in a "fuel gauge" type format with 25%, 50%, 75% and 100% (red, red, yellow, green) capacity indications. An LED indicator 63 (Fig. 2B) provides a visual warning to the user when the vehicle battery 72 has been connected in reverse polarity. "Boost" and on/off LEDs 62 provide visual indications when the booster device is provide jump-start power, and when the booster device is turned on, respectively.

[0036] A USB output 56 circuit (Fig. 2C) is included to provide a USB output for charging portable electronic devices such as smartphones from the internal lithium battery pack 32. Control circuit 57 from the microcontroller 1 allows the USB Out 56 to be turned on and off by software control to prevent the internal

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lithium battery getting too low in capacity. The USB output is brought to the outside of the device on a standard USB connector 58, which includes the standard voltage divider required for enabling charge to certain smartphones that require it.

[0037] The USB charge circuit 52 allows the internal lithium battery pack 32 to be charged using a standard USB charger. This charge input uses a standard micro-USB connector 48 allowing standard cables to be used. The 5V potential provided from standard USB chargers is up-converted to the 12.4VDC voltage required for charging the internal lithium battery pack using a DC-DC converter 49. The DC-DC converter 49 can be turned on and off via circuit 53 by an output from the microcontroller 1.

[0038] In this way, the microcontroller software can turn the charge off if the battery voltage is measured to be too high by the A/D input 22. Additional safety is provided for helping to eliminate overcharge to the internal lithium battery using a lithium battery charge controller 50 that provides charge balance to the internal lithium battery cells 51. This controller also provides safety redundancy for eliminating over discharge of the internal lithium battery.

[0039] Fig. 3 is a perspective view of a handheld device 300 in accordance with an exemplary embodiment of the invention. 301 is a power on switch. 302 shows the LED "fuel gauge" indicators 61. 303 shows a 12 volt output port connectable to a cable device 400, described further below. 304 shows a flashlight control switch for activating flashlight LEDs 45. 305 is a USB input port for charging the internal lithium battery, and 306 is a USB output port for providing charge from the lithium battery to other portable devices such as smartphones, tablets, music players, etc. 307 is a "boost on" indicator showing that power is being provided to the 12V output port. 308 is a "reverse" indicator showing that the vehicle battery is improperly connected with respect to polarity. 309 is a "power on" indicator showing that the device is powered up for operation.

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[0040] Fig. 4 shows a jumper cable device 400 specifically designed for use with the handheld device 300. Device 400 has a plug 401 configured to plug into 12 volt output port 303 of the handheld device 300. A pair of cables 402a and 402b are integrated with the plug 401, and are respectively connected to battery terminal clamps 403a and 403b via ring terminals 404a and 404b. The port 303 and plug 401 may be dimensioned so that the plug 401 will only fit into the port 303 in a specific orientation, thus ensuring that clamp 403a will correspond to positive polarity, and clamp 403b will correspond to negative polarity, as indicated thereon. Additionally, the ring terminals 404a and 404b may be disconnected from the clamps and connected directly to the terminals of a vehicle battery. This feature may be useful, for example, to permanently attach the cables 302a-302b to the battery of a vehicle. In the event that the battery voltage becomes depleted, the handheld booster device 300 could be properly connected to the battery very simply by plugging in the plug 401 to the port 303.

[0041] The invention having been thus described, it will be apparent to those skilled in the art that the same may be varied in many ways without departing from the spirit or scope of the invention. Any and all such variations are intended to be encompassed within the scope of the following claims.

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CLAIMS:

1. An apparatus for jump starting a vehicle having a depleted or discharged vehicle battery with positive and negative polarity terminals, the apparatus comprising:

a power supply;

a positive polarity vehicle battery terminal connector;

a negative polarity vehicle battery terminal connector;

a vehicle battery isolation sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the vehicle battery isolation sensor configured to detect a presence of the vehicle battery when connected between the positive and negative polarity vehicle battery terminal connectors;

a reverse polarity sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the reverse polarity sensor configured to detect a polarity of the vehicle battery connected between the positive and negative polarity vehicle battery terminal connectors and to provide an output signal indicating that the positive and negative polarity terminals of the vehicle battery are properly connected to the positive and negative polarity vehicle battery connectors;

a power switch connected between the power supply and the positive and negative polarity vehicle battery terminal connectors; and

a microcontroller configured to receive input signals from the vehicle isolation sensor and the reverse polarity sensor, the microcontroller is configured to provide an activating output signal to turn on the power switch to cause the power supply to be connected to the positive and negative polarity vehicle battery connectors in response to the microcontroller receiving input signals simultaneously from the sensors indicating both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors, and the microcontroller is configured to provide a deactivating output signal to turn off the power switch to cause the power supply to be disconnected

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from the positive and negative polarity vehicle battery connectors in response to the microcontroller receiving input signals from the sensors indicating the absence of the vehicle battery connected to the positive and negative polarity vehicle battery connectors and/or improper polarity connection of the positive and negative polarity terminals of the vehicle battery to the positive and negative polarity vehicle battery connectors.

2. An apparatus for jump starting a vehicle having a depleted or discharged vehicle battery with positive and negative polarity terminals, the apparatus comprising:

a power supply;

a positive polarity vehicle battery terminal connector;

a negative polarity vehicle battery terminal connector;

a vehicle battery isolation sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the vehicle battery isolation sensor configured to detect a presence of the vehicle battery when connected between the positive and negative polarity vehicle battery terminal connectors;

a reverse polarity sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the reverse polarity sensor configured to detect a polarity of the vehicle battery connected between the positive and negative polarity vehicle battery terminal connectors and to provide an output signal indicating that the positive and negative polarity terminals of the vehicle battery are properly connected to the positive and negative polarity vehicle battery connectors;

a power switch connected between the power supply and the positive and negative polarity vehicle battery terminal connectors; and

a microcontroller configured to receive input signals from the vehicle isolation sensor and the reverse polarity sensor, the microcontroller configured to control operation of the power switch,

wherein the microcontroller is configured to turn on the power switch when receiving input signals from the vehicle isolation sensor and reverse polarity sensor indicating both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity

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connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors, and

wherein the microcontroller is configured to turn off the power switch when receiving input signals from the sensors indicating the absence of the vehicle battery connected to the positive and negative polarity vehicle battery connectors and/or improper polarity connection of the positive and negative polarity terminals of the vehicle battery to the positive and negative polarity vehicle battery connectors.

3. An apparatus for jump starting a vehicle having a depleted or discharged vehicle battery with positive and negative polarity terminals, the apparatus comprising:

a power supply;

a positive polarity vehicle battery terminal connector;

a negative polarity vehicle battery terminal connector;

a vehicle battery isolation sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the vehicle battery isolation sensor configured to detect a presence of the vehicle battery when connected between the positive and negative polarity vehicle battery terminal connectors;

a reverse polarity sensor connected in circuit with the positive and negative polarity vehicle battery terminal connectors, the reverse polarity sensor configured to detect a polarity of the vehicle battery connected between the positive and negative polarity vehicle battery terminal connectors and to provide an output signal indicating that the positive and negative polarity terminals of the vehicle battery are properly connected to the positive and negative polarity vehicle battery connectors;

a power switch connected between the power supply and the positive and negative polarity vehicle battery terminal connectors; and

a microcontroller configured to receive input signals from the vehicle isolation sensor and the reverse polarity sensor, the microcontroller is configured to turn on the power switch to cause the power supply to be connected to the positive and negative polarity vehicle battery connectors in response to the microcontroller receiving input signals simultaneously from the sensors indicating

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both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors, and the microcontroller is configured to turn off the power switch to prevent the power supply from being connected to the positive and negative polarity vehicle battery connectors in response to the microcontroller not receiving the input signals simultaneously from the sensors indicating both the presence and connection of the vehicle battery to the positive and negative polarity vehicle battery connectors and proper polarity connection of the positive and negative polarity terminals of the vehicle battery with the positive and negative polarity battery terminal connectors.

4. The apparatus according to claim 1, 2 or 3, wherein the vehicle battery isolation sensor is a separate isolation sensor configured to detect the presence of the vehicle battery connected to the positive and negative polarity vehicle battery connectors.

5. The apparatus according to claim 1, 2 or 3, wherein the vehicle battery isolation sensor detects presence or absence of the vehicle battery prior to any initial connection and is not reliant upon any pre-established connection or operation of the circuit with the positive and negative polarity battery terminal connectors.

6. The apparatus according to claim 1, 2 or 3, wherein the positive and negative polarity vehicle battery terminal connectors comprise a positive polarity battery clamp and a negative polarity battery clamp.

7. The apparatus according to claim 1, 2 or 3, wherein the positive and negative polarity vehicle battery terminal connectors comprise a positive polarity battery clamp connected to a positive polarity battery cable and a negative polarity battery clamp connected to a negative polarity battery cable.

8. The apparatus according to claim 1, 2 or 3, further comprising an output port having positive and negative polarity outputs, the output port being

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configured to connect with a single removable plug, the single plug being connected to the positive and negative polarity cables.

9. The apparatus according to claim 1, 2 or 3, wherein the power supply comprises a lithium ion battery.

10. The apparatus of claim 9, wherein the lithium ion battery comprises a battery pack of multiple lithium ion batteries.

11. The apparatus of claim 1, 2 or 3, wherein the power switch comprises a plurality of FETs in parallel.

12. The apparatus of claim 1, 2 or 3, wherein the vehicle isolation sensor and reverse polarity sensor comprise optically coupled isolator phototransistors.

13. The apparatus of claim 1, 2 or 3, further comprising a plurality of power diodes coupled between the positive and negative polarity vehicle battery terminal connectors and the power supply to prevent back-charging of the power supply from an electrical system connected to the positive and negative polarity vehicle battery terminal connectors.

14. The apparatus of claim 1, 2 or 3, further comprising a temperature sensor configured to detect temperature of the power supply and to provide a temperature signal to the microcontroller.

15. The apparatus of claim 1, 2 or 3, further comprising a voltage measurement circuit configured to measure output voltage of the power supply and to provide a voltage measurement signal to the microcontroller.

16. The apparatus of claim 1, 2 or 3, further comprising a voltage regulator configured to convert output voltage of the power supply to a voltage level appropriate to provide operating power to electrical components of the apparatus.

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17. The apparatus of claim 1, 2 or 3, further comprising a USB output port configured to provide charging power from the power supply to a USB-chargeable device.

18. The apparatus of claim 1, 2 or 3, further comprising a USB charging port configured to provide charging power from an external power source to the power supply.

19. The apparatus of claim 1, 2 or 3, further comprising a flashlight circuit configured to provide a source of light to a user.

20. The apparatus of claim 19, wherein the source of light is at least one LED.

21. The apparatus of claim 19, wherein the microcontroller is configured to control the at least one LED to provide a visual alarm indicating an emergency situation.

22. The apparatus of claim 1, 2 or 3, further comprising a plurality of visual indicators configured to display remaining capacity status of the power supply.

23. The apparatus of claim 22, wherein said plurality of visual indicators comprises a plurality of LEDs providing output light of different colors.

24. The apparatus of claim 1, 2 or 3, further comprising a visual indicator configured to warn a user when a vehicle battery is connected with reverse polarity.

25. The apparatus of claim 1, 2 or 3, further comprising separate visual indicators configured to display the power on status of the apparatus, and the jump start boost power status of power supplied to the positive and negative polarity vehicle battery terminal connectors

26. The apparatus of claim 1, 2 or 3, further comprising a manual override switch configured to activate a manual override mode to enable a user to connect

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jump start power to charge the vehicle battery when the vehicle battery isolation sensor is unable to detect presence of the vehicle battery.

27. The apparatus of claim 26, wherein said microcontroller is configured to detect actuation of the manual override switch for at least a predetermined period of time before activation of the manual override mode.

28. The apparatus of claim 1, 2 or 3, further comprising a jumper cable device including a plug configured to plug into an output port of the apparatus, a pair of battery cables integrated with the plug at one respective end thereof and being configured to be connected to terminals of the vehicle battery at another respective end thereof.

29. The apparatus of claim 28, wherein the jumper cable device further comprises a pair of ring terminals configured to respectively connect the pair of battery cables at another end thereof with either the positive and negative polarity vehicle battery terminals or the positive or negative polarity battery clamps.

30. The apparatus of claim 28, wherein the output port and the plug are dimensioned so that the plug will fit into the output port only in one specific orientation.

THE NOCO COMPANY

WATERMARK PATENT AND TRADE MARKS ATTORNEYS

P41255AU02

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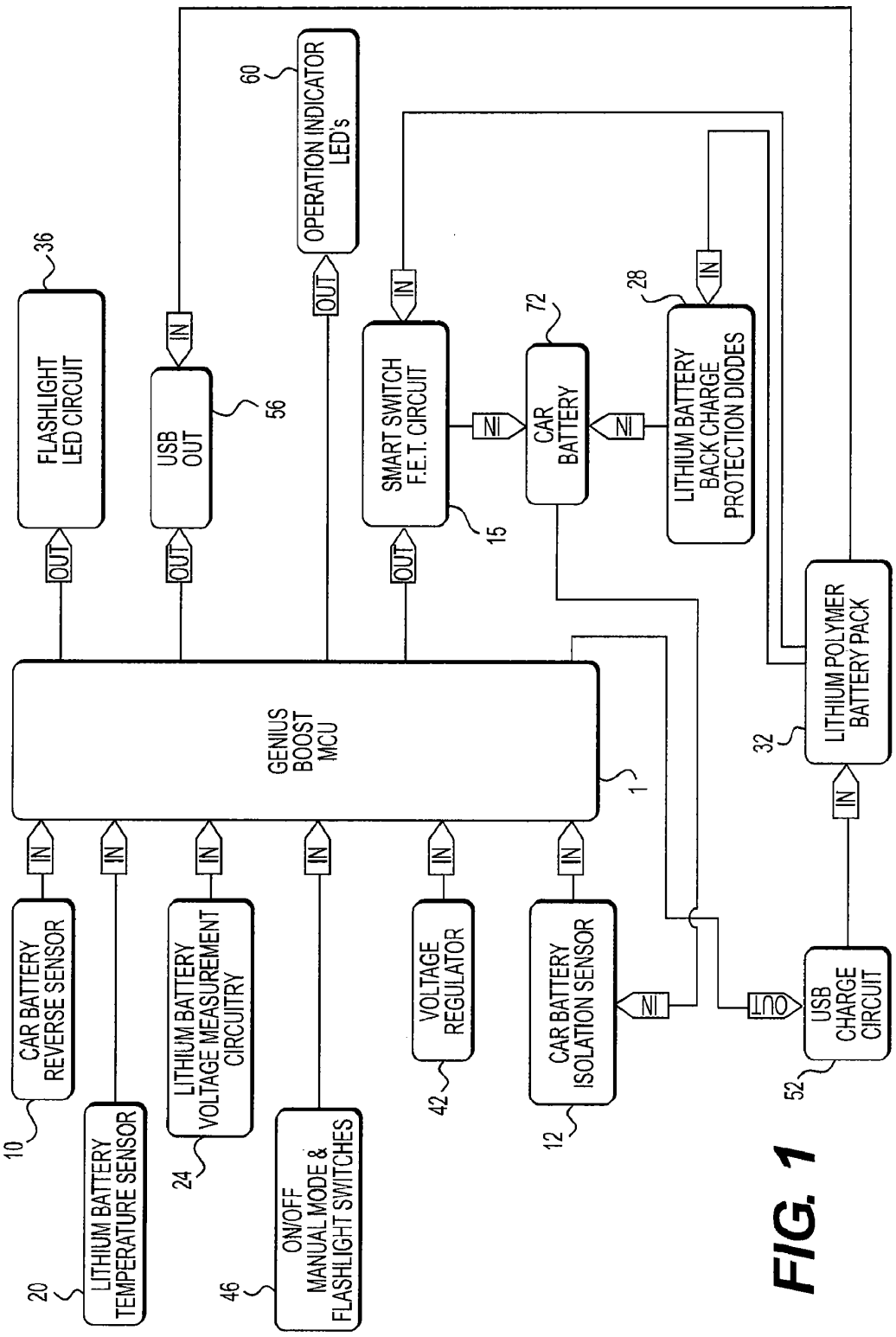


FIG. 1

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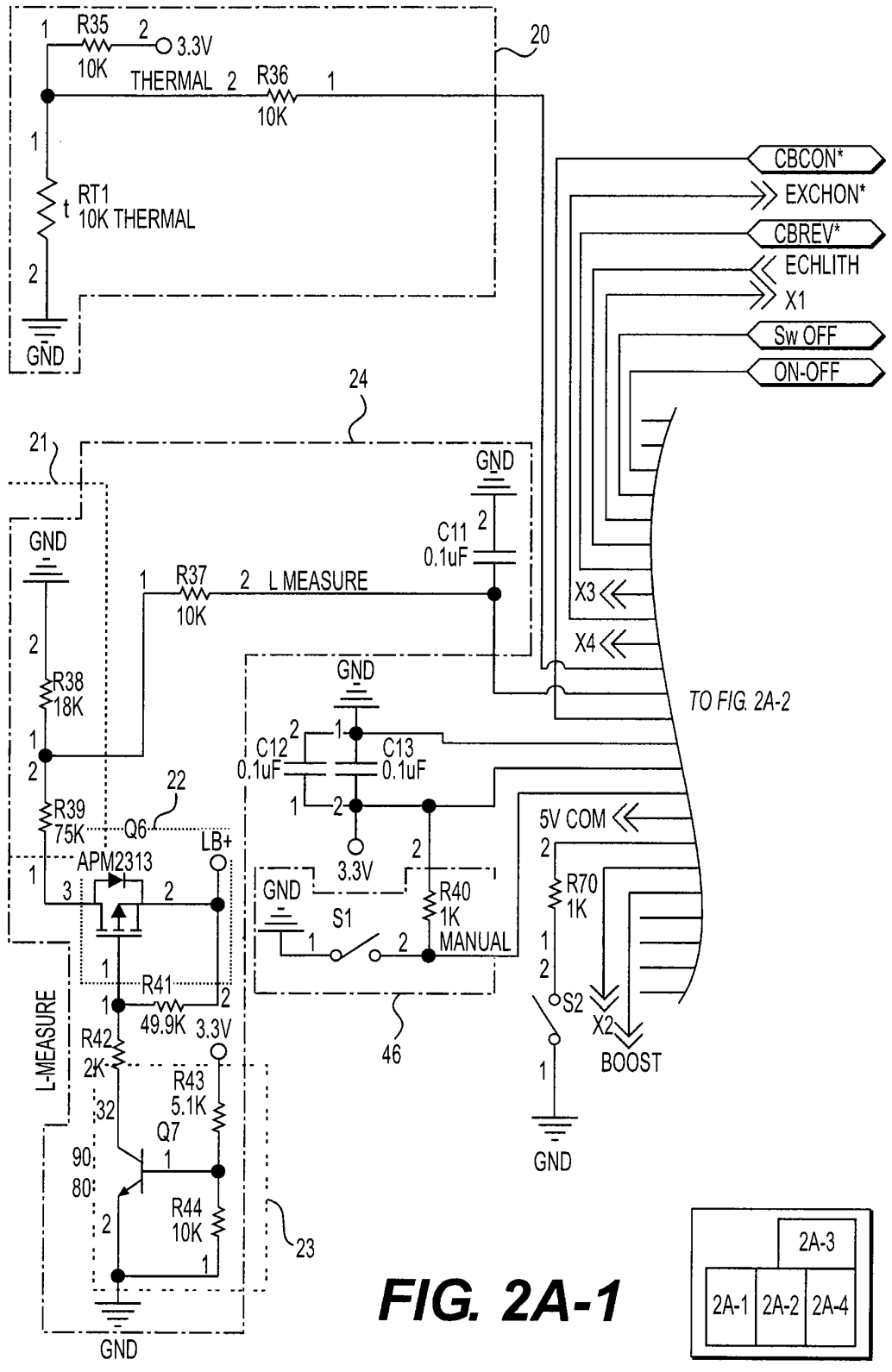
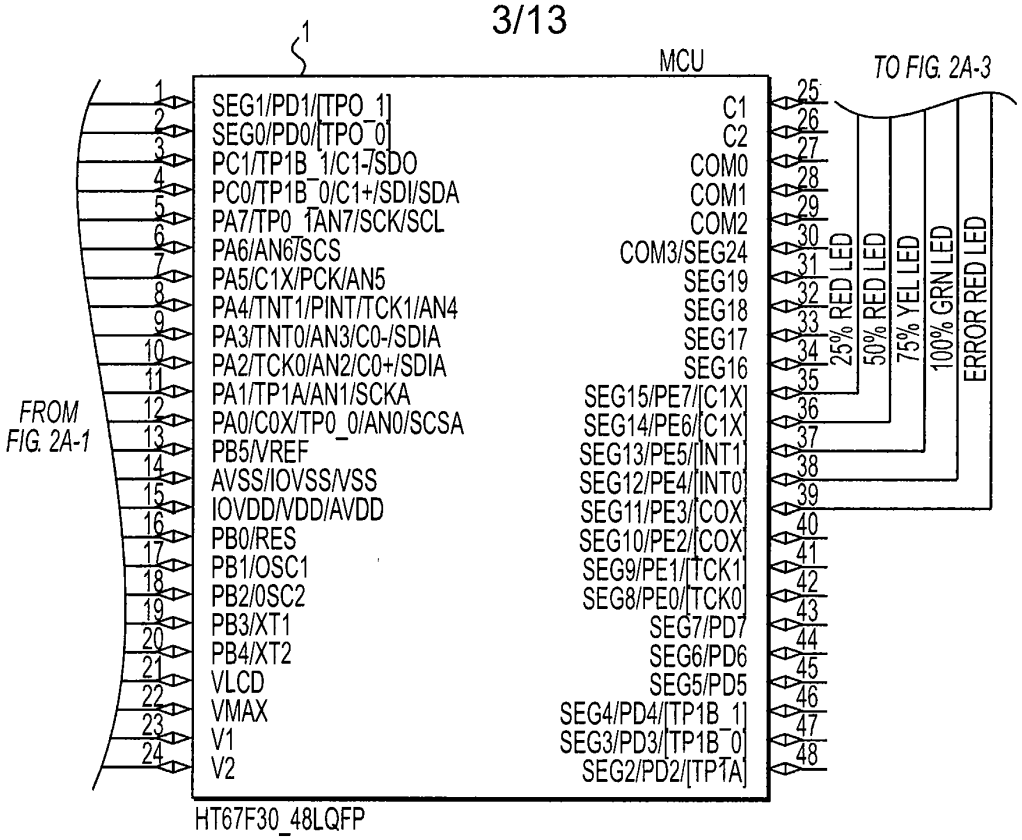


FIG. 2A-1

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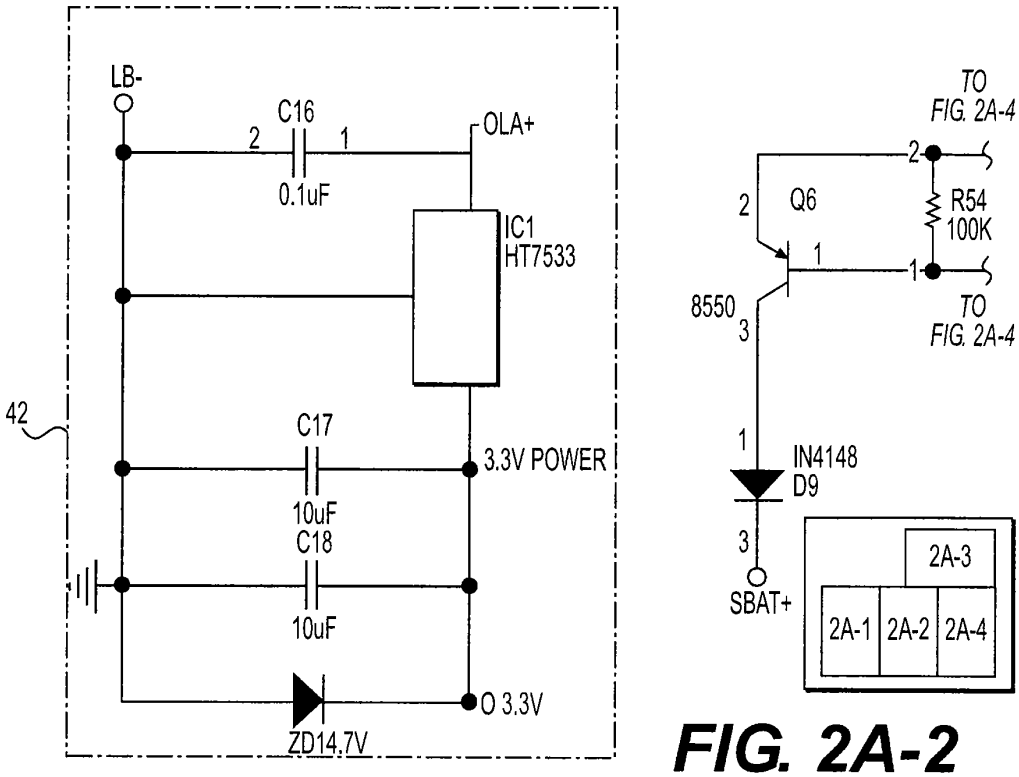


FIG. 2A-2

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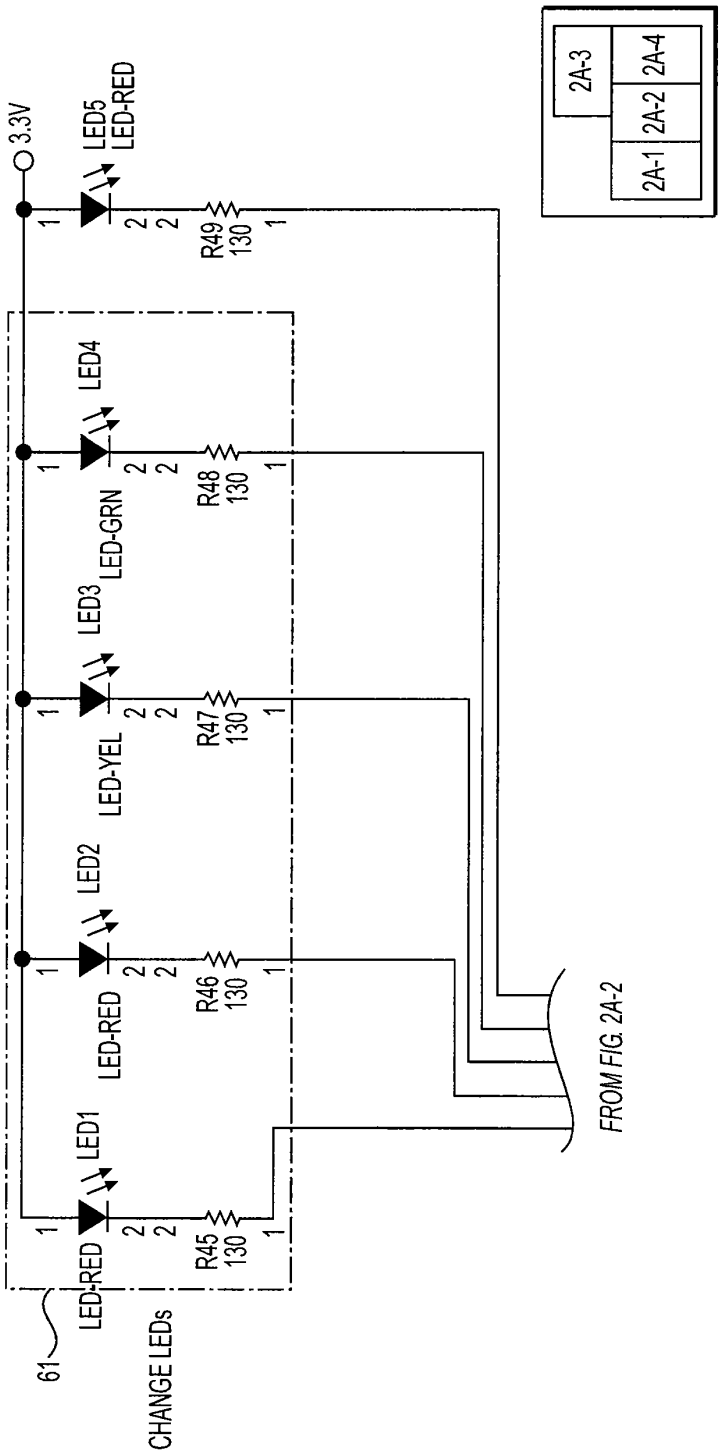


FIG. 2A-3

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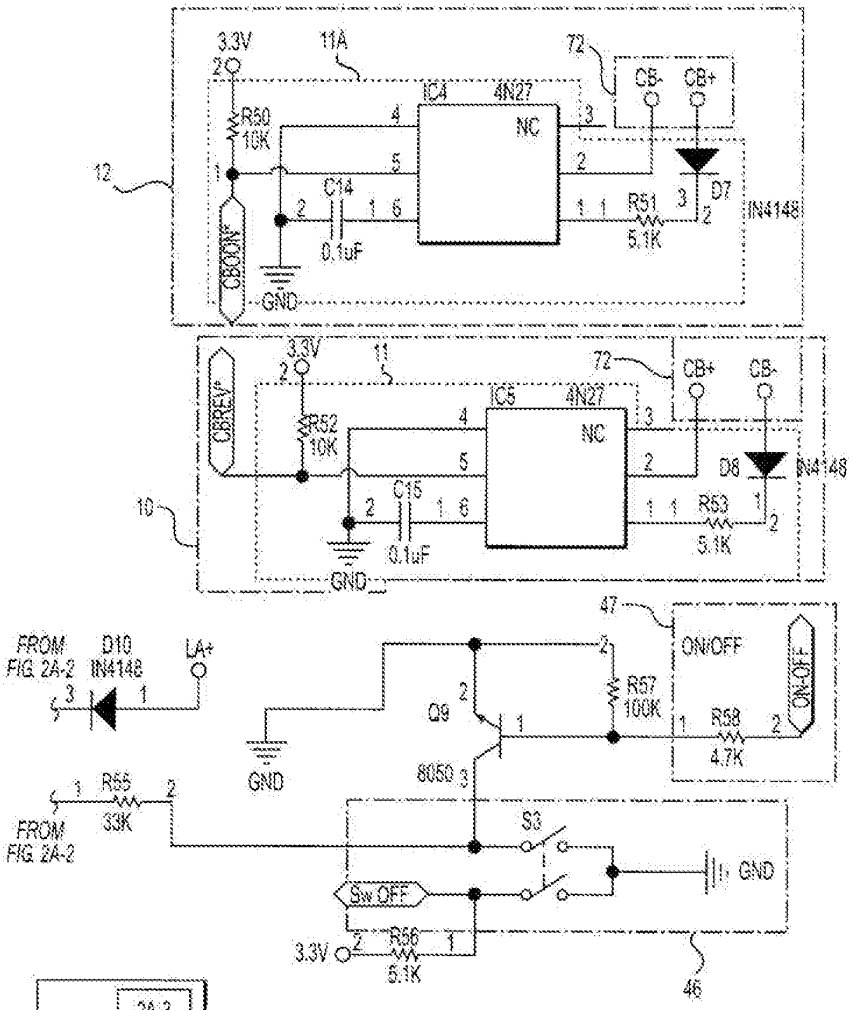


FIG. 2A-4

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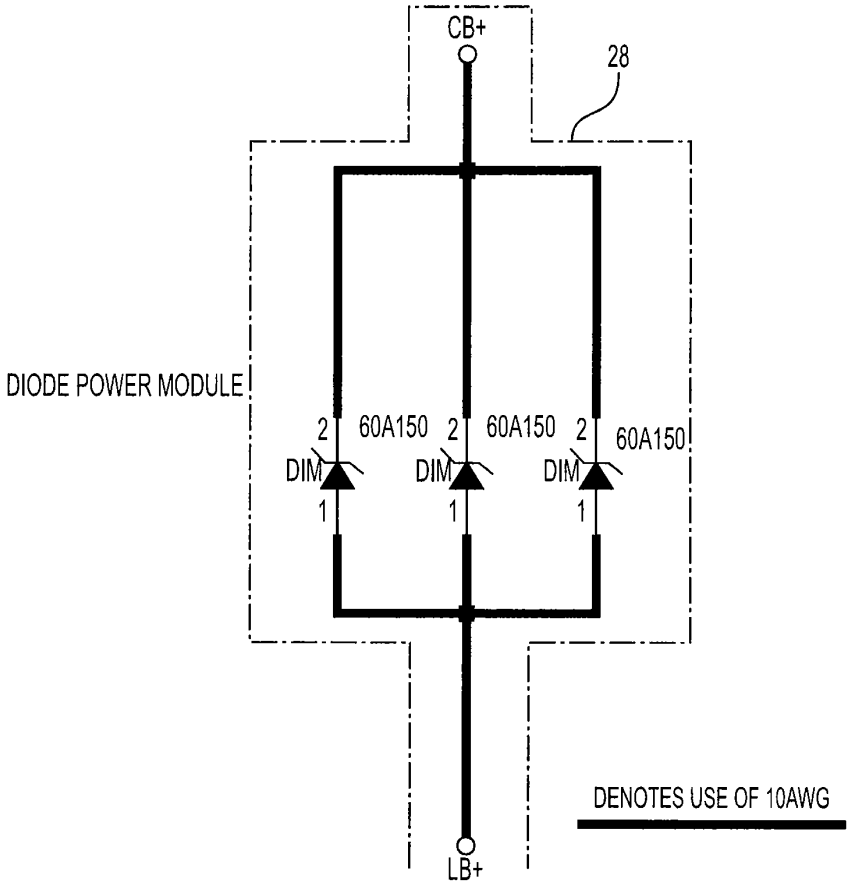
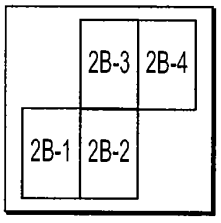


FIG. 2B-1



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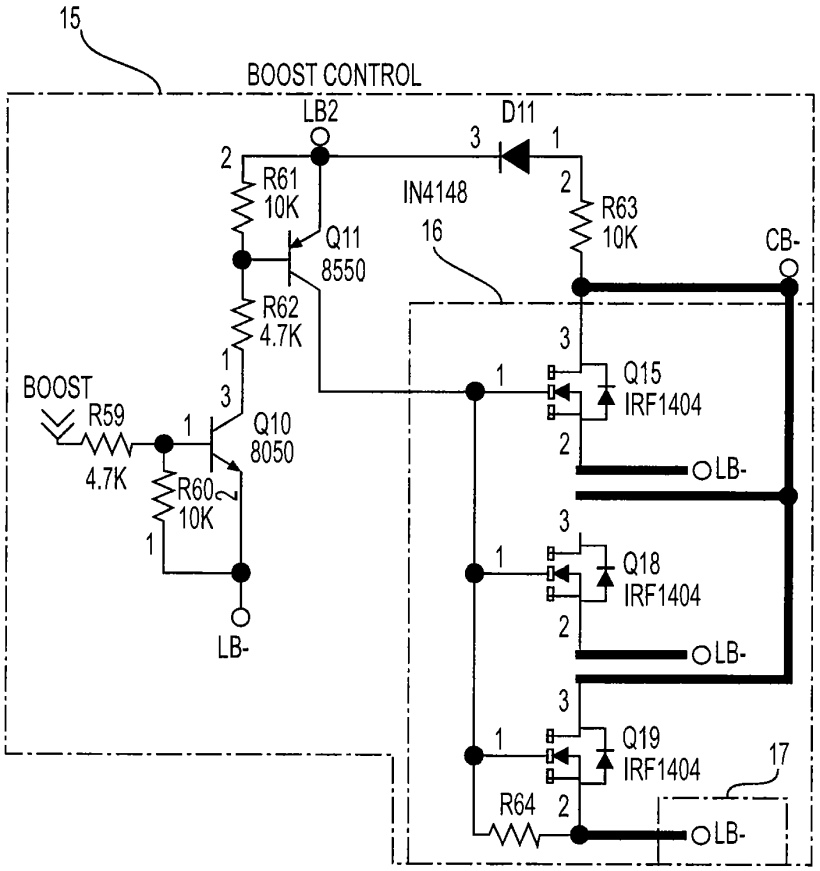
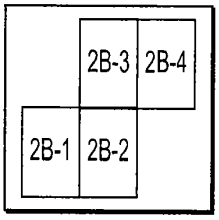


FIG. 2B-2



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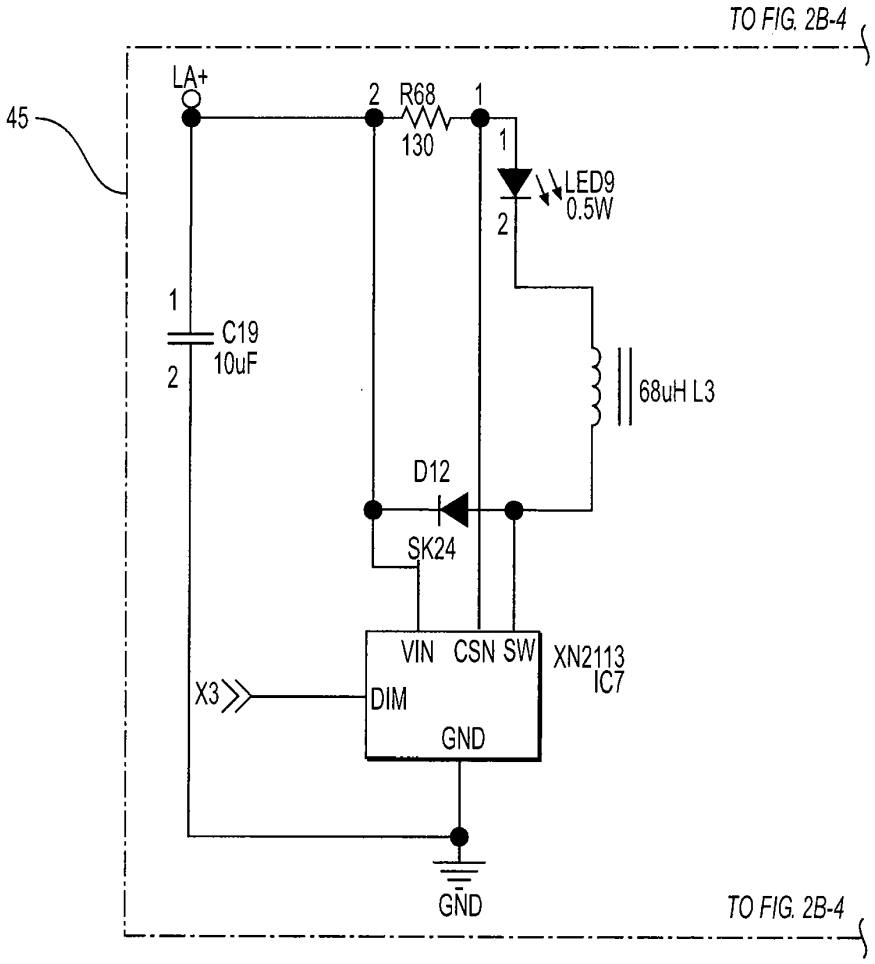
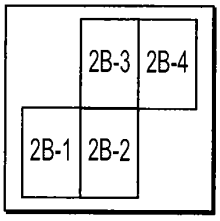


FIG. 2B-3



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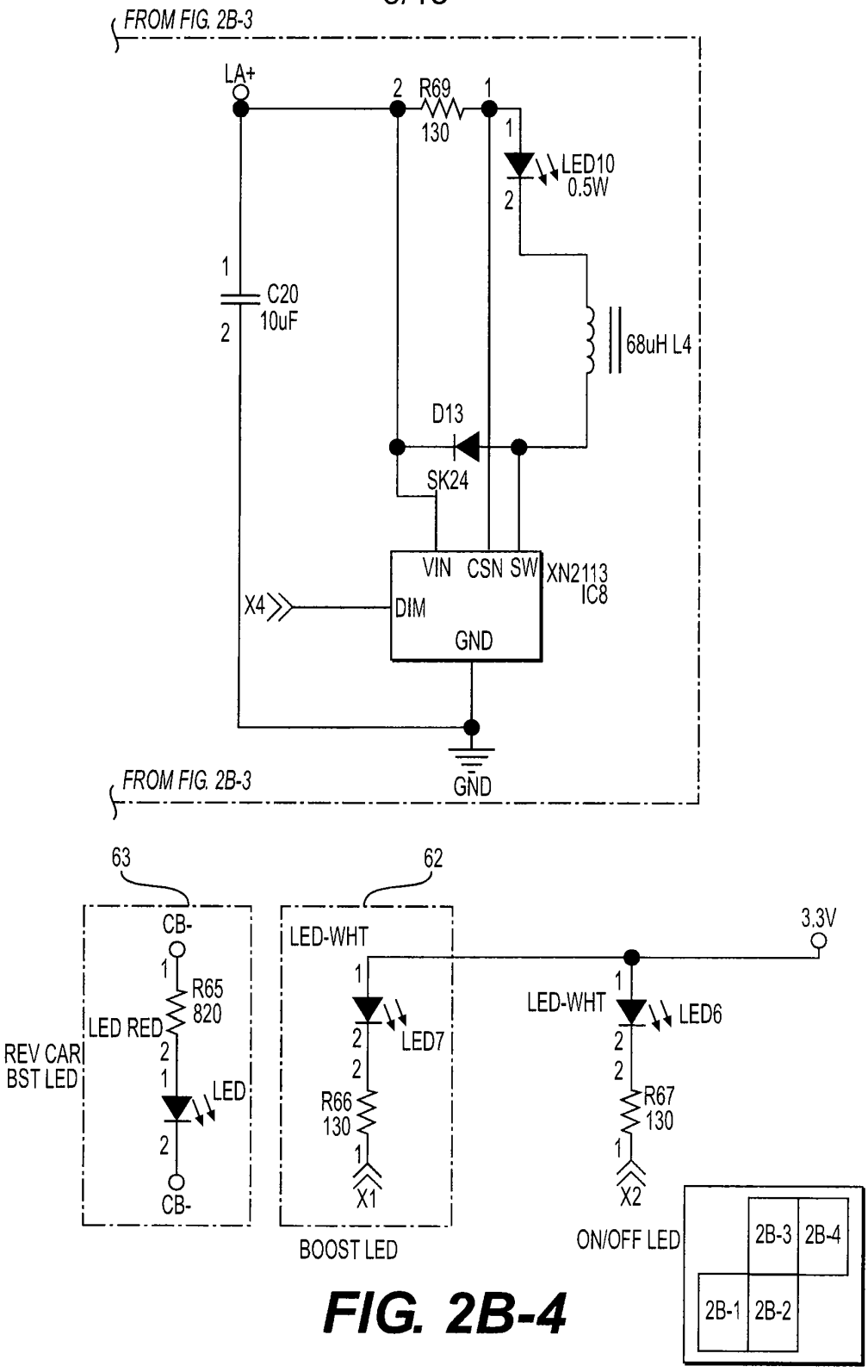
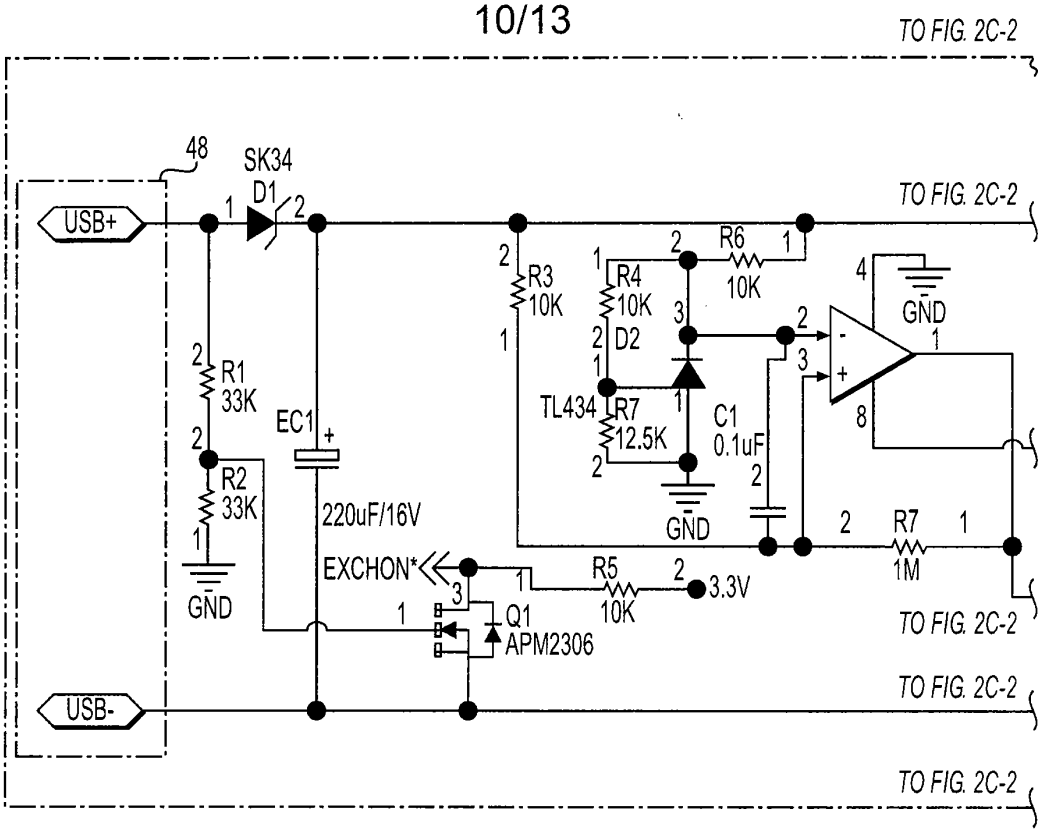


FIG. 2B-4

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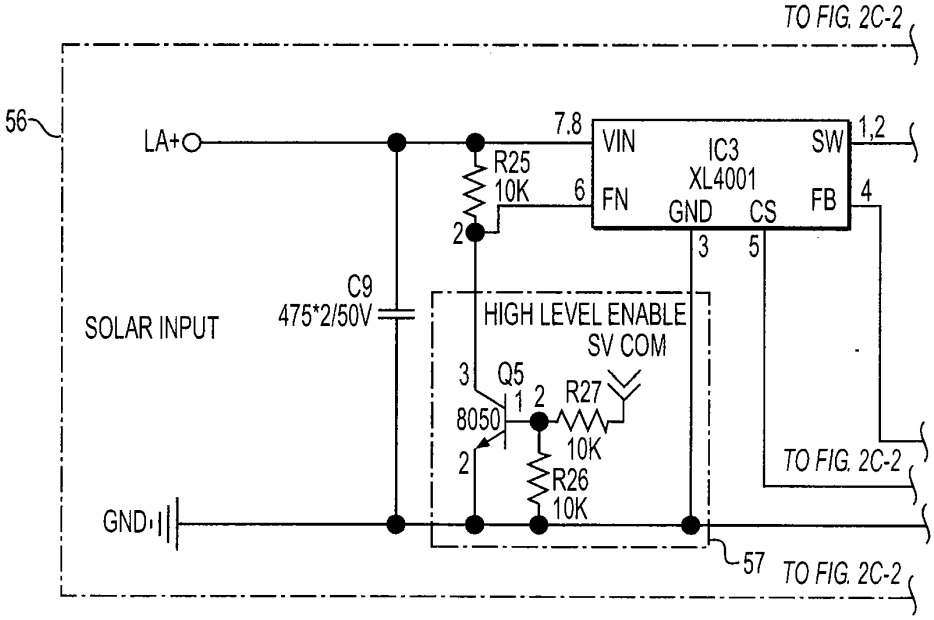
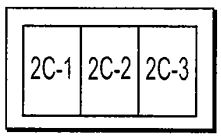


FIG. 2C-1



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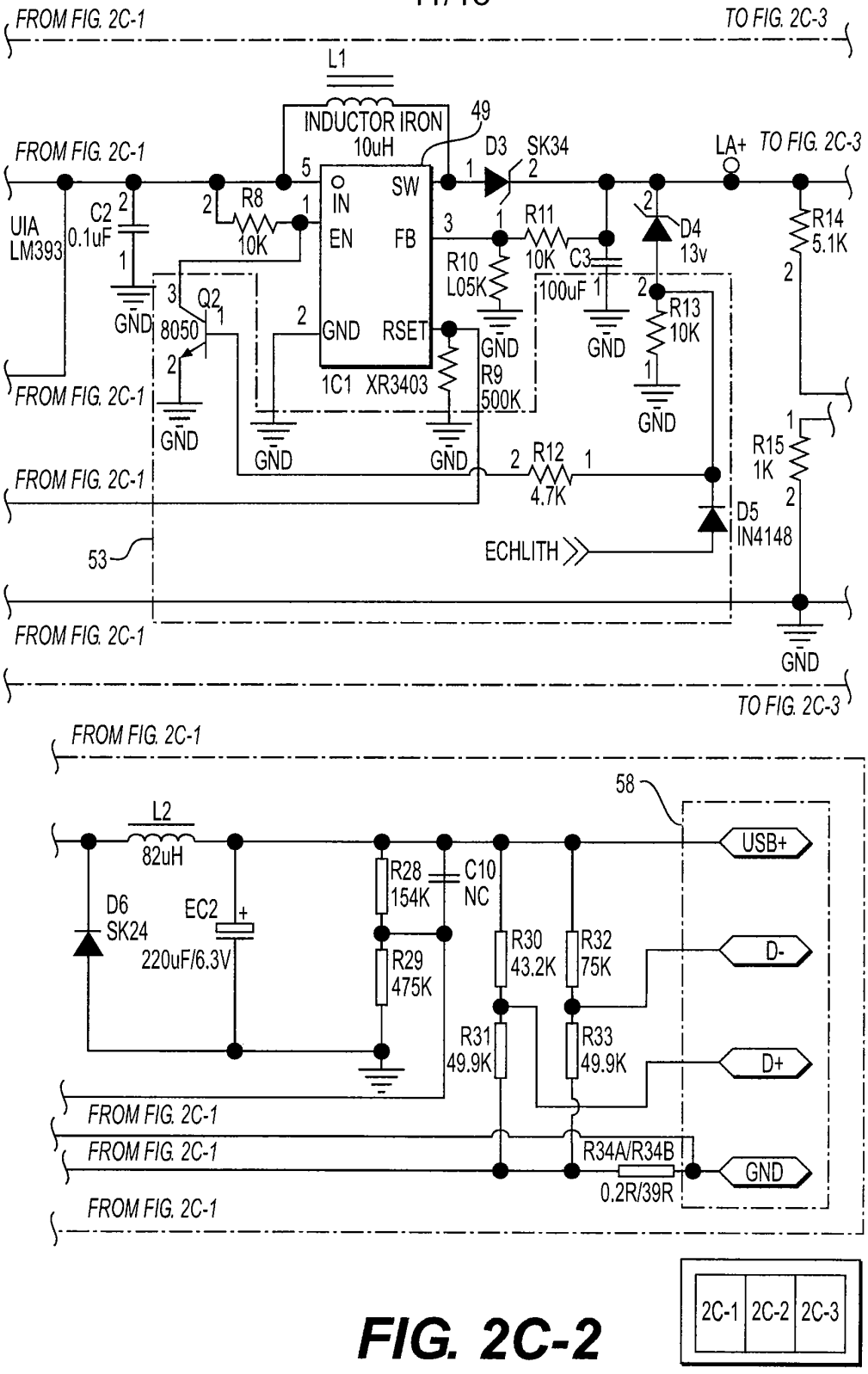
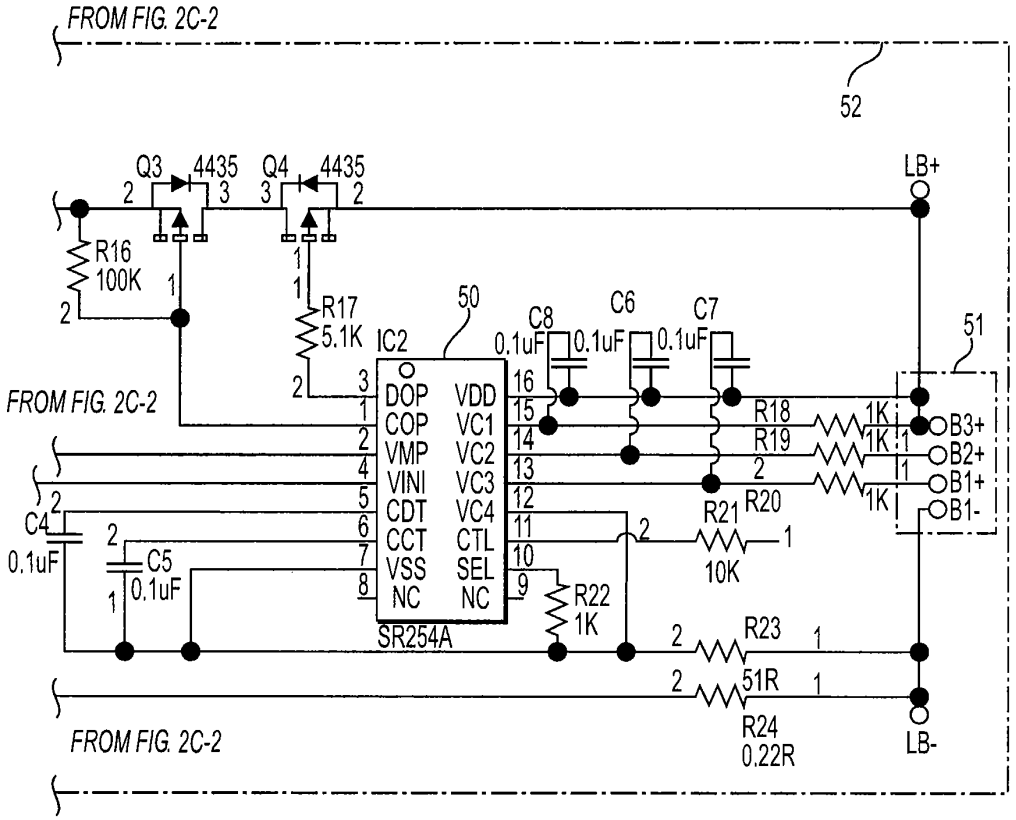


FIG. 2C-2

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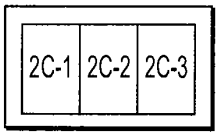


FIG. 2C-3

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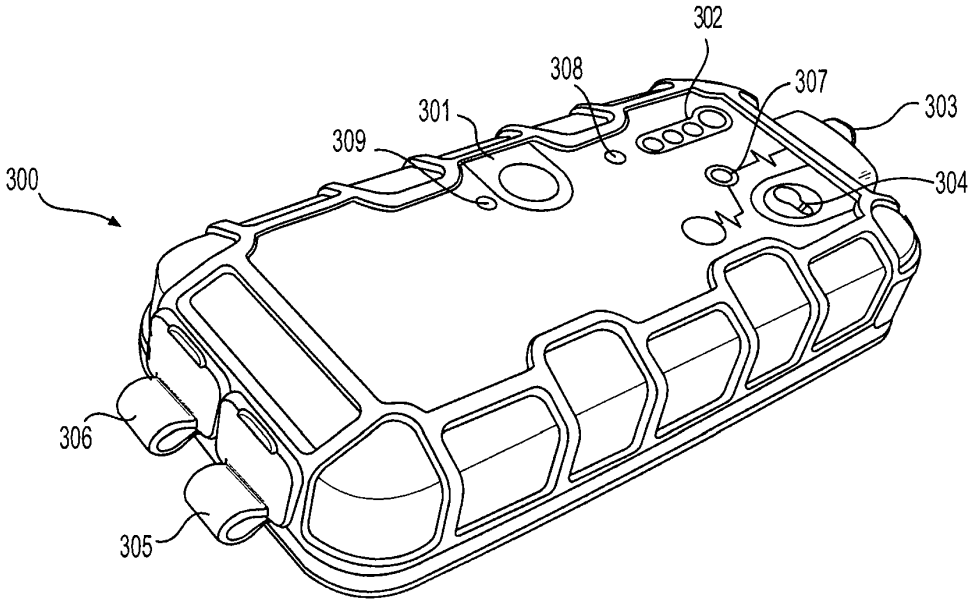


FIG. 3

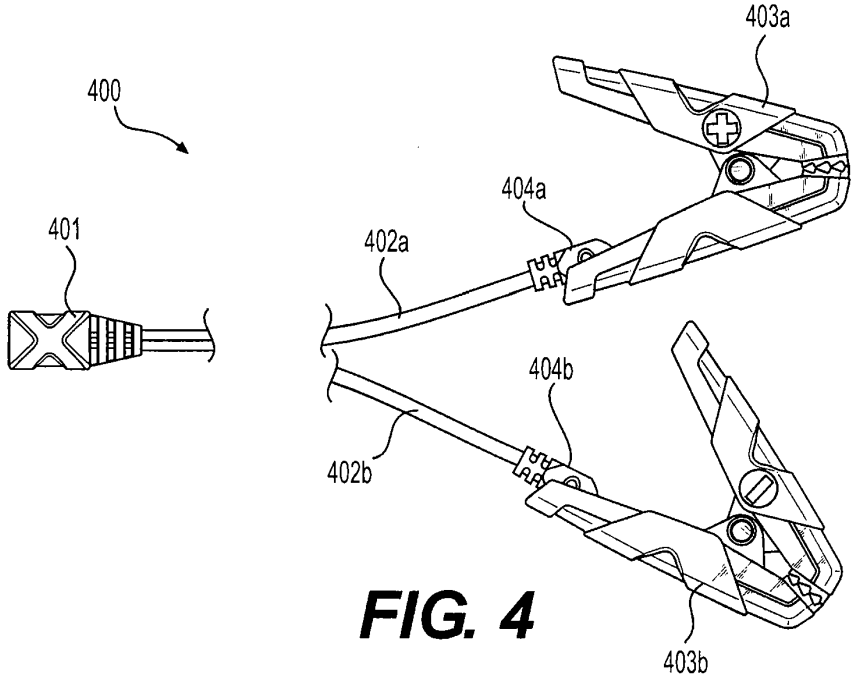


FIG. 4

AUSTRALIA
Patents Act

IN THE MATTER of Australian Patent Application No. 2019201559 in the name of The NOCO Company

- and –

Opposition thereto by Brown & Watson International Pty Ltd

ANNEXURE

This is the Annexure marked **CS-6** produced and shown to Cory Seligman at the time of signing his Declaration.

(12) STANDARD PATENT (11) Application No. **AU 2016269555 B2**
(19) AUSTRALIAN PATENT OFFICE

(54) Title
Portable vehicle battery jump start apparatus with safety protection

(51) International Patent Classification(s)
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B60R 16/00 (2006.01) ***H02J 7/00*** (2006.01)
B60R 16/03 (2006.01)

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(62) Divisional of:
2015258229

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(56) Related Art
US 2004/0130298 A1
WO 2004/036714 A2

20162695555 09 Dec 2016

ABSTRACT

A handheld device for jump starting a vehicle engine includes a rechargeable lithium ion battery pack (32) and a microcontroller (1). The lithium ion battery is coupled to a power output port of the device through a power switch circuit (15) actuated by the microcontroller. A vehicle battery isolation sensor (12) connected in circuit with positive and negative polarity outputs detects the presence of a vehicle battery (72) connected between the positive and negative polarity outputs. A reverse polarity sensor (10) connected in circuit with the positive and negative polarity outputs detects the polarity of a vehicle battery connected between the positive and negative polarity outputs, such that the microcontroller will enable power to be delivered from the lithium ion power pack to the output port only when a good battery is connected to the output port and only when the battery is connected with proper polarity of positive and negative terminals.

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PORTABLE VEHICLE BATTERY JUMP START APPARATUS WITH SAFETY PROTECTION

FIELD OF THE INVENTION

[0001] The present invention relates generally to apparatus for jump-starting a vehicle having a depleted or discharged battery.

BACKGROUND TO THE INVENTION

[0002] Prior art devices are known for jump-starting a vehicle, which provide either a pair of electrical connector cables that connect a fully-charged battery of another vehicle to the engine start circuit of the dead battery vehicle, or portable booster devices which include a fully-charged battery which can be connected in circuit with the vehicle's engine starter through a pair of cables.

[0003] Problems with the prior art arose when either the jumper terminals or clamps of the cables were inadvertently brought into contact with each other while the other ends were connected to a charged battery, or when the positive and negative terminals were connected to the opposite polarity terminals in the vehicle to be jumped, thereby causing a short circuit resulting in sparking and potential damage to batteries and/or bodily injury.

[0004] Various attempts to eliminate these problems have been made in the prior art. U.S. Patent No. 6,212,054 issued April 3, 2001, discloses a battery booster pack that is polarity sensitive and can detect proper and improper connections before providing a path for electric current flow. The device uses a set of LEDs connected to optical couplers oriented by a control circuit. The control circuit controls a solenoid assembly controlling the path of power current. The control circuit causes power current to flow through the solenoid assembly only if the points of contact of booster cable clamp connections have been properly made.

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[0005] U.S. Patent No. 6,632,103 issued October 14, 2003, discloses an adaptive booster cable connected with two pairs of clips, wherein the two pairs of clips are respectively attached to two batteries to transmit power from one battery to the other battery. The adaptive booster cable includes a polarity detecting unit connected to each clip, a switching unit and a current detecting unit both provided between the two pairs of clips. After the polarity of each clip is sensed by the polarity detecting unit, the switching unit generates a proper connection between the two batteries. Therefore, the positive and negative terminals of the two batteries are correctly connected based on the detected result of the polarity detecting unit.

[0006] U.S. Patent No. 8,493,021 issued July 23, 2013, discloses apparatus that monitors the voltage of the battery of a vehicle to be jump started and the current delivered by the jump starter batteries to determine if a proper connection has been established and to provide fault monitoring. Only if the proper polarity is detected can the system operate. The voltage is monitored to determine open circuit, disconnected conductive clamps, shunt cable fault, and solenoid fault conditions. The current through the shunt cable is monitored to determine if there is a battery explosion risk, and for excessive current conditions presenting an overheating condition, which may result in fire. The system includes an internal battery to provide the power to the battery of the vehicle to be jump started. Once the vehicle is started, the unit automatically electrically disconnects from the vehicle's battery.

[0007] U.S. Patent No. 5,189,359 issued February 23, 1993, discloses a jumper cable device having two bridge rectifiers for developing a reference voltage, a four-input decoder for determining which terminals are to be connected based on a comparison of the voltage at each of the four terminals to the reference voltage, and a pair of relays for effecting the correct connection depending on the determination of the decoder. No connection will be made unless only one terminal of each battery has a higher voltage than the reference voltage, indicating "positive" terminals, and one has a lower voltage than the reference voltage, indicating "negative" terminals, and that, therefore, the two

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high voltage terminals may be connected and the two lower voltage terminals may be connected. Current flows once the appropriate relay device is closed. The relay device is preferably a MOSFET combined with a series array of photodiodes that develop MOSFET gate-closing potential when the decoder output causes an LED to light.

[0008] U.S. Patent No. 5,795,182 issued August 18, 1998, discloses a polarity independent set of battery jumper cables for jumping a first battery to a second battery. The apparatus includes a relative polarity detector for detecting whether two batteries are configured cross or parallel. A three-position high current capacity crossbar pivot switch is responsive to the relative polarity detector for automatically connecting the plus terminals of the two batteries together and the minus terminals of the two batteries together regardless of whether the configuration detected is cross or parallel, and an undercurrent detector and a delay circuit for returning the device to its ready and unconnected state after the device has been disconnected from one of the batteries. The crossbar pivot switch includes two pairs of contacts, and a pivot arm that pivots about two separate points to ensure full electrical contact between the pairs of contacts. The invention can also be used to produce a battery charger that may be connected to a battery without regard to the polarity of the battery.

[0009] U.S. Patent No. 6,262,492 issued July 17, 2001, discloses a car battery jumper cable for accurately coupling an effective power source to a failed or not charged battery, which includes a relay switching circuit connected to the power source and the battery by two current conductor pairs. First and second voltage polarity recognition circuits are respectively connected to the power source and the battery by a respective voltage conductor pair to recognize the polarity of the power source and the battery. A logic recognition circuit produces a control signal subject to the polarity of the power source and the battery, and a driving circuit controlled by the control signal from the logic recognition circuit drives the relay switching circuit, enabling the two poles of the power source to be accurately coupled to the two poles of the battery.

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[0010] U.S. Patent No. 5,635,817 issued June 3, 1997, discloses a vehicle battery charging device that includes a control housing having cables including a current limiting device to prevent exceeding of a predetermined maximum charging current of about 40 to 60 amps. The control housing includes a polarity detecting device to verify the correct polarity of the connection of the terminals of the two batteries and to electrically disconnect the two batteries if there is an incorrect polarity.

[0011] U.S. Patent No. 8,199,024 issued June 12, 2012, discloses a safety circuit in a low-voltage connecting system that leaves the two low-voltage systems disconnected until it determines that it is safe to make a connection. When the safety circuit determines that no unsafe conditions exist and that it is safe to connect the two low-voltage systems, the safety circuit may connect the two systems by way of a "soft start" that provides a connection between the two systems over a period of time that reduces or prevents inductive voltage spikes on one or more of the low-voltage systems. When one of the low-voltage systems has a completely-discharged battery incorporated into it, a method is used for detection of proper polarity of the connections between the low-voltage systems. The polarity of the discharged battery is determined by passing one or more test currents through it and determining whether a corresponding voltage rise is observed.

[0012] U.S. Patent No. 5,793,185 issued August 11, 1998, discloses a hand-held jump starter having control components and circuits to prevent overcharging and incorrect connection to batteries.

[0013] While the prior art attempted solutions to the abovementioned problems as discussed above, each of the prior art solutions suffers from other shortcomings, either in complexity, cost or potential for malfunction. Accordingly, there exists a need in the art for further improvements to vehicle jump start devices.

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SUMMARY OF THE INVENTION

[0014] In accordance with an aspect of the invention, an apparatus is provided for jump starting a vehicle engine, comprising: an internal power supply; an output port having positive and negative polarity outputs; a vehicle battery isolation sensor connected in circuit with said positive and negative polarity outputs, configured to detect presence of a vehicle battery connected between said positive and negative polarity outputs; a reverse polarity sensor connected in circuit with said positive and negative polarity outputs, configured to detect polarity of a vehicle battery connected between said positive and negative polarity outputs and to provide an output signal indicating whether positive and negative terminals of said vehicle battery are properly connected with said positive and negative polarity outputs of said output port; a power switch connected between said internal power supply and said output port; and a microcontroller configured to receive input signals from said vehicle isolation sensor and said reverse polarity sensor, and to provide an output signal to said power switch, such that said power switch is turned on to cause said internal power supply to be connected to said output port in response to signals from said sensors indicating the presence of a vehicle battery at said output port and proper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs, and is not turned on when signals from said sensors indicate either the absence of a vehicle battery at said output port or improper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs.

[0015] In accordance with an embodiment of the invention, the internal power supply is a rechargeable lithium ion battery pack.

[0016] A jumper cable device may also be provided, having a plug configured to plug into said output port; a pair of cables integrated with the plug at one respective end thereof; said pair of cables being configured to be separately connected to terminals of a battery at another respective end thereof.

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[0017] Comprises/comprising and grammatical variations thereof when used in this specification are to be taken to specify the presence of stated features, integers, steps or components or groups thereof, but do not preclude the presence or addition of one or more other features, integers, steps, components or groups thereof.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] Fig. 1 is a functional block diagram of a handheld vehicle battery boost apparatus in accordance with one aspect of the present invention;

[0019] Figs. 2A – 2C are schematic circuit diagrams of an example embodiment of a handheld vehicle battery boost apparatus in accordance with an aspect of the invention;

[0020] Fig. 3 is a perspective view of a handheld jump starter booster device in accordance with one example embodiment of the invention; and

[0021] Fig. 4 is a plan view of a jumper cable usable with the handheld jump starter booster device in accordance with another aspect of the invention.

DETAILED DESCRIPTION OF THE INVENTION

[0022] FIG. 1 is a functional block diagram of a handheld battery booster according to one aspect of the invention. At the heart of the handheld battery booster is a lithium polymer battery pack 32, which stores sufficient energy to jump start a vehicle engine served by a conventional 12 volt lead-acid or valve regulated lead-acid battery. In one example embodiment, a high-surge lithium polymer battery pack includes three 3.7V, 2666 mAh lithium polymer batteries in a 3S1P configuration. The resulting battery pack provides 11.1V, 2666Ah (8000Ah at 3.7V, 29.6Wh). Continuous discharge current is 25C (or 200 amps), and burst discharge current is 50C (or 400 amps). The maximum charging current of the battery pack is 8000mA (8 amps).

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[0023] A programmable microcontroller unit (MCU) 1 receives various inputs and produces informational as well as control outputs. The programmable MCU 1 further provides flexibility to the system by allowing updates in functionality and system parameters, without requiring any change in hardware. According to one example embodiment, an 8 bit microcontroller with 2K x 15 bits of flash memory is used to control the system. One such microcontroller is the HT67F30, which is commercially available from Holtek Semiconductor Inc.

[0024] A car battery reverse sensor 10 monitors the polarity of the vehicle battery 72 when the handheld battery booster device is connected to the vehicle's electric system. As explained below, the booster device prevents the lithium battery pack from being connected to the vehicle battery 72 when the terminals of the battery 72 are connected to the wrong terminals of the booster device. A car battery isolation sensor 12 detects whether or not a vehicle battery 72 is connected to the booster device, and prevents the lithium battery pack from being connected to the output terminals of the booster device unless there is a good (e.g. chargeable) battery connected to the output terminals.

[0025] A smart switch FET circuit 15 electrically switches the handheld battery booster lithium battery to the vehicle's electric system only when the vehicle battery is determined by the MCU 1 to be present (in response to a detection signal provided by isolation sensor 12) and connected with the correct polarity (in response to a detection signal provided by reverse sensor 10). A lithium battery temperature sensor 20 monitors the temperature of the lithium battery pack 32 to detect overheating due to high ambient temperature conditions and overextended current draw during jump starting. A lithium battery voltage measurement circuit 24 monitors the voltage of the lithium battery pack 32 to prevent the voltage potential from rising too high during a charging operation and from dropping too low during a discharge operation.

[0026] Lithium battery back-charge protection diodes 28 prevent any charge current being delivered to the vehicle battery 72 from flowing back to the lithium battery pack 32 from the vehicle's electrical system. Flashlight LED circuit 36 is

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provided to furnish a flashlight function for enhancing light under a vehicle's hood in dark conditions, as well as providing SOS and strobe lighting functions for safety purposes when a vehicle may be disabled in a potentially dangerous location. Voltage regulator 42 provides regulation of internal operating voltage for the microcontroller and sensors. On/Off manual mode and flashlight switches 46 allow the user to control power-on for the handheld battery booster device, to control manual override operation if the vehicle has no battery, and to control the flashlight function. The manual button functions only when the booster device is powered on. This button allows the user to jump-start vehicles that have either a missing battery, or the battery voltage is so low that automatic detection by the MCU is not possible. When the user presses and holds the manual override button for a predetermined period time (such as three seconds) to prevent inadvertent actuation of the manual mode, the internal lithium ion battery power is switched to the vehicle battery connect port. The only exception to the manual override is if the car battery is connected in reverse. If the car battery is connected in reverse, the internal lithium battery power shall never be switched to the vehicle battery connect port.

[0027] USB charge circuit 52 converts power from any USB charger power source, to charge voltage and current for charging the lithium battery pack 32. USB output 56 provides a USB portable charger for charging smartphones, tablets, and other rechargeable electronic devices. Operation indicator LEDs 60 provide visual indication of lithium battery capacity status as well as an indication of smart switch activation status (indicating that power is being provided to the vehicle's electrical system).

[0028] Detailed operation of the handheld booster device will now be described with reference to the schematic diagrams of Figs. 2A-2C. As shown in Fig. 2A, the microcontroller unit 1 is the center of all inputs and outputs. The reverse battery sensor 10 comprises an optically coupled isolator phototransistor (4N27) connected to the terminals of vehicle battery 72 at input pins 1 and 2 with a diode D8 in the lead conductor of pin 1 (associated with the negative terminal CB-), such that if the battery 72 is connected to the terminals of the booster

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device with the correct polarity, the optocoupler LED 11 will not conduct current, and is therefore turned off, providing a "1" or high output signal to the MCU 1. The car battery isolation sensor 12 comprises an optically coupled isolator phototransistor (4N27) connected to the terminals of vehicle battery 72 at input pins 1 and 2 with a diode D7 in the lead conductor of pin 1 (associated with the positive terminal CB+), such that if the battery 72 is connected to the terminals of the booster device with the correct polarity, the optocoupler LED 11A will conduct current, and is therefore turned on, providing a "0" or low output signal to the MCU, indicating the presence of a battery across the jumper output terminals of the handheld booster device.

[0029] If the car battery 72 is connected to the handheld booster device with reverse polarity, the optocoupler LED 11 of the reverse sensor 10 will conduct current, providing a "0" or low signal to microcontroller unit 1. Further, if no battery is connected to the handheld booster device, the optocoupler LED 11A of the isolation sensor 12 will not conduct current, and is therefore turned off, providing a "1" or high output signal to the MCU, indicating the absence of any battery connected to the handheld booster device. Using these specific inputs, the microcontroller software of MCU 1 can determine when it is safe to turn on the smart switch FET 15, thereby connecting the lithium battery pack to the jumper terminals of the booster device. Consequently, if the car battery 72 either is not connected to the booster device at all, or is connected with reverse polarity, the MCU 1 can keep the smart switch FET 15 from being turned on, thus prevent sparking/short circuiting of the lithium battery pack.

[0030] As shown in Fig. 2B, the FET smart switch 15 is driven by an output of the microcontroller 1. The FET smart switch 15 includes three FETs (Q15, Q18, and Q19) in parallel, which spreads the distribution of power from the lithium battery pack over the FETs. When that microcontroller output is driven to a logic low, FETs 16 are all in a high resistance state, therefore not allowing current to flow from the internal lithium battery negative contact 17 to the car battery 72 negative contact. When the microcontroller output is driven to a logic high, the FETs 16 (Q15, Q18, and Q19) are in a low resistant state, allowing current to flow

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freely from the internal lithium battery pack negative contact 17 (LB-) to the car battery 72 negative contact (CB-). In this way, the microcontroller software controls the connection of the internal lithium battery pack 32 to the vehicle battery 72 for jumpstarting the car engine.

[0031] Referring back to Fig. 2A, the internal lithium battery pack voltage can be accurately measured using circuit 24 and one of the analog-to-digital inputs of the microcontroller 1. Circuit 24 is designed to sense when the main 3.3V regulator 42 voltage is on, and to turn on transistor 23 when the voltage of regulator 42 is on. When transistor 23 is conducting, it turns on FET 22, thereby providing positive contact (LB+) of the internal lithium battery a conductive path to voltage divider 21 allowing a lower voltage range to be brought to the microcontroller to be read. Using this input, the microcontroller software can determine if the lithium battery voltage is too low during discharge operation or too high during charge operation, and take appropriate action to prevent damage to electronic components.

[0032] Still referring to Fig. 2A, the temperature of the internal lithium battery pack 32 can be accurately measured by two negative temperature coefficient (NTC) devices 20. These are devices that reduce their resistance when their temperature rises. The circuit is a voltage divider that brings the result to two analog-to-digital (A/D) inputs on the microcontroller 1. The microcontroller software can then determine when the internal lithium battery is too hot to allow jumpstarting, adding safety to the design.

[0033] The main voltage regulator circuit 42 is designed to convert internal lithium battery voltage to a regulated 3.3 volts that is utilized by the microcontroller 1 as well as by other components of the booster device for internal operating power. Three lithium battery back charge protection diodes 28 (see Fig. 2B) are in place to allow current to flow only from the internal lithium battery pack 32 to the car battery 72, and not from the car battery to the internal lithium battery. In this way, if the car electrical system is charging from its alternator, it

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cannot back-charge (and thereby damage) the internal lithium battery, providing another level of safety.

[0034] The main power on switch 46 (Fig. 2A) is a combination that allows for double pole, double throw operation so that with one push, the product can be turned on if it is in the off state, or turned off if it is in the on state. This circuit also uses a microcontroller output 47 to "keep alive" the power when it is activated by the on switch. When the switch is pressed the microcontroller turns this output to a high logic level to keep power on when the switch is released. In this way, the microcontroller maintains control of when the power is turned off when the on/off switch is activated again or when the lithium battery voltage is getting too low. The microcontroller software also includes a timer that turns the power off after a predefined period of time, (such as, e.g. 8 hours) if not used.

[0035] The flashlight LED circuit 45 shown in Fig. 2B controls the operation of flashlight LEDs. Two outputs from the microcontroller 1 are dedicated to two separate LEDs. Thus, the LEDs can be independently software-controlled for strobe and SOS patterns, providing yet another safety feature to the booster device. LED indicators provide the feedback the operator needs to understand what is happening with the product. Four separate LEDs 61 (Fig. 2A) are controlled by corresponding individual outputs of microcontroller 1 to provide indication of the remaining capacity of the internal lithium battery. These LEDs are controlled in a "fuel gauge" type format with 25%, 50%, 75% and 100% (red, red, yellow, green) capacity indications. An LED indicator 63 (Fig. 2B) provides a visual warning to the user when the vehicle battery 72 has been connected in reverse polarity. "Boost" and on/off LEDs 62 provide visual indications when the booster device is provide jump-start power, and when the booster device is turned on, respectively.

[0036] A USB output 56 circuit (Fig. 2C) is included to provide a USB output for charging portable electronic devices such as smartphones from the internal lithium battery pack 32. Control circuit 57 from the microcontroller 1 allows the USB Out 56 to be turned on and off by software control to prevent the internal

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lithium battery getting too low in capacity. The USB output is brought to the outside of the device on a standard USB connector 58, which includes the standard voltage divider required for enabling charge to certain smartphones that require it.

[0037] The USB charge circuit 52 allows the internal lithium battery pack 32 to be charged using a standard USB charger. This charge input uses a standard micro-USB connector 48 allowing standard cables to be used. The 5V potential provided from standard USB chargers is up-converted to the 12.4VDC voltage required for charging the internal lithium battery pack using a DC-DC converter 49. The DC-DC converter 49 can be turned on and off via circuit 53 by an output from the microcontroller 1.

[0038] In this way, the microcontroller software can turn the charge off if the battery voltage is measured to be too high by the A/D input 22. Additional safety is provided for helping to eliminate overcharge to the internal lithium battery using a lithium battery charge controller 50 that provides charge balance to the internal lithium battery cells 51. This controller also provides safety redundancy for eliminating over discharge of the internal lithium battery.

[0039] Fig. 3 is a perspective view of a handheld device 300 in accordance with an exemplary embodiment of the invention. 301 is a power on switch. 302 shows the LED "fuel gauge" indicators 61. 303 shows a 12 volt output port connectable to a cable device 400, described further below. 304 shows a flashlight control switch for activating flashlight LEDs 45. 305 is a USB input port for charging the internal lithium battery, and 306 is a USB output port for providing charge from the lithium battery to other portable devices such as smartphones, tablets, music players, etc. 307 is a "boost on" indicator showing that power is being provided to the 12V output port. 308 is a "reverse" indicator showing that the vehicle battery is improperly connected with respect to polarity. 309 is a "power on" indicator showing that the device is powered up for operation.

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[0040] Fig. 4 shows a jumper cable device 400 specifically designed for use with the handheld device 300. Device 400 has a plug 401 configured to plug into 12 volt output port 303 of the handheld device 300. A pair of cables 402a and 402b are integrated with the plug 401, and are respectively connected to battery terminal clamps 403a and 403b via ring terminals 404a and 404b. The port 303 and plug 401 may be dimensioned so that the plug 401 will only fit into the port 303 in a specific orientation, thus ensuring that clamp 403a will correspond to positive polarity, and clamp 403b will correspond to negative polarity, as indicated thereon. Additionally, the ring terminals 404a and 404b may be disconnected from the clamps and connected directly to the terminals of a vehicle battery. This feature may be useful, for example, to permanently attach the cables 302a-302b to the battery of a vehicle. In the event that the battery voltage becomes depleted, the handheld booster device 300 could be properly connected to the battery very simply by plugging in the plug 401 to the port 303.

[0041] The invention having been thus described, it will be apparent to those skilled in the art that the same may be varied in many ways without departing from the spirit or scope of the invention. Any and all such variations are intended to be encompassed within the scope of the following claims.

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THE CLAIMS DEFINING THE INVENTION ARE AS FOLLOWS:

1. Apparatus for jump starting a vehicle engine, comprising:

an internal power supply;

an output port having positive and negative polarity outputs;

a vehicle battery isolation sensor connected in circuit with said positive and negative polarity outputs, configured to detect presence of a vehicle battery connected between said positive and negative polarity outputs;

a reverse polarity sensor connected in circuit with said positive and negative polarity outputs, configured to detect polarity of a vehicle battery connected between said positive and negative polarity outputs and to provide an output signal indicating whether positive and negative terminals of said vehicle battery are properly connected with said positive and negative polarity outputs of said output port;

a power switch connected between said internal power supply and said output port; and

a microcontroller configured to receive input signals from said vehicle isolation sensor and said reverse polarity sensor, and to provide an output signal to said power switch, such that said power switch is turned on to cause said internal power supply to be connected to said output port in response to signals from said sensors indicating the presence of a vehicle battery at said output port and proper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs, and is not turned on when signals from said sensors indicate either the absence of a vehicle battery at said output port or improper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs.

2. The apparatus of claim 1, wherein said internal power supply comprises a lithium ion battery.

3. The apparatus of claim 2, wherein said lithium ion battery comprises a battery pack of multiple lithium ion batteries.

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4. The apparatus of claim 1, wherein said power switch comprises a plurality of FETs in parallel.

5. The apparatus of claim 1, wherein said vehicle isolation sensor and reverse polarity sensor comprise optically coupled isolator phototransistors.

6. The apparatus of claim 1, further comprising a plurality of power diodes coupled between said output port and said internal power supply to prevent back-charging of said internal power supply from an electrical system connected to said output port.

7. The apparatus of claim 1, further comprising a temperature sensor configured to detect temperature of said internal power supply and to provide a temperature signal to said microcontroller.

8. The apparatus of claim 1, further comprising a voltage measurement circuit configured to measure output voltage of said internal power supply and to provide a voltage measurement signal to said microcontroller.

9. The apparatus of claim 1, further comprising a voltage regulator configured to convert output voltage of said internal power supply to a voltage level appropriate to provide operating power to internal components of the apparatus.

10. The apparatus of claim 1, further comprising a USB output port configured to provide charging power from said internal power supply to a USB-chargeable device.

11. The apparatus of claim 1, further comprising a USB charging port configured to provide charging power from an external power source to said internal power supply.

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12. The apparatus of claim 1, further comprising a flashlight circuit configured to provide a source of light to a user.

13. The apparatus of claim 12, wherein said source of light is at least one LED.

14. The apparatus of claim 13, wherein said microcontroller is configured to control said at least one LED to provide a visual alarm indicating an emergency situation.

15. The apparatus of claim 1, further comprising a plurality of visual indicators configured to display remaining capacity status of said internal power supply.

16. The apparatus of claim 15, wherein said plurality of visual indicators comprises a plurality of LEDs providing output light of different colors.

17. The apparatus of claim 1, further comprising a visual indicator configured to warn a user when a vehicle battery is connected with reverse polarity.

18. The apparatus of claim 1, further comprising separate visual indicators configured to display the power on status of the apparatus, and the jump start boost power status of power supplied to said output port.

19. The apparatus of claim 1, further comprising a manual override switch configured to activate a manual override mode to enable a user to connect jump start power to said output port when said vehicle battery isolation sensor is unable to detect presence of a vehicle battery.

20. The apparatus of claim 19, wherein said microcontroller is configured to detect actuation of said manual override switch for at least a predetermined period of time before activation of said manual override mode.

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21. The apparatus of claim 1, further comprising a jumper cable device including a plug configured to plug into said output port, a pair of cables integrated with the plug at one respective end thereof and being configured to be connected to terminals of a battery at another respective end thereof.

22. The apparatus of claim 21, wherein said jumper cable device further comprises a pair of ring terminals configured to respectively connect said pair of cables at said another end thereof with one of a battery terminal and a battery terminal clamp.

23. The apparatus of claim 21, wherein said output port and said plug are dimensioned so that the plug will fit into the output port only in one specific orientation.

THE NOCO COMPANY

WATERMARK PATENT AND TRADE MARKS ATTORNEYS

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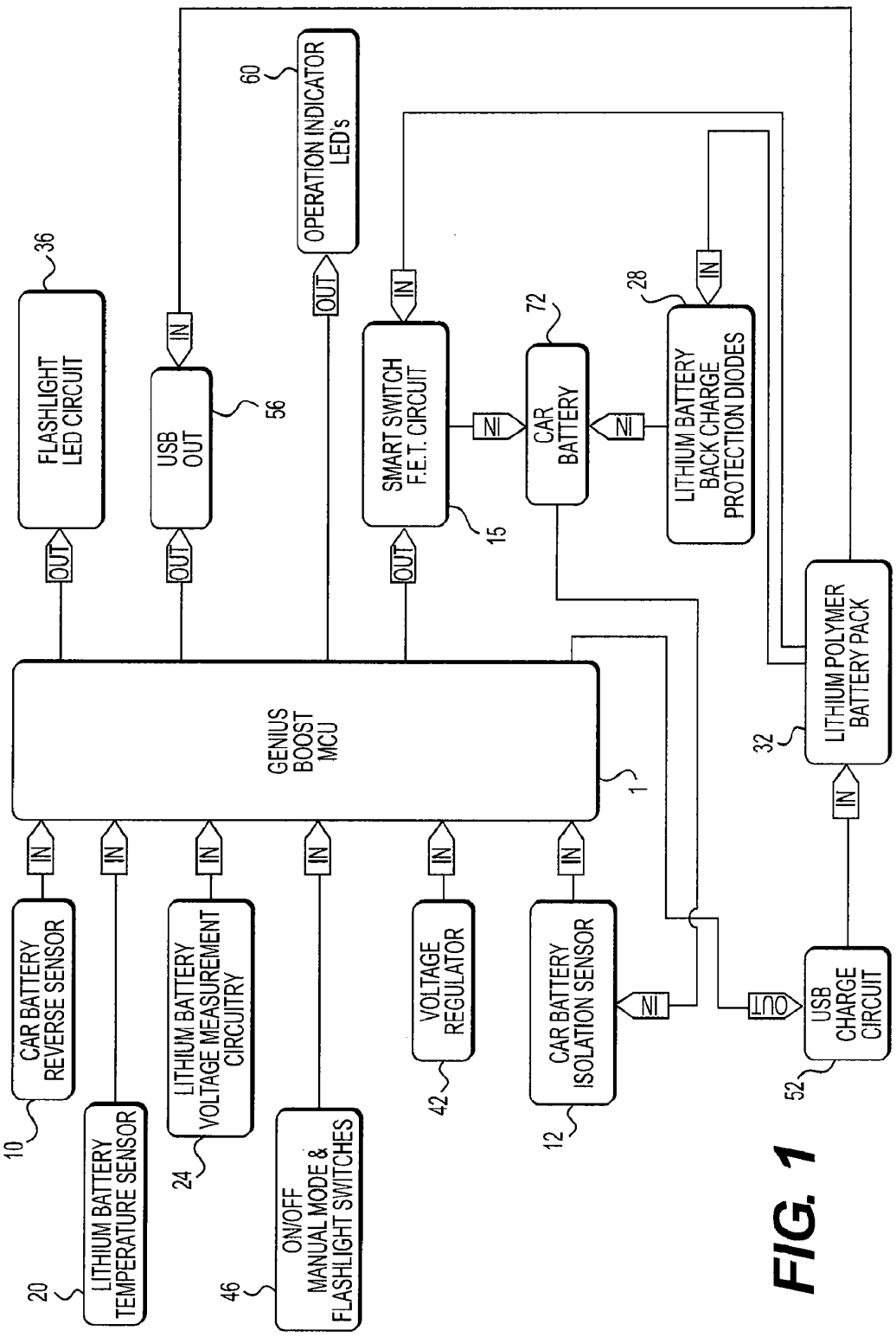


FIG. 1

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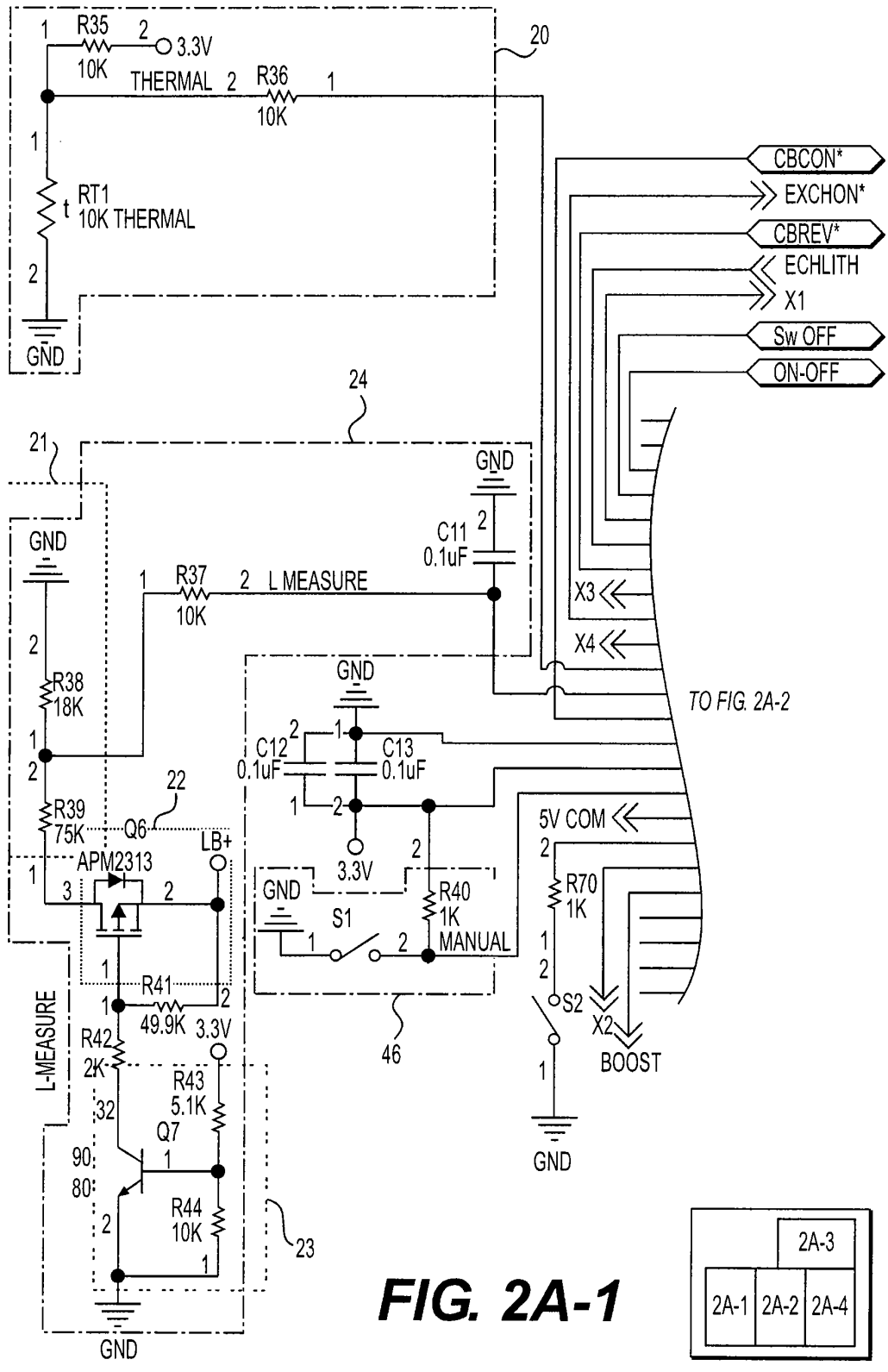
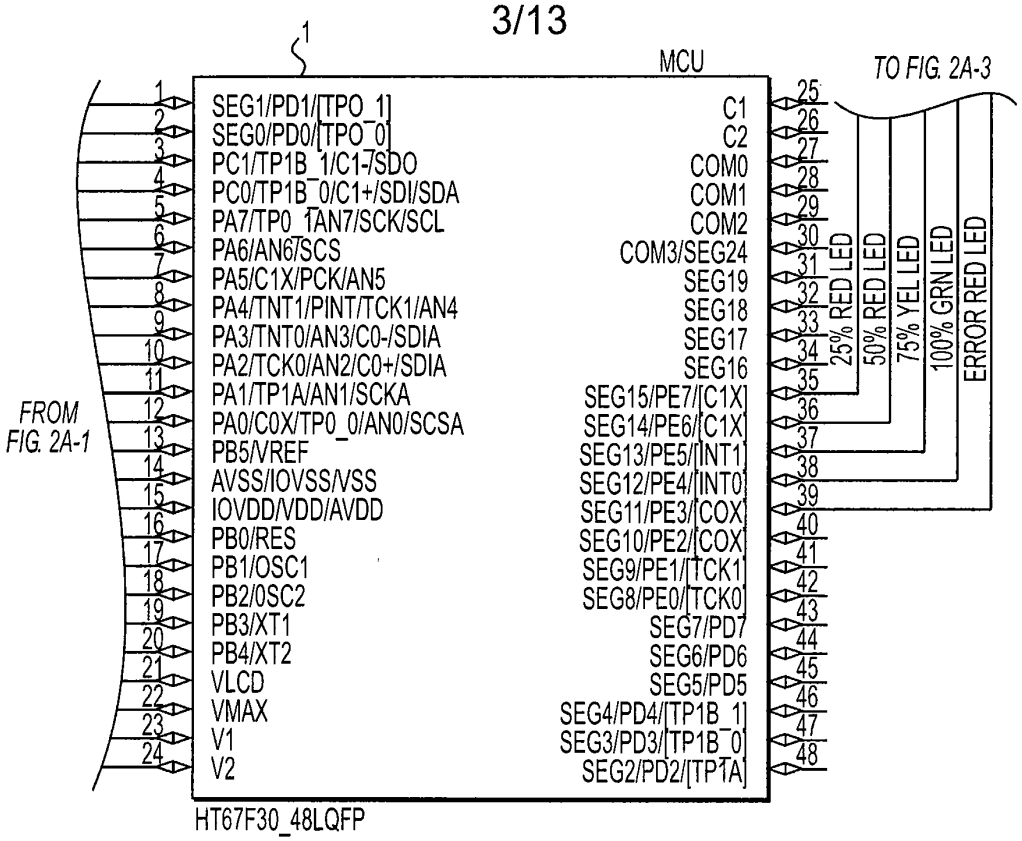


FIG. 2A-1

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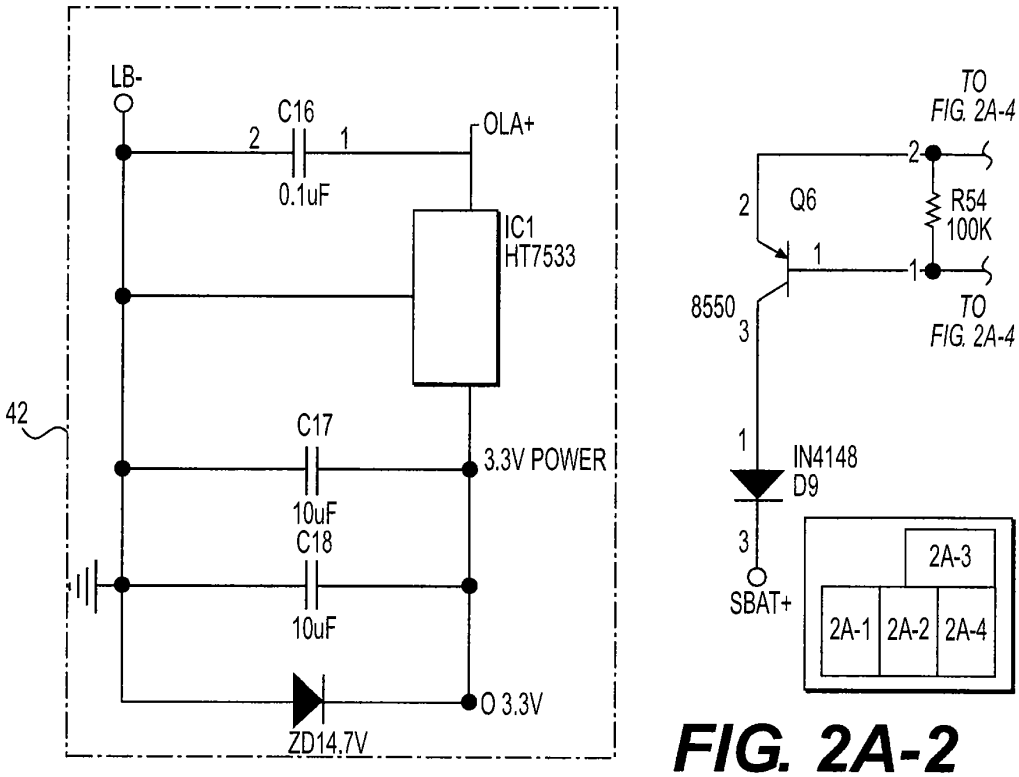


FIG. 2A-2

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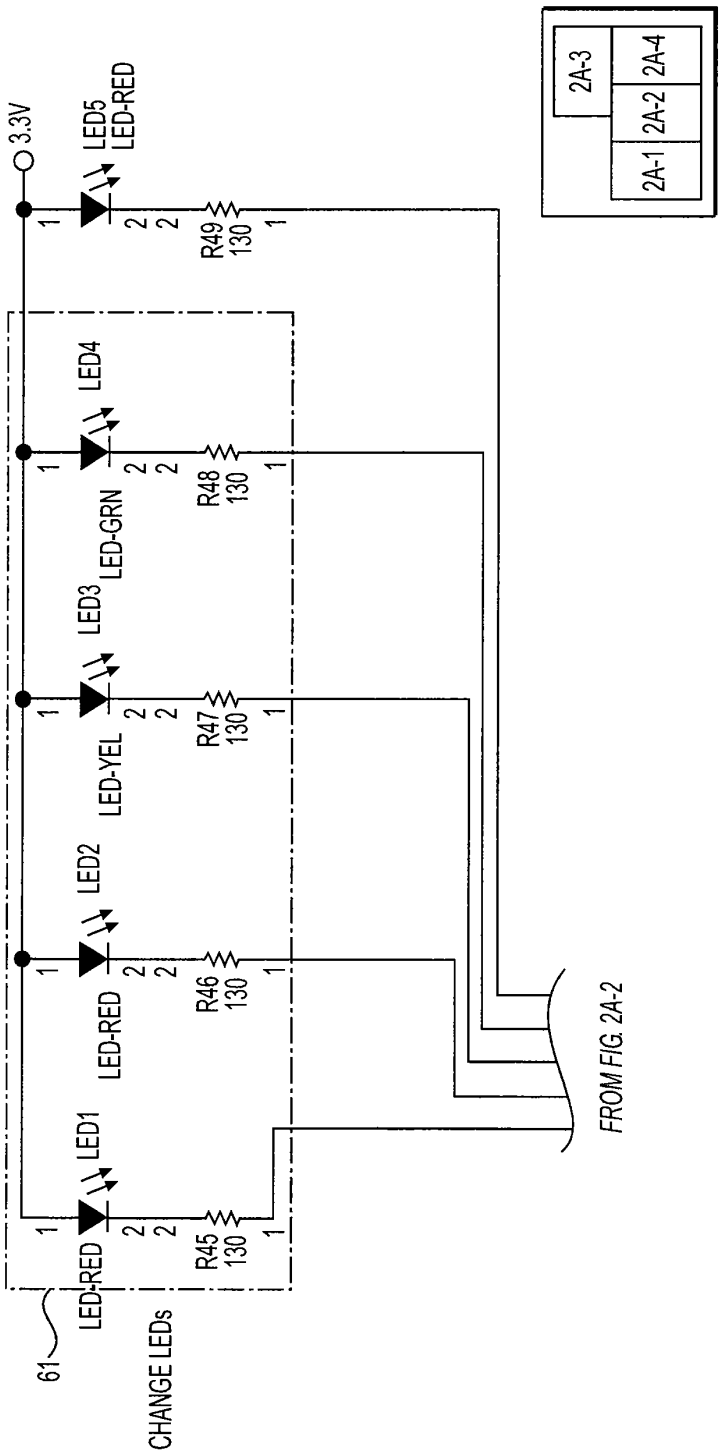


FIG. 2A-3

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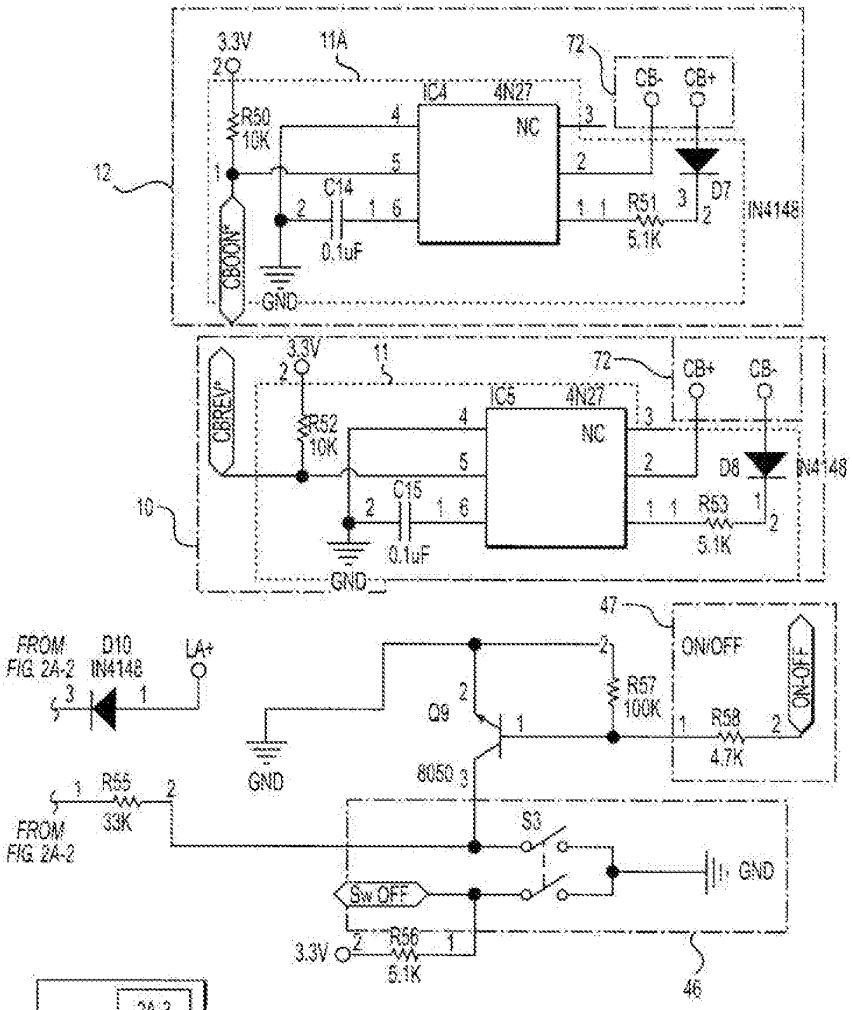


FIG. 2A-4

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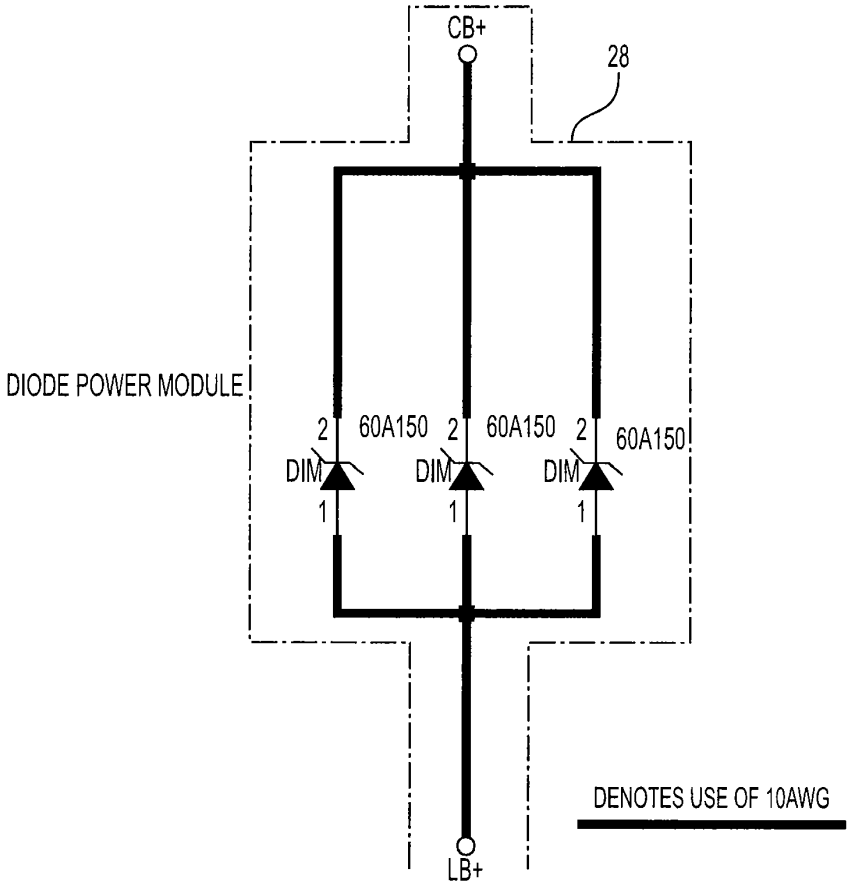
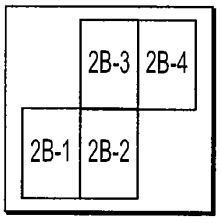


FIG. 2B-1



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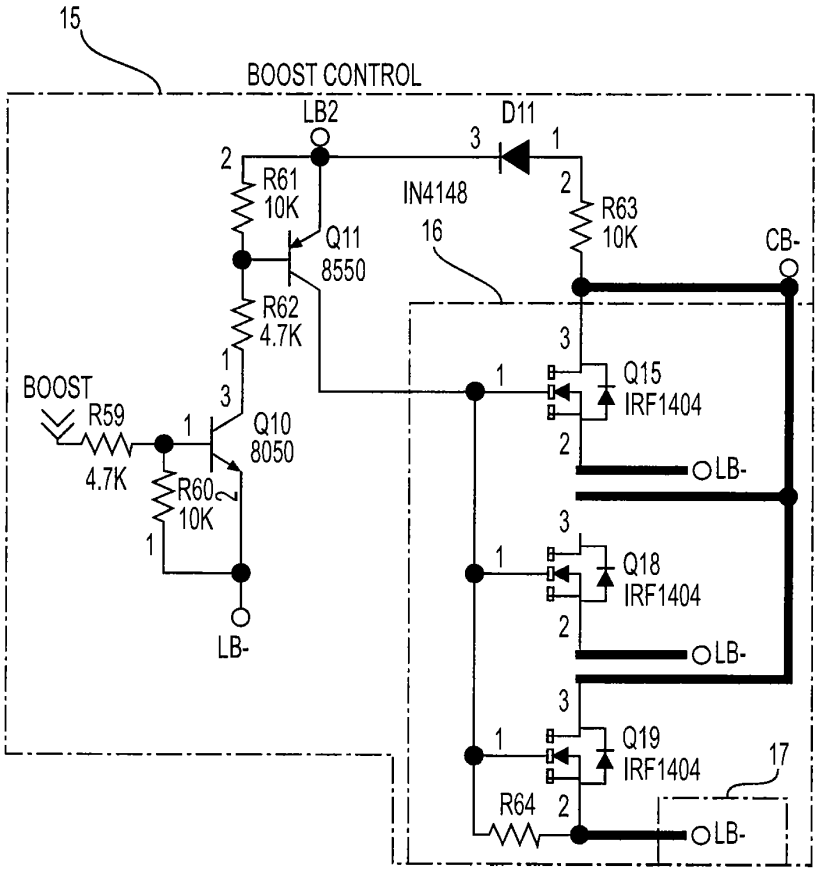
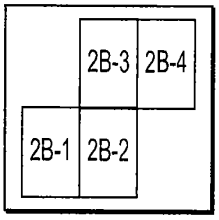


FIG. 2B-2



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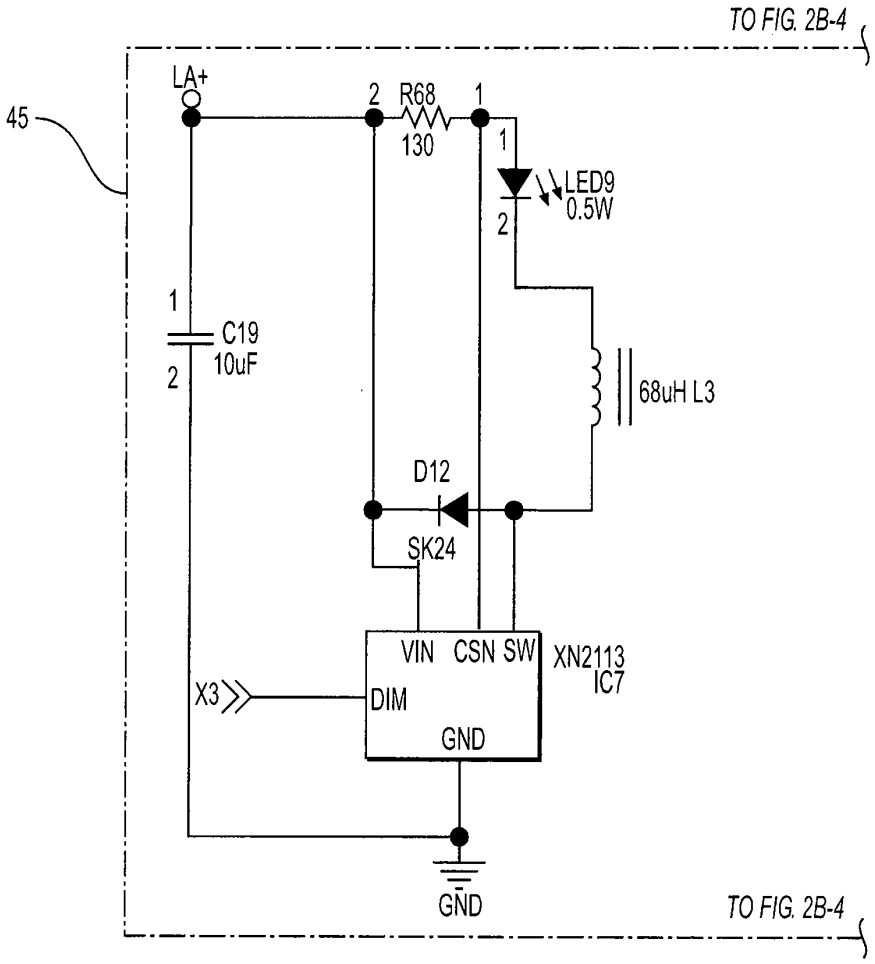
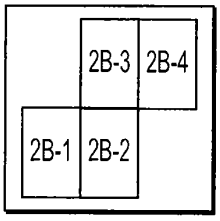


FIG. 2B-3



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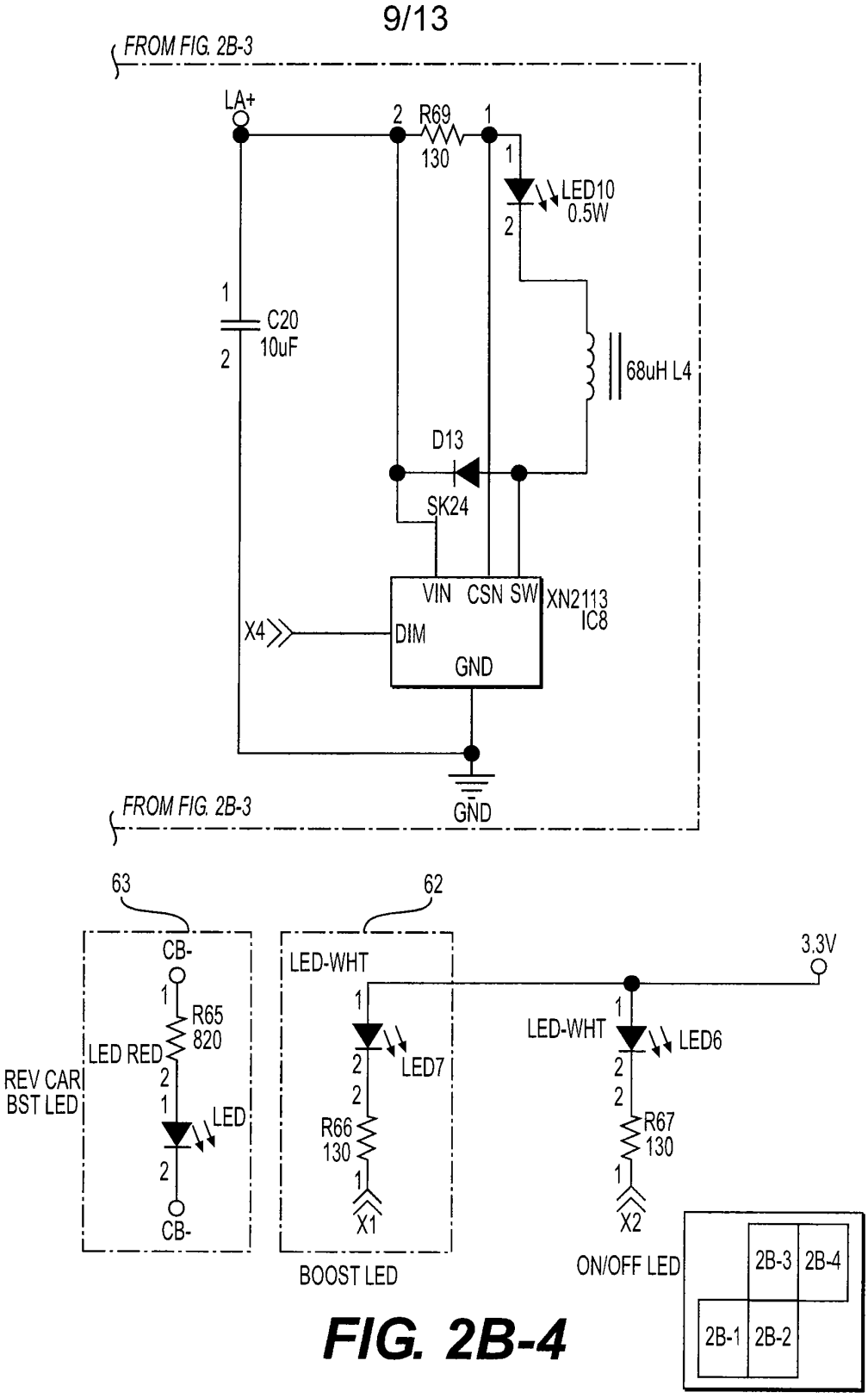


FIG. 2B-4

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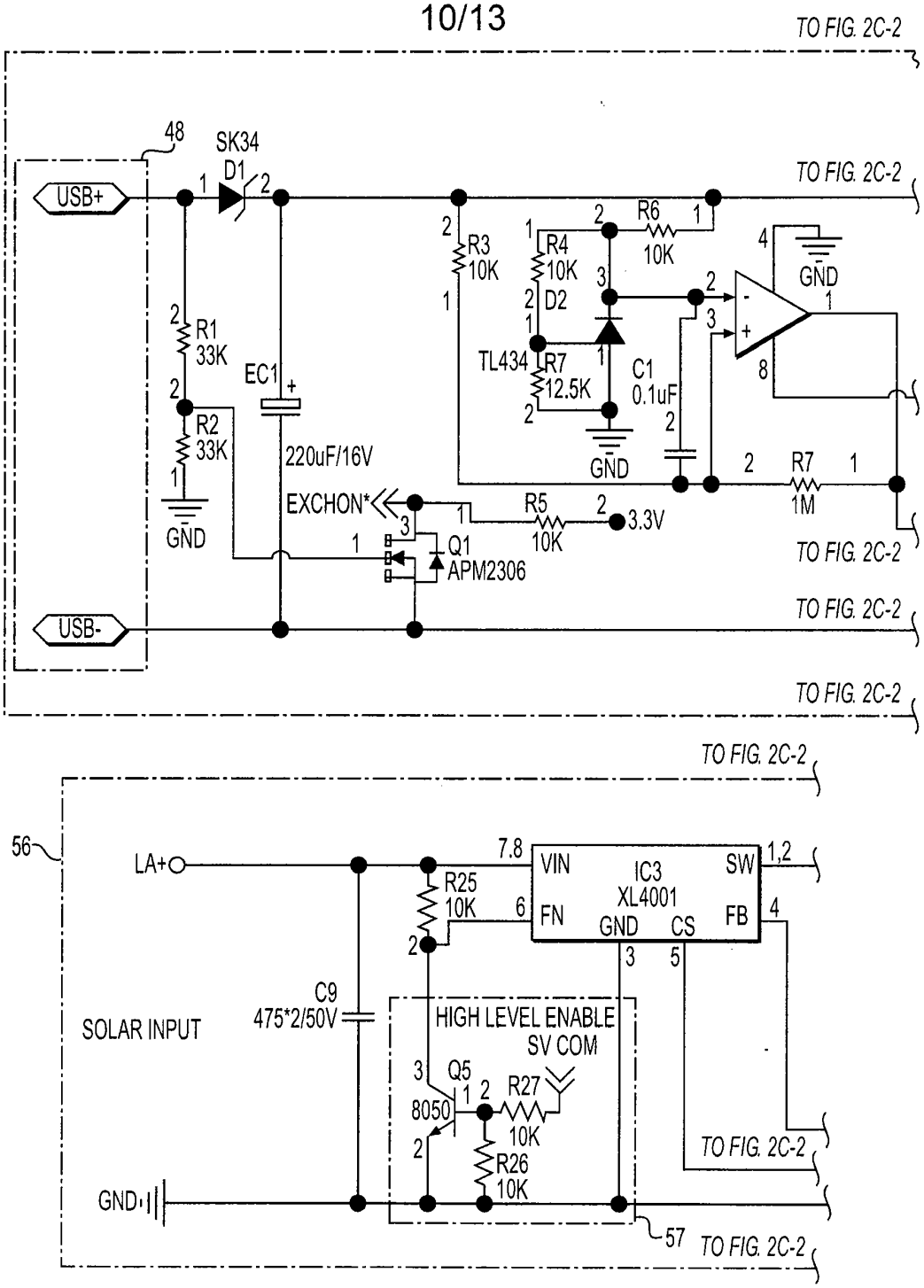
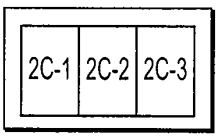


FIG. 2C-1



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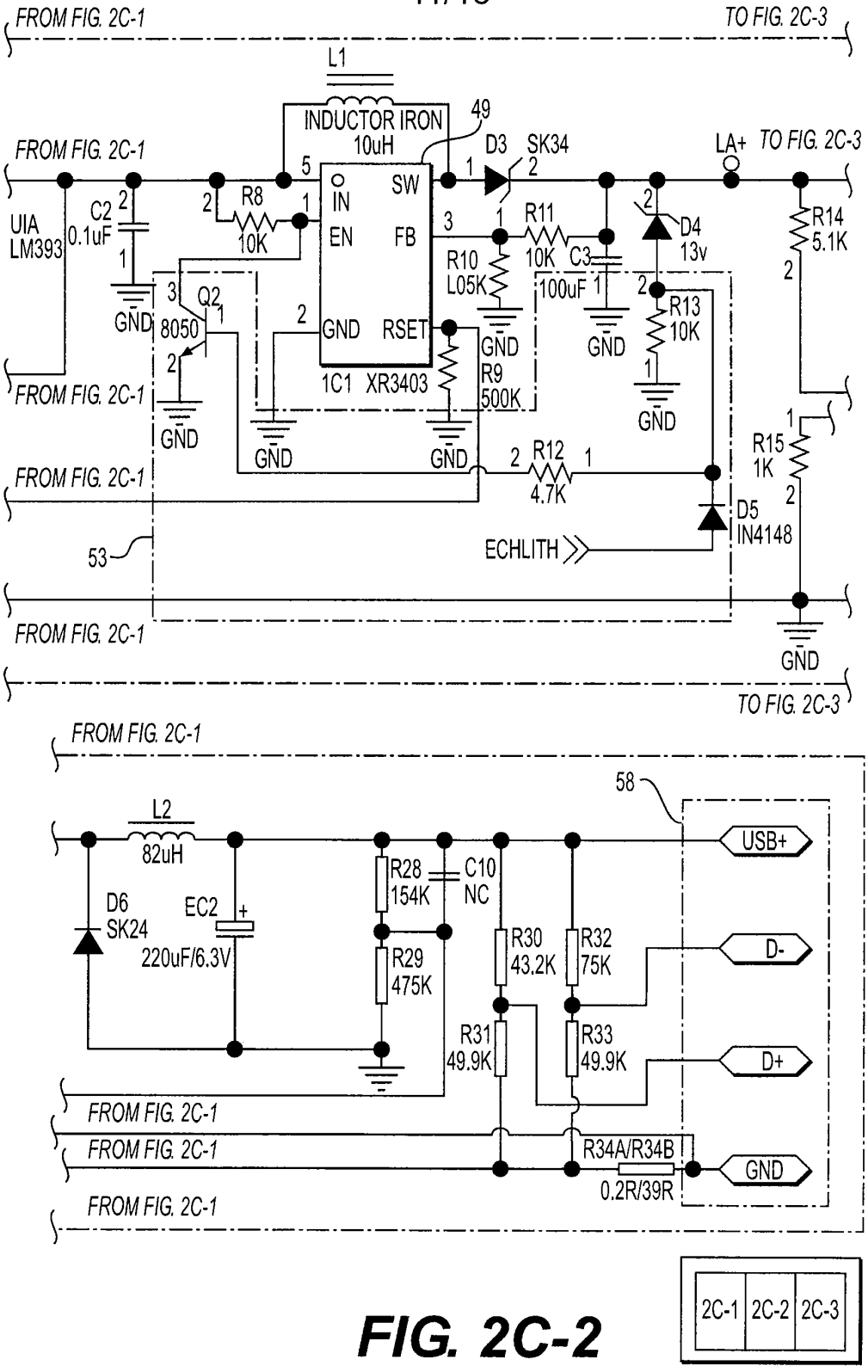
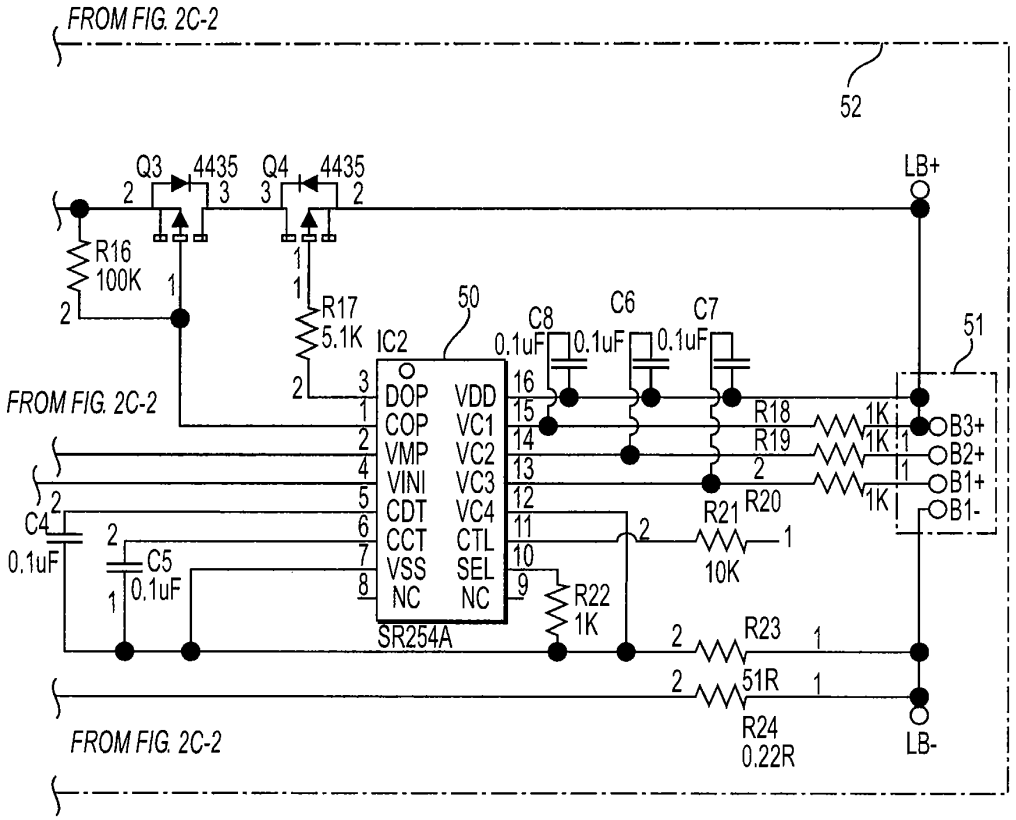


FIG. 2C-2

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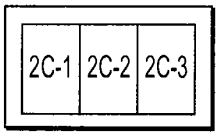


FIG. 2C-3

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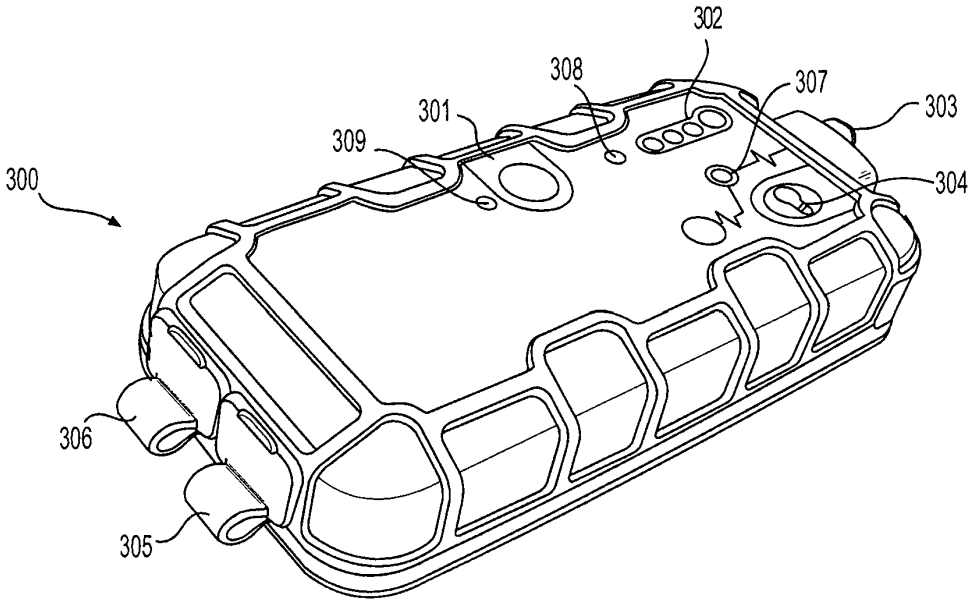


FIG. 3

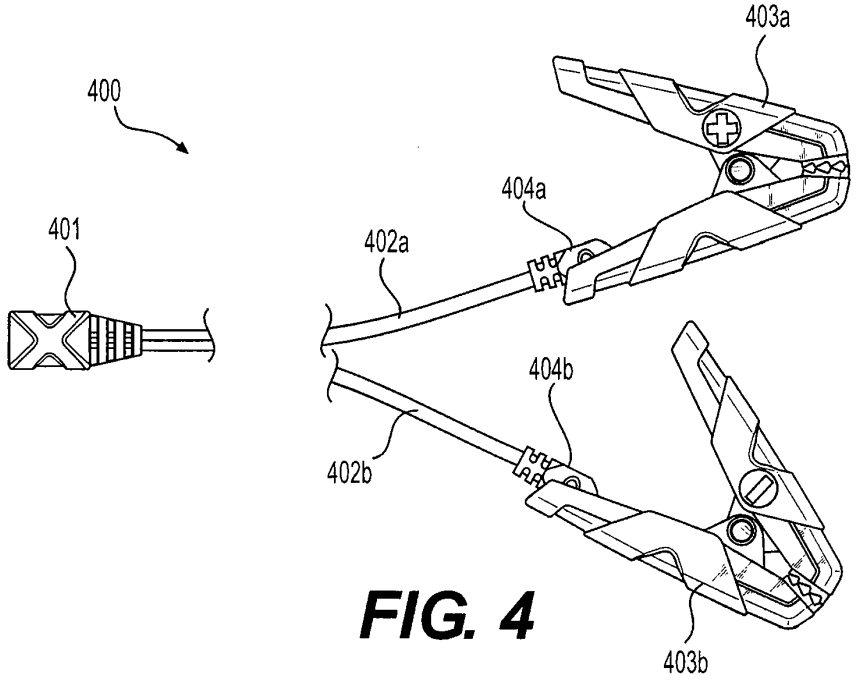


FIG. 4

Espacenet

AU6997198A Portable booster battery

Applicants: CLORE AUTOMOTIVE LLC

Inventors: ROZON LUC

Classifications:

IPC ***B60R16/04; H01M10/46; H01M10/48; H01M2/02; H01M2/10; H01M2/22;*** *H01M2/20; H01M6/50; H02J7/00;* (IPC1-7): H01M10/46; H01M2/10;

CPC **B60R16/04 (EP,US); H01M10/46 (EP,US); H01M50/20 (EP,US);** H01M50/50 (EP,US); H01M6/5044 (EP,US); H02J7/342 (EP,US); Y02E60/10 (EP); Y02P70/50 (EP);

Priorities: AU7851194A 1994-10-25; CA2109166A 1993-10-25

Application: AU6997198A·1998-06-09

Publication: AU6997198A·1998-07-30

Published as: **AU694452B2**; AU6997198A;**AU709769B2**; **AU7851194A**; **CA2109166A1**; **CA2109166C**; **CA2175074A1**; **DE69415922T2**; **DE9422177U1**; **EP0651456A1**; **EP0651456B1**; **EP0911902A2**; **EP0911902A3**; **EP0911902B1**; **JP3233363B2**; **JPH09507604A**; **US5589292A**; **WO9512221A1**

Portable booster battery

Abstract

No abstract found. Please consult other publications of this patent family in "Available in", if displayed above.

AU6997198A Portable booster battery

Data originating from sources other than the EPO may not be accurate, complete, or up to date.

4/ P/00/01 1 Regulation 3.2 AUSTRALIA Patents Act 1990 ORIGINAL COMPLETE SPECIFICATION STANDARD PATENT 4SIS I 5, 4 'I SI C C S 9.

SC 4., 9., I 4..

Invention Title: Portable Booster Battery The following statement is a full description of this invention, including the best method of performing it known to me/us:□br/□ tIMM\W ICMt "114% C 1/'1A PORTABLE BOOSTER BATTERY Field of the Invention The present invention relates to batteries and more specifically to batteries that are moved from location to location, to connect to different devices, especially discharged for dead batteries of motor vehicles.

Background of the Invention Most automobiles are presently powered by an internal combustion engine which must be spun up to speed externally before they can operate. The engines are usually spun up to speed by an electric motor that is powered by battery. The As battery is then charged by a generator connected to the engine once the engine is operating or running. The battery is usually able to store enough charge for the periods that the engine is not running in order to start the engine when needed.

When the battery does not have sufficient charge to start the engine, a way must be found to recharge the battery or bypass the battery with a separate charge.

Since very often a discharged battery is caused by an external drain such as leaving the lights on or playing the radio, once the engine is started by either recharging the battery or bypassing it by sending a separate charge the 01automobile will continue to operate properly.

t Since there are many things that will temporally cause a battery to lose its charge, the need to recharge or bypass batteries with separate charges is common. Very often another or booster battery is brought to the vicinity of the dead battery and electrical cables are used to connect the booster battery to the dead battery in parallel in order to recharge and/or bypass the dead battery. This often known as boosting or jump starting the dead battery or engine.

In this method of boosting, the cables are disconnected from the batteries after each use so as to prevent short circuits. This method and structure however, is cumbersome since there are at least two parts and they demand great attention 2since there are 4 connections to make and a bad connection in either one will result in a short circuit or failure to start the engine.

Some manufacturers have tried to resolve the problem by combining the battery and cables in one unit, The problems that have arisen with these units are that the cables which are permanently connected to the battery are always live so they have to be protected as to not touch each other. The amount of amperage available in these batteries is very large and if the cables touch each other it would create a short circuit and damage the cables and batteries. To isolate the live cables, some manufacturers have used protective pouches. These are not practical to use since they are often in the way when trying to boost. Also it is time consuming to put the cables in and out of the pouches.

Other manufacturers have incorporated a male cigar lighter plug at the end of the cables permitting the user to plug this into the female cigar lighter plug of the vehicle. The problem with this unit is that one can only use this tool on vehicles equipped with the female cigar lighter plugs. Also, since the plugs almost always Ip.. have a maximum amperage rating of 30 amps and that most starter motors draw much more than 30 amps, the capacity is not adequate.

Summary and Objects of the Invention V It is any object of the present invention to provide a portable booster battery which can be easily carried to a car with a dead battery and connected to the dead battery of the car in order to provide sufficient charge to start the engine. It is also an object of the present invention to make the portable booster battery easy to use, maintain and safe from electrical short circuits which could damage the battery, the cables and the surrounding environment.

The present invention addresses these objectives by providing a portableI automobile booster including;□br/□ an electrical storage device having a positive terminal and a negative terminal;□br/□ CD/981600086 3 a housing for containing said electrical storage device;□br/□ a first cable having a first end and a second end, the first end connected to the positive terminal of said electrical storage device;□br/□ a second cable having a first end and a second end, the first end connected to the negative terminal of said electrical storage device;□br/□ a first clamp connected to the second end of said first cable, said first clamp including a hand gripping end and a clamping end, said clamping end constructed for electrically connecting said first cable to a positive terminal of an automobile battery, said hand gripping end operable to selectively open and close said clamping end;□br/□ 1se a second clamp connected to the second end of said 15 second cable, said second clamp including a hand gripping end and a clamping end, said clamping end constructed for electrically connecting said second cable to one of a negative terminal of said automobile battery and a ground of an automobile, said hand gripping end operable to selectively open and close said clamping end;□br/□ a first holster connected to said housing and provided for receiving said first clamp; and a second holster connected to said housing and provided for receiving said second clamp.

Preferably the housing includes a plastic material. More preferably the electrical storage device includes a battery. The battery may be a sealed, non-spillable battery. Advantageously, the first holster is pivotably connected to said housing 4with the pivotal connection to the housing being preferably at least 90 degrees.

More advantageously, the first holster includes a bit, and the clamping end of said first clamp is attached to said bit. Also, the first holster may include a cover.

The various features of novelty which characterize the invention are pointed out with particularly in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference is made to the accompanying drawings and descriptive matter in which preferred embodiments of the invention are illustrated.

Brief Description of the Drawings In the drawings:□br/□ Fig 1 is a plan view of an embodiment of the present invention;□br/□ 0 Fig 2 is a partial cross sectional side view according to section line I-11 of Fig 1 and with the holster pivoted approximately 300;□br/□ Fig 3 is a view of the bit means without the cover of the holster and with a portion a 0 *1 #rr" 15 of the housing;□br/□ Fig 4 is a perspective view of another embodiment of the present invention;□br/□ Fig 5 is a view of one recharging plug;□br/□ Fig 6 is a view another recharging plug.

Detailed Description of the Preferred Embodiments Referring to the drawings, in particular Fig 1, the unit comprises of a housing 1 which is preferably made out of plastic. Inside the housing 1 is the electrical storage device which is preferably a sealed non-spillable battery. First and second electrical cables 6 are connected to terminals of the battery inside the housing 1.

The cable 6 extend outside the housing and are preferably held to the housing by Vgrooves 10 when the cables are not in use.

4 4I 4t 4 At the other end of the cable 6 from the battery which is inside the housing 1, are clamp means 7 for electrically connecting the cable to the terminals of a dead battery or portions of an electrical system. As can be seen in the drawings, especially Figs 1 and 2, the housing has a box-like shape. First and second dimensions of the box-like shape are of a size that is roughly or approximately similar to the two largest dimensions of the clamp means 7.

Holster means 4 are preferably positioned on opposite sides of the housing 1. The holster means 4 includes a cover 8 which is rounded at one end and opened at another end 22. The holster means 4 also includes bit means 5 for connecting with the clamp means 7 when the clamps means is inside the holster means 4.

The cover 8 is made of non-electrically conductive material and is preferable that the bit means 5 and the housing 1 are also non-conducting. The holster means 4 is pivotably connected to the housing 1 by at least 900. This allows easier insertion 15 and removal of the clamps means 7 independent of the position of the housing 1.

The bit means 5 is preferably positioned in substantially the middle of the holster with regard to the length of the housing 1.

The unit also can have a recharging connection 12 for charging the energy storage device. Preferably this recharging connection 12 is male cigar lighter plug which can extend from the housing 1 in order to plug into

the cigar lighter receptacle of an automobile. An accessory power connection 11 is also provided for a powering accessories with the unit. This accessory connection 11 is preferably a female cigar lighter receptacle and can be used power such equipment as portable lights, invertors, compressors, vacuum cleaners and refrigerators.

In order to determine the amount of charge in the energy storage device, the present invention has a display means 13 which displays the present charge of the device. The preferred embodiment the display means consists of a test button 14 and indicator lights CD/98160008 6 6 To use the unit, one puts the housing 1 close to the engine one wishes to boost, either on its bottom 3 or on its back side 9. Next one pivots the holster 4 to the desired angle, opens the clamp 7, and removes the clamp 7 from the holster. The positive claim is connected to the positive post of the battery one wishes to boost, the negative clamp is connected to a good ground of the engine. The engine, is then started. To use the booster as a power supply, the male cigar plug of any 12 volt accessory is plugged into the female cigar plug on the unit.

In another embodiment of the present invention, as shown in Fig 4, the recharging connection can also be the same as the accessory connection 11. A special recharging plug 16 as shown in Fig 5, or 17 as shown in Fig 6, is connected to the accessory connection 11. With the recharging plug 16 of Fig 5, one end is plugged Vftllinto the accessory connection 11, and the other end is plug into the female cigar 4..,og lighter receptacle in an automobile. With the recharging plug 17 of Fig 6, the male 4. cigar lighter plug 18 is plugged into the accessory connection 11 and the other end has a wall outlet plug 19 which is plugged into a wall outlet. The embodiment of Fig 4 also has a recharging light 20 indicating that the battery is recharging.

While specific embodiments of the invention have been shown and described in detail to illustrate the application of the principles of the invention, it will be '44C I44tt understood that the invention may be embodied otherwise without departing from such principles.

It will be understood that the invention disclosed and defined herein extends to all alternative combinations of two or more of the individual features mentioned or evident from the text or drawings. All of those different combinations constitute various alternative aspects of the invention.

It will also be understood that where the term "comprises" or its grammatical variants, is employed herein, it is equivalent to the term "includes" and is not to be taken as excluding the presence of other elements or features.

AU6997198A Portable booster battery

Data originating from sources other than the EPO may not be accurate, complete, or up to date.

4 44 t4 4 4 L4,4 414£ '4 a housing for containing said electrical storage device;□br/□ a first cable having a first end and a second end, the first end connected to the positive terminal of said electrical storage device;□br/□ a second cable having a first end and a second end, the first end connected to the negative terminal of said electrical storage device;□br/□ a first clamp connected to the second end of said first cable, said first clamp including a hand gripping end and a clamping end, said clamping end constructed for electrically connecting said first cable to a positive terminal of an automobile battery, said hand gripping end operable to selectively open and close said clamping end;□br/□ a second clamp connected to the second end of said second cable, said second clamp including a hand gripping end and a clamping end, said clamping end constructed for electrically connecting said second cable to one of a negative terminal of said automobile battery and a ground of an automobile, said hand gripping end operable to selectively open and close said clamping end;□br/□ a first holster connected to said housing and provided for receiving said first clamp; and CD/9160008 6 x 'I o FI.ir 444o ro a second holster connected to said housing and receiving said clamp.

2 A portable automobile booster according to claim 1, housing includes a plastic material.

3 A portable automobile booster according to claim 1 wherein the electrical storage device includes a battery.

4 A portable automobile booster according to claim 3, battery includes a sealed, non-spillable battery.

provided for wherein the or claim 2, wherein the A portable automobile booster according to any one of claims 1 to 4, wherein said first holster is pivotably connected to said housing.

6 A portable automobile booster according to claim 5, wherein said first holster is pivotably connected to said housing by at least degrees.

7 A portable automobile booster according to any one of claims 1 to 6, wherein said first holster includes a bit, and the clamping end of said first clamp is attached to said bit.

8 A portable automobile booster according to any one of claims 1 to 7, wherein said first holster includes a cover.

9 A portable automobile booster substantially as hereinbefore described with reference to the accompanying drawings.

CENTURY MFG. CO by their Registered Patent Attorneys FREEHILLS PATENT ATTORNEYS 9 June 1998 CD/9816.

6 ABSTRACT i A portable automobile booster including an electrical storage i device having a positive terminal and a negative terminal; a housing for containing said electrical storage device; a first cable (6) having a first end and a second end, the first end connected to the positive terminal of said electrical storage device; a second cable (6) having a first end and a second end, the first end connected to the negative terminal of said electrical storage device; a first clamp (7) connected to the second end of said first cable said first clamp including a hand gripping end and a clamping end, said clamping end constructed for electrically connecting said first cable to a 1,o ~positive terminal of an automobile battery, said hand gripping end i ooperable to selectively open and close said clamping end; a second i, ;clamp connected to the second end of said second cable .4 o0 i 15 said second clamp including a hand gripping end and a clamping end, said clamping end constructed for electrically connecting said second cable to one of a negative terminal of said automobile battery and a ground of an automobile, said hand gripping end operable to selectively open and close said clamping end; a first holster (4) connected to said housing and provided for receiving said first clamp and a second holster connected to said housing (1) iX", and provided for receiving said second clamp iIi.

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

THE NOCO COMPANY, INC., Plaintiff, v. SHENZHEN DIKA NA'ER E-COMMERCE CO., LTD., Defendant.	Lead Case No. 1:17-cv-02282 Judge Christopher A. Boyko
THE NOCO COMPANY, INC., Plaintiff, v. SHENZHEN CHANGXINYANG TECHNOLOGY CO., LTD., Defendant.	Case No. 1:17-cv-02209 Judge Christopher A. Boyko
THE NOCO COMPANY, INC., Plaintiff, v. SHENZHEN VALUELINK E-COMMERCE CO., LTD., Defendant.	Case No. 1:17-cv-02210 Judge Christopher A. Boyko

DEFENDANTS' AMENDED FINAL INVALIDITY AND UNENFORCEABILITY CONTENTIONS

Pursuant to L.P.R. 3-5, 3-6, 3-10, and the Court's order on September 17, 2019 (Dkt. No. 67), Defendants Shenzhen Dika Na'er E-Commerce Co., Ltd., Shenzhen Changxinyang

DELTRAN EX1002
IPR2024-01219

Technology Co., Ltd., and Shenzhen Valuelink E-Commerce Co., Ltd. (collectively, "Defendants") provides the following amended joint final invalidity and unenforceability contentions with respect to U.S. Patent No. 9,007,015 (the "'015 Patent).

L.P.R. 3-5(a)

Defendants identify the follow prior art reference which anticipate and/or render obvious claims 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21 and 23 of the '015 Patent:

U.S. Patent No. 7,345,450 to Krieger ("Krieger"), issued March 18, 2008.
U.S. Patent No. 9,506,446 to Xinfang ("Xinfang"), issued November 29, 2016.
U.S. Patent No. 6,426,606 to Purkey ("Purkey"), issued July 30, 2002.
U.S. Patent No. 8,072,900 to Brown ("Brown"), issued December 13, 2011.
U.S. Patent No. 9,525,297 to Wang ("Wang'), issued December 20, 2011.
U.S. Patent No. 5,650,974 to Yoshimura ("Yoshimura") issued July 22, 1997.
The Powerall PBJS12000RD Jump Starter ("Powerall Jump Starter"), offered for sale by Gryphon Mobile Electronics at least as early as November 5, 2013.
The Lightning 12V Jump Starter ("Lightning Jump Starter"), offered for sale by Pilot, Inc. at least as early as March 2014.
The L3 Model Jump Starter, offered for sale by Shenzhen Tsevie Company at as early as May 19, 2019.

L.P.R. 3-5(b)

As per L.P.R. 3-5(b), Defendants identify the following claims as being anticipated or rendered obvious by the prior art cited herein, the grounds for which are cited fully in the accompanying exhibits. Claims 1, 2, 3, 9, 10, 12, 13, 14, 15, 17, 21 and 23 are anticipated under 35 U.S.C. § 102 by the Lightning 12V Jump Starter ("Lightning Jump Starter) made and offered for sale by Pilot, Inc. before the effective filing date of the '015 Patent. In the alternative, claims 1, 2, 3, 9, 10, 12, 13, 14, 15, 17, 21 and 23 are rendered obvious under 35. U.S.C. § 103 by the

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Lightning Jump Starter itself or by the Lightning Jump Starter in view of Krieger. Claims Claim 11 is rendered obvious under 35. U.S.C. § 103 by Lightning Jump Starter in view of Xinfang. Claims 19 and 20 are rendered obvious under 35. U.S.C. § 103 by Lightning Jump Starter in view of Purkey. *See* Ex. A. Claims 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 17, 21 and 23 are rendered obvious under 35. U.S.C. § 103 by Krieger in view of Xinfang. Claims 19 and 20 are rendered obvious under 35. U.S.C. § 103 by Krieger in view of Xinfang and Purkey. *See* Ex. B. Claims 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, and 23 are rendered obvious under 35 U.S.C. § 103 by Purkey in view of Xinfang. *See* Ex. C. Claims 1, 2, 3, 10, 11, 12, 13, 14, 15, 20 and 23 are rendered obvious under 35 U.S.C. § 103 by Brown in view of Wang and Xinfang. *See* Ex. D. Claims 1, 2, 3, 9, 10, 12, 13, 14, 15, 17, 19, 20, 21, and 23 are anticipated under 35 U.S.C. § 102 by the Powerall PBJS12000RD. In the alternative, claims 1, 2, 3, 9, 10, 12, 13, 14, 15, 17, 19, 20, 21, and 23 are rendered obvious under 35 U.S.C. § 103 by the Powerall PBJS12000RD. *See* Ex. E. Claims 1, 9, and 17 are obvious under 35 U.S.C. § 103 by Krieger in view of Yoshimura. *See* Ex. F. Claims 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 17, 21 and 23 are rendered obvious under 35. U.S.C. § 103 by Krieger in view of Xinfang and in view of Yoshimura. *See* Ex. G.

L.P.R. 3-5(c)

As per L.P.R. 3-5(c), Defendants hereby produce the attached charts marked Exhibits A – G.

L.P.R. 3-5(d)

Defendants state that claim 3 is invalid as indefinite under 35 U.S.C. § 112(b). In addition, claims 1, 2, 3, 9, 10, 12, 13, 14, 15, 17, 19, 20, 21 and 23 are invalid under 35 U.S.C. § 112(a) as they all fail to meet the written description and enablement requirement. More specifically, the reverse polarity sensor circuitry disclosed in the '015 is erroneous and will not enable a person of

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ordinary skill in the art to practice the disclosed inventions. For example, due to the presence of diode D8, the optocoupler LED 11 of the reverse sensor 10 will provide a "1" or high output signal to the MCU 1 even if the car battery 72 is connected to the handheld booster device with reverse polarity.

L.P.R. 3-5(e)

Defendants do not assert that the '015 Patent is unenforceable at this time. However, Defendants reserve the right to assert such should any facts come to light during the course of discovery.

L.P.R. 3-6(a)

Defendants have produced documents bates labeled DNIC - 000039 through DNIC - 000610. Additional documents have been produced by Pilot, Inc. (bates labeled Pilot_Shen_00000001 through Pilot_Shen_00001441) and Gryphon Mobile Electronics, LLC.

L.P.R. 3-6(b)

Defendants state that they currently have no documents relevant to L.P.R. 3-5(e).

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Dated: September 23, 2019

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Shenzhen Changxinyang Technology Co., Ltd., and
Shenzhen Valuelink E-Commerce Co.

CERTIFICATE OF SERVICE

I hereby certify that all counsel of record are being served today with a copy of this document via electronic mail.

September 23, 2019 */s/ Timothy Wang*
Timothy Wang

DELTRAN EX1002
IPR2024-01219

AO 120 (Rev. 08/10)

TO:	REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK
Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450	

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Northern District of Ohio, Eastern Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
1:19-cv-01855	8/14/2019	for the Northern District of Ohio, Eastern Division

PLAINTIFF	DEFENDANT
The NOCO Company, Inc.	Shenzhen Lianfa Tong Technology Co., Ltd. and Shenzhen Mediatek Tong Technology Co., Ltd.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,007,015	4/14/2015	The NOCO Company
2			
3			
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO:	**Mail Stop 8** **Director of the U.S. Patent and Trademark Office** **P.O. Box 1450** **Alexandria, VA 22313-1450**	**REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK**

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Northern District of Ohio, Eastern Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
1:19-cv-01856	8/14/2019	for the Northern District of Ohio, Eastern Division

PLAINTIFF	DEFENDANT
The NOCO Company, Inc.	Sictec Instruments Company Limited

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,007,015	4/14/2015	The NOCO Company
2			
3			
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

IN THE HIGH COURT OF JUSTICE **HP-2020-000022**
BUSINESS AND PROPERTY COURTS OF ENGLAND AND WALES
INTELLECTUAL PROPERTY LIST (ChD)
PATENTS COURT

B E T W E E N :

THE NOCO COMPANY
(a company incorporated under the laws of Ohio, United States of America)
Claimant

and

RING AUTOMOTIVE LIMITED
Defendant

Annex A to the Grounds of Invalidity

PROJECTA

2 x 22 AMP HOUR HIGH PERFORMANCE

JUMPSTARTER



P/No.s HP2012, HP2200

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IMPORTANT SAFETY INFORMATION

Please read this manual thoroughly before use and store in a safe place for future reference.

WARNINGS

Risk of explosive gas. Working in the vicinity of a lead-acid battery can be dangerous. Batteries release explosive gases during normal operation, charging and while jumpstarting a battery. Before using this jumpstarter, read and follow the instructions carefully. Follow all manufacturer's instructions and warnings of the vehicle's battery and other equipment being used.

Jumpstart lead-acid batteries only. Do not use to jumpstart dry-cell batteries commonly found in household appliances. These batteries may burst and cause injury and/or property damage.

Do not smoke, use matches, use a cigarette lighter, or allow a spark or flame near the battery.

Do not allow metal to come in contact with the battery posts. It may spark or short-circuit the battery and cause an explosion.

Always wear eye protection when operating the jumpstarter

Remove rings, bracelets, necklaces and watches when working with a lead-acid battery.

Contains a sealed non-spillable lead acid battery and must be disposed of properly.

Ensure correct polarity when connecting to vehicle.

Do not submerge jumpstarter in water.

IMPORTANT CHARGING INFORMATION

Charge jumpstarter prior to first use, this may take up to 24 hours.

Fully recharge the jumpstarter after every use and follow charging instructions.

When jumpstarter is not in use ensure jumpstarter is always on charge.

Do not allow jumpstarter to become very flat. If the jumpstarter's battery is below 12.6V in 12V mode or below 25.2V in 24V mode, ensure the jumpstarter is charged immediately.

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FEATURES

ENGINE STARTING CAPABILITIES

HP2012

The HP2012 is suitable for starting 12V vehicles.
12V: Petrol vehicles up to 6 litres and diesel vehicles up to 4.5 litres

HP2200

The HP2200 is suitable for starting both 12V and 24V vehicles.
12V: Petrol vehicles up to 6 litres and diesel vehicles up to 4.5 litres
24V: Petrol & Diesel vehicles up to 7 litres in capacity.

TOTAL SAFEGUARD PROTECTION

POLARITY & SURGE PROTECTION

Prevents sparking from accidental reverse connection, as well as protecting your vehicle from spikes in voltage levels.

CRANKING PROTECTION

Prevents your jumpstarter batteries from being over discharged often caused by over cranking.

DISCHARGE PROTECTION

Discharge protection disconnects power to all 12V accessories when the battery voltage reaches low levels.

UNDER & OVER VOLTAGE PROTECTION

The jumpstarter will deactivate and sound an alarm if connected to a battery of a different voltage to the setting of the jumpstarter, preventing reverse charge and damage to the jumpstarter battery. This feature will also disconnect the jumpstarter if the vehicles alternator is malfunctioning with high voltage.

LCD DIGITAL DISPLAY

The jumpstarter is fitted with an LCD digital display that displays the batteries state of charge, battery voltage mode, correct connection and other warning messages during operation.

HEAVY-DUTY FULLY INSULATED LEADS

Long 1.6m leads allow easy connection to the vehicles battery while the jumpstarter is on the ground. Quality cable ensures optimal performance.

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HIGH PERFORMANCE BATTERY

High quality AGM battery delivers instant starting power to vehicles. Maintenance free and fully sealed battery ensures convenience and safety.

240V AND 12V RECHARGING

4A adaptor allows recharging from a 240 Volt AC outlet.
The DC lead allows charging from either the 12V or 24V accessory socket.

5 STAGE AUTOMATIC CHARGE CONTROL

Both the HP2012 and HP2200 feature in-built 5 stage charge control that delivers a complete and thorough charge to the jumpstarter batteries in both 240VAC and 12/24VDC charge modes. 5 stage charging gives your jumpstarter batteries longer life, better performance and can be left connected permanently without risk of overcharging.

REVERSE POLARITY PROTECTION & ALARM

Prevents sparking from accidental reverse connection. The alarm sounds when the jumpstarter clamps are connected incorrectly.

SURGE PROTECTED

The HP2012/HP2200 features built in surge protection so you can safely jump start vehicles with EFI and computer management systems.

PORTABLE POWER

The accessory socket & heavy duty accessory sockets can be used to power 12 Volt DC appliances such as camping lights, radios, MP3 players and computers.

INBUILT L.E.D WORK LIGHT

An inbuilt L.E.D work light provides illumination for safer, more convenient operation at night.

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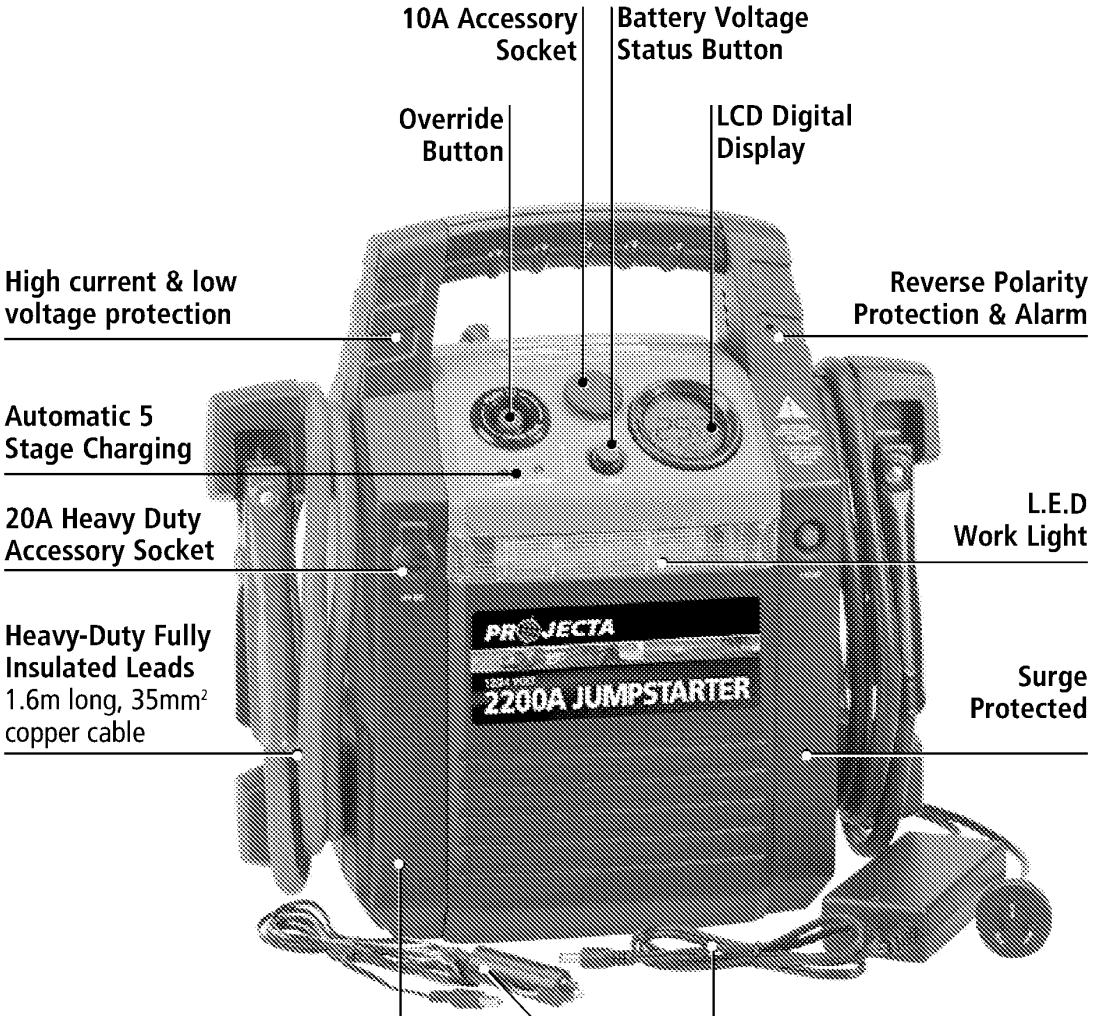
SPECIFICATIONS

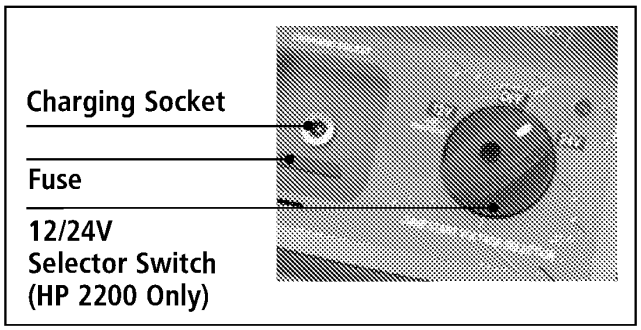
Part No.	HP2012	HP2200
Battery		
Battery Capacity	2 x 12V 22Ah AGM	2 x 12V 22Ah AGM
Battery Short Circuit Current	2000A	2200A at 12V,1100A at 24V
Clamp Output	600A	640A at 12V, 500A at 24V
12V DC Power outlets		
Accessory Socket	10A	10A
Heavy Duty Accessory Socket	20A	20A
Protection	20A overload, 11.0V LVD (25A ATS Fuse)	20A overload, 11.0V LVD (25A ATS Fuse)
Jumpstarter Leads		
Length	1.6 meters	1.6 meters
Cable	35mm2	35mm2
Polarity Protection	MCU controlled solenoid	MCU controlled solenoid
Overload Protection	MCU controlled solenoid	MCU controlled solenoid
Recharging		
240V	4A	4A
DC Charging	12V–24V 4A	12V–24V 4A
Control	Automatic 5 Stage	Automatic 5 Stage
Jumpstart connection voltages		
12V Mode	1.2V–15.0V	1.2V–15.0V
24V Mode	N/A	15.1V–30V
Override	0V–1.2V	0V–1.2V
LCD Display		
Jumpstart Mode	12V	12V & 24V
Jumpstarter Battery Voltage	Battery test button	Battery test button
L.E.D Charge Indication		
Blue	Charging	Charging
Green	Fully Charged	Fully Charged
Dimensions & Weight		
Height	370mm	370mm
Width	390mm	390mm
Depth	200mm	200mm
Weight	16.3Kg	17.5Kg

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PRODUCT OVERVIEW

Image of HP2200 (HP2012 not shown)





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VEHICLE JUMPSTARTING INSTRUCTIONS

NOTE: Instructions for negatively earthed vehicles only

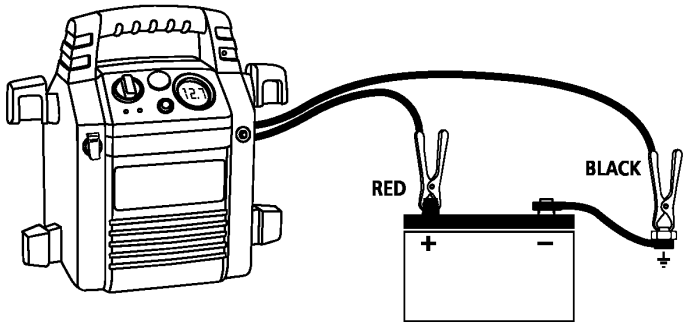
1. Insert supplied fuse into fuse holder below charging socket.
2. Your jumpstarter should be charged for 24 hours prior to first use and as soon as possible after each use.
3. Before making any connections, check the jumpstarter battery status by pressing the red INTERNAL BATTERY STATUS button. The jumpstarter's battery voltage should be above 12.6V in 12V mode and above 25.2V in 24V mode.
4. Turn your vehicle's ignition OFF before connecting the jumpstarter's clamps to your vehicle.

5a. To operate the HP2012 rotate the switch at the back of the unit to ON AND CHARGING. The HP2012 will jumpstart 12V vehicles only.

5b. If operating the HP2200 select the required voltage to suit the vehicle by rotating the switch on the back of the jumpstarter to 12V AND CHARGING or 24V.

6. Connect the Red Positive (+) clamp to the positive (+) terminal of the battery in the vehicle and the Black Negative (-) clamp to any non-moving metal part of the engine block. DO NOT CONNECT TO FUEL LINE. Always double check that you have the proper connections.

   If the jumpstarter fails to start your vehicle refer to the LCD screen for any error it may indicate & check that the clamps are correctly connected with good contact. If the vehicle's battery is below 1.2V ensure all connections are correct and then press the OVER RIDE button to manually engage the jumpstarter.
7. Turn the vehicle's ignition to ON and start the vehicle. After the engine has started, rotate the power switch to the OFF position.
8. Disconnect the Black clamp and then the Red clamp
9. Recharge the jumpstarter.



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UNDERSTANDING YOUR JUMPSTARTER

STATUS	SCREEN DISPLAY	SCREEN ILLUMINATION
Incorrect Battery Voltage	ERR / v24.0* (Scrolling Display) *Example only: Display shows actual battery voltage.	Screen flashing
Reverse Connection	- OR + (+/- Alternating) REV / CON (Scrolling Display)	Screen flashing
Low Battery Voltage **12V Mode:** less than 12.0V **24V Mode:** less than 24.0V	LO / BAT (Scrolling Display)	ON
Low Battery Voltage **Switched Off:** less than 11.5V	LO / BAT (Scrolling Display)	OFF
Input Charge Voltage Above 30.0V	OVL	Screen flashing
Jumpstarter Over Temperature	OL	Screen flashing
Accessories Current Overload	ACC / OL (Scrolling Display)	Screen flashing
Accessories Low Voltage Disconnect (LVD)	ACC / LVO (Scrolling Display)	OFF
Battery Charging Bulk Timed Out	BAT / ERR (Scrolling Display)	Screen flashing
Positive (Red) Clamp Connected	- OR +	ON
Negative (Black) Clamp Connected	- OK +	ON
Jumpstarter Connected	- OK +	ON
Internal Battery Voltage (Battery Status Button)	v 12.8 MODE 12 v	ON
Jumpstarter Mode (When switched to 12V)	MODE 12 v	OFF
Jumpstarter Mode (When switched to 24V, HP2200 only)	MODE 24 v	OFF

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ALARM	REMEDY
Beeping Intermittently	Check voltage of battery being jumpstarted. Ensure the jumpstarter voltage is switched to the same voltage as the vehicle being jumpstarted
Constantly On	Check the jumpstarter clamps are connected correctly to the battery
Beeping Intermittently	Recharge jumpstarter
Beeping Intermittently	Recharge jumpstarter **OR** to override/cancel warning hold the BATTERY STATUS button while the jumpstarter is switched to the off position
OFF	Check input charge voltage is below 30V
OFF	Allow jumpstarter temperature to cool down
Beeping Intermittently	Check current draw of appliance being used
OFF	Recharge jumpstarter or press Override button
OFF	Disconnect any appliance connected to the jumpstarter. If no load is connected to the jumpstarter the batteries may be faulty and require replacing
OFF	No action required
OFF	No action required
OFF	No action required
OFF	No action required
OFF	No action required
OFF	No action required

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CHARGING WITH AC ADAPTOR

IMPORTANT: DO NOT POWER ANY APPLIANCE FROM THE JUMPSTARTER WHILE IT IS BEING CHARGED USING THE AC CHARGER.

1. To charge, rotate the switch on the back of the unit to ON AND CHARGING (HP2012) or 12V AND CHARGING (HP2200).
2. Plug the output end of the AC charger into the charging socket (back of jumpstarter) and connect the charger to a 240VAC outlet and turn ON.
3. The CHARGING LED will illuminate blue when charging & the FULL LED will illuminate solid green when the jumpstarter is fully charged. The jumpstarter will automatically stop charging and the jumpstarter will initiate maintenance charge mode keeping the battery fully charged and ready for use without the risk of overcharging.

   Charging time: 15 hours if the battery is completely flat.

WHEN TO CHARGE

Your jumpstarter is shipped fully charged, however, an extended period of time may elapse in shipment or storage before the jumpstarter is purchased. Therefore you should charge the jumpstarter before using it for the first time. It is recommended to charge fully after each use. If the jumpstarter is not being used, it is recommended to leave the jumpstarter permanently on charge ensuring the battery is always maintained fully charged and ready for use.

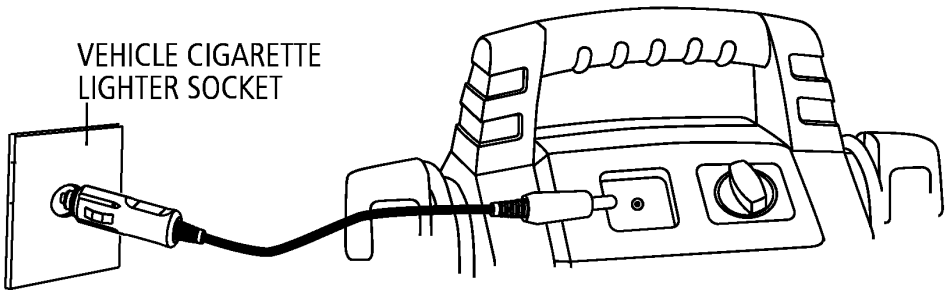
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CHARGING WITH 12V DC

Your Jumpstarter can be recharged from a 12V DC socket. A single-ended accessory plug and lead is included for recharging while driving.

1. To charge, rotate the switch on the back of the unit to ON AND CHARGING (HP2012) and 12V AND CHARGING (HP2200).
2. Connect the 12V charging lead to your vehicles cigarette lighter socket and to the jumpstarter's charging socket.
3. Start the car. The vehicle's alternator will charge both the jumpstarter and the vehicle battery at the same time. The CHARGING LED will illuminate blue while charging and the FULL LED will illuminate solid green when fully charged. The jumpstarter's charge control will automatically stop charging and initiate maintenance mode keeping the battery fully charged and ready for use without risk of overcharging. Once the vehicle is turned off the jumpstarter will stop charging.

   Note: Appliances can be run from the jumpstarter during DC charging, for example a fridge or light.



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L.E.D CHARGE INDICATORS

Your jumpstarter unit features two coloured L.E.D's that illuminate various signals to indicate different stages of charging.

L.E.D	L.E.D SIGNAL & STAGES OF CHARGING				
	Bulk	Absorption	Analysis	Recondition	Float
Charging (Blue)	Solid On ———	Solid On ———	Off	Flashing - - - - -	Off
Charged (Green)	Off	Flashing - - - - -	Flashing - - - - -	Flashing - - - - -	Solid On ———

5 STAGES OF CHARGING:

BULK (CONSTANT CURRENT)

The bulk stage reduces charging time by charging the battery at the maximum rate (constant current) to a set voltage, at which point the battery is approximately 80% charged.

ABSORPTION (CONSTANT VOLTAGE)

The absorption stage charges the battery to 100% by adjusting the charge rate allowing the battery to absorb more power.

ANALYSIS

The analysis mode tests the battery to ensure that it has taken the charge; if the battery passes the test the charger will proceed to the float stage, but if the battery fails the test, the charger will apply a recondition charge to try to return the battery to full charge.

RECONDITION

If after charging, the battery is unable to hold the charge the battery reconditioning function is initiated automatically. This is most likely to take place on batteries that have been deeply discharged, prior to charging.

FLOAT

The float stage maintains the battery at 100% charge without overcharging or damaging the battery. This means the charger can be left connected to the battery indefinitely.

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USING THE PROJECTA HP2012/HP2200 JUMPSTARTER AS A POWER SUPPLY

These jumpstarter's utilise 2 x 22Ah AGM batteries and can be used as a power supply by connecting a cigarette lighter or accessory plug into the 12V DC socket at the front of the jumpstarter.
It is recommended to check the battery capacity before running accessories.

Below is a list of approximate run times for various appliances.

Appliance	Estimated power consumption (Watts)	Estimated time* (Hours)
Car phones, fluorescent lights	4	77
Radios, depth finders	9	54
Fridges (portable compressor style)	14	39
Camcorders, portable TVs	15	31
Electrical tools, bilge pumps	24	18
Cooler/warmers, spotlights	48	8
Air compressors, car vacuum cleaners	80	4

*Estimated time is based on a fully charged jumpstarter

IMPORTANT: OVER CURRENT & LOW VOLTAGE PROTECTION

Over Current Protection: If the power demand on the jumpstarter exceeds 20 Amps an alarm will sound & the power to the appliance will be automatically disconnected. Check the current draw of the appliance connected to the jumpstarter is not greater than 20A.

Low Voltage Protection: If the jumpstarter's battery voltage falls below 11V while running an appliance, the appliance will be automatically disconnected. It is recommended to recharge the jumpstarter immediately. Once the battery voltage reaches 13V the appliance will automatically reconnect.
Note: As a result of the appliance being disconnected the jumpstarter batteries may increase in voltage slightly above 11V. In circumstances where it is essential to keep the appliance running the OVER RIDE button can be pressed allowing you to continue powering the appliance for a short period of time before the 11V disconnect point is reached again.

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CHECKING BATTERY CAPACITY

The jumpstarter is equipped with a LCD DIGITAL DISPLAY. When the BATTERY VOLTAGE STATUS button is pressed the display will indicate the battery voltage level.

To check the battery capacity :

Step 1 Disconnect any appliance and accessories that might be running from the jumpstarter, as this will effect the reading. Ensure the jumpstarter is not being charged.

Step 2 Press the battery voltage button and read the LED voltage display (displayed as volts).

Step 3 Refer to the table below for the conversion of volts to battery capacity as a percentage.

Battery Capacity	Battery voltage reading (12V)	Battery voltage reading (24V)
100%	12.6 Volt or greater	25.2 Volt
75%	12.4 Volt	24.8 Volt
50%	12.2 Volt	24.4 Volt
25%	12.0 Volt	24.0 Volt
0%	11.0 Volt	22.0 Volt

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FREQUENTLY ASKED QUESTIONS

Q. How do I work out how long my appliance will run from the Jumpstarter

A. When the jumpstarter is fully charged the battery will be able to provide 44 Amp hours of 12V power. If you have an appliance that uses 2.5 Amps and you use it for one hour, you have just used 2.5 Amp hours.

For example:-
The jumpstarter is powered by 2 x 22Ah (44Ah) batteries and you are powering a small TV drawing approximately 2.5 Amps

Equation: 44 Amp hours ÷ 2.5 Amps = 17.6 Hours (18 hours)

Q. How can I improve the charging time when charging from my vehicle?

A. Disconnect any appliances connected to the jumpstarter. Car cigarette lighter sockets are usually connected to the battery with small (light) cable. If your jumpstarter is taking longer than 11–13 hours to recharge, the cable between the vehicle's battery and cigarette lighter socket may require upgrading.

Q. When I use the 12 Volt DC sockets the appliance does not work?

A. Check to make sure the appliance does not exceed the rated current of the socket used.

Accessory Socket:	Max 10A
Heavy Duty Accessory Socket:	Max 20A
Maximum Combined Load:	20A

If the load on your jumpstart exceeds 20A the jumpstarter will disengage the power accessories. To restart the jumpstarter and continue powering your appliance press the OVER RIDE button on the front of the jumpstarter.

Q. When I connect the jumpstarter up to the battery the alarm is going off?

A. The jumpstarter is designed to give off an alarm in the following circumstances.

1. If the positive and negative clamps are touching each other.
2. Reverse connection i.e. positive clamp connected to negative terminal or negative clamp connected to positive terminal.
3. If the jumpstarter voltage is different to the vehicle's voltage.
4. Over temperature protection, jumpstarter has reached high operating temperature's. Cease operation of the jumpstarter for 10 minutes to allow the unit to cool down before resuming operation.
5. The battery is very flat & jumpstarter may need recharging.

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Q. Why didn't my jumpstarter start my vehicle?

A. There could be a number of reasons why the jumpstarter did not start your vehicle.

Check the following:

1. Ensure the jumpstarter battery is fully charged. Press the INTERNAL BATTERY STATUS button to check the condition of the battery (state of charge). Refer to page 13 ("Checking Battery Capacity") for further information.
2. Ensure you have followed the correct operating procedure. Refer to page 7 ("Vehicle Jumpstarting Instructions").
3. Ensure the correct voltage is selected on the jumpstarter for the type of vehicle being jumpstarted, 12V mode for 12V vehicles & 24V mode for 24V vehicles (HP2200 Only).
4. The vehicle's battery may be below 1.2V, the minimum start voltage for the jumpstarter. Ensure all connections are correct, then press the OVER RIDE button, to manually activate the jumpstarter. Refer to page 7 ("Vehicle Jumpstarting Instructions, Step 5") for further information.
5. Ensure the vehicle being jumpstarted does not require more than:

   HP2012: 600 Amps Clamp Output

   HP2200: 640 Amps Clamp Output at 12V OR
   500 Amps Clamp Output at 24V.

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WARRANTY STATEMENT

Brown & Watson International Pty Ltd ("BWI") of 1500 Ferntree Gully Road, Knoxfield, Vic., telephone (03) 9730 6000, fax (03) 9730 6050, warrants that all products described in its current catalogue will under normal use and service be free of failures in material and workmanship for a period of one (1) year from the date of the original purchase by the customer as marked on the invoice. This warranty does not cover ordinary wear and tear, abuse, alteration of products or damage caused by the purchaser.

To make a warranty claim the consumer must deliver the product at their cost to the original place of purchase or to any other place which may be nominated by either BWI or the retailer from where the product was bought in order that the warranty assessment may be performed. The consumer must also deliver the original invoice evidencing the date and place of purchase together with an explanation in writing as to the nature of the claim.

In the event that the claim is determined to be for a minor failure of the product then BWI reserves the right to repair or replace it at its discretion. In the event that a major failure is determined the consumer will be entitled to a replacement or a refund as well as compensation for any other reasonably foreseeable loss or damage.

This warranty is in addition to any other rights or remedies that the consumer may have under State or Federal legislation.

IMPORTANT NOTE

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

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TWM417714U – Machine Translation

Title

Multifunctional portable power supply device

Abstract:

A multifunctional portable power supply device, comprising: a control circuit, an accumulator, a USB socket and a power socket; wherein the control circuit is arranged in the body; the accumulator is arranged in the body and connected to the control circuit; the USB socket is set on the main body and is connected to the control circuit. One end of a USB transmission line can be connected to the USB socket and the other end is connected to a solar panel, so that the power generated by the solar panel can be controlled by the control circuit to charge the battery. The power socket is set on the main body and connected to the control circuit. One end of a power cord can be connected to the power socket and the other end is connected to the cigarette lighter socket of a car, so that the control circuit activates the battery to supply power to the car, in order to assist the rescue of starting the car's power supply.

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Description:

[Technical field to which the invention belongs]

[0001] This invention is a multi-functional portable power device, especially an innovative structure that combines a storage device and a control circuit, which can be used as a device to assist in starting car power rescue and outdoor power supply.

[Prior Art]

[0002] During the process of using the car, car drivers will inevitably encounter situations where the car cannot be started. The reason for this is often related to insufficient battery power, and there are several possible reasons, such as forgetting to turn off the car. Lights, the surrounding temperature is too low, the battery itself is too old and ineffective; and when this problem occurs, if the car is parked in a place where the car passes frequently, perhaps the driver can use the battery connection of another car to assist in starting The engine solves the problem; or, if the car happens to be parked near the maintenance yard, it can be repaired by maintenance personnel.

[0003] However, sometimes drivers may encounter difficulties in seeking help (such as late at night, remote areas), and eventually, they

may not be able to drive due to insufficient battery power, which delays the original plan and itinerary, causing great driver Loss.

[Content of the invention]

[0004] In view of the aforementioned shortcomings of the prior art, the inventors, based on their experience in manufacturing various power supply devices and accumulated technologies, carefully studied various solutions to the above-mentioned shortcomings. After continuous research, experimentation and improvement, they finally developed and designed the present invention. The invention of a brand-new multi-functional portable power supply device, intending to eliminate the deficiencies caused by the prior art technology.

[0005] One of the purposes of the present invention is to provide a multifunctional portable power supply device that combines an innovative structure with a storage device and a control circuit, which can be used as a rescue to assist in starting the car's power supply.

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[0006] Another purpose of the present invention is to provide a multifunctional portable power supply device, which combines an innovative structure of a storage device and a control circuit to be used as an outdoor power source.

[0007] According to the above-mentioned purpose, the portable power supply device of this invention is provided with a main body, the main body includes: a control circuit, an accumulator, a USB socket and a power socket; wherein the control circuit is arranged in the main body; the accumulator Set in the main body and connected to the control circuit; the USB socket is set on the main body and connected to the control circuit. One end of a USB transmission line can be connected to the USB socket and the other end is connected to a solar panel to make the solar panel generate electricity. The generated electricity is controlled by the control circuit to charge the battery; the power socket is located on the main body and is connected to the control circuit. One end of the power cord can be connected to the power socket and the other end to a car. On the cigarette lighter socket, the control circuit activates the accumulator to supply power to the car as an aid to start the car's power supply; in this way, when the car driver encounters a situation where the car's battery is insufficient to start the car, he can start the car with the power of the accumulator to achieve the purpose of self-relief.

[0008] In order to facilitate your reviewer to have a further understanding and understanding of the purpose, shape, features and effects of the structure and device of this invention, the examples and diagrams are described in detail as follows:

[Implementation mode]

[0009] This invention is about a "multifunctional portable power device". Please refer to Figures 1, 2 and 3. The portable power device of this invention is provided with a body 10, which includes: a control circuit 11, a battery 12, a USB socket 13, and a power socket 14.

[0010] Wherein, the control circuit 11 is provided in the main body 10.

[0011] The accumulator 12 is arranged in the main body 10 and is connected to the control circuit 11.

[0012] The USB socket 13 is arranged on the main body 10 and is connected to the control circuit 11. One end of a USB transmission line 131 can be connected to the USB socket 13 and the other end is connected to a solar panel 15, so that the solar panel 15 generates electricity. Through the control of the control circuit 11, the accumulator 12 is charged and stored.



[0013] The power socket 14 is arranged on one end of the main body 10 and is connected to the control circuit 11. One end of a power cord 141 is connected to the power socket 14 and the other end is connected to a cigarette lighter socket 16 of a car and the control circuit 11. The starting accumulator 12 supplies power to the car as a rescue to assist in starting the car's power supply.

[0014] In this way, when the car driver encounters a situation where the car battery is insufficient to start, he can start the car with the power of the accumulator 12 of the portable power device of this invention to achieve the purpose of self-relief.

[0015] In addition, the main body 10 is provided with a yellow light 101, a green light 102, and a red light 103. The yellow light 101, the green light 102, and the red light 103 are respectively connected to the control circuit 11. When the control circuit 11 detects the storage device 12 when overcharged, the yellow light 101 is activated to emit a yellow warning light. When the control circuit 11 detects that the storage device 12 is normal, the green light 102 is activated to emit a green normal light. When the control circuit 11 detects the storage device 12 12 when charging is required, the red light 103 is activated to give a red reminder that charging is required.

[0016] The main body 10 is provided with a switch 17 which is connected to the control circuit 11, and the main body can be turned on (ON) and closed (OFF) by manipulating the switch 17 to turn on (ON)/close (OFF) 10 of the operation.

[0017] An LED lamp 18 is provided on one end of the main body 10, and the LED lamp 18 is connected to the control circuit 11. When the main body 10 is turned on (ON), the control circuit 11 can activate

the storage device 12 to supply power to the LED lamp 18. The LED lamp 18 is turned on for illumination. When the main body 10 is turned off (OFF), the LED lamp 18 is turned off (OFF).

[0018] Please refer to FIG. 4, where the bottom of the main body 10 is provided with a mounting hole 104 for mounting a stand 19, so that the main body 10 stands on a flat surface by the support of the stand 19.

[0019] The body 10 is provided with a dustproof switch 20 on one side of the USB socket 13. The dustproof switch 20 has a dustproof cover 21. By pushing the dustproof switch 20, the dustproof cover 21 can cover/leave the USB socket 13, thereby Prevent fine dust particles from falling into the USB socket 13.

[0020] When one end of the power cord 141 is connected to the power socket 14 and the other end is connected to the cigarette lighter socket 16 of the car, the control circuit 11 can stabilize and stabilize the power supply of the car.

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[0021] When one end of the power cord 141 is connected to the power socket 14 and the other end is connected to the cigarette lighter socket 16 of the car, the electric power generated by the power supply equipment of the car can also be used to charge and store the battery 12.

[0022] In addition, one end of a USB transmission line 131 can be connected to the USB socket 13 and the other end can be connected to a portable electronic device (not shown in the figure) (for example: tablet computer, mobile phone, notebook computer... etc.) to control The circuit 11 activates the storage device 12 to supply power to the portable electronic device.

[0023] In summary, the multifunctional portable power supply device created by this invention does have an unprecedented innovative structure. It has not been seen in any publications, and there is no similar product on the market. Therefore, its novelty should be considered. In addition, the unique features and functions of this invention are far from comparable to those of conventional ones, so it is indeed more progressive than conventional ones, and it complies with the requirements of my country's patent law on the requirements for new patent applications. Patent applications are filed in accordance with the law.

[0024] The above are only the best specific embodiments of this invention, but the structural features of this invention are not limited to this. Any change or modification that can be easily thought of by anyone familiar with the art in this invention field can be covered. In the following patent scope of this case.

[Schematic description]

[0043] Figures 1 and 2 are two three-dimensional appearance diagrams of the created multifunctional portable power device.

[0044] Figure 3 is the circuit block diagram of the creative multifunctional portable power supply device.

[0045] Figure 4 is a schematic diagram of the tripod of the creative multifunctional portable power device.

[Description of main component symbols]

[0025] 10 body
[0026] 101 yellow light
[0027] 102 green light
[0028] 103 red light
[0029] 104 mounting holes
[0030] 11 control circuit
[0031] 12 accumulator
[0032] 13 USB socket
[0033] 131 USB cable
[0034] 14 power outlet
[0035] 141 power cable
[0036] 15 solar panels
[0037] 16 car cigarette socket
[0038] 17 switch
[0039] 18 LED lights
[0040] 19 tripod
[0041] 20 dust switch
[0042] 21 dust cover

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Claims:

1. A multifunctional portable power supply device, which is provided with a body, the body includes: a control circuit arranged in the body; an accumulator arranged in the body and connected to the control circuit; and a USB socket arranged in the body it is connected to the control circuit; one end of a USB transmission line is connected to the USB socket and the other end is connected to a solar panel, so that the power generated by the solar panel is controlled by the control circuit to charge and store electricity; a power socket is set on one end of the main body and is connected to the control circuit; one end of a power cord is connected to the power socket and the other end is connected to a cigarette lighter

socket of a car, so that the control circuit activates the battery to supply power to the car, as a rescue aid to start the car power supply.

2. The multifunctional portable power supply device described in item 1 of the scope of patent application, wherein the main body is provided with a yellow light, a green light and a red light, and the yellow light, green light and red light are respectively connected to the control circuit, when the control circuit detects that the storage device is overcharged, it activates the yellow light to emit a yellow warning light, when the control circuit detects that the storage device is normal, it activates the green light to emit a green normal light, when the control circuit detects the When the accumulator needs to be charged, the red light is activated to indicate that it needs to be charged.



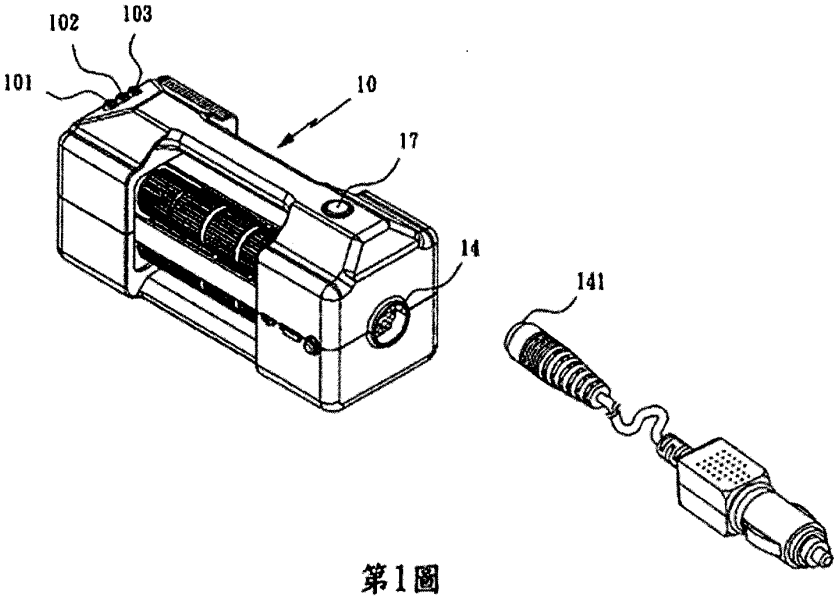
3. The multifunctional portable power supply device described in item 1 of the scope of patent application, wherein a switch is provided on the main body, and the switch is connected with the control circuit, and the switch is turned on (ON)/closed (OFF) by manipulating the switch , to start (ON) and close (OFF) the operation of the main body.

4. The multifunctional portable power supply device described in the first item of the scope of patent application, wherein an LED lamp is provided on one end of the main body, and the LED lamp is connected with the control circuit. When the main body is turned on (ON), the control circuit activates the accumulator to supply power to the LED lamp, so that the LED lamp is lit for illumination.

5. The multifunctional portable power supply device described in item 1 of the scope of patent application, wherein a mounting hole is provided at the bottom of the main body, and the mounting hole is for mounting a tripod.

6. The multifunctional portable power supply device described in item 1 of the scope of patent application, wherein the main body is provided with a dust-proof switch on one side of the USB socket, and the dust-proof switch has a dust-proof cover and a cover for the USB socket.

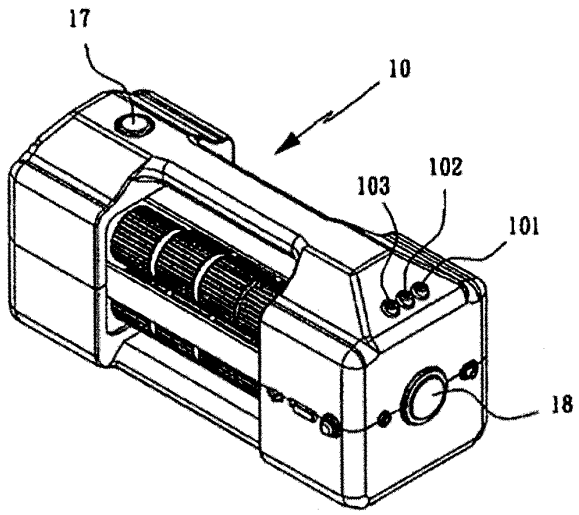
Figures:



第1圖

FIG. 1

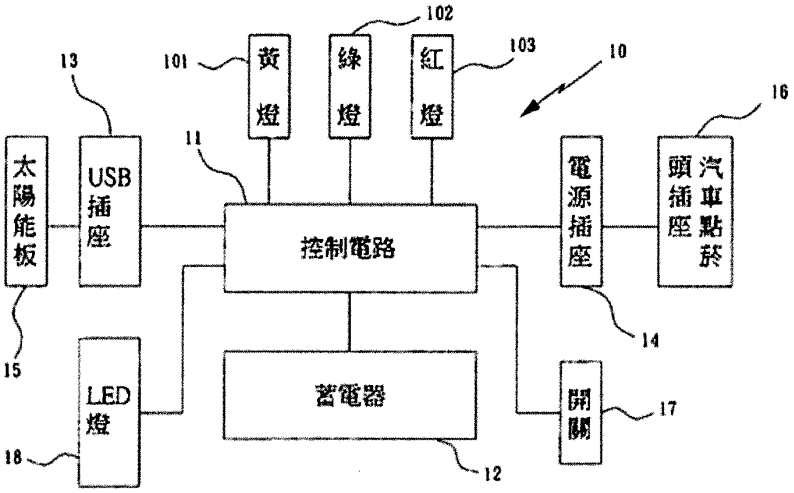
1614848416280115051 10



第2圖

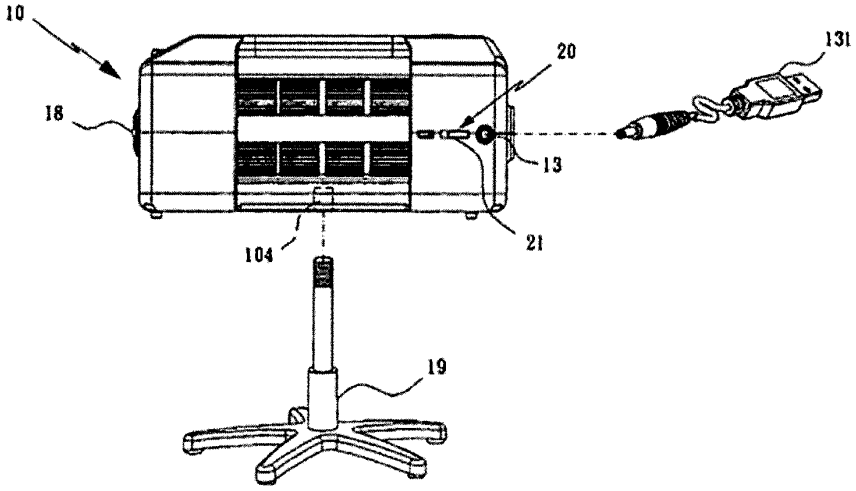
FIG. 2

1614848416280115051110



第3圖

FIG. 3



第4圖

FIG. 4

1614848416280115051110


16148484162801150511O

IN THE UNITED STATES DISTRICT COURT
FOR THE NORTHERN DISTRICT OF OHIO
EASTERN DIVISION

THE NOCO COMPANY, INC., Plaintiff, v. SHENZHEN DIKA NA'ER E-COMMERCE CO., LTD., Defendant.	Lead Case No. 1:17-cv-02282 Judge Christopher A. Boyko
THE NOCO COMPANY, INC., Plaintiff, v. SHENZHEN CHANGXINYANG TECHNOLOGY CO., LTD., Defendant.	Case No. 1:17-cv-02209 Judge Christopher A. Boyko
THE NOCO COMPANY, INC., Plaintiff, v. SHENZHEN VALUELINK E-COMMERCE CO., LTD., Defendant.	Case No. 1:17-cv-02210 Judge Christopher A. Boyko

DEFENDANTS' AMENDED FINAL INVALIDITY AND UNENFORCEABILITY CONTENTIONS

Pursuant to L.P.R. 3-5, 3-6, 3-10, and the Court's order on September 17, 2019 (Dkt. No. 67), Defendants Shenzhen Dika Na'er E-Commerce Co., Ltd., Shenzhen Changxinyang

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Technology Co., Ltd., and Shenzhen Valuelink E-Commerce Co., Ltd. (collectively, "Defendants") provides the following amended joint final invalidity and unenforceability contentions with respect to U.S. Patent No. 9,007,015 (the "'015 Patent).

L.P.R. 3-5(a)

Defendants identify the follow prior art reference which anticipate and/or render obvious claims 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21 and 23 of the '015 Patent:

U.S. Patent No. 7,345,450 to Krieger ("Krieger"), issued March 18, 2008.
U.S. Patent No. 9,506,446 to Xinfang ("Xinfang"), issued November 29, 2016.
U.S. Patent No. 6,426,606 to Purkey ("Purkey"), issued July 30, 2002.
U.S. Patent No. 8,072,900 to Brown ("Brown"), issued December 13, 2011.
U.S. Patent No. 9,525,297 to Wang ("Wang'), issued December 20, 2011.
U.S. Patent No. 5,650,974 to Yoshimura ("Yoshimura") issued July 22, 1997.
The Powerall PBJS12000RD Jump Starter ("Powerall Jump Starter"), offered for sale by Gryphon Mobile Electronics at least as early as November 5, 2013.
The Lightning 12V Jump Starter ("Lightning Jump Starter"), offered for sale by Pilot, Inc. at least as early as March 2014.
The L3 Model Jump Starter, offered for sale by Shenzhen Tsevie Company at as early as May 19, 2019.

L.P.R. 3-5(b)

As per L.P.R. 3-5(b), Defendants identify the following claims as being anticipated or rendered obvious by the prior art cited herein, the grounds for which are cited fully in the accompanying exhibits. Claims 1, 2, 3, 9, 10, 12, 13, 14, 15, 17, 21 and 23 are anticipated under 35 U.S.C. § 102 by the Lightning 12V Jump Starter ("Lightning Jump Starter) made and offered for sale by Pilot, Inc. before the effective filing date of the '015 Patent. In the alternative, claims 1, 2, 3, 9, 10, 12, 13, 14, 15, 17, 21 and 23 are rendered obvious under 35. U.S.C. § 103 by the

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Lightning Jump Starter itself or by the Lightning Jump Starter in view of Krieger. Claims Claim 11 is rendered obvious under 35. U.S.C. § 103 by Lightning Jump Starter in view of Xinfang. Claims 19 and 20 are rendered obvious under 35. U.S.C. § 103 by Lightning Jump Starter in view of Purkey. *See* Ex. A. Claims 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 17, 21 and 23 are rendered obvious under 35. U.S.C. § 103 by Krieger in view of Xinfang. Claims 19 and 20 are rendered obvious under 35. U.S.C. § 103 by Krieger in view of Xinfang and Purkey. *See* Ex. B. Claims 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 17, 19, 20, 21, and 23 are rendered obvious under 35 U.S.C. § 103 by Purkey in view of Xinfang. *See* Ex. C. Claims 1, 2, 3, 10, 11, 12, 13, 14, 15, 20 and 23 are rendered obvious under 35 U.S.C. § 103 by Brown in view of Wang and Xinfang. *See* Ex. D. Claims 1, 2, 3, 9, 10, 12, 13, 14, 15, 17, 19, 20, 21, and 23 are anticipated under 35 U.S.C. § 102 by the Powerall PBJS12000RD. In the alternative, claims 1, 2, 3, 9, 10, 12, 13, 14, 15, 17, 19, 20, 21, and 23 are rendered obvious under 35 U.S.C. § 103 by the Powerall PBJS12000RD. *See* Ex. E. Claims 1, 9, and 17 are obvious under 35 U.S.C. § 103 by Krieger in view of Yoshimura. *See* Ex. F. Claims 1, 2, 3, 9, 10, 11, 12, 13, 14, 15, 17, 21 and 23 are rendered obvious under 35. U.S.C. § 103 by Krieger in view of Xinfang and in view of Yoshimura. *See* Ex. G.

L.P.R. 3-5(c)

As per L.P.R. 3-5(c), Defendants hereby produce the attached charts marked Exhibits A – G.

L.P.R. 3-5(d)

Defendants state that claim 3 is invalid as indefinite under 35 U.S.C. § 112(b). In addition, claims 1, 2, 3, 9, 10, 12, 13, 14, 15, 17, 19, 20, 21 and 23 are invalid under 35 U.S.C. § 112(a) as they all fail to meet the written description and enablement requirement. More specifically, the reverse polarity sensor circuitry disclosed in the '015 is erroneous and will not enable a person of

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ordinary skill in the art to practice the disclosed inventions. For example, due to the presence of diode D8, the optocoupler LED 11 of the reverse sensor 10 will provide a "1" or high output signal to the MCU 1 even if the car battery 72 is connected to the handheld booster device with reverse polarity.

L.P.R. 3-5(e)

Defendants do not assert that the '015 Patent is unenforceable at this time. However, Defendants reserve the right to assert such should any facts come to light during the course of discovery.

L.P.R. 3-6(a)

Defendants have produced documents bates labeled DNIC - 000039 through DNIC - 000610. Additional documents have been produced by Pilot, Inc. (bates labeled Pilot_Shen_00000001 through Pilot_Shen_00001441) and Gryphon Mobile Electronics, LLC.

L.P.R. 3-6(b)

Defendants state that they currently have no documents relevant to L.P.R. 3-5(e).

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Dated: September 23, 2019

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Shenzhen Changxinyang Technology Co., Ltd., and
Shenzhen Valuelink E-Commerce Co.

CERTIFICATE OF SERVICE

I hereby certify that all counsel of record are being served today with a copy of this document via electronic mail.

September 23, 2019 */s/ Timothy Wang*
Timothy Wang

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PTO/SB/08a (01-22)
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT
(Not for submission under 37 CFR 1.99)

Application Number	16819831
Filing Date	2020-03-16
First Named Inventor	NOOK
Art Unit	2859
Examiner Name	DIAO
Attorney Docket Number	054985-000055-US-02-01

U.S.PATENTS Remove

Examiner Initial*	Cite No	Patent Number	Kind Code[1]	Issue Date	Name of Patentee or Applicant of cited Document	Pages,Columns,Lines where Relevant Passages or Relevant Figures Appear
	1	5716735		1998-02-10	MUFFOLETTO et al.	
	2	6799993		2004-10-05	KRIEGER	
	3	7015674		2006-03-21	VONDERHAAR	
	4	7017055		2006-03-21	HO	
	5	7893558		2011-02-22	LEE	
	6	7893655		2011-02-22	VESELIC	
	7	9048666		2015-06-02	SU	
	8	9070938		2015-06-30	HASHIMOTO et al.	

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	Art Unit	2859
	Examiner Name	DIAO
	Attorney Docket Number	054985-000055-US-02-01

	9	9537136		2017-01-03	RYU	
	10	9601800		2017-03-21	NAKAMOTO et al.	
	11	9748541		2017-08-29	BURKE	
	12	9748778		2017-08-29	TOYA	
	13	10084173		2018-09-25	HA	
	14	10128483		2018-11-13	LEE	
	15	10218172		2019-02-26	CHEN et al.	
	16	10328808		2019-06-25	NOOK et al.	
	17	10981452		2021-04-20	NOOK et al.	
	18	6822425		2004-11-23	KRIEGER et al.	
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	Attorney Docket Number	054985-000055-US-02-01

	20	8376775		2013-02-19	RINHARDT	
	21	8493021		2013-07-23	RICHARDSON et al.	
	22	6215273		2001-04-10	SHY	
	23	5637978		1997-06-10	KELLETT	
	24	9608294		2017-03-28	KO	
	25	4142771		1979-03-06	BARNES	
	26	7679317		2010-03-16	VASELIC	
	27	8736227		2014-05-27	CHADBOURNE et al.	

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	1	20020155752		2002-10-24	WINKLE et al.	

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	Examiner Name	DIAO
	Attorney Docket Number	054985-000055-US-02-01

	2	20040106038		2004-06-03	SHIMAMURA et al.	
	3	20060071631		2006-04-06	CHEUNG et al.	
	4	20070132537		2007-06-14	OSBUN	
	5	20080157732		2008-07-03	WILLIAMS	
	6	20090026837		2009-01-29	LEE	
	7	20100173182		2010-07-08	BAXTER	
	8	20100052620		2010-03-04	WONG	
	9	20110268996		2011-11-03	LEE	
	10	20110308856		2011-12-22	PARK	
	11	20120187897		2012-07-26	LENK et al.	
	12	20120295150		2012-11-22	GAO et al.	

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	Art Unit	2859
	Examiner Name	DIAO
	Attorney Docket Number	054985-000055-US-02-01

	13	20120270097		2012-10-25	YASUI et al.	
	14	20130154550		2013-06-20	BALMEFRIZOL et al.	
	15	20130295444		2013-11-07	KIM et al.	
	16	20140127550		2014-05-08	ROH et al.	
	17	20150015184		2015-01-15	SU	
	18	20150037662		2015-02-05	PINON et al.	
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	20	20160111914		2016-04-21	WILLARD et al.	
	21	20160155996		2016-06-02	DAI	
	22	20170309872		2017-10-26	KUBOKI et al.	
	23	20180369599		2018-12-27	SMITH	

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	Examiner Name	DIAO
	Attorney Docket Number	054985-000055-US-02-01

	24	20190081472		2019-03-14	GUO et al.	
	25	20160181587		2016-06-23	KOEBLER	
	26	20070132427		2007-06-14	VESELIC	
	27	20090108814		2009-04-30	WILKINS	
	28	20070182363		2007-08-09	YANG	
	29	20130104817		2013-05-02	MILLER	
	30	20140077755		2014-03-20	ZHANG	
	31	20140139175		2014-05-22	GONZALEZ	
	32	20150380697		2015-12-31	OSBORNE et al.	
	33	20080150473		2008-06-26	WISE	
	34	20120038365		2012-02-16	NAGATA et al.	

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	Art Unit	2859
	Examiner Name	DIAO
	Attorney Docket Number	054985-000055-US-02-01

	35	20150222060		2015-08-06	KIM et al.			

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	1	2012/081140	WO	A1	2012-06-21	PANASONIC CORP		
	2	2015/195321	WO	A1	2015-12-23	IOXUS INC		
	3	2 265 267	GB	A	1993-09-22	CYBER ELECTRONICS CO. LTD.		
	4	20 2014 011 413	DE	U1	2020-04-27	NOCO CO	English Abstract from corresponding WO2016003471A1	☓
	5	2003-112586	JP	A	2003-04-15	DENSO CORP	English Abstract attached	☒
	6	2008-146998	JP	A	2008-06-26	NISSAN MOTOR	English Abstract attached	☒
	7	2012-004106	JP	A	2012-01-05	SAMSUNG SDI CO LTD	English Abstract attached	☒
	8	2012-230962	JP	A	2012-11-22	JM ENERGY CORP	English Abstract attached	☒

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	Examiner Name	DIAO
	Attorney Docket Number	054985-000055-US-02-01

	9	2014-523623	JP	A	2014-09-11	LG CHEMICAL LTD	English Abstract from corresponding WO2013015539A1	☒
	10	102447288	CN	A	2012-05-09	SANMENXIA SUDA TRAFFIC ENERGY SAVING TECHNOLOGY CO	English Abstract attached	☒
	11	103715737	CN	A	2014-04-09	UNIV HANGZHOU DIANZI	English Abstract attached	☒
	12	104442429	CN	A	2015-03-25	KE GUOPING	English Abstract attached	☒
	13	1440892	CN	A	2003-09-10	TOYOTA AUTOCAR LTD	English Abstract attached	☒
	14	202058834	CN	U	2011-11-30	HAIRISHENG ELECTRICAL APPLIANCE PRODUCTS SHENZHEN	English Abstract attached	☒
	15	2012/068635	WO	A1	2012-05-31	CLIPSAL AUSTRALIA PTY LTD	publication of AU2011334615	☐
	16	1/2013/500793	PH		2017-01-31	CLIPSAL AUSTRALIA PTY LTD		☐
	17	3182855	JP	U	2013-04-11	ASIA BRIGHT INDUSTRIAL (HONG KONG) CO. LTD		☐
	18	2002141056	JP	A	2002-05-17	YAZAKI CORP	English Abstract attached	☒
	19	102414923	CN	A	2012-04-11	TOYOTA MOTOR CO LTD; YAZAKI CORP	English Abstract attached	☒

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	Examiner Name	DIAO
	Attorney Docket Number	054985-000055-US-02-01

	20	104488111	CN	A	2015-04-01	SK INNOVATION CO LTD	English Abstract attached	☒
	21	2020201223	AU	A1	2020-03-12	NOCO CO		☐

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	1	Copy of Australian Office Action for AU Patent Application No.: AU2020201224, mailed October 26, 2021.	
	2	DECLARATION by Cory Seligman (30 Pages) and ANNEXURE marked CS-1 (137 Pages), in the matter of AU 2019201559 and Opposition by Brown & Watson; 2020-Nov-23	
	3	Copy of Petition for Inter Partes Review of US Patent No. 9007015 for Shenzhen Mediatek Tong Technology v. Noco Company (69 Pages); IPR2020-01387; 2020-Jul-29	
	4	Copy of Petition for Inter Partes Review of US Patent No. 9007015 for Guangdong Boltpower Energy Co., Ltd. v. Noco Company (106 Pages); IPR2021-00309; 2020-Dec-11	
	5	Exhibit 1004 from IPR2021-00309; PTAB Decision Denying Institution of Inter Partes Review of the '015 patent in Case IPR2018-00503	
	6	Exhibit 1016 from IPR2020-01387; The NOCO Company, Inc. v. Shenzhen Lianfa Tong Technology Co. Ltd., et al., Case No. 1:19-cv-01855, (N.D. Ohio) First Amended Complaint for Patent Infringement	

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	First Named Inventor	NOOK
	Art Unit	2859
	Examiner Name	DIAO
	Attorney Docket Number	054985-000055-US-02-01

EXAMINER SIGNATURE			
Examiner Signature		Date Considered	

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through a citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

[1] See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. [2] Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). [3] For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. [4] Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. [5] Applicant is to place a check mark here if English language translation is attached.

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	Filing Date	2020-03-16
	First Named Inventor	NOOK
	Art Unit	2859
	Examiner Name	DIAO
	Attorney Docket Number	054985-000055-US-02-01

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

Signature	/William L. Klima/	Date (YYYY-MM-DD)	2022-05-02
Name/Print	William L. Klima	Registration Number	32422

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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1. The information on this form will be treated confidentially to the extent allowed under the Freedom of Information Act (5 U.S.C. 552) and the Privacy Act (5 U.S.C. 552a). Records from this system of records may be disclosed to the Department of Justice to determine whether the Freedom of Information Act requires disclosure of these record s.

2. A record from this system of records may be disclosed, as a routine use, in the course of presenting evidence to a court, magistrate, or administrative tribunal, including disclosures to opposing counsel in the course of settlement negotiations.

3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.

4. A record in this system of records may be disclosed, as a routine use, to a contractor of the Agency having need for the information in order to perform a contract. Recipients of information shall be required to comply with the requirements of the Privacy Act of 1974, as amended, pursuant to 5 U.S.C. 552a(m).

5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.

6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).

7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.

8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.

9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

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AO 120 (Rev. 08/10)

TO:	**Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450**	**REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK**

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Northern District of Ohio, Eastern Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
1:20-cv-01166	5/28/2020	for the Northern District of Ohio, Eastern Division

PLAINTIFF	DEFENDANT
The NOCO Company, Inc.	Shenzhen Yike Electronics Co., Ltd.

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,007,015	4/14/2015	The NOCO Company, Inc.
2			
3			
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
3		
4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

AO 120 (Rev. 08/10)

TO:	**Mail Stop 8 Director of the U.S. Patent and Trademark Office P.O. Box 1450 Alexandria, VA 22313-1450**	**REPORT ON THE FILING OR DETERMINATION OF AN ACTION REGARDING A PATENT OR TRADEMARK**

In Compliance with 35 U.S.C. § 290 and/or 15 U.S.C. § 1116 you are hereby advised that a court action has been filed in the U.S. District Court for the Northern District of Ohio, Eastern Division on the following

☐ Trademarks or ☑ Patents. (☐ the patent action involves 35 U.S.C. § 292.):

DOCKET NO.	DATE FILED	U.S. DISTRICT COURT
1:20-cv-01173	5/28/2020	for the Northern District of Ohio, Eastern Division

PLAINTIFF	DEFENDANT
The NOCO Company, Inc.	Nice Team Enterprise Limited

	PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1	9,007,015	4/14/2015	The NOCO Company, Inc.
2			
3			
4			
5			

In the above—entitled case, the following patent(s)/ trademark(s) have been included:

DATE INCLUDED	INCLUDED BY ☐ Amendment ☐ Answer ☐ Cross Bill ☐ Other Pleading	
PATENT OR TRADEMARK NO.	DATE OF PATENT OR TRADEMARK	HOLDER OF PATENT OR TRADEMARK
1		
2		
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4		
5		

In the above—entitled case, the following decision has been rendered or judgement issued:

DECISION/JUDGEMENT

CLERK	(BY) DEPUTY CLERK	DATE

Copy 1—Upon initiation of action, mail this copy to Director Copy 3—Upon termination of action, mail this copy to Director
Copy 2—Upon filing document adding patent(s), mail this copy to Director Copy 4—Case file copy

IN THE UNITED STATES DISTRICT COURT
FOR THE MIDDLE DISTRICT OF FLORIDA
ORLANDO DIVISION

THE NOCO COMPANY, an Ohio corporation, Plaintiff, v. DELTONA TRANSFORMER CORPORATION, a Florida Corporation. and DELTRAN USA, LLC, a Florida Limited Liability Company Defendants.	Case 6:20-cv-00050-PGB-GJK

DEFENDANT DELTONA TRANSFORMER CORPORATION'S INVALIDITY CONTENTIONS

Defendant Deltona Transformer Corporation ("DTC") submits its Invalidity Contentions ("Invalidity Contentions") with respect to United States Patent No. 9,007,015 ("the '015 Patent"). Pursuant to the Case Management and Scheduling Order in this action (Doc. 30 at 3-4) and this Court's order dated May 7, 2020 (Doc. 38), DTC's "Disclosure of Non-Infringement and Invalidity Contentions" are due no later than May 13, 2020. This document contains DTC's Invalidity Contentions. The Non-Infringement Contentions are contained in a separate document served herewith.

On April 6, 2020, Plaintiff The NOCO Company, Inc. ("NOCO" or "Plaintiff") served its Disclosure of Infringement Contentions ("Infringement Contentions"). In those contentions,

NOCO asserted infringement of claims 1-3, 9-13, 15, 17, and 19 of the '015 Patent (the "Asserted Claims").

The Asserted Claims are invalid because they are anticipated or rendered obvious under 35 U.S.C. §§ 102 and 103; are not enabled and/or lack written description under 35 U.S.C. § 112(a); and/or are indefinite under 35 U.S.C. § 112(b).

These Invalidity Contentions reflect DTC's knowledge, thinking, and contentions as of the date of service. The disclosures are based upon DTC's current knowledge, information, or belief. Discovery and DTC's search for prior art are ongoing and are expected to include additional patents and printed publications as well as prior art products, some details of which are in the possession, custody, and control of Plaintiff and third parties. Expert discovery has not yet begun. Furthermore, DTC has received limited documents from NOCO and minimal third-party discovery. Additionally, to the extent the Court's claim construction renders additional prior art relevant to invalidity, DTC reserves the right to supplement these contentions.

The parties have not exchanged proposed claim constructions, and the Court has not issued a claim construction ruling. DTC's contentions are based in part on the implied claim constructions in NOCO's Infringement Contentions against DTC. DTC's reliance on NOCO's Infringement Contentions does not mean that DTC agrees with NOCO's contentions or implied constructions. Rather, DTC has attempted to disclose the invalidating prior art and other grounds for invalidity of which they are currently aware based on their understanding of the scope of NOCO's contentions. Nothing in DTC's Invalidity Contentions should be presumed to represent DTC's position regarding the construction of any claim terms except to the extent

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the terms identified as indefinite are not capable of construction. DTC's positions in its Invalidity Contentions do not constitute any concession by DTC for purposes of infringement. *See, e.g.*, *Vanmoor v. Wal-Mart Stores, Inc.*, 201 F.3d 1363, 1366 (Fed. Cir. 2000).

In addition, DTC's identification of prior art disclosures that anticipate or render obvious a particular claim limitation is not an admission that the claim limitation satisfies the requirements of 35 U.S.C. § 112. Where DTC asserts that an asserted claim is invalid under 35 U.S.C. § 112, DTC nonetheless has provided prior art disclosures that anticipate or render obvious the Asserted Claim on the assumption that NOCO will contend the claim is definite.

DTC reserves the right to present additional items of prior art under 35 U.S.C. § 102, or § 103 located during the course of discovery or further investigation. In addition, DTC reserves the right to assert further grounds of invalidity under 35 U.S.C. §§ 102 and 103 to the extent that discovery or further investigation yields information forming the bases for such invalidity. DTC further reserves the right to modify and supplement, without prejudice, their Invalidity Contentions in response to any findings as to the priority date(s) of the Asserted Claims; the Court's construction of the Asserted Claims; positions otherwise taken by NOCO or their expert(s) concerning claim construction, infringement, equivalents, or invalidity issues; or any amendment by NOCO of their Infringement Contentions, in accordance with the Federal Rules of Civil Procedure and other applicable rules and statutes.

I. PRIOR ART

Subject to the reservations above, DTC identifies each item of prior art presently known that anticipates or renders obvious the Asserted Claims. The patents/applications, publications,

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and systems identified are also relevant for their showing of the state of the art and reasons and motivations for making improvements, additions, and combinations.

A. Prior Art Patents

DTC identifies the patents and published applications set forth below as prior art references, each of which anticipates or renders obvious (alone or in combination with other references) one or more of the Asserted Claims of the patents-in-suit under 35 U.S.C. § 102 or § 103. Prior art patents and applications included in these contentions may be related (such as a divisional, continuation, continuation-in-part, parent, or child) to earlier- or later-filed patents or publications, may have counterparts filed in other jurisdictions, or may incorporate (or be incorporated by) other patents or publications by reference. The listed patents and applications are intended to be representative of those other patents or publications to the extent they exist and includes all earlier published and/or filed related and/or incorporated references disclosed in those documents. DTC accordingly reserves the right to modify, amend, or supplement these contentions with those related patents or patent applications, as well as other prior art references, upon further investigation.

Table 1 – Prior Art Patents/Publications

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2015/0137740	Allos	System and Method for Mobile Charging	11/13/2013*	5/21/2015
WO	2012/080996	Tracy	A JUMP STARTER	12/16/2010*	6/21/2012
U.S.	2005/0116688	YIN	Power source with an anti-reverse connection and	11/28/2003*	6/2/2005

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Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
			short circuit protection circuit for starting motor vehicles		
U.S.	2006/0220610	Solberg	Power management controller	4/5/2005	10/5/2006
EP	0 616 409	Herbert	Portable electrical power supply	9/21/1994	9/21/1994
U.S.	2004/0239290	Krieger	Combination jump starter and high frequency charger	3/21/2003*	12/2/2004
U.S.	2003/0141845	Krieger	High frequency battery charger and method of operating same	1/25/2002*	7/31/2003
U.S.	6,822,425	Krieger	High frequency battery charger and method of operating same	1/25/2002*	11/23/2004
U.S.	2014/0368155	Chen	Smart vehicle rescue battery apparatus	6/18/2013	12/18/2014
U.S.	2006/0176011	Lui	Battery charger with polarity switching capability	2/7/2005	8/10/2006
U.S.	2001/0025618	Kelling	Capacitive remote vehicle starter	3/24/2000*	10/4/2001
U.S.	6,679,212	Kelling	Capacitive remote vehicle starter	3/24/2000*	1/20/2004
U.S.	2014/0084844	Weflen	Self-contained automotive battery booster system	9/23/2013*	3/27/2014
U.S.	9,809,183	Weflen	Self-contained automotive battery booster system	9/23/2013*	11/7/2017
U.S.	2004/0150373	Chan	Vehicle jump starter with polarity compensation	1/30/2003	8/5/2004

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2012/0025766	Reade	Charging Apparatus and Portable Power Supply	7/27/2010*	2/2/2012
U.S.	9,153,978	Reade	Charging Apparatus and Portable Power Supply	7/27/2010*	10/6/2015
U.S.	2006/0244412	Bonzer	Automotive jump-starter with polarity detection, current routing circuitry and lighted cable connection pairs	5/2/2005	11/2/2006
U.S.	6,759,833	Chen	Charger capable of switching polarity	5/6/2003	7/6/2004
U.S.	3,590,357	Reid	Battery booster	11/5/1969	6/29/1971
U.S.	5,194,799	Tomant-schger	Booster battery assembly	3/11/1991	3/16/1993
U.S.	2014/0210399	Urschel	Portable electric power source for aircraft	1/25/2013	7/31/2014
U.S.	3,638,108	Channing	Method of testing an automobile battery and electrical system while in circuit, using a booster battery	4/28/1969	1/25/1972
WO	2012/036556	Eidsvig	Device for charging of rechargeable batteries	9/13/2010*	3/22/2012**
U.S.	2015/0306964	Wang	Automobile charger	4/28/2014*	10/29/2015
U.S.	9,525,297	Wang	Automobile charger	4/28/2014*	12/20/2016
WO	2011/113734	Reichow	On-board electrical system for a vehicle	3/13/2010*	9/22/2011**

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	2013/0162029	Reichow	On-board electrical system for a vehicle	3/13/2010*	6/27/2013
U.S.	9,243,601	Reichow	On-board electrical system for a vehicle	3/13/2010*	1/26/2016
U.S.	6,650,086	Chang	Automatic detecting and switching vehicle charger	11/26/2002	11/18/2003
U.S.	6,147,471	Hunter	Single-point direct current connector	10/1/1999	11/14/2000
U.S.	2004/0130298	Krieger	Microprocessor controlled booster apparatus with polarity protection	2/19/2002*	7/8/2004
U.S.	7,345,450	Krieger	Microprocessor controlled booster apparatus with polarity protection	2/19/2002*	3/18/2008
U.S.	2002/0041174	Purkey	Apparatus for providing supplemental power to an electrical system and related methods	10/10/2000*	4/11/2002
U.S.	6,426,606	Purkey	Apparatus for providing supplemental power to an electrical system and related methods	10/10/2000*	7/30/2002
U.S.	6,344,733	Crass	Portable jump-starting battery pack with charge monitoring system	1/31/2000*	2/5/2002
U.S.	5,281,904	Tomkins	Multi mode cordless battery charger	9/29/1992	1/25/1994
U.S.	2015/0054336	Liu	Mobile power bank	8/23/2013*	2/26/2015

Country of Origin	Number	First Named Inventor	Title	Effective Prior Art Date	Issue/ Publication Date
U.S.	9,506,446	Liu	Mobile power bank	8/23/2013*	11/29/2016
WO	2014/106407	Lei	Emergency power source	1/7/2013*	10/7/2014**
U.S.	2015/0340907	Lei	Emergency power source	1/7/2013*	11/26/2014
U.S.	9,954,391	Lei	Emergency power source	1/7/2013*	4/24/2018
U.S.	2008/0143290	Chavakula	Multi-Power Charger and Battery Backup System	12/19/2006	7/19/2008
U.S.	7,893,657	Chavakula	Multi-Power Charger and Battery Backup System	12/19/2006	2/22/2011
U.S.	2011/0175461	Tinaphong	Method and apparatus for harvesting energy	1/7/2010	7/21/2011
U.S.	8,362,745	Tinaphong	Method and apparatus for harvesting energy	1/7/2010	1/29/2013
USB Implementers Forum, Inc.			Battery Charging Specification, Revision 1.1	4/15/2009	4/15/2009

* The date shown is the date the U.S. or WIPO patent document is effective as prior art pursuant to 35 U.S.C. §102(d)(2). The document is also effective as prior art at least as of its actual filing date in the U.S. pursuant to 35 U.S.C. §102(d)(1).

** The date shown is the publication date of the WIPO patent document. The document is also effective as prior art at least as its actual filing date in the U.S. pursuant to 35 U.S.C. §102(d)(1).

C. Prior Art Offered for Sale or Publicly Used or Known

DTC identifies products and systems (collectively "Product Prior Art") that were publicly known, in public use, offered for sale, sold, and/or invented in the U.S. (and not abandoned, suppressed, or concealed) prior to the purported effective filing date of the patents-

in-suit and/or prior to the alleged invention date of the claimed inventions. This Public Prior Art anticipates or renders obvious (alone or in combination with other references) one or more of the Asserted Claims of the patents-in-suit under 35 U.S.C. §§ 102(a), (b), (e), (g), and/or § 103(a).

Most notably, one of the accused products, the Battery Tender® Portable Power Pack, is a private label product based on a lithium ion battery jump starter that was publicly known and used and on sale prior to the priority date of the '015 patent. Accordingly, to the extent that NOCO is able to establish that such product infringes the '015 patent, NOCO admits, as a matter of law, that such product anticipates the '015 patent.

In addition, DTC is currently investigating the dates of conception and reduction to practice of such Public Prior Art and when such Public Prior Art was first known or used by others. There were dozens of portable jump starters on the market prior to the priority date of the '015 patent, and others launched in the United States at approximately the same time as the '015 patent. DTC is still investigating these prior art products and intends to seek third-party discovery as appropriate during the course of this litigation. Additionally, the Court's claim construction may cause additional prior art products to be invalidating. In the course of their investigation, DTC may identify additional prior art documents describing these products and systems that may also anticipate and/or render obvious the one or more Asserted Claims of the patents-in-suit as invalidating printed publications. DTC accordingly reserves the right to modify, amend, or supplement these contentions with those products, as well as other prior art references, upon further investigation. At present, DTC identifies the following products as invalidating prior art.

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Table 2 – Product Prior Art

Item Offered for Sale or Publicly Used or Known	Date Offered for Sale or Became Publicly Used or Known[1]	Identity of Person Offering for Sale or Making Use or Making
MICRO-START/PPS	**As late as July 29, 2013**	**Antigravity Batteries**
E-Power	**As late as April 15, 2013**	**Carku**
Battery Tender Power Pack	**Prior to July 3, 2014**	**Carku/Deltran USA LLC**
PowerAll	**As late as March 26, 2014**	**Gryphon Mobile Electronics LLC**
Electromate 400	**As late as 2013**	**Black & Decker**

[1] DTC will further develop the facts as to the dates these products were offered for sale or became publicly used or known as discovery progresses.

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II. INVALIDITY UNDER 35 U.S.C. §§ 102 AND 103

The '015 Patent also is invalid as anticipated under 35 U.S.C. §§ 102(a), (b), or (e) or rendered obvious under 35 U.S.C. § 103, as set forth below.[2] The '015 Patent, under NOCO's apparent understanding of the Asserted Claims in their Infringement Contentions, generally recite, with regard to claim 1, an apparatus for jump starting a vehicle that includes an internal power supply, an output port, a vehicle battery isolation sensor, a reverse polarity sensor, a power switch, and a microcontroller. *See* '015 Patent at 8:4-37 (claim 1). The vehicle battery isolation sensor is configured to detect the presence of a vehicle battery connected between the positive and negative polarity outputs of the output port. *Id.* at 8:9-12. The reverse polarity sensor is configured to detect the polarity of the vehicle batter and to provide an output signal indicating whether the battery is properly connected with the positive and negative outputs. *Id.* at 8:13-20. The microcontroller is configured to receive signals from the vehicle battery isolation and reverse polarity sensors and to output a signal to the power switch such that the power switch is turned on when the signals indicate the presence of a battery and proper polarity and is turned off when the signals do not indicate the presence of a batter or improper polarity. *Id.* at 8:21-37. The claims dependent on claim 1 recite limitations on the internal power source (claims 2-3), other well-known limitations regarding individual internal components (claims 4-9), USB ports (claims 10-11), various limitations regarding a light source (claims 12-18), a manual override switch (claims 19-20), and cable terminals (claims

[2] To the extent the Court disagrees with DTC's non-infringement, § 112 lack of written description and § 112 indefiniteness positions, the obviousness and anticipation positions, if considered inconsistent, are offered in the alternative.

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21-23). *See Id.* at 8:38-10:22. NOCO did not "invent" any of these features. Rather, the '015 Patent merely combines prior art elements according to known methods to yield predictable results and therefore are invalid for obviousness.

Accordingly, to the extent the references disclosed in Tables 1 and 2 above are found not to anticipate the '015 Patent, they render the Asserted Claims obvious under 35 U.S.C. § 103 either alone or in combination with the knowledge of a person of ordinary skill in the art or each other. It would have been obvious to the person of ordinary skill in the art as of the purported effective filing date of the '015 Patent to combine the various references cited herein so as to practice the Asserted Claims. The prior-art items render the claim obvious because, as discussed above, the missing feature was known to persons skilled in the art in the field at the time, and could have been added by those persons to the device or method disclosed by the prior art, and adding that known feature would yield predictable results, so that the subject matter of the claim as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art. *See KSR Int'l Co. v. Teleflex, Inc.*, 550 U.S. 398 (2007).

The motivation to combine comes from many sources, including the prior art (specific and as a whole), common knowledge, common sense, predictability, expectations, industry trends, design incentives or need, market demand or pressure, market forces, obviousness to try, the nature of the problem faced, or knowledge possessed by a person of ordinary skill. DTC reserves the right to rely on the knowledge of those skilled in the art, the testimony of expert witnesses, or other prior art, to show that it would have been obvious to include the allegedly missing limitation and to explain the motivation to combine the prior art elements.

The combinations that render the Asserted Claim obvious are identified in the claim charts attached as Charts A (publications) and B (products)[3] (collectively, "Invalidity Charts") and listed in Table 4 below. These Invalidity Charts identify where specifically in each item of prior art each element of the Asserted Claims is found. Each Invalidity Chart identifies by citation the disclosures within the prior art reference(s) that teach the relevant claim elements, limitations, or rationale supporting the combination(s). The inclusion of certain exemplary combinations in these Invalidity Charts does not exclude other combinations. The combinations are not meant to be exhaustive. The discussions in the charts are only exemplary and not an exhaustive discussion of everywhere in the cited referenced where the claim element can be found or obviated. DTC contends that it would have been obvious to a person of ordinary skill in the art to combine any of the various references cited herein so as to practice the Asserted Claim. DTC reserves the right to identify additional specific combinations as well as to detail and explain such combinations. DTC further reserves the right to amend or otherwise modify this disclosure if and when further relevant information is provided by NOCO or other circumstances change.

Table 3 – Invalidity Charts

Chart No.	References	§102 or 103
1	U.S. 2015/0137740 Allos and/or WO 2012/080996 Tracy and/or	§102 – claims 1-3, 9-13, 15, 17, and 19

[3] Included in the Products chart are certain documents that also qualify as publications – e.g., brochures, websites, advertisements, etc., and so their inclusion in the products chart should not lead to the inference that they only qualify as "on sale" prior art but rather may also qualify as published or public prior art as well.

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	U.S. 2005/0116688 YIN and/or U.S. 2006/0220610 Solberg and/or EP 0 616 409 Herbert and/or U.S. 2004/0130298 (issued as US 7,345,450) Krieger and/or U.S. 2004/0239290 Krieger and/or U.S. 2003/0141845 Krieger and/or U.S. 2007/0285049 to Krieger and/or U.S. 2014/0368155 Chen and/or U.S. 2006/0176011 Lui and/or U.S. 2001/0025618(issued as US 6,679,212) Kelling and/or U.S. 2014/0084844 (issued as US 9,809,183) Weflen and/or U.S. 2004/0150373 Chan and/or U.S. 2012/0025766 (issued as US 9,153,978) Reade and/or U.S. 2006/0244412 Bonzer and/or U.S. 6,759,833 Chen and/or U.S. 3,590,357 Reid and/or U.S. 5,194,799 Tomantschger and/or U.S. 2014/0210399 Urschel and/or U.S. 3,638,108 Channing and/or WO 2012/036556 Eidsvig and/or U.S. 2015/0306964 (issued as US 9,525,297) Wang and/or WO 2011/113734 (issued as US 9,243,601) Reichow and/or U.S. 6,650,086 Chang and/or U.S. 6,147,471 Hunter and/or U.S. 2002/0041174 (issued as US 6,426,606) Purkey and/or U.S. 6,344,733 Crass and/or U.S. 5,281,904 Tomkins and/or U.S. 2015/0054336 (issued as US 9,506,446) Liu and/or U.S. 2015/0340907 (issued as US 9,954,391) Lei and/or U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula and/or U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong and/or USB Implementers Forum, Inc.	§103 – claims 1-3, 9-13, 15, 17, and 19

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2	Antigravity Batteries MICRO-START/PPS and/or Carku E-Power and/or Deltran Battery Tender Power Pack and/or Gryphon Mobile Electronics LLC PowerAll and/or Black & Decker Electromate 400	§102 – claims 1-3, 9-13, 15, 17, and 19 §103 – claims 1-3, 9-13, 15, 17, and 19
	U.S. 2015/0137740 Allos alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2005/0116688 Yin, U.S. 2004/0239290 Krieger, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1-3, 9, 15, 17, 19 §103 – claims 10-13
	U.S. 2005/0116688 Yin alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of WO 2012/080996 A1 Tracey, U.S. 2005/0116688 Yin, U.S. 2006/0220610 Solberg, EP 0 616 409 Herbert, U.S. 2004/0239290 Krieger, U.S. 2003/0141845 Krieger, U.S. 2004/0130298 (issued as US 7,345,450) Krieger, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 2014/0210399 Urschel, U.S. 3,638,108 Channing, WO 2012/036556 Eidsvig, U.S. 2015/0306964 (issued as US 9,525,297) Wang, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 6,344,733 Crass, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1, 12, 17 §103 – claims 2, 3, 9-11, 13, 15, 19

	U.S. 2006/0220610 Solberg alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of WO 2012/080996 A1 Tracey, U.S. 2005/0116688 Yin, EP 0 616 409 Herbert, U.S. 2004/0239290 Krieger, U.S. 2003/0141845 Krieger, U.S. 2004/0130298 (issued as US 7,345,450) Krieger, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 2014/0210399 Urschel, U.S. 3,638,108 Channing, WO 2012/036556 Eidsvig, U.S. 2015/0306964 (issued as US 9,525,297) Wang, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 6,344,733 Crass, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1, 9, 17, 19 §103 – claims 2, 3, 10-13, 15
	U.S. 2004/0239290 Krieger alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2006/0220610 Solberg, EP 0 616 409 Herbert, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,638,108 Channing, U.S. 2015/0306964 (issued as US 9,525,297) Wang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1, 3, 11, 12, 15, 17, 19 §103 – claims 2, 9, 10-13
	U.S. 2004/0130298 (issued as US 7,345,450) Krieger alone (§102) or in combination (§103) with knowledge	§102 – claims 1, 3, 15, 17

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	of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2005/0116688 Yin, U.S. 2006/0220610 Solberg, EP 0 616 409 Herbert, U.S. 2004/0239290 Krieger, U.S. 2003/0141845 Krieger, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 3,638,108 Channing, U.S. 2015/0306964 (issued as US 9,525,297) Wang, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§103 – claims 2, 9-13, 19
	U.S. 2007/0285049 Krieger alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2005/0116688 Yin, U.S. 2004/0239290 Krieger, U.S. 2006/0244412 Bonzer, U.S. 2014/0210399 Urschel, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1, 3, 9, 10, 15, 17, 19 §103 – claims 2, 11-13
	U.S. 2004/0150373 Chan alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2005/0116688 Yin, U.S. 2006/0220610 Solberg, EP 0 616 409 Herbert, U.S. 2004/0239290 Krieger, U.S. 2003/0141845 Krieger, U.S. 2004/0130298 (issued as US 7,345,450) Krieger, U.S. 2007/0285049 Krieger, U.S. 2001/0025618 (issued as US 6,679,212) Kelling, U.S. 2014/0084844 (issued as	§102 – claim 1 §103 – claims 2, 3, 9-13, 15, 17, 19

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	US 9,809,183) Weflen, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 2014/0210399 Urschel, U.S. 3,638,108 Channing, WO 2012/036556 Eidsvig, U.S. 2015/0306964 (issued as US 9,525,297) Wang, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 6,344,733 Crass, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	
	U.S. 2015/0306964 (issued as US 9,525,297) Wang alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2004/0239290 Krieger, U.S. 2004/0130298 (issued as US 7,345,450) Krieger, U.S. 2007/0285049 Krieger, U.S. 2001/0025618 (issued as US 6,679,212) Kelling, U.S. 2014/0084844 (issued as US 9,809,183) Weflen, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 2006/0244412 Bonzer, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 2014/0210399 Urschel, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2015/0340907 (issued as US 9,954,391) Lei, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	§102 – claims 1, 9, 15 §103 – claims 2, 3, 10-13, 17, 19
	U.S. 2015/0340907 (issued as US 9,954,391) Lei alone (§102) or in combination (§103) with knowledge of a POSA and/or one or more of U.S. 2015/0137740 Allos, WO 2012/080996 A1 Tracey, U.S. 2006/0220610	§102 – claims 1, 2, 9, 12, 13, 15, 17 §103 – claims 3, 10, 11, 19

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	Solberg, U.S. 2004/0239290 Krieger, U.S. 2007/0285049 Krieger, U.S. 2012/0025766 (issued as US 9,153,978) Reade, U.S. 3,590,357 Reid, U.S. 5,194,799 Tomantschger, U.S. 3,638,108 Channing, WO 2011/113734 (issued as US 9,243,601) Reichow, U.S. 6,650,086 Chang, U.S. 2002/0041174 (issued as US 6,426,606) Purkey, U.S. 2015/0054336 (issued as US 9,506,446) Xinfang, U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula, U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong, USB Implementers Forum, Inc., Antigravity Batteries MICRO-START/PPS, Carku E-Power, Deltran Battery Tender Power Pack, Gryphon Mobile Electronics LLC PowerAll, Black & Decker Electromate 400	

While DTC has identified citations in the references for the claim limitations, each and every disclosure of the same limitation in the same reference is not necessarily identified. In an effort to focus the issues, DTC cites only portions of the references, even when a reference may contain additional support for or disclosure of a particular claim element. Where DTC cites a particular figure, table, or image relating to a prior art reference, the citation should be understood to encompass any text referring or relating to the directly cited material, in addition to the directly cited material itself. Similarly, where a cited portion of text refers to a figure, table, or image, the citation should be understood to include the figure as well.

DTC's reference to a prior art apparatus in these contentions should be interpreted as a reference to the product itself and any corresponding patents, publications, or product literature cited in these contentions that relates to the cited apparatus. In addition, DTC may rely on other documents or things that have not yet been located to support their contentions regarding such prior art apparatuses that are referenced in these contentions. Any physical embodiments of

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the references described in the Invalidity Charts that were publicly available during the relevant time period also constitute prior art.

For any claim limitation that NOCO alleges is not disclosed in a particular prior art reference, DTC reserves the right to assert that such limitation is inherent, that the limitation would have been obvious to one of ordinary skill in the art at the relevant time, or that the limitation is disclosed in one or more prior art references that individually or in combination would have rendered the asserted claim obvious.

DTC further reserves the right to identify and rely on additional art or teachings within the cited art. Unless otherwise stated, it should be presumed that DTC intends to rely upon each reference in its entirety to the extent relevant or appropriate, including references cited in or referenced within the prior art identified below.

The prior art references produced by DTC reflect the "state of the art" as of the purported effective filing date of the '015 Patent or the alleged invention date of the Asserted Claims. These references illustrate the scope and content of the prior art, the knowledge of those skilled in the relevant field, as well as the motivations of skilled persons to modify and combine known systems and components during the relevant time period. Persons of ordinary skill in the art read a prior art reference as a whole, and in the context of other publications and literature. Accordingly, DTC may rely on uncited portions of the prior art references and on other publications and expert testimony to provide context, and as aids to understanding and interpreting the portions of references that are cited. DTC may also rely on uncited portions of the prior art references, other publications, and the testimony of experts to establish that a

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person of ordinary skill in the art would have been motivated to modify or combine certain of the cited references so as to render the claims obvious.

III. INVALIDITY BASED ON 35 U.S.C. § 112

The Asserted Claims are invalid under 35 U.S.C. § 112, first paragraph, for lack of written description and/or enablement, and second paragraph, for failing to particularly point out and distinctly claim the subject matter that the applicants regard as their invention. DTC's invalidity contentions under 35 U.S.C. § 112 are set forth below.

In making these contentions, DTC is not necessarily proposing a specific level of ordinary skill in the art, and these contentions are based at least in part on what NOCO may contend is the level of ordinary skill in the art. DTC does not concede that NOCO's contentions as to the level of ordinary skill in the art are proper and may contest any such contentions. DTC further reserve the right to modify and supplement, without prejudice, their Invalidity Contentions in light of positions taken by NOCO or their expert witness(es) concerning claim construction, infringement, equivalents or invalidity issues, or claim construction positions adopted by the Court.

Indefiniteness

The Asserted Claims are invalid as indefinite because they do not "particularly point[] out and distinctly claim[] the subject matter." 35 U.S.C. § 112(b). A patent is indefinite "if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention." *Nautilus, Inc. v. Biosig Instruments, Inc.*, 134 S. Ct. 2120, 2124 (2014).

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For example, the following claim terms are not reasonably certain and are nowhere defined or explained with specificity in the '015 Patent or prosecution history:

Claim	**Element**	**Reason for invalidity under 35 U.S.C. § 112, ¶ 1**
1	vehicle isolation sensor	This term lacks antecedent basis.
1	signals from said sensors	It is not possible to discern with reasonable certainty which signals are referred to because there is no recited signal from the vehicle isolation sensor

As a result, the claims fail to reasonably apprise those skilled in the art as to their scope when read in light of the specification, rendering the limits of the patent unknown.

V. DOCUMENT PRODUCTION

In connection with their disclosure of these contentions, DTC also produces documents.

Dated: May 13, 2020

Respectfully submitted,

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CERTIFICATE OF SERVICE

I HEREBY CERTIFY that on May 13, 2020, a true and correct copy of the foregoing document is being served via e-mail on counsel for Plaintiff, as follows:

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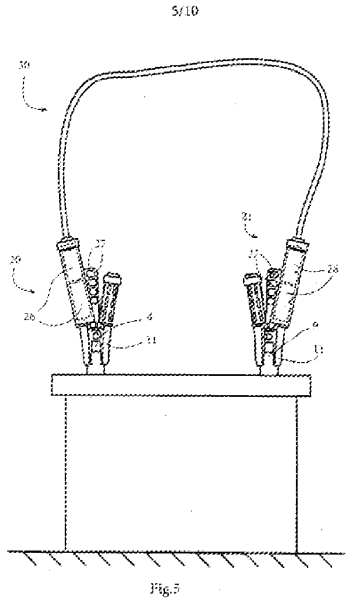
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Exhibit 1. Printed Publications

Claim No.	Claim	Printed Publications
1[PRE]	Apparatus for jump starting a vehicle engine, comprising:	To the extent the preamble is limiting, the following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, the limitation: **<u>WO 2012/080996 A1 to Tracey et al.</u>** Abstract ("A jump starter (1, 30, 50) for a flat battery, such as a vehicle battery…."); 1:7 ("This invention relates to a jump starter system for a battery, especially a vehicle battery."); 2:1-2 ("According to the invention, there is provided a jump starter for a battery such as a vehicle battery…."; 5:7-9 ("Referring to Figs. 1 and 2 there is illustrated a jump starter system 1 according to the invention. The jump starter system comprises a first crocodile clip 2 having a first handle 3 for connection to one terminal 4 of a flat vehicle battery 5."); Figure 2.  5/10 Fig.5

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Claim No.	Claim	Printed Publications
		U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger ¶3 [1:22-25] ("It is well known that when an engine of an automobile is not able to be started due to insufficient electric power, a battery of the automobile can be jump started by power from a battery of another automobile or from a battery in a booster device to thereby start the engine."); ¶9 [2:8-11] ("There is therefore a need for a self-contained jump starter system that can be used as a jump starter, tester, and diagnostic system for a vehicle to assist in performing vehicle diagnostics and minor vehicle repairs."); ¶35 [6:45-47] ("Once a proper polarity connection is made between the batteries, the depleted battery 11 is charged or the vehicle is jump started."); ¶43 [8:40-42] ("Referring now to FIG. 5, an example of a microprocessor controlled jump starter system according to an embodiment of the invention is described. The microprocessor 60 can be programmed to perform essentially all of the control functions needed for operation of the jump starter."); ¶49 [9:47-51] ("The microprocessor 60 may also be used to conduct a test of an alternator of a vehicle. When the alternator of a vehicle is working properly, the voltage level of the depleted battery 11 rises rapidly immediately after the battery is jump-started.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶5 ("Dual-mode battery chargers currently exist. When operated in a first mode, the battery charger delivers a high current output for a short duration of time. This short duration, high current can be used to **jump-start a vehicle with a dead battery**.); ¶22 ("However, the boost circuit is adapted provide a high current that can be used to jump-start a vehicle with a depleted battery."); ¶41 ("The boost circuit 16 is used to provide a high current boost that can be used to jump-start a vehicle with a dead battery."); ¶48 ("Referring again to FIG. 1, boost circuit 16 is now described. Boost circuit 16 provides a high current pulse that can be used to jump-start a dead battery.") **U.S. 2004/0239290 to Krieger**

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Claim No.	Claim	Printed Publications
		Abstract ("A portable jump starter/charger combination includes a housing and a jump starter battery enclosed within the housing for providing a first DC output. A battery charger is also enclosed within the housing and provides a second DC output. A function selector switch has a first input coupled to the first DC output of the jump starter battery, a second input coupled to the second DC output of the charger and an output coupled to battery cables. The function selector switch is operative to selectively connect one of the first and second inputs to the output of the function selector for either jump starting a vehicle with a dead battery or charging the dead battery through the pair of battery cables."); ¶4 ("There are a number of portable jump starters for vehicles having a dead starter battery. Such units provide the ability to jump-start a motor when another vehicle's battery is not available to the motorist. Portable jump starters usually have an internal battery which is used to jump start the vehicle."); ¶24 ("This combination of the functionalities of a jump starter and a charger provides a motorist with the ability, not only to jump-start a vehicle with a dead battery, but also to charge the battery with the same cables used for jump-starting.") **U.S. 2007/0285049 to Krieger** ¶13 ("A **power source 20**, for example a battery, such as a sealed lead acid battery, a nickel cadmium battery, a nickel metal hydride battery or the like, may be disposed in the housing 10 (FIG. 3). The **battery 20** may be adapted to provide DC power for a variety of applications."); ¶17 ("The battery 20 may also be used to provide jumpstarting power for vehicles such as cars, RVs, and the like, which cannot start due to a depleted vehicle battery.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** Abstract ("An apparatus for providing power, the apparatus having a housing; a battery module positioned inside of the housing, the battery module having: a battery, a battery circuit board coupled to the battery and an ignition output port coupled to the battery circuit board; a circuit board positioned inside of the housing

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Claim No.	Claim	Printed Publications
		and coupled to the battery module, the circuit board having: a charge module, a discharge module, a lighting module and a control module coupled to the charge module, the discharge module and the lighting module; a light source coupled to the circuit board; and wherein the apparatus is configured to provide sufficient power to **jump start a vehicle**."); ¶2 [1:19-23] ("The present invention relates to mobile power technology and, more particularly, to a mobile power bank capable of charging electronic devices, jump starting an ignition system of a vehicle with a weak or dead battery, and operating as a flashlight."); ¶6 [1:45-49] ("The present invention according to an embodiment provides a mobile power bank, vehicle ignition system jump starter, and a flashlight. The mobile power bank is capable of jump starting a vehicle by providing power for a vehicle ignition and starter motor."); ¶7 [1:62-63] ("The apparatus is configured to provide sufficient power to jump start a vehicle."); ¶12 [2:65-3:6] ("The apparatus further comprises: a light source coupled to the circuit board; a charging port coupled to the charging module; at least one Universal Serial Bus interface coupled to the discharge module; and a Light Emitting Diode indicator module coupled to the circuit board and configured to indicate a charge level of the battery; wherein the apparatus is configured to provide sufficient power to jump start a vehicle at a voltage higher than about 13.6 volts."); ¶26 [4:5-7] ("If the vehicle battery power is low, the mobile power bank 10 can be used to jump start the ignition.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶5 ("An objective of the present invention is to provide an emergency power source, which is easy to be recharged, to output a high current for starting a vehicle and accurately control the outputting of high current."); ¶7 ("Input terminals of the battery pack are connected to output terminals of a charging circuit and a solar panel input circuit, output terminals of the battery pack are connected to a high current outputting circuit for outputting a high current used for starting a vehicle, and an external smart battery detection system is connected between the battery pack and the high current outputting circuit."); ¶20 ("The emergency power source of the present invention uses lithium-ion batteries as its battery pack, which have

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Claim No.	Claim	Printed Publications
		characteristics of light weight, small size, durability, high instantaneous discharging current and rechargeability, which can meet the demand of high current for starting a vehicle."); ¶26 ("As shown in FIGS. 1 to 3, an emergency power source includes a housing having at its inside a battery pack 4 for storing electric energy. Input terminals of the battery pack 4 are connected to output terminals of a charging circuit 1 and a solar panel input circuit 2, output terminals of the battery pack 4 are connected to a high current outputting circuit 7 for outputting a high current used for starting a vehicle, and an external smart battery detection system 6 is connected between the battery pack 4 and the high current outputting circuit 7."); ¶27 ("The emergency power source uses lithium-ion batteries as its battery pack, which has the characteristics of light weight, small size, durability, high instantaneous discharge current and rechargeability, which is capable of supplying a high current for starting a vehicle."); ¶31 ("The high current outputting circuit 7 has an output voltage of 12V DC or 24V DC, and an instantaneous current ranging from 100 A to 600 A, which can be used as a starting power source for vehicles in emergency.") **U.S. 2005/0116688 to Yin** ¶1 ("The present invention relates to a power source for starting motor vehicles and more particularly pertains to a power source with a circuit for protecting against reverse polarity connection and short circuit of the battery clamps during jump starting of a motor vehicle's engine."); ¶2 ("The present invention relates to a power source for starting motor vehicles and more particularly pertains to a power source with a circuit for protecting against reverse polarity connection and short circuit of the battery clamps during jump starting of a motor vehicle's engine."); ¶19 ("Power source with an anti-reverse connection and short circuit protection circuit for starting motor vehicles according to the present invention is hereinafter described with reference to FIGS. 1 to 3.") **U.S. 2014/0368155 to Chen**

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		¶4 ("The vehicle rescue battery is used to connect to the vehicle battery to start the vehicle engine urgently if the power of the vehicle battery is not enough to start the vehicle engine (for example, the vehicle engine has not been started for a long time)."); ¶17 ("FIG. 1 shows a block diagram of the smart vehicle rescue battery apparatus of the present invention. A smart vehicle rescue battery apparatus 10 is applied to a vehicle battery 20. The smart vehicle rescue battery apparatus 10 is used to connect to the vehicle battery 20 to start a vehicle engine (not shown in FIG. 1) if the power of the vehicle battery 20 is not enough to start the vehicle engine.") **U.S. 2015/0137740 to Allos** ¶10 ("The mobile charging system 100 further includes at least two types of circuits, including a jump start and boost circuit 104, and the charging circuit 106. The jumpstart and boost circuit 104 may be employed to provide an immediate jumpstart to a battery."); *see also* U.S. Provisional Patent Application 61/903,779 at 2-3. **U.S. 2006/0220610 to Solberg** ¶2 ("The inventions relate to charging systems, and more particularly, to energy delivery systems that are capable of delivering current to a vehicle."); ¶5 ("When a battery is dead or weakened, it is sometimes necessary to recharge the battery to a level that can be used to start a vehicle. One common way of recharging a battery is by jumping it with another battery. To jump a battery, a second battery is connected in parallel with the dead or weakened battery."); ¶19 ("A portable charging system is capable of sourcing power to start a vehicle and support other vehicle systems."); ¶44 ("The term charging is intended to broadly encompass mechanisms and methods that source a current and/or voltage that is capable of starting a vehicle as well as other mechanisms and methods that may supplement another power source within or coupled to a vehicle.") The following references also disclose, teach, or suggest this element:

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		EP 0 616 409 to Herbert, e.g., at ¶¶17, 36-37; U.S. 2001/0025618 to Kelling, e.g., at ¶22; U.S. 2014/0084844 to Weflen, e.g., at ¶49; U.S. 2004/0150373 to Chan, e.g., at ¶¶1, 19, 21; U.S. 2006/0244412 to Bonzer, e.g., at ¶4; U.S. 6,759,833 to Chen, e.g., at 1:11-23; U.S. 3,590,357 to Reid, e.g., at 1:4-35; U.S. 5,194,799 to Tomantschger, e.g., at 1:5-21; U.S. 6,650,086 Chang; e.g., at 1:12-19; U.S. 6,147,471 to Hunter, e.g., at 1:62-67; U.S. 2002/0041174 to Purkey, e.g., at ¶46; U.S. 6,344,733 to Crass, e.g., at 2:24-41; U.S. 5,281,904 to Tomkins, e.g., at 2:63-3:7
1[A]	an internal power supply;	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **WO 2012/080996 A1 to Tracey et al.** Abstract ("The clips are interconnected (10, 28, 53) and **on-board starter batteries (15, 26)** are provided along the interconnecting cable (10) and/or at least one of the clips (20, 21). The **on-board starter battery (15, 26)** may comprise a lithium iron phosphate battery.") 2:10-14 ("an **on-board starter battery** means provided along the interconnection means and/or adjacent at least one of the clips"); 5:12-14 ("In the invention there is an **on-board starter battery** which comprises a plurality of interconnected batteries 15 which may be of the lithium iron phosphate type.") **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶28 [5:11-15] ("FIG. 1 illustrates a battery booster device including a polarity protection circuit according to an exemplary embodiment of the invention. A **boosting battery 2** with a positive terminal 4 and a negative terminal 6 is provided in the booster device.") **U.S. 2004/0239290 to Krieger** ¶4 ("There are a number of portable jump starters for vehicles having a dead starter battery. Such units provide the ability to jump-start a motor when another vehicle's battery is not available to the motorist. Portable jump starters usually have an

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		internal battery which is used to jump start the vehicle."); ¶6 ("Further, the known devices do not take advantage of their **internal battery** in addressing other possible needs of a motorist."); ¶8 ("In an exemplary embodiment, a portable jump starter/charger apparatus is provided that comprises: a housing; an **internal battery**, housed inside the housing; a pair of jumper cables coupled to the **internal battery**; and a function selector switch operative to switch between jump starting an external battery with the pair of jumper cables, and charging an external battery with the pair of jumper cables."); ¶17 ("The DC input 302 is coupled to the jump starter circuit 304, and can charge the **internal battery 308** of the jump starter circuit 304 directly. The **internal battery 308** can also be charged by the high frequency charger 306."); ¶18 ("The jump starter circuit of the present invention may include a polarity protection circuit (not shown) that can be electrically coupled to the depleted battery and to the **internal battery 308**. The polarity protection circuit can prevent current flow between the batteries unless a proper polarity connection is achieved, i.e. the positive terminal of the **internal battery** is connected to the positive terminal of the depleted battery and the negative terminal of the **internal battery** is connected to the negative terminal of the depleted battery.") **U.S. 2007/0285049 to Krieger** ¶13 ("A **power source 20**, for example a battery, such as a sealed lead acid battery, a nickel cadmium battery, a nickel metal hydride battery or the like, may be disposed in the housing 10 (FIG. 3). The **battery 20** may be adapted to provide DC power for a variety of applications."); ¶17 ("The battery 20 may also be used to provide jumpstarting power for vehicles such as cars, RVs, and the like, which cannot start due to a depleted vehicle battery.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** Abstract ("An apparatus for providing power, the apparatus having a housing; a battery module positioned inside of the housing, the battery module having: a battery, a battery circuit board coupled to the battery and an ignition output port

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		coupled to the battery circuit board; a circuit board positioned inside of the housing and coupled to the battery module, the circuit board having: a charge module, a discharge module, a lighting module and a control module coupled to the charge module, the discharge module and the lighting module; a light source coupled to the circuit board; and wherein the apparatus is configured to provide sufficient power to jump start a vehicle."); ¶7 [1:50-55] ("Accordingly, the present invention according to an embodiment is directed to an apparatus for providing power comprising: a housing; a battery module positioned inside of the housing, the battery module further comprising: a battery, a battery circuit board coupled to the battery and an ignition output port coupled to the battery circuit board."); ¶27 [4:8-14] ("The mobile power bank 10 includes a housing 12, a control circuit board 14, and a battery module 16. The housing 12 comprises an upper cover 18 and a base cover 20. The upper cover 18 is coupled to the base cover 20 to form an enclosed, storage space. The control circuit board 14 and the battery module 16 may be accommodated and fixed inside the storage space.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶7 ("An emergency power source has a housing. The housing has at its inside a **batter[y] pack** for storing electric energy. Input terminals of the **battery pack** are connected to output terminals of a charging circuit and a solar panel input circuit, output terminals of the **battery pack** are connected to a high current outputting circuit for outputting a high current used for starting a vehicle, and an external smart battery detection system is connected between the **battery pack** and the high current outputting circuit."); ¶8 ("In certain embodiments, the battery pack consists of lithium-ion batteries connected in series or parallel, each battery having a positive electrode made of lithium iron phosphate, lithium cobalt oxide, nickel cobalt manganese ternary lithium or lithium manganate and a negative electrode made of artificial or natural graphite, the output terminal of the battery pack is further connected to a multipath DC-DC voltage regulator circuit and a LED driving circuit, each path of the DC-DC voltage regulator circuit is connected to a MCU controller circuit, and the MCU controller circuit is further connected to a smart LED electric

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		quantity display system for displaying the electric quantity of the emergency power source, an output terminal of the LED driving circuit is connected to a LED lighting lamp, and an equalization protection circuit is connected in parallel with the battery pack for protecting the battery pack."); ¶26 ("As shown in FIGS. 1 to 3, an emergency power source includes a housing having at its inside a **battery pack 4** for storing electric energy. Input terminals of the **battery pack 4** are connected to output terminals of a charging circuit 1 and a solar panel input circuit 2, output terminals of the **battery pack 4** are connected to a high current outputting circuit 7 for outputting a high current used for starting a vehicle, and an external smart battery detection system 6 is connected between the **battery pack 4** and the high current outputting circuit 7.") **U.S. 2005/0116688 to Yin** ¶5 ("To attain this, the power source of the present invention generally comprises a rechargeable battery, a flash light circuit, a positive battery clamp which is connected via a normally open contact relay to the positive terminal of the rechargeable battery, a negative battery clamp which is connected to the negative terminal of the rechargeable battery, and a circuit for protecting against reverse polarity connection and short circuit of the battery clamps …"); ¶20 ("As illustrated in FIG. 1, the power source with an anti-reverse connection and short circuit protection circuit for starting motor vehicles generally comprises a charging circuit, **an internal rechargeable battery B**, a circuit for protecting against reverse polarity connection and short circuit of the battery clamps, a flash light circuit, an electricity testing circuit, an inverting circuit, a fluorescent tube circuit, a light L and an air pump M. Save for the circuit for protecting against reverse polarity connection and short circuit of the battery clamps and the flash light circuit, the other circuits are connected in ways similar to those of the current power sources for starting vehicles in the marketplace."); ¶26 ("The power source provides electric power via the first diode D1 to the first relay JD1, thereby energizing the first relay JD1 and connecting the rechargeable battery B with the vehicle's battery to start the

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		vehicle."); ¶28 ("The rechargeable battery B provides power to the flash light circuit making the light L1 to flash.") **U.S. 2014/0368155 to Chen** ¶7 ("The smart vehicle rescue battery apparatus includes **a battery unit** …"); ¶8 ("Moreover, the battery unit is a storage battery."); ¶18 ("The smart vehicle rescue battery apparatus 10 includes **a battery unit 102** …"); ¶23 ("Moreover, the battery unit 102 is a storage battery.") **U.S. 2015/0137740 to Allos** ¶9 ("Coupled to the housing may be a **rechargeable source of energy 105**, which is in many cases a **plurality of battery cells** which may be charged, e.g., from a wall or other outlet source."); ¶16 ("The batteries may be lead acid, absorption glass mat (AGM), lithium ion, or the equivalent …"); *see also* U.S. Provisional Patent Application 61/903,779 at 1-2. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶5 ("To achieve the purpose described above, the present disclosure provides the following technical solutions: a novel automobile charger comprises a direct current power supply …"); ¶23 ("Refer to FIG. 1, a novel automobile charger comprises a **direct current power supply**, wherein the positive pole of the direct current power supply is connected with one end or lead of the DC to DC module, one end of the battery voltage detection module and one end of the load module simultaneously, while the negative pole of the direct current voltage is connected with the other end of the DC to DC module, one end of the microcontroller, one end of the automobile start control module and the other end of the battery voltage detection module simultaneously.") **U.S. 2006/0220610 to Solberg**

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		¶20 ("…a plurality of **boost modules 108 and 110**."); ¶21 ("The link may connect one or more of the outputs of the **boost modules 108 and 110** to an input of the receiver 120."); ¶24 ("In FIG. 1, the boost modules 108 and 110 are separate active energy storage elements. The energy storage elements may deliver current that is proportional to the rate of change of the voltage they store. A first boost module 108 may deliver a substantially smaller amount of current than the second boost module I 10. When the boost modules 108 and 110 are delivering current during a common time period, some second boost modules 110 may deliver a substantially larger current than some first boost modules 108. In some charging systems, the second boost module 110 delivers a boost current that is almost twice the boost current or greater than twice the boost current delivered by the first boost module 108."); ¶30 ("In FIG. 2, the first and second boost modules 208 and 210 comprise separate active circuit elements (e.g., capacitors or ultra capacitors) that store charge.") The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶¶36-37; U.S. 2006/0176011 to Lui, e.g., at ¶34; U.S. 2001/0025618 to Kelling, e.g., at ¶16; U.S. 2014/0084844 to Weflen, e.g., ¶¶21-22; U.S. 2004/0150373 to Chan, e.g., at ¶17; U.S. 2012/0025766 to Reade, e.g., at ¶¶31-32; U.S. 2006/0244412 to Bonzer, e.g., at ¶21; U.S. 6,759,833 to Chen, e.g., at 2:21-34; U.S. 3,590,357 to Reid, e.g., at 1:36-54; U.S. 5,194,799 to Tomantschger, e.g., at 6:37-55; U.S. 2014/0210399 to Urschel, e.g., at ¶30; U.S. 3,638,108 to Channing, e.g., at 3:25-31; U.S. 6,650,086 Chang; e.g., at 3:16-18; U.S. 6,344,733 to Crass, e.g., at 2:42-58; U.S. 5,281,904 to Tomkins, e.g., at 3:13-25
1[B]	an output port having positive and negative polarity outputs;	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶28 [5:15-21] ("The positive terminal 4 of the boosting battery 2 is coupled to one of a pair of alligator clamps 8, 10 to be connected to a battery to be charged 11

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		(depleted battery) via a wire or battery cable. The negative terminal 6 of the boosting battery 2 is connected to the other of the alligator clamps 8, 10 to be connected to the battery to be charged 11 via a wire or battery cable.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶64 ("Typically, the battery charger includes **a pair of clamps 60, 61** for connection to the positive terminal and the negative terminal, respectively, of the battery to be charged 21. A polarity detection circuit detects the polarity of the connection of **clamps 60, 61** and provides a signal to the microprocessor 50. In response to the signal from polarity detection circuit, the microprocessor controls the operation of the battery charger to supply power to the battery 21 or indicate an incorrect polarity accordingly.") **U.S. 2004/0239290 to Krieger** ¶5 ("However, this patent teaches jumpstarting the vehicle through a set of jumper cables, and charging the dead vehicle battery from a DC output that presumably requires a separate set of cables connected between the DC output and the terminals of the dead battery."); ¶14 ("The jump starter/charger also has two conventional jumper cables, including a positive jumper cable 106 and a negative jumper cable (not visible) in FIG. 1. The positive and negative cables are selectively coupled to the jump starting circuit and the charging circuit.") **U.S. 2007/0285049 to Krieger** ¶16 ("The jump starter therefore may include a set of jumper cables 16 that may be used to connect the battery 20 in the housing 10 to the depleted vehicle battery. Such jumper cables 16 are well known to those of ordinary skill in the art."); ¶17 ("The jumper cables may be detachable from the housing. An end of the jumper cables may include a plug 17 that may be received in the housing 10 to connect the cables to the internal battery 20. At an end of the cables 16 opposite the plug 17

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		there may be a pair of clamps 24 for connecting to the depleted battery. The housing 10 may also include clips or holsters for the jumper cables 16. The housing 10 may also be provided with pins, guides, compartments or the like in order to allow a user to wrap the jump starter cables 16 for storage, thus keeping the cables neat and accessible.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶7 [1:50-55] ("Accordingly, the present invention according to an embodiment is directed to an apparatus for providing power comprising: a housing; a battery module positioned inside of the housing, the battery module further comprising: a battery, a battery circuit board coupled to the battery and **an ignition output port** coupled to the battery circuit board."); ¶8 [1:64-2:4] ("In an embodiment, the **ignition output port** outputs power at a voltage higher than about 13.6 volts. The ignition output port may further comprise a positive and negative barrel jack. The battery may comprise a lithium iron phosphate battery cell or a lithium cobalt oxide battery cell. Optionally, the battery circuit board is configured to boost battery voltage output to the ignition output board to above about 13.6 volts."); ¶11 [2:40-43] ("Optionally, the apparatus further comprises a vehicle ignition cable having a first end coupleable to the ignition output port and a second end coupleable to terminals of a vehicle battery."); ¶13 [3:10-13]("Optionally, the apparatus further comprises a vehicle ignition cable having a first end coupleable to the **ignition output port** and a second end coupleable to terminals of a vehicle battery."); ¶34 [5:6-9] ("In an embodiment, the battery module 16 includes battery cells 42, a battery circuit board 44, an ignition output port 46, and a connecting ribbon cable 48."); ¶38 [5:52-61] ("The output of the battery cell 42 is provided to the vehicle's ignition via a vehicle ignition cable (not shown) coupleable to the ignition output port 46. In an embodiment, the vehicle ignition cable has a first end with a connector configured to fit into the ignition output port 46 and a second end with positive and negative connectors, such as clamps or clips, that are connectable to vehicle battery terminals. **The output port 46 may be a positive and negative barrel socket.** In an embodiment, the mobile power bank of the present invention is

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		provided in a kit with the vehicle ignition cable."); ¶55 [8:49-56] ("In an embodiment, sidewalls of the upper cover 18 have openings adjacent to the flashlight 28, the charging port 34, the USB interfaces 38, 40, the LED indicator module 32, and the ignition output port 46. The openings allow the flashlight 28 and LED indication lights of the LED indicator module 32 to emit light outside of the housing 12 and allow external devices and adaptors access to the charging port 34, the USB interfaces 38, 40 and the ignition output port 46.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶7 ("Input terminals of the battery pack are connected to output terminals of a charging circuit and a solar panel input circuit, output terminals of the battery pack are connected to a high current outputting circuit for outputting a high current used for starting a vehicle, and an external smart battery detection system is connected between the battery pack and the high current outputting circuit."); ¶9 ("In certain embodiments, the external smart battery detection system includes a red power source clip and a black power source clip for connecting with an external battery, a relay switchable between an ON state and an OFF state according to a detection signal, a voltage identifying system for identifying the voltage of an external lead-acid battery or a lithium-ion starting battery, and a current identifying system for identifying a current flowing through an external starting circuit, two terminals of a coil of the relay are connected to the voltage identifying system, an input terminal of the relay is connected to the current identifying system, an output terminal of the relay is connected to the high current outputting circuit, **the red and black power source clips are connected to the positive and negative electrodes of the battery pack** through an reverse-insertion-proof connector or welded wires, the voltage identifying system is connected to the red and black power source clips, the relay is a 12V or 24V relay with a rating current ranging from 20 A to 300 A and 4 to 6 pins, the external smart battery detection system is either disposed outside the emergency power source and connected to the emergency power source through a reverse-insertion-proof connector, or disposed inside the emergency power source while the red and black power source clips is disposed outside the emergency

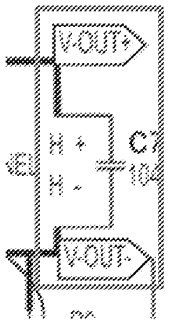
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		power."); ¶26 ("Input terminals of the battery pack 4 are connected to output terminals of a charging circuit 1 and a solar panel input circuit 2, output terminals of the battery pack 4 are connected to a high current outputting circuit 7 for outputting a high current used for starting a vehicle, and an external smart battery detection system 6 is connected between the battery pack 4 and the high current outputting circuit 7."); ¶29 ("The external smart battery detection system 6 includes a red power source clip and a black power source clip for connecting with an external battery, a relay switchable between an ON state and an OFF state according to a detection signal, a voltage identifying system for identifying the voltage of an external lead-acid battery or a lithium-ion starting battery, and a current identifying system for identifying a current flowing through an external starting circuit. The voltage identifying system is connected between two terminals of a coil of the relay, an input terminal of the relay is connected to the current identifying system, an output terminal of the relay is connected to the high current outputting circuit 7, **the red and black power source clips are connected to the battery pack through an anti-reverse connector connected to the positive and negative electrodes of the battery pack 4 or conducting wires welded to the positive and negative electrodes of the battery pack 4**.") **U.S. 2005/0116688 to Yin** ¶2 ("A power source generally comprises a battery and **two battery clamps which are connected to the positive and negative terminals of the battery respectively**."); ¶5 ("… a positive battery clamp which is connected via a normally open contact relay to the positive terminal of the rechargeable battery, a negative battery clamp which is connected to the negative terminal of the rechargeable battery …"); ¶21 ("As illustrated in FIG. 2, the positive terminal of the rechargeable battery B is connected via a normally open contact relay JD1 to one part of the positive battery clamp 1. The negative terminal of the rechargeable battery B is connected to one part of the negative battery clamp."); Figure 3 **U.S. 2014/0368155 to Chen**

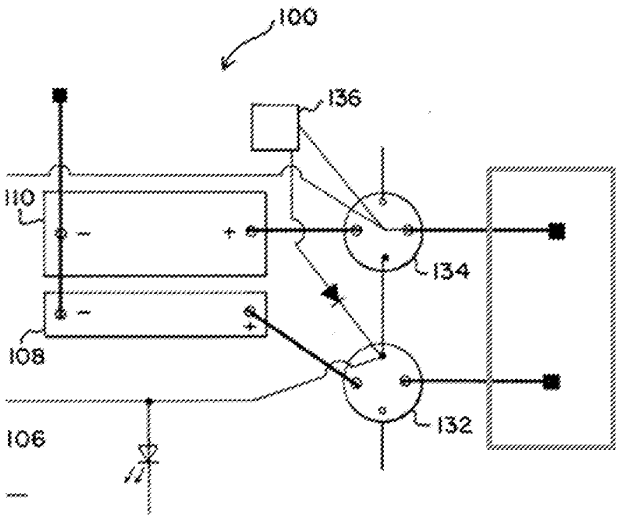
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		¶19 ("The first switch unit 104 is **electrically connected** to the battery unit 102 and the vehicle battery A. The second switch unit 106 is **electrically connected** to the battery unit 102, the first switch unit 104 and **the vehicle battery 20**. The third switch unit 108 is **electrically connected** to the battery unit 102, the first switch unit 104 and the **vehicle battery 2**0. The fourth switch unit 110 is **electrically connected** to the battery unit 102, the second switch unit 106, the third switch unit 108 and the **vehicle battery 20**."); ¶21 ("The control unit 112 is configured to turn on the first switch unit 104 and the fourth switch unit 110 and turn off the second switch unit 106 and the third switch unit 108, when the polarity of a contact connecting the first switch unit 104, the third switch unit 108 and the vehicle battery 20 is judged to be **a positive pole** and when the polarity of a contact connecting the second switch unit 106, the fourth switch unit 110 and the vehicle battery 20 is judged to be **a negative pole**."); ¶22 ("The control unit 112 is configured to turn on the first switch unit 104 and the fourth switch unit 110 and turn off the second switch unit 106 and the third switch unit 108, when the polarity of a contact connecting the first switch unit 104, the third switch unit 108 and the vehicle battery 20 is judged to be **a positive pole** and when the polarity of a contact connecting the second switch unit 106, the fourth switch unit 110 and the vehicle battery 20 is judged to be **a negative pole**.") **U.S. 2015/0137740 to Allos** ¶17 ("The mobile charging system may be connected to the electrical system of that vehicle via battery cables 18 and 19 and clamped onto each terminal of a dead battery."); *see also* U.S. Provisional Patent Application 61/903,779 at 2. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶23 ("Refer to FIG. 1, a novel automobile charger comprises a direct current power supply, wherein the positive pole of the direct current power supply is connected with one end or lead of the DC to DC module, one end of the battery voltage

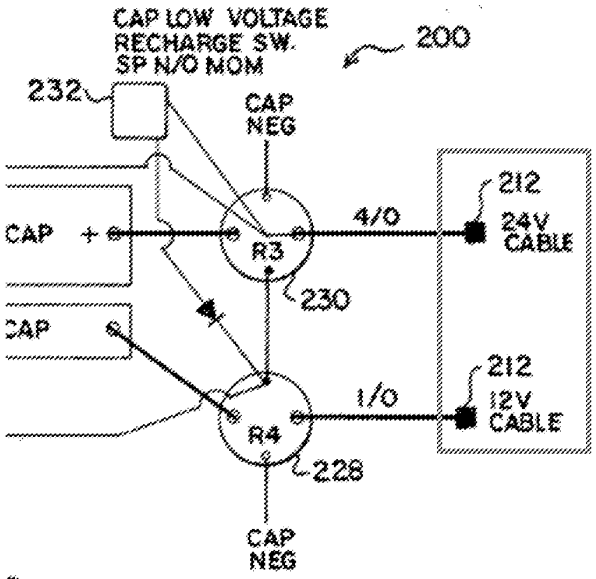
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		detection module and one end of the load module simultaneously, while the negative pole of the direct current voltage is connected with the other end of the DC to DC module, one end of the microcontroller, one end of the automobile start control module and the other end of the battery voltage detection module simultaneously. A third end of the DC to DC module is connected with the other end of the microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the load detection module respectively, wherein the other end of the load detection module is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module.")  Figure 2 **U.S. 2006/0220610 to Solberg** ¶32 ("At act 504, the operator couples the charging cables to a vehicle. The connection may comprise connecting one or both output cables to separate or common elements of the vehicle's battery or electrical system."); ¶36 ("At act 604, the operator couples the charging cables to a vehicle. The connection may comprise connecting one or both output cables to separate or common elements of the

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		vehicle's battery or electrical system."); ¶40 ("At act 702, the operator couples the charging cables to a vehicle. The connection may comprise connecting one or both output cables to separate or common elements of the vehicle's battery or electrical system.")  Figure 1

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		 Figure 2 The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶¶31, 41-44; U.S. 2014/0084844 to Weflen, e.g., ¶23; U.S. 2004/0150373 to Chan, e.g., at ¶17
1[C]	a vehicle battery isolation sensor connected in circuit with said positive and negative polarity outputs, configured to detect presence of a vehicle battery connected between said positive and negative polarity outputs;	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶44 [8:48-53] ("By way of a **feedback circuit or other means**, the microprocessor 60 can monitor the voltage and/or current being supplied to the depleted battery 11 from the booster battery 2, the voltage and/or current of the battery 11 and can

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		detect short circuits or other faults, as described in more de tail below."); ¶48 [9:33-38] ("Microprocessor 60 can be programmed to detect if clamps 8, 10 are connected to a battery or have been disconnected. To perform the detection, the microprocessor 60 deactivates the switch 12 into a non-conducting state. **Via the feedback circuit or other means**, the microprocessor **detects whether clamps 8,10 are connected to a battery**.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶67 ("Once a correct polarity connection has been established, the transistor 72 may remain on even after clamps 60, 61 are disconnected from the battery 21. The disconnected clamps are thus still powered-up. Therefore, **a means for detecting the presence of a battery at the clamps may be provided**. The microprocessor 50 can be programmed to detect when the clamps 60, 61 have been disconnected and, in response, turn transistor 72 off. **A voltage divider comprised of resistors 74 and 76 is provided for this purpose**. The voltage divider divides the voltage across the clamps 60, 61 and provides a portion of this voltage to the microprocessor 50. When the clamps are disconnected from the battery 21, the voltage across the clamps 60, 61 will greatly increase. The voltage provided by the **voltage divider** will also increase in a corresponding manner. When the voltage provided to the microprocessor 50 exceeds a selected amount, for example, 18 volts, the microprocessor 50 detects that the clamps 60, 61 have been disconnected and immediately turns off transistors 69 and 70, which turns off transistor 72. Various resistors, such as resistor 78, may also be included in the circuit."); ¶68 ("According to another embodiment of the invention, the **means for detecting the presence of a battery** at the clamps may **detect the presence of a current flowing through the clamps 60, 61**, instead of, or in addition to the voltage across the clamps. The presence of a current flowing through the clamps 60, 61 may indicate whether the clamps 60, 61 are connected to a battery. A current flows through the clamps when they are connected to a battery and no current should flow through the clamps when they are not connected to a battery. The microprocessor 50 is adapted to detect the current flowing through the clamps 60, 61. **When no current is detected**, the

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		microprocessor 50 detects that the clamps 60, 61 have been disconnected and immediately turns off transistors 69 and 70, which turns off transistor 72."); ¶76 ("If the charge complete flag is not set, the process proceeds to step 134 (in FIG. 7) and detects if a battery is connected to the charger. This check can prevent current from being supplied from the battery charger unless a battery is connected to the battery charger, preventing a, potentially hazardous situation. The **means for detecting the presence of a battery** at the clamps discussed above in connection with FIG. 5 can be perform this check.") **U.S. 2004/0239290 to Krieger** ¶16 ("An example of a high-frequency charger that may be used to implement the present invention is described in U.S. patent application Ser. No. 10/270,391, entitled "A High Frequency Battery Charger and Method of Operating Same," commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety."); ¶18 ("An example of a jump starter that may be used to implement the present invention is described in U.S. patent application Ser. No. 10/315,061 entitled "Microprocessor Controlled Jump Starter System With Polarity Protection," commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety. The jump starter circuit of the present invention may include a polarity protection circuit (not shown) that can be electrically coupled to the depleted battery and to the internal battery 308. The polarity protection circuit can prevent current flow between the batteries unless a proper polarity connection is achieved, i.e. the positive terminal of the internal battery is connected to the positive terminal of the depleted battery and the negative terminal of the internal battery is connected to the negative terminal of the depleted battery. The above-mentioned U.S. patent application Ser. No. 10/315,061 describes a polarity protection circuit that may be used to implement this aspect of the described embodiment.")¶19 ("Both the jump starter 304 and the high frequency charger 306 have their own **internal diagnostics** (not shown, but described and illustrated in the above mentioned applications incorporated herein by reference) that check, for example,

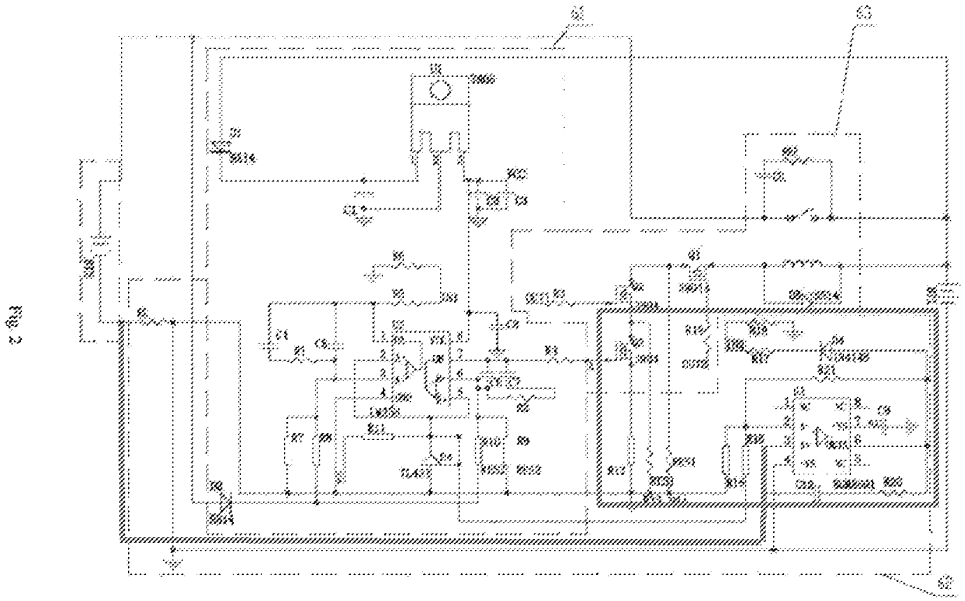
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		the status of the internal and/or depleted battery and whether the jumper cables are correctly attached to the external battery. The diagnostics can generate error codes which the microprocessor 312 can display on display 208 to notify the user of an error.") **U.S. 2007/0285049 to Krieger** ¶16 ("For example, a booster apparatus as described in U.S. patent application Ser. No. 10/315,061, which is incorporated herein by reference, may be provided.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶9 ("…a **current identifying system for identifying a current flowing through an external starting circuit**."); ¶17 ("In certain embodiments, a circuit of the current identifying system includes: a high-accuracy operational amplifier U3 whose model is SGM8591, resistors R12, R13, R14, R15, R16, R17, R18, R20, R21 and RS, capacitors C9 and C12, a switching diode D4 whose model is IN4148; and wherein pin 1 of U3 is floating, pin 2 of U3 is connected with a terminal of R16, a terminal of R15 and a terminal of R21, pin 3 of U3 is connected with a terminal of C12, a terminal of RS, and a negative electrode of BT2, pin 4 of U3 is grounded with a negative electrode of BT1 and the other terminal of RS, pin 5 of U3 is floating, pin 6 of U3 is connected with a terminal of R20, the other terminal of R21 and a positive electrode of D4, the other terminal of R20 is connected to the other terminal of C12, pin 7 of U3 is connected with terminal VCC and a terminal of C9, the other terminal of C9 is grounded, pin 8 of U3 is floating, a negative electrode of D4 is connected to a terminal of R17, the other terminal of R17 is connected with a terminal of R18 and terminal IN2, the other terminal of R18 is grounded, the other terminal of R15 is connected with a terminal of R12, a terminal of R13, and a terminal of R14."); ¶32 ("FIGS. 2 and 3 show a circuit diagram of the external smart battery detection system 6. BT1 is a rechargeable battery, which is the battery pack 4 in FIG. 1, and BT2 is a vehicle battery to be charged."); ¶33 ("Specifically, a circuit 62 of the current identifying system includes: a high-accuracy operational

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		amplifier U3 whose model is SGM8591, resistors R12, R13, R14, R15, R16, R17, R18, R20, R21 and RS, capacitors C9 and C12, a switching diode D4 whose model is IN4148; and wherein pin 1 of U3 is floating, pin 2 of U3 is connected with a terminal of R16, a terminal of R15 and a terminal of R21, pin 3 of U3 is connected with a terminal of C12, a terminal of RS, and a negative electrode of BT2, pin 4 of U3 is grounded with a negative electrode of BT1 and the other terminal of RS, pin 5 of U3 is floating, pin 6 of U3 is connected with a terminal of R20, the other terminal of R21 and a positive electrode of D4, the other terminal of R20 is connected to the other terminal of C12, pin 7 of U3 is connected with terminal VCC and a terminal of C9, the other terminal of C9 is grounded, pin 8 of U3 is floating, a negative electrode of D4 is connected to a terminal of R17, the other terminal of R17 is connected with a terminal of R18 and terminal IN2, the other terminal of R18 is grounded, the other terminal of R15 is connected with a terminal of R12, a terminal of R13, and a terminal of R14."

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		 Figure 2 ¶36 ("When the emergency power source is disconnected from the external rechargeable battery, or the current is smaller than the preset current value, R15 and R16 in the **circuit 62 of the current identifying system** provide a detection signal to U3. Then U3 sends an output signal to the MCU controller chip according to the detection signal, based on which the MCU controller chip may determine the ON or OFF state of the circuit to make proper instructions.") **U.S. 2005/0116688 to Yin** ¶21 ("The circuit for protecting against reverse polarity connection and short circuit of the battery clamps comprises two relays JD1, JD2 and at least two diodes D1, D2; **one terminal of the wire coils of the first relay JD1** and the second relay JD2

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		are connected to the positive battery clamp 1; the other terminal of the wire coil of the **first relay JD1 is connected to the positive terminal of the first diode D1** and the negative terminal of the first diode D1 is connected to the negative battery clamp; the other terminal of the wire coil of the second relay JD2 is connected to the negative terminal of the second diode D2 and the positive terminal of the second diode D2 is connected to the negative battery clamp."); ¶23 ("As illustrated in FIGS. 2 and 3, a conducting wire 2 is disposed on one part of the positive battery clamp 1. The **conducting wire 2 is connected via the wire coil of the first relay JD1** and the **first diode D1** with the negative battery clamp."); ¶24 ("In normal situations, the battery clamps have no electricity and this prevents short circuit of the battery clamps. When the battery clamps are connected to the vehicle's battery, the polarity detecting circuit will detect the polarity automatically and if the polarity is correct, the circuit will **allow the first relay JD1 to conduct electricity** and thus connect the circuit of the rechargeable battery B and the vehicle's battery to start the vehicle."); ¶26 ("The power source **provides electric power via the first diode D1 to the first relay JD1**, thereby **energizing the first relay JD1** and connecting the rechargeable battery B with the vehicle's battery to start the vehicle."); ¶27 ("After starting the vehicle, the operator removes the battery clamps from the vehicle's battery. The two parts 11, 12 of the positive battery clamp 1 will be instantly separated and this will **cause the first relay JD1 to be in an off state** and even if the two parts 11, 12 contact each other again, the first relay JD1 will remain in an off state and short circuit will not occur in the rechargeable battery B and so the rechargeable battery B will not burnt out.") **U.S. 2015/0137740 to Allos** ¶22 ("When the mobile charging system is correctly connected to a vehicle with a discharged battery, the green warning light 10 will illuminate, indicating proper connection. Component 18 with circuit C16 will have positive voltage and component 19 with circuit C1 will have negative voltage. C16 and C1 circuits are monitored by component 20 (forward polarity sense circuit), and this component includes three resistors with ratio values biased for low voltage detection. When

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		circuit C16 voltage value is 2 or more volts more positive than circuit C1, **the operational amplifier L2722 will conduct and switch its output circuit C25 to 12V positive to energize component 21 (Relay 3)**. When relay 3 N.O. (normally open) contacts are closed, 12V power from circuit C14 will connect with circuit C24 to **turn green light on** in component 10, indicating the correct and safe hook-up of the mobile charging system."); *see also* U.S. Provisional Patent Application 61/903,779 at 2. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶5 ("A third end of the DC to DC module is connected with the other end of the microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the **load detection module** respectively, wherein the other end of the **load detection module** is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶6 ("the **load detection module** which comprises the automobile storage battery or the automobile engine **detects whether the load module is correctly connected**."); ¶23 ("A third end of the DC to DC module is connected with the other end of the microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the **load detection module** respectively, wherein the other end of the **load detection module** is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶24 ("… two ends of the automobile storage battery are in parallel connection with the capacitor C7, resistors R9, 10, a capacitor C6 and a resistor R13 to form **the load detection module** together …");¶25 ("The battery voltage detection module conducts the measurement of the batter voltage, and the automobile start control

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		module conducts the power supply or the power outage for the load module through the microcontroller, wherein **the load detection module detects whether the load module is correctly connected**."); ¶26 ("The microcontroller in the present disclosure determines whether the automobile storage battery is connected with the automobile engine through the load detection module, wherein the automobile start control model is automatically activated and the battery starts to supply power to the load module when the load is correctly connected; the automobile start control model is automatically deactivated and the battery stops supplying power to the load module when assuming that the load is not connected or the positive and negative polarities are reversely connected."); Figure 2 **U.S. 2006/0220610 to Solberg** ¶23 ("With or without input and output isolation (e.g., such as through **an opt-coupler**), the control module 104 monitors an output of the charging system 100 and compares it against a fixed or a programmable voltage level or voltage range. When the voltage equals or rises above the voltage level or falls within the voltage range, the control module 104 activates the second switch 130 that couples one or more of the boost modules 108 and 110 to the outputs of the charging system 100."); ¶29 ("The output of the charging system 200 is monitored by **a voltage and/or current monitoring circuit** within the controller 204. Voltage and/or current monitored at the output interface 212 are compared against a fixed or programmed reference. When the output exceeds the reference, a control signal activates the second, third, and fourth relays 224, 228, and 230.") The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶¶37; U.S. 2004/0150373 to Chan, e.g., at ¶¶17-21; U.S. 2012/0025766 to Reade, e.g., at ¶¶79, 103, 138, 154; U.S. 2006/0244412 to Bonzer, e.g., at Fig. 3; U.S. 6,759,833 to Chen, e.g., at 2:36-43; WO 2012/036556 to Eidsvig, e.g., at 5:12-15; U.S. 2002/0041174 to Purkey, e.g., at ¶62
1[D]	a reverse polarity sensor connected in circuit with said positive and	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation:

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	negative polarity outputs, configured to detect polarity of a vehicle battery connected between said positive and negative polarity outputs and to provide an output signal indicating whether positive and negative terminals of said vehicle battery are properly connected with said positive and negative polarity outputs of said output port;	**WO 2012/080996 A1 to Tracey et al.** 3:19-20 ("In one embodiment, the protection means comprises a circuit to short gate current to ground in the event of accidental reverse polarity connection."); 6:23-24 ("An integrated circuit IC1 is connected via a resistor R2 to the positive lead 103 and is connected to the negative lead 105 via reverse polarity indicator (LED1)."); 6:28-29 ("The circuit of the jump starter circuit 100 protects from voltage mismatch, reverse polarity, short circuit, over-discharge, and over-use."); 8:16-29 ("The circuit also protects against accidental reverse polarity connection. Should the operator inadvertently connect the jump starter circuit 100 backwards to the vehicle battery (i.e. positive clamp 4 to negative terminal and vice versa), the system offers two levels of protection. The first level is passive. As the MOSFETS Ql through Q3 are non-conductive, no current flow takes place upon connection. This eliminates any potentially dangerous and destructive electrical arcing at the vehicle battery terminals. Such arcing conditions have been linked with the destruction of modern vehicle electronic controls. Secondly, current from the vehicle battery flows via the resistor R2, reverse polarity indicator LED1 and the input side of the semiconductor photo-relay type TLP222 (IC1) thus illuminating LED1 and the input photo LED in IC1 . Even if the vehicle battery is severely discharged, the current requirement of IC1 is very small and will in most cases be less than 5 mA. Should the user ignore the reverse polarity indicator LED1 and depress SWl , MOSFET gate current is shunted to ground via an output MOSFET in IC 1 thus preventing the successful triggering of Q1 -Q3 and damage to the vehicle or to the jump starter 1.") **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** Abstract ("A polarity protection circuit for a battery booster device is provided. … The polarity protection circuit is electrically connected to the battery to be charged and to the boosting battery. The polarity protection circuit prevents current flow between the batteries unless proper polarity is achieved."); ¶2 [1:15-18] ("The present invention relates to a booster device used for boosting a depleted battery and

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		in particular to microprocessor control of the booster apparatus and a polarity protection circuit."); ¶10 [2:25-28] ("The polarity protection circuit is electrically connected to the battery to be charged (depleted battery) and to a boosting battery or other power source. The polarity protection circuit prevents current flow between the batteries unless proper polarity is achieved."); ¶11 [2:40-44] ("As mention above, a polarity protection circuit is provided in the booster device and prevents current flow between the batteries unless a proper polarity connection between the two batteries is achieved."); ¶31 [5:22-30] ("The switch 12 is activated by a polarity sensing circuit 16 to allow current flow from the boosting battery 2 to the depleted battery 11. The polarity sensing circuit 16 is coupled to the boosting battery 2 and to the depleted battery 11 when the clamps 8, 10 are connected to the depleted battery 11. The polarity sensing circuit 16 senses the polarity of the connection between the boosting battery 2 and the depleted battery 11 and provides a signal indicating the state of the connection. The signal from the polarity sensing circuit 16 is provided to the switch 12. When a proper polarity connection is signaled, the switch 12 completes the boosting circuit and permits current flow to the depleted battery 11."); ¶45 [8:60-66] ("Opto-isolator 16 is coupled to clamps 8, 10 via resistor 62 such that LED 26 is forward biased when a correct polarity connection between the boosting battery 2 and the depleted battery 11 is made. When forward biased, LED 26 turns on phototransistor 22. The collector 23 of the phototransistor 22 is coupled to a supply voltage via internal circuitry in the microprocessor 60. When the phototransistor 22 is on, **a first signal** of a first voltage is present at the collector 23 and is sensed by the microprocessor 60. When the phototransistor 22 is off, **a second signal** of a second voltage is present at the collector 23 and is sensed by the microprocessor 60.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶63 ("Additional **polarity and short-circuit protection circuitry** can also be provided, as shown in the embodiment of FIG. 5. FIG. 5 is a partial schematic diagram of a battery charger showing only the short circuit and polarity protection elements to simplify the understanding of this embodiment. The other elements of

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		the battery charger can be included as shown in FIGS. 1, 3, and 4."); ¶64 ("In this embodiment, the battery charger is provided with a **polarity detection circuit**. Only when the polarity detection circuit detects that the battery has been connected to the battery charger with correct polarity is power supplied to the battery. Typically, the battery charger includes a pair of clamps 60, 61 for connection to the positive terminal and the negative terminal, respectively, of the battery to be charged 21. A **polarity detection circuit detects the polarity of the connection of clamps 60, 61 and provides a signal to the microprocessor 50**. In response to the signal from polarity detection circuit, the microprocessor controls the operation of the battery charger to supply power to the battery 21 or indicate an incorrect polarity accordingly."); ¶65 ("In the embodiment illustrated in FIG. 5, the polarity detection circuit includes an **opto-isolator 62 connected to clamps 60, 61 and to microprocessor 50**. The opto-isolator includes a light-emitting diode (LED) 63 and a phototransistor 65. When the battery 21 is connected with correct polarity, clamp 60 is connected to the positive terminal and clamp 61 is connected to the negative terminal of the battery 21. LED 63 is then forward biased and turns on phototransistor 65. When the phototransistor 65 is turned on, it provides a logic high signal to a pin a4 of the microprocessor 50. The logic high signal indicates to the microprocessor 50 that a correct polarity connection has been made. Connecting clamp 60 to the negative terminal of battery 21 reverse biases the LED 63, and no signal is provided to the microprocessor 50.") **U.S. 2004/0239290 to Krieger** ¶18 ("An example of a jump starter that may be used to implement the present invention is described in U.S. patent application Ser. No. 10/315,061 entitled "Microprocessor Controlled Jump Starter System With Polarity Protection," commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety. The jump starter circuit of the present invention may include **a polarity protection circuit** (not shown) that can be electrically coupled to the depleted battery and to the internal battery 308. The **polarity protection circuit** can prevent current flow between the batteries

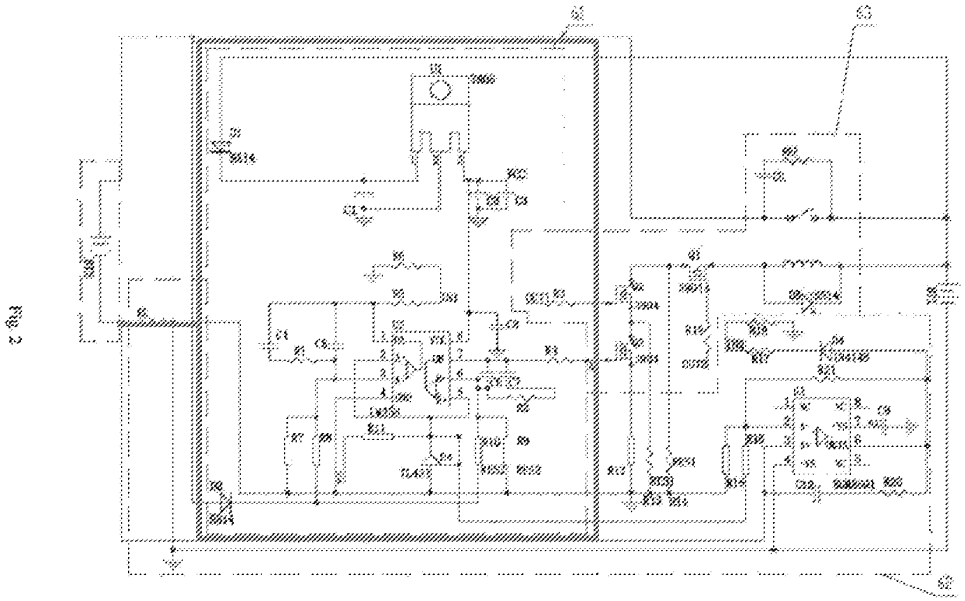
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		unless a proper polarity connection is achieved, i.e. the positive terminal of the internal battery is connected to the positive terminal of the depleted battery and the negative terminal of the internal battery is connected to the negative terminal of the depleted battery. The above-mentioned **U.S. patent application Ser. No. 10/315,061 describes a polarity protection circuit** that may be used to implement this aspect of the described embodiment.") **U.S. 2007/0285049 to Krieger** ¶16 ("The jump starter therefore may include a set of jumper cables 16 that may be used to connect the battery 20 in the housing 10 to the depleted vehicle battery. Such jumper cables 16 are well known to those of ordinary skill in the art. For example, **a booster apparatus as described in U.S. patent application Ser. No. 10/315,061**, which is incorporated herein by reference, may be provided.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶9 ("… a **voltage identifying system** for identifying the voltage of an external lead-acid battery or a lithium-ion starting battery."); ¶30 ("When the red and black power source clips are respectively connected to the positive and negative electrodes of the external battery, **if the connection is correct, a feedback voltage displayed by the voltage identifying system is positive, otherwise the feedback voltage is negative**."); ¶34 ("Specifically, the **circuit 61** of the voltage identifying system includes: a dual operational amplifier U2 whose model is LM358, a three-terminal voltage regulator circuit U1 whose model is a 7805, resistors R1, R2, R4, R5, R6, R7, R8, R9, R10 and R11, capacitors C1, C2, C3, C4, C5, C6, C7 and C8, schottky diodes D1 and D2 whose model are SS14, and a three-terminal adjustable shunt voltage reference U4 whose model is TL431; and wherein pin 1 of U2 is connected with a terminal of R5, a terminal of C5 and a terminal of C4, the other terminal of R5 is connected with a terminal of R6 and terminal IN1, the other terminal of R6 is grounded, pin 2 of U2 is connected to pin 5 of U2, a terminal of R11, a negative electrode of U4, a reference electrode of U4, and the other terminal of R16, the

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		other terminal of R11 is connected to terminal VCC, pin 3 of U2 is connected with the other terminal of C5, a terminal of R1, a terminal of R7 and a terminal of R8, the other terminal of R1 is connected to the other terminal of C4, pin 4 of U2 is grounded with the other terminal of R7, a positive electrode of U4 and a terminal of R9, the other terminal of R8 is connected with a negative electrode of D2 and a terminal of R10, a positive electrode of D2 is connected to a positive electrode of BT2, pin 6 of U2 is connected with the other terminal of R10, the other terminal of R9, a terminal of C6 and a terminal of R2, pin 7 of U2 is connected with the other terminal of C6, a terminal of C7 and a terminal of R4, the other terminal of R4 is connected to node A, the other terminal of C7 is connected to the other terminal of R2, pin 8 of U2 is connected with a terminal of C8, a terminal of C2, a terminal of C3, pin 3 of U1 and terminal VCC, the other terminal of C8 is grounded, the other terminal of C2 is grounded with the other terminal of C3, pin 1 of U1 is connected with a terminal of C1 and a negative electrode of D1, pin 2 of U1 is grounded with the other terminal of C1, a positive electrode of D1 is connected to the positive electrode of BT1."); ¶36 ("When the preset voltage value is 8.1V and the output voltage value is smaller than the preset value, R7 and R8 of the **circuit 61** of **the voltage identifying system may provide a detection signal** to U2, and U2 may send an output signal to terminal IN1 according to the detection signal. Then the MCU controller chip further controls the control switch Q2 in the circuit 63 of the relay according to the signal from terminal IN1. When the output voltage is bigger than a preset value, which may be 12.6V in the invention, R9 and R10 of the circuit 61 of the voltage identifying system may provide a detection signal to U2, and U2 may send a signal according to the detection signal to control the control switch Q3 in the circuit 63 of the relay.")

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		 Figure 2 **U.S. 2005/0116688 to Yin** ¶24 ("High current relays and **polarity detecting circuit** are used in the present invention. In normal situations, the battery clamps have no electricity and this prevents short circuit of the battery clamps. When the battery clamps are connected to the vehicle's battery, **the polarity detecting circuit will detect the polarity automatically and if the polarity is correct, the circuit will allow the first relay JD1 to conduct electricity and thus connect the circuit of the rechargeable battery B and the vehicle's battery** to start the vehicle. If the polarity is detected to be reversely connected, the circuit will maintain the first relay JD1 in an off state and the rechargeable battery B and the vehicle's battery are not connected and so the vehicle's battery will not be burnt out owing to the reverse polarity connection.");

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		¶25 ("When the battery clamps are not connected with the vehicle's battery, the first relay JD1 has no voltage and is in an off state and the battery clamps have no electricity. This can prevent danger caused by short circuit of the battery clamps."); ¶26 ("When the battery clamps and the vehicle's battery are connected with the correct polarity, **the second diode D2 is reversely biased**, the second relay JD2 is in an off state, the light L1 does not flash and the buzzer BU does not sound. The **power source provides electric power via the first diode D1** to the first relay JD1, thereby energizing the first relay JD1 and connecting the rechargeable battery B with the vehicle's battery to start the vehicle."); ¶28 ("When the two battery clamps are reversely connected to the two terminals of vehicle's battery, **the first diode D1 is in a reversed close state** in the circuit of the first relay JD1 and so the **first relay JD1 remains in an off state**, which leads to the disconnection of the rechargeable battery B and the vehicle's battery, thereby eliminating the risks of incurring high current and sparks. Simultaneously, the vehicle's battery provides power to the second relay JD2 and the buzzer BU via **the second diode D2, thereby energizing the second relay JD2 and making the buzzer BU to sound**. The rechargeable battery B provides power to the flash light circuit making the light L1 to flash.") **U.S. 2014/0368155 to Chen** ¶18 ("… a voltage polarity detection unit 114 …"); ¶19 ("The voltage polarity detection unit 114 is electrically connected to the first switch unit 104, the second switch unit 106, the third switch unit 108, the fourth switch unit 110, the vehicle battery 20 and the control unit 112."); ¶20 ("The voltage polarity detection unit 114 is configured to detect the voltage polarity of the vehicle battery 20 and inform the control unit 112."); ¶23 ("The voltage polarity detection unit 114 is, for examples but not limited to, a microprocessor, a microcontroller, or a voltage polarity detection apparatus having electronic components.") **U.S. 2015/0137740 to Allos**

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		¶45 ("This reverse source of voltage originates from the vehicle battery. Component 13 is a **reverse polarity sense circuit** that uses circuit C1 and C16 for input signals. It also uses circuit C14 from fuse No.5 for a 12 voltpower source that originates from battery 2a."); ¶46 ("The **reverse polarity sense circuit 13** includes in one implementation three resistors with ratio values biased for low voltage, e.g., approximately negative 2 volts or greater at circuit C16. An operational amplifier L2722 may be configured as a voltage comparator. This component will output positive 12 volts through circuit C23 when its negative input is more negative than its positive input with approximately 2 volts or greater. This only occurs in reverse polarity connection to vehicle battery."); ¶47 ("The **reverse polarity sense circuit** is designed and configured in this manner to have the ability to detect reverse polarity condition even if the vehicle battery is discharged from 12 volts to as low as 2 volts."); ¶48 ("Once the **reverse polarity sense circuit** detects reverse polarity, it will conduct current and switch output circuit C23 to positive 12 volts energizing component 14 relay 1 that will **result in the enabling of the reverse polarity protection feature of the mobile charging system**, and the **disabling of the boost cycle power source to component 11**."); *see also* U.S. Provisional Patent Application 61/903,779 at 2, 5. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶5 ("A third end of the DC to DC module is connected with the other end of the microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the **load detection module** respectively, wherein the other end of the **load detection module** is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶6 ("the **load detection module** which comprises the automobile storage battery or the automobile engine **detects whether the load module is correctly connected**."); ¶23 ("A third end of the DC to DC module is connected with the other end of the

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		microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the **load detection module** respectively, wherein the other end of the **load detection module** is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶24 ("… two ends of the automobile storage battery are in parallel connection with the capacitor C7, resistors R9, 10, a capacitor C6 and a resistor R13 to form **the load detection module** together …");¶25 ("The battery voltage detection module conducts the measurement of the batter voltage, and the automobile start control module conducts the power supply or the power outage for the load module through the microcontroller, wherein **the load detection module detects whether the load module is correctly connected**."); ¶26 ("The microcontroller in the present disclosure determines whether the automobile storage battery is connected with the automobile engine through the load detection module, wherein the automobile start control model is automatically activated and the battery starts to supply power to the load module when the load is correctly connected; the automobile start control model is automatically deactivated and the battery stops supplying power to the load module when assuming that the load is not connected or the positive and negative polarities are reversely connected."); Figure 2 **U.S. 2006/0220610 to Solberg** ¶23 ("When the voltage equals or rises above the voltage level or falls within the voltage range, the control module 104 activates the second switch 130 that couples one or more of the boost modules 108 and 110 to the outputs of the charging system 100. When the control module 104 detects a reverse polarity, the second switch 130 is deactivated effectively shutting down the charging system 100."); ¶29 ("When a reverse polarity connection is detected, the control signal does not flow from the controller 204, which deactivates the second relay 224 and shuts down the charging system 200.")

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Claim No.	Claim	Printed Publications
		The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶38; U.S. 2006/0176011 to Lui, e.g., at ¶6; U.S. 2001/0025618 to Kelling, e.g., at ¶17; U.S. 2014/0084844 to Weflen, e.g., at ¶14; U.S. 2004/0150373 to Chan, e.g., at ¶3; U.S. 2012/0025766 to Reade, e.g., at ¶161; U.S. 2006/0244412 to Bonzer, e.g., at ¶13; U.S. 6,759,833 to Chen, e.g., at 1:34-44; U.S. 3,590,357 to Reid, e.g., at 3:61-4:62; Fig. 2; U.S. 5,194,799 to Tomantschger, e.g., at 5:24-33, 6:51-55; 2014/0210399 to Urschel, e.g., at ¶38; U.S. 3,638,108 to Channing, e.g., at 3:14-45; WO 2012/036556 to Eidsvig, e.g., at 7:25-26; U.S. 2013/0162029 to Reichow, e.g., at ¶24; U.S. 2002/0041174 to Purkey, e.g., at ¶20; U.S. 5,281,904 to Tomkins, e.g., at 3:60-4:4
1[E]	a power switch connected between said internal power supply and said output port; and	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **<u>WO 2012/080996 A1 to Tracey et al.</u>** 3:8-11 ("In one embodiment, the control circuit further comprises a **switch** in the negative lead which is turned on for use. In one embodiment, the switch is a solid state switch. In one embodiment, the **switch comprises a MOSFET switch**. In one embodiment, the switch is an SCR. In one embodiment, there is a plurality of switches arranged in parallel."); 6:24-26 ("Also, a manual contact switch 115 (SW1) is connected on one side to the positive lead 3, and on the other to a Zener diode ZD1, a resistor Rl, in turn linked with a bank of MOSFET switches Ql, Q2, and Q3."); 7:8-11: ("The battery 102 positive terminal is also connected to the momentary action single pole normally open **switch SW1 115**. This **switch**, the Zener diode ZD1 , the resistor Rl and Metal Oxide Semiconductor Field Effect Transistors (MOSFETS) Ql to Q3 comprise the power-switching and over-discharge elements."); 7: 13-20 ("To activate the jump-starter system it must be connected to a vehicle battery by means of the positive and negative jaws 56 linked to the conductors 104 and 106. The **activation switch 115 (SW1)** is then briefly depressed. This switch may be located at any convenient location of the housing[.] Current flows from the battery (BAT) via ZD1 and Rl to the gates of International

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		Rectifier IRF 1324s MOSFETS (or alternates) Ql, Q2 and Q3 via their respective gate resistors R4, R5 and R6. Capacitor CI is also charged. Once a Vgs of 10V is applied to the MOSFETS Ql, Q2, and Q3 they begin conducting from drain to source with a very low ON state resistance, typically about 0.00033 Ohms for three parallel connected parts."); 8:5-7 ("When the voltage across CI drops below the gate threshold voltage of the MOSFETS, they will rapidly come out of conduction and switch off the output.") **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶29 [5:22-30] ("A switch 12 is coupled to one of the wires or battery cables to be connected to the depleted battery 11. The switch 12 is activated to complete a boosting circuit between the boosting battery 2 and the depleted battery 11 only when a correct polarity connection between the batteries is attained. In the embodiment shown, the switch 12 is arranged between the negative terminal 6 of the boosting battery 2 and the alligator clamp 10 intended to be connected to the negative terminal of the depleted battery 11.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶66 ("**Transistor 72 acts as a switch to connect battery 21 to the charger circuit.** Only when switch 72 is closed will transistor 69 complete the connection between the battery charger and the battery 21. The opening and closing of transistor 72 is controlled via transistors 69 and 70. A control electrode of transistor 69 receives the control signal from the microprocessor. When the control signal is received, transistor 69 turns on, which, in turn, turns on transistor 70. Current flow through transistor 70 activates a control electrode for transistor 72 and turns transistor 72 on, completing the circuit between the charger circuit and battery 21. Only when the control signal is provided to transistor 69 is it possible for transistor 72 to be turned on.") **U.S. 2004/0239290 to Krieger**

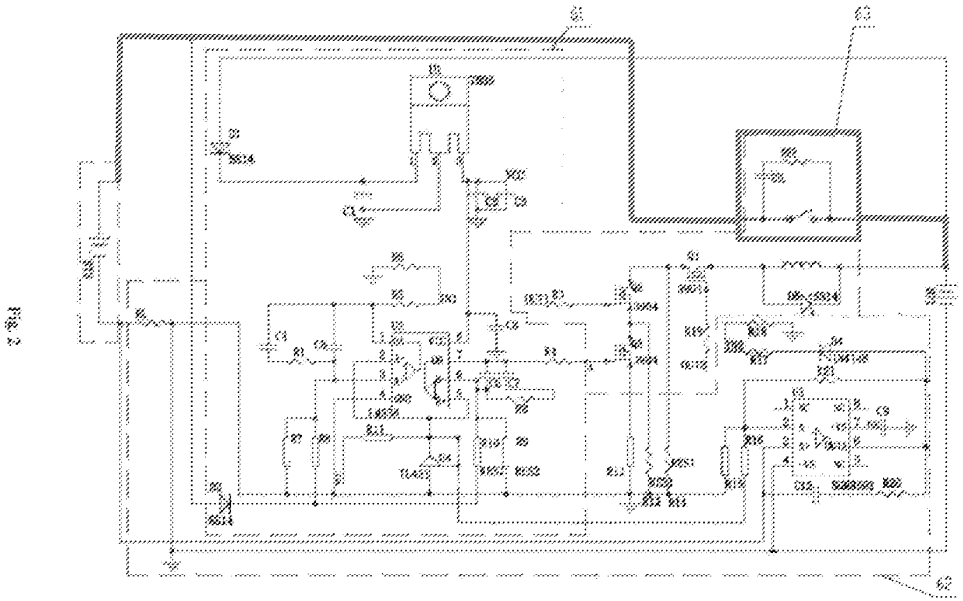
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		¶18 ("An example of a jump starter that may be used to implement the present invention is described in U.S. patent application Ser. No. 10/315,061 entitled "Microprocessor Controlled Jump Starter System With Polarity Protection," commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety. The jump starter circuit of the present invention may include a polarity protection circuit (not shown) **that can be electrically coupled to the depleted battery and to the internal battery 308**. The polarity protection circuit can **prevent current flow between the batteries unless a proper polarity connection is achieved**, i.e. the positive terminal of the internal battery is connected to the positive terminal of the depleted battery and the negative terminal of the internal battery is connected to the negative terminal of the depleted battery. The above-mentioned **U.S. patent application Ser. No. 10/315,061 describes a polarity protection circuit** that may be used to implement this aspect of the described embodiment."); ¶20 ("Both the jump starter 304 and the high frequency charger 306 may be coupled to the function selector switch 110. The function selector switch 110 may be either a manually operated or an automatoically operated [sic]. The function selector switch 110 that is automatically operated may be controlled by the microprocessor controller 312 or other suitable controller. The function selector switch 110 may be used to selectively connect the jumper cables to the output of the jump starter 304 and the output of the high frequency charger 306. Thus, both the jump starter 304 and the high frequency charger 306 use the same set of jumper cables 316.") **U.S. 2007/0285049 to Krieger** ¶16 ("For example, a booster apparatus as described in U.S. patent application Ser. No. 10/315,061, which is incorporated herein by reference, may be provided.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei**

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		¶29 ("The external smart battery detection system 6 includes a red power source clip and a black power source clip for connecting with an external battery, a **relay** switchable between an ON state and an OFF state according to a detection signal …"); ¶30 ("When the red and black power source clips are respectively connected to the positive and negative electrodes of the external battery, if the connection is correct, a feedback voltage displayed by the voltage identifying system is positive, otherwise the feedback voltage is negative. The positive feedback voltage ranges from value a of 6 to 24 V to value b of 9 to 30 V, and a is smaller than b. If the connection is reverse, the **relay does not work**, and the high current outputting circuit 7 may be cut off."); ¶31 ("In this invention, when the feedback voltage ranges from value a to value b and is of a positive value, the coil of the **relay receives a voltage signal so that its contact is closed** and **its output terminal is coupled to the high current outputting circuit 7**, and the emergency power source starts to power an external device with a high current."); ¶35 ("…a negative electrode of D5 is connected with the other terminal of the coil of the relay, a terminal of a normally open contact of the relay, a terminal of R22, and a positive electrode of BT1, the other terminal of R22 is connected to a terminal of C11, the other terminal of C11 is connected with a terminal of the normally open contact of the relay and a positive electrode of BT2..")

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		 Figure 2 **U.S. 2005/0116688 to Yin** ¶26 ("The power source **provides electric power via the first diode D1 to the first relay JD1**, thereby **energizing the first relay JD1** and connecting the rechargeable battery B with the vehicle's battery to start the vehicle."); ¶27 ("After starting the vehicle, the operator removes the battery clamps from the vehicle's battery. The two parts 11, 12 of the positive battery clamp 1 will be instantly separated and this will **cause the first relay JD1 to be in an off state** and even if the two parts 11, 12 contact each other again, the first relay JD1 will remain in an off state and short circuit will not occur in the rechargeable battery B and so the rechargeable battery B will not burnt out.")

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		U.S. 2014/0368155 to Chen ¶7 ("The first switch unit is electrically connected to the battery unit and the vehicle battery. The second switch unit is electrically connected to the battery unit, the first switch unit and the vehicle battery. The third switch unit is electrically connected to the battery unit, the first switch unit and the vehicle battery. The fourth switch unit is electrically connected to the battery unit, the second switch unit, the third switch unit and the vehicle battery."); ¶18 ("The smart vehicle rescue battery apparatus 10 includes a battery unit 102, a first switch unit 104, a second switch unit 106, a third switch unit 108, a fourth switch unit 110, a control unit 112, a voltage polarity detection unit 114 and a charging unit 116.") **U.S. 2015/0137740 to Allos** ¶27 ("During the boost function, component 15 is also energized, closing internal contacts and transferring 12V power from C14 to C21, for the purpose of energizing contactor 17 N.C.to break open internal contacts that will disconnect circuit C20 from C16. **Component 17 acts as an isolator between the boost function and charging function of the MCS**. It is also energized during reverse polarity conditions."); ¶41 ("Current flows through the meter to circuit C20 and then to component 17 contactor N.C. **When component 17 is de-energized, current flows through it from circuit C20 to circuit C16 and then to component 18 to the vehicle battery**."); ¶42 ("**Component 17 acts as an isolator between charging and boost cycles**. As such, the same is de-energized during a charging cycle of the mobile charging system, and energized during jump start or "boost" function and during reverse polarity detection condition. During the charging cycle of the mobile charging system, the voltage output will vary between 13.8 to 14.3 volts, depending on the condition of the vehicle discharged battery."); ¶50 ("Component 15 may be de-energized during a reverse polarity condition and may act as an interrupt during boost cycle. When circuit C21 has +12 Volts it will **energize component 17** (Normally Closed) Contactor resulting in a circuit **break between circuit C16**

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		vehicle battery and circuit C20 that controls the mobile charging system output, thus providing protection to amp meter 8 and fuse box 4 and other internal mobile charging system components. In addition, it also prevents the mobile charging system boost and charge functions from causing electrical damage to the weak or discharged vehicle battery and electrical system by isolating the same from the mobile charging system internal power source."); *see also* U.S. Provisional Patent Application 61/903,779 at 3, 5. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶6 ("… the **automobile start control module** conducts the power supply or the power outage for the load module through the microcontroller …"); ¶11 ("As a further solution of the present disclosure that: the automobile start control module is the electronic switch."); ¶ 23 ("Refer to FIG. 1, a novel automobile charger comprises a direct current power supply, wherein the positive pole of the direct current power supply is connected with one end or lead of the DC to DC module, one end of the battery voltage detection module and one end of the load module simultaneously, while the negative pole of the direct current voltage is connected with the other end of the DC to DC module, one end of the microcontroller, one end of the **automobile start control module** and the other end of the battery voltage detection module simultaneously. A third end of the DC to DC module is connected with the other end of the microcontroller, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the **automobile start control module** and one end of the load detection module respectively, wherein the other end of the load detection module is connected with the third end of the **automobile start control module** and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶24 ("a Drive port of the **automobile start control module** is connected with the automobile engine and one end of a resistor R14 simultaneously, wherein the other end of the resistor R14 is grounded."); ¶25 ("the **automobile start control module** conducts the power supply or the power outage for the load module

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		through the microcontroller"); ¶26 ("The microcontroller in the present disclosure determines whether the automobile storage battery is connected with the automobile engine through the load detection module, wherein the **automobile start control model** [sic] is **automatically activated and the battery starts to supply power to the load module** when the load is correctly connected; the **automobile start control model** [sic] is **automatically deactivated and the battery stops supplying power to the load module** when assuming that the load is not connected or the positive and negative polarities are reversely connected. In the standby mode, the microcontroller closes all outputs when the battery voltage is lower than 9V, and recovers the normal operation only when the battery voltage is larger than 10V; the automobile engine will generate the normal voltage to recharge the battery after the automobile starts, whereas the **automobile start control module** is deactivated immediately once the recharging voltage is larger than the voltage before that battery starts the power supply, to protect the battery from damages caused by charging with the normal voltage; the automobile start control module is the electronic switch, which can prevent the load from being reversely connected and recharging of the normal voltage, thus protecting the battery and prolonging lifespan."); ¶27 ("The automobile engine will generate abnormal voltage to recharge the direct current power supply after the automobile starts, and the **automobile start control module** is deactivated immediately once the recharging voltage is larger than the voltage before the direct current power supply starts the power supply, to protect the direct current power supply from damages caused by charging with normal voltage charge.") **U.S. 2006/0220610 to Solberg** ¶23 ("A control module 104 coupled to an output of charging system 100 and the **second switch 130 controls the states of the second, third, and fourth switches 130, 132, and 134**. With or without input and output isolation (e.g., such as through an opt-coupler), the control module 104 monitors an output of the charging system 100 and compares it against a fixed or a programmable voltage level or voltage range. When the voltage equals or rises above the voltage level or falls within the

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		voltage range, the control module 104 **activates the second switch 130** that couples one or more of the boost modules 108 and 110 to the outputs of the charging system 100. When the control module 104 detects a reverse polarity, the **second switch 130 is deactivated** effectively shutting down the charging system 100."); ¶29 ("The output of the charging system 200 is monitored by a voltage and/or current monitoring circuit within the controller 204. Voltage and/or current monitored at the output interface 212 are compared against a fixed or programmed reference. When the output exceeds the reference, **a control signal activates the second, third, and fourth relays 224, 228, and 230**. When a reverse polarity connection is detected, the control signal does not flow from the controller 204, which **deactivates the second relay 224** and shuts down the charging system 200. Analog gauges, digital, or light emitting diode displays 302 (as shown in FIG. 3) may provide a reverse polarity warning. A speaker or piezoelectric elements 302 may provide an audible warning to the user of a reverse polarity connection.") The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶¶30; U.S. 2006/0176011 to Lui, e.g., at ¶40; U.S. 2001/0025618 to Kelling, e.g., at ¶17; U.S. 2004/0150373 to Chan, e.g., at ¶¶12; U.S. 2006/0244412 to Bonzer, e.g., at ¶21-22; U.S. 6,759,833 to Chen, e.g., at 1:34-43; U.S. 5,194,799 to Tomantschger, e.g., at 6:37-55; U.S. 2014/0210399 to Urschel, e.g., at ¶40; U.S. 3,638,108 to Channing, e.g., at 6:35-46; U.S. 2013/0162029 to Reichow, e.g., at ¶24; U.S. 6,650,086 Chang; e.g., at 4:41-62; U.S. 2002/0041174 to Purkey, e.g., at ¶21; U.S. 6,344,733 to Crass, e.g., at 2:42-58; U.S. 5,281,904 to Tomkins, e.g., at 3:26-38
1[F]	a microcontroller configured to receive input signals from said vehicle isolation sensor and said reverse polarity sensor, and to provide an output signal to said power switch, such that said power switch is turned on to cause said internal power supply	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **<u>WO 2012/080996 A1 to Tracey et al.</u>** 6:23-26 ("An integrated circuit IC1 is connected via a resistor R2 to the positive lead 103 and is connected to the negative lead 105 via reverse polarity indicator (LED1). Also, a manual contact switch 115 (SW1) is connected on one side to the

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	to be connected to said output port in response to signals from said sensors indicating the presence of a vehicle battery at said output port and proper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs, and is not turned on when signals from said sensors indicate either the absence of a vehicle battery at said output port or improper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs.	positive lead 3, and on the other to a Zener diode ZD1 , a resistor Rl , in turn linked with a bank of MOSFET switches Ql , Q2, and Q3."); 7:13-20: ("To activate the jump-starter system it must be connected to a vehicle battery by means of the positive and negative jaws 56 linked to the conductors 104 and 106. The activation switch 1 15 (SW1) is then briefly depressed. This switch may be located at any convenient location of the housing Current flows from the battery (BAT) via ZD1 and Rl to the gates of International Rectifier IRF 1324s MOSFETS (or alternates) Ql , Q2 and Q3 via their respective gate resistors R4, R5 and R6. Capacitor CI is also charged. Once a Vgs of 10V is applied to the MOSFETS Ql , Q2, and Q3 they begin conducting from drain to source with a very low ON state resistance, typically about 0.00033 Ohms for three parallel connected parts."); 8:22-26 ("Secondly, current from the vehicle battery flows via the resistor R2, reverse polarity indicator LED1 and the input side of the semiconductor photo-relay type TLP222 (IC1) thus illuminating LED1 and the input photo LED in IC1 . Even if the vehicle battery is severely discharged, the current requirement of IC1 is very small and will in most cases be less than 5 mA.") **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶12 [2:45-46] ("In a further embodiment, the battery booster device may also comprise a **microprocessor**. The **microprocessor** can be used as part of a polarity protection circuit."); ¶43 [8:40-44] ("Referring now to FIG. 5, an example of a microprocessor controlled jump starter system according to an embodiment of the invention is described. The **microprocessor 60 can be programmed to perform essentially all of the control functions needed for operation of the jump starter**."); ¶44 [8:48-53] ("By way of a feedback circuit or other means, the microprocessor 60 can monitor the voltage and/or current being supplied to the depleted battery 11 from the booster battery 2, the voltage and/or current of the battery 11 and can detect short circuits or other faults, as described in more de tail [sic] below."); ¶45 [8:59-9:10] ("In this embodiment, **microprocessor 60 is used to control the switch 12**. Opto-isolator 16 is coupled to clamps 8, 10 via resistor 62 such that LED 26 is forward biased when a correct polarity connection between the

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		boosting battery 2 and the depleted battery 11 is made. When forward biased, LED 26 turns on phototransistor 22. The collector 23 of the phototransistor 22 is coupled to a supply voltage via internal circuitry in the microprocessor 60. When the phototransistor 22 is on, a first signal of a first voltage is present at the collector 23 and is sensed by the microprocessor 60. When the phototransistor 22 is off, a second signal of a second voltage is present at the collector 23 and is sensed by the microprocessor 60. The **microprocessor 60 provides output signals to activate the switch 12** into a conducting state when it receives the first signal and provides an output signal to deactivate the switch 12 into a non-conducting state when it receives the second signal. Additionally, the **microprocessor can deactivate switch 12** to terminate the jump starting process when a fault is detected."); ¶46 [9:11-26] ("The output signals from the **microprocessor 60** to control switch 12 are provided to control electrodes 14 a-14 d of transistors 12 a-12 d, as shown in FIG. 5. The control electrodes 14 a-14 d of the transistors are electrically connected to the microprocessor 60 via a level translator 68. Microprocessors normally run on low voltages, e.g., 5 volts. A low voltage power supply is provided to the **microprocessor 60** from battery 2 via a voltage regulator 70. The low voltage output signals from the **microprocessor 60** should be translated to higher voltages before being supplied to the transistors 12 a-12 d. The level translator 68 translates the output voltage of the **microprocessor 60** to the higher levels that are needed to operate transistors 12 a-12 d. Accordingly, the output signals from the **microprocessor 60** are used by the level translator 68 to generate control signals for the control electrodes of the FETs."); ¶47 [9:27-32] ("If the polarity connections of clamps 8, 10 to the depleted battery 11 are not correct, the switch 12 remains off. The display 64 may be controlled by the microprocessor 60 to display a message indicating reverse polarity. The microprocessor 60 may additionally activate an alarm such as buzzer 72 in response to the incorrect polarity connection."); ¶48 [9:33-42] ("**Microprocessor 60 can be programmed to detect if clamps 8, 10 are connected to a battery or have been disconnected**. To perform the detection, the microprocessor 60 deactivates the switch 12 into a non-conducting state. Via the feedback circuit or other means, the microprocessor detects whether clamps 8,10 are connected to a battery. If no battery is present, the switch 12 is placed in a non-

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		conducting state, that is, all the FETs 12 a-12 d are placed in a non-conducting state. If a battery is present, the jump starting process continues.") **U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger** ¶57 ("The embodiment shown in FIG. 4 includes a **microprocessor** that controls many of the functions of the battery charger."); ¶58 ("In this embodiment, a **microprocessor 50 is coupled to switches 22, 24**, which may, for example, comprise FETS, and to the high frequency transformer portion 8."); ¶64 ("A polarity detection circuit detects the polarity of the connection of clamps 60, 61 and provides a signal to the microprocessor 50. In response to the signal from polarity detection circuit, the **microprocessor controls the operation of the battery charger to supply power to the battery 21 or indicate an incorrect polarity accordingly**."); ¶65 ("When the phototransistor 65 is turned on, it provides a logic high signal to a pin a4 of the **microprocessor 50**. The logic high signal indicates to the microprocessor 50 that a correct polarity connection has been made. Connecting clamp 60 to the negative terminal of battery 21 reverse biases the LED 63, and no signal is provided to the **microprocessor 50**."); ¶66 ("In response to the logic high signal, the **microprocessor 50 outputs a control signal to a control circuit for completing the connection between the battery charger and the battery 21**. Here, the control circuit includes a transistor 72 coupled between one of the clamps 60, 61 and the charger circuit. Transistor 72 acts as a switch to connect battery 21 to the charger circuit. Only when switch 72 is closed will transistor 69 complete the connection between the battery charger and the battery 21. The opening and closing of transistor 72 is controlled via transistors 69 and 70. **A control electrode of transistor 69 receives the control signal from the microprocessor**. When the control signal is received, transistor 69 turns on, which, in turn, turns on transistor 70. Current flow through transistor 70 activates a control electrode for transistor 72 and turns transistor 72 on, completing the circuit between the charger circuit and battery 21. **Only when the control signal is provided to transistor 69 is it possible for transistor 72 to be turned on.**"); ¶67 ("Once a correct polarity connection has been established, the transistor 72 may remain on even after clamps

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		60, 61 are disconnected from the battery 21. The disconnected clamps are thus still powered-up. Therefore, a **means for detecting the presence of a battery** at the clamps may be provided. The **microprocessor 50 can be programmed to detect when the clamps 60, 61 have been disconnected and, in response, turn transistor 72 off**. A voltage divider comprised of resistors 74 and 76 is provided for this purpose. The voltage divider divides the voltage across the clamps 60, 61 and provides a portion of this voltage to the microprocessor 50. When the clamps are disconnected from the battery 21, the voltage across the clamps 60, 61 will greatly increase. The voltage provided by the voltage divider will also increase in a corresponding manner. When the voltage provided to the **microprocessor 50** exceeds a selected amount, for example, 18 volts, the **microprocessor 50 detects that the clamps 60, 61 have been disconnected and immediately turns off transistors 69 and 70, which turns off transistor 72**. Various resistors, such as resistor 78, may also be included in the circuit."); ¶68 ("The presence of a current flowing through the clamps 60, 61 may indicate whether the clamps 60, 61 are connected to a battery. A current flows through the clamps when they are connected to a battery and no current should flow through the clamps when they are not connected to a battery. The **microprocessor 50 is adapted to detect the current flowing through the clamps 60, 61**. When no current is detected, the microprocessor 50 detects that the clamps 60, 61 have been disconnected and immediately turns off transistors 69 and 70, which turns off transistor 72.") **U.S. 2004/0239290 to Krieger** ¶16 ("An example of a high-frequency charger that may be used to implement the present invention is described in **U.S. patent application Ser. No. 10/270,391**, entitled "A High Frequency Battery Charger and Method of Operating Same," commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety.") (incorporating U.S. 2003/0141845 [Issued as U.S. 6,822,425] to Krieger, e.g., at ¶57 ("The embodiment shown in FIG. 4 includes a **microprocessor** that controls many of the functions of the battery charger."); ¶58; ¶64; ¶65; ¶66; ¶67; ¶68); ¶17 ("A **microprocessor**,

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		described below, may be used to control the charging process.") (quoted above); ¶18 ("**An example of a jump starter that may be used to implement the present invention is described in U.S. patent application Ser. No. 10/315,061 entitled "Microprocessor Controlled Jump Starter System With Polarity Protection,"** commonly owned by the Assignee of the present application and the disclosure of which is incorporated herein by reference in its entirety. The jump starter circuit of the present invention may include a polarity protection circuit (not shown) that can be electrically coupled to the depleted battery and to the internal battery 308. The polarity protection circuit can prevent current flow between the batteries unless a proper polarity connection is achieved, i.e. the positive terminal of the internal battery is connected to the positive terminal of the depleted battery and the negative terminal of the internal battery is connected to the negative terminal of the depleted battery. The above-mentioned **U.S. patent application Ser. No. 10/315,061** describes a polarity protection circuit that may be used to implement this aspect of the described embodiment.") (incorporating U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger, e.g., at ¶12 [2:45-46] ("In a further embodiment, the battery booster device may also comprise a **microprocessor**. The **microprocessor** can be used as part of a polarity protection circuit."); ¶43; ¶44; ¶45; ¶46; ¶47; ¶48) (quoted above) **U.S. 2007/0285049 to Krieger** ¶14 ("Additionally, the battery 20 may provide power for a controller 14, such as a **microprocessor or other circuitry**, which may be used to **control the operation of the various components** described below that may be provided in the jump starter."); ¶16 ("For example, a booster apparatus as described in U.S. patent application Ser. No. 10/315,061, which is incorporated herein by reference, may be provided.") (incorporating U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger, e.g., at ¶12 [2:45-46] ("In a further embodiment, the battery booster device may also comprise a **microprocessor**. The **microprocessor** can be used as part of a polarity protection circuit."); ¶43; ¶44; ¶45; ¶46; ¶47; ¶48) (quoted above)

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		U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei ¶19 ("a MCU controller chip J1"); ¶26 ("The output terminals of the battery pack are further connected to a multipath DC-DC voltage regulator circuit and a LED driving circuit 12, each path of the DC-DC voltage regulator circuit is connected to a **MCU controller circuit 14** …"); ¶30 ("When the red and black power source clips are respectively connected to the positive and negative electrodes of the external battery, if the connection is correct, a feedback voltage displayed by the voltage identifying system is positive, otherwise the feedback voltage is negative. The positive feedback voltage ranges from value a of 6 to 24 V to value b of 9 to 30 V, and a is smaller than b. If the connection is reverse, the relay does not work, and the high current outputting circuit 7 may be cut off. If the external smart battery detection system 6 fails, to further ensure the safety of the emergency power source, in the circuit of the emergency power source of the invention, a disposable or recoverable fuse 5 is provided and is connected between the output terminals of the battery pack 4 and the external smart battery detection system 6."); ¶31 ("In this invention, when the feedback voltage ranges from value a to value b and is of a positive value, the coil of the relay receives a voltage signal so that its contact is closed and its output terminal is coupled to the high current outputting circuit 7, and the emergency power source starts to power an external device with a high current. At this time, the current identifying system detects the current flowing through the high current outputting circuit 7. If the current is lower than value c, which ranges from 0.1 A to 10 A, the voltage signal across the coil of the relay disappears, the contact is then open, thus its output terminal is disconnected from the high current outputting circuit 7 to stop powering the external device with the high current."); ¶36 ("When the emergency power source is disconnected from the external rechargeable battery, or the current is smaller than the preset current value, R15 and R16 in the circuit 62 of the current identifying system provide a detection signal to U3. Then U3 sends an output signal to the MCU controller chip according to the detection signal, **based on which the MCU controller chip may determine the ON or OFF state of the circuit to make proper instructions**. When the preset voltage value is 8.1V and the output voltage value is smaller than the preset value,

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		R7 and R8 of the circuit 61 of the voltage identifying system may provide a detection signal to U2, and U2 may send an output signal to terminal IN1 according to the detection signal. Then the **MCU controller chip further controls the control switch Q2** in the circuit 63 of the relay according to the signal from terminal IN1. When the output voltage is bigger than a preset value, which may be 12.6V in the invention, R9 and R10 of the circuit 61 of the voltage identifying system may provide a detection signal to U2, and U2 may send a signal according to the detection signal to control the control switch Q3 in the circuit 63 of the relay. In this invention, the circuit 61 of the voltage identifying system and the circuit 62 of the current identifying system co-operate to provide the signal to the MCU controller chip. **With the determination of the MCU controller chip, the switches Q1, Q2 and Q3 in the circuit 63 of the replay can be controlled to achieve charging and protecting**.") **U.S. 2005/0116688 to Yin** ¶24 ("High current relays and **polarity detecting circuit** are used in the present invention. In normal situations, the battery clamps have no electricity and this prevents short circuit of the battery clamps. When the battery clamps are connected to the vehicle's battery, **the polarity detecting circuit will detect the polarity automatically and if the polarity is correct, the circuit will allow the first relay JD1 to conduct electricity and thus connect the circuit of the rechargeable battery B and the vehicle's battery** to start the vehicle. If the polarity is detected to be reversely connected, the circuit will maintain the first relay JD1 in an off state and the rechargeable battery B and the vehicle's battery are not connected and so the vehicle's battery will not be burnt out owing to the reverse polarity connection."); ¶25 ("When the battery clamps are not connected with the vehicle's battery, the first relay JD1 has no voltage and is in an off state and the battery clamps have no electricity. This can prevent danger caused by short circuit of the battery clamps."); ¶26 ("When the battery clamps and the vehicle's battery are connected with the correct polarity, **the second diode D2 is reversely biased**, the second relay JD2 is in an off state, the light L1 does not flash and the buzzer BU does not sound. The

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		power source provides electric power via the first diode D1 to the first relay JD1, thereby energizing the first relay JD1 and connecting the rechargeable battery B with the vehicle's battery to start the vehicle."); ¶28 ("When the two battery clamps are reversely connected to the two terminals of vehicle's battery, **the first diode D1 is in a reversed close state** in the circuit of the first relay JD1 and so the **first relay JD1 remains in an off state**, which leads to the disconnection of the rechargeable battery B and the vehicle's battery, thereby eliminating the risks of incurring high current and sparks. Simultaneously, the vehicle's battery provides power to the second relay JD2 and the buzzer BU via **the second diode D2, thereby energizing the second relay JD2 and making the buzzer BU to sound**. The rechargeable battery B provides power to the flash light circuit making the light L1 to flash.") **U.S. 2014/0368155 to Chen** ¶7 ("The **control unit** is electrically connected to the first switch unit, the second switch unit, the third switch unit and the fourth switch unit. The voltage polarity detection unit is electrically connected to the first switch unit, the second switch unit, the third switch unit, the fourth switch unit, the vehicle battery and the control unit. The **voltage polarity detection unit** is configured to detect the voltage polarity of the vehicle battery and **inform the control unit**. The **control unit** is configured to **turn on the first switch unit and the fourth switch unit and turn off the second switch unit and the third switch unit**, when the polarity of a contact connecting the first switch unit, the third switch unit and the vehicle battery is judged to be a positive pole and when the polarity of a contact connecting the second switch unit, the fourth switch unit and the vehicle battery is judged to be a negative pole. The control unit is configured to **turn on the second switch unit and the third switch unit** and **turn off the first switch unit and the fourth switch unit**, when the polarity of the contact connecting the first switch unit, the third switch unit and the vehicle battery is judged to be the negative pole and when the polarity of the contact connecting the second switch unit, the fourth switch unit and the vehicle battery is judged to be the positive pole."); ¶13 ("Moreover, the control unit is, for examples but not limited to, a microprocessor, a **microcontroller**, or a

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		control circuit having an integrated circuit and electronic components."); ¶19 ("The **control unit 112** is electrically connected to the first switch unit 104, the second switch unit 106, the third switch unit 108, the fourth switch unit 110 and the voltage polarity detection unit 114. The voltage polarity detection unit 114 is electrically connected to the first switch unit 104, the second switch unit 106, the third switch unit 108, the fourth switch unit 110, the vehicle battery 20 and **the control unit 112**."); ¶20 ("The voltage polarity detection unit 114 is configured to detect the voltage polarity of the vehicle battery 20 and **inform the control unit 112**."); ¶21 ("The control unit 112 is configured to **turn on the first switch unit 104 and the fourth switch unit 110** and **turn off the second switch unit 106 and the third switch unit 108**, when the polarity of a contact connecting the first switch unit 104, the third switch unit 108 and the vehicle battery 20 is judged to be a positive pole and when the polarity of a contact connecting the second switch unit 106, the fourth switch unit 110 and the vehicle battery 20 is judged to be a negative pole."); ¶22 ("The control unit 112 is configured to **turn on the second switch unit 106 and the third switch unit 108** and **turn off the first switch unit 104 and the fourth switch unit 110**, when the polarity of the contact connecting the first switch unit 104, the third switch unit 108 and the vehicle battery 20 is judged to be the negative pole and when the polarity of the contact connecting the second switch unit 106, the fourth switch unit 110 and the vehicle battery 20 is judged to be the positive pole."); ¶23 ("The control unit 112 is, for examples but not limited to, a microprocessor, a **microcontroller**, or a control circuit having an integrated circuit and electronic components.") **U.S. 2015/0137740 to Allos** ¶11 ("In particular, it is noted that variations in values of voltages and currents may be employed in given implementations, and that certain circuit components may be combined in various ways or implemented with different circuitry, including **microprocessors**. Accordingly, equivalent circuit configurations are also intended to be encompassed by the scope of present principles."); ¶22 ("When the mobile charging system is correctly connected to a vehicle with a discharged battery, the

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		green warning light 10 will illuminate, indicating proper connection. Component 18 with circuit C16 will have positive voltage and component 19 with circuit C1 will have negative voltage. C16 and C1 circuits are monitored by component 20 (forward polarity sense circuit), and this component includes three resistors with ratio values biased for low voltage detection. When circuit C16 voltage value is 2 or more volts more positive than circuit C1, the operational amplifier L2722 will conduct and switch its output circuit C25 to 12V positive to energize component 21 (Relay 3). When relay 3 N.O. (normally open) contacts are closed, 12V power from circuit C14 will connect with circuit C24 to turn green light on in component 10, indicating the correct and safe hook-up of the mobile charging system."); ¶41 ("Current flows through the meter to circuit C20 and then to component 17 contactor N.C. When component 17 is de-energized, current flows through it from circuit C20 to circuit C16 and then to component 18 to the vehicle battery."); ¶48 ("Once the reverse polarity sense circuit detects reverse polarity, it will conduct current and switch output circuit C23 to positive 12 volts **energizing component 14 relay 1 that will result in the enabling of the reverse polarity protection feature** of the mobile charging system, and the disabling of the boost cycle power source to component 11."); ¶49 ("**When component 14 is energized, normally open relay 1 contacts will close**, connecting circuit C14 (+12V source) with circuit C18 that feeds component 10 (polarity indicator) red warning light and buzzer in the instrument panel to warn the technician of the incorrect connection of the mobile charging system to the vehicle battery. Circuit C18 also feeds component 15 (Normally Closed) relay 2 contacts that connect to circuit C21."); ¶50 ("**Component 15 may be de-energized during a reverse polarity condition and may act as an interrupt during boost cycle**. When circuit C21 has +12 Volts it will energize component 17 (Normally Closed) Contactor **resulting in a circuit break between circuit C16 vehicle battery and circuit C20 that controls the mobile charging system output**, thus providing protection to amp meter 8 and fuse box 4 and other internal mobile charging system components. In addition, it also prevents the mobile charging system boost and charge functions from causing electrical damage to the weak or discharged vehicle battery and electrical system by

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		isolating the same from the mobile charging system internal power source."); *see also* U.S. Provisional Patent Application 61/903,779 at 2, 4-5. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶6 ("As a further solution of the present disclosure that: the DC to DC module provides a stable voltage for the **microcontroller** which **collects relevant data to conduct the corresponding control**. The battery voltage detection module conducts the measurement of the batter[y] voltage, the automobile start control module conducts the power supply or the power outage for the load module through the **microcontroller**, and the load detection module which comprises the automobile storage battery or the automobile engine detects whether the load module is correctly connected."); ¶10 ("As a further solution of the present disclosure that: in the standby mode, the **microcontroller closes all outputs** when the voltage of the direct current power supply is lower than that of the state being able to supply power and then recovers when it is higher than that of the state being able to supply power."); ¶ 23 ("Refer to FIG. 1, a novel automobile charger comprises a direct current power supply, wherein the positive pole of the direct current power supply is connected with one end or lead of the DC to DC module, one end of the battery voltage detection module and one end of the load module simultaneously, while the negative pole of the direct current voltage is connected with the other end of the DC to DC module, one end of the **microcontroller**, one end of the automobile start control module and the other end of the battery voltage detection module simultaneously. A third end of the DC to DC module is connected with the other end of the **microcontroller**, and the other three ends of the microcontroller are connected with the third end of the battery voltage detection module, the other end of the automobile start control module and one end of the load detection module respectively, wherein the other end of the load detection module is connected with the third end of the automobile start control module and the other end of the load module simultaneously; the load module which comprises the automobile storage battery and the automobile engine is located on the end of the load module."); ¶25 ("The DC to DC module in the present disclosure provides

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		the stable voltage for the **microcontroller which collects relevant data** to conduct the corresponding control. The battery voltage detection module conducts the measurement of the batter voltage, and the **automobile start control module conducts the power supply or the power outage for the load module through the microcontroller**, wherein the load detection module detects whether the load module is correctly connected."); ¶26 ("**The microcontroller in the present disclosure determines whether the automobile storage battery is connected** with the automobile engine through the load detection module, wherein the **automobile start control model** [sic] is **automatically activated and the battery starts to supply power to the load module** when the load is correctly connected; the **automobile start control model** [sic] is **automatically deactivated and the battery stops supplying power to the load module** when assuming that the load is not connected or the positive and negative polarities are reversely connected. In the standby mode, the **microcontroller closes all outputs** when the battery voltage is lower than 9V, and recovers the normal operation only when the battery voltage is larger than 10V; the automobile engine will generate the normal voltage to recharge the battery after the automobile starts, whereas the automobile start control module is deactivated immediately once the recharging voltage is larger than the voltage before that battery starts the power supply, to protect the battery from damages caused by charging with the normal voltage; the automobile start control module is the electronic switch, which can prevent the load from being reversely connected and recharging of the normal voltage, thus protecting the battery and prolonging lifespan.") **U.S. 2006/0220610 to Solberg** ¶23 ("**A control module 104** coupled to an output of charging system 100 and the second switch 130 controls the states of the second, third, and fourth switches 130, 132, and 134. With or without input and output isolation (e.g., such as through an opt-coupler), the **control module 104 monitors an output of the charging system 100** and compares it against a fixed or a programmable voltage level or voltage range. When the voltage equals or rises above the voltage level or falls within the

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		voltage range, the **control module 104 activates the second switch 130** that couples one or more of the boost modules 108 and 110 to the outputs of the charging system 100. When the control module 104 detects a reverse polarity, **the second switch 130 is deactivated effectively shutting down the charging system 100**."); ¶29 ("The output of the charging system 200 is monitored by a voltage and/or current monitoring circuit within the **controller 204**. Voltage and/or current monitored at the output interface 212 are compared against a fixed or programmed reference. When the output exceeds the reference, **a control signal activates the second, third, and fourth relays 224, 228, and 230**. When a reverse polarity connection is detected, **the control signal does not flow from the controller 204, which deactivates the second relay 224 and shuts down the charging system 200**. Analog gauges, digital, or light emitting diode displays 302 (as shown in FIG. 3) may provide a reverse polarity warning. A speaker or piezoelectric elements 302 may provide an audible warning to the user of a reverse polarity connection.") The following references also disclose, teach, or suggest this element: U.S. 2006/0176011 to Lui, e.g., at ¶21; U.S. 2004/0150373 to Chan, e.g., at ¶¶17-21; U.S. 2006/0244412 to Bonzer, e.g., at ¶21-22; U.S. 2014/0210399 to Urschel, e.g., at ¶39; WO 2012/036556 to Eidsvig, e.g., at 3:25-26; 5:8-10; U.S. 2013/0162029 to Reichow, e.g., at ¶22-24; U.S. 6,650,086 Chang; e.g., at 3:9-15; U.S. 2002/0041174 to Purkey, e.g., at ¶57-61; U.S. 6,344,733 to Crass, e.g., at 2:42-3:37
2	The apparatus of claim 1, wherein said internal power supply comprises a lithium ion battery	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **WO 2012/080996 A1 to Tracey et al.** Abstract ("The on-board starter battery (15, 26) may comprise a **lithium iron phosphate battery**."); 2:13-14 ("In one embodiment, the on-board starter battery means comprises a lithium iron phosphate battery."); 5:12-15 ("In the invention there is an on-board starter battery which comprises a plurality of interconnected batteries 15 which may be of the **lithium iron phosphate type**. The battery cells

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		can be of either cylindrical, prismatic or pouch type. The voltage is between 3.2 and 3.7 V nominal and of **lithium iron chemistry**."); 5:33-6:3 ("The jump starter 50 comprises a first clip 51 and a second clip 52 interconnected by a power cable 53. The first clip 51 has a housing 55 for a battery of sufficient capacity to provide the full starting power, in this embodiment of the **lithium iron phosphate type**. Also, the first clip 51 comprises a pair of jaws 56 having finger grips 57 for pressing together for opening and closing."); 6:11-12 ("The jump starter 50 involves use of close-proximity high-power batteries of the **lithium iron phosphate type**."); 9:32-34 ("In a still further embodiment, referring to Fig. 12, a 4-cell **Lithium iron battery** is connected to a positive jump-starter clamp by means of a number of parallel connected positive thermal coefficient (PTC) type resettable fuses."); Claim 2 ("A jump starter as claimed in claim 1 , wherein the on-board starter battery means (1 , 26) comprises a **lithium iron phosphate battery**.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶8 [1:67-2:1] ("The battery may comprise a **lithium iron phosphate** battery cell or a **lithium cobalt oxide** battery cell."); ¶35 5:12-27 ("In an embodiment of the present invention, the battery cell 42 is a **lithium iron phosphate** cell. In an additional embodiment, the battery cell 42 is a **lithium cobalt oxide** cell. Preferably, the output of the ignition output port's voltage is higher than about 13.6V. The voltage of the vehicle battery is generally less than about 13.6V and the output voltage of the ignition output port 46 is higher than 13.6V. The voltage differential can effectively prevent voltage reverse charging from the vehicle battery to the device 10 upon vehicle ignition start; thereby preventing reverse charging of the battery cell 42. Thus, the voltage differential protects the battery cell 42 and extends the life of the battery module 16. **Lithium iron phosphate and lithium cobalt oxide battery cells** have a large discharge capacity and may provide an output voltage higher than about 13.6V."); **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei**

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		¶8 ("In certain embodiments, the battery pack consists of **lithium-ion batteries** connected in series or parallel, each battery having a positive electrode made of lithium iron phosphate, lithium cobalt oxide, nickel cobalt manganese ternary lithium or lithium manganate and a negative electrode made of artificial or natural graphite …"); ¶20 ("The emergency power source of the present invention uses **lithium-ion batteries** as its battery pack, which have characteristics of light weight, small size, durability, high instantaneous discharging current and rechargeability, which can meet the demand of high current for starting a vehicle."); ¶26 ("Furthermore, the battery pack 4 consists of **lithium-ion batteries** connected in series or parallel, each having a positive electrode made of lithium iron phosphate, lithium cobalt oxide, nickel cobalt manganese ternary lithium or lithium manganate and a negative electrode made of artificial or natural graphite."); ¶27 ("The emergency power source uses lithium-ion batteries as its battery pack, which has the characteristics of light weight, small size, durability, high instantaneous discharge current and rechargeability, which is capable of supplying a high current for starting a vehicle.") **U.S. 2015/0137740 to Allos** ¶9 ("Coupled to the housing may be a **rechargeable source of energy 105**, which is in many cases a **plurality of battery cells** which may be charged, e.g., from a wall or other outlet source."); ¶16 ("The batteries may be lead acid, absorption glass mat (AGM), lithium ion, or the equivalent …"); *see also* U.S. Provisional Patent Application 61/903,779 at 1-2. The following references also disclose, teach, or suggest this element: U.S. 2014/0210399 to Urschel, e.g., at ¶57
3	The apparatus of claim 2, wherein said lithium ion battery comprises a battery pack of multiple lithium ion batteries.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **WO 2012/080996 A1 to Tracey et al.**

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		2:16-17 ("In one embodiment, there is a plurality of on-board starter batteries along the interconnection means."); 2:19-20 ("In one embodiment, the on-board starter battery means comprises a plurality of separate batteries which are electrically interconnected."); 5:12-13 ("In the invention there is an on-board starter battery which comprises a plurality of interconnected batteries 15 which may be of the lithium iron phosphate type."); 5:29-30 ("In this embodiment there are two batteries 26 housed within each handle 25, and finger- gripping features 27 are provided to aid user operation."); **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶34 ("In an embodiment, the battery module 16 includes battery cells 42, a battery circuit board 44, an ignition output port 46, and a connecting ribbon cable 48. The battery cell 42 may have a multi-cell structure. In an embodiment of the present invention, the battery cell 42 has four battery cells.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶8 ("In certain embodiments, the battery pack consists of **lithium-ion batteries connected in series or parallel**, each battery having a positive electrode made of lithium iron phosphate, lithium cobalt oxide, nickel cobalt manganese ternary lithium or lithium manganate and a negative electrode made of artificial or natural graphite …"); ¶26 ("Furthermore, the battery pack 4 consists of **lithium-ion batteries connected in series or parallel**, each having a positive electrode made of lithium iron phosphate, lithium cobalt oxide, nickel cobalt manganese ternary lithium or lithium manganate and a negative electrode made of artificial or natural graphite.") **U.S. 2015/0137740 to Allos** ¶9 ("Coupled to the housing may be a **rechargeable source of energy 105**, which is in many cases a **plurality of battery cells** which may be charged, e.g., from a wall

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		or other outlet source."); ¶16 ("The batteries may be lead acid, absorption glass mat (AGM), lithium ion, or the equivalent …"); *see also* U.S. Provisional Patent Application 61/903,779 at 1-2. The following references also disclose, teach, or suggest this element: U.S. 2014/0210399 to Urschel, e.g., at ¶57
9	The apparatus of claim 1, further comprising a voltage regulator configured to convert output voltage of said internal power supply to a voltage level appropriate to provide operating power to internal components of the apparatus.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶46 [9:16-26] ("A low voltage power supply is provided to the microprocessor 60 from battery 2 via a voltage regulator 70. The low voltage output signals from the microprocessor 60 should be translated to higher voltages before being supplied to the transistors 12 a-12 d. The level translator 68 translates the output voltage of the microprocessor 60 to the higher levels that are needed to operate transistors 12 a-12 d. Accordingly, the output signals from the microprocessor 60 are used by the level translator 68 to generate control signals for the control electrodes of the FETs."); ¶52 [10:27-29] ("Voltage regulator 70 is coupled to the boosting battery 2 and the depleted battery 11 for detecting their charge levels."); ¶53 [10:30-43] ("In order to measure the charge level of the boosting battery 2, clamps 8, 10 should be disconnected from the depleted battery 11. The voltage regulator then produces a voltage proportional to the voltage of the boosting battery 2, and which is within the operating range of the microprocessor 60. The microprocessor 60 is programmed to detect when the voltage of the boosting battery 2 falls below a predetermined level, for example, about 80% of its rated value. The buzzer 72 or other device can then be activated to indicate to the operator that the charge of the boosting battery 2 is low and that it should be recharged. The booster system may be plugged into a standard 110/220-volt electrical outlet via a standard wall charger 82 to recharge the boosting battery 2."); ¶54 [10:44-54] ("In order to measure the voltage of the depleted battery 11, switch 12 between the boosting battery 2 and the depleted battery 11 should be in a non-conducting state. Microprocessor 60 can be controlled via operator input

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		from input device 66 to place switch 12 in a non-conducting state. Clamps 8, 10 are then connected to the depleted battery 11. The voltage regulator produces a voltage proportional to the voltage of the depleted battery 11. The microprocessor 60 receives this signal from the voltage regulator 70 and determines and displays the voltage of the depleted battery 11 on display 64.") **U.S. 2007/0285049 to Krieger** ¶14 ("In one embodiment, **a voltage regulator** optionally included may convert DC input power, for example from the battery 20, into a USB compatible 5V/500 mA DC power output. The **voltage regulator** may be a component of the power inverter 60. A charging port 19 for mobile telephones or other portable devices may also be provided. Additionally, the battery 20 may **provide power for a controller 14**, such as a microprocessor or other circuitry, which may be used to control the operation of the various components described below that may be provided in the jump starter.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶42 ("In an embodiment, the discharge module 54 includes a constant current and constant voltage output circuit 66, a discharge module over-discharge protection circuit 68, and a discharge module power test circuit 70. The constant current and constant voltage output circuit 66 is coupled to the USB output module 36, so that the first USB interface 38 and the second USB interface 40 maintain a constant charging current and constant voltage.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶11 ("In certain embodiments, the DC-DC **voltage regulator circuit** includes a DC-DC 19V boost circuit having an output voltage of 19V, a DC-DC 12V output circuit having an output voltage of 12V, and a DC-DC 5V buck circuit having an output voltage of 5V."); ¶18 ("… a three-terminal **voltage regulator circuit U1** whose model is 7805 …"); ¶20 ("The battery pack of the emergency power source is also

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		connected to the **voltage regulator circuit** for outputting a variety of voltage levels …"); ¶26 ("The DC-DC **voltage regulator circuit** includes a DC-DC 19V boost circuit 11 of an output voltage of 19V, a DC-DC 12V output circuit 10 of an output voltage of 12V, and a DC-DC 5V buck circuit 9 of an output voltage of 5V."); ¶27 ("The battery pack of the emergency power source is also connected to the **voltage regulator circuit** for outputting a variety of voltage levels, and by connecting the output terminal of the respective path of the voltage regulator circuit to the MCU controller circuit, various outdoor power demands of mobile phones, computers, digital cameras, car playing pumps, car refrigerators, car cleaners, etc. can be satisfied."); ¶34 ("…a three-terminal **voltage regulator circuit U1** whose model is a 7805 …") **U.S. 2015/0137740 to Allos** ¶31 ("The mobile charging system may contain in one implementation **five primary components used to regulate the output voltage and current** to properly recharge a discharged vehicle battery, and these are components 3 a, 3 b, 5, 6 and 7. Components 3 a and 3 b are as noted above, e.g., switching regulator DC to DC converters. In one specific implementation the same are identical in model and part numbers, with the same electrical characteristics and specifications. Because of their configuration, they share the same inputs and outputs and are connected (wired) in parallel; therefore, the shared output current will max out at 40 amperes."); *see also* U.S. Provisional Patent Application 61/903,779 at 3. **U.S. 2015/0306964 [issued as U.S. 9,525,297] to Wang** ¶6 ("As a further solution of the present disclosure that: the **DC to DC module provides a stable voltage** for the microcontroller which collects relevant data to conduct the corresponding control."); ¶24 ("Refer to FIG. 2, the **DC to DC module** comprises a diode D1, a resistor R1, capacitor C1, a HT7530 voltage stabilizing tube, capacitors C2 and C3, wherein the positive pole of the diode D1 is connected with the positive pole of the battery, the negative pole of the diode D1 is connected

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		with one end of the capacitor C1 and an IN port of the HT7530 voltage stabilizing tube simultaneously through the resistor R1, and an OUT port of the HT7530 voltage stabilizing tube is connected with one end of the capacitor C2, one end of the capacitor C3 and a VDD port of the microcontroller U2, while the other end of the capacitor C1, the other end of the capacitor C2 and the other end of the capacitor C3 as well as a GND port of the HT7530 voltage stabilizing tube are grounded and connected with the negative pole of the battery simultaneously …"); ¶25 ("The **DC to DC module** in the present disclosure **provides the stable voltage** for the microcontroller which collects relevant data to conduct the corresponding control.") **U.S. 2006/0220610 to Solberg** ¶25 ("In other charging systems, a **current monitoring and limiting circuit** within the control module 104 may deactivate the second switch 130 to protect the user and charging system 100 against high current and/or **voltage** conditions."); ¶31 ("In other charging systems, a current and/or **voltage monitoring and limiting circuit** within the control module 104 may deactivate the second relay 224 to protect the user and charging system 200 against high current and/or **voltage** conditions.") The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶46; U.S. 3,638,108 to Channing, e.g., at 7:34-36; U.S. 2002/0041174 to Purkey, e.g., at ¶11-12, 58, 61, Fig. 6
10	The apparatus of claim 1, further comprising a USB output port configured to provide charging power from said internal power supply to a USB-chargeable device.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶42 ("The discharge module 54 is connected to the USB (Universal Serial Bus) output module 36. In an embodiment, the discharge module 54 includes a constant current and constant voltage output circuit 66, a discharge module over-discharge protection circuit 68, and a discharge module power test circuit 70. The constant current and constant voltage output circuit 66 is coupled to the USB output module

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		36, so that the first USB interface 38 and the second USB interface 40 maintain a constant charging current and constant voltage."); ¶43 ("The discharge module over-discharge protection circuit 68 is used when the battery module 16 is supplying energy via the USB output module 36. The discharge module over-discharge protection circuit 68 prevents damage to the battery module and an external device charging via the USB output module 36 when the battery module's power output is below a predetermined threshold.") **U.S. 2007/0285049 to Krieger** ¶14 ("Several different types of DC power outlets may be provided. For example, **USB port 18** may be provided on the housing 10. The **USB port 18** may be used to provide a USB power supply. In one embodiment, a voltage regulator optionally included may convert DC input power, for example from the battery 20, into a USB compatible 5V/500 mA DC power output.") **U.S. 2013/0099736 to Roberts** ¶35 ("A USB port 114 allows for an external device 116 to be powered and/or charged by the battery charger if the external device 116 includes a USB compatible charging device 118. When inserted into the USB port 114, which is coupled to the auxiliary USB power supply 52 of FIG. 2, the USB charging device 118 conveys power from the USB port 114 to the external device 116. This allows a user to charge the vehicle battery 12 while simultaneously powering and/or charging a mobile telephone, hand-held computer, or any other external device. In a presently contemplated embodiment, the USB port 114 may convey electrical power rated up to approximately ten watts to the external device 116 (the power required to charge certain cellular, wireless or hand-held devices) through the USB charging device 118.") The following references also disclose, teach, or suggest this element: U.S. 2012/0025766 to Reade, e.g., at ¶25

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11	The apparatus of claim 1, further comprising a USB charging port configured to provide charging power from an external power source to said internal power supply.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0239290 to Krieger** ¶17 ("In addition to the AC input plug 204, the apparatus may also have a DC input 302. The DC input 302 is coupled to the jump starter circuit 304, and can charge the internal battery 308 of the jump starter circuit 304 directly. The internal battery 308 can also be charged by the high frequency charger 306. A microprocessor, described below, may be used to control the charging process.") **U.S. 2015/0054336 [issued as U.S. 9,506,446] to Xinfang** ¶32 ("The charging port 34 may be an AC or DC charging port and is connectable to an external charging circuit adaptor for charging the battery module 16.") **U.S. 2008/0143290 [issued as U.S. 7,893,657] to Chakavula** ¶33 ("As described below (FIG. 10) the detection of the input source is automatic and governed by processor logic. When an input cable is used to connect either to an AC, DC or **USB**/Firewire source, the processor senses the type of power it receives and automatically converts that power to the type necessary to charge the portable unit that has been selected by the user based on the plug or bridge selected or by the power requirements of the portable unit that are selected by the user via the control panel."); ¶39 ("The MPC can automatically select which way to charge its internal rechargeable battery when either connected to an AC, DC, **USB**/Firewire, solar or hand crank method of charging its internal battery.") **U.S. 2011/0175461 [issued as U.S. 8,362,745] to Tinaphong** ¶39 ("As can be seen from FIG. 2, the energy harvesting circuit also includes a USB charger port or connector 24 for providing a connection to an external source of

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		voltage (preferably, about 5 volts DC), to charge the internal second storage device 18, which as will be explained is preferably a lithium polymer battery, using a lap top computer or other device connectable to the USB charger connector 24. The USB charger connector 24 has its +5 volt input pin connected to the connection between the output of the first stage DC-to-DC converter circuit 20 and the input of the second stage DC-to-DC converter circuit 22."); ¶40 ("The second stage DC-to-DC converter circuit 22 acts as a low drop out, step down voltage converter/regulator to convert the 4.5 volts from the first stage DC-to-DC converter circuit 20 (or the 5 volt DC signal provided on the USB charger connector 24 from an external source) to a 3.7 volt DC signal on the output of the second DC-to-DC converter circuit 22. This output voltage of the second stage DC-to-DC converter circuit 22 is provided to the positive side of a lithium polymer battery 18 forming part of the energy harvesting circuit, the negative side of the battery being preferably grounded. Preferably, the lithium polymer battery is a 3.7 volt, 1.5 amp battery which is used as a second storage device 18 which is charged by the rectified and DC-converted voltage generated by the energy harvesting circuit from the RF signal received by the antenna 2, or by an external DC power source connected to the USB charger connector 24." **<u>USB Implementers Forum, Inc.</u>** §1.4.8. ("A Portable Device is considered to be any USB or OTG device that is capable of operating from its own battery, and is also capable of drawing current from USB for purposes of operating and/or charging its battery.") The following references also disclose, teach, or suggest this element: U.S. 2015/0137740 to Allos at ¶9; EP 0 616 409 to Herbert at ¶32; U.S. 2004/0130298 (issued as US 7,345,450) Krieger at ¶53; U.S. 2007/0285049 to Krieger at ¶15; U.S. 2001/0025618(issued as US 6,679,212) to Kelling at ¶¶22-24; U.S. 2012/0025766 (issued as US 9,153,978) to Reade at ¶79; U.S. 2006/0244412 to Bonzer at ¶23; U.S. 5,194,799 to Tomantschger at 7:10-25; U.S. 2014/0210399 to Urschel at ¶¶27, 34-35; U.S. 2002/0041174 (issued as US 6,426,606) to Purkey at

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		Abstract, ¶26; U.S. 5,281,904 Tomkins at 5:18-22; U.S. 2015/0054336 [issued as U.S. 9,506,446] to Xinfang at ¶¶30-32; U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei at ¶¶5, 20
12	The apparatus of claim 1, further comprising a flashlight circuit configured to provide a source of light to a user.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0239290 to Krieger** ¶23 ("The DC output 108 can be used to provide power to the built in air compressor 206, a **removable light 314** or any other type of accessory."); ¶24 ("The motorist can further inflate a tire, and **illuminate an area with the removable light**. The jump starter/charger of the present invention also allows the motorist to use AC appliances anywhere."). **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶2 ("The present invention relates to mobile power technology and, more particularly, to a mobile power bank capable of charging electronic devices, jump starting an ignition system of a vehicle with a weak or dead battery, and operating as a **flashlight**."); ¶6 ("The present invention according to an embodiment provides a mobile power bank, vehicle ignition system jump starter, and a **flashlight**."); ¶26 ("The mobile power bank 10 functions as a mobile power bank, vehicle battery jump starter, and a flashlight."); ¶29 ("The second plate 24 may be provided with a master control button 26 and a **flashlight 28**. The **flashlight 28** and the master control button 26 may be positioned on opposite surfaces of the second plate 24. Preferably, the **flashlight 28** is placed adjacent to an edge of the base cover 20."); ¶44 ("The lighting module 56 is connected to the **flashlight 28**. In an embodiment, the lighting module 56 includes a lighting module over-discharge protection circuit 72 and a lighting module power test circuit 74. The lighting module over-discharge protection circuit 72 limits discharge of the battery module 16 to the flashlight 28 when the battery power output to the flashlight is below a predetermined threshold to protect the battery module and the flashlight. The lighting module power test

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		circuit 74 detects the battery module's power levels during illumination of the flashlight 28.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶8 ("… the MCU controller circuit is further connected to a smart LED electric quantity display system for displaying the electric quantity of the emergency power source, an output terminal of the LED driving circuit is connected to a LED lighting lamp …"); ¶20 ("The LED lighting lamp may provide outdoor lighting."); ¶26 ("the MCU controller circuit 14 is further connected to a smart LED electric quantity display system 8 for displaying the electric quantity of the emergency power source, an output terminal of the LED driving circuit 12 is connected to a LED lighting lamp 13"); ¶27 ("The LED lighting lamp may provide outdoor lighting.") **U.S. 2005/0116688 to Yin** ¶5 ("… a flash light circuit …"); ¶20 ("… a flash light circuit …"); ¶28 ("The rechargeable battery B provides power to the flash light circuit making the light L1 to flash.") **U.S. 2013/0099736 to Roberts** ¶33 ("FIG. 5 shows the LED 100 on the positive terminal clamp 16 in action. A user grasping the positive terminal clamp 16 depresses the switch 102 (covered by the user's hand) to activate the LED 100, illuminating a "+" marking (or other indicia) on the positive terminal 20 of the battery 12 in an otherwise dark region under the hood of a car. Applying the LED 100 to the positive terminal clamp 16 may be advantageous because the positive terminal clamp 16 is typically secured to the positive terminal 20 before the negative terminal clamp 18 is secured to the negative terminal 22 in order to make the connections necessary for charging a vehicle battery 10. In addition, disposing the LED 100 on the positive terminal clamp 16 adds a distinction to the positive terminal clamp 16, making it less likely to be

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		mistaken for the negative terminal clamp 18."); ¶34 ("A close up view of the positive terminal clamp 16 with the LED 100 illuminated is illustrated in FIG. 6. The LED 100 shines light from an outside edge of the clamp so that the illumination may not be obscured by the teeth 104 used to clamp directly onto the positive terminal 20. Positioning the LED 100 near the tip of the clamp allows a light path 106 to reach farther in the direction of the clamp tip than if it were positioned closer to the gripped region of the clamp.") The following references also disclose, teach, or suggest this element: U.S. 2004/0239290 to Krieger, e.g., at ¶23-24; U.S. 2006/0244412 to Bonzer, e.g., at ¶¶23-25; 5,194,799 to Tomantschger, e.g., at 4:17-26
13	The apparatus of claim 12, wherein said source of light is at least one LED.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶8 ("… the MCU controller circuit is further connected to a smart LED electric quantity display system for displaying the electric quantity of the emergency power source, an output terminal of the LED driving circuit is connected to a LED lighting lamp …"); ¶20 ("The LED lighting lamp may provide outdoor lighting."); ¶26 ("the MCU controller circuit 14 is further connected to a smart LED electric quantity display system 8 for displaying the electric quantity of the emergency power source, an output terminal of the LED driving circuit 12 is connected to a LED lighting lamp 13"); ¶27 ("The LED lighting lamp may provide outdoor lighting.") **U.S. 2013/0099736 to Roberts** ¶33 ("FIG. 5 shows the LED 100 on the positive terminal clamp 16 in action. A user grasping the positive terminal clamp 16 depresses the switch 102 (covered by the user's hand) to activate the LED 100, illuminating a "+" marking (or other indicia) on the positive terminal 20 of the battery 12 in an otherwise dark region under the hood of a car. Applying the LED 100 to the positive terminal clamp 16 may be

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		advantageous because the positive terminal clamp 16 is typically secured to the positive terminal 20 before the negative terminal clamp 18 is secured to the negative terminal 22 in order to make the connections necessary for charging a vehicle battery 10. In addition, disposing the LED 100 on the positive terminal clamp 16 adds a distinction to the positive terminal clamp 16, making it less likely to be mistaken for the negative terminal clamp 18."); ¶34 ("A close up view of the positive terminal clamp 16 with the LED 100 illuminated is illustrated in FIG. 6. The LED 100 shines light from an outside edge of the clamp so that the illumination may not be obscured by the teeth 104 used to clamp directly onto the positive terminal 20. Positioning the LED 100 near the tip of the clamp allows a light path 106 to reach farther in the direction of the clamp tip than if it were positioned closer to the gripped region of the clamp.") The following references also disclose, teach, or suggest this element: U.S. 2006/0244412 to Bonzer, e.g., at ¶24
15	The apparatus of claim 1, further comprising a plurality of visual indicators configured to display remaining capacity status of said internal power supply.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶53 [10:30-43] ("In order to measure the charge level of the boosting battery 2, clamps 8, 10 should be disconnected from the depleted battery 11. The voltage regulator then produces a voltage proportional to the voltage of the boosting battery 2, and which is within the operating range of the microprocessor 60. The microprocessor 60 is programmed to detect when the voltage of the boosting battery 2 falls below a predetermined level, for example, about 80% of its rated value. The buzzer 72 or other device can then be activated to indicate to the operator that the charge of the boosting battery 2 is low and that it should be recharged. The booster system may be plugged into a standard 110/220-volt electrical outlet via a standard wall charger 82 to recharge the boosting battery 2.") **U.S. 2007/0285049 to Krieger**

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		¶24 ("An on/off switch 58 may control the operation of the jump starter. A **set of indicator lights 64** may be provided to show **the status of the internal battery 20** or portable batteries being charged. The controller 14 may monitor the various components of the jump starter and show results on **a display**. The display may include, for example, a linear meter, a digital read out or a bar graph which may allow a user to monitor the operation of the jump starter, such as **the status on the internal battery**, the battery in a vehicle being jump started, or the portable batteries. **A battery gauge** such as a linear meter for a digital read out or a bar graph may be provided to display to the user **the status of the internal and/or the external battery** being charged. The **gauge** or read out may be provided on a front surface of the housing.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶31 ("The LED **indicator module 32** may include a plurality of LED's. In an embodiment, the LED indicator module 32 has five LED's in the control circuit board 14, to indicate the available power and the charging status of the battery module 16."); ¶46 ("When the mobile power bank 10 is connected to an external power source for charging the battery module 16 via the charging port 34 and is in a charged state, the power test circuit 64 detects the battery capacity of the battery module 16 and activates the LED indicator module 32 for a battery charging indicator."); ¶47 ("For example, when the power test circuit 64 detects battery voltage of the battery module 16 is lower than about 10.8V, the control module 58 may control the LED indicator module 32 to stop all LED's from lighting up. When the detected battery voltage is greater than about 12.6V, the control module 58 may control the LED indicator module 32 so that one LED is lit and another LED is flashing. When the detected battery voltage is greater than about 13V, the control module 58 may control the LED indicator module 32 so that two LED's are lit and another LED is flashing."); ¶48 ("When the battery voltage is greater than about 13.2V, the control module 58 may control the LED indicator module 32 so that three LED's are lit and another LED is flashing. When the battery voltage is greater

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		than about 13.3V, the control module 58 may control the LED indicator module 32 so that four LED's are lit and another LED is flashing. When the battery voltage is equal to or greater than about 13.4V, the control module 58 may control the LED indicator module 32 so that all five LED are lit. As will be understood by one of skill in the art, the number of LED's controlled by the LED module 32 and battery charge indications may be varied."); ¶50 ("If the discharge module power test circuit 70 indicates there is no power load when the battery voltage of the battery module 16 is lower than about 10.8V, then the control module 58 may control the LED module 32 so that one LED is flashing; when the detected battery voltage is greater than about 12.6V, the control module can control the LED module so that one LED is lit; when the detected battery voltage is greater than about 13V, the control module may control the LED module so that two LED's are lit; when the detected battery voltage is greater than about 13.2V, the control module may control the LED module so that three LED's are lit; when the detected battery voltage is greater than about 13.3V, the control module may control the LED module so that four LED's are lit; when the detected battery voltage is equal to or greater than about 13.4V, the control module can control the LED module so that all five LED's are lit."); ¶51 ("If the master control button 26 is activated, and the control module 58 detects that the a power load is connected (for example, if a greater than 50 A power load current is detected, then a power load is considered to be connected), then the control module 58 may turn on the discharge module power test circuit 70 and the LED indicator module 32 to activate the discharged battery indicator. Specifically, when the detected voltage of the battery module 16 is equal to or lower than about 10.8V, the control module 58 may control the LED module 32 so that one LED is flashing; when the detected battery voltage is greater than about 12.6V, the control module can control the LED module 32 so that one LED is lit; when the detected battery voltage is greater than about 13V, the control module may control the LED module 32 so that two LED's are lit; when the detected battery voltage is greater than about 13.2V, the control module can control the LED module 32 so that three LED's are lit; when the detected battery voltage is greater than about 13.3V, the control module may control the LED module 32 so that four LEDs are lit; when the detected battery voltage is equal to or greater than about 13.4V, the control module

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		can control the LED module 32 so that all five LED's are lit."); ¶52 ("As will be understood by one of skill in the art, the power bank system 10 may have a plurality of LED indicator modules. For example, there may be a first LED indicator module for indicating battery charge level and a second LED indicator module for indicating power output level. The plurality of LED indicator modules may be controlled by the control module 58 or by separate modules, such as the power charging module 52 and the discharge module 54.") **U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei** ¶8 ("… the MCU controller circuit is further connected to a smart LED electric quantity display system for displaying the electric quantity of the emergency power source …"); ¶26 ("… the MCU controller circuit 14 is further connected to a smart LED electric quantity display system 8 for displaying the electric quantity of the emergency power source …"); ¶27 ("Moreover, by a smart LED electric quantity display system 8, the power usage status of the battery pack 4 in the emergency power source can be detected in real time.") **U.S. 2015/0137740 to Allos** ¶17 ("When the 36 VDC battery pack is fully charged, charger 1 may be configured to automatically shut off and a green light may illuminate on **battery fuel gauge 9** when the test switch 20 is pressed, indicating that the mobile charging system is ready to be used."); *see also* U.S. Provisional Patent Application 61/903,779 at 2, 6-7. The following references also disclose, teach, or suggest this element: U.S. 2004/0239290 to Krieger, e.g., at ¶15; U.S. 2012/0025766 to Reade, e.g., at ¶95; U.S. 2006/0244412 to Bonzer, e.g., at ¶25; U.S. 2014/0210399 to Urschel, e.g., at ¶33; WO 2012/036556 to Eidsvig, e.g., at 7:5-14; U.S. 2002/0041174 to Purkey, e.g., at ¶59; U.S. 6,344,733 to Crass, e.g., at 3:16-22

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17	The apparatus of claim 1, further comprising a visual indicator configured to warn a user when a vehicle battery is connected with reverse polarity.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **WO 2012/080996 A1 to Tracey et al.** 6:23-24 ("An integrated circuit IC1 is connected via a resistor R2 to the positive lead 103 and is connected to the negative lead 105 via **reverse polarity indicator (LED1)**."); 8:22-25 ("Secondly, current from the vehicle battery flows via the resistor R2, reverse polarity indicator LED1 and the input side of the semiconductor photo-relay type TLP222 (IC1) thus illuminating LED1 and the input photo LED in IC1."); 10:1-4 ("A warning light emitting diode LED1 and its associated series limiting resistor are connected in parallel with the PTC devices. During normal engine starting operation the PTC devices are cold and exhibit a low resistance thus permitting normal current flow. As there is little voltage drop across the devices in this state, LED1 is extinguished."); 10:6-11 ("Should any of the following fault conditions occur: clamp short circuit, reverse connection to vehicle or incorrect voltage selection, then a larger than normal current flow will result causing the PTC devices to rapidly warm up and exhibit a high resistance thus limiting current flow to a very low level and preventing damage to the jump starter unit or the flat battery. As most of the battery (BAT1) voltage will now be developed across the PTC devices, LED1 is illuminated thus informing the user that a fault condition has occurred.") **U.S. 2004/0130298 [issued as U.S. 7,345,450] to Krieger** ¶38 [7:34-36] ("The indicator 40 may provide a visual or audio indication to a user that a proper polarity connection has or has not been established. The indicator 40 illustrated in FIG. 4 includes a resistor 41 and an LED 42."); ¶39 [7:53-57] ("If the alligator clamps 8, 10 are connected to depleted battery 11 with an incorrect polarity, LED 42 is forward biased and is illuminated indicating an incorrect connection.")

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		U.S. 2015/0340907 [issued as U.S. 9,954,391] to Lei ¶10 ("In certain embodiments, when the red and black power source clips are respectively connected to the positive and negative electrodes of the external battery, if the connection is correct, a feedback voltage displayed by the voltage identifying system is positive, otherwise the feedback voltage is negative …"); ¶30 ("When the red and black power source clips are respectively connected to the positive and negative electrodes of the external battery, if the connection is correct, a feedback voltage displayed by the voltage identifying system is positive, otherwise the feedback voltage is negative.") **U.S. 2005/0116688 to Yin** ¶5 ("… a flash light circuit …"); ¶20 ("… a flash light circuit …"); ¶28 ("**When the two battery clamps are reversely connected to the two terminals of vehicle's battery**, the first diode D1 is in a reversed close state in the circuit of the first relay JD1 and so the first relay JD1 remains in an off state, which leads to the disconnection of the rechargeable battery B and the vehicle's battery, thereby eliminating the risks of incurring high current and sparks. Simultaneously, the vehicle's battery provides power to the second relay JD2 and the buzzer BU via the second diode D2, thereby energizing the second relay JD2 and making the buzzer BU to sound. **The rechargeable battery B provides power to the flash light circuit making the light L1 to flash**.") **U.S. 2015/0137740 to Allos** ¶5 ("The mobile charging system may include an indicator, e.g., **a green light indicator**, to alert the operator when the system is interfaced correctly to the vehicle."); ¶22 ("When the mobile charging system is correctly connected to a vehicle with a discharged battery, the **green warning light 10 will illuminate**, indicating proper connection. … When relay 3 N.O. (normally open) contacts are closed, 12V power from circuit C14 will connect with circuit C24 to **turn green**

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		light on in component 10, indicating the correct and safe hook-up of the mobile charging system."); ¶49 ("When component 14 is energized, normally open relay 1 contacts will close, connecting circuit C14 (+12V source) with circuit C18 that feeds component 10 (polarity indicator) **red warning light and buzzer** in the instrument panel to warn the technician of the incorrect connection of the mobile charging system to the vehicle battery. Circuit C18 also feeds component 15 (Normally Closed) relay 2 contacts that connect to circuit C21."); *see also* U.S. Provisional Patent Application 61/903,779 at 1, 2, 5, 7. **U.S. 2006/0220610 to Solberg** ¶23 ("A **display** and a device that converts electric signals into sound may warn a user of a reverse polarity connection."); ¶29 ("Analog gauges, digital, or **light emitting diode displays 302** (as shown in FIG. 3) may provide a reverse polarity warning.") The following references also disclose, teach, or suggest this element: EP 0 616 409 to Herbert, e.g., at ¶37; U.S. 2004/0239290 to Krieger, e.g., at ¶15; U.S. 2003/0141845 to Krieger, e.g., at ¶64; U.S. 2001/0025618 to Kelling, e.g., at ¶17; U.S. 2014/0084844 to Weflen, e.g., at ¶15; U.S. 5,194,799 to Tomantschger, e.g., at 4:7-16; U.S. 2014/0210399 to Urschel, e.g., at ¶33; U.S. 3,638,108 to Channing, e.g., at 3:57-71; 5:63-71
19	The apparatus of claim 1, further comprising a manual override switch configured to activate a manual override mode to enable a user to connect jump start power to said output port when said vehicle battery isolation sensor is unable to detect presence of a vehicle battery.	The following prior art references alone or in combination suggest, teach, or anticipate, either in part or whole, this limitation: **WO 2012/080996 A1 to Tracey et al.** 3:13-17 ("In one embodiment, a gate of the switch is connected to the positive lead by a user-activated switch. In one embodiment, the user-activated switch is of the type for momentary closing. In one embodiment, the user-activated switch is connected to the gate via a diode, preferably a Zener diode. In one embodiment, the switch is solid state and is reverse biased to prevent current flow if a system to

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		which the clamps are connected attempts to return charge."); 6:24-26 ("Also, a manual contact switch 115 (SW1) is connected on one side to the positive lead 3, and on the other to a Zener diode ZD1, a resistor Rl, in turn linked with a bank of MOSFET switches Ql, Q2, and Q3."); 7:8-11 ("The battery 102 positive terminal is also connected to the momentary action single pole normally open switch SW1 1 15. This switch, the Zener diode ZD1 , the resistor Rl and Metal Oxide Semiconductor Field Effect Transistors (MOSFETS) Ql to Q3 comprise the power-switching and over-discharge elements."); 7:13-15 ("To activate the jump-starter system it must be connected to a vehicle battery by means of the positive and negative jaws 56 linked to the conductors 104 and 106. The **activation switch 115** (SW1) is then briefly depressed."); 9:4-5 ("Unlike other jump starter protection circuits that require a vehicle battery to be present for correct operation, this jump starter circuit 100 can operate with a completely dead battery or none at all. However in this case, reverse polarity detection is not available.") **U.S. 2007/0285049 to Krieger** ¶24 ("An **on/off switch 58** may control the operation of the jump starter.") **U.S. 2015/0054336 [issued as US 9,506,446] to Xinfang** ¶11 ("In an embodiment, the circuit board further comprises a master control button and the housing further comprises a button cap positioned adjacent the master control button such that operation of the button cap causes operation of the master control button."); ¶29 ("The second plate 24 may be provided with a master control button 26 and a flashlight 28. The flashlight 28 and the master control button 26 may be positioned on opposite surfaces of the second plate 24. Preferably, the flashlight 28 is placed adjacent to an edge of the base cover 20. In an embodiment, the master control button 26 is operable in a direction parallel to the second plate 24. The upper cover 18 is provided with a button cap 30 in the corresponding position of the master control button 26. The button cap 30 may be operated by a user to press the master control button 26.")

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		U.S. 2015/0137740 to Allos ¶24 ("The jump-start and boost functions can be activated with, e.g., a two-minute timer switch 11. The **switch dial** can be rotated manually clockwise and set up to a maximum time of 2 minutes (and thus other times are also possible).") **U.S. 2006/0220610 to Solberg** ¶38 ("An operator may couple one or more of the boost modules to the vehicle's battery or electrical system by activating **a mechanical or electromechanical switch**. When the switch is activated, the charging system couples the boost modules to the vehicle's battery or electric system for a predetermined period of time at act 614. If additional charging is needed, the operator may re-couple one or both of the boost modules to the vehicle's battery or charging system by re-activating switch.") The following references also disclose, teach, or suggest this element: U.S. 2004/0239290 to Krieger, e.g., at ¶14; U.S. 3,590,357 to Reid, e.g., at 4:38-49; U.S. 5,194,799 to Tomantschger, e.g., at 3:3-12; U.S. 3,638,108 to Channing, e.g., at 3:32-45; U.S. 2013/0162029 to Reichow, e.g., at ¶24; U.S. 6,650,086 Chang; e.g., at 4:63-5:9; U.S. 2002/0041174 to Purkey, e.g., at ¶60

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Exhibit 2. Prior Art Products

DTC is currently investigating the dates of conception and reduction to practice of such Public Prior Art and when such Public Prior Art was first known or used by others. There were dozens of portable jump starters on the market prior to the priority date of the '015 patent, and others launched in the United States at approximately the same time as the '015 patent. DTC is still investigating these prior art products and intends to seek third-party discovery as appropriate during the course of this litigation. Additionally, the Court's claim construction may cause additional prior art products to be invalidating. In the course of their investigation, DTC may identify additional prior art documents describing these products and systems that may also anticipate and/or render obvious the one or more Asserted Claims of the patents-in-suit as invalidating printed publications. DTC accordingly reserves the right to modify, amend, or supplement these contentions with those products, as well as other prior art references, upon further investigation.

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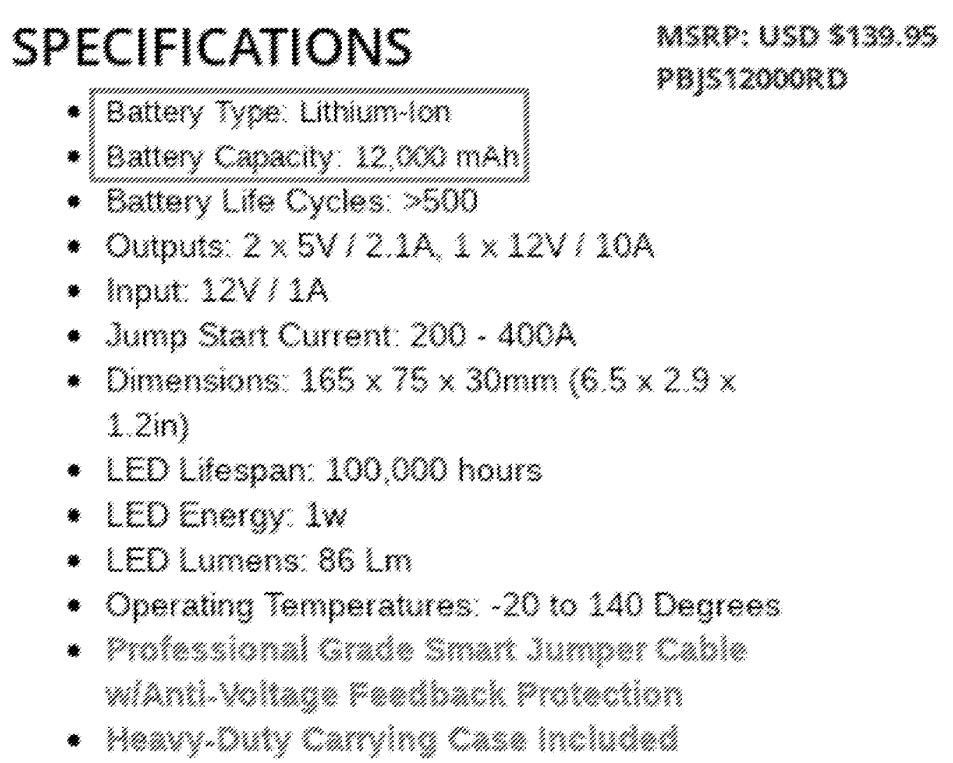
Claim No.	Claim	Prior Art Products
1	Apparatus for jump starting a vehicle engine, comprising:	**Gryphon Mobile Electronics Power All**  DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

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	Antigravity Batteries Micro-Start DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63 **Black & Decker Electromate 400**	

Claim No.	Claim	Prior Art Products
	an internal power supply;	**Gryphon Mobile Electronics Power All**

Claim No.	Claim	Prior Art Products

Claim No.	Claim	Prior Art Products
		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

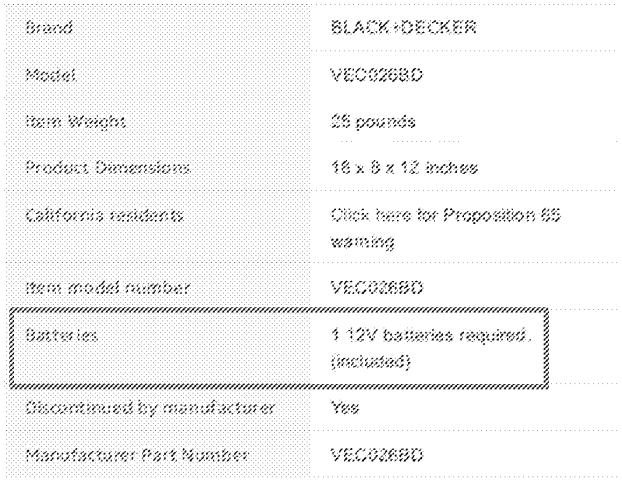
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Antigravity Batteries Micro-Start

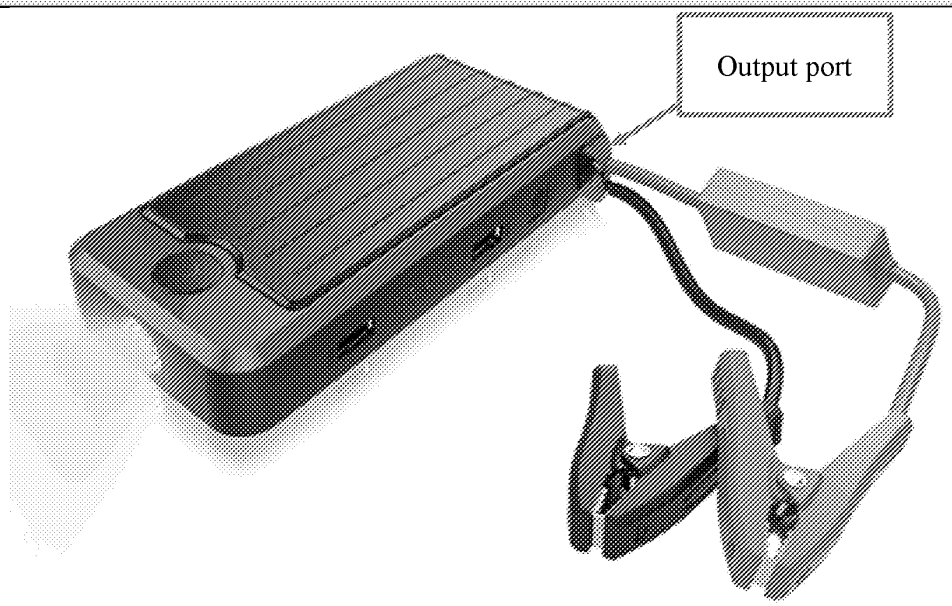
The Micro-Start PPS (Personal Power Supply) is the world's smallest Jump Starter and Personal Power Supply (only 6" x 2-7/8" x 1"). The built-in Extreme Power Lithium battery can hold a charge for up to a year and not only will it jump-start any car, truck, motorcycle or powersports vehicle multiple times, but also provides hours of backup power to all of your electronic devices. Weighing less than a pound (14 oz.) and small enough to fit in your pocket, you can take it with you anywhere and remain confident that you will be able to start your vehicle, make that important call, or power your child's PSP on that long trip in the car. It even has a built in flashlight with S.O.S patterns built in! Whatever you do, don't get stuck without back up power again...

Claim No.	Claim	Prior Art Products
		DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63 **Black & Decker Electromate 400** 

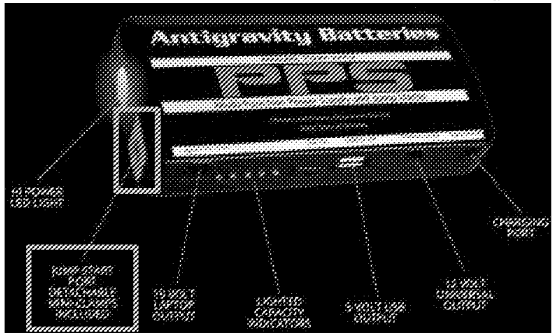
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Claim No.	Claim	Prior Art Products
		Technical Details  Brand: BLACK+DECKER Model: VEC026BD Item Weight: 25 pounds Product Dimensions: 16 x 8 x 12 inches California residents: Click here for Proposition 65 warning Item model number: VEC026BD Batteries: 1 12V batteries required. (included) Discontinued by manufacturer: Yes Manufacturer Part Number: VEC026BD
	an output port having positive and negative polarity outputs;	**Gryphon Mobile Electronics Power All**

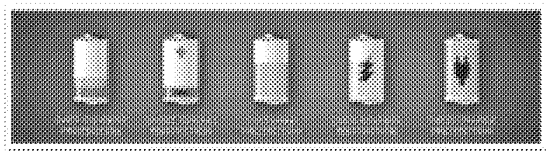
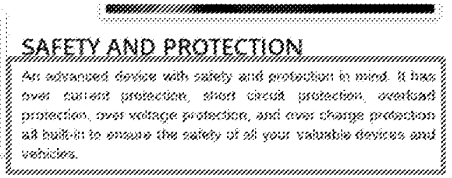
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		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

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Claim No.	Claim	Prior Art Products
		Antigravity Batteries Micro-Start   DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63

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Claim No.	Claim	Prior Art Products
	a vehicle battery isolation sensor connected in circuit with said positive and negative polarity outputs, configured to detect presence of a vehicle battery connected between said positive and negative polarity outputs;	**Gryphon Mobile Electronics Power All**    DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

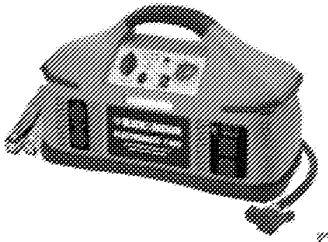
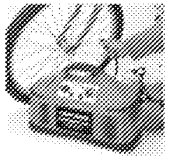
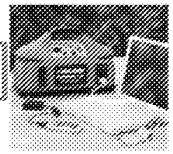
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Claim No.	Claim	Prior Art Products
		Antigravity Batteries Micro-Start  DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63 "7. It has built-in over-charge and over-discharge protections for long battery life" (DELTRAN0000548, DELTRAN0000551, DELTRAN0000554)
	a reverse polarity sensor connected in circuit with said positive and negative polarity outputs, configured to detect polarity of a vehicle battery connected between said positive and negative polarity outputs and to provide an output signal indicating whether positive and	**Black & Decker Electromate 400**

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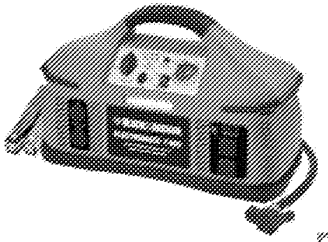
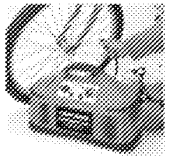
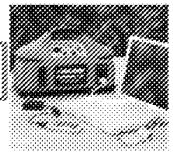
Claim No.	Claim	Prior Art Products
	negative terminals of said vehicle battery are properly connected with said positive and negative polarity outputs of said output port;	 179 ratings | 17 answered questions Currently unavailable. We don't know when or if this item will be back in stock. • 450 amps instantly jump-starts without the need of another vehicle • Built-in ultra-bright LED work light for emergency roadside assistance • Exclusive built-in 120 volt AC charger for use with ordinary household extension cord for recharging • Reverse hook-up warning alarm to prevent damage to vehicle or electronics • One year warranty

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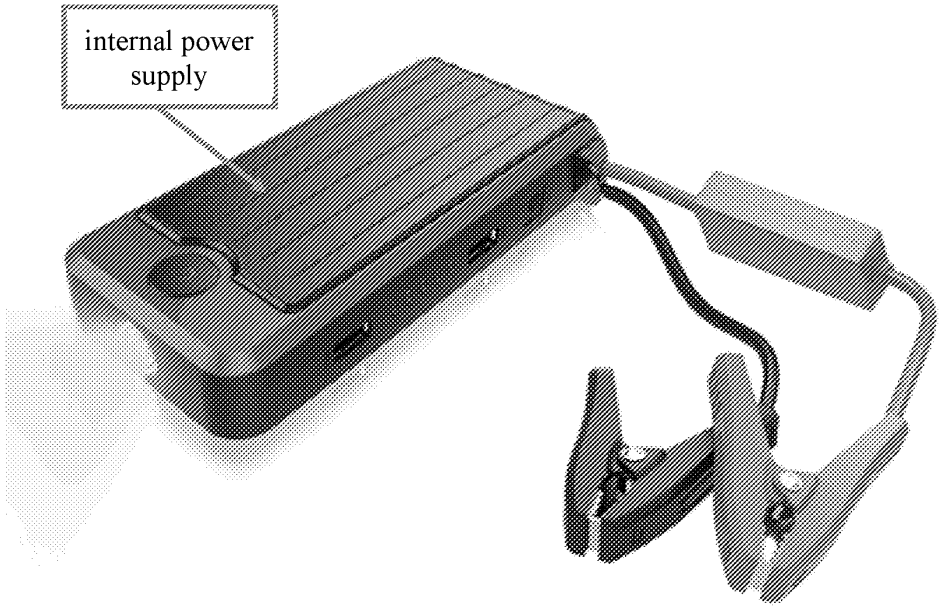
Claim No.	Claim	Prior Art Products
		The Black & Decker Electromate 400 Portable Power Station/Jump Starter/Compressor has ASU instant amps to start your car in the unlikely event that your battery goes dead. You can never count on finding someone to jump-start your car, even if you have a set of jumper cables. The Power Station/Jump-Starter/Compressor will alleviate this problem by giving you the power you need to do it yourself.  Black & Decker's Electromate 400 is a powerful and compact tool to restart your vehicle. View larger. **Ideal for Roadside Emergencies** When your car loses power, the Electromate 400 has enough power to both jump-start your vehicle and run emergency appliances such as portable lights, radios, cell phones, and small tools. The Electromate 400 is also ideal for non-emergency situations like tailgating parties, camping, power outages, and any other situation where no wall outlet is available. It comes equipped with one 120V AC power outlet and one 12V DC outlet, allowing you to charge and operate more than one appliance at once. **Inflates Tires, Sports Equipment, and More** There's also a built-in air compressor that allows you to inflate bicycle tires, sports equipment, and pool toys, but this compressor is also powerful enough to pump up the tires on your vehicle. **Other Features** The Electromate 400 also comes equipped with a built-in, ultra-bright LED work light for emergency roadside assistance and an exclusive, built-in 12V- a keyless on/off power safety switch, reverse hook-up warning alarm in case the jump-start cables are attached to the wrong terminals, vehicle **Rechargeable** This unit recharges easily from any household AC outlet or DC automobile cigarette-plug style outlet, so that it will be ready the next time you need it. **Warranty** Black & Decker offers a full 2-year warranty.  The Electromate 400 comes equipped with an air compressor.  Power small appliances with the 120V AC and 12V DC outlets.
	a power switch connected between said internal power supply and said output port; and	**Black & Decker Electromate 400**

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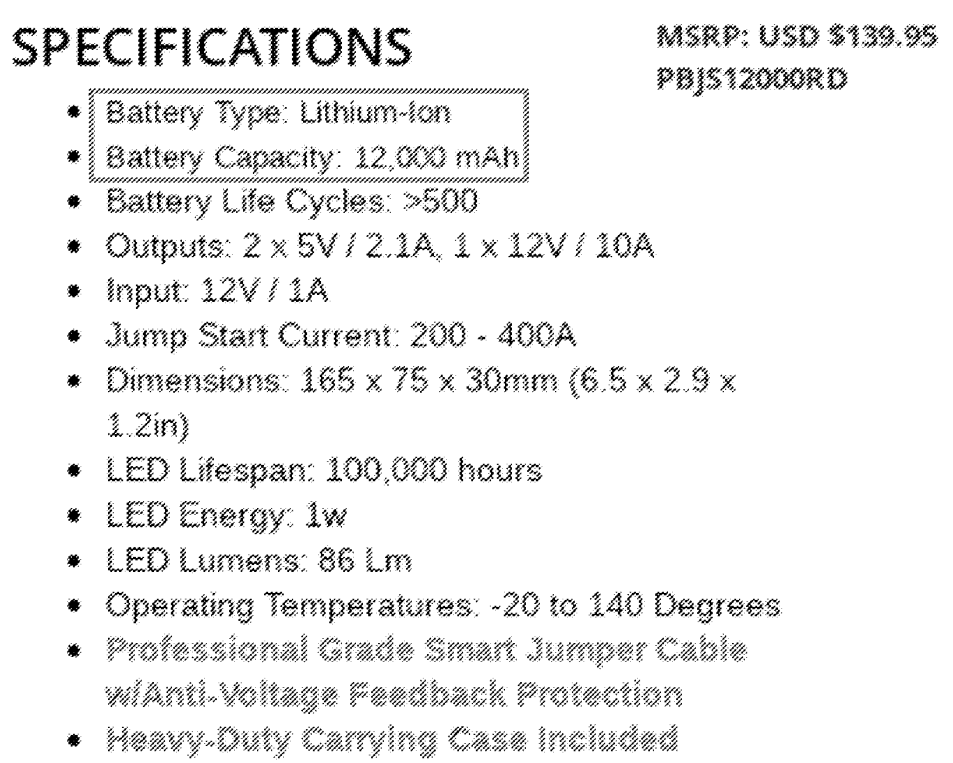
Claim No.	Claim	Prior Art Products
		 ★★★★☆ ▾ 179 ratings | 17 answered questions Currently unavailable. We don't know when or if this item will be back in stock. • 450 amps instantly jump-starts without the need of another vehicle • Built-in ultra-bright LED work light for emergency roadside assistance • Exclusive built-in 120 volt AC charger for use with ordinary household extension cord for recharging • Reverse hook-up warning alarm to prevent damage to vehicle or electronics • One year warranty

Claim No.	Claim	Prior Art Products
		The Black & Decker Electromate 400 Portable Power Station/Jump Starter/Compressor has 450 instant amps to start your car in the unlikely event that your battery goes dead. You can never count on finding someone to jump-start your car, even if you have a set of jumper cables. The Power Station/Jump-Starter/Compressor will alleviate this problem by giving you the power you need to do it yourself.  Black & Decker's Electromate 400 is a powerful and compact tool to restart your vehicle. View larger. **Ideal for Roadside Emergencies** When your car loses power, the Electromate 400 has enough power to both jump-start your vehicle and run emergency appliances such as portable lights, radios, cell phones, and small tools. The Electromate 400 is also ideal for non-emergency situations like tailgating parties, camping, power outages, and any other situation where no wall outlet is available. It comes equipped with one 120V AC power outlet and one 12V DC outlet, allowing you to charge and operate more than one appliance at once. **Inflates Tires, Sports Equipment, and More** There's also a built-in air compressor that allows you to inflate bicycle tires, sports equipment, and pool toys, but this compressor is also powerful enough to pump up the tires on your vehicle. **Other Features** The Electromate 400 also comes equipped with a built-in, ultra-bright LED work light for emergency roadside assistance and an exclusive, built-in 12V- a keyless on/off power safety switch, reverse hook-up warning alarm in case the jump-start cables are attached to the wrong terminals, vehicle **Rechargeable** This unit recharges easily from any household AC outlet or DC automobile cigarette-plug style outlet, so that it will be ready the next time you need it. **Warranty** Black & Decker offers a full 2-year warranty.  The Electromate 400 comes equipped with an air compressor.  Power small appliances with the 120V AC and 12V DC outlets.
	a microcontroller configured to receive input signals from said vehicle isolation sensor and said reverse polarity sensor, and to provide an output signal to said power switch, such that said power switch is turned on to cause said internal power supply to be connected to said output port in response to signals from said sensors indicating the presence of a vehicle battery at said output port and proper polarity connection of positive and negative terminals of said vehicle battery with said positive	

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Claim No.	Claim	Prior Art Products
	and negative polarity outputs, and is not turned on when signals from said sensors indicate either the absence of a vehicle battery at said output port or improper polarity connection of positive and negative terminals of said vehicle battery with said positive and negative polarity outputs.	
2	The apparatus of claim 1, wherein said internal power supply comprises a lithium ion battery	**Gryphon Mobile Electronics Power All** 

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Claim No.	Claim	Prior Art Products
		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

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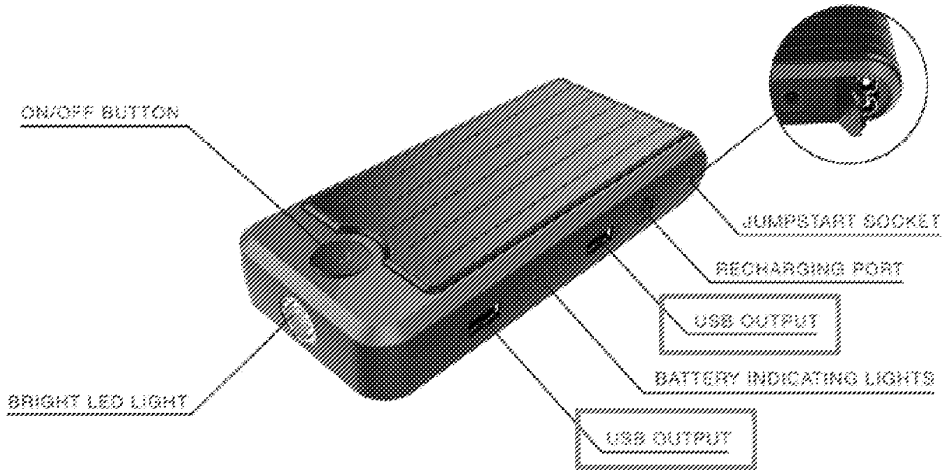
Antigravity Batteries Micro-Start

The Micro-Start PPS (Personal Power Supply) is the world's smallest Jump Starter and Personal Power Supply (only 6" x 2-7/8" x 1"). The built-in Extreme Power Lithium battery can hold a charge for up to a year and not only will it jump-start any car, truck, motorcycle or powersports vehicle multiple times, but also provides hours of backup power to all of your electronic devices. Weighing less than a pound (14 oz.) and small enough to fit in your pocket, you can take it with you anywhere and remain confident that you will be able to start your vehicle, make that important call, or power your child's PSP on that long trip in the car. It even has a built in flashlight with S.O.S patterns built in! Whatever you do, don't get stuck without back up power again...

Claim No.	Claim	Prior Art Products
		DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63
3	The apparatus of claim 2, wherein said lithium ion battery comprises a battery pack of multiple lithium ion batteries.	
9	The apparatus of claim 1, further comprising a voltage regulator configured to convert output voltage of said internal power supply to a voltage level appropriate to provide operating power to internal components of the apparatus.	
10	The apparatus of claim 1, further comprising a USB output port configured to provide charging power from said internal power supply to a USB-chargeable device.	**Gryphon Mobile Electronics Power All**

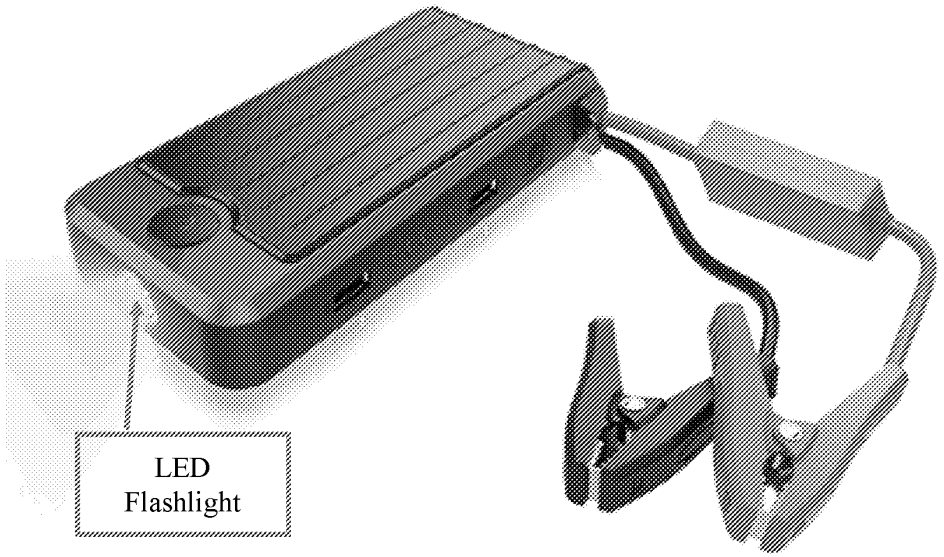
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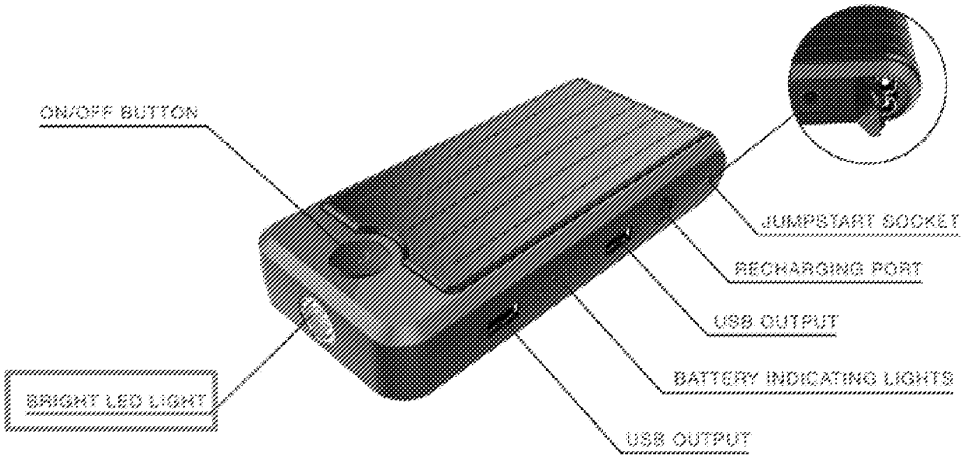
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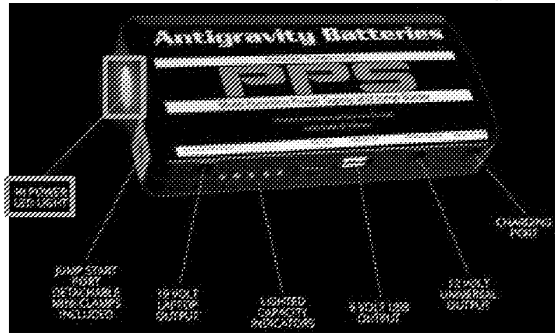
	Antigravity Batteries Micro-Start DELTRAN 0000544; DELTRAN 0000547; DELTRAN 0000548-554; DELTRAN 0000562-63	

Claim No.	Claim	Prior Art Products
11	The apparatus of claim 1, further comprising a USB charging port configured to provide charging power from an external power source to said internal power supply.	
12	The apparatus of claim 1, further comprising a flashlight circuit configured to provide a source of light to a user.	**Gryphon Mobile Electronics Power All** 

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Claim No.	Claim	Prior Art Products
		 DELTRAN 0000558-59; See also PowerAll Website Dated January 20, 2014: https://web.archive.org/web/20140120001814/http://www.thepowerall.com/product.html (last visited May 6, 2020)

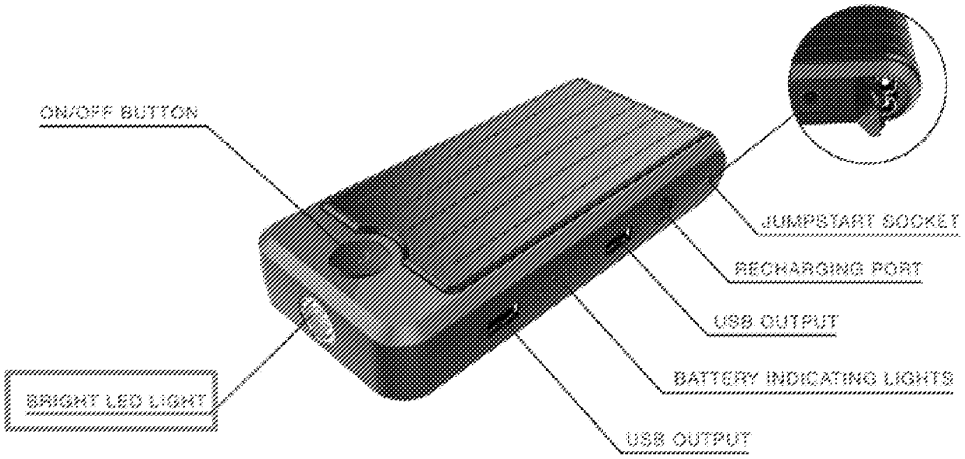
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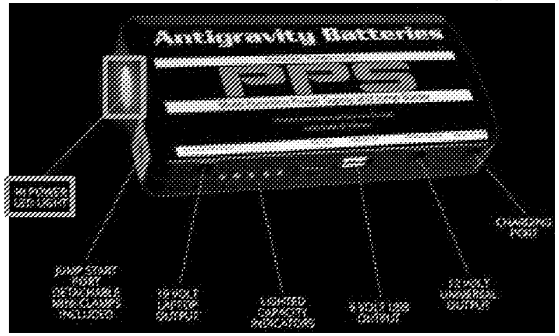
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Claim No.	Claim	Prior Art Products
13	The apparatus of claim 12, wherein said source of light is at least one LED.	**Gryphon Mobile Electronics Power All**

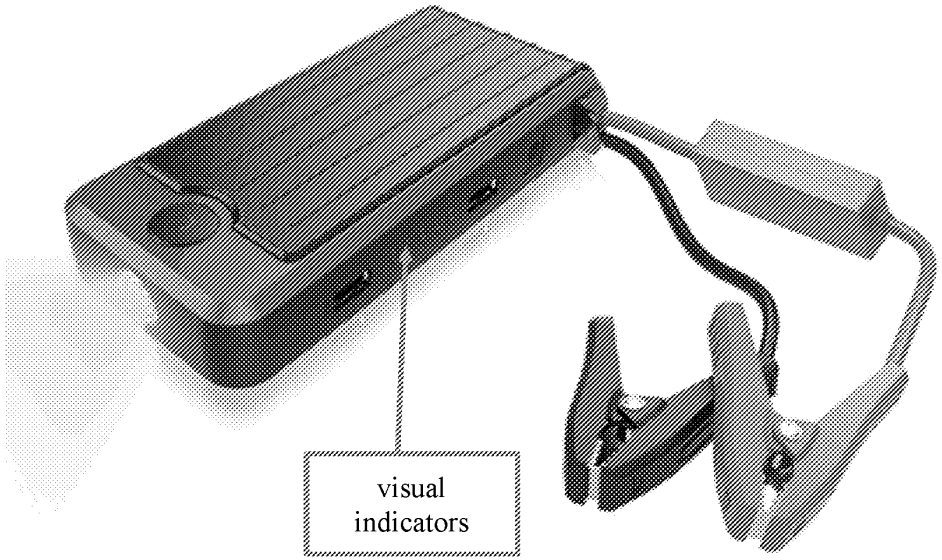
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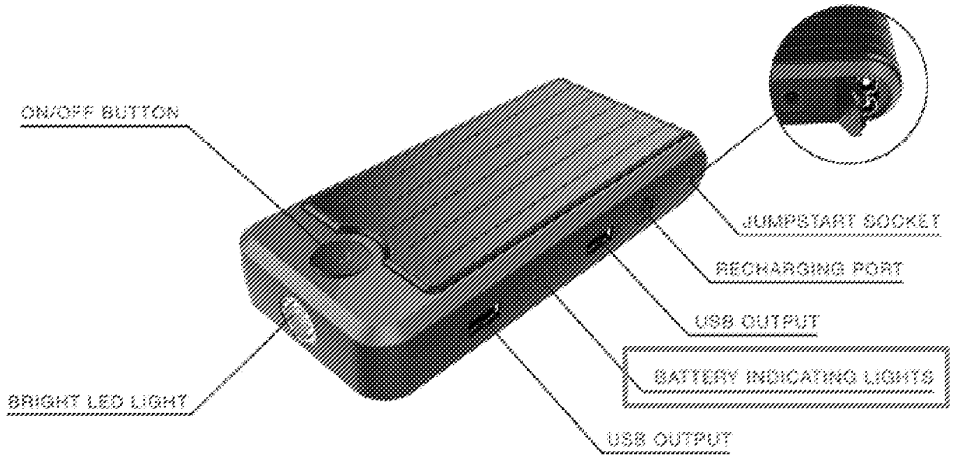
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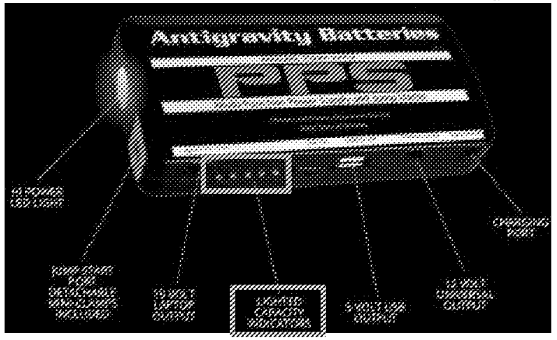
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Claim No.	Claim	Prior Art Products
15	The apparatus of claim 1, further comprising a plurality of visual indicators configured to display remaining capacity status of said internal power supply.	**Gryphon Mobile Electronics Power All** 

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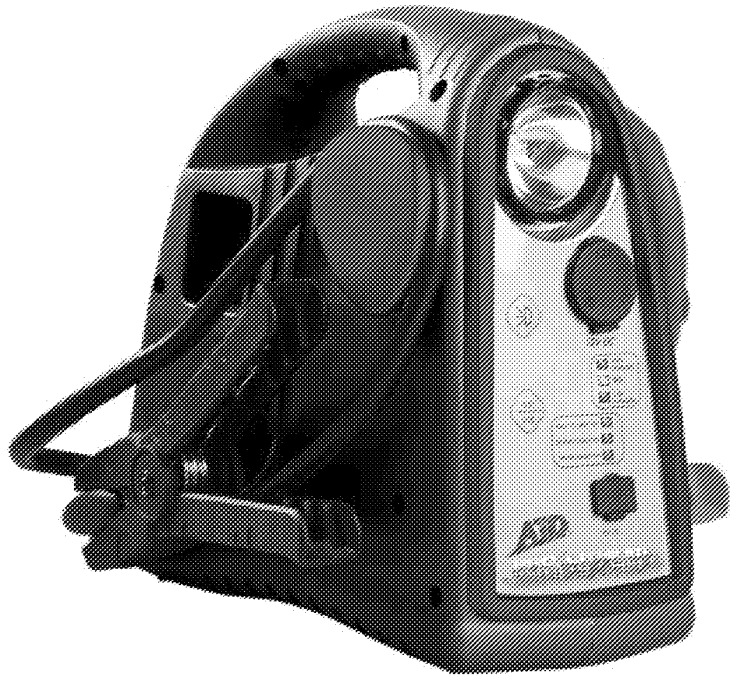
Claim No.	Claim	Prior Art Products
17	The apparatus of claim 1, further comprising a visual indicator configured to warn a user when a vehicle battery is connected with reverse polarity.	
19	The apparatus of claim 1, further comprising a manual override switch configured to activate a manual override mode to enable a user to connect jump start power to said output port when said vehicle battery isolation sensor is unable to detect presence of a vehicle battery.	

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ATD

PRO LITHIUM JUMPSTART

ATD-5900 Manual



BC

1112

Specifications

Weight	7.71 lbs. (3.5Kg)
Product Size	9.25" x 9.25" x 7.5" (235 x 235 x 190mm)
Functions	700A Cranking Amps
	12V DC Output (with 15A overload protection)
	High Intensity LED
	USB - 5VDC, 2.1A
Battery	Lithium Iron
Charging	12V/1A Charger
Accessories	Cigarette socket, Charger, Instruction Manual

1. Features

- Used to start 12V vehicles without the use of other vehicles or AC power supplies.
- Reverse connection alarm, short circuit alarm, low voltage alarm and over-temperature alarm.
- 12V DC cigarette power outlet with overload protection provides power for appliances designed to plug into vehicles 12V power source.
- High intensity LED emergency light can be used for emergency repairs or other emergency situations.
- Li-Fe (Lithium-Iron) Battery with more powerful performance needs no attention other than charging.
- 12V/1A adaptor with automatic overcharge protection
- 5V, 2.1A USB, provides power for small electrical appliances (MP3 player, etc.)
- LED shows the internal battery status
- High strength Polypropylene housing

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2. WARNING ⚠

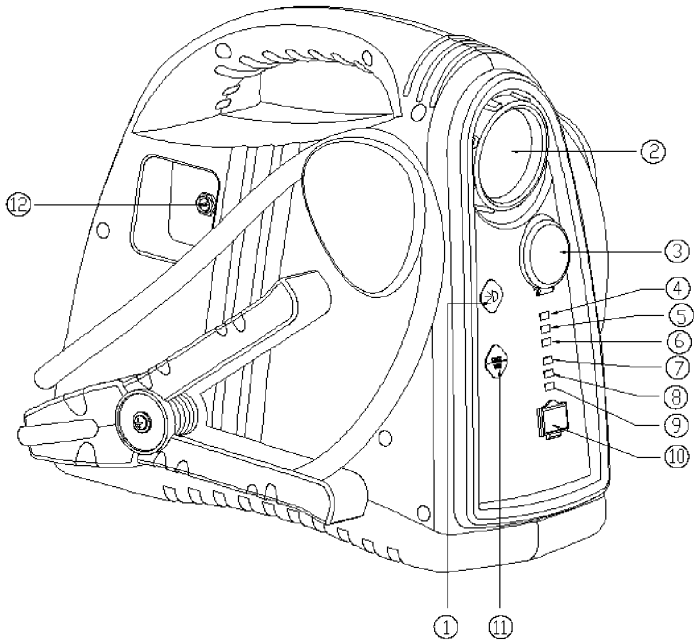
Before using the jumpstart, read and follow the instructions carefully. Also pay close attention to the cautionary statements on the vehicles battery and any other equipment you be using.

As a safety measure, there is NO VOLTAGE present at the clamp ends. The ATD-5900 automatically detects when it is hooked up correctly to a battery, then and only then will it deliver the voltage to the clamps.

- Do not smoke, use matches, use a cigarette lighter, or allow a spark or flame near the battery.
- Do not allow metal to come in contact with the battery poles. It may spark or short-circuit the battery and cause an explosion.
- Remove any and ALL jewelry and watches when working with a Li-Fe battery.
- Stop using the jumpstart when you hear the alarm or when indicating LED (6) is on. The reason may be from:

1) The voltage is less than 8V - Charge the jumpstart to prevent battery failure.
2) The temperature is higher than 140˚F (60˚C) - Cool the jumpstart to at least 104˚F (40˚C).
3) The jumpstart is connected backwards, incorrectly connected or short connected. Correctly connect the clamps.

3. Pro-Lithium Jumpstart Features:



1. Emergency LED light Switch
2. Emergency LED light
3. 12V output
4. Full charge LED
5. 50% capacity LED
6. Charge/Low voltage alarm/Over-temp indicator
7. Clamp correct connection indicator
8. Reverse connection indicator
9. Incorrect connection indicator
10. USB 5V DC output outlet
11. Test/USB output Switch
12. Charger input outlet

4. USING THE "BOOSTER" FUNCTION

WARNING ⚠

Ensure that you are using this on a 12 VOLT SYSTEM ONLY, otherwise the battery could explode. Please strictly follow the following steps; otherwise, it could cause damage to the jumpstart, the vehicle or personal injury or death

1. Turn the vehicle ignition and subsidiary equipment off.
2. **DO NOT** touch the red positive (+) clamp against the black negative (-) clamp.
3. Ensure the area is well ventilated.
4. Connect the red positive (+) clamp to the battery positive (+) terminal first. Be sure that the clamp does not contact any moving parts or fuel lines.
5. Connect the black negative (-) clamp to a suitable ground on the vehicle chassis.
6. If there is a reverse connection between positive and negative poles, the jumpstart emits an audible alarm the red LED (8) will be on, indicating the reverse connection. Please adjust the positive and negative polarity.
7. If connected incorrectly to a vehicle that uses a 24v system, the jumpstart emits an audible alarm the red LED (9) will be on, indicating the incorrect connection; this jumpstart will not work in this situation. **Only use on vehicles with a 12v system.**
8. If connected incorrectly to a vehicle that has a 6v system, it won't send out any alarm information. Attempting to start your 6v system with this jumpstart will cause damage to the jumpstart and the vehicle. **Only use on vehicles with a 12v system**.
9. With the correct connection, LED (7) will be on, now you can start the car. If the battery (internal and external) voltage is less than 8v, it will shut off automatically.
10. Do not try to start the vehicle for more than 5 seconds at a time.

11. If the engine does not start properly, wait at least 3 minutes before attempting to restart.
12. After the vehicles engine starts, disconnect the black (-) clamp first, and then disconnect the red (+) clamp. Re-wrap the cables after each use.
13. After use, always recharge the jumpstarts battery fully.
14. Frequently test the battery's voltage and recharge it when (5) or (6) LED is on.
15. Low temperature start performance of the Li-Fe battery will be affected at temperatures lower than -10˚C (14˚F) After a few attempts to start, the battery should warm up and produce more cranking amps. While this isn't the case with typical Sealed Lead Acid batteries, this is normal for Li-Fe batteries.

5. Charging using the AC adaptor

CAUTION ⚠

1. Use only the charger included with your jumpstart to recharge this jumpstart. Non-standard products will shorten the life of the battery and void the warranty.
2. Charge your jumpstart battery for 8 hours before using for the first time.
3. After using, press the test/USB switch button (11), check the battery voltage by Indicating LED's (4), (5) & (6), if the indicating LED (5) or (6) are on, it means the battery must be recharged.
4. Recharge the jumpstart battery after each use if possible, and thereafter, at least every 6-12 months.

How to charge:

1. Plug the charger into 110V AC power outlet
2. Plug the connector into the socket (12) located in side of the jumpstart. The charging indicating LED light (6) indicated the jumpstart is charging.
3. Depending on the use of the jumpstart, charging time is approximately 6-8 hours.

4. LED indicator (4) indicated a full charge.
5. Disconnect the charger.
6. In order to achieve maximum battery life, it is recommended to use your jumpstart often, so that the capacity of the battery is protected and its life expectancy will be extended.

6. USING THE 12V DC POWER SOURCE

1. Open the cover of cigarette lighter socket, on the front of the jumpstart (3)
2. Plug the jack plug of 12v electrical appliances into the cigarette lighter socket.

Note:
The maximum power of the cigarette lighter is 150W. If the power of your appliance is more than 150W, the socket output will shut down automatically, and will recover in 30 seconds.

7. USING THE USB PORT AND LED WORK LIGHT

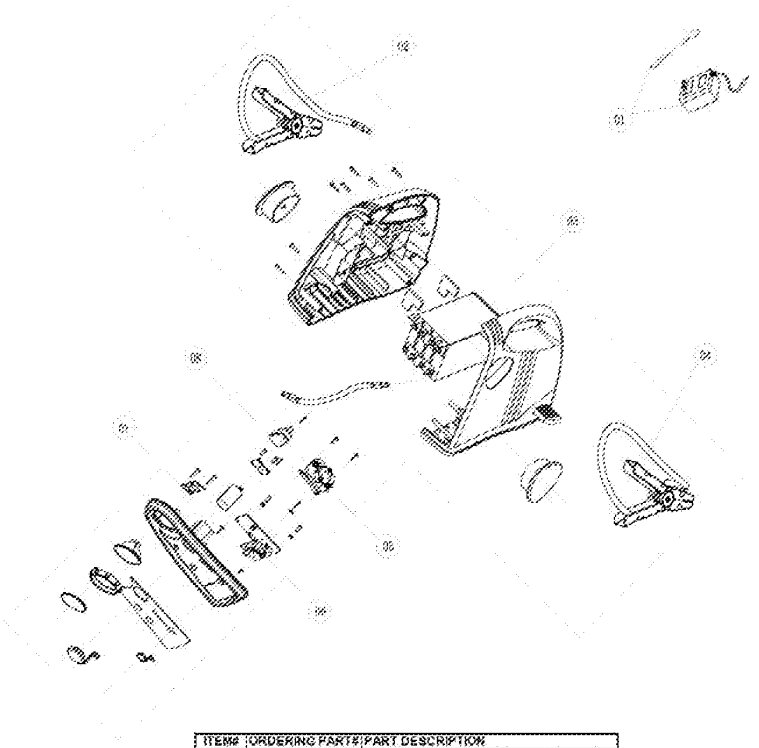
1. Push the test/USB switch button (12) one time to turn on the USB (10) outlet. Push again to switch it off. (If the battery is less than 10V, the USB output will turn off automatically.)
2. Push the light switch button (1) one time to turn on the LED work light. Push again to turn it off.

8. MAINTENANCE

1. Always inspect the power station before use to ensure the cables are in perfect condition and the clamps are clean and free from corrosion
2. Keep your jumpstart clean by wiping with a dry cloth. **DO NOT** use solvents as a cleaning agent.
3. Keep your jumpstart at **HIGH** or **FULL CHARGE** status at all times.

9. PARTS

ATD-5900



ITEM#	ORDERING PART#	PART DESCRIPTION
1	PRT5900.01	12V 1A AC CHARGER W/ DC TO DC CORD
2	PRT5900.02	CABLE AND CLAMP ASSY (NEG.)
3	PRT5900.03	12V 9AH LIFE BATTERY
4	PRT5900.04	CABLE AND CLAMP ASSY (POS.+)
5	PRT5900.05	RELAY
6	PRT5900.06	PCB
7	PRT5900.07	POS
8	PRT5900.08	CIRCUIT BREAKER

IMPORTANT!

Register your product(s) online to ensure faster and more efficient customer service.

For warranty registration form, please visit...

http://atdtools.com/registration/

TECHNICAL SERVICE BULLETIN

Bulletin # 5900-111612

As a safety measure, when the clamps aren't connected to a battery, they won't have voltage output between the positive and negative clamps. **THERE WILL BE NO VOLTAGE PRESENT AT THE CLAMP ENDS OF THE ATD-5900 UNTIL IT IS CONNECTED TO AN EXTERNAL BATTERY.** There is a solenoid in line with the positive cable on this unit that detects as little as **6 volts** and opens the circuit to the positive cable end. It will detect the voltage of that external battery to judge if the connection is correct for a 12V battery. If so, the ATD5900 will be ready to work. If not, it won't work, until you hook the clamps correctly, or have at least **6 volts** present in your battery.

This voltage detection function is very important for safety purposes because there is no on/off switch on this unit. This feature is designed to prevent any possible damage, such as hooking it up backwards or having it connected to the wrong voltage battery.

Also as a reminder, if the clamps are connected incorrectly to a battery, the "wrong or reverse connection" LED will be on and the "Ready to Start" LED will NOT be on. This too is to remind the user that it will not work and to not to try to jump a car in such condition.

Thank you,

-Jon Lovetto

Customer Service / Parts Manager

ATD Tools, Inc.

D21

From: wanny <sales10@car-ku.com>

Sent: Sunday, December 22, 2013 4:54 AM

To: j@no.co

Subject: Re:Fw:Lithium JumpCharge

Attachments: Catalogue.pdf

Dear Jonathan ,

Thank you for your inquiry.

Shenzhen Carku Technolog Co.,Ltd is a professional manufacturer of jump starter, with design patent certificate. Carku also have got CE, ROHS, FCC certificate for exportation.

Enclosed pls find our catalogue for your reference, some of hot models are included. We'd like to supply you a sample to test, the model is Epower-01-elite, the sample price is 60$, with shipping cost to America 35$, the total is 95$.

About your requirement of quotation for order 10,000, 25,000, 50,000, 100,000 unit, we'd like to get more information about the order. If you order 10,000 units at 1 time, you will get a favorabe price than you order them in a year.The quotattion can be sent to you after you test our jump starter.

Pls supply your design ID, as the tooling cost is different, we need the design ID to estimate the cost.

Welcome to visit our company if you come to China.

Looking forward to your reply.

Best wishes
Wanny

Bank information for you:

HK Bank Details of CARKU TECHNOLOGY CO LIMITED:

Beneficiary Bank Name: HSBC

Bank Code: 004

Bank Account no.: 801 229196 838

Beneficiary Bank Address: 1 Queen's Road Central, Hong Kong

SWIFT Code: HSBCHKHHHKH

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----- Original Message -----
From:"Jonathan Nook" <j@no.co>
To: "infocarku@car-ku.com" <infocarku@car-ku.com>
Cc:
Sent:Sat Dec 21 2013 03:48:35 GMT+0800 (中国标准时间)
Subject: Lithium JumpCharge

Hi Carku:

My sourcing team provided me with your website. We are looking for a lithium-ion jump starter. Your multifunction jump starter is similar to what we are looking for. We would like to get a quotation and samples as soon as possible. We would also require our own design ID, which we would provide. Please provide a quotation on 10,000, 25,000, 50,000 and 100,000 units at a time. Include freight terms, payment terms and estimated tooling costs.

Thank you. Jonathan

Jonathan Lewis Nook, MBA | CVO, President
The NOCO Company Since 1914
HQ | 30339 Diamond Parkway, #102 | Glenwillow, OH 44139 | USA
[Phone] 216.464.8131 x207 [Email] j@no.co<mailto:j@no.co> [Skype] jonathannook
no.co<http://no.co>

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Hi Carku:

My sourcing team provided me with your website. We are looking for a lithium-ion jump starter. Your multifunction jump starter is similar to what we are looking for. We would like to get a quotation and samples as soon as possible. We would also require our own design ID, which we would provide. Please provide a quotation on 10,000, 25,000, 50,000 and 100,000 units at a time. Include freight terms, payment terms and estimated tooling costs.

Thank you. Jonathan

Jonathan Lewis Nook, MBA | CVO, President

The NOCO Company Since 1914

HQ | 30339 Diamond Parkway, #102 | Glenwillow, OH 44139 | USA

[Phone] 216.464.8131 x207 [Email] j@no.co [Skype] jonathannook

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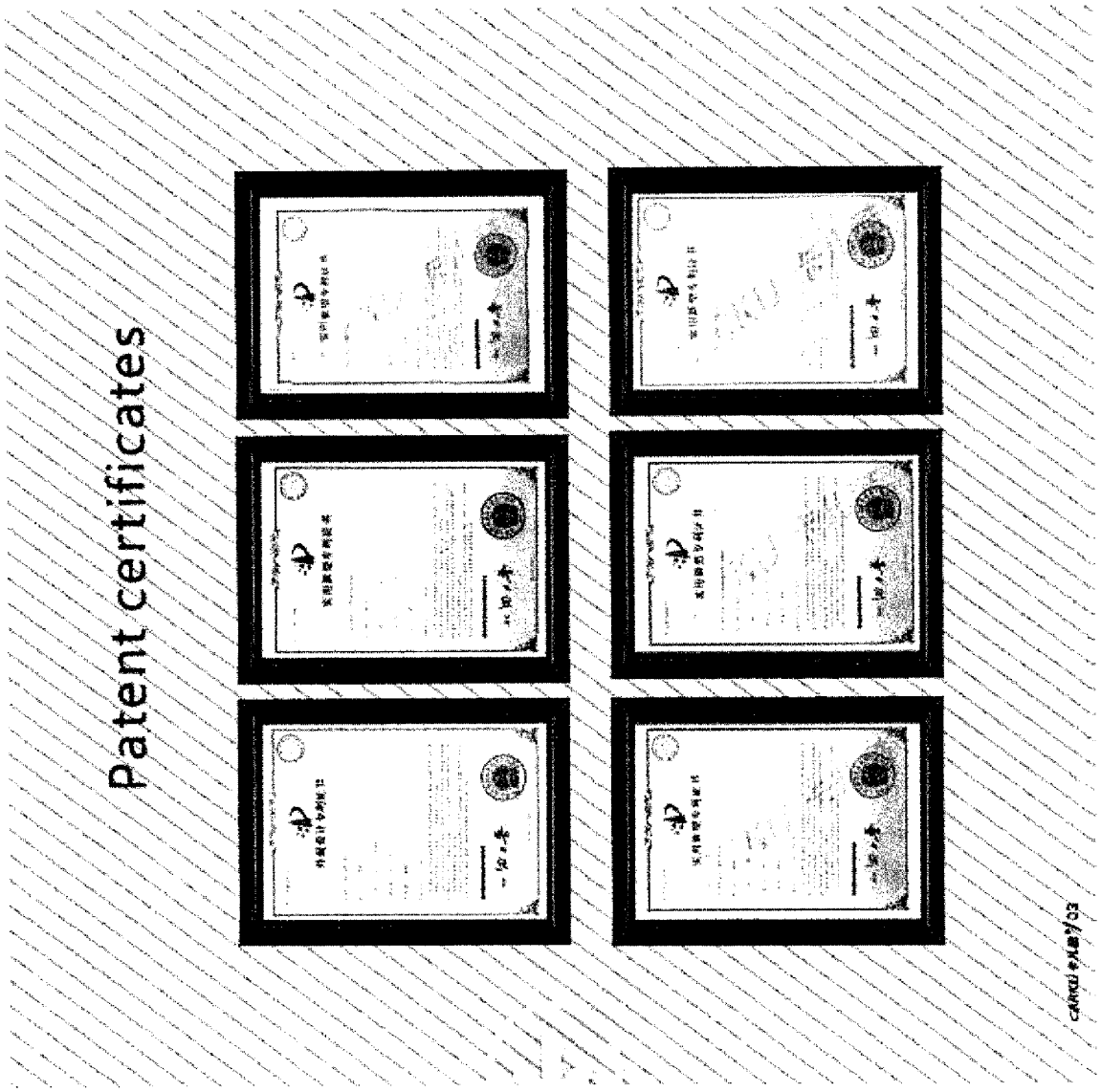
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CARKU卡儿酷®
WELCOME TO
CARKU
CAR POWER
WORLD
深圳市华思旭科技有限公司
SHENZHEN CARKU TECHNOLOGY CO.,LTD.

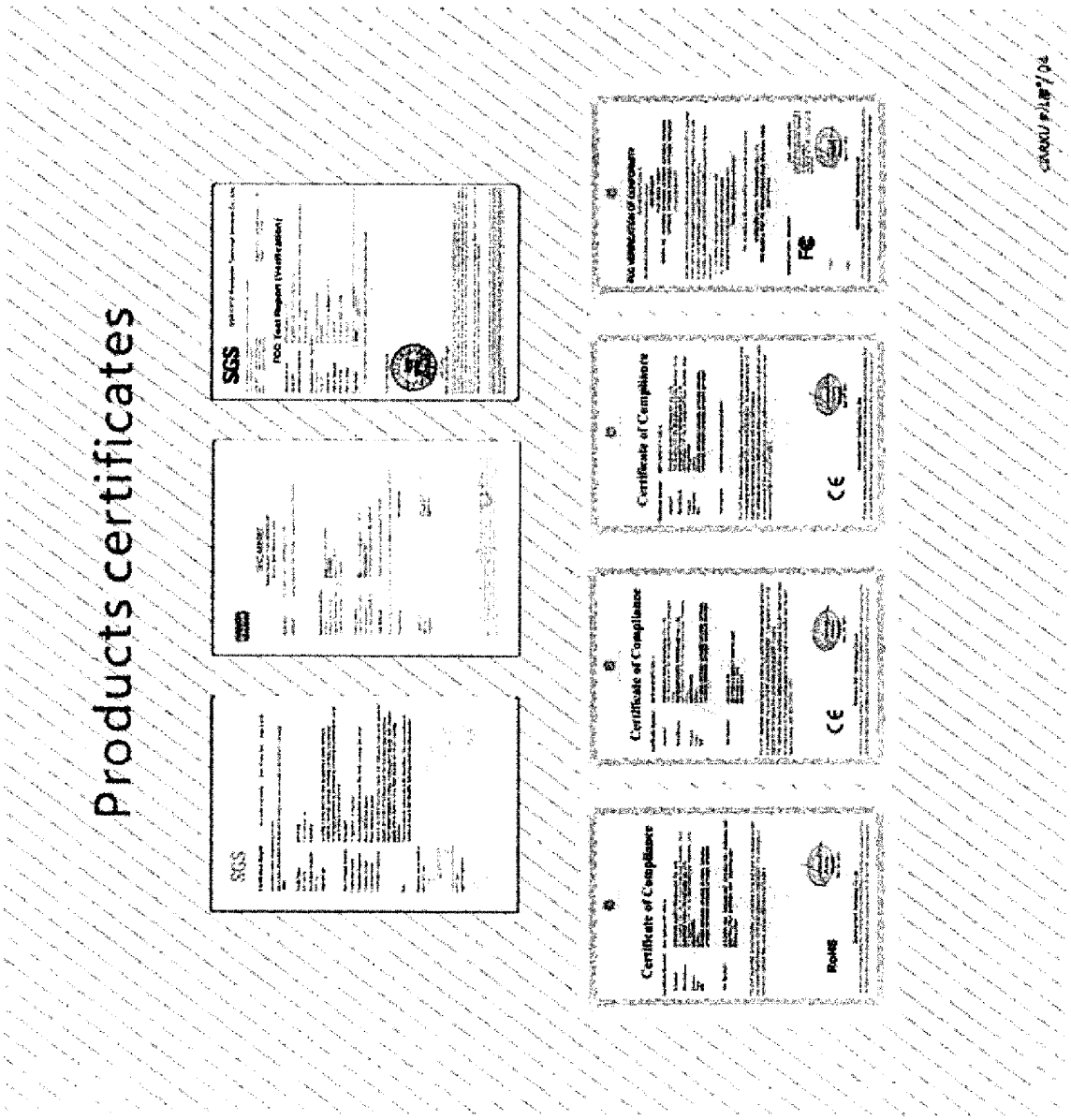
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ODM & OEM

We provide your company
with the specific products to
meet your unique needs;

-Engineer Solutions
-Custom Molding
-Custom Branding

Strategic Partners

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NEW ARRIVALS

Model:E-Power-02

Multi-Function Jump Starter

TECHNICAL SPECIFICATIONS:

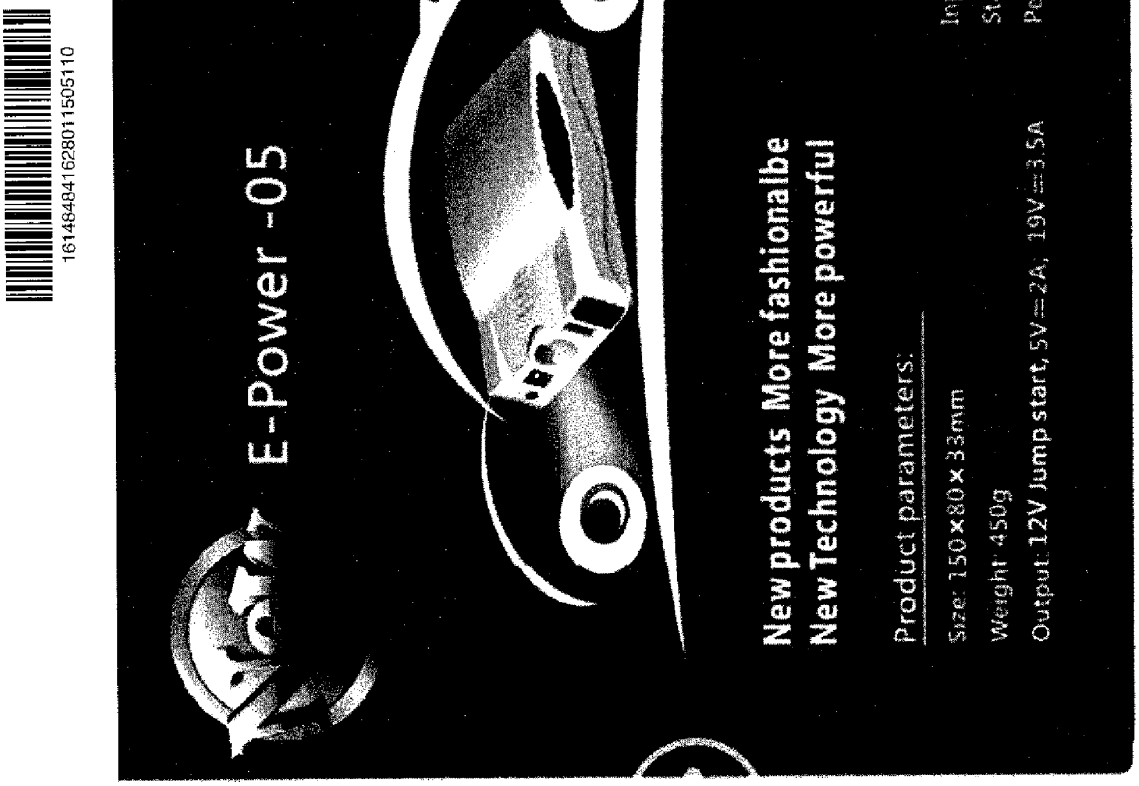
Capacity:8000mAh
Input: 12V/1A
Output: 5V/2A
12V Jump start
LED light(lingt,burst flash & SOS)

Starting Current: 200A
Peak Current: 400A
Size:128×73×25 mm
Weight:300g
Operating Temp.:-20℃~60℃/-4℉~140℉
Lifetime:>1000 cycles

E-Power-03

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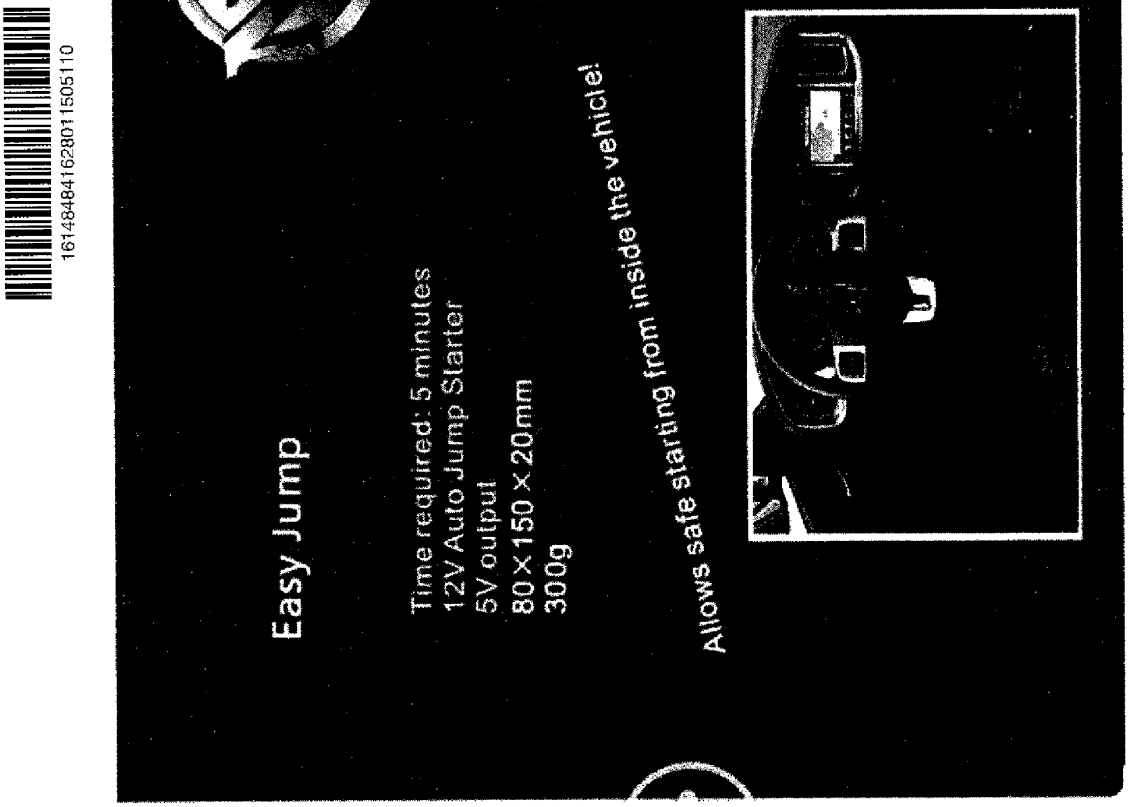
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12V/24V Jump Starter
TECHNICAL SPECIFICATIONS:
Input : 12V 1A
Output : 12V Jump start; 24V Jump start
Start Current : 500A(12V)/300A(24V)
Peak Current : 1000A(12V)/500A(24V)
Size : 247×216×64mm
Weight : 1500g
Operating Temp. : -20℃~60℃/-4℉~140℉
Lifetime : >1000 cycles



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Benachrichtigung über den Erhalt eines Nachgangs zum Aktenzeichen: 20 2014 011 347.5	
Dokumenten Referenz-Nr. (DRN):	2021022515482100DE
Nachgang eingegangen am:	25.02.2021
Nachgang erhalten von:	CN=dompatent von Kreisler, C=de, O=dompatent von Kreisler, OU=Kanzlei, E=mail@dompatent.de
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gültig bis:	18.03.2024 00:59:59
Eigentümer:	CN=Alexander Schuld 64512
Seriennummer:	76287475175410384332323189894946175104
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Geschäftszeichen des Einreichenden:	203166DE Gh/Sld/ZW
Einreichende(r):	Shenzhen CARKU Technology Co., Ltd. Dalang Street, Longhua, Shenzhen, Guangdong CN

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D22

From: wanny <sales10@car-ku.com>
Sent: Wednesday, April 23, 2014 11:24 PM
To: Giuseppe Orfanò
Subject: E-catalogue from Carku
Attachments: Carku catalogue.ppt

Dear Giuseppe,
Enclosed pls check our E-catalogue for you.Pls review all of the models, Carku jump starters are with best quality, the designs are followed by other factories.We hope to get more inquiry from you.
Any question about the product, pls send me reply.
Best wishes

Wanny
Foreign Sales Department Manager
CARKU™ 卡儿酷
Shenzhen Carku Technology Co.,Ltd
ADD: 2 Floor, Block A, Tongsheng Technology Building,Huahui Road,Dalang, Longhua New District, Shenzhen China 518109
Tel: 86-0755-85298289-877
Fax: 86-0755-61673510
Mobile: 0086-13076965851
0086-13714962190
QQ: 2769424685
Skype: carku15
Skype: yifengwan
Mail: sales10@car-ku.com
Website: http://www.car-ku.com

1614848416280115051110

From: Giuseppe Orfanò
Date: 2014-04-23 23:07
To: sales10@car-ku.com
Subject: request sample E-POWER-21
Dear Wanny,

it was a pleasure to meet you at the show. We would like to study better your slim jump starter (E-Power-21) and order a sample for our testing. Cause high transport costs out of Switzerland would it be possible that you make local the request (Fedex/UPS or whatever) and include in the PI also the cost for the transport?

I remain at your fully disposal for every question

Best Regards – Cordiali saluti – Freundliche Grüsse – Cordialement

Giuseppe Orfanò
Leiter Market-Management

KRAUTLI (Schweiz) AG
Badenerstrasse 41 • PF 160 • 8104 Weiningen ZH
Tel. +41 (0)44 439 66 25 • Fax +41 (0)44 439 66 30
g.orfano@krautli.ch • www.krautli.ch
MSN: giuseppe80@hotmail.ch • Skype: giuseppe.orf-1

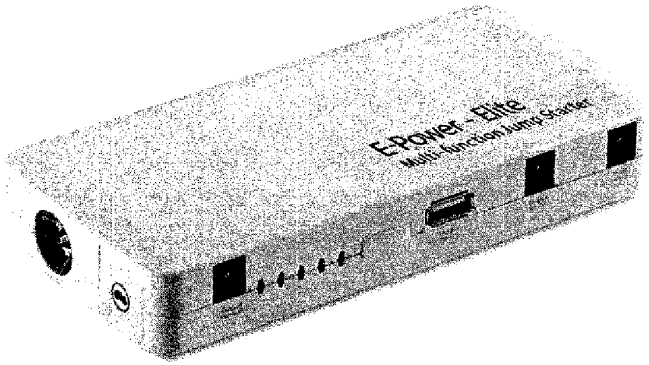
EyeSystem

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CARKU卡儿酷®

Model : EPOWER-Elite



TECHNICAL SPECIFICATION :

Input : 14V1A

Output : 12V/10A ; 5V/2A; 19V/3.5A
12V Jump start
LED light (light, burst flashing, SOS)

Start Current : 200A

Peak Current : 400A

Size : 160*75*28mm

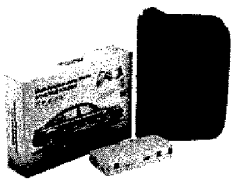
Weight : 420g Battery capacity:12000mAh

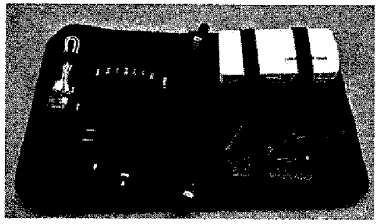
Operating Temp. : -20℃~60℃/-4℉~140℉

Lifetime : >1000 cycles

ACCESSORIES :

Home charger*1	Jumper Cable*1
Car charger*1	3 Mobile connectors*1 (Micro, iP4, iP5)
Laptop connectors*8+swtich cable*1	





Packing: Color Box + PU bag

FEATURES :

1. Powerful capability for jump Start 12V vehicle.
2. Supply power for 19V laptop.
3. Supply power for Mobile, Tablet PC, MP3/MP4, PSP, Camera and other digital devices.
4. Supply power for car refrigerator, blast pump, and other 12V devices.
5. LED light (light, burst flashing, SOS)

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CARKU卡儿酷®

Model : EPOWER-Standard



TECHNICAL SPECIFICATION :

Input : 14V1A

Output : 12V/10A ; 5V/2A
12V Jump start
LED light (light, burst flashing, SOS)

Start Current : 200A

Peak Current : 400A

Size : 160*75*28mm

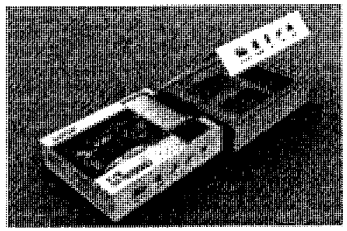
Weight : 350g Battery capacity:10000mAh

Operating Temp. : -20℃~60℃/-4℉~140℉

Lifetime : >1000 cycles

ACCESSORIES :

Home charger*1	Jumper Cable*1
Car charger*1	3 mobile connectors*1





Packing: Color Box + PE tray

FEATURES :

1. Powerful capability for jump Start 12V vehicle
2. Supply power for Mobile, Tablet PC, MP3/MP4, PSP, Camera and other digital devices.
3. Supply power for car refrigerator, blast pump, and other 12V devices.
4. LED light (light, burst flashing, SOS)

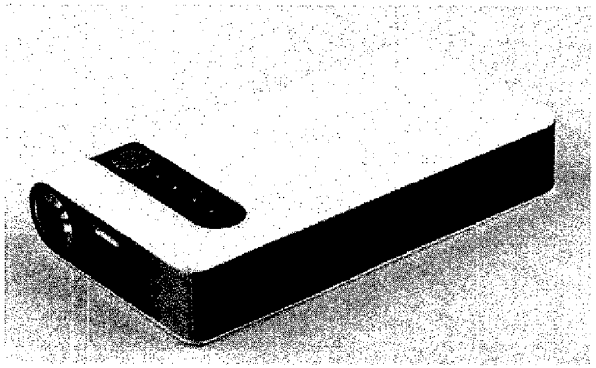
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25.02.2021
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CARKU卡儿酷®

Model : EPOWER-3



TECHNICAL SPECIFICATION :

Input : 14V1A

Output : 5V/2A;
12V Jump start
LED light (light, burst flashing, SOS)

Start Current : 200A

Peak Current : 400A

Size : 131*75*24mm

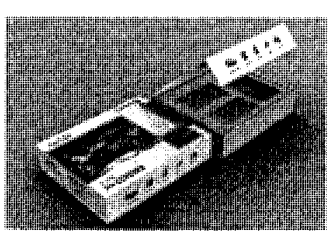
Weight : 300g,Battery capacity:8000mAh

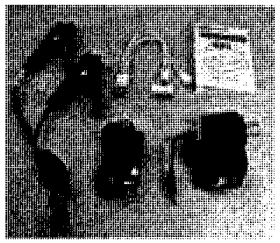
Operating Temp. : -20℃ ~ 60℃/-4℉ ~ 140℉

Lifetime : >1000 cycles

ACCESSORIES :

Home charger*1	Jumper Cable*1
Car charger*1	3 mobile connectors*1





Packing: Color Box + PE tray

FEATURES :

1. Powerful capability for jump Start 12V vehicle.
2. Supply power for Mobile, Tablet PC, MP3/MP4, PSP, Camera and other digital devices.
3. LED light(light, burst flashing, SOS)

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CARKU卡儿酷®
Model : EPOWER-05

TECHNICAL SPECIFICATION :

Input : 14V1A

Output : 5V/2A; 19V/3.5A
12V Jump start
LED light (light, burst flashing, SOS)

Start Current : 200A

Peak Current : 400A

Size : 150*80*33mm

Weight : 450g,Battery capacity:12000mAh

Operating Temp. : -20°C ~ 60°C/-4°F~140°F

Lifetime : >1000 cycles

ACCESSORIES :

Home charger*1 Jumper Cable*1

Car charger*1 3 mobile connectors*1 (Micro, iP4, iP5)

Laptop connectors*8+swtich cable*1

Packing: Color Box + bag

FEATURES :

1. Powerful capability for Jump Start 12V vehicle
2. Supply power for 19V laptop
3. Supply power for Mobile, Tablet PC, MP3/MP4, PSP, Camera and other digital devices.
4. LED light (light, burst flashing, SOS)

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Shenzhen Carku Technology Co. Ltd.
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16148484162801150511O

CARKU卡儿酷®

Model : EPOWER-10
The slimmest jump starter



TECHNICAL SPECIFICATION :

Input : 14V1A; Micro USB5V/2A

Output : 5V/2A;
12V Jump start
LED light (light, burst flashing, SOS)

Start Current : 150A

Peak Current : 300A

Size : 139*75*15mm

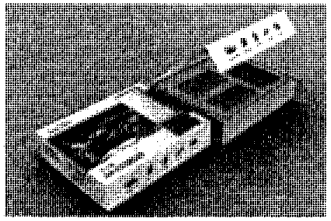
Weight : 200g,Battery capacity:6000mAh

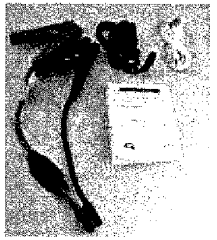
Operating Temp. : -20℃~60℃/-4℉~140℉

Lifetime : >1000 cycles

ACCESSORIES :

Home charger*1	Jumper Cable*1
Car charger*1	3 mobile connectors*1





Packing: Color Box + EVA tray

FEATURES :

1. Powerful capability for jump Start 12V vehicle.
2. Supply power for Mobile, Tablet PC, MP3/MP4, PSP, Camera and other digital devices.
3. LED light(light, burst flashing, SOS)

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CARKU卡儿酷®

Model : Electronic Scorpion

TECHNICAL SPECIFICATION :

Input : 14V1A

Output : 12V Jump start

Start Current : 300A

Peak Current : 600A

Size : 180*70*35mm

Weight : 690g,Battery capacity:13000mAh

Operating Temp. : -20℃ ~ 60℃/-4℉~140℉

Lifetime : >1000 cycles

ACCESSORIES :

Home charger*1

FEATURES :

Powerful capability for jump Start 12V vehicle

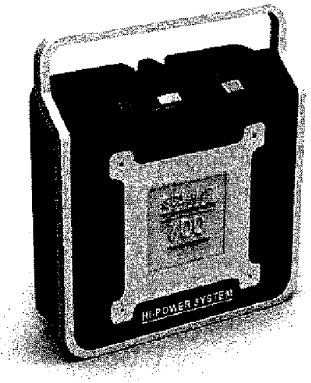
Packing: Color Box + PE tray

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CARKU卡儿酷®

Model： 12V/24V Jump Starter



TECHNICAL SPECIFICATION :

Input： 14V1A

Output： 12V Jump start; 24V Jump start

Start Current： 500A(12V)/300A(24V)

Peak Current： 1000A(12V)/500A(24V)

Size： 247*216*64mm

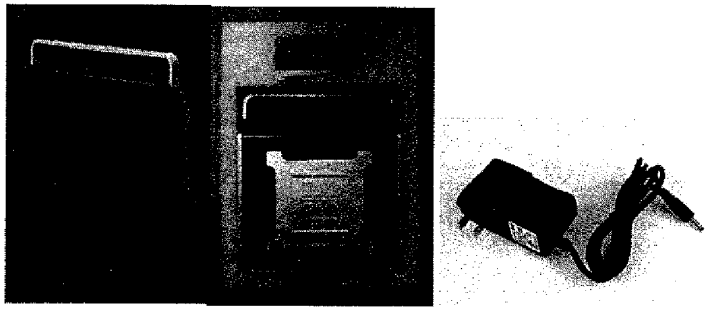
Weight： 1500g,Battery capacity:24000mAh

Operating Temp.：-20℃~60℃/-4℉~140℉

Lifetime： >1000 cycles

ACCESSORIES :

Home charger*1



Packing: Color Box + PE tray

FEATURES :

Powerful capability for jump Start 12V vehicle and 24V vehicle
Recognize the positive and negative poles intelligently
Anti-recharge protection.
Short circuit protection.

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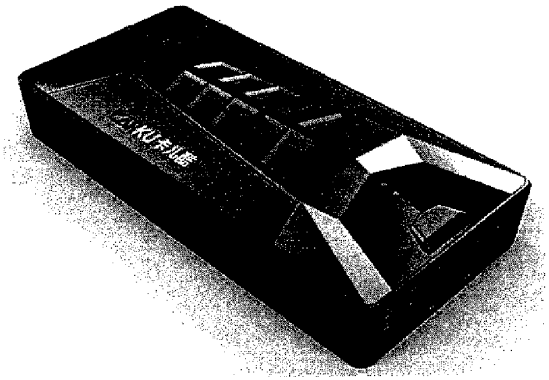
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CARKU卡儿酷®

Model : E-Power-20



TECHNICAL SPECIFICATION :

Input : 14V1A

Output : 5V/2A; 5V/1A; 19V/3.5A
12V Jump start
LED light (light, burst flashing, SOS)

Start Current : 200A

Peak Current : 400A

Size : 155*74*31.5mm

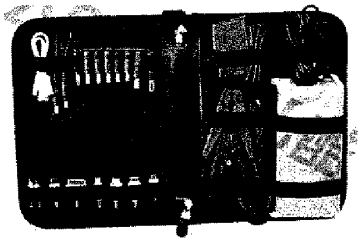
Weight : 400g,Battery capacity:10000mAh

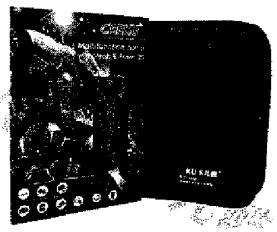
Operating Temp. : -20℃~60℃

Lifetime : >1000 cycles

ACCESSORIES :

Home charger*1	Intelligent Jumper Cable*1
Car charger*1	3 mobile connectors*1 (Micro, iP4, iP5)
Laptop connectors*8+swtich cable*1	





Packing: Color Box + PU bag

FEATURES :

1. Powerful capability for jump Start 12V vehicle.
2. Supply power for 19V laptop.
3. Supply power for Mobile, Tablet PC, MP3/MP4, PSP, Camera and other digital devices.
4. LED light (light, burst flashing, SOS)

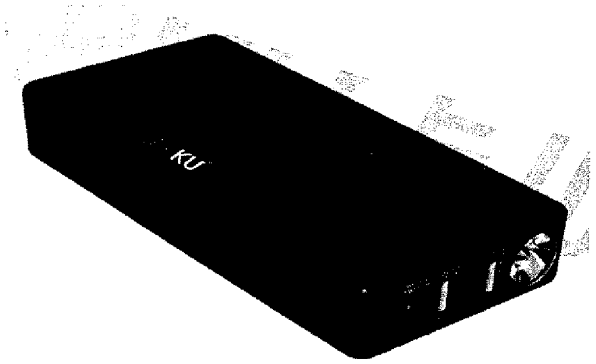
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CARKU卡儿酷®

Model : E-Power-20B



TECHNICAL SPECIFICATION :

Input : 14V1A

Output : 5V/2A; 5V/1A;
15V10A (Car fast charge)
LED light (light, burst flashing, SOS)

Size : 155*75*31mm

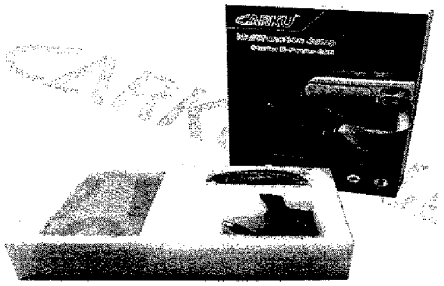
Weight : 325g,Battery capacity:7500mAh

Operating Temp. : 0℃~60℃

Lifetime : >1000 cycles

ACCESSORIES :

Home charger*1 Car charger*1



Packing: Color Box + PE tray

FEATURES :

1. Emergency start the vehicle, fast charge vehicle battery from Cigar socket.
2. Supply power for Mobile, Tablet PC, MP3/MP4, PSP, Camera and other digital devices
3. LED light (light, burst flashing, SOS)

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Shenzhen CarKu Technology Co. Ltd.
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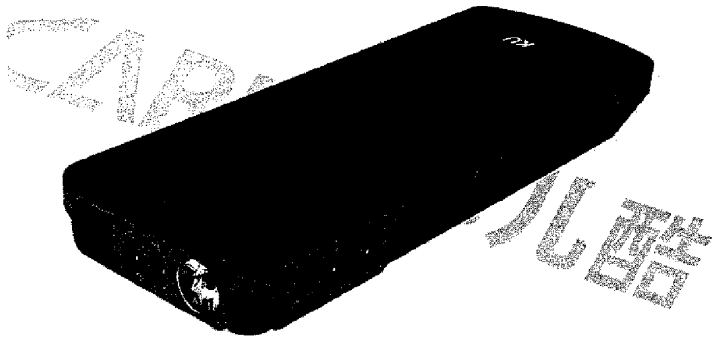
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CARKU卡儿酷®

Model : E-Power-21



TECHNICAL SPECIFICATION :

Input : 14V1A

Output : 5V/2A; 5V/1A; 12V10A; 19V/3.5A
12V Jump start
LED light (light, burst flashing, SOS)

Start Current : 300A

Peak Current : 600A

Size : 230*87*28mm

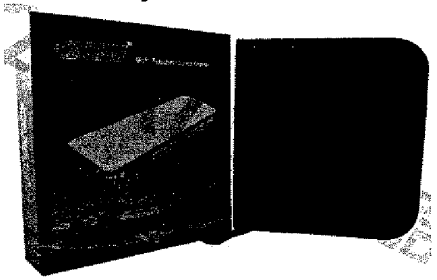
Weight : 615g,Battery capacity:18000mAh

Operating Temp. : -20℃~60℃

Lifetime : >1000 cycles

ACCESSORIES :

Home charger*1	Intelligent Jumper Cable*1
Car charger*1	3 mobile connectors*1 (Micro, iP4, iP5)
Laptop connectors*8+swtich cable*1	



Packing: Color Box + PU bag

FEATURES :

1. Powerful capability for jump start 12V vehicle.
2. Supply power for 19V laptop.
3. Supply power for Mobile, Tablet PC, MP3/MP4, PSP, Camera and other digital devices.
4. Supply power for car refrigerator, blast pump, and other 12V devices.
5. LED light (light, burst flashing, SOS)

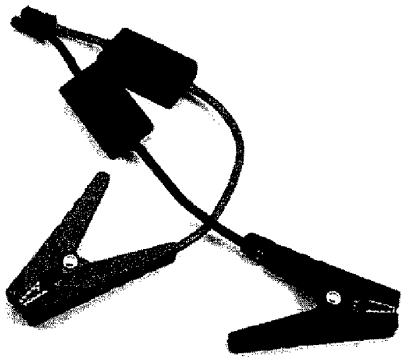
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CARKU卡儿酷®

Jumper Cable

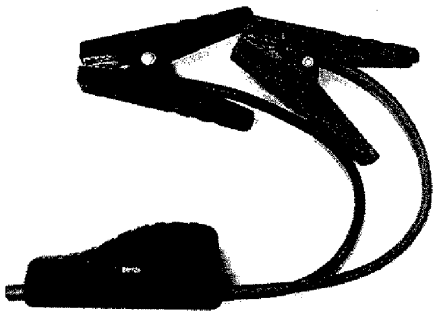


FEATURES :

1.Reverse Charge Protection.

2.Short-Circuit Protection.

Intelligent Jumper Cable



FEATURES :

1.Reverse Polarity Protection: No short-circuit damage is possible even when the clamps are connected incorrectly between positive (+) and negative (-) terminals.

2.Reverse Charge Protection: No reverse charge back to our products after the vehicle starts.

3.Short-Circuit Protection: No short circuit occurs in the product when the two Clamps are connected.

4.Overload Protection: Stop the product from over discharging, protecting the battery when it reaches a low level.

5.Starting override: While the vehicle battery is completely dead or no battery is present, Push "Test" button to force- start the vehicle.

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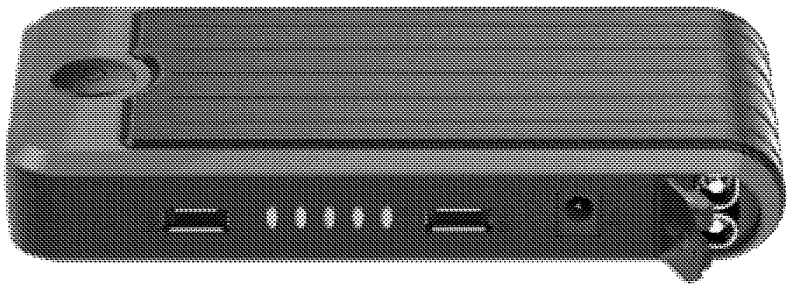
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How-To Geek

This Portable USB Charger Battery Pack Can Also Jump Start Your Car

LOWELL HEDDINGS @lowellheddings
UPDATED JANUARY 13, 2014, 9:19AM EDT

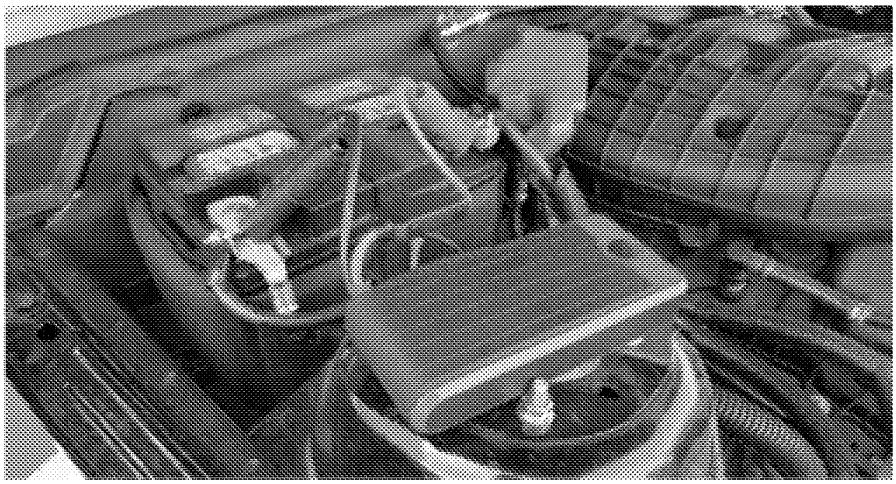


The other day we wrote a guide to help people choose a battery pack for recharging their mobile devices, but we never considered that some people might want to also use it as a jump starter for their car. Well, we came across one that can do just that.

RELATED: *The Complete Guide to Buying an External Battery Pack*

The PowerAll PBJS12000R Rosso Red/Black Portable Power Bank and Car Jump Starter not only has the longest name for a product ever, it also works as 3 different products: a 12,000 mAh battery charger for your phone or tablet, a LED flash light, and a jump starter for your car. It's compact and lightweight, so you could easily carry it around with you, or just stick it in the glove compartment while traveling.

You'd think that it would require a really large battery pack to jump start your car, but according to the manufacturer, this thing can be used for jump starting purposes up to 20 times if fully charged. You just hook up the two jumper cable clamps — red for positive and black for negative, of course, and then attempt to start the car. And yes, it comes with the jumper cables.



Yeah, you can actually jump-start your car with this battery pack.

If you have to jump your car at night, you'll be glad to know that it comes with a built-in LED flashlight, strobe light, and SOS signal flash that lasts for 120 hours for when you get really lost on an island or something. It's got both AC and DC chargers, a big set of adapters for every device you can imagine, and dual USB ports to plug a standard USB charger into.

Yeah, we realize that this isn't actually a *new* product, but it's probably one that you've never heard of (we certainly hadn't). Thanks to PopSci for pointing it out.

PowerAll PBJS12000R Rosso Red/Black Portable Power Bank and Car Jump Starter
[Amazon]

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› What Is the "Windows Feature Experience Pack" on Windows 10?



LOWELL HEDDINGS

Lowell is the founder and CEO of How-To Geek. He's been running the show since creating the site back in 2006. Over the last decade, Lowell has personally written more than 1000 articles which have been viewed by over 250 million people. Prior to starting How-To Geek, Lowell spent 15 years working in IT doing consulting, cybersecurity, database management, and programming work.

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CONTAINS SCHUMACHER CONFIDENTIAL BUSINESS INFORMATION
SUBJECT TO PROTECTIVE ORDER

UNITED STATES INTERNATIONAL TRADE COMMISSION
WASHINGTON, D.C.

Before the Honorable Clark S. Cheney
Administrative Law Judge

In the Matter of **CERTAIN PORTABLE BATTERY JUMP STARTERS AND COMPONENTS THEREOF**	**Investigation No. 337-TA-1256**

RESPONSE OF SCHUMACHER ELECTRIC CORPORATION AND SCHUMACHER POWER TECHNOLOGY (BINHAI) CO. LTD., TO THE COMPLAINT OF THE NOCO COMPANY UNDER SECTION 337 OF THE TARIFF ACT OF 1930 AND NOTICE OF INVESTIGATION

Pursuant to 19 C.F.R. § 210.13(a), Schumacher Electric Corporation ("SEC") and Schumacher Power Technology (Binhai) Co. Ltd. ("SPT"), ("SEC" and "SPT", collectively, "Schumacher" or "Schumacher Respondents"), hereby respond to the Amended Complaint filed by The NOCO Company. ("Complainant" or "NOCO") on February 3, 2021, and any amendments permitted thereto, in the above-captioned investigation ("this Investigation") and to the Notice of Investigation issued by the United States International Trade Commission ("Commission") dated March 17, 2021.

The following headings and numbered paragraphs correspond to and respond to the numbered paragraphs set forth in the Complaint as amended for ease of reference. However, to the extent that such headings themselves contain factual and legal characterizations, Schumacher Respondents deny such characterizations. As an initial matter, Schumacher denies that it has engaged in unfair competition or violated Section 337 of the Tariff Act of 1930, as amended, by importing, selling for importation, or selling within the United States after importation any

devices, products, or articles that infringe any valid and enforceable patent asserted in this Investigation.

Because discovery by Schumacher has just begun, Schumacher has not yet had sufficient time and opportunity to collect and review all of the information that may be relevant to the issues raised in this Response. Schumacher therefore reserves the right to amend or supplement its responses, including raising additional defenses, based on any additional facts or developments that become available or that arise after the filing of this Response. As such, Schumacher denies each and every allegation in the Amended Complaint that is not expressly admitted below. Any factual allegation admitted below is admitted only as to the specific admitted facts, and not as to any purported conclusions, characterizations, implications, or speculations that might follow from the admitted facts.

I. INTRODUCTION

1. The NOCO Company ("NOCO" or "Complainant"), a 100 plus year old company designing and creating premium battery products in the United States for the automotive industry, respectfully requests that the U.S. International Trade Commission ("Commission") commence an investigation pursuant to Section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337 ("Section 337") to remedy the unlawful importation into the United States, the sale for importation, offer for sale, and/or the sale within the United States after importation by the owner, importer, or consignee, of certain portable battery jump starters and components thereof that infringe one or more of the valid and enforceable United States patents owned by NOCO.

RESPONSE: Schumacher states that the allegations contained in ¶ 1 of the Amended Complaint are conclusions of law as to which no response is necessary. To the extent any response is required, Schumacher admits that Complainant has filed the Complaint against all of the proposed respondents, that Complainant has requested the Commission to institute an investigation addressing the sale for importation, importation, and/or sale within the United

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States after importation of certain portable battery jump starters and components thereof.

Schumacher denies that it has engaged in any unlawful act as alleged by the Complainant.

2. On information and belief, the Proposed Respondents, as listed in Section II.B., supra, are manufacturers, importers, trading companies, and retailers based in China and the United States. Respondents have engaged, and continue to engage, in unfair acts in violation of Section 337 through the unlicensed importation, sale for importation, offer for sale, and/or sale after importation into the United States of portable battery jump starters having certain safety features ("Accused Products"). Upon information and belief, the Accused Products have been imported into the United States.

RESPONSE: Schumacher states that statements and allegations of ¶ 2 of the Amended Complaint contain opinions and legal arguments rather than factual assertions and, therefore, denies the same. Schumacher states that the allegations contained in ¶ 2 of the Amended Complaint also include conclusions of law as to which no response is necessary. Schumacher admits that it imported and/or offered for sale in the United States the Schumacher Accused Products and denies that it has engaged in any unlawful act as alleged by the Complainant.

3. The Accused Products infringe one or more of the Asserted Claims of United States Patent Nos. 9,007,015 and 10,604,024 (collectively, the "Asserted Patents"), which are both owned by NOCO. Pursuant to Commission Rule 210.12(a)(9)(i), copies of the '015 Patent and the '024 Patent, are attached to this Complaint as Exhibits 1 – 2, respectively.

RESPONSE: Schumacher states that the allegations contained in ¶ 3 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Schumacher further denies that its Accused Products infringe any of the asserted claims of any of the Asserted Patents of Complainant.

4. Certain of Respondents' Accused Products also infringe one or more of U.S. Trademark Reg. Nos. 4,811,656 and 4,811,749 (collectively, the "Asserted Trademarks"), which are both owned by NOCO, in violation of Section 337(a)(1)(C). Pursuant to Commission Rule

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210.12(a)(9)(i), copies of the '656 Trademark and '749 Trademark are attached to this Complaint as Exhibits 3-4, respectively.

RESPONSE: Schumacher assumes that the allegations in ¶ 4 of the Amended Complaint are directed to other Respondents and, therefore, denies all the allegations in ¶ 4 of the Amended Complaint as concerns Schumacher. Schumacher further states that the allegations contained in ¶ 4 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same.

5. Complainant asserts that the Accused Products infringe at least the following claims of one or more Asserted Patents in violation of Section 337(a)(1)(B)(i), either literally or under the doctrine of equivalents:

Asserted Patent	Asserted Claims[3]
9,007,015	**1**, 4, 11, 14, 18, 19, 21
10,604,024	**1,** 4, 5, 6, 16, 19, 23, 24, 26, **29**, **30**

Table 1. The Asserted Claims

RESPONSE: Schumacher states that the allegations contained in ¶ 5 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Schumacher further denies that its Accused Products infringe any of the asserted claims of any of the Asserted Patents of Complainant.

6. Pursuant to Commission Rules 210.10(b)(1) and 210.12(a)(12), Complainant states that a plain English description of the category of Accused Products is portable, battery-powered devices that are used to jump-start batteries such as those in automobiles, trucks, and other vehicles, and related components, namely battery cables and clamps.

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RESPONSE: Schumacher states that the allegations contained in ¶ 6 of the Complaint contain opinions and legal arguments rather than factual assertions and, therefore, denies the same.

7. As required by Section 337(a)(2) and (3), a domestic industry exists and is well established in the United States for each of the Asserted Products and for products and technology protected by the Asserted Patents and Asserted Trademarks.

RESPONSE: Schumacher states that the allegations contained in ¶ 7 of the Complaint contain opinions and legal arguments rather than factual assertions and, therefore, denies the same.

8. Complainant NOCO seeks a general exclusion order pursuant to Section 337(d)(2) excluding from entry into the United States all products that infringe one or more claims of any of the Asserted Patents and/or are sold or advertised using the Asserted Trademarks. Complainant further seeks cease and desist orders pursuant to Section 337(f) directing Respondents and those acting in conjunction with Respondents to cease the importation, offering for sale, promotion, marketing, advertising, demonstration, and warehousing of inventory for distribution, sale, and use of such products within the United States. Complainant also seeks a bond pursuant to Section 337(j).

RESPONSE: Schumacher states ¶ 8 of the Complaint is not an allegation. Thus, no response is required. To the extent any response is required, Schumacher admits that Complainant seeks, as relief, a general exclusion order, a cease and desist order and to impose a bond in this Investigation but denies that Complainant is entitled to such relief against Schumacher Respondents and denies any infringement. Schumacher denies that the Complainant is entitled to any relief against Schumacher Respondents as a result of this Investigation or that it needs relief in order to protect a domestic industry.

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9. In the alternative, should the Commission find that a general exclusion order is not appropriate, NOCO respectfully requests that limited exclusion orders be entered against each named Respondent and its subsidiaries, predecessors, affiliates, agents, successors, and assigns.

RESPONSE: Schumacher states ¶ 9 of the Complaint is not an allegation. Thus, no response is required. To the extent any response is required, Schumacher admits that Complainant seeks, as relief, a limited exclusion order in this Investigation but denies that Complainant is entitled to such relief against Schumacher Respondents and denies any infringement. Schumacher denies that the Complainant is entitled to any relief against Schumacher Respondents as a result of this Investigation or that it needs relief in order to protect a domestic industry.

II. THE PARTIES

A. Complainant NOCO

10. Complainant NOCO is an Ohio corporation having its principal place of business at 30339 Diamond Parkway #102, Glenwillow, Ohio 44139.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 10 of the Complaint and, therefore, denies the same.

11. NOCO is a privately held family company that was founded in the United States over 100 years ago. Joseph H. Nook, a tire and battery distributor from Cleveland, Ohio, founded The NOCO Company in 1914. Mr. Nook set out to develop a product that would prevent battery corrosion. After several hundred different formulations, Mr. Nook began commercially manufacturing and distributing the world's first Battery Corrosion Preventative which he called "NCP2," which is an acronym for "No Corrosion Product" which is applied in "2 Steps." The NCP2 brand quickly became a household name in every major battery and automotive shop. For over 100 years, the NCP2 brand has been preventing battery corrosion on over a billion vehicles and applications worldwide.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 11 of the Complaint and, therefore, denies the same.

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12. Today, NOCO, still owned and managed by the Nook family, remains a leading innovator in the automotive battery industry, and designs and manufactures premium consumer battery chargers, jump starters, solar panels, and portable power devices as well as a wide range related battery products and accessories.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 12 of the Complaint and, therefore, denies the same.

13. NOCO has all right, title, and interest in the Asserted Patents and Asserted Trademarks. See Exs. 6 and 7.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 13 of the Complaint and, therefore, denies the same.

14. NOCO takes significant measures to protect its intellectual property rights. NOCO first began noticing the appearance of the Accused Products in the U.S. marketplace in 2014 shortly after the introduction of its Boost® products and since then has continuously endeavored to stop the entities involved. NOCO's IPR protection efforts are outlined in Section XI, infra.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 14 of the Complaint and, therefore, denies the same.

B. Proposed Respondents

15. The sections below provide information sufficient to identify the Proposed Respondents. Additional information regarding the Proposed Respondents' unfair acts as they relate to the Accused Products can be found in Section VI below, and in the attached Confidential Declaration of Anne Hurst. See Ex. 44C. For the purposes of this Complaint, the Proposed Respondents are grouped by the entity that is believed to be the manufacturer of a particular design, and all entities related to the importation of that design.

RESPONSE: Schumacher states that ¶ 15 of the Complaint is not an allegation. Thus, no response is required. To the extent any response is required, Respondent lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 15 and, therefore, denies the same. Schumacher further states that the allegations contained in the second sentence of ¶ 15 of

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the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Schumacher admits that there is a Section VI in this Complaint and the Complainant has attached a Confidential Declaration of Anne Hurst.

1. Carku Respondents

a) Advance Auto Parts, Inc.

16. On information and belief, Respondent Advance Auto Part, Inc. ("Advance Auto") is a company organized and existing under the laws of the United States, having its principal place of business located at 2635 East Millbrook Road, Raleigh, North Carolina 27604.

RESPONSE: The allegations in ¶ 16 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 16 of the Complaint and, therefore, denies the same.

17. On information and belief, Advance Auto is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 17 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 17 of the Complaint and, therefore, denies the same.

b) Antigravity Batteries LLC

18. On information and belief, Respondent Antigravity Batteries LLC ("Antigravity") is a company organized and existing under the laws of the United States, having its principal place of business located at 15622 Broadway Center Street, Gardena, California 90248.

RESPONSE: The allegations in ¶ 18 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 18 of the Complaint and, therefore, denies the same.

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19. On information and belief, Antigravity is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 19 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 19 of the Complaint and, therefore, denies the same.

c) Aukey Technology Co., Ltd. **[Respondent Removed]**

20. On information and belief, Respondent Aukey Technology Ltd. ("Aukey") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 102, Building P09, Huanancity Elec-Trading Center, Longgang District, Shenzhen, China.

RESPONSE: The allegations in ¶ 20 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 20 of the Complaint and, therefore, denies the same.

21. On information and belief, Aukey **[Respondent Removed]** is in the business of manufacturing jump starters in China. Aukey sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 21 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 21 of the Complaint and, therefore, denies the same.

d) Autogen Technology Co., Ltd. **[Respondent Removed]**

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22. On information and belief, Respondent Autogen Technology Co., Ltd. ("Autogen") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Bld 21B No 3021 Kaixuan Rd, Shanghai, China.

RESPONSE: The allegations in ¶ 22 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 22 of the Complaint and, therefore, denies the same.

23. On information and belief, Autogen**[Respondent Removed]** is in the business of manufacturing jump starters in China. Autogen sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 23 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 23 of the Complaint and, therefore, denies the same.

e) Gooloo Technologies LLC

24. On information and belief, Respondent Gooloo Technologies LLC ("Gooloo") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 303 Room Bantian Business Center Bantian Wuhe Road, Longgang Dist., Shenzhen China 51800. Gooloo is believed to be affiliated with Shenzhen Gooloo ECommerce Co., Ltd.

RESPONSE: The allegations in ¶ 24 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 24 of the Complaint and, therefore, denies the same.

25. On information and belief, Gooloo is in the business of manufacturing jump starters in China. Gooloo Tech sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: The allegations in ¶ 25 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 25 of the Complaint and, therefore, denies the same.

f) Guangzhou Unique Electronics Co., Ltd. **[Respondent Removed]**

26. On information and belief, Respondent Guangzhou Unique Electronics Co., Ltd. ("Guangzhou Unique Electronics") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at NO. 9, Jinfa Logistics Park, Baiyun Lake Street, Baiyun District, Guagnzhou, China 510000.

RESPONSE: The allegations in ¶ 26 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 26 of the Complaint and, therefore, denies the same.

27. On information and belief, Guangzhou Unique Electronics**[Respondent Removed]** is in the business of manufacturing jump starters in China. Guangzhou Unique Electronics sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: The allegations in ¶ 27 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 27 of the Complaint and, therefore, denies the same.

g) **Horizon Tool, Inc**.

28. On information and belief, Respondent Horizon Tool, Inc. ("Horizon Tool") is a company organized and existing under the laws of the United States, having its principal place of business located at 7918 Industrial Village Road, Greensboro, North Carolina 27409. Horizon Tool is believed to be affiliated with AllStart LLC and Cal-Van & Horizon Tool Inc.

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RESPONSE: The allegations in ¶ 28 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 28 of the Complaint and, therefore, denies the same.

29. On information and belief, Horizon Tool is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 29 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 29 of the Complaint and, therefore, denies the same.

h) Huizhou Grepro E-Commerce [Respondent Removed]

30. On information and belief, Respondent Huizhou Grepro E-Commerce ("Huizhou Grepro") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 2004 B Kaibinsiji Build, Yunshanxi Road, Huicheng District, Huizhou, China.

RESPONSE: The allegations in ¶ 30 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 30 of the Complaint and, therefore, denies the same.

31. On information and belief, Huizhou Grepro **[Respondent Removed]** is in the business of manufacturing jump starters in China. Huizhou Grepro sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 31 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 31 of the Complaint and, therefore, denies the same.

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i) **Medcursor, Inc. [Respondent Removed]**

32. On information and belief, Medcursor, Inc. ("Medcursor") is a company organized and existing under the laws of the United States, having its principal place of business located at 6130 W Flamingo Road, Suite 1818, Las Vegas, Nevada 89103.

RESPONSE: The allegations in ¶ 32 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 32 of the Complaint and, therefore, denies the same.

33. On information and belief, Medcursor **[Respondent Removed]** is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 33 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 33 of the Complaint and, therefore, denies the same.

j) Nekteck, Inc.

34. On information and belief, Nekteck, Inc. ("Nekteck") is a company organized and existing under the laws of the United States, having its principal place of business located at 421 S Brookhurst Street, Suite 127, Anaheim, California 92804.

RESPONSE: The allegations in ¶ 34 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 34 of the Complaint and, therefore, denies the same.

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35. On information and belief, Nekteck is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 35 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 35 of the Complaint and, therefore, denies the same.

k) PowerMax Battery (U.S.A.), Inc.

36. On information and belief, PowerMax Battery (U.S.A.), Inc. ("PowerMax") is a company organized and existing under the laws of the United States, having its principal place of business located at 1520 S Grove Avenue, Ontario, California 91761.

RESPONSE: The allegations in ¶ 36 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 36 of the Complaint and, therefore, denies the same.

37. On information and belief, PowerMax is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 37 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 37 of the Complaint and, therefore, denies the same.

l) Prime Global Products, Inc.

38. On information and belief, Prime Global Products, Inc. ("Prime Global Products") is a company organized and existing under the laws of the United States, having its principal place of business located at 2220 Airport Industrial Drive, Suite 100, Ball Ground, Georgia 30107.

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RESPONSE: The allegations in ¶ 38 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 38 of the Complaint and, therefore, denies the same.

39. On information and belief, Prime Global Products is in the business of manufacturing jump starters in China. Prime Global Products sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 39 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 39 of the Complaint and, therefore, denies the same.

m) Shenzhen Carku Technology Co., Ltd.

40. On information and belief, Respondent Shenzhen Carku Technology Co., Ltd. ("Carku") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Building A, Qixing Creative Workshop (Dalang), Lianrun Road, Gaofeng Community, Dalang Street, Longhua New District, China. Carku is believed to be affiliated with MigOwatt Group LLC.

RESPONSE: The allegations in ¶ 40 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 40 of the Complaint and, therefore, denies the same.

41. On information and belief, Carku is in the business of manufacturing jump starters in China. Carku sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 41 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 41 of the Complaint and, therefore, denies the same.

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n) Shenzhen Moock Technology Co., Ltd. **[Respondent Removed]**

42. On information and belief, Respondent Shenzhen Moock Technology Co., Ltd. ("Shenzhen Moock") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 718, Zerun Center, Bantian Street, Longgang District, Shenzhen, Guangdong, China.

RESPONSE: The allegations in ¶ 42 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 42 of the Complaint and, therefore, denies the same.

43. On information and belief, Shenzhen Moock**[Respondent Removed]** is in the business of manufacturing jump starters in China. Shenzhen Moock sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 43 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 43 of the Complaint and, therefore, denies the same.

o) Shenzhen Take Tools Co., Ltd.

44. On information and belief, Respondent Shenzhen Take Tools Co., Ltd. ("Shenzhen Take Tools") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. B714, Niulanqian Building, Minzhi Road, Longhua District, Shenzhen, Guangdong, China 518000.

RESPONSE: The allegations in ¶ 44 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 44 of the Complaint and, therefore, denies the same.

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45. On information and belief, Shenzhen Take Tools is in the business of manufacturing jump starters in China. Shenzhen Take Tools sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 45 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 45 of the Complaint and, therefore, denies the same.

p) Sictec Instruments Co., Ltd. **[Respondent Removed]**

46. On information and belief, Respondent Sictec Instruments Co., Ltd. ("Sictec Instruments") is a Hong Kong corporation that is organized and existing under the laws of Hong Kong and has a principal place of business located at Suites 908-090, Level 9, Landmark North, 39 Lung Sum Avenue, Sheung Shui, Hong Kong 999077.

RESPONSE: The allegations in ¶ 46 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 46 of the Complaint and, therefore, denies the same.

47. On information and belief, Sictec Instruments**[Respondent Removed]** is in the business of manufacturing jump starters in Hong Kong. Sictec Instruments sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 47 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 47 of the Complaint and, therefore, denies the same.

q) Walmart Inc.

48. On information and belief, Walmart Inc. ("Walmart") is a company organized and existing under the laws of the United States, having its principal place of business located at 702

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S.W. 8th Street, Bentonville, Arkansas 72716. Walmart is believed to be affiliated with Wal-Mart Stores, Inc.; Sam's West, Inc (d/b/a Sam's Club); and Sam's East, Inc. (d/b/a Sam's Club).

RESPONSE: The allegations in ¶ 48 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 48 of the Complaint and, therefore, denies the same.

49. On information and belief, Walmart is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 49 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 49 of the Complaint and, therefore, denies the same.

r) 70mai Co., Ltd.

50. On information and belief, 70mai Co., Ltd. ("70mai") is a company organized and existing under the laws of the United States, having its principal place of business located at Room 2220, Building 2, No. 588, Zixing Road, Minhang District, Shanghai, China.

RESPONSE: The allegations in ¶ 50 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 50 of the Complaint and, therefore, denies the same.

51. On information and belief, 70mai is in the business of manufacturing jump starters in China. 70mai sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: The allegations in ¶ 51 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 51 of the Complaint and, therefore, denies the same.

2. Boltpower Respondents

a) Anker Technology (UK) Ltd.

52. On information and belief, Respondent Anker Technology (UK) Ltd., ("Anker Technology UK") is a United Kingdom company organized and existing under the laws of the United Kingdom and has a principal place of business located at Suite B, Fairgate House, 205 Kings Road, Tyseley, Birmingham, United Kingdom B11 2AA. Anker is believed to be affiliated with Anker Technology Co., Ltd. and Anker Innovations Ltd.

RESPONSE: The allegations in ¶ 52 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 52 of the Complaint and, therefore, denies the same.

53. On information and belief, Anker Innovations, Anker Technology, and Anker Technology (UK) are in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 53 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 53 of the Complaint and, therefore, denies the same.

b) Arteck Electronic Co., Ltd.

54. On information and belief, Respondent Arteck Electronic Co., Ltd. ("Arteck Electronic") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. 1104-51, Tower B, Jinfengcheng Building, Shennan East Road No. 501, Shenzhen, Guangdong, China 518100.

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RESPONSE: The allegations in ¶ 54 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 54 of the Complaint and, therefore, denies the same.

55. On information and belief, Arteck Electronic is in the business of manufacturing jump starters in China. Arteck Electronic sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 55 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 55 of the Complaint and, therefore, denies the same.

c) Best Parts, Inc.

56. On information and belief, Respondent Best Parts, Inc. ("Best Parts") is a company organized and existing under the laws of the United States, having its principal place of business located at 123 S Front Street, Memphis, Tennessee 38103-3607.

RESPONSE: The allegations in ¶ 56 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 56 of the Complaint and, therefore, denies the same.

57. On information and belief, Best Parts is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 57 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 57 of the Complaint and, therefore, denies the same.

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d) Circus Link, Inc. **[Respondent Removed]**

58. On information and belief, Respondent Circus Link, Inc. ("Circus Link") is a company organized and existing under the laws of the United States, having its principal place of business located at 2132 S. Grove Ave, Unit N, Ontario, California 91761.

RESPONSE: The allegations in ¶ 58 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 58 of the Complaint and, therefore, denies the same.

59. On information and belief, Circus Link**[Respondent Removed]** is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 59 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 59 of the Complaint and, therefore, denies the same.

e) Deltran USA, LLC

60. On information and belief, Respondent Deltran USA, LLC ("Deltran") is a company organized and existing under the laws of the United States, having its principal place of business located at 801 International Speedway Blvd., DeLand, Florida 32724.

RESPONSE: The allegations in ¶ 60 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 60 of the Complaint and, therefore, denies the same.

61. On information and belief, Deltran is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: The allegations in ¶ 61 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 61 of the Complaint and, therefore, denies the same.

f) FlyLink Tech Technologies Co., Ltd.

62. On information and belief, Respondent FlyLink Tech Technologies Co., Ltd. ("FlyLink Tech") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 2 Floor, 9 Building, Hengling Ind. Park Min Zhi Street, Bao'an District, Shenzhen China.

RESPONSE: The allegations in ¶ 62 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 62 of the Complaint and, therefore, denies the same.

63. On information and belief, FlyLink Tech is in the business of manufacturing jump starters in China. FlyLink Tech sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 63 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 63 of the Complaint and, therefore, denies the same.

g) Fconegy Co., Ltd. **[Respondent Removed]**

64. On information and belief, Respondent Fconegy Co., Ltd. ("Fconegy") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 20th Floor, Hefeng Building, Meilong Rd., Longhua New District, Shenzhen Guangdong, China.

RESPONSE: The allegations in ¶ 64 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 64 of the Complaint and, therefore, denies the same.

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65. On information and belief, Fconegy **[Respondent Removed]** is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 65 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 65 of the Complaint and, therefore, denies the same.

h) Guangdong Boltpower Energy Co., Ltd.

66. On information and belief, Respondent Guangdong Boltpower Energy Co., Ltd. ("Boltpower") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 3-6 Floor KelunTe Building No. 5 Ganli Road, Longgang District, Shenzhen City, Guangdong, China. Boltpower is believed to be affiliated with Dongguan Boltpower Co., Ltd. and Hunan Boltpower New Energy Co., Ltd.

RESPONSE: The allegations in ¶ 66 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 66 of the Complaint and, therefore, denies the same.

67. On information and belief, Boltpower is in the business of manufacturing jump starters in China. Boltpower sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: The allegations in ¶ 67 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 67 of the Complaint and, therefore, denies the same.

i) Guangzhou Autolion Electric Technology Co., Ltd.

68. On information and belief, Respondent Guangzhou Autolion Electronic Technology Co., Ltd. ("Autolion") is a Chinese corporation that is organized and existing under the laws of China

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and has a principal place of business located at Room 902, No. 69, Xianlie Middle Road, Yuexiu District, Guagnzhou, Guangdong, China.

RESPONSE: The allegations in ¶ 68 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 68 of the Complaint and, therefore, denies the same.

69. On information and belief, Autolion is in the business of manufacturing jump starters in China. Autolion sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: The allegations in ¶ 69 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 69 of the Complaint and, therefore, denies the same.

j) Integrated Supply Network, LLC **[Respondent Removed]**

70. On information and belief, Integrated Supply Network, LLC ("Integrated Supply Network") is a company organized and existing under the laws of the United States, having its principal place of business located at 2727 Interstate Drive, Lakeland, Florida 33805.

RESPONSE: The allegations in ¶ 70 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 70 of the Complaint and, therefore, denies the same.

71. On information and belief, Integrated Supply Network**[Respondent Removed]** is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 71 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 71 of the Complaint and, therefore, denies the same.

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k) K-Tool International

72. On information and belief, K-Tool International ("K-Tool") is a company organized and existing under the laws of the United States, having its principal place of business located at 45255 Five Mile Road Plymouth, Michigan 48170.

RESPONSE: The allegations in ¶ 72 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 72 of the Complaint and, therefore, denies the same.

73. On information and belief, K-Tool is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 73 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 73 of the Complaint and, therefore, denies the same.

l) Lowe's Companies, Inc.

74. On information and belief, Lowe's Companies, Inc. ("Lowe's") is a company organized and existing under the laws of the United States, having its principal place of business located at 1000 Lowe's Blvd. Mooresville, North Carolina.

RESPONSE: The allegations in ¶ 74 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 74 of the Complaint and, therefore, denies the same.

75. On information and belief, Lowe's is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: The allegations in ¶ 75 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 75 of the Complaint and, therefore, denies the same.

m) Matco Tools Corporation

76. On information and belief, Matco Tools Corporation ("Matco") is a company organized and existing under the laws of the United States, having its principal place of business located at 4403 Allen Road Stow, Ohio 44224.

RESPONSE: The allegations in ¶ 76 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 76 of the Complaint and, therefore, denies the same.

77. On information and belief, Matco is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 77 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 77 of the Complaint and, therefore, denies the same.

n) MonoPrice, Inc.

78. On information and belief, Mono Price, Inc. ("MonoPrice") is a company organized and existing under the laws of the United States, having its principal place of business located at 1 Pointe Drive, 4th Floor Brea, California 92821.

RESPONSE: The allegations in ¶ 78 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 78 of the Complaint and, therefore, denies the same.

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79. On information and belief, MonoPrice is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 79 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 79 of the Complaint and, therefore, denies the same.

o) National Automotive Parts Association, LLC

80. On information and belief, National Automotive Parts Association, LLC ("NAPA") is a company organized and existing under the laws of the United States, having its principal place of business located at 2085 Marietta Blvd Northwest Atlanta, GA 30318. NAPA is believed to be affiliated with Genuine Parts Company, a company organized and existing under the Laws of the United States, having its principal place of business located at 2999 Wildwood Parkway, Atlanta, Georgia 30339.

RESPONSE: The allegations in ¶ 80 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 80 of the Complaint and, therefore, denies the same.

81. On information and belief, NAPA is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 81 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 81 of the Complaint and, therefore, denies the same.

p) O'Reilly Automotive, Inc.

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82. On information and belief, O'Reilly Automotive, Inc. ("O'Reilly") is a company organized and existing under the laws of the United States, having its principal place of business located at 233 South Patterson Avenue Springfield, Missouri 65802.

RESPONSE: The allegations in ¶ 82 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 82 of the Complaint and, therefore, denies the same.

83. On information and belief, O'Reilly is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 83 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 83 of the Complaint and, therefore, denies the same.

q) Pep Boys **[Respondent Removed]**

84. On information and belief, Pep Boys ("Pep Boys") is a company organized and existing under the laws of the United States, having its principal place of business located at 3111 West Allegheny Avenue Philadelphia, Pennsylvania 19132.

RESPONSE: The allegations in ¶ 84 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 84 of the Complaint and, therefore, denies the same.

85. On information and belief, Pep Boys**[Respondent Removed]** is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 85 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 85 of the Complaint and, therefore, denies the same.

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r) Schumacher Power Technology Ltd.

86. On information and belief, Respondent Schumacher Power Technology Ltd. ("Schumacher") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. 30, Century Road, Binhai County, Yancheng, Jiangsu, China, 215127. Schumacher is believed to be affiliated with Schumacher Electric Corp.

RESPONSE: SPT denies Schumacher Power Technology Ltd. is the correct spelling of the Schumacher entity in China. Schumacher admits the correct spelling is Schumacher Power Technology (Binhai) Co., Ltd. Schumacher further admits that it is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. 30, Century Road, Binhai County, Yancheng, Jiangsu, China, 215127. SPT admits it is affiliated with SEC. SPT denies the rest of the allegations contained in ¶ 86 of the Complaint.

87. On information and belief, Schumacher is in the business of manufacturing jump starters in China. Schumacher sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: SPT admits that it manufactures jump starters in China. SPT states that the allegations contained in the second sentence of this ¶ 87 of the Complaint are conclusions of law as to which no response is necessary. To the extent any response is required, SPT admits that it only sells jump starters to SEC. SPT denies that it has engaged in any unlawful act as alleged by the Complainant.

Schumacher Electric Corp.

87a) On information and belief, Respondent Schumacher Electric Corp. ("Schumacher") is a company organized and existing under the laws of the United States, having its principal place of business located at 801 E Business Center Drive Mount Prospect, Illinois 60056.

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RESPONSE: SEC admits that it is a company organized and existing under the laws of the United States, having its principal place of business located at 801 E Business Center Drive, Mount Prospect, Illinois 60056.

87b) On information and belief, Schumacher is in the business of manufacturing jump starters in China. Schumacher sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: SEC denies that SEC is in the business of manufacturing jump starters in China. SEC states that the allegations contained in the second sentence of this ¶ 87b) of the Complaint are conclusions of law as to which no response is necessary. To the extent any response is required, SEC admits that it sells, offers for sale, imports and/or has imported jump starters into the United States. SEC denies that it has engaged in any unlawful act as alleged by the Complainant.

s) Shenzhen Chic Electrics Co., Ltd. **[Respondent Removed]**

88. On information and belief, Respondent Shenzhen Chic Electrics., Ltd. ("Shenzhen Chic Electrics") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 2 #5 Floor, Hualangjia Industrial Zone, Kukeng Community, Guanlan Street, Longhua New District, Shenzhen China.

RESPONSE: The allegations in ¶ 88 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 88 of the Complaint and, therefore, denies the same.

89. On information and belief, Shenzhen Chic Electrics**[Respondent Removed]** is in the business of manufacturing jump starters in China. Shenzhen Chic Electrics sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: The allegations in ¶ 89 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 89 of the Complaint and, therefore, denies the same.

t) Shenzhen Dingjiang Technology Co., Ltd. LLLC

90. On information and belief, Respondent Shenzhen Dingjiang Technology Co., Ltd. LLLC ("Shenzhen Dingjiang Technology") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 701G, HuafengBao'anZhigu Innovation Park Yintian 4th Road, Xixiang St., Bao'an District, Shenzhen, China 518000.

RESPONSE: The allegations in ¶ 90 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 90 of the Complaint and, therefore, denies the same.

91. On information and belief, Shenzhen Dingjiang Technology is in the business of manufacturing jump starters in China. Shenzhen Dingjiang Technology sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: The allegations in ¶ 91 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 91 of the Complaint and, therefore, denies the same.

u) Shenzhen Lianfatong Technology Co., Ltd. **[Respondent Removed]**

92. On information and belief, Respondent Shenzhen Lianfatong Technology Co., Ltd. ("Shenzhen Lianfatong") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 3A-E, Ganyutong Building, Qingji Road, Qinghu Community, Longhua Street, Longhua New District, Shenzhen, Guangdong, China 518000.

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RESPONSE: The allegations in ¶ 92 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 92 of the Complaint and, therefore, denies the same.

93. On information and belief, Shenzhen Lianfatong**[Respondent Removed]** is in the business of manufacturing jump starters in China. Shenzhen Lianfatong sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: The allegations in ¶ 93 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 93 of the Complaint and, therefore, denies the same.

v) Shenzhen Li Feng Maoyiyouxiangongsi [Respondent Removed]

94. On information and belief, Respondent Shenzhen Li Feng Maoyiyouxiangongsi ("Shenzhen Li Feng Maoyiyouxiangongsi") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at China Da Wan Xin Cun Dong, 38 Dong 201 Long Gang Qu Yuan Shan Jie Dao, DaKang, Shenzhen Guangdong, China 518000.

RESPONSE: The allegations in ¶ 94 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 94 of the Complaint and, therefore, denies the same.

95. On information and belief, Shenzhen Li Feng Maoyiyouxiangongsi**[Respondent Removed]** is in the business of manufacturing jump starters in China. Shenzhen Li Feng Maoyiyouxiangongsi sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

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RESPONSE: The allegations in ¶ 95 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 95 of the Complaint and, therefore, denies the same.

w) Shenzhen Mediatek Tong Technology Co., Ltd.

96. On information and belief, Respondent Shenzhen Mediatek Tong Technology Co., Ltd. ("Shenzhen Mediatek") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 3A-E, Qianyu Tong Building, Qingji Road, Longhua Street, Longhua New District, Shenzhen, China.

RESPONSE: The allegations in ¶ 96 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 96 of the Complaint and, therefore, denies the same.

97. On information and belief, Shenzhen Mediatek is in the business of manufacturing jump starters in China. Shenzhen Mediatek sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: The allegations in ¶ 97 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 97 of the Complaint and, therefore, denies the same.

x) Shenzhen Topdon Technology Co., Ltd.

98. On information and belief, Respondent Shenzhen Topdon Technology Co., Ltd. ("Shenzhen Topdon") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 5th Floor, Building 12, Taihua Wutong Island, Intersection of Shunchang Road and Hangkong Road, Xixiang Subdistrict, Baoan District, Guangdong, Shenzhen, China 518112.

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RESPONSE: The allegations in ¶ 98 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 98 of the Complaint and, therefore, denies the same.

99. On information and belief, Shenzhen Topdon is in the business of manufacturing jump starters in China. Shenzhen Topdon sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: The allegations in ¶ 99 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 99 of the Complaint and, therefore, denies the same.

y) Shenzhen Valuelink E-Commerce Co., Ltd.

100. On information and belief, Respondent Shenzhen Valuelink E-Commerce Co., Ltd. ("Shenzhen Valuelink") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 2nd Two-way ChangJiangPu, Heao Community, HengGang Street Office, Longgang District, Shenzhen, China 518000.

RESPONSE: The allegations in ¶ 100 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 100 of the Complaint and, therefore, denies the same.

101. On information and belief, Shenzhen Valuelink is in the business of manufacturing jump starters in China. Shenzhen Valuelink sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 101 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 101 of the Complaint and, therefore, denies the same.

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z) Smart Well Enterprise Limited [Respondent Removed]

102. On information and belief, Smart Well Enterprise Limited ("Smart Well") is a Hong Kong company organized and existing under the laws of Hong Kong, having its principal place of business located at 14/F., Chun Wo Commercial Centre, 25 Wing Wo Street, Central, Hong Kong.

RESPONSE: The allegations in ¶ 102 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 102 of the Complaint and, therefore, denies the same.

103. On information and belief, Smart Well**[Respondent Removed]** is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

RESPONSE: The allegations in ¶ 103 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 103 of the Complaint and, therefore, denies the same.

aa) Tii Trading Inc.

104. On information and belief, Tii Trading Inc. ("Tii Trading") is a company organized and existing under the laws of the United States, having its principal place of business located at 13200 Brooks Drive, Suite F, Baldwin Park, California 91706.

RESPONSE: The allegations in ¶ 104 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 104 of the Complaint and, therefore, denies the same.

105. On information and belief, Tii Trading is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: The allegations in ¶ 105 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 105 of the Complaint and, therefore, denies the same.

bb) Zhejiang Qingyou Electronic Commerce Co., Ltd.

106. On information and belief, Zhejiang Qingyou Electronic Commerce Co., Ltd. ("Zhejiang Qingyou Electronic") is a company organized and existing under the laws of the United States, having its principal place of business located at Room 266-270, Building 7, No. 253, Tinglan Street, Qiaosi Street, Yuhang District, Hangzhou, Zhejiang, China.

RESPONSE: The allegations in ¶ 106 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 106 of the Complaint and, therefore, denies the same.

107. On information and belief, Zhejiang Qingyou Electronic is in the business of manufacturing jump starters in China. Zhejiang Qingyou Electronic sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 107 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 107 of the Complaint and, therefore, denies the same.

3. Smartech Respondents

a) Smartech Products, Inc.

108. On information and belief, Smartech Products, Inc. ("Smartech") is a company organized and existing under the laws of the United States, having its principal place of business located at 8700 Larkin Road, Suite B, Savage, Maryland 20763.

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RESPONSE: The allegations in ¶ 108 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 108 of the Complaint and, therefore, denies the same.

109. On information and belief, Smartech is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 109 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 109 of the Complaint and, therefore, denies the same.

4. Weego Respondents

a) Shenzhen Jieruijia Technology Co., Ltd.

110. On information and belief, Respondent Shenzhen Jieruijia Technology Co., Ltd. ("Shenzhen Jieruijia") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at No. 8 Mu Dun Road, No. 1 Industrial Zone, Lou Cun Community, Gong Ming, Guagn Ming District, Shenzhen City, China.

RESPONSE: The allegations in ¶ 110 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 110 of the Complaint and, therefore, denies the same.

111. On information and belief, Shenzhen Jieruijia is in the business of manufacturing jump starters in China. Shenzhen Jieruijia sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 111 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 111 of the Complaint and, therefore, denies the same.

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b) Paris Corporation

112. On information and belief, Paris Corporation ("Paris Corporation") is a company organized and existing under the laws of the United States, having its principal place of business located at 800 Highland Drive Westhampton, New Jersey 08060.

RESPONSE: The allegations in ¶ 112 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 112 of the Complaint and, therefore, denies the same.

113. On information and belief, Paris Corporation is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 113 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 113 of the Complaint and, therefore, denies the same.

5. WinPlus Respondents

a) Shenzhen Winplus Technology Co., Ltd. [Respondent Removed]

114. On information and belief, Respondent Shenzhen Winplus Technology Co., Ltd. ("Shenzhen Winplus") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 307, Building 5, LixiangJiayaun, Jindaotian Road, Buji, Longgang District, Shenzhen, China 518000. Shenzhen Winplus is believed to be affiliated with Winplus Technology (Hk) Ltd., a Hong Kong company organized and existing under the laws of Hong Kong with a principal place of business located at Flat/Room 1103 11F, Hang Seng Mongkok Building, 677 Nathan Road, Mongkok, Hong Kong.

RESPONSE: The allegations in ¶ 114 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 114 of the Complaint and, therefore, denies the same.

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115. On information and belief, Shenzhen Winplus**[Respondent Removed]** is in the business of manufacturing jump starters in China. Shenzhen Winplus Battery sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 115 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 115 of the Complaint and, therefore, denies the same.

b) Winplus North America, Inc.

116. On information and belief, Winplus North America, Inc. ("Winplus North America") is a company organized and existing under the laws of the United States, having its principal place of business located at 2975 Red Hill Ave, Suite 100, Costa Mesa, California 92626.

RESPONSE: The allegations in ¶ 116 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 116 of the Complaint and, therefore, denies the same.

117. On information and belief, Winplus is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 117 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 117 of the Complaint and, therefore, denies the same.

6. Great Neck Respondents

a) AutoZone, Inc.

118. On information and belief, Respondent AutoZone, Inc. ("AutoZone") is a company organized and existing under the laws of the United States, having its principal place of business located at 123 South Front Street, Memphis, Tennessee 38103.

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RESPONSE: The allegations in ¶ 118 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 118 of the Complaint and, therefore, denies the same.

119. On information and belief, AutoZone is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 119 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 119 of the Complaint and, therefore, denies the same.

b) Great Neck Global, Inc. & Great Neck Saw Manufacturers, Inc.

120. On information and belief, Respondent Great Neck Global, Inc. ("Great Neck Global") is a Taiwanese corporation that is organized and existing under the laws of Taiwan and has a principal place of business located at No. 19, Lane 96, Section 2, Zhongshan North Road, Taipei, Taiwan 104.

RESPONSE: The allegations in ¶ 120 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 120 of the Complaint and, therefore, denies the same.

121. Great Neck is believed to be associated and/or operate under the name Great Neck Saw Manufacturers, Inc., ("Great Neck U.S.") a company organized and existing under the laws of the United States, having its principal place of business located at 165 East 2nd Street, Mineola, New York 11501.

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RESPONSE: The allegations in ¶ 121 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 121 of the Complaint and, therefore, denies the same.

122. On information and belief, Great Neck Global is in the business of manufacturing jump starters in Taiwan. On information and belief, Great Neck U.S. sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 122 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 122 of the Complaint and, therefore, denies the same.

7. ThiEye Respondents

a) Dongguan Hangchebao Energy Technology Co., Ltd.

123. On information and belief, Respondent Dongguan Hangchebao Energy Technology Co., Ltd. ("Hangchebao") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 201, Changde Road No. 37, Humen Town Dongguan City, Guangdong, China.

RESPONSE: The allegations in ¶ 123 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 123 of the Complaint and, therefore, denies the same.

124. On information and belief, Hangchebao is in the business of manufacturing jump starters in China. Hanchebao sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents and Asserted Trademarks.

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RESPONSE: The allegations in ¶ 124 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 124 of the Complaint and, therefore, denies the same.

b) ThiEye Technologies Co., Ltd.

125. On information and belief, Respondent ThiEye Technologies Co., Ltd. ("ThiEye Technologies") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at Room 405, 4th Floor, Building B, Bantian International Center, Longgang District, China.

RESPONSE: The allegations in ¶ 125 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 125 of the Complaint and, therefore, denies the same.

126. On information and belief, ThiEye Technologies is in the business of manufacturing jump starters in China. ThiEye Technologies sells, offers for sale, imports, and/or has imported into the United States, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 126 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 126 of the Complaint and, therefore, denies the same.

8. Energen/ Performance Tool Respondents

a) Best Buy Co., Inc.

127. On information and belief, Respondent Best Buy Co., Inc. ("Best Buy") is a company organized and existing under the laws of the United States, having its principal place of business located at 7601 Penn Avenue, South Richfield, Minnesota 552423.

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RESPONSE: The allegations in ¶ 127 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 127 of the Complaint and, therefore, denies the same.

128. On information and belief, Best Buy is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 128 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 128 of the Complaint and, therefore, denies the same.

b) Chao Fung Trading Co. Ltd. [Respondent Removed]

129. On information and belief, Respondent Chao Fung Trading Co. Ltd. ("Chao Fung Trading") is a Chinese corporation that is organized and existing under the laws of China and has a principal place of business located at 911 Jinmao Toer Mingzhou Road W Beilun District Ningbo, China (Taiwan).

RESPONSE: The allegations in ¶ 129 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 129 of the Complaint and, therefore, denies the same.

130. On information and belief, Chao Fung Trading**[Respondent Removed]** is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 130 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 130 of the Complaint and, therefore, denies the same.

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c) Energen, Inc.

131. On information and belief, Respondent Energen, Inc. ("Energen") is a company organized and existing under the laws of the United States, having its principal place of business located at 17008 Evergreen Place Unit B, City of Industry, California 91745.

RESPONSE: The allegations in ¶ 131 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 131 of the Complaint and, therefore, denies the same.

132. On information and belief, Energen is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 132 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 132 of the Complaint and, therefore, denies the same.

d) Wilmar Corporation [Respondent Removed]

133. On information and belief, Wilmar Corporation ("Wilmar") is a company organized and existing under the laws of the United States, having its principal place of business located at P.O. Box 88259 Tukwila, Washington 98138.

RESPONSE: The allegations in ¶ 133 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 133 of the Complaint and, therefore, denies the same.

134. On information and belief, Wilmar**[Respondent Removed]** is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: The allegations in ¶ 134 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 134 of the Complaint and, therefore, denies the same.

9. Halo Respondents

a) Halo2Cloud, LLC

134a) On information and belief, Respondent Halo2Cloud, LLC ("Halo2Cloud") is a company organized and existing under the laws of the United States, having its principal place of business located at 6 Central Row, Hartford, Connecticut 06103.

RESPONSE: The allegations in ¶ 134a) concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 134a) of the Complaint and, therefore, denies the same.

134b) On information and belief, Halo2Cloud is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 134b) concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 134b) of the Complaint and, therefore, denies the same.

b) QVC, Inc.

134c) On information and belief, QVC, Inc. ("QVC") is a company organized and existing under the laws of the United States, having its principal place of business located at 250 Dove Court Santa Paula, California 93060.

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RESPONSE: The allegations in ¶ 134c) concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 134c) of the Complaint and, therefore, denies the same.

134d) On information and belief, QVC is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 134d) concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 134d) of the Complaint and, therefore, denies the same.

c) Zagg Co. Rrd Gst4

134e) On information and belief, Zagg Co. Rrd Gst ("Zagg") is a company organized and existing under the laws of the United States, having its principal place of business located at 381 Airtech Parkway, Plainfield, Indiana 46168. Zagg is believed to be affiliated with Zagg, Inc., company organized an existing under the laws of the United States, having its principal place of business located at 910 West Legacy Center Way, Suite 500, Midvale, Utah 84047.

RESPONSE: The allegations in ¶ 134e) concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 134e) of the Complaint and, therefore, denies the same.

134f) On information and belief, Zagg is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

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RESPONSE: The allegations in ¶ 134f) concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 134f) of the Complaint and, therefore, denies the same.

10. Jump-n-Carry Respondents

134g) On information and belief, Respondent Clore Automotive, LLC ("Clore Automotive") is a company organized and existing under the laws of the United States, having its principal place of business located at 8735 Rosehill Suite 220, Lenexa, Kansas 66215.

RESPONSE: The allegations in ¶ 134g) concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 134g) of the Complaint and, therefore, denies the same.

134h) On information and belief, Clore Automotive is in the business of importing and/or selling within the United States after importation, inter alia, jump starters that infringe one or more claims of the Asserted Patents.

RESPONSE: The allegations in ¶ 134h) concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 134h) of the Complaint and, therefore, denies the same.

III. THE PRODUCTS AT ISSUE

135. The products at issue are portable battery jump starter packs that allow users to safely jump start cars, boats, motorcycles, and more without connecting to another vehicle. The Accused Products and components thereof in this matter include safety features claimed by Complainant's Asserted Patents that prevent injury to the user and damage to the battery being jump started.

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RESPONSE: Schumacher states that ¶ 135 of the Amended Complaint is not an allegation. Thus, no response is required. To the extent any response is required, Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 135 and, therefore, denies the same. Schumacher further denies that its Accused Products infringe any claims of the Asserted Patents.

136. Since the early days of automobiles, the prevalent method to recharge a dead car battery has been through the use of "jumper cables," where two cables are run from a live battery in a running vehicle to a dead battery of a second vehicle. The many problems associated with jumper cables are well known, including the fact that a second car with a live battery is needed to perform a jump start, and the danger of sparking and short circuits, especially when the cables from the live battery to the dead battery are misconnected (referred to as "reverse polarity") or not fully connected.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 136 of the Amended Complaint and, therefore, denies the same.

137. Numerous efforts to improve the jump-starting process have been undertaken over the years, most of which have had significant deficiencies such as lack of portability or failure to solve safety problems and did not achieve significant popularity.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 137 of the Amended Complaint and, therefore, denies the same.

138. The advent of lithium-ion batteries has permitted the introduction of compact jump starters that do not require the use of a second vehicle, providing consumer convenience as well as certain safety advantages over prior jump-starting devices.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 138 of the Amended Complaint and, therefore, denies the same.

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A. Complainant's Jump Starters

139. NOCO has successfully developed innovative automobile battery products in the United States for over 100 years. In 2014, NOCO introduced the Boost® lithium jump starter, which incorporates the patented safety features described herein. A photograph of one model of NOCO's Boost® jumping a dead battery is shown below, and a video demonstrating how the Boost® operates can be found at https://www.youtube.com/watch?v=QULcgAZUs0Y



Fig. 1- NOCO Boost® ProTM (GB150)- 3,000A Jump Starter

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 139 of the Amended Complaint and, therefore, denies the same.

140. NOCO currently offers a range of products for the charging, jump-starting, and storage of vehicle batteries. The products at issue here include the entire line of NOCO Boost® jump starters, namely, the Boost® SportTM, Boost® PlusTM, Boost® XLTM, Boost® HDTM, Boost® ProTM, and Boost® MaxTM. See Ex. 8.

RESPONSE: Schumacher admits Exhibit 8 includes jump starter products, but it lacks sufficient knowledge or information to form a belief as to the content of the chart and the allegations in ¶ 140 of the Complaint and, therefore, denies the same.

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141. The NOCO Boost® jump starters are ultra-portable, lightweight, and compact. They outperform traditional lead-acid battery booster packs at a fraction of the size and weight. The Boost® jump starters provide users a safe and easy-to-use car battery jump starter pack without the worry of incorrect connections or sparks. Boost® jump starters safely connect to any 12-volt vehicle battery due to NOCO's mistake-proof design featuring spark-proof technology and reverse polarity protection. All Boost® jump starters also feature a 2.1A USB output port to power any USB device, and an LED flashlight with 7 light modes, including SOS and Emergency Strobe. See Ex. 8. NOCO offers six Boost® models, which provide a range from 500A to 20,000A for a wide variety of vehicle batteries and applications.

RESPONSE: Schumacher admits Exhibit 8 includes jump starter products, but it lacks sufficient knowledge or information to form a belief as to the content of the chart and the allegations in ¶ 141 of the Complaint and, therefore, denies the same.

142. Since its introduction, the Boost® has become known for its safety, ease of use, and reliability, among other features. As a result, the Boost® has enjoyed tremendous popularity, becoming one of the, if not the, market-leading compact lithium jump starters in the United States.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 142 of the Amended Complaint and, therefore, denies the same.

B. Respondents' Jump Starters

143. On information and belief, the Accused Products include portable battery jump starters that are manufactured in China and then imported into the United States. These products incorporate the patented technology claimed in the Asserted Patents. Examples of infringing jump starter models offered by three of the Respondents are shown below:

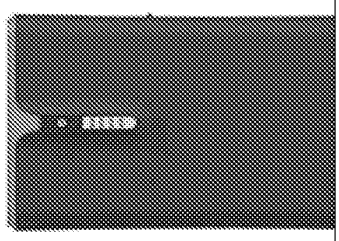
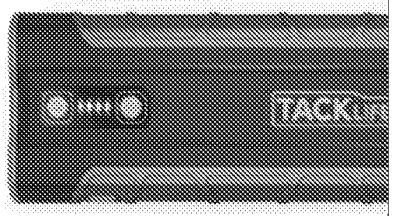
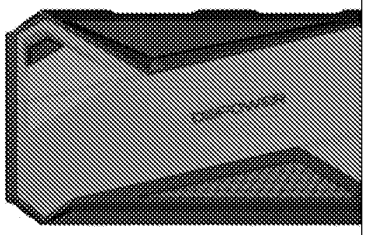
Gooloo GP1500	Tacklife T8 Max	DB Power DJS50
		

Fig. 2- Examples of Accused Products

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RESPONSE: Schumacher denies all the allegations in ¶ 143 of the Amended Complaint, except admits that Schumacher's portable battery jump starters are made in China and they have been imported into the United States. Schumacher further denies any of its product infringe any of the claims in the Asserted Patents.

144. It is often difficult to determine the source of the Accused Products, as the Chinese manufacturers of these products frequently distribute them through several entities, even when the products are made in the same facility. There have also been instances of the Chinese manufacturers changing their names or using trading companies to ship the products to the United States. For these reasons, there are many instances in which neither the shipping documents nor the product packaging indicate the manufacturer of the product.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 144 of the Amended Complaint and, therefore, denies the same.

145. Respondents target customers in the United States through their own websites and also sell the accused jump starters via online marketplaces, including Amazon. Numerous Respondents' Accused Products are also sold in brick-and-mortar retail locations in the United States and/or on the websites of these retailers.

RESPONSE: Schumacher denies all the allegations in ¶ 145 of the Amended Complaint, except admits that Schumacher's portable battery jump starters are sold via online marketplaces, including Amazon.com and also in some brick-and-mortar retail locations. Schumacher further denies any of its product infringe any of the claims in the Asserted Patents.

IV. THE ASSERTED PATENTS

146. The Asserted Patents generally relate to portable battery jump starters and safety features contained therein. These jump starters can be used to jump start the batteries of many vehicles including cars, trucks, boats, and motorcycles.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 146 of the Amended Complaint and, therefore, denies the same.

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147. The identification, ownership, non-technical description, foreign counterparts, and licensees for each Asserted Patent are identified below.

RESPONSE: Schumacher states that ¶ 147 of the Amended Complaint is not an allegation. Thus, no response is required. To the extent any response is required, Respondent lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 147 and, therefore, denies the same.

A. U.S. Patent No. 9,007,015

1. Identification of the Patent and Ownership

148. The '015 Patent, titled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection" issued on April 15, 2015, naming Jonathan L. Nook, William K. Nook, James R. Stanfield, and Derek M. Underhill as the inventors. Ex. 1 (Certified copy of '015 Patent) at 1. The '015 Patent is based on U.S. Patent Application No. 14/325,938 filed on July 8, 2014. Id. The '015 Patent is a continuation of Application No. PCT/US2014/045343, filed on July 3, 2014. The '015 Patent will expire on July 3, 2034.

RESPONSE: Schumacher admits that the '015 Patent is on its face entitled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection" and states on its face that it was issued on April 15, 2015, naming Jonathan L. Nook, William K. Nook, James R. Stanfield, and Derek M. Underhill as the inventors. Schumacher further admits that the '015 Patent on its face is based on U.S. Patent Application No. 14/325,938 filed on July 8, 2014 and it is a continuation of Application No. PCT/US2014/045343, filed on July 3, 2014. Schumacher admits that the Amended Complaint is accompanied by Ex. 1, which purports to be a certified copy of the '015 Patent. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the remainder of ¶ 148 of the Amended Complaint and, therefore, denies the same.

149. This Complaint is accompanied by a certified copy of the prosecution history for the '015 Patent and the references cited therein. See Appx. A1 and A2.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Appx. A1 and A2, which purport to be the certified copies of the prosecution history for the '015 Patent and the references cited therein.

150. NOCO owns by assignment all rights, title, and interest in the '015 Patent. See Ex. 6.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 6, which purport to be the assignment of the '015 Patent. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 150 of the Amended Complaint and, therefore, denies the same.

2. Non-Technical Description of the Patent

151. The '015 Patent relates to an improved portable jump starter incorporating a rechargeable lithium-ion battery and a microcontroller. The '015 Patent describes a novel apparatus that incorporates a power switch actuated by a microcontroller such that power will be delivered from the lithium-ion power pack to the output port only when the battery is connected to the output port and only when the battery is connected with the proper polarity of positive and negative terminals. This solves the problem of sparking or potential damage to the battery and/or bodily injury when the jumper terminals or clamps of the cables were inadvertently brought in contact with each other, or when positive and negative terminals were connected to the opposite polarity terminals in the vehicle to be jumped.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 151 of the Amended Complaint and, therefore, denies the same.

152. The '015 Patent has 23 claims, 1 of which is an independent claim. Complainant is asserting claims 1, 4, 11, 14, 18, 19 and 21.

RESPONSE: Schumacher admits that the '015 Patent on its face has 23 claims, including one independent claim. Schumacher further admits that Complainant has asserted

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claims 1, 4, 11, 14, 18, 19 and 21 of the '015 Patent against it. Schumacher denies that the claim 1of the '015 Patent valid and Schumacher further denies any of its product infringe any of the claims in the '015 Patent. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the remainder of ¶ 152 of the Amended Complaint and, therefore, denies the same.

3. Foreign Counterparts of the Patent

153. The following is a list of current foreign patents and foreign applications that are presently understood to correspond or otherwise relate to the '015 Patent:

- CA2,916,782 (Canada)
- GB2527858 (United Kingdom)
- DE10204114997B4 (Germany)
- (Australia) Patent Application (Approved) No. 20201223
- (Germany) Patent Application No. 102014020005.1
- (Germany) Patent Application No. 102014020004.3

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 153 of the Amended Complaint and, therefore, denies the same.

154. NOCO owns all right, title, and interest in and to each of these foreign patents and applications, there are no other foreign patents corresponding to the '015 Patent, and there are no other pending, rejected, or abandoned foreign patent applications corresponding to the '015 Patent.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 154 of the Amended Complaint and, therefore, denies the same.

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4. Licensees to the Patent

155. All licensees to the '015 Patent are identified in Confidential Ex. 5C. There are no other licensees relating to the '015 Patent.

RESPONSE: Schumacher admits that Amended Complainant attached Confidential Ex. 5C which appears to be a list of licensees. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the remainder of ¶ 155 of the Amended Complaint and, therefore, denies the same.

B. U.S. Patent No. 10,604,024

1. Identification of the Patent and Ownership

156. The '024 Patent, titled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection" issued on March 31, 2020 naming Jonathan L. Nook, William K. Nook, James R. Stanfield, and Derek M. Underhill as the inventors. Ex. 2 (Certified copy of '024 Patent) at 1. The '024 Patent is based on U.S. Patent Application No. 15/691,884 filed on Aug. 31, 2017. Id. The '024 Patent is a continuation of Application No. 14/619,655, filed February 11, 2015, now U.S. Patent No. 9,770,992, which claims priority to PCT/US2014/045434, filed July 3, 2014. The '024 Patent will expire on July 3, 2034.

RESPONSE: Schumacher admits that the '024 Patent is on its face entitled "Portable Vehicle Battery Jump Start Apparatus with Safety Protection" and states on its face that it was issued on March 31, 2020, naming Jonathan L. Nook, William K. Nook, James R. Stanfield, and Derek M. Underhill as the inventors. Schumacher further admits that the '024 Patent on its face is based on U.S. Patent Application No. 15/691,884 filed on Aug. 31, 2017. Schumacher further admits that the '024 Patent on its face is a continuation of Application No. 14/619,655, filed February 11, 2015, now U.S. Patent No. 9,770,992, which claims priority to PCT/US2014/045434, filed July 3, 2014. Schumacher admits that the Amended Complaint is accompanied by Ex. 2, which purports to be a certified copy of the '024 Patent. Schumacher

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lacks sufficient knowledge or information to form a belief as to the allegations in the remainder of ¶ 156 of the Amended Complaint and, therefore, denies the same.

157. This Complaint is accompanied by a certified copy of the prosecution history for the '024 Patent and the references cited therein. See Appx. B1 and B2.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Appx. B1 and B2, which purport to be the certified copies of the prosecution history for the '024 Patent and the references cited therein.

158. NOCO owns by assignment all rights, title, and interest in the '024 Patent. See Ex. 7.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 7, which purport to be the assignment of the '024 Patent. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 158 of the Amended Complaint and, therefore, denies the same.

2. Non-Technical Description of the Patent

159. The '024 Patent relates to an improved portable jump starter incorporating a rechargeable lithium-ion battery and a microcontroller. The '024 Patent is a continuation of the '015 Patent but claims inventive features not claimed in that patent, including: the device being turned on when the microcontroller receives simultaneous signals from the sensors indicating that the device's battery clamps are connected to the vehicle battery proper polarity; and the device being turned off when the microcontroller receives signals from the sensors indicating that the device's battery clamps have become disconnected from the vehicle battery and/or an improper polarity condition.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 159 of the Amended Complaint and, therefore, denies the same.

160. The '024 Patent has 30 claims, 3 of which are independent claims. Complainant is asserting claims 1, 4, 5, 6, 16, 19, 23, 24, 26, 29, 30.

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RESPONSE: Schumacher admits that the '024 Patent on its face has 30 claims, including 3 independent claims. Schumacher further admits that Complainant has asserted claims 1, 4, 5, 6, 16, 19, 23, 24, 26, 29 and 30 of the '024 Patent against it. Schumacher denies that the claims 1, 29 and 30 of the '024 Patent valid and Schumacher further denies any of its product infringe any of the claims in the '024 Patent. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the remainder of ¶ 160 of the Amended Complaint and, therefore, denies the same.

3. Foreign Counterparts of the Patent

161. See Section IV.A.3, *supra.*

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 161 of the Amended Complaint and, therefore, denies the same.

4. Licensees to the Patent

162. All licensees to the '024 Patent are identified in Confidential Ex. 5C. There are no other licensees relating to the '024 Patent.

RESPONSE: Schumacher admits that Amended Complainant attached Confidential Ex. 5C which appears to be a list of licensees. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the remainder of ¶ 162 of the Amended Complaint and, therefore, denies the same.

V. THE ASSERTED TRADEMARKS

A. U.S. Trademark Reg. No. 4,811,656

163. The federal registration of the ULTRASAFE mark, Reg. No. 4,811,656, issued on September 15, 2015 to NOCO. NOCO has continuously used this mark in commerce since at least August 2014 for its jump starters (Classes 021 023, 026, 036, and 038.). Affidavits have

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been filed pursuant to Section 8 and 15 of the Lanham Act, 15 U.S.C.§§ 1058 and 1065, and this registration is incontestable. A copy of the Certificate of Registration for the Registered Trademark is attached hereto as Exhibit 3.

RESPONSE: Schumacher admits that the Reg. No. 4,811,656 is on its face for ULTRASAFE mark and issued on September 15, 2015 to NOCO. Schumacher admits that the Amended Complaint is accompanied by Exhibit 3, which purports to be a certified copy of the 4,811,656 trademark registration. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the remainder of ¶ 163 of the Amended Complaint and, therefore, denies the same.

164. Pursuant to Commission Rule 210.12(d), NOCO will file a certified copy of the prosecution history of the ULTRASAFE trademark for U.S. Trademark Reg. No. 4,811,656, as Appendix C.

RESPONSE: Schumacher admits that Amended Complainant attached Appendix C which appears to be an uncertified copy of the prosecution history of the ULTRASAFE trademark for U.S. Trademark Reg. No. 4,811,656. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the remainder of ¶ 164 of the Amended Complaint and, therefore, denies the same.

B. U.S. Trademark Reg. No. 4,811,749

165. The federal registration of the SAFELY JUMP START A DEAD BATTERY IN SECONDS mark, Reg. No. 4,811,749, issued on September 15, 2015 to NOCO. NOCO has continuously used this mark in commerce since at least August 2014 for its jump starters (Classes 021, 023, 026, 036, 038, 100, 101, and 102). Affidavits have been filed pursuant to Section 8 and 15 of the Lanham Act, 15 U.S.C. §§ 1058 and 1065, and this registration is incontestable. A copy of the Certificate of Registration for the Registered Trademark is attached hereto as Exhibit 4.

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RESPONSE: Schumacher admits that the Reg. No. 4,811,749 is on its face for SAFELY JUMP START A DEAD BATTERY IN SECONDS mark and issued on September 15, 2015 to NOCO. Schumacher admits that the Amended Complaint is accompanied by Exhibit 4, which purports to be a certified copy of the 4,811,749 trademark registration. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the remainder of ¶ 165 of the Amended Complaint and, therefore, denies the same.

166. Pursuant to Commission Rule 210.12(d), NOCO will file a certified copy of the prosecution history of the "Safely Jump Start a Dead Battery in Seconds" trademark for U.S. Trademark Reg. No. 4,811,749, as Appendix D.

RESPONSE: Schumacher admits that Amended Complainant attached Appendix D which appears to be an uncertified copy of the prosecution history of the "Safely Jump Start a Dead Battery in Seconds" trademark for U.S. Trademark Reg. No. 4,811,749. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the remainder of ¶ 166 of the Amended Complaint and, therefore, denies the same.

VI. UNFAIR ACTS OF THE PROPOSED RESPONDENTS

A. Infringement of the Asserted Patents

167. On information and belief, Respondents, without authorization, have been and still are infringing each of the Asserted Patents in the United States. Respondents' unlawful and unfair acts include the importation into the United States, sale for importation into the United States, or sale within the United States after importation of the infringing Accused Products. Respondents have violated, and continue to violate, Section 337 of the Tariff Act of 1930 in view of U.S. patent laws. Respondents are not licensed under the Asserted Patents.

RESPONSE: Schumacher denies all the allegations in ¶ 167 of the Amended Complaint, except admits that Schumacher's portable battery jump starters have been sold for importation into the United States, imported into the United States and sold within the United States after

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importation. Schumacher further denies any of its product infringe any of the claims in the Asserted Patents.

168. Specifically, NOCO asserts that the Respondents directly infringe, literally or under the doctrine of equivalents, at least the following independent claims of the Asserted Patents, in violation of 35 U.S.C. §§ 271(a) and Section 337 (a)(1)(B)(i):

Claim Chart	'015 Patent	'024 Patent
Claim Chart 01-Carku	1	1, 29, 30
Claim Chart 02- Boltpower	1	1, 29, 30
Claim Chart 03- Smartech	1	1, 29, 30
Claim Chart 04-Weego	1	1, 29, 30
Claim Chart 05-Winplus	1	1, 29, 30
Claim Chart 06- Great Neck	1	
Claim Chart 07- ThiEye	1	1, 29, 30
Claim Chart 08- Energen/ Performance	1	1, 29, 30
Claim Chart 09- HALO	1	1, 29, 30
Claim Chart 10- Clore	1	1, 29, 30

Table 2. Asserted Independent Claims Infringed by Proposed Respondents

RESPONSE: Schumacher denies the allegations in ¶ 168 of the Amended Complaint. Table 2 in ¶ 168 concerns parties not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in Table 2 in ¶ 168 of the Amended Complaint and, therefore, denies the same.

169. For purposes of assessing infringement, the Accused Products are divided into groups based on suspected manufacturer. The claim charts are designated Claim Chart 01 through Claim Chart 10, and the Accused Products within each design group are set forth on Exhibit 9. The Accused Products within each design group share a common design, at least with respect to the portions relevant to the infringement analysis of the independent claims of the '015 and '024 Patent claims. Each of the Respondents imports, sells for importation, and/or sells within the United States after importation at least one of the Accused Products and therefore directly infringes, literally or under the doctrine of equivalents, one or more of claims 1, 4, 11, 14, 18, 19, 21 of the '015 Patent and/or one or more of claims 1, 4, 5, 6, 16, 19, 23, 24, 26, 29, 30 of the '024 Patent with respect to such Respondent's Accused Products.

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RESPONSE: Schumacher states that the first two sentences in ¶ 169 of the Amended Complaint are not an allegations. Thus, no response is required. To the extent any response is required, Respondent lacks sufficient knowledge or information to form a belief as to the allegations in the first two sentences in ¶ 169 and, therefore, denies the same. Schumacher denies all the allegations in the remaining of ¶ 169 of the Amended Complaint, except admits that Schumacher's portable battery jump starters have been imported into the United States, sold for importation into the United States and sold within the United States after importation . Schumacher further denies any of its product infringe any of the claims in the Asserted Patents.

1. Claim Chart 01- Carku Accused Products

a) Carku Design

170. The Accused Products in Claim Chart 01 ("Carku Design") are lithium battery powered jump starters having a cable assembly that includes a relay and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an optocoupler sensor. The Carku Design Accused Products are offered by numerous sellers under multiple brand names. On information and belief, the Carku Design Accused Products are manufactured by at least Respondent Carku. The Tacklife T8 Pro model jump starter is representative of the Carku Design Accused Products.

RESPONSE: The allegations in ¶ 170 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 170 of the Amended Complaint and, therefore, denies the same.

b) Infringement of the '015 Patent

171. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Carku Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Carku Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Carku Design Accused

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Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 171 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 171 of the Amended Complaint and, therefore, denies the same.

172. A claim chart comparing independent claim 1 of the '015 Patent to the representative Carku Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 111.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 111, which on its face entitled "Claim Chart – Carku". The allegations in ¶ 172 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 172 of the Amended Complaint and, therefore, denies the same.

c) Infringement of the '024 Patent

173. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Carku Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Carku Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Carku Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 173 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 173 of the Amended Complaint and, therefore, denies the same.

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174. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Carku Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 111.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 111, which on its face entitled "Claim Chart – Carku". The allegations in ¶ 174 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 174 of the Amended Complaint and, therefore, denies the same.

2. Claim Chart 02- Boltpower Accused Products

a) Boltpower Design

175. The Accused Products in Claim Chart 02 ("Boltpower Design") are lithium battery powered jump starters that includes a relay and two sensors. The Boltpower Design Accused Products are offered by numerous sellers under multiple brand names. The BEATIT D11, Lemsir V1, and BEATIT D10 Pro model jump starters are representative of the three designs of Accused Products manufactured by Boltpower.

RESPONSE: The allegations in ¶ 175 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 175 of the Amended Complaint and, therefore, denies the same.

b) Infringement of the '015 Patent

176. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Boltpower Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Boltpower Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Boltpower Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

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RESPONSE: The allegations in ¶ 176 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 176 of the Amended Complaint and, therefore, denies the same.

177. A claim chart comparing independent claim 1 of the '015 Patent to the representative Boltpower Design Accused Products, and including photographs and drawings where applicable, is attached as Ex. 112.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 112, which on its face entitled "Claim Chart – BoltPower". The allegations in ¶ 177 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 177 of the Amended Complaint and, therefore, denies the same.

c) Infringement of the '024 Patent

178. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Boltpower Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Boltpower Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Boltpower Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 178 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 178 of the Amended Complaint and, therefore, denies the same.

179. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Boltpower Design Accused Products, and including photographs and drawings where applicable, is attached as Ex. 112.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 112, which on its face entitled "Claim Chart – BoltPower". The allegations in ¶ 179 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 179 of the Amended Complaint and, therefore, denies the same.

3. Claim Chart 03- Smartech Accused Products

a) Smartech Design

180. The Accused Products in Claim Chart 03 ("Smartech Design") are lithium battery powered jump starters offered under the SMARTECH brand and have a cable assembly that includes a relay and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an operational amplifier sensor. The SMARTECH JS-10000 model jump starter is representative of the Smartech Design Accused Products.

RESPONSE: The allegations in ¶ 180 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 180 of the Amended Complaint and, therefore, denies the same.

b) Infringement of the '015 Patent

181. On information and belief, select Respondents, including Respondent Smartech, import, sell for importation, and/or sell within the United States after importation the Design 05 Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Smartech Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Smartech Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 181 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 181 of the Amended Complaint and, therefore, denies the same.

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182. A claim chart comparing independent claim 1 of the '015 Patent to the representative Smartech Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 113.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 113, which on its face entitled "Claim Chart – Smartech". The allegations in ¶ 182 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 182 of the Amended Complaint and, therefore, denies the same.

c) Infringement of the '024 Patent

183. On information and belief, select Respondents, including Respondent Smartech, import, sell for importation, and/or sell within the United States after importation the Smartech Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Smartech Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Smartech Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 183 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 183 of the Amended Complaint and, therefore, denies the same.

184. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Smartech Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 113.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 113, which on its face entitled "Claim Chart – Smartech". The allegations in ¶ 184 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 184 of the Amended Complaint and, therefore, denies the same.

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4. Claim Chart 04- Weego Accused Products

a) Weego Design

185. The Accused Products in Claim Chart 04 ("Weego Design") are lithium battery powered jump starters offered under the WEEGO brand and have a cable assembly that includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an optocoupler sensor. The WEEGO 22S model jump starter is representative of the Weego Design Accused Products.

RESPONSE: The allegations in ¶ 185 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 185 of the Amended Complaint and, therefore, denies the same.

b) Infringement of the '015 Patent

186. On information and belief, select Respondents, including Respondent Carku, import, sell for importation, and/or sell within the United States after importation the Weego Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Weego Design Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Weego Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 186 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 186 of the Amended Complaint and, therefore, denies the same.

187. A claim chart comparing independent claim 1 of the '015 Patent to the representative Weego Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 114.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 114, which on its face entitled "Claim Chart – Weego". The allegations in ¶ 187 concern

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another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 187 of the Amended Complaint and, therefore, denies the same.

c) Infringement of the '024 Patent

188. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Weego Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Weego Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Weego Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 188 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 188 of the Amended Complaint and, therefore, denies the same.

189. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Weego Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 114.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 114, which on its face entitled "Claim Chart – Weego". The allegations in ¶ 189 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 189 of the Amended Complaint and, therefore, denies the same.

5. Claim Chart 05- Winplus Accused Products

a) Winplus Design

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190. The Accused Products in Claim Chart 05 ("Winplus Design") are lithium battery powered jump starters offered under the WINPLUS and TYPE-S brands and have a cable assembly that includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is also a resistive divider sensor. On information and belief, the WINPLUS and TYPE S brand jump starters are manufactured by Respondent Shenzhen Winplus. The Type S–AC56388-BLK model jump starter is representative of the Winplus Design Accused Products.

RESPONSE: The allegations in ¶ 190 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 190 of the Amended Complaint and, therefore, denies the same.

b) Infringement of the '015 Patent

191. On information and belief, select Respondents, including Respondent Winplus, import, sell for importation, and/or sell within the United States after importation the Winplus Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Winplus Design Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Winplus Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 191 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 191 of the Amended Complaint and, therefore, denies the same.

192. A claim chart comparing independent claim 1 of the '015 Patent to the representative Winplus Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 115.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 115, which on its face entitled "Claim Chart – Winplus". The allegations in ¶ 192 concern another party and are not directed to Schumacher. Schumacher lacks sufficient

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knowledge or information to form a belief as to the allegations in ¶ 192 of the Amended Complaint and, therefore, denies the same.

c) Infringement of the '024 Patent

193. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Winplus Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Winplus Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Winplus Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 193 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 193 of the Amended Complaint and, therefore, denies the same.

194. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Winplus Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 115.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 115, which on its face entitled "Claim Chart – Winplus". The allegations in ¶ 194 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 194 of the Amended Complaint and, therefore, denies the same.

6. Claim Chart 06- Great Neck Accused Products

a) Great Neck Design

195. The Accused Products in Claim Chart 06 ("Great Neck Design") are lithium battery powered jump starters having a SMART CLAMP branded cable assembly. The cable assembly includes a power switch with multiple transistors, and two sensors. The first sensor, which is the

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claimed vehicle battery isolation sensor, includes a resistive divider sensor and transistor. The second sensor, which is the claimed reverse polarity sensor, is a resistive divider sensor. The Great Neck Accused Products are offered under at least the OEM Tools brand. The OEMTOOLS 24474 model jump starter is representative of the Great Neck Accused Products.

RESPONSE: The allegations in ¶ 195 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 195 of the Amended Complaint and, therefore, denies the same.

b) Infringement of the '015 Patent

196. On information and belief, select Respondents, including OEM Tools, import, sell for importation, and/or sell within the United States after importation the Great Neck Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Great Neck Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Great Neck Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 196 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 196 of the Amended Complaint and, therefore, denies the same.

197. A claim chart comparing independent claim 1 of the '015 Patent to the representative Great Neck Accused Product, and including photographs and drawings where applicable, is attached as Ex. 116.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 116, which on its face entitled "Claim Chart – Great Neck". The allegations in ¶ 197 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 197 of the Amended Complaint and, therefore, denies the same.

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7. Claim Chart 07- ThiEye Accused Products

a) ThiEye Design

198. The Accused Products in Claim Chart 07 ("ThiEye Design") are lithium battery powered jump starters having a SMART CABLE branded cable assembly. The cable assembly includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is also a resistive sensor. The ThiEye Design Accused Products manufactured by Respondent ThiEye are offered under multiple brands, namely BUTURE, Finnemge, and UTRAI. The BUTURE BR500 model jump starter is representative of the ThiEye Design Accused Products.

RESPONSE: The allegations in ¶ 198 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 198 of the Amended Complaint and, therefore, denies the same.

b) Infringement of the '015 Patent

199. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the ThiEye Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the ThiEye Design Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The ThiEye Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 199 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 199 of the Amended Complaint and, therefore, denies the same.

200. A claim chart comparing independent claim 1 of the '015 Patent to the representative ThiEye Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 117.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 117, which on its face entitled "Claim Chart – ThiEye". The allegations in ¶ 200 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or

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information to form a belief as to the allegations in ¶ 200 of the Amended Complaint and, therefore, denies the same.

c) Infringement of the '024 Patent

201. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the ThiEye Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the ThiEye Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The ThiEye Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 201 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 201 of the Amended Complaint and, therefore, denies the same.

202. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative ThiEye Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 117.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 117, which on its face entitled "Claim Chart – ThiEye". The allegations in ¶ 202 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 202 of the Amended Complaint and, therefore, denies the same.

8. Claim Chart 08- Energen/Performance Tool Accused Products

a) Energen/Performance Tool Design

203. The Accused Products in Claim Chart 08 ("Energen/ Performance Tool Design") are lithium battery powered jump starters having a cable assembly labeled as "SMART BOOSTER CABLE". The cable assembly includes a power switch with multiple transistors, and two sensors. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive sensor. The second sensor, which is the claimed reverse polarity sensor, is a resistive divider

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sensor. The Energen/Performance Tool Accused Products are offered under multiple brands, including Energen and Performance Tool. The ENERGEN AL12 model jump starter is representative of the Design 11 Accused Products.

RESPONSE: The allegations in ¶ 203 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 203 of the Amended Complaint and, therefore, denies the same.

b) Infringement of the '015 Patent

204. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Energen/Performance Tool Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Energen/Performance Tool Accused Products also infringe one or more of dependent claims 4, 10, 11, 14, 18, 19 and 21 of the '015 Patent. The Energen/Performance Tool Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 204 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 204 of the Amended Complaint and, therefore, denies the same.

205. A claim chart comparing independent claim 1 of the '015 Patent to the representative Design 11 Accused Product, and including photographs and drawings where applicable, is attached as Ex. 118.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 118, which on its face entitled "Claim Chart – Energen & Performance Tool". The allegations in ¶ 205 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 205 of the Amended Complaint and, therefore, denies the same.

c) Infringement of the '024 Patent

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206. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the Energen/Performance Tool Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Energen/Performance Tool Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Energen/Performance Tool Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 206 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 206 of the Amended Complaint and, therefore, denies the same.

207. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Energen/Performance Tool Accused Product, and including photographs and drawings where applicable, is attached as Ex. 118.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 118, which on its face entitled "Claim Chart – Energen & Performance Tool". The allegations in ¶ 207 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 207 of the Amended Complaint and, therefore, denies the same.

9. Claim Chart 09- HALO Accused Products

a) HALO Design

208. The Accused Products in Claim Chart 09 ("HALO Design") are lithium battery powered jump starters offered under the HALO BOLT brand, that include a relay and two sensors within the main housing of the jump starter. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is an optocoupler sensor. The HALO BOLT 4400 model jump starter is representative of the HALO Design Accused Products.

RESPONSE: The allegations in ¶ 208 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 208 of the Amended Complaint and, therefore, denies the same.

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b) Infringement of the '015 Patent

209. On information and belief, select Respondents, including Halo2Cloud, import, sell for importation, and/or sell within the United States after importation the HALO Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the HALO Design Accused Products also infringe one or more of dependent claims 10, 11, 14, 18, 19 and 21 of the '015 Patent. The HALO Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 209 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 209 of the Amended Complaint and, therefore, denies the same.

210. A claim chart comparing independent claim 1 of the '015 Patent to the representative HALO Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 119.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 119, which on its face entitled "Claim Chart – HALO". The allegations in ¶ 210 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 210 of the Amended Complaint and, therefore, denies the same.

c) Infringement of the '024 Patent

211. On information and belief, select Respondents import, sell for importation, and/or sell within the United States after importation the HALO Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the HALO Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The HALO Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

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RESPONSE: The allegations in ¶ 211 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 211 of the Amended Complaint and, therefore, denies the same.

212. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative HALO Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 119.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 119, which on its face entitled "Claim Chart – HALO". The allegations in ¶ 212 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 212 of the Amended Complaint and, therefore, denies the same.

10. Claim Chart 10- Clore Accused Products

a) Clore Design

213. The Accused Products in Claim Chart 10 ("Clore Design") are lithium battery powered jump starters offered under the Jump-n-Carry brand that have the power switch and two sensors within the main housing of the jump starter. The first sensor, which is the claimed vehicle battery isolation sensor, is a resistive divider sensor. The second sensor, which is the claimed reverse polarity sensor, is optocoupler sensor. The Jump-n-Carry JNC345 model jump starter is representative of the Clore Design Accused Products.

RESPONSE: The allegations in ¶ 213 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 213 of the Amended Complaint and, therefore, denies the same.

b) Infringement of the '015 Patent

214. On information and belief, select Respondents, including Respondent Clore

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Automotive, sell for importation, and/or sell within the United States after importation the Clore Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claim 1 of the '015 Patent. Certain of the Clore Design Accused Products also infringe one or more of dependent claims 4, 10, 14, 18, 19 and 21 of the '015 Patent. The Clore Design Accused Products satisfy all asserted claim limitations of the '015 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 214 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 214 of the Amended Complaint and, therefore, denies the same.

215. A claim chart comparing independent claim 1 of the '015 Patent to the representative Clore Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 120.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 120, which on its face entitled "Claim Chart – Clore". The allegations in ¶ 215 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 215 of the Amended Complaint and, therefore, denies the same.

c) Infringement of the '024 Patent

216. On information and belief, select Respondents, including Respondent Clore Automotive, import, sell for importation, and/or sell within the United States after importation the Clore Design Accused Products, which directly infringe, literally and/or under the doctrine of equivalents, at least independent claims 1, 29 and 30 of the '024 Patent. Certain of the Clore Design Accused Products also infringe one or more of dependent claims 4, 5, 6, 16, 19, 23, 24, and 26 of the '024 Patent. The Clore Design Accused Products satisfy all asserted claim limitations of the '024 Patent at the time of importation into the United States.

RESPONSE: The allegations in ¶ 216 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 216 of the Amended Complaint and, therefore, denies the same.

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217. A claim chart comparing independent claims 1, 29, and 30 of the '024 Patent to the representative Clore Design Accused Product, and including photographs and drawings where applicable, is attached as Ex. 120.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exhibit 120, which on its face entitled "Claim Chart – Clore". The allegations in ¶ 217 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 217 of the Amended Complaint and, therefore, denies the same.

B. Infringement of the Asserted Trademarks

218. NOCO owns all right, title, and interest in the Asserted Trademarks and has standing to bring an action for trademark infringement under the Lanham Act, 15 U.S.C. § 1051 et seq.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 218 of the Amended Complaint and, therefore, denies the same.

219. The Asserted Trademarks are on the Principal Register and such registration is prima facie evidence of validity, including secondary meaning. 15 U.S.C. § 1057(b). The Asserted Trademarks are used in commerce by NOCO to market, advertise, and sell the Boost® jump starters.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 219 of the Amended Complaint and, therefore, denies the same.

220. As explained below, a number of the Respondents use at least one of the Asserted Trademarks in point-of-sale displays posted on online retail stores with the intention of attracting U.S. consumers. These point-of-sale webpages, which include Respondents' own sites as well as third-party commerce sites including Amazon, contain images superimposed with NOCO's Asserted Trademarks and/or use NOCO's Asserted Trademarks in the descriptions of the Accused Products. The webpages provide means for purchasing the Accused Products. Such displays are likely to cause confusion or mistake, and to deceive potential consumers and the

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public as to the source, origin, sponsorship or approval of Respondents' Accused Products, or as to the affiliation, connection, or association between Respondents and/or their jump starters and NOCO and/or the Boost(R) jump starters.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 219 of the Amended Complaint and, therefore, denies the same.

221. The exhibits cited below are screenshots of the Accused Products being displayed on a webpage where the product may be purchased. The importation of the Accused Products via these webpages is further described in Section VII.

RESPONSE: Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 221 of the Amended Complaint and, therefore, denies the same.

222. The Asserted Trademarks are valid, owned by NOCO, and these webpages demonstrate a likelihood of confusion at the point-of-sale, and therefore Respondents are in violation of Section 32 of the Lanham Act. 15 U.S.C. § 1114. The Respondents identified in the table below import into the United States, sell for importation, and/or sell in the United States after importation certain jump starters and components thereof, using point of sale webpages, and/or packaging that infringe the NOCO Trademarks:

Ultrasafe ('656 TM)	**Safely Jump Start a Dead Battery in Seconds ('749 TM)**
Audew	Autown
Autown	Beatit
Jumtop	Imazing
Sanrock	Jumtop
Topdon	Nexpow
Trekpow	Sanrock
	Trekpow

Table 3. Accused Products Infringing NOCO Asserted Trademarks

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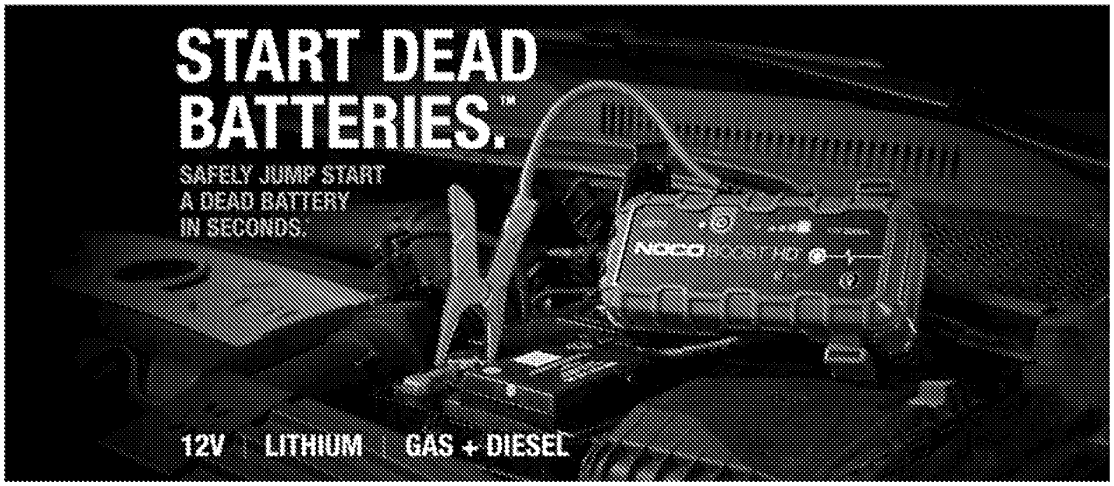


Fig. 3- NOCO Website- Use of the '749 Trademark



Fig. 4- NOCO Website- Use of the '656 and '749 Trademarks. Ex. 104

RESPONSE: The allegations in ¶ 222 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 222 of the Amended Complaint and, therefore, denies the same.

Audew

223. The Audew brand uses the NOCO "Ultrasafe" and "Safely Jump Start a Dead Battery in Seconds" trademarks on its website and Amazon listing for its jump starters, which infringes NOCO's '656 and '749 Trademarks and are likely to cause confusion at the point-ofsale. See Ex. 27 and 50; see also Ex. 121 (importation evidence).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exs 27 and 50, which on the face Audew's website and Amazon.com listing for Audew jump starters, respectively. Schumacher further admits that the Amended Complaint is accompanied by Ex. 121. The allegations in ¶ 223 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 223 of the Amended Complaint and, therefore, denies the same.

Autown

224. The Amazon listing for the Autown brand of jump starters includes the phrase "jump starter your dead battery in seconds," and "jump start dead battery fast and safely" which infringes NOCO's '749 Trademark and is likely to cause confusion at the point-of-sale. See Ex. 28 and 29. The Autown brand also markets its products using the term "ultra-safe" infringing the '656 Trademark. See Ex. 29; see also Ex. 52 (importation evidence).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exs 28 and 29, which on the face Amazon.com listing for Autown jump starters. Schumacher further admits that the Amended Complaint is accompanied by Ex. 52. The allegations in ¶ 224 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 224 of the Amended Complaint and, therefore, denies the same.

Beatit

225. The Beatit brand uses the phrases "Safely Jumper start a dead battery in seconds" and "jump start a dead battery in seconds" on their Amazon listings for its jump starters, both of which infringe NOCO's '749 Trademark and are likely to cause confusion at the point-of -sale. See Ex. 30; see also Ex. 122 (importation evidence).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 30, which on the face Amazon.com listing for Beatit jump starters. Schumacher further admits

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that the Amended Complaint is accompanied by Ex. 122. The allegations in ¶ 225 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 225 of the Amended Complaint and, therefore, denies the same.

Imazing

226. The Imazing brand jump starter listing on Amazon uses the phrase "safely jump start a dead battery in seconds" which infringes the NOCO '749 Trademark and is likely to cause confusion at the point-of-sale. See Ex. 33; see also Ex. 124 (importation evidence).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 33, which on the face listing for Imazing jump starters. Schumacher further admits that the Amended Complaint is accompanied by Ex. 124. The allegations in ¶ 226 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 226 of the Amended Complaint and, therefore, denies the same.

Jumtop

227. The Jumtop brand of jump starters uses the phrases "ULTRA SAFE," "ultra-safe" and "jump start a dead battery in seconds" on its Amazon listings for its jump starters, which infringes both the NOCO '656 and '749 Trademarks and is likely to cause confusion at the pointof-sale. See Ex. 34, 35 and 36; see also Ex. 72 (importation evidence).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exs 34, 35 and 36, which on the face Amazon.com listing for Jumtop jump starters. Schumacher further admits that the Amended Complaint is accompanied by Ex. 72. The allegations in ¶ 227 concern another party and are not directed to Schumacher. Schumacher lacks sufficient

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knowledge or information to form a belief as to the allegations in ¶ 227 of the Amended Complaint and, therefore, denies the same.

Nexpow

228. The Nexpow brand of jump starters uses the phrase "jump start a dead battery in seconds" on its Amazon listing for its jump starters, which infringes the NOCO '749 Trademark and is likely to cause confusion at the point-of-sale. See Ex. 37; see also Ex. 79 (importation evidence).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 37, which on the face Amazon.com listing for Nexpow jump starters. Schumacher further admits that the Amended Complaint is accompanied by Ex. 79. The allegations in ¶ 228 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 228 of the Amended Complaint and, therefore, denies the same.

Sanrock

229. The Sanrock brand of jump starters uses the phrases "safely jump start a dead battery in seconds" and "ultra-safe" in its Amazon listings for its jump starters, which infringes the NOCO '656 and '749 Trademarks and is likely to cause confusion at the point-of-sale. See Ex. 38 and 39; see also Ex. 86 (importation evidence).

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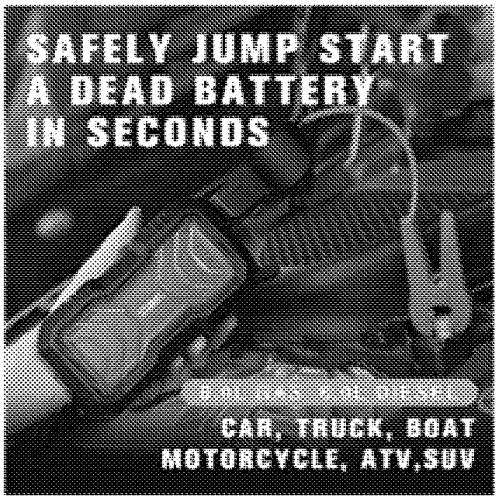


Fig.5- Image from Sanrock Amazon listing showing infringement of '749 Trademark

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exs 38 and 39, which on the face Amazon.com listing for Sanrock jump starters. Schumacher further admits that the Amended Complaint is accompanied by Ex. 86. The allegations in ¶ 229 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 229 of the Amended Complaint and, therefore, denies the same.

Topdon

230. The Topdon brand of jump starters uses the phrase "ultra safe" on the packaging of its Volcano jump starters, infringing the NOCO '656 Trademark. See Ex. 40; see also Ex. 92 (importation evidence).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 40, which on the face packaging of Topdon jump starters. Schumacher further admits that the Amended Complaint is accompanied by Ex. 92. The allegations in ¶ 230 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to

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form a belief as to the allegations in ¶ 230 of the Amended Complaint and, therefore, denies the same.

Trekpow

231. The Trekpow brand of jump starters uses the phrases "ultra-safe," "jump start dead battery in seconds," and "safely jump start a dead battery in seconds" in its Amazon listings, which infringes the NOCO '656 and '749 Trademarks and is likely to cause confusion at the point-ofsale. See Ex. 41, 42 and 43; see also Ex. 95 (importation evidence).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exs 41, 42 and 43, which on the face Amazon.com listing for Trekpow jump starters. Schumacher further admits that the Amended Complaint is accompanied by Ex. 95. The allegations in ¶ 231 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 231 of the Amended Complaint and, therefore, denies the same.

VII. SPECIFIC INSTANCES OF IMPORTATION AND SALE

232. As stated above, on information and belief, a subset of Respondents manufactures and/or have manufactured outside the United States, import into the United States, and/or sell for importation into the United States the Accused Products. Other named Respondents import into the United States and/or sell after importation into the United States the Accused Products. The Accused Products, certain portable battery jump starters and related components, are imported, sold for importation, and/or sold after importation as described below.

RESPONSE: Schumacher denies all the allegations in ¶ 232 of the Amended Complaint, except admits that Schumacher's portable battery jump starters have been sold for importation into the United States, imported into the United States and sold within the United States after importation. Schumacher further denies any of its product infringe any of the claims in the Asserted Patents.

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A. Carku Brands

1. AllStart

233. On information and belief, model numbers Boost (No. 550), Boost Max (No. 560), Boost Ultra (No. 590), and Micro-Boost (No. 540) (collectively, the "AllStart Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name AllStart. See Ex. 44C, ¶¶ 5-6.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 233 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 233 of the Amended Complaint and, therefore, denies the same.

234. On information and belief, products sold under the brand AllStart are manufactured by and/or imported for sale by Respondents Horizon Tool, Carku, and Boltpower. See Ex. 44C, ¶¶ 5-6.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 234 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 234 of the Amended Complaint and, therefore, denies the same.

235. The AllStart Accused Products are sold after importation into the United States. For example, a receipt from cal-vantools.com showing the purchase of an AllStart Boost (No.550) at an address in the United States is attached as Ex. 46. On information and belief, the AllStart Accused Products are also sold by Walmart, Advance Auto, and Horizon Tool. See, e.g., https://www.walmart.com/ip/AllStart-540-Micro-Boost-Battery-Jump-Starter-500AMP-V6Engines/635710663.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 46, which on its face an email. The allegations in ¶ 235 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 235 of the Amended Complaint and, therefore, denies the same.

236. The packaging of the AllStart Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 5 (citing Ex. 46).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 236 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 236 of the Amended Complaint and, therefore, denies the same.

2. Antigravity Batteries

237. On information and belief, model numbers XP-1, XP-10, XP-10-HD, and XP-3 (collectively, the "Antigravity Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Antigravity. See Ex. 44C, ¶¶ 9-10.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 237 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 237 of the Amended Complaint and, therefore, denies the same.

238. On information and belief, products sold under the brand Antigravity are manufactured by and/or imported for sale by Respondents Antigravity, Carku, and Gulin. See Ex.

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44C, ¶¶ 9-10.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 238 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 238 of the Amended Complaint and, therefore, denies the same.

239. The Antigravity Accused Products are sold after importation into the United States. For example, a receipt from antigravitybatteries.com showing the purchase of an Antigravity XP1 and XP-10-HD at an address in the United States is attached as Ex. 48. The Antigravity Accused Products are also sold by Respondent Walmart. See, e.g., https://www.walmart.com/ip/Antigravity-Batteries-XP-10-HD-Heavy-Duty-MICRO-STARTJump-Starter-Portable-Power-Supply-Kit/580014186.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 48, which on its face includes an email. The allegations in ¶ 239 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 239 of the Amended Complaint and, therefore, denies the same.

240. The packaging of the Antigravity Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 10 (citing Ex. 48).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 240 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 240 of the Amended Complaint and, therefore, denies the same.

3. Audew

241. On information and belief, model numbers Epower-146 (1000A/10800mAh), 500A/13800mAH, 800A/16800mAh, Epower-172 (1500A/17000mAh), and Epower-155 (1500A/2000mAh) (collectively, the "Audew Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Audew. See Ex. 44C, ¶¶ 13-14.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 241 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 241 of the Amended Complaint and, therefore, denies the same.

242. On information and belief, products sold under the brand Audew are manufactured by and/or imported for sale by Respondents Carku and Guangzhou Unique Electronics**[Respondent Removed]**. See Ex. 44C, ¶¶ 13-14; Ex. 121.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 242 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 242 of the Amended Complaint and, therefore, denies the same.

243. The Audew Accused Products are sold after importation into the United States. For example, a receipt from audew.com showing the purchase of an Audew Epower-146 (1000A/10800mAh) and Epower-172 (1500A/17000mAh) at an address in the United States is attached as Ex. 121. The Audew Accused Products are also sold by Respondent Walmart. See,

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e.g., https://www.walmart.com/ip/Audew-Jump-Starter-Car-Auto-Battery-Jump-Starter-Portable2000A-Charger-20000mAh/226026281?findingMethod=wpa

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 121, which on its face includes an email. The allegations in ¶ 243 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 243 of the Amended Complaint and, therefore, denies the same.

244. The packaging of the Audew Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 11; Ex. 121.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 244 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 244 of the Amended Complaint and, therefore, denies the same.

4. Autogen **[Respondent Removed]**

245. On information and belief, model number MJS-P111B (4000A) (the "Autogen Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Autogen. See Ex. 44C, ¶¶ 15-16.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 245 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 245 of the Amended Complaint and, therefore, denies the same.

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246. On information and belief, products sold under the brand Autogen **[Respondent Removed]**are manufactured by and/or imported for sale by Respondents Autogen and Carku. See Ex. 44C, ¶¶ 15-16.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 246 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 246 of the Amended Complaint and, therefore, denies the same.

247. The Autogen**[Respondent Removed]** Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Autogen MJS-P111B (4000A) at an address in the United States is attached as Ex. 51.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 51, which on its face includes a receipt. The allegations in ¶ 247 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 247 of the Amended Complaint and, therefore, denies the same.

248. The packaging of the Autogen **[Respondent Removed]** Accused Product indicates that the product was "Made in China." See Ex. 44C, ¶ 15 (citing Ex. 51).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 248 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 248 of the Amended Complaint and, therefore, denies the same.

5. Freeman

249. On information and belief, model number P800AJS (the "Freeman Accused

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Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Freeman. See Ex. 44C, ¶¶ 47-48.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 249 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 249 of the Amended Complaint and, therefore, denies the same.

250. On information and belief, products sold under the brand Freeman are manufactured by and/or imported for sale by Respondents Prime Global Products and Carku. See Ex. 44C, ¶¶ 47-48.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 250 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 250 of the Amended Complaint and, therefore, denies the same.

251. The Freeman Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Freeman P800AJS at an address in the United States is attached as Ex. 66.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 66, which on its face includes a receipt. The allegations in ¶ 251 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 251 of the Amended Complaint and, therefore, denies the same.

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252. The packaging of the Freeman Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 47 (citing Ex. 66).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 252 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 252 of the Amended Complaint and, therefore, denies the same.

6. Gooloo

253. On information and belief, model numbers GP1500, GP200, GP37-Plus, GP80 (800A), and GT-1500 (collectively, the "Gooloo Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Gooloo. See Ex. 44C, ¶¶ 49-51.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 253 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 253 of the Amended Complaint and, therefore, denies the same.

254. On information and belief, products sold under the brand Gooloo are manufactured by and/or imported for sale by Respondent Gooloo and Carku. See Ex. 44C, ¶¶ 41-42.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 254 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 254 of the Amended Complaint and, therefore, denies the same.

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255. The Gooloo Accused Products are sold after importation into the United States. For example, receipts from Amazon.com showing the purchase of a Gooloo GP80 (800A), GP200, and GT-1500 at an address in the United States is attached as Ex. 67. The Gooloo Accused Products are also sold by Respondent Walmart. See, e.g., https://www.walmart.com/ip/GOOLOO-800Amp-12-Volt-SuperSafe-Car-Jump-Starter-with-LED-Flashlight-and-USB-for-Up-to-4-5-Liter-Gasoline/801082784

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 67, which on its face includes a receipt. The allegations in ¶ 255 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 255 of the Amended Complaint and, therefore, denies the same.

256. The packaging of the Gooloo Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶¶ 49-50 (citing Ex. 57).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 256 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 256 of the Amended Complaint and, therefore, denies the same.

7. Grepro **[Respondent Removed]**

257. On information and belief, model numbers GP-JS-1500A (GP71C) and GP-JS500A (collectively, the "Grepro Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Grepro. See Ex. 44C, ¶¶ 52-53.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 257 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 257 of the Amended Complaint and, therefore, denies the same.

258. On information and belief, products sold under the brand Grepro**[Respondent Removed]** are manufactured by and/or imported for sale by Respondents Huizhou Grepro E-Commerce and Carku. See Ex. 44C, ¶¶ 52-53. The Grepro Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Grepro GP-JS-1500A (GP71C) at an address in the United States is attached as Ex. 131.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher further admits that the Amended Complaint is accompanied by Ex. 131, which on its face includes a receipt. The allegations in ¶ 258 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 258 of the Amended Complaint and, therefore, denies the same.

259. The packaging of the Grepro**[Respondent Removed]** Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 52 (citing Ex. 68); Ex. 131.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 259 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 259 of the Amended Complaint and, therefore, denies the same.

8. iClever

260. On information and belief, model number IC-JQ21Y (the "iClever Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name iClever. See Ex. 44C, ¶¶ 56-58.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 260 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 260 of the Amended Complaint and, therefore, denies the same.

261. On information and belief, products sold under the brand iClever are manufactured by and/or imported for sale by Respondent Carku. See Ex. 44C, ¶¶ 56-58.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 261 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 261 of the Amended Complaint and, therefore, denies the same.

262. On information and belief, the iClever Accused Product is sold after importation into the United States. See Ex. 44C, ¶¶ 56-58 (citing Ex. 70).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 262 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 262 of the Amended Complaint and, therefore, denies the same.

263. On information and belief, the iClever Accused Product is manufactured in China. See Ex. 44C, ¶¶ 56-58 (citing Ex. 70).

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 263 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 263 of the Amended Complaint and, therefore, denies the same.

9. M Moock

264. On information and belief, model numbers MK200 (1500A) and MK800 (2000A) (collectively, the "M Moock Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name M Moock. See Ex. 44C, ¶¶ 74-75.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 264 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 264 of the Amended Complaint and, therefore, denies the same.

265. On information and belief, products sold under the brand M Moock are manufactured by and/or imported for sale by Respondent Shenzhen Moock**[Respondent Removed]**. See Ex. 44C, ¶¶ 74-75.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 265 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 265 of the Amended Complaint and, therefore, denies the same.

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266. The M Moock Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a M Moock MK800 (2000A) at an address in the United States is attached as Ex. 125.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 125, which on its face includes photos of a Moock product. The allegations in ¶ 266 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 266 of the Amended Complaint and, therefore, denies the same.

267. The packaging of the M Moock Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 71; Ex. 125.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 267 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 267 of the Amended Complaint and, therefore, denies the same.

10. Nekteck

268. On information and belief, model numbers NK-JS19800 (2000A/19800mAh), NKJS12000 (D31) (500A/12000mAh), NK-JS12000 (600A/16800mAh), and D45 (800A/20000mAh) (collectively, the "Nekteck Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Nekteck. See Ex. 44C, ¶¶ 76-77.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 268 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 268 of the Amended Complaint and, therefore, denies the same.

269. On information and belief, products sold under the brand Nekteck are manufactured by and/or imported for sale by Respondents Nekteck, Medcursor**[Respondent Removed]**, and Sictec Instruments**[Respondent Removed]**. See Ex. 44C, ¶¶ 76-77.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 269 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 269 of the Amended Complaint and, therefore, denies the same.

270. The Nekteck Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Nekteck NK-JS12000 (D31) (500A/12000mAh) and NK-JS12000 (600A/16800mAh) at an address in the United States is attached as Ex. 132.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 132, which on its face includes a receipt. The allegations in ¶ 270 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 270 of the Amended Complaint and, therefore, denies the same.

271. The packaging of the Nekteck Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 76 (citing Ex. 78); Ex. 132.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 271 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 271 of the Amended Complaint and, therefore, denies the same.

11. PowerMax

272. On information and belief, model numbers PM91004 and PM91006 (collectively, the "PowerMax Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name PowerMax. See Ex. 44C, ¶¶ 88-89

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 272 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 272 of the Amended Complaint and, therefore, denies the same.

273. On information and belief, products sold under the brand PowerMax are manufactured by and/or imported for sale by Respondents PowerMax and Carku. See Ex. 44C, ¶¶ 88-89.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 273 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 273 of the Amended Complaint and, therefore, denies the same.

274. The PowerMax Accused Products are sold after importation into the United States. For example, a receipt from Home Depot (homedepot.com) showing the purchase of a PowerMax PM91006 at an address in the United States is attached as Ex. 84.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 84, which on its face includes a receipt. The allegations in ¶ 274 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 274 of the Amended Complaint and, therefore, denies the same.

275. On information and belief, the PowerMax Accused Products are manufactured in China. See Ex. 44C, ¶ 88 (citing Ex. 84).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 275 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 275 of the Amended Complaint and, therefore, denies the same.

12. Tacklife

276. On information and belief, model numbers KP120, KP200, T6, T8 (Newer Model), T8 Max, T8 MAX, and T8 Pro (collectively, the "Tacklife Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Tacklife. See Ex. 44C, ¶¶ 103-107.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 276 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 276 of the Amended Complaint and, therefore, denies the same.

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277. On information and belief, products sold under the brand Tacklife are manufactured by and/or imported for sale by Respondents Aukey**[Respondent Removed]** and Shenzhen Take Tools. See Ex. 44C, ¶¶ 103-107.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 277 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 277 of the Amended Complaint and, therefore, denies the same.

278. The Tacklife Accused Products are sold after importation into the United States. For example, receipts from Amazon.com showing the purchase of a Tacklife T8, T8 (Newer Model), T8 MAX, and T8 Pro at an address in the United States are attached as Ex. 126.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 126, which on its face includes receipts. The allegations in ¶ 278 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 278 of the Amended Complaint and, therefore, denies the same.

279. The packaging of the Tacklife Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶¶ 103-106; Ex. 126.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exs. 44C and 126. The allegations in ¶ 279 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 279 of the Amended Complaint and, therefore, denies the same.

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13. Xiaomi

280. On information and belief, model number Midrive PS02 (11100 mAh 600A) (the "Xiaomi Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Xiaomi. See Ex. 44C, ¶¶ 131-132; Ex. 130C.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst and Ex. 130C, which on its face a supplement declaration of Anne E. Hurst. The allegations in ¶ 280 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 280 of the Amended Complaint and, therefore, denies the same.

281. On information and belief, products sold under the brand Xiaomi are manufactured by and/or imported for sale by Respondents 70mai and Carku. See Ex. 44C, ¶¶ 131-133; Ex. 130C.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst and Ex. 130C, which on its face a supplement declaration of Anne E. Hurst. The allegations in ¶ 281 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 281 of the Amended Complaint and, therefore, denies the same.

282. The Xiaomi Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a PS02 (11100 mAh 600A) jump starter at an address in the United States is attached as Ex. 129. In addition, Walmart.com and Amazon.com listings indicate the Xiaomi Accused Product is manufactured by and/or imported by Respondent 70mai. See Ex. 44C, ¶¶ 131-133 (citing Ex. 102); Ex. 130C.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst and Ex. 130C, which on its face a supplement declaration of Anne E. Hurst. The allegations in ¶ 282 concern another party and are

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not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 282 of the Amended Complaint and, therefore, denies the same.

283. The packaging of the Xiaomi Accused Product identifies "70mai Co., Ltd." and indicates it was "Made in China." See Ex. 44C, ¶¶ 131-133 (citing Ex. 102); Ex. 130C (citing Ex. 129).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst and Ex. 130C, which on its face a supplement declaration of Anne E. Hurst. The allegations in ¶ 283 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 283 of the Amended Complaint and, therefore, denies the same.

B. Boltpower Brands

1. Ampeak

284. On information and belief, model number JS1 (the "Ampeak Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Ampeak. See Ex. 44C, ¶¶ 7-8.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 284 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 284 of the Amended Complaint and, therefore, denies the same.

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285. On information and belief, products sold under the brand Ampeak are manufactured by and/or imported for sale by Respondent Valuelink. See Ex. 44C, ¶¶ 5-6.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 285 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 285 of the Amended Complaint and, therefore, denies the same.

286. The Ampeak Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Ampeak JS1 at an address in the United States is attached as Ex. 47.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 47, which on its face includes a receipt. The allegations in ¶ 286 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 286 of the Amended Complaint and, therefore, denies the same.

287. The packaging of the Ampeak Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 7 (citing Ex. 47).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 287 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 287 of the Amended Complaint and, therefore, denies the same.

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2. Arteck

288. On information and belief, model numbers A7, D29, JS08, and JS12 (collectively, the "Arteck Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Arteck. See Ex. 44C, ¶¶ 11-12.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 288 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 288 of the Amended Complaint and, therefore, denies the same.

289. On information and belief, products sold under the brand Arteck are manufactured by and/or imported for sale by Respondents Arteck Electronic and Boltpower. See Ex. 44C, ¶¶ 11-12.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 289 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 289 of the Amended Complaint and, therefore, denies the same.

290. The Arteck Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Arteck A7 at an address in the United States is attached as Ex. 49.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 49, which on its face includes a receipt. The allegations in ¶ 290 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 290 of the Amended Complaint and, therefore, denies the same.

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291. The packaging of the Arteck Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 11 (citing Ex. 49).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 291 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 291 of the Amended Complaint and, therefore, denies the same.

3. Autown

292. On information and belief, model numbers RP-PI-01 (1000A), RP-PI02 (500A/10000mAh), RP-PI-03 (800A), and RP-PI-04 (2000A) (collectively, the "Autown Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Autown. See Ex. 44C, ¶¶ 17-18.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 292 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 292 of the Amended Complaint and, therefore, denies the same.

293. On information and belief, products sold under the brand Autown are manufactured by and/or imported for sale by Respondents Boltpower and Zhejiang Qingyou Electronic. See Ex. 44C, ¶¶ 17-18.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 293 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 293 of the Amended Complaint and, therefore, denies the same.

294. The Autown Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of an Autown RP-PI-03 (800A) at an address in the United States is attached as Ex. 52.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 52, which on its face includes a receipt. The allegations in ¶ 294 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 294 of the Amended Complaint and, therefore, denies the same.

295. The packaging of the Autown Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 17 (citing Ex. 52).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 295 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 295 of the Amended Complaint and, therefore, denies the same.

4. Battery Tender

296. On information and belief, model numbers 030-1011-WAL (1000A/8000mAh), 030-1011-WH (1000A/8000mAh), 030-1000-PM (600A/6000mAh), and 030-1010-WH (800A/7200mAh) (collectively, the "Battery Tender Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Battery Tender. See Ex. 44C, ¶¶ 19-20.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 296 concern another

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party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 296 of the Amended Complaint and, therefore, denies the same.

297. On information and belief, products sold under the brand Battery Tender are manufactured by and/or imported for sale by Respondents Deltran and Boltpower. See Ex. 44C, ¶¶ 19-20.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 297 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 297 of the Amended Complaint and, therefore, denies the same.

298. The Battery Tender Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Battery Tender 0301010-WH (800A/7200mAh) at an address in the United States is attached as Ex. 53.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 53, which on its face includes a receipt. The allegations in ¶ 298 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 298 of the Amended Complaint and, therefore, denies the same.

299. The packaging of the Battery Tender Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 19 (citing Ex. 53).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 299 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 299 of the Amended Complaint and, therefore, denies the same.

5. Beatit

300. On information and belief, model numbers B10 (500A), B10 Pro (800A), B7 (1200A), BP101 (2200A), D11 (800A), G18 (2000A), and G22 (1500A) (collectively, the "Beatit Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Beatit. See Ex. 44C, ¶¶ 21-23.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 300 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 300 of the Amended Complaint and, therefore, denies the same.

301. On information and belief, products sold under the brand Beatit are manufactured by and/or imported for sale by Respondents Boltpower, Shenzhen Mediatek Tong, and Lianfatong**[Respondent Removed]**. See Ex. 44C, ¶¶ 21-23.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 301 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 301 of the Amended Complaint and, therefore, denies the same.

302. The Beatit Accused Products are sold after importation into the United States. For example, receipts from Amazon.com showing the purchase of a Beatit B10, B10 Pro (800A), B7 (1200A), BP101 (2200A), D11 (800A), and G18 (200A) at an address in the United States is attached as Ex. 122.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 122, which on its face includes a receipt. The allegations in ¶ 302 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 302 of the Amended Complaint and, therefore, denies the same.

303. The packaging of the Beatit Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶¶ 21-22; Ex. 122.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Exs. 44C and 122. The allegations in ¶ 303 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 303 of the Amended Complaint and, therefore, denies the same.

6. Boltpower

304. On information and belief, model numbers A7P, D28, D29, G33A, and N02 (collectively, the "Boltpower Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Boltpower. See Ex. 44C, ¶¶ 24-26.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 304 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 304 of the Amended Complaint and, therefore, denies the same.

305. On information and belief, products sold under the brand Boltpower are manufactured by and/or imported for sale by Respondent Boltpower and Tii Trading. See Ex. 44C, ¶¶ 24-26.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 305 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 305 of the Amended Complaint and, therefore, denies the same.

306. The Boltpower Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com and eBay.com showing the purchase of a Boltpower A7P, D28, D29, G33A, and N02 at an address in the United States is attached as Ex. 55.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 55, which on its face includes a receipt. The allegations in ¶ 306 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 306 of the Amended Complaint and, therefore, denies the same.

307. The packaging of the Boltpower Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶¶ 24-25 (citing Ex. 55).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 307 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 307 of the Amended Complaint and, therefore, denies the same.

7. DB Power/Valuelink

308. On information and belief, model numbers DJS50 (800A/18000mAh), DJS80,

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G15, G16 (2000A/20800mAh), A09, DJS40, DJS50, DJS60, G09D, and N01(collectively, the "DB Power Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name DB Power. See Ex. 44C, ¶¶ 31-32.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 308 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 308 of the Amended Complaint and, therefore, denies the same.

309. On information and belief, products sold under the brand DB Power are manufactured by and/or imported for sale by Respondents Boltpower and Shenzhen Valuelink. See Ex. 44C, ¶¶ 31-32.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 309 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 309 of the Amended Complaint and, therefore, denies the same.

310. The DB Power Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a DB Power DJS50 (800A/1800mAh) and G16 (2000A/20800mAh) at an address in the United States is attached as Ex. 58.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 58, which on its face includes a receipt. The allegations in ¶ 310 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 310 of the Amended Complaint and, therefore, denies the same.

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311. The packaging of the DB Power Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 31 (citing Ex. 58).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 311 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 311 of the Amended Complaint and, therefore, denies the same.

8. DieHard

312. On information and belief, model numbers 43448 (8000mAH) and DH110 (400A) (collectively, the "DieHard Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name DieHard. See Ex. 44C, ¶¶ 33-34.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher admits that the DieHard Accused Products are manufactured outside the United States and sold for importation into the United States, imported into the United States and/or sold within the United States after importation. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 312 of the Amended Complaint and, therefore, denies the same.

313. On information and belief, products sold under the brand Schumacher are manufactured by and/or imported for sale by Respondents Boltpower and Schumacher. See Ex. 44C, ¶¶ 33-34.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher admits that the DieHard

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Accused Products sold under the brand DieHard are manufactured by Respondents Boltpower or SPT. Schumacher further admits that the DieHard Accused Products sold under the brand DieHard are imported for sale by Respondent SEC. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 313 of the Amended Complaint and, therefore, denies the same.

314. The DieHard Accused Products are sold after importation into the United States. For example, receipts from Amazon.com and menards.com showing the purchase of a Die Hard DH110 and 43448 at an address in the United States are attached as Ex. 59. On information and belief, the DieHard Accused Products are also sold by Walmart. See, e.g., https://www.walmart.com/ip/Diehard-Jumpstart-400amp/126963604?wmlspartner=wlpa&selectedSellerId=5227

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 59, which on its face includes a receipt and an email. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 314 of the Amended Complaint and, therefore, denies the same.

315. The packaging of the DieHard Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 33 (citing Ex. 59).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 315 of the Amended Complaint and, therefore, denies the same.

9. Duralast

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316. On information and belief, model numbers DL-2000lI and DL-800L (collectively, the "Duralast Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Duralast. See Ex. 44C, ¶¶ 35-36.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher admits that the Duralast Accused Products are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 316 of the Amended Complaint and, therefore, denies the same.

317. On information and belief, products sold under the brand Duralast are manufactured by and/or imported for sale by Respondents Boltpower, Schumacher, and Best Parts. See Ex. 44C, ¶¶ 21-23

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher admits that the DL-800L is manufactured by Boltpower. Schumacher denies that the DL2000LI is manufactured by Boltpower. Schumacher admits that SEC imports into the United States or sells within the United States after importation the Duralast Accused Products. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 317 of the Amended Complaint and, therefore, denies the same.

318. The Duralast Accused Products are sold after importation into the United States. For example, a receipt from Autozone.com showing the purchase of a Duralast DL-800L at an address in the United States is attached as Ex. 60.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 60, which on its face includes an email. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in the reminder of ¶ 318 of the Amended Complaint and, therefore, denies the same.

319. The packaging of the Duralast Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 35 (citing Ex. 60).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 319 of the Amended Complaint and, therefore, denies the same.

10. EverStart

320. On information and belief, model number SL097 (collectively, the "EverStart Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name EverStart. See Ex. 44C, ¶¶ 39-40.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher admits that the EverStart Accused Products are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 320 of the Amended Complaint and, therefore, denies the same.

321. On information and belief, products sold under the brand EverStart are manufactured by and/or imported for sale by Respondents Boltpower and Schumacher. See Ex. 44C, ¶¶ 39-40.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher admits that the EverStart Accused Products are manufactured by Boltpower and imported for sale by SEC. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 321 of the Amended Complaint and, therefore, denies the same.

322. The EverStart Accused Products are sold after importation into the United States. For example, a receipt from Walmart.com showing the purchase of an EverStart SL097 at an address in the United States is attached as Ex. 62.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 62, which on its face includes an email. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 322 of the Amended Complaint and, therefore, denies the same.

323. The packaging of the EverStart Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 39 (citing Ex. 62).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 323 of the Amended Complaint and, therefore, denies the same.

11. Fconegy **[Respondent Removed]**

324. On information and belief, model numbers FC100 and FC200 (collectively, the "Fconegy Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Fconegy. See Ex. 44C, ¶¶ 41-42.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 324 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 324 of the Amended Complaint and, therefore, denies the same.

325. On information and belief, products sold under the brand Fconegy**[Respondent Removed]** are manufactured by and/or imported for sale by Respondents Boltpower and Fconegy. See Ex. 44C, ¶¶ 41-42; Ex. 31.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 325 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 325 of the Amended Complaint and, therefore, denies the same.

326. The Fconegy **[Respondent Removed]** Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Fconegy FC100 at an address in the United States is attached as Ex. 63.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 63, which on its face includes photos and a website page. The allegations in ¶ 326 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 326 of the Amended Complaint and, therefore, denies the same.

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327. The packaging of the Fconegy**[Respondent Removed]** Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 41 (citing Ex. 63).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 327 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 327 of the Amended Complaint and, therefore, denies the same.

12. Flylinktech

328. On information and belief, model numbers CF100, CF200, CF300, CF400, and CF600 (collectively, the "Flylinktech Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Flylinktech. See Ex. 44C, ¶¶ 43-44.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 328 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 328 of the Amended Complaint and, therefore, denies the same.

329. On information and belief, products sold under the brand Flylinktech are manufactured by and/or imported for sale by Respondents Boltpower and Flylink Tech Company. See Ex. 44C, ¶¶ 43-44.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 329 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 329 of the Amended Complaint and, therefore, denies the same.

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330. The Flylinktech Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Flylinktech CF600 at an address in the United States is attached as Ex. 64.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 64, which on its face includes a receipt. The allegations in ¶ 330 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 330 of the Amended Complaint and, therefore, denies the same.

331. The packaging of the Flylinktech Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 43 (citing Ex. 64).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 331 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 331 of the Amended Complaint and, therefore, denies the same.

13. Imazing

332. On information and belief, model numbers G26, G27, G29P, IM23, IM25, IM27/G26, IM29/G29, IM31, and J8 (collectively, the "Imazing Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Imazing. See Ex. 44C, ¶¶ 59-60.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 332 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 332 of the Amended Complaint and, therefore, denies the same.

333. On information and belief, products sold under the brand Imazing are manufactured by and/or imported for sale by Respondents Boltpower, Circus Link**[Respondent Removed]**, and Smart Well**[Respondent Removed]**. See Ex. 44C, ¶¶ 59-60.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 333 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 333 of the Amended Complaint and, therefore, denies the same.

334. The Imazing Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Imazing J8 and IM23, and IM31 at an address in the United States is attached as Ex. 124. The Imazing Accused Products are also sold by Respondent Walmart. See, e.g., https://www.walmart.com/ip/Imazing-Portable-Car-Lithium-Jump-Starter-2500A-Peak-21000mAh-Up-10L-Gas-Diesel-Engine-12V-Auto-Battery-Booster-Power-Pack-Jumper-Cables-QC-3-0-110V-/180839543

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 124, which on its face includes a receipt. The allegations in ¶ 334 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 334 of the Amended Complaint and, therefore, denies the same.

335. The packaging of the Imazing Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 59; Ex. 124.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 335 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 335 of the Amended Complaint and, therefore, denies the same.

14. Jumtop

336. On information and belief, model numbers N13, D09, E18, and N12 (collectively, the "Jumtop Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Jumtop. See Ex. 44C, ¶¶ 63-64.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 336 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 336 of the Amended Complaint and, therefore, denies the same.

337. On information and belief, products sold under the brand Jumtop are manufactured by and/or imported for sale by Respondents Boltpower and Autolion. See Ex. 44C, ¶¶ 63-64.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 337 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 337 of the Amended Complaint and, therefore, denies the same.

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338. The Jumtop Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Jumtop N13 at an address in the United States is attached as Ex. 72.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 72, which on its face includes a receipt. The allegations in ¶ 338 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 338 of the Amended Complaint and, therefore, denies the same.

339. The packaging of the Jumtop Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 63 (citing Ex. 72).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 339 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 339 of the Amended Complaint and, therefore, denies the same.

15. KTI (K-Tool International)

340. On information and belief, model numbers KTI-74391, KTI-74392, and KTI-74393 (collectively, the "K-Tool Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name K-Tool. See Ex. 44C, ¶¶ 65-66.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 340 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 340 of the Amended Complaint and, therefore, denies the same.

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341. On information and belief, products sold under the brand K-Tool are manufactured by and/or imported for sale by Respondents K-Tool and Boltpower. See Ex. 44C, ¶¶ 65-66.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 341 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 341 of the Amended Complaint and, therefore, denies the same.

342. The K-Tool Accused Products are sold after importation into the United States. For example, a receipt from Walmart.com showing the purchase of a K-Tool KTI-74392 at an address in the United States is attached as Ex. 73. The K-Tool Accused Products are also sold by Respondent Advance Auto Parts. See, e.g., https://shop.advanceautoparts.com/p/k-toolinternational-jump-starter-power-s-kti74392/12009092-P?searchTerm=kti%20jump%20starter 343. The packaging of the K-Tool Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 65 (citing Ex. 73).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 73, which on its face includes an email. The allegations in ¶ 342 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 342 of the Amended Complaint and, therefore, denies the same.

343. The packaging of the K-Tool Accused Products indicates that the products are "Made in China." *See* Ex. 44C, ¶ 65 (citing Ex. 73).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 343 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 343 of the Amended Complaint and, therefore, denies the same.

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16. Lemsir

344. On information and belief, model numbers L6 (800A/10800mAh), V1 (2000A/21000mAh), V2 (1500A/15600mAh), V3 (2200A/21000mAh), and V8 (800A/12800mAh) (collectively, the "Lemsir Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Lemsir. See Ex. 44C, ¶¶ 67-68.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 344 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 344 of the Amended Complaint and, therefore, denies the same.

345. On information and belief, products sold under the brand Lemsir are manufactured by and/or imported for sale by Respondents Boltpower, Shenzhen Mediatek Tong, and Lianfatong**[Respondent Removed]**. See Ex. 44C, ¶¶ 67-68.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 345 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 345 of the Amended Complaint and, therefore, denies the same.

346. The Lemsir Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Lemsir V8 (800A/12800mAh) at an address in the United States is attached as Ex. 74.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 74, which on its face includes a receipt. The allegations in ¶ 346 concern another party and are

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not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 346 of the Amended Complaint and, therefore, denies the same.

347. The packaging of the Lemsir Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 67 (citing Ex. 74).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 347 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 347 of the Amended Complaint and, therefore, denies the same.

17. Loftek

348. On information and belief, model numbers Y29 and G21 (collectively, the "Loftek Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Loftek. See Ex. 44C, ¶¶ 69-70.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 348 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 348 of the Amended Complaint and, therefore, denies the same.

349. On information and belief, products sold under the brand Loftek are manufactured by and/or imported for sale by Respondent Boltpower. See Ex. 44C, ¶¶ 69-70.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 349 concern another

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party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 349 of the Amended Complaint and, therefore, denies the same.

350. The Loftek Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Loftek G21 at an address in the United States is attached as Ex. 75.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 75, which on its face includes photos. The allegations in ¶ 350 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 350 of the Amended Complaint and, therefore, denies the same.

351. The packaging of the Loftek Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 69 (citing Ex. 75).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 351 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 351 of the Amended Complaint and, therefore, denies the same.

18. Matco Tools

352. On information and belief, model numbers MICROJUMP, MINIJUMP3, and VERSAPRO3 (collectively, the "Matco Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Matco. See Ex. 44C, ¶¶ 71-73.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 352 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 352 of the Amended Complaint and, therefore, denies the same.

353. On information and belief, products sold under the brand Matco are manufactured by and/or imported for sale by Respondents Matco, Boltpower, Carku, and Horizon Tool. See Ex. 44C, ¶¶ 71-73.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 353 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 353 of the Amended Complaint and, therefore, denies the same.

354. The Matco Accused Products are sold after importation into the United States. For example, receipts from matcotools.com showing the purchase of a Matco MICROJUMP and VERSAPRO3 at an address in the United States is attached as Ex. 76.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 76, which on its face includes emails. The allegations in ¶ 354 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 354 of the Amended Complaint and, therefore, denies the same.

355. The packaging of the Matco Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶¶ 71-72 (citing Ex. 76).

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 355 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 355 of the Amended Complaint and, therefore, denies the same.

19. Nexpow

356. On information and belief, model numbers G7 (2000A) and G7 (1500A) (collectively, the "Nexpow Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Nexpow. See Ex. 44C, ¶¶ 78-79.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 356 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 356 of the Amended Complaint and, therefore, denies the same.

357. On information and belief, products sold under the brand Nexpow are manufactured by and/or imported for sale by Respondents Boltpower and Hangchebao. See Ex. 44C, ¶¶ 78-79.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 357 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 357 of the Amended Complaint and, therefore, denies the same.

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358. The Nexpow Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Nexpow G17 (1500A) at an address in the United States is attached as Ex. 79.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 79, which on its face includes a receipt. The allegations in ¶ 358 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 358 of the Amended Complaint and, therefore, denies the same.

359. The packaging of the Nexpow Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶¶ 78 (citing Ex. 79).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 359 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 359 of the Amended Complaint and, therefore, denies the same.

20. PowerCache

360. On information and belief, model numbers 39602 and 39603 (G19) (collectively, the "PowerCache Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name PowerCache. See Ex. 44C, ¶¶ 86-87.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 360 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 360 of the Amended Complaint and, therefore, denies the same.

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361. On information and belief, products sold under the brand PowerCache are manufactured by and/or imported for sale by Respondents Boltpower and MonoPrice. See Ex. 44C, ¶¶ 86-87.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 361 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 361 of the Amended Complaint and, therefore, denies the same.

362. The PowerCache Accused Products are sold after importation into the United States. For example, a receipt from Monoprice.com showing the purchase of a PowerCache 39603 (G19) at an address in the United States is attached as Ex. 83.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 83, which on its face includes an email. The allegations in ¶ 362 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 362 of the Amended Complaint and, therefore, denies the same.

363. The packaging of the PowerCache Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶¶ 86-87 (citing Ex. 83).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 363 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 363 of the Amended Complaint and, therefore, denies the same.

21. Roav

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364. On information and belief, model numbers Pro 1000A and Pro 800 (collectively, the "Roav Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Roav. See Ex. 44C, ¶¶ 90-91.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 364 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 364 of the Amended Complaint and, therefore, denies the same.

365. On information and belief, products sold under the brand Roav are manufactured by and/or imported for sale by Respondents Boltpower and Anker Technology (UK). See Ex.85.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 85, which on its face includes photos, an email and online listings. The allegations in ¶ 365 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 365 of the Amended Complaint and, therefore, denies the same.

366. The Roav Accused Products are sold after importation into the United States. For example, a receipt from bestbuy.com showing the purchase of a Roav Pro 800 at an address in the United States is attached as Ex. 85. On information and belief, the Roav Accused Products are also sold by Respondents NAPA, Walmart and Best Buy. See, e.g., https://www.bestbuy.com/site/anker-roav-jump-starter-pro-black/6297939.p?skuId=6297939

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 85, which on its face includes an email. The allegations in ¶ 366 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 366 of the Amended Complaint and, therefore, denies the same.

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367. The packaging of the Roav Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 90 (citing Ex. 85).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 367 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 367 of the Amended Complaint and, therefore, denies the same.

22. Sanrock

368. On information and belief, model number G37 (the "Sanrock Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Sanrock. See Ex. 44C, ¶¶ 92-93.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 368 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 368 of the Amended Complaint and, therefore, denies the same.

369. On information and belief, products sold under the brand Sanrock are manufactured by and/or imported for sale by Respondents Boltpower and Shenzhen Li Feng Maoyiyouxiangognsi**[Respondent Removed]**. See Ex. 44C, ¶¶ 92-93.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 369 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 369 of the Amended Complaint and, therefore, denies the same.

370. The Sanrock Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Sanrock G37 at an address in the United States is attached as Ex. 86.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 86, which on its face includes a receipt. The allegations in ¶ 370 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 370 of the Amended Complaint and, therefore, denies the same.

371. The packaging of the Sanrock Accused Product indicates that the product is "Made in China." See Ex. 44C, ¶ 92 (citing Ex. 86).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 371 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 371 of the Amended Complaint and, therefore, denies the same.

23. Schumacher

372. On information and belief, model numbers SL1312 (600A), SL1314 (600A), SL1315 (800A), SL1316 (1000A), SL1317 (1000A), SL1327 (800A), SL 1396 (800A) (collectively, the "Schumacher Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Schumacher. See Ex. 44C, ¶¶ 94-98.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher admits that the Schumacher

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Accused Products are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 372 of the Amended Complaint and, therefore, denies the same.

373. On information and belief, products sold under the brand Schumacher are manufactured by and/or imported for sale by Respondents Boltpower, Schumacher, and Pep Boys**[Respondent Removed]**. See Ex. 44C, ¶¶ 94-98.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher denies that the Schumacher Accused Products are manufactured by Respondents Boltpower, Schumacher and Pep Boys. Schumacher admits that the SL1312 (600A), SL1314 (600A), SL1315 (800A), SL1317 (1000A) and SL1327 (800A) are manufactured by Respondent Boltpower. Schumacher further admits that the SL1316 (1000A) is manufactured by SPT. Schumacher admits that the Schumacher Accused Products are imported for sale by SECchumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 373 of the Amended Complaint and, therefore, denies the same.

374. The Schumacher Accused Products are sold after importation into the United States. For example, receipts from batterychargers.com, Walmart.com, Oreillyauto.com, and homedepot.com showing the purchase of a Schumacher SL 1312, SL1315, SL1316, and SL1396 at an address in the United States are attached as Ex. 87. On information and belief, the Schumacher Accused Products are also sold by Respondents AutoZone, Advance Auto, NAPA, and Lowe's. See, e.g., https://www.lowes.com/pd/Schumacher-Electric-1200-Amp-Car-Battery-Jump-Starter-with-Digital-Display/1000569111;

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 87, which on its face includes emails, photos and online listings. Schumacher admits it sold the

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Schumacher Accused Products within the United States after importation. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 374 of the Amended Complaint and, therefore, denies the same.

375. The packaging of the Schumacher Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 97 (citing Ex. 87).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. Schumacher admits that some photos on Ex. 87 on its face state "Made in China." Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in the reminder of ¶ 375 of the Amended Complaint and, therefore, denies the same.

24. Tooliom

376. On information and belief, model number Epower-125 (2000A) (the "Tooliom Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Tooliom. See Ex. 44C, ¶¶ 108-109.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 376 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 376 of the Amended Complaint and, therefore, denies the same.

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377. On information and belief, products sold under the brand Tooliom are manufactured by and/or imported for sale by Respondents Boltpower and Carku. See Ex. 44C, ¶¶ 108-109.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 377 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 377 of the Amended Complaint and, therefore, denies the same.

378. The Tooliom Accused Product is after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Tooliom Epower-125 (2000A) at an address in the United States is attached as Ex. 91.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 91, which on its face includes photos and online listings. The allegations in ¶ 378 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 378 of the Amended Complaint and, therefore, denies the same.

379. The packaging of the Tooliom Accused Product indicates that the product is "Made in China." See Ex. 44C, ¶ 108 (citing Ex. 91).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 379 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 379 of the Amended Complaint and, therefore, denies the same.

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25. Topdon

380. On information and belief, model numbers VOLCANO1500 and VOLCANO2000 (collectively, the "Topdon Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Topdon. See Ex. 44C, ¶¶ 110-111.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 380 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 380 of the Amended Complaint and, therefore, denies the same.

381. On information and belief, products sold under the brand Topdon are manufactured by and/or imported for sale by Respondents Boltpower, Shenzhen Topdon, and Shenzhen Dingjiang Technology. See Ex. 44C, ¶¶ 110-111.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 381 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 381 of the Amended Complaint and, therefore, denies the same.

382. The Topdon Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Topdon VOLCANO2000 at an address in the United States is attached as Ex. 92.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 92, which on its face includes a receipt. The allegations in ¶ 382 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 382 of the Amended Complaint and, therefore, denies the same.

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383. The packaging of the Topdon Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 110 (citing Ex. 92).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 383 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 383 of the Amended Complaint and, therefore, denies the same.

26. Topvision

384. On information and belief, model number G26 (the "Topvision Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Topvision. See Ex. 44C, ¶¶ 112-113.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 384 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 384 of the Amended Complaint and, therefore, denies the same.

385. On information and belief, products sold under the brand Topvision are manufactured by and/or imported for sale by Respondent Boltpower. See Ex. 44C, ¶¶ 112-113.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 385 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 385 of the Amended Complaint and, therefore, denies the same.

386. The Topvision Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Topvision G26 at an address in the United States is attached as Ex. 93.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 93, which on its face includes a receipt. The allegations in ¶ 386 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 386 of the Amended Complaint and, therefore, denies the same.

387. The packaging of the Topvision Accused Product indicates that the products is "Made in China." See Ex. 44C, ¶ 112 (citing Ex. 93).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 387 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 387 of the Amended Complaint and, therefore, denies the same.

27. Trekpow

388. On information and belief, model numbers A18, G22, and TJ2500 (collectively, the "Trekpow Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Trekpow. See Ex. 44C, ¶¶ 116-117.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 388 concern another

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party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 388 of the Amended Complaint and, therefore, denies the same.

389. On information and belief, products sold under the brand Trekpow are manufactured by and/or imported for sale by Respondent Boltpower. See Ex. 44C, ¶¶ 116-117.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 389 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 389 of the Amended Complaint and, therefore, denies the same.

390. The Trekpow Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Trekpow G22 at an address in the United States is attached as Ex. 95.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 95, which on its face includes a receipt. The allegations in ¶ 390 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 390 of the Amended Complaint and, therefore, denies the same.

391. The packaging of the Trekpow Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 116.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 391 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 391 of the Amended Complaint and, therefore, denies the same.

28. Vavofo

392. On information and belief, model number G23P (the "Vavofo Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Vavofo. See Ex. 44C, ¶¶ 122-124.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 392 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 392 of the Amended Complaint and, therefore, denies the same.

393. On information and belief, products sold under the brand Vavofo are manufactured by and/or imported for sale by Respondent Boltpower. See Ex. 44C, ¶¶ 122-124.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 393 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 393 of the Amended Complaint and, therefore, denies the same.

394. On information and belief, the Vavofo Accused Product is sold after importation into the United States. For example, a listing from Amazon.com indicating the Vavofo Accused Product is manufactured by Respondent Boltpower is attached as Ex. 98.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 98, which on its face includes a listing. The allegations in ¶ 394 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 394 of the Amended Complaint and, therefore, denies the same.

395. The Vavofo Accused Product also indicates that the product is "Made in China." See Ex. 44C, ¶ 122 (citing Ex. 98).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 395 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 395 of the Amended Complaint and, therefore, denies the same.

29. Vekkia

396. On information and belief, model numbers THOR-1000 and THOR-3000(collectively, the "Vekkia Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Vekkia. See Ex. 44C, ¶¶ 125-126.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 396 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 396 of the Amended Complaint and, therefore, denies the same.

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397. On information and belief, products sold under the brand Vekkia are manufactured by and/or imported for sale by Respondents Boltpower and Chic Electrics**[Respondent Removed]**. See Ex. 44C, ¶¶ 124126.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 397 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 397 of the Amended Complaint and, therefore, denies the same.

398. The Vekkia Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Vekkia THOR-1000 at an address in the United States is attached as Ex. 128.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 128, which on its face includes a receipt. The allegations in ¶ 398 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 398 of the Amended Complaint and, therefore, denies the same.

399. The packaging of the Vekkia Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 125; Ex. 128.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 399 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 399 of the Amended Complaint and, therefore, denies the same.

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30. Yaber

400. On information and belief, model numbers YR100, YR200, YR 600, YR500, YR700, and YR400 (collectively, the "Yaber Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Yaber. See Ex. 44C, ¶¶ 134-135.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 400 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 400 of the Amended Complaint and, therefore, denies the same.

401. On information and belief, products sold under the brand Yaber are manufactured by and/or imported for sale by Respondents Boltpower and ThiEye Technologies. See Ex. 44C, ¶¶ 134-135.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 401 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 401 of the Amended Complaint and, therefore, denies the same.

402. The Yaber Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Yaber YR400 at an address in the United States is attached as Ex. 103.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 103, which on its face includes a receipt. The allegations in ¶ 402 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 402 of the Amended Complaint and, therefore, denies the same.

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403. The packaging of the Yaber Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 134 (citing Ex. 103).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 403 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 403 of the Amended Complaint and, therefore, denies the same.

C. Smartech Brands

1. Smartech

404. On information and belief, model numbers JS-10000, JS-15000, JS-15000N, JS6000, JS-8000, JS-8000N, and TECH-5000P (collectively, the "Smartech Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Smartech. See Ex. 44C, ¶¶ 99-100.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 404 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 404 of the Amended Complaint and, therefore, denies the same.

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405. On information and belief, products sold under the brand Smartech are manufactured by and/or imported for sale by Respondent Smartech. See Ex. 44C, ¶¶ 99-100.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 405 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 405 of the Amended Complaint and, therefore, denies the same.

406. The Smartech Accused Products are sold after importation into the United States. For example, a receipt from smartech.com showing the purchase of a Smartech JS-10000, JS15000, JS-15000N, JS-8000N, and TECH-5000P at an address in the United States is attached as Ex. 88. The Smartech Accused Products are also sold by Respondent Walmart. See, e.g., https://www.walmart.com/ip/Smartech-JS-15000N-15000-mAh-Lithium-Powered-VehicleJump-Starter-and-Power-Bank-Starter-and-Power-Bank/286772303

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 88, which on its face includes an email. The allegations in ¶ 406 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 406 of the Amended Complaint and, therefore, denies the same.

407. The packaging of the Smartech Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 99 (citing Ex. 88).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 407 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 407 of the Amended Complaint and, therefore, denies the same.

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D. Weego Brands

1. Weego

408. On information and belief, model numbers 22, 44.1, 66.2, 154, 22s (collectively, the "Weego Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Weego. See Ex. 44C, ¶¶ 127-128.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 408 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 408 of the Amended Complaint and, therefore, denies the same.

409. On information and belief, products sold under the brand Weego are manufactured by and/or imported for sale by Respondents Paris Corporation and Carku. See Ex. 44C, ¶¶ 127128.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 409 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 409 of the Amended Complaint and, therefore, denies the same.

410. The Weego Accused Products are sold after importation into the United States. For example, a receipt from myweego.com showing the purchase of a Weego 22s at an address in the United States is attached as Ex. 101. The Weego Accused Products are also sold by Respondent Walmart. See, e.g., https://www.walmart.com/ip/Weego-22s-Jump-Starter-1700-Peak-300-Cranking-Amps-Simple-and-Safe-Lithium-Ion-Water-Resistant-USA-Designed-andEngineered/337164284

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 101, which on its face includes an email. The allegations in ¶ 410 concern another party and are

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not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 410 of the Amended Complaint and, therefore, denies the same.

411. The packaging of the Weego Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 127 (citing Ex. 101).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 411 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 411 of the Amended Complaint and, therefore, denies the same.

E. Winplus Brands

1. Type S

412. On information and belief, model numbers AC56388-BLK, AC56789-AM, AC56794-1 (collectively, the "Type S Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Type S. See Ex. 44C, ¶¶ 118-119.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 412 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 412 of the Amended Complaint and, therefore, denies the same.

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413. On information and belief, products sold under the brand Type S are manufactured by and/or imported for sale by Respondents Shenzhen Winplus**[Respondent Removed]** and Winplus North America. See Ex. 44C, ¶¶ 118-119.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 413 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 413 of the Amended Complaint and, therefore, denies the same.

414. The Type S Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Type S AC56388-BLK at an address in the United States is attached as Ex. 96. The Type S Accused Products are also available from Respondent Walmart. See, e.g., https://www.walmart.com/ip/Type-S-Lithium-Jump-Starter- Portable-Power-Bank-w-Built-in-Wireless-Charging/571679308

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 96, which on its face includes a receipt. The allegations in ¶ 414 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 414 of the Amended Complaint and, therefore, denies the same.

415. The packaging of the Type S Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 118 (citing Ex. 96).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 415 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 415 of the Amended Complaint and, therefore, denies the same.

2. Winplus

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416. On information and belief, model numbers AC530171-1, AC55717-1, AC559296/1, AC55929-60, (collectively, the "Winplus Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Winplus. See Ex. 44C, ¶¶ 129-130.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 416 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 416 of the Amended Complaint and, therefore, denies the same.

417. On information and belief, products sold under the brand Winplus are manufactured by and/or imported for sale by Respondents Shenzhen Winplus**[Respondent Removed]** and Winplus North America. See Ex. 44C, ¶¶ 129-130.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 417 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 417 of the Amended Complaint and, therefore, denies the same.

418. The Winplus Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Winplus AC55717-1 at an address in the United States is attached as Ex. 100. On information and belief, the Winplus Accused Products are also sold by Respondents Walmart, Pep Boys**[Respondent Removed]**, Advanced Auto, and AutoZone. See http://winplus.com/usa/support/retail-locations/

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 100, which on its face includes photos and online listings. The allegations in ¶ 418 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or

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information to form a belief as to the allegations in ¶ 418 of the Amended Complaint and, therefore, denies the same.

419. The packaging of the Winplus Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 129 (citing Ex. 100).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 419 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 419 of the Amended Complaint and, therefore, denies the same.

F. Great Neck Brands

1. OEM Tools

420. On information and belief, model numbers 24474 (8000mAh), 24475 (12000mAh), and 24476 (18000mAh) (collectively, the "OEM Tools Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name OEM Tools. See Ex. 44C, ¶¶ 80-81.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 420 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 420 of the Amended Complaint and, therefore, denies the same.

421. On information and belief, products sold under the brand OEM Tools are manufactured by and/or imported for sale by Respondent Great Neck. See Ex. 44C, ¶¶ 80-81.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 421 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 421 of the Amended Complaint and, therefore, denies the same.

422. The OEM Tools Accused Products are sold after importation into the United States. For example, a receipt from Autozone.com showing the purchase of a OEM Tools 24474 (8000mAh) at an address in the United States is attached as Ex. 80.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 80, which on its face includes a receipt. The allegations in ¶ 422 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 422 of the Amended Complaint and, therefore, denies the same.

423. The packaging of the OEM Tools Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 80 (citing Ex. 80).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 423 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 423 of the Amended Complaint and, therefore, denies the same.

G. ThiEye Brands

1. Buture

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424. On information and belief, model numbers BR300 and BR500 (collectively, the "Buture Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Buture. See Ex. 44C, ¶¶ 27-28.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 424 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 424 of the Amended Complaint and, therefore, denies the same.

425. On information and belief, products sold under the brand Buture are manufactured by and/or imported for sale by Respondent ThiEye Technologies. See Ex. 44C, ¶¶ 27-28.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 425 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 425 of the Amended Complaint and, therefore, denies the same.

426. The Buture Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Buture BR500 at an address in the United States is attached as Ex. 56.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 56, which on its face includes a receipt. The allegations in ¶ 426 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 426 of the Amended Complaint and, therefore, denies the same.

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427. The packaging of the Buture Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 27 (citing Ex. 56).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 427 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 427 of the Amended Complaint and, therefore, denies the same.

2. Fnnemge

428. On information and belief, model number Q9C (the "Fnnemge Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Fnnemge. See Ex. 44C, ¶¶ 45-46.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 428 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 428 of the Amended Complaint and, therefore, denies the same.

429. On information and belief, products sold under the brand Fnnemge are manufactured by and/or imported for sale by Respondents ThiEye and Hangchebao. See Ex. 44C, ¶¶ 45-46.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 429 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 429 of the Amended Complaint and, therefore, denies the same.

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430. The Fnnemge Accused Product is sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Fnnemge Q9C at an address in the United States is attached as Ex. 123.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 123, which on its face includes a receipt. The allegations in ¶ 430 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 430 of the Amended Complaint and, therefore, denies the same.

431. The packaging of the Fnnemge Accused Product indicates that the product is "Made in China." See Ex. 44C, ¶¶ 45; Ex. 123.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 431 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 431 of the Amended Complaint and, therefore, denies the same.

3. Utrai

432. On information and belief, model number Jstar One (the "Utrai Accused Product") is manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Utrai. See Ex. 44C, ¶¶ 120-121.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 432 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 432 of the Amended Complaint and, therefore, denies the same.

433. On information and belief, products sold under the brand Utrai are manufactured by and/or imported for sale by Respondent ThiEye Technologies. See Ex. 44C, ¶¶ 120-121.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 433 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 433 of the Amended Complaint and, therefore, denies the same.

434. The Utrai Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Utrai Jstar One at an address in the United States is attached as Ex. 127.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 127, which on its face includes photos, online listings and a trademark registration. The allegations in ¶ 434 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 434 of the Amended Complaint and, therefore, denies the same.

435. The packaging of the Utrai Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 120; Ex. 127.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 435 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information

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to form a belief as to the allegations in ¶ 435 of the Amended Complaint and, therefore, denies the same.

H. Energen & Performance Tool Brands

1. Energen

436. On information and belief, model numbers AL12 and AL6 (collectively, the "Energen Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Energen. See Ex. 44C, ¶¶ 37-38.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 436 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 436 of the Amended Complaint and, therefore, denies the same.

437. On information and belief, products sold under the brand Energen are manufactured by and/or imported for sale by Respondent Energen. See Ex. 44C, ¶¶ 37-38.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 437 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 437 of the Amended Complaint and, therefore, denies the same.

438. The Energen Accused Products are sold after importation into the United States. For example, a receipt from myenergen.com showing the purchase of an Energen AL12 at an address in the United States is attached as Ex. 61. The Energen Accused Products are also sold by

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Respondents Best Buy and Walmart. See https://myenergen.com/resellers/

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 61, which on its face includes an email. The allegations in ¶ 438 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 438 of the Amended Complaint and, therefore, denies the same.

439. The packaging of the Energen Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶ 37 (citing Ex. 61).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 439 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 439 of the Amended Complaint and, therefore, denies the same.

2. Performance Tool

440. On information and belief, model number W16750 (collectively, the "Performance Tool Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Performance Tool. See Ex. 44C, ¶¶ 82-83.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 440 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 440 of the Amended Complaint and, therefore, denies the same.

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441. On information and belief, products sold under the brand Performance Tool are manufactured by and/or imported for sale by Respondent Wilmar Corporation **[Respondent Removed]** and Chao Fung Trading Co.**[Respondent Removed]**. See Ex. 44C, ¶¶ 82-83.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 441 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 441 of the Amended Complaint and, therefore, denies the same.

442. The Performance Tool Accused Products are sold after importation into the United States. For example, a receipt from carid.com showing the purchase of a Performance Tool W16750 at an address in the United States is attached as Ex. 81. The Performance Tool Accused Products are also sold by RespondentWalmart. See, e.g., https://www.walmart.com/ip/Performance-Tool-W1665-900-amp-Jump-StarterInflator/55558632

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 81, which on its face includes an email. The allegations in ¶ 442 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 442 of the Amended Complaint and, therefore, denies the same.

443. The packaging of the Performance Tool Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶¶ 82-83 (citing Ex. 81).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 443 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 443 of the Amended Complaint and, therefore, denies the same.

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I. Halo Brands

1. HALO

444. On information and belief, model numbers Bolt 44000, Bolt 57720, Bolt 58830, Bolt Flashlight, and Bolt Wireless (collectively, the "Halo Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Halo. See Ex. 44C, ¶¶ 54-55.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 444 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 444 of the Amended Complaint and, therefore, denies the same.

445. On information and belief, products sold under the brand Halo are manufactured by and/or imported for sale by Respondents Carku, ZhongKang**[Respondent Removed]**, and Halo2Cloud. See Ex. 44C, ¶¶ 54-55.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 445 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 445 of the Amended Complaint and, therefore, denies the same.

446. The Halo Accused Products are sold after importation into the United States. For example, a receipt from Zagg.com showing the purchase of a Halo Bolt 44000 at an address in the United States is attached as Ex. 69.

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RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 69, which on its face includes an email. The allegations in ¶ 446 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 446 of the Amended Complaint and, therefore, denies the same.

447. The packaging of the Halo Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶¶ 54 (citing Ex. 69).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 447 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 447 of the Amended Complaint and, therefore, denies the same.

J. Clore Brands

1. Jump-N-Carry

448. On information and belief, model numbers JNC325 and JNC345 (collectively, the "Jump-N-Carry Accused Products") are manufactured outside the United States and sold for importation into the United States, imported into the United States, and/or sold within the United States after importation under the brand name Jump-N-Carry. See Ex. 44C, ¶¶ 61-62.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 448 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 448 of the Amended Complaint and, therefore, denies the same.

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449. On information and belief, products sold under the brand Jump-N-Carry are manufactured by and/or imported for sale by Respondent Clore Automotive. See Ex. 44C, ¶¶ 61-62.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 449 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 449 of the Amended Complaint and, therefore, denies the same.

450. The Jump-N-Carry Accused Products are sold after importation into the United States. For example, a receipt from Amazon.com showing the purchase of a Jump-N-Carry JNC345 at an address in the United States is attached as Ex. 107.

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 107, which on its face includes a receipt. The allegations in ¶ 450 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 450 of the Amended Complaint and, therefore, denies the same.

451. The packaging of the Jump-N-Carry Accused Products indicates that the products are "Made in China." See Ex. 44C, ¶¶ 61 (citing Ex. 107).

RESPONSE: Schumacher admits that the Amended Complaint is accompanied by Ex. 44C, which on its face a declaration of Anne E. Hurst. The allegations in ¶ 451 concern another party and are not directed to Schumacher. Schumacher lacks sufficient knowledge or information to form a belief as to the allegations in ¶ 451 of the Amended Complaint and, therefore, denies the same.

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VIII. HARMONIZED TARIFF SCHEDULE ITEM NUMBERS

452. The Accused Products are classified under at least the following subheadings of the Harmonized Tariff Schedule of the United States: 8504.40 (static converters) 8506.50 (lithium batteries); 8507.10, 8507.60 (lithium-ion electric storage batteries); 8511.40, 8511.50 (starter motors and generators), 8516.60, 8516.71 (ovens, coffee or tea makers); 8539.50.00 (LED lamps). These classifications are exemplary in nature and not intended to restrict the scope of any exclusion order or other remedy ordered by the Commission.

RESPONSE: Schumacher denies the statements and allegations contained in ¶ 452 of the Amended Complaint to the extent that they contain opinions and legal arguments rather than factual assertions and, therefore, require no response. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining factual allegations in ¶ 452 of the Amended Complaint and, therefore, denies the same.

IX. DOMESTIC INDUSTRY

453. As required by 19 U.S.C. § 1337(a)(2), a domestic industry, as defined by 19 U.S.C. § 1337(a)(3), exists in the United States with respect to the Asserted Patents. Since its founding in 1914 with the development of battery corrosion preventative products in Cleveland, Ohio, where NOCO remains headquartered to this day, NOCO continues to research, develop, manufacture, and sell innovative battery-related products.

RESPONSE: Schumacher denies the statements and allegations contained in ¶ 453 of the Complaint to the extent that they contain opinions and legal arguments rather than factual assertions and, therefore, require no response. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining factual allegations in ¶ 453 of the Complaint and, therefore, denies the same.

A. Technical Prong

454. NOCO has, and continues to make, significant and substantial investments in plant and equipment, labor and capital, and engineering and research and development with respect to the products that practice one or more claims of the Asserted Patents ("NOCO Domestic Industry

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Products"), including all six of the NOCO Boost® jump starter models. The NOCO Boost® jump starters practice at least the following claims of the Asserted Patents shown in Table 4:

Asserted Patent	Exemplary DI Claim(s)	Exemplary DI Product
9,007,015	1	GB40
10,604,024	1, 29, 30	GB40

Table 4. Asserted Patents Practiced by Domestic Industry Products

RESPONSE: Schumacher denies the statements and allegations contained in ¶ 454 of the Complaint to the extent that they contain opinions and legal arguments rather than factual assertions and, therefore, require no response. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining factual allegations in ¶ 454 of the Amended Complaint and, therefore, denies the same.

455. The NOCO Domestic Industry Products all practice the claims of the Asserted Patents in the same manner. Claim charts demonstrating how the representative NOCO Domestic Industry Product practices these claims are attached as Confidential Exhibit 10C. This claim chart provides a basis for the domestic industry relating to both the '015 and '024 Patents.

RESPONSE: Schumacher admits Confidential Exhibit 10C, on its face, purports to be a copy of claim charts. Schumacher states that the allegations contained in ¶ 455 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Schumacher denies the statements and allegations contained in ¶ 455 of the Amended Complaint to the extent that they contain opinions and legal arguments rather than factual assertions and, therefore, require no response. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining allegations in ¶ 455 of the Amended Complaint and, therefore, denies the same.

456. The Asserted Trademarks appear in NOCO's website marketing materials and product information. See Ex. 8 and 104. This use of the Asserted Trademarks in commerce provides a basis for the domestic industry relating to both the '656 and '749 Trademarks.

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RESPONSE: Schumacher admits Confidential Exhibit 10C, on its face, purports to be a copy of claim charts. Schumacher states that the allegations contained in ¶ 456 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Schumacher states that the allegations contained in ¶ 456 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining allegations in ¶ 456 of the Amended Complaint and, therefore, denies the same.

B. Economic Prong

457. NOCO conducts all of its engineering, research and development, product design, testing, and sample construction in the United States. As such, NOCO has made significant investments in plant and equipment, labor and capital, and substantial investments in engineering, research and development with respect to the Asserted Patents and Asserted Trademarks in the United States, satisfying the requirements of 19 U.S.C. § 337(a)(3)(A)-(C). NOCO has invested, and continued to invest, in the United States millions of dollars per year in activities related to the design, engineering, development, testing, marketing, distribution, customer service, and warranty fulfillment relating to the NOCO Domestic Industry Products.

RESPONSE: Schumacher states that the allegations contained in ¶ 457 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Schumacher denies the statements and allegations contained in ¶ 457 of the Amended Complaint to the extent that they contain opinions and legal arguments rather than factual assertions and, therefore, require no response. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining allegations in ¶ 457 of the Amended Complaint and, therefore, denies the same.

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458. NOCO's headquarters in Glenwillow, Ohio houses NOCO's sales and marketing department, and serves as the main distribution center for North America. NOCO conducts product testing, compliance activities, and other technical support the Glenwillow facility. Accompanying this Complaint as Confidential Exhibit 105C is the Declaration of Jeffery Weiner, which provides information about NOCO's investments in connection with the NOCO Domestic Industry Products. Ex. 105C (DI Dec.) at ¶¶16-35.

RESPONSE: Schumacher admits Confidential Exhibit 105C, on its face, purports to be a copy of Declaration of Jeffery Weiner. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining allegations in ¶ 458 of the Amended Complaint and, therefore, denies the same.

459. NOCO conducts its design, research, and development activities at its facility in Peoria, Arizona. Id. at ¶13. NOCO conducts additional product design activities at its facility in Tempe, Arizona. Id. at ¶ 14.

RESPONSE: Schumacher lacks knowledge or information sufficient to form a belief as to the allegations in ¶ 459 of the Amended Complaint and, therefore, denies the same.

460. NOCO has also employed significant labor and capital with respect to the NOCO Domestic Industry Products. See Ex. 105C at ¶¶ 22-30.

RESPONSE: Schumacher admits Exhibit 105C, on its face, purports to include NOCO's labor and capital employment. Schumacher states that the allegations contained in ¶ 460 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining allegations in ¶ 460 of the Amended Complaint and, therefore, denies the same.

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461. The first NOCO Boost® jump starter was introduced in 2014, and NOCO has continually improved the product since then. Notably, NOCO's spending on research and development has increased in each of the past three years. Ex. 105C at ¶33. From 2017 to the present, NOCO has paid several million dollars in payroll to engineering and technical personnel in the United States, whose employment pertains to the engineering and technical aspects of the Boost® product line, including the patented subject matter. Id. at ¶34. NOCO has also invested in customer-specific design projects.

RESPONSE: Schumacher admits Exhibit 105C, on its face, purports to include NOCO's spending on research and development. Schumacher denies the statements and allegations contained in ¶ 461 of the Amended Complaint to the extent that they contain opinions and legal arguments rather than factual assertions and, therefore, require no response. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining allegations in ¶ 461 of the Amended Complaint and, therefore, denies the same.

462. Since 2016 the majority of NOCO's revenue has been derived from sales of its Boost® line of jump starters. Id. at ¶15.

RESPONSE: Schumacher lacks knowledge or information sufficient to form a belief as to the allegations in ¶ 462 of the Amended Complaint and, therefore, denies the same.

X. RELATED LITIGATION

463. As of the date of the filing of this complaint, there have been 20 lawsuits involving the '015 Patent in U.S. District Courts. A chart outlining this litigation and its status is included as Ex. 108. The '015 Patent is also involved in two pending Inter Partes Review proceedings pending before the Patent Trial and Appeal Board ("PTAB") of the United States Patent and Trademark Office. One was filed by Carku (IPR2020-00944) on May 14, 2020 and the PTAB has instituted review. The other was filed by Shenzhen Mediatek Tong Technology Co, Ltd. on July 29, 2020; NOCO filed its preliminary response to the petition on December 16, 2020 and the PTAB's decision on whether or not to institute review is expected by March 2021.

RESPONSE: Schumacher admits Exhibit 108, on its face, purports to be a copy of chart outlining litigations. Subject to the foregoing, Schumacher lacks knowledge or information

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sufficient to form a belief as to the remaining allegations in ¶ 463 of the Amended Complaint and, therefore, denies the same.

464. There has been no litigation involving the '024 Patent.

RESPONSE: Schumacher lacks knowledge or information sufficient to form a belief as to the allegations in ¶ 464 of the Amended Complaint and, therefore, denies the same.

465. As of the date of filing the complaint, there have been thirteen district court actions involving the Asserted Trademarks. See Ex. 109. There have been no proceedings before the PTAB.

RESPONSE: Schumacher admits Exhibit 109, on its face, purports to include district court actions involving the Asserted Trademarks. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining allegations in ¶ 465 of the Amended Complaint and, therefore, denies the same.

466. Other than the litigation specified above, to Complainant's knowledge, the Asserted Patents and Asserted Trademarks are not and have not been the subject of any current or prior litigation.

RESPONSE: Schumacher lacks knowledge or information sufficient to form a belief as to the allegations in ¶ 466 of the Amended Complaint and, therefore, denies the same.

XI. GEO

467. A general exclusion order is needed to prevent the circumvention of an order limited to the Proposed Respondents due to the widespread pattern of infringement, as well as the difficulty in identifying the source of the Accused Products. 19 U.S.C. § 1337 (d)(2). This is evidenced by the fact that Accused Products continue to enter the market despite NOCO's aggressive ongoing enforcement measures.

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RESPONSE: Schumacher states that the allegations contained in ¶ 467 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Schumacher denies the statements and allegations contained in ¶ 467 of the Amended Complaint to the extent that they contain opinions and legal arguments rather than factual assertions and, therefore, require no response. Schumacher denies that it has engaged in any infringement as alleged by the Complainant.

468. Starting in 2014, NOCO began noticing the appearance of the Accused Products in the marketplace. NOCO responded by filing lawsuits against five foreign entities that were offering infringing jump starters on Amazon.com. Since then, NOCO has filed sixteen additional lawsuits, including suits in Canada, the United Kingdom and Germany. As a result of these efforts, NOCO secured a permanent injunction against two of the foreign entities barring them from selling or offering to sell jump starters that infringe NOCO's '015 patent and entered into a settlement agreement with a third foreign entity providing a substantial payment for past damages and a license for future sales. The remaining suits are pending.

RESPONSE: Schumacher lacks knowledge or information sufficient to form a belief as to the allegations in ¶ 468 of the Amended Complaint and, therefore, denies the same.

469. Despite these efforts, and successful litigation outcomes, NOCO continues to notice new market entrants selling jump starters with the same features as the NOCO Boost® products. NOCO vigilantly monitors Amazon.com listings and works with Amazon to remove listings for infringing products. NOCO estimates that in the past two years, it has had to file hundreds of takedown notices with Amazon. NOCO also filed a lawsuit against numerous defendants, including named Respondents Shenzhen Valuelink, Aukey**[Respondent Removed]**, Shenzhen Mediatek, Gooloo, Guangzhou Unique Electronics**[Respondent Removed]**, alleging that these companies, inter alia, manipulated Amazon.com algorithms, which determine the product that will receive the "Amazon's Choice" Badge, such that defendants' products would receive the "Amazon's Choice" Badge instead of NOCO. See The NOCO Company v. Shenzhen Valuelink E-Commerce Co., Ltd., et al., N.D. Ohio, No. 1:20-cv-00049-SO, (Jan. 9, 2020).

RESPONSE: Schumacher states that the allegations contained in ¶ 469 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any

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response is required, denies the same. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining allegations in ¶ 469 of the Amended Complaint and, therefore, denies the same.

470. In pursuit of these enforcement efforts, NOCO has expended significant employee time in addition to legal fees. Through continuous monitoring, NOCO employees identify infringing products or abuse (e.g., manipulation of the Amazon platform) weekly, sometimes daily.

RESPONSE: Schumacher states that the allegations contained in ¶ 470 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining allegations in ¶ 470 of the Amended Complaint and, therefore, denies the same.

471. In addition to products infringing the Asserted Patents, NOCO regularly sees 1) unauthorized use of NOCO trademarks; 2) unauthorized use of NOCO copyrighted images - in whole, or in part, meaning an entity has slightly modified a NOCO image to use with their product; 3) copying NOCO content with a similar look and stylization. For example, the FCOEnegy website (Ex. 31) uses a photo copied from the NOCO website that includes NOCO-branded jumper cables:

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CONTAINS SCHUMACHER CONFIDENTIAL BUSINESS INFORMATION – SUBJECT TO PROTECTIVE ORDER

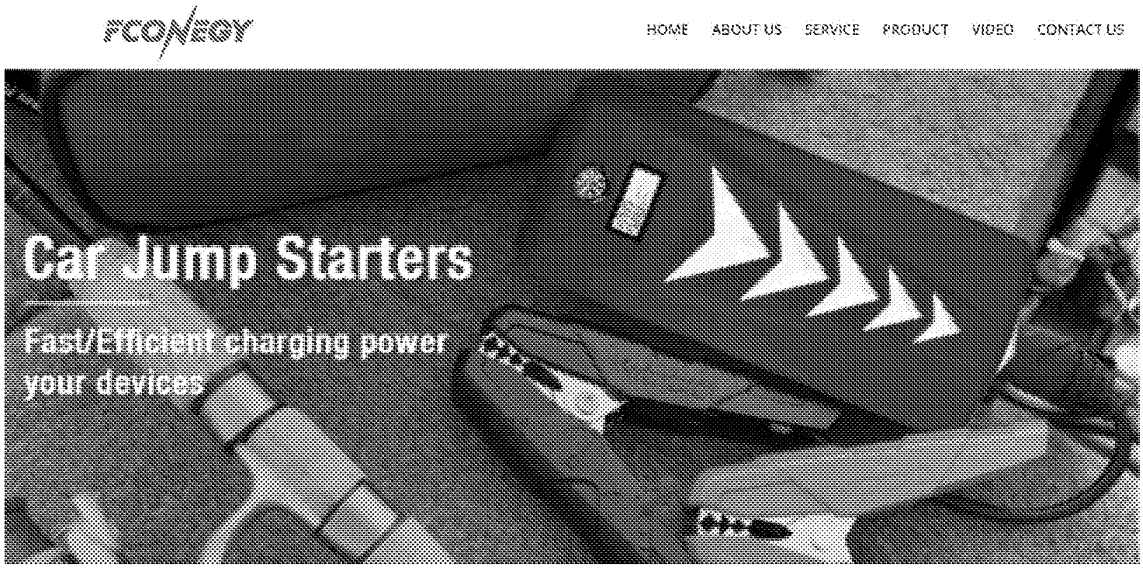


Fig. 6- Excerpt from FCOEngergy website, Ex. 31



Fig. 7- Photo from NOCO Website's HD Boost Battery Clamp Listing (Ex. 110)

RESPONSE: Schumacher admits Exhibit 31, on its face, purports to be a snapshot of FCOEnegy website. Schumacher admits Exhibit 110, on its face, purports to be a photo from NOCO Website's HD Boost Battery Clamp Listing. Schumacher states that the allegations contained in ¶ 471 of the Amended Complaint are conclusions of law as to which no response is

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necessary, but to the extent any response is required, denies the same. Schumacher denies the statements and allegations contained in ¶ 471 of the Amended Complaint to the extent that they contain opinions and legal arguments rather than factual assertions and, therefore, require no response. Subject to the foregoing, Schumacher lacks knowledge or information sufficient to form a belief as to the remaining allegations in ¶ 471 of the Amended Complaint and, therefore, denies the same.

472. Notably, NOCO has filed no less than 50 claims of infringement through Amazon Brand Registry for the Asserted Trademark ULTRASAFE.

RESPONSE: Schumacher lacks knowledge or information sufficient to form a belief as to the allegations in ¶ 472 of the Amended Complaint and, therefore, denies the same.

473. In terms of abuse or manipulation of the Amazon marketplace, NOCO has identified the following types of activities by proposed Respondents or other sellers of the Accused Products: 1) manipulating Amazon organic search ranking; 2) depressing legitimate products organic search ranking; 3) fake positive and negative reviews; 4) false product return claims to force a product takedown; 5) altering competitive products' browse nodes; 6) manipulating the Amazon Choice badge; and 7) altering NOCO content.

RESPONSE: Schumacher lacks knowledge or information sufficient to form a belief as to the allegations in ¶ 473 of the Amended Complaint and, therefore, denies the same.

474. Each instance of infringement or abuse is reported to NOCO's Global HQ, at which point it is either submitted to Amazon Brand Registry or becomes the subject of a lawsuit. For some types of infringement, NOCO has elected to stop using Brand Registry after finding that Amazon often simply modifies the listing with the infringing content; NOCO is now filing lawsuits in almost every instance. In 2020, NOCO enrolled in the Amazon SVS Program, at a cost of approximately $500,000 to help resolve these issues more efficiently. Registering with the SVS Program was critical as the number of infractions and instance of abuse were too high for the category manager assigned to NOCO to assist in resolution. The abuse by NOCO's competitors

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has become so prevalent that Amazon has placed the NOCO products into multiple exclusive protection programs.

RESPONSE: Schumacher lacks knowledge or information sufficient to form a belief as to the allegations in ¶ 474 of the Amended Complaint and, therefore, denies the same.

XII. REQUESTED RELIEF

475. Proposed Respondents have infringed and will continue to infringe the Asserted Patents and Asserted Trademarks as specified in Section VI above unless the Commission prohibits the importation into and sale within the United States after importation of the Accused Products.

RESPONSE: Schumacher admits Section VI of the Amended Complaint, on its face, purports to specify the Asserted Patents and Asserted Trademarks. Schumacher states that the allegations contained in ¶ 475 of the Amended Complaint are conclusions of law as to which no response is necessary, but to the extent any response is required, denies the same. Schumacher denies the statements and allegations contained in ¶ 475 of the Amended Complaint to the extent that they contain opinions and legal arguments rather than factual assertions and, therefore, require no response.

476. Accordingly, NOCO respectfully requests that the United States International Trade Commission:

a) Institute an immediate investigation pursuant to Section 337(b)(1) of the Tariff Act of 1930, as amended, 19 U.S.C. § 1337, into Proposed Respondents' violations of Section 337 arising from the sale for importation into the United States, importation, and/or sale within the United States after importation of certain portable battery jump starters and components thereof that infringe the Asserted Patents and/or Asserted Trademarks;

b) Schedule and conduct a hearing, pursuant to 19 U.S.C. § 1337 (c), for purposes of receiving evidence and hearing arguments concerning whether Proposed Respondents have violated Section 337 and, following the hearing, determine that Proposed Respondents have violated Section 337;

c) Issue a permanent general exclusion order, pursuant to 19 U.S.C. § 1337(d)(1), excluding from entry into the United States certain portable battery jump starters and components thereof that are imported, sold for importation, or sold after importation that infringe

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