

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WINPLUS NORTH AMERICA, INC.,
Petitioner,

v.

SHENZHEN CARKU TECHNOLOGY CO., LTD.
Patent Owner.

U.S. Patent No. 10,148,105 to Lei

Case No.: IPR2023-00368

**PETITION FOR *INTER PARTES* REVIEW
UNDER 35 U.S.C. § 311 *ET SEQ.* AND 37 C.F.R. § 42.100 *ET SEQ.***

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List of Exhibits

Exhibit No.	Description	Identifier
1001	Asserted U.S. Patent No. 10,148,105	The '105 Patent
1002	Prosecution history of the '105 Patent	'105 File History
1003	Prosecution history of the '105 Patent's reissue application No. 17/112,920 updated until Sept 30, 2022	Reissue History
1004	Declaration of Alex Z. Kattamis, Ph.D.	
1005	U.S. Patent Application Pub. No. 2016/0268645	Koebler
1006	Chinese Utility Model No. CN204905522U	Liu
1007	German Utility Model No. 202015103173	Zonesking
1008	U.S. Patent No. 8,493,021	Richardson
1009	U.S. Patent No. 9,007,015	Nook
1010	U.S. Patent No. 3,267,452	The '452 Patent
1011	U.S. Patent No. 2,659,042	The '042 Patent
1012	U.S. Patent No. 4,163,134	The '134 Patent
1013	Balakrishnan Article	
1014	U.S. Patent Pub. No. 2014/0368155	The '115 Publication
1015	U.S. Patent No. 3,950,688	The '688 Patent
1016	U.S. Patent No. 4,871,957	The '957 Patent
1017	U.S. Patent No. 5,909,103	The '103 Patent
1018	U.S. Patent No. 7,446,508	The '508 Patent
1019	U.S. Patent No. 7,592,778	The '778 Patent
1020	U.S. Patent No. 4,366,430	The '430 Patent
1021	U.S. Patent No. 4,463,402	The '402 Patent
1022	U.S. Patent No. 4,769,586	The '586 Patent
1023	U.S. Patent No. 4,488,147	The '147 Patent
1024	CV of Alex Z. Kattamis, Ph.D.	
1025	Shenzhen Carku v. Winplus, Case No. 8:21-cv-02021, Complaint w-exhibits (DN1)	
1026	Shenzhen Carku v. Winplus, Case No. 8:21-cv-02021, Stay Order (DN40)	

Mandatory Notices under 37 C.F.R. § 42.8

Real Party-In-Interest - 37 C.F.R. § 42.8(b)(1)

Petitioner certifies that Winplus North America, Inc. (“Petitioner”) is the real party-in-interest.

Related Matters - 37 C.F.R. § 42.8(b)(2)

Petitioner identifies the following related administrative matter: U.S. Patent No. 10,148,105 (“the ’105 Patent”) is currently the subject of a reissue proceeding – Application No. 17/112,920 filed on December 4, 2020. Petitioner will be filing a Motion to Stay this reissue proceeding pending this IPR.

Petitioner also identifies the following related judicial matter: *Shenzhen CARKU Technology Co., Ltd. v. Winplus North America, Inc.*, Case No. 8:21-cv-02021, pending in the Central District of California. The ’105 Patent is being asserted in this proceeding.

Lead and Back-Up Counsel - 37 C.F.R. § 42.8(b)(3)

The Petitioner identifies the following lead and back-up counsel:

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Pursuant to 37 C.F.R. § 42.10(b), an appropriate Power of Attorney is filed concurrently herewith.

Service Information - 37 C.F.R. § 42.8(b)(4)

Service information for lead and back-up counsel is provided in the designation of lead and back-up counsel above. Petitioner hereby consents to service by email at the following email address: HZNL0102IPR@brookskushman.com.

Fees - 37 C.F.R. § 42.15(a)

The filing fees associated with this Petition are being charged to Deposit

Account 023978. The Board is authorized to charge any additional fees or credit any refunds pertaining to this Petition to Deposit Account 023978.

I. Introduction

Petitioner requests *inter partes* review (“IPR”) of U.S. Patent No. 10,148,105 (EX1001, “the ’105 Patent”) pursuant to 35 U.S.C. §311 and 37 C.F.R. §42.100 *et seq.*

II. Requirements under 37 C.F.R. § 42.104

A. Grounds for Standing – 37 C.F.R. § 42.104(a)

Petitioner certifies the ’105 Patent is available for IPR and Petitioner is not barred or estopped from requesting IPR.

B. Challenged Claims – 37 C.F.R. § 42.104(b)(1) and (2)

Petitioner requests IPR for claims 1-10 as follows:

Ground	Basis¹	References	Claims Challenged
1	§ 103	Koebler (EX1005), Liu (EX1006), and the knowledge/skill of a POSITA	1-5, 7-9
2	§ 103	Zonesking (EX1007), Richardson (EX1008), and the knowledge/skill of a POSITA	1-7, 9-10
3	§ 103	Zonesking, Richardson, Liu, and the knowledge/skill of a POSITA	8

¹ Post-AIA applies.

Ground	Basis ¹	References	Claims Challenged
4	§ 103	Nook (EX1009), Zonesking, and the knowledge/skill of a POSITA	1-7, 9-10
5	§ 103	Nook, Zonesking, Liu, and the knowledge/skill of a POSITA	8

Each reference relied upon is prior art under 35 U.S.C. § 102 (post-AIA) and provides a reasonable likelihood that at least one Challenged Claim is unpatentable.

III. Level of Skill of POSITA

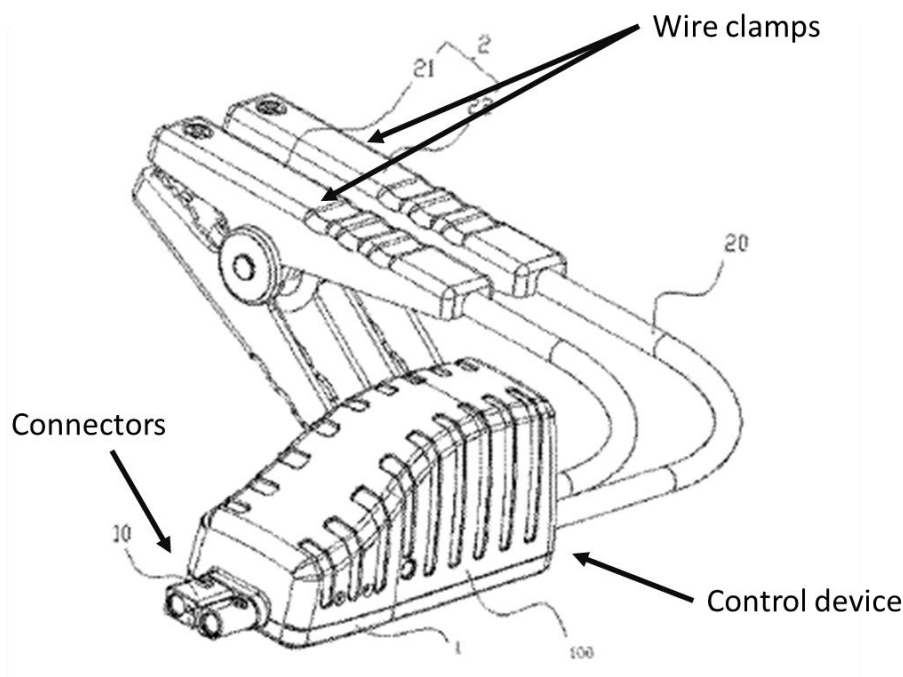
A POSITA would have had an undergraduate degree in electrical engineering (or equivalent subject) together with 2-3 years of experience in electrical systems. (EX1004, ¶¶45-48.) A POSITA would also have experience and be familiar with vehicle battery charging and jump starting. (*Id.* at ¶¶46.) This description is approximate and additional development experience could make up for less education and vice versa. (*Id.*)

IV. U.S. Patent No. 10,148,105 (EX1001, “the ’105 Patent”)

A. The ’105 Patent Disclosure

As shown below, the ’105 Patent discloses a battery clamp having first and second wire clamps and a control device for jump starting a battery. (EX1001, Abstract; EX1004, ¶31). The disclosure purportedly solves problems associated

with use of a lithium battery as a power supply with such a battery clamp – problems which could result in explosion of the battery. (*Id.* at 1:45-48; EX1004, ¶31.)



EX1004, Figure 2 of '105 Patent²

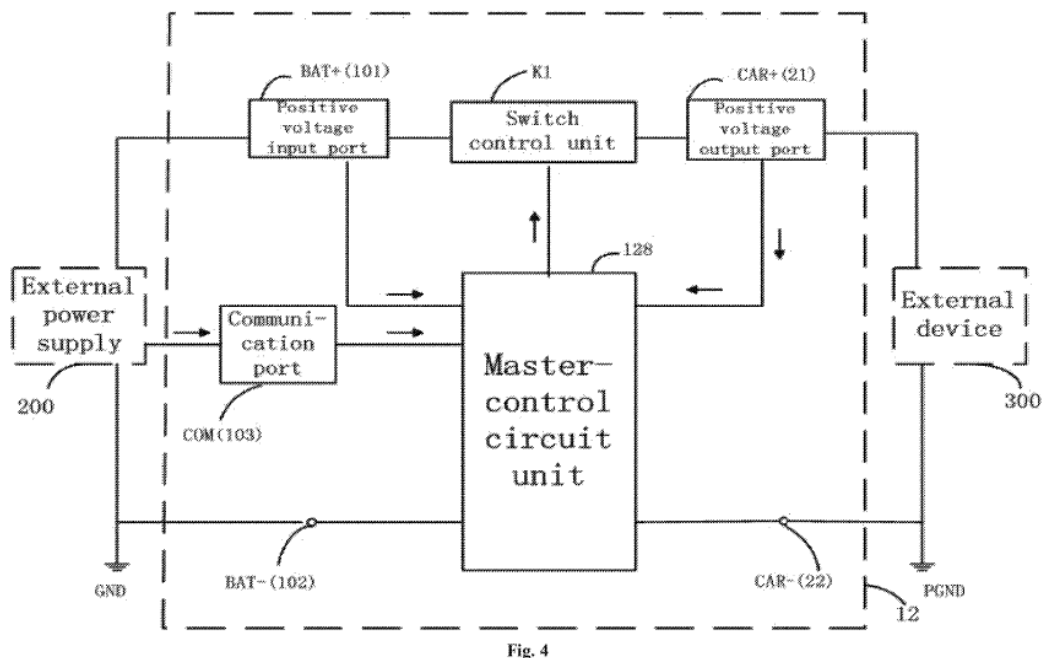
The battery clamp includes a control device 1 with wire clamps 2 and a connector 10 extending from either side. Wire clamps 21, 22 are positive and negative electrodes for connecting to the device to be charged. (EX1001, the '105 Patent at 4:10-22; EX1004, ¶33.)

The battery clamp monitors status information of the external power supply (e.g., temperature) and sends this information to the control device through a

² Annotations to figures added.

communication connector. (EX1001 at 9:61-10:9.) The control device uses this information in the decision process of whether to allow jump starting to occur. (*Id.*) For example, if the supply battery is overheating such that its temperature exceeds a threshold, the controller would prevent the supply of power to the external device. (*Id.*)

Figure 4 illustrates the master-control board of the control device of the purported invention. (EX1001, '105 Patent at 5:1-7.)



EX1001, Figure 4.

Figure 4 also illustrates the communication port through which the status information (e.g., temperature) of the external power supply is sent to the master-control circuit unit. (EX1001 at 5:32-34.) Based on the status information, the master-control circuit then directs the switch control unit to either allow or

prevent the flow of power to the external device. (*Id.* at 2:1-3; EX1004, ¶36.)

Other inputs to the master-control circuit include voltage and electric current, which the switch control circuit may utilize to control whether power is supplied. (EX1001 at 5:49-52; EX1004, ¶36.)

B. Prosecution History

1. Original Prosecution

Patent Owner filed U.S. Application No. of 15/245,146 (“the ’146 application”) on August 23, 2016. (EX1002 at 42). The ’146 application had 10 claims. (*Id.* at 20-22.) Claims 1-3 and 8-10 were rejected as anticipated by US 2007/0018609 to Yen. (EX1002 at 249-254.) The Examiner indicated claims 4-7 recited allowable subject matter. (*Id.* at 253.)

Patent Owner responded on April 9, 2018, amended claim 1 and argued it overcame Yen. (EX1002 at 260-269). Patent Owner argued Yen disclosed no communications connector and could not deliver an instantaneous starting current. (*Id.* at 267.) The claims were allowed. (*Id.* at 280-284.)

2. Reissue Prosecution

On December 4, 2020, Patent Owner filed broadening Reissue Application No. 17/112,920 (hereinafter “the ’920 application”). (EX1003 at 31-33.)

Patent Owner amended claims 1-4 and 6-7, cancelled claims 5 and 8-10, and added new claims 11-25. (EX1003 at 34-38.) The amendments removed limitations

including the control device “housing.” (*Id.* at 34.)

The PTO rejected all pending claims pursuant to the “original patent requirement” of 35 U.S.C. § 251, for claiming more than Patent Owner was entitled to claim. (*Id.* at 70.) All claims were additionally rejected as anticipated under 35 U.S.C. § 102 over both Takano (claims 1 and 2) and Hung (claims 16, 18-20 and 22-24) and/or rendered obvious under 35 U.S.C. § 103 over Richardson and Hung (claims 16 and 18-25), and Richardson, Hung and Takano (claims 1-4, 6-7 and 11-15). (EX1003 at 81-98.)

Patent Owner then again amended claim 1, cancelled claims 11-25, and added new claims 26-29. (*Id.* at 127.) Thus, claims 1-4, 6-7 and 26-29 remained. On September 9, 2022, a second Non-Final Office Action was issued, rejecting all pending claims 1-4, 6-7 and 26-29. (*Id.* at 146-171.) On September 30, 2022, Patent Owner filed an IDS citing more than 100 new references. (*Id.* at 186-190.) There has been no further activity as of the filing of this IPR.

V. State of the Art

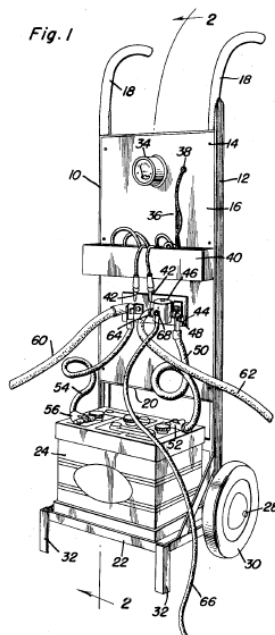
A. Vehicle Battery Jump Starters

Jumper cables are well known and include two wire clamps at each end – one set is colored red for attachment to positive terminals, and the others are black for attachment to negative terminals. (EX1004, ¶¶49-50; EX1003 at 164.) A direct

electrical connection is then made, allowing the vehicle to start. (*Id.*)



Jump starters that utilize their own battery (as opposed to another vehicle's battery) are also well known. (EX1004, ¶¶52-53.)



EX1011, Figure 1.

B. Potential Hazards of Jump Starting

Potential hazards associated when jump starting with conventional cables that

could include sparking when connecting a vehicle with a functioning battery to a discharged battery. (EX1012 at 1:5-40; EX1004, ¶¶54-57.) Sparking and potential ignition of gases could occur. (*Id.*) Accidental misconnection of jumper cables may also produce dangerous consequences – such as “severe damage to alternator systems, transistor radios, voltage regulators, ignition systems as well as the batteries.” (EX1010, 1:15-36.) Or accidental contacting of the positive and negative clamps, or reverse-polarity connection between vehicles, are additional known hazards. (EX1004, ¶56.)

The use of lithium ion (Li-ion) batteries has become more common in battery chargers. (EX1004, ¶57.) But Li-ion batteries have safety concerns like “thermal runaway,” which may cause the battery to explode. (*Id.*) To prevent this situation, it is well known that Li-ion batteries should be operated within a safe range of voltages and temperatures. (EX1013.) It is therefore common to monitor the status of Li-ion systems. (EX1004, ¶57.)

C. Controls to Prevent Hazards

Battery jump starters have long included controls to prevent, or terminate, battery charging so that any hazard is averted. (EX1004, ¶¶58-74.) For instance, control circuits may decide to terminate charging based on received supply battery voltage, the vehicle voltage, the current passing between the batteries or the temperature of the supply battery. (EX1004, ¶59.) Such “smart” or “intelligent”

battery jump starters could detect hazardous conditions prevent jump starting when a hazardous condition is detected. (See EX1006, Liu at Abstract; EX1014; EX1015 at 2:09-14; EX1016 at 1:7-10, 2:11-20, 10:52-54.)

Controls that monitor the temperature of Li-ion batteries were also well known. (EX1004, ¶61.) Detecting the temperature of the Li-ion battery pack during battery charging and adjusting the charging current based on temperature was also known. (See EX1018 at 3:58-4:8; 5:47-55, 7:38-51; EX1009 at 6:25-27; EX1008 at 2:64-66.)

1. Control Circuits on Conventional Jumper Cables

For vehicle battery-to-battery jumper cables control circuitry may be housed in the jumper cables themselves. (EX1004, ¶¶67-70; EX1020 at 1:33-45; Figs 3 and 4; EX1016 at 4:30-53 and 3:60-64.)

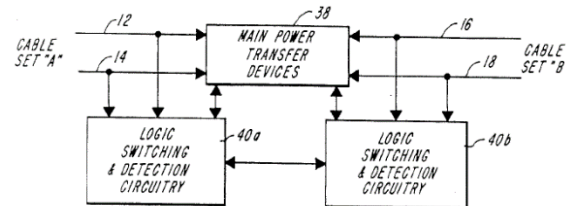
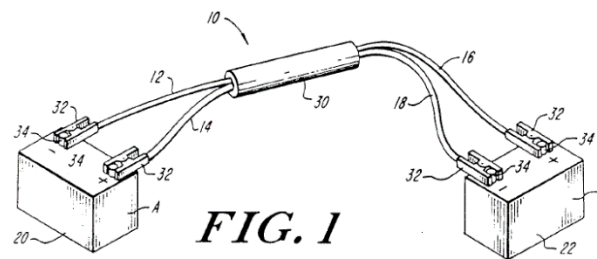
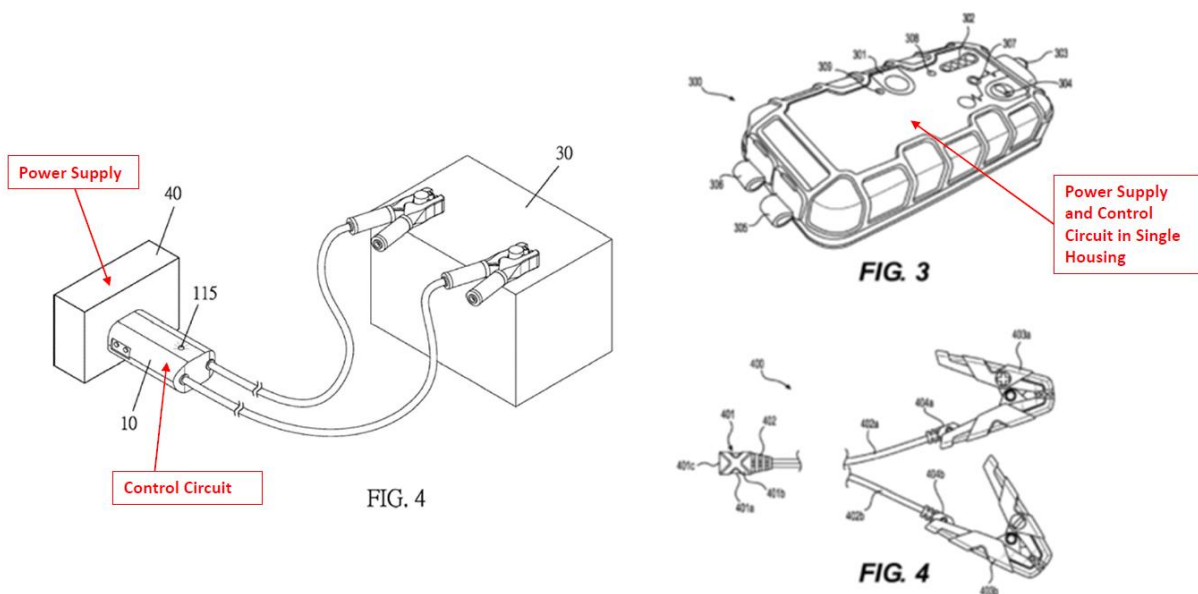


FIG. 2A

EX1020, Figure 1 and 2A.

2. Control Circuits in Jump Starters with External Batteries

For jumper starters utilizing external batteries, it is known the battery can either be: (1) enclosed in a housing with control circuitry, or (2) external from, but connected to, the control circuitry housing. (EX1004, ¶¶71-74.) Examples of both designs are shown below:



EX1007, Zonesking at Fig. 4³

EX1009, Nook at Figs. 3 and 4

Advantages to enclosing the battery and controller in the same housing may include: (1) fewer component parts and easier transportation; (2) less likely a component will be misplaced, thereby rendering the jumper cables useless; (3) more compact design. (EX1004, ¶¶73-74.) But disadvantages may include: (1) the jump starter cannot be used if the internal battery is depleted; or (2) complete replacement if *either* the power supply or control circuitry becomes defective. (*Id.*)

Advantages to not enclosing the battery and controller in the same housing may include: (1) if one power supply loses its charge, a second power supply can be connected – without waiting for the other to be re-charged; and (2) only a given

³ Unless indicated, annotations are added.

defective component needs to be replaced, not the entire jump starter. (EX1004, ¶74.)

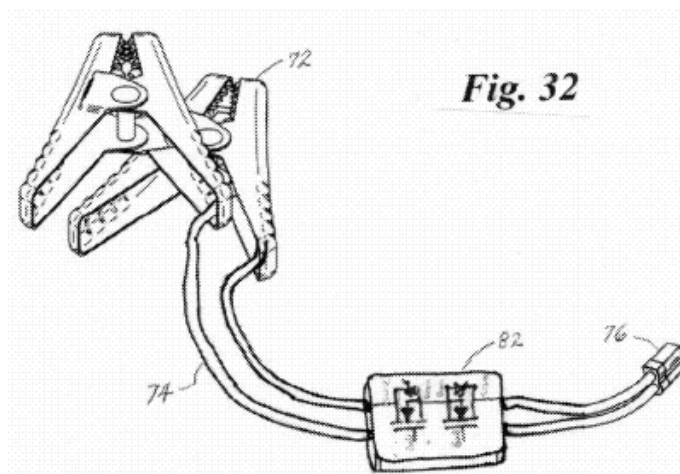
D. Indicator Lights and Alerts on Jump Starters

The use of buttons and warning alerts (e.g., buzzers, indicator lights) on battery jump starters was well-known at the time of the invention. (EX1004, ¶¶75-76.)

VI. Overview of Prior Art References

A. Koebler

Koebler was filed on March 13, 2015 and qualifies as prior art. Koebler's control apparatus includes hazard prevention mechanisms. (EX1005, Koebler at Abstract). Koebler's jumper system includes a control circuit enclosed within a housing. (EX1005, Koebler at [0068].) Wire clamps (72) and a connector (76) are located on either side of the housing.



EX1005, Koebler Figure 32.

Koebler monitors the supply battery's voltage and temperature to determine whether to provide jump start charging. (EX1005, Koebler at [0093].) Koebler's control circuit also includes "short circuit protection" and "protection from reverse polarity, high temperature, overvoltage, over-discharge voltage." (EX1005, Koebler at [0071].) A buzzing circuit sounds when the battery is not in a proper condition for jump starting. (*Id.* at [0116].)

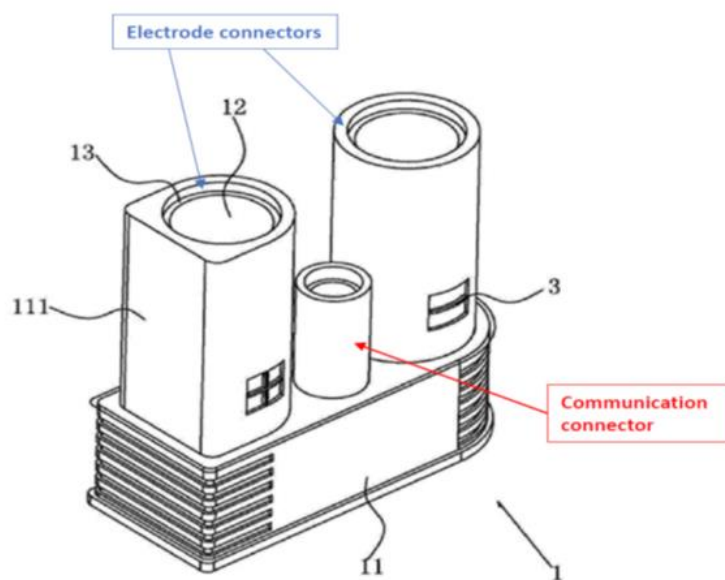
B. Richardson

Richardson issued on July 23, 2013 and qualifies as prior art. Richardson's "portable" apparatus supplies power to jump start a vehicle. (EX1008, Richardson at Abstract, 1:14-20, 1:33-37.) Richardson recognizes the hazards related to the use of conventional jumper cables. (EX1008, Richardson at 1:40-52.) To avoid these hazards, Richardson monitors parameters of both the supply battery and battery to be charged both prior to allowing for connection, to determine whether to terminate

the connection. (*Id.* at 1:57-67, 2:43-44, 2:64-66.) Richardson includes a connector (“sensor wiring harness”) which communicates the temperature data, monitored on the supply battery, to the control circuit. (*Id.*)

C. Liu

Liu issued or was published on December 23, 2015 and qualifies as prior art. (EX1006 at 12.) Lui’s connector permits connection of an external power supply to a control circuit for an “intelligent emergency automotive jump starter power supply.” (EX1006, Liu at 12.) Liu’s connector provides the supply battery’s temperature to the control circuit to determine if jump start charging should be permitted. (EX1006, Liu at [0026].) Liu’s connector, shown below, includes three terminals - two to connect to the electrodes of the power supply battery and a third connector for monitoring and sending the temperature status of the battery. (EX1006, Liu at Abstract.)



EX1006, Liu Figure 1

D. Zonesking

Zonesking patented/published on August 13, 2015, and thus qualifies as prior art. (EX1007 at 11.) Zonesking discloses a “smart jumper cable” for vehicles. (EX1007, Zonesking at [0001].) Zonesking describes potential damage that can occur to the supply batteries if among other things there is an improper connection to the vehicle. (*Id.* at [0003].) To protect the batteries, Zonesking’s control circuit includes “battery detection” logic to determine if jump starting should occur. (*Id.* at [0001].) Zonesking also describes the use of a supply battery voltage detector, the result of which is used in the decision process to connect the supply battery to the vehicle. (*Id.* at [0014].)

As shown below, Zonesking’s control circuit is not enclosed within the same

housing as the power supply. Instead, Zonesking's housing includes two electrodes at one end with wire clamps for attaching to the battery to be charged and a connector at the other end for connecting to an external power supply. (*Id.*)

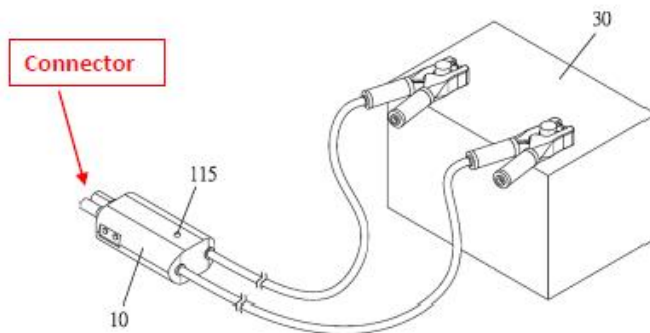


FIG. 3

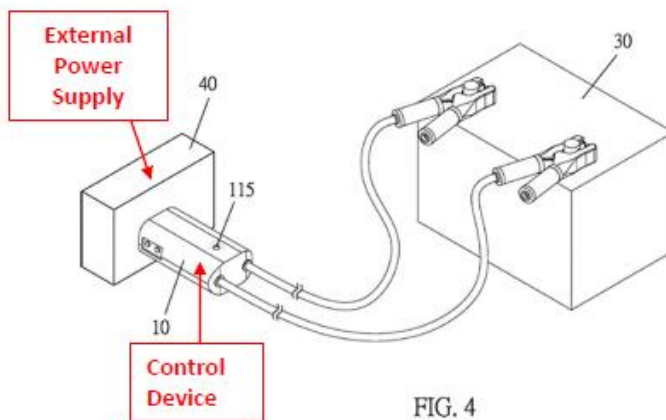


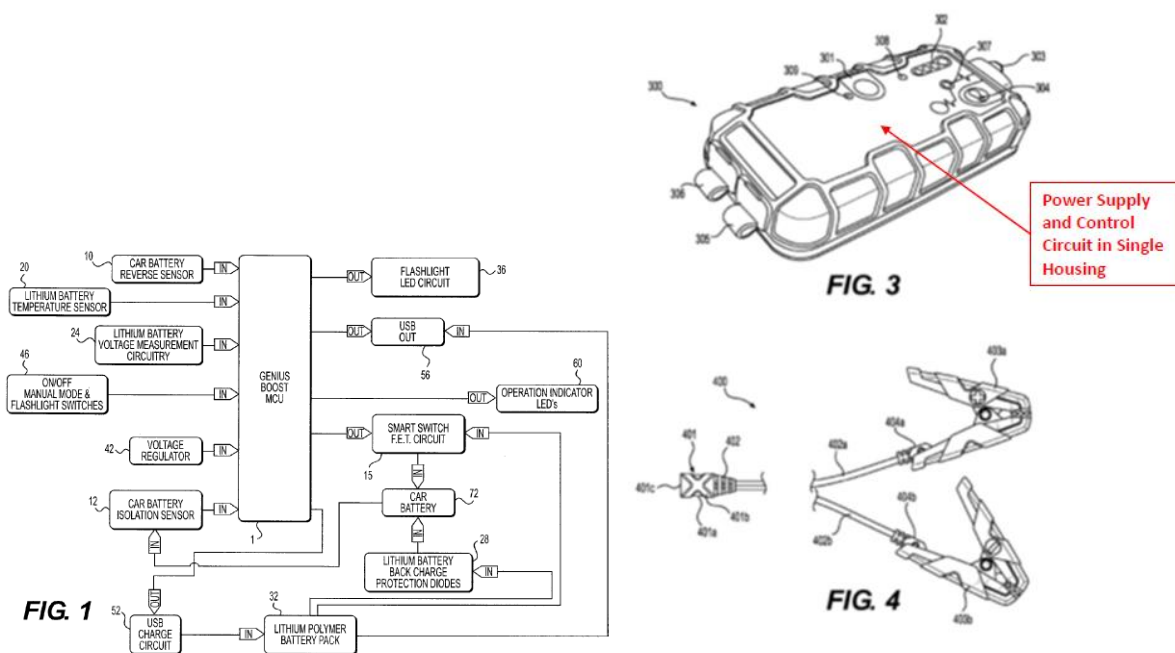
FIG. 4

Ex1007, Zonesking Figs. 3 and 4

E. Nook

Nook issued on April 14, 2015 and qualifies as prior art. (EX1009.) Nook discloses “[a] handheld device for jump starting a vehicle engine [that] includes a rechargeable lithium-ion battery pack and a microcontroller.” (*Id.* at Abstract).

Nook's battery pack and control circuit are both enclosed in a single housing. (*Id.* at Figures 3 and 4.) The control circuit can monitor various inputs from the power supply (e.g., voltage and temperature) to determine if charging should occur. (*Id.* at 3:16-36.)



EX1009, Nook Figures 1, 3 and 4

Nook's control circuit includes a polarity sensor and a temperature sensor which the microprocessor uses to determine if charging should occur. (*Id.* at 8:54-56, 4:38-45.)

VII. Unpatentability Grounds

Petitioner has a reasonable likelihood of proving unpatentability for each of the following grounds. 35 U.S.C. § 314(a); 37 C.F.R. § 42.104(b)(4).

A. Claims 1-5 and 7-9 are Obvious in View of Koebler, Liu, and Knowledge/Skill of POSITA

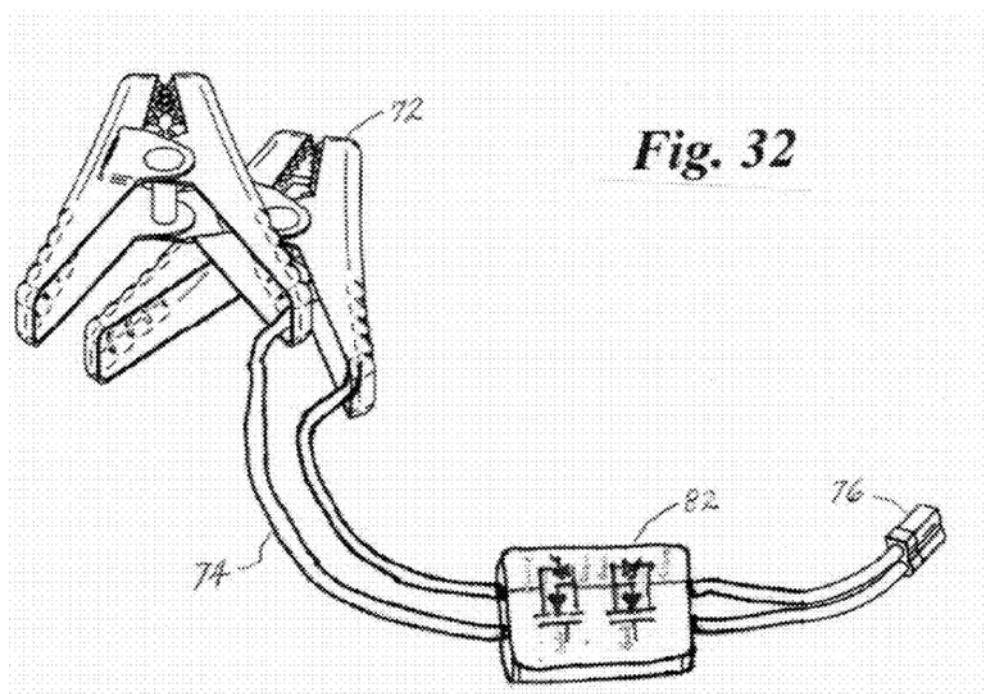
The combination of Koebler (EX1005) and Liu (EX1006), when considered in view of the knowledge of a POSITA, render claims 1-5 and 7-9 obvious. (See EX1004, ¶¶107-195.) Koebler teaches the claimed smart jump starter (“battery clamp”) for an external power supply that includes a housing for a master-control board, wire clamps for connection to an external device and a control circuit that determines whether power should be sent from the external power supply to the device based on status information (e.g., temperature) of the external battery. While Koebler does not expressly disclose a communication connector for sending the status information from the external battery to the control device, it would have been obvious to design it to do so in view of the teachings of Liu. Liu teaches a connector for a smart jump starter with an external power supply that has both electrode connections for power and a communications connector for sending status information.

1. Independent Claim 1

a. Limitation [1.0]

... A battery clamp for delivering an instantaneous starting current from an external power supply to an external device, the battery clamp comprising:

To the extent the preamble is limiting, Koebler teaches a battery clamp for delivering an instantaneous starting current from an external power supply to an external device. (EX1005 at [0112]; EX1004, ¶¶196-197.) Figures 30-32 of Koebler describe a battery clamp for jump starting an engine from an external power supply. (*Id.*)



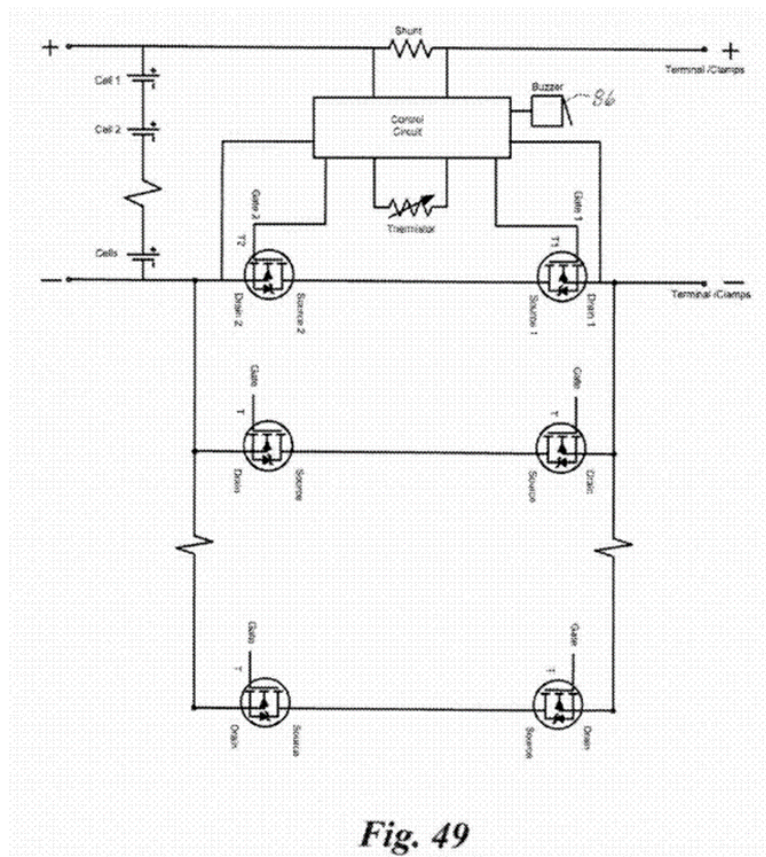
EX1005, Koebler Figure 32

b. Limitation [1.1]

... a control device, comprising:

Koebler discloses a control device. Koebler describes a control circuit located either “within the battery housing or the cable housing.” (EX1005, Koebler at [0116]; EX1004 at ¶¶111-114.) Koebler teaches that this control circuit protects

“against reverse polarity, overvoltage, over-discharge voltage, and excessively high temperature by opening the circuit to terminate the charging.” (*Id.*) The control circuit is schematically detailed in Koebler Fig. 49.

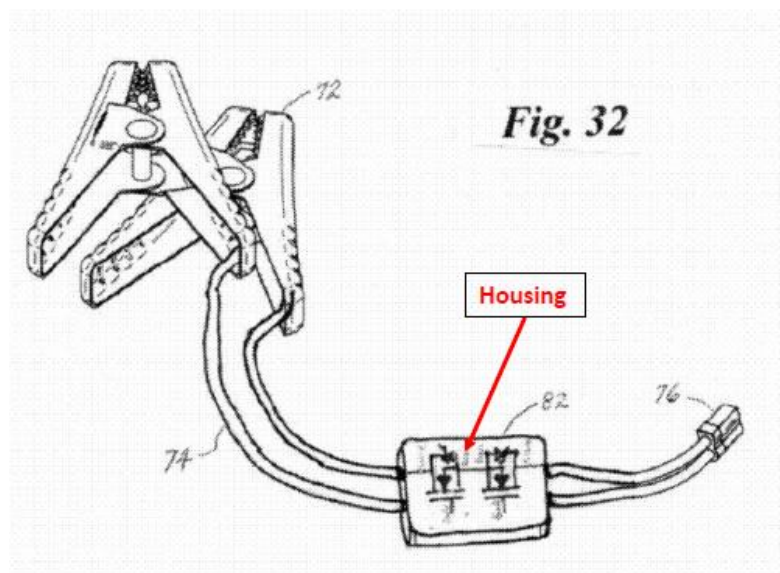


EX1005, Koebler Figure 49

c. Limitation [1.2]

... a housing

Koebler teaches that the control circuit board is located within a housing.
(EX1005, Koebler at [0116]; EX1004, ¶¶115-116.)



EX1005, Koebler Fig. 32

d. Limitation [1.3]

... a master-control board mounted within the housing; and

Koebler discloses a master-control board mounted within the housing. Koebler describes a control circuit board “which can be located within either the battery housing or the cable housing.” (EX1005, Koebler at [0116]; EX1004, ¶¶117-120.)

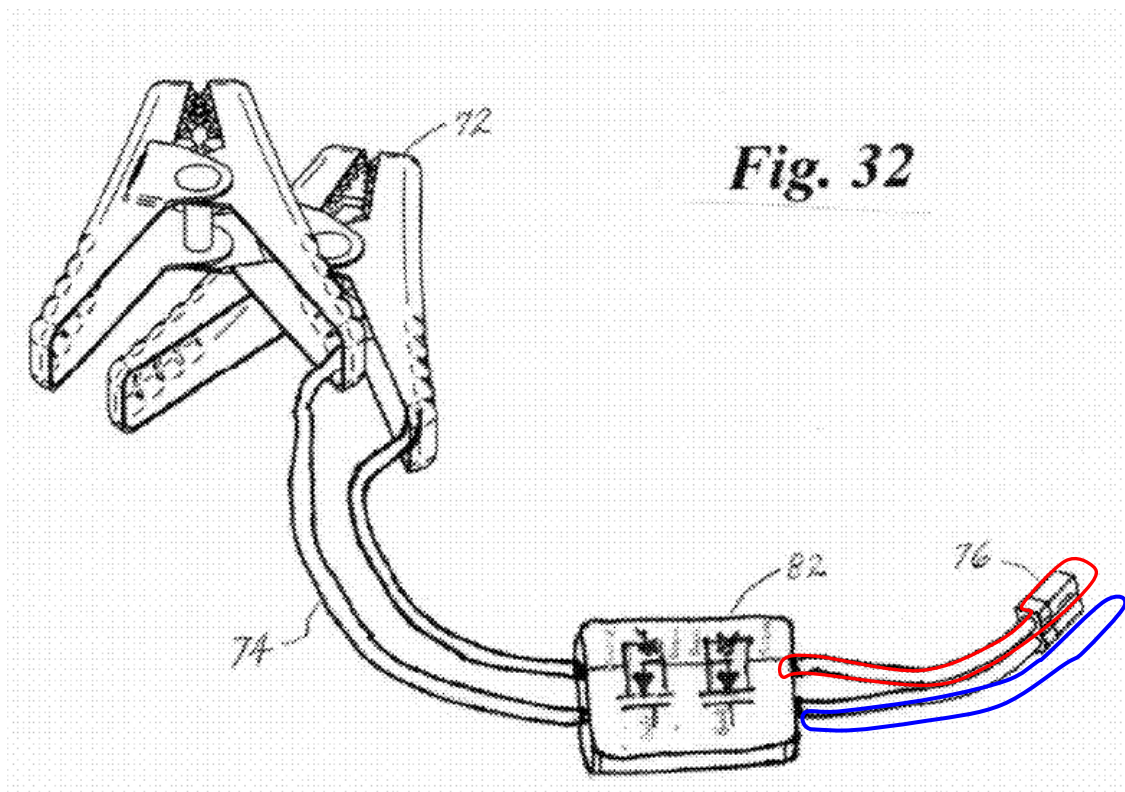
A POSITA would recognize that the Koebler control circuit board would need to be mounted within the housing, by being held in place in the housing, or secured via clips, screws or other means, to provide a functional, durable product. (EX1004, ¶¶119-120.) Moreover, a POSITA would have understood how to form the housing to enclose and secure Koebler’s circuitry using known techniques commonly employed for similar products. (*Id.*) A POSITA would have also understood the

housing would need to be designed to securely house the circuit board to provide a functional, durable product. (*Id.*)

e. Limitation [1.4]

... connectors disposed at one side of the housing, and being electrically connected to the master control board, comprising:

Koebler describes jumper cables with attached battery clamps are connected to one side of the cable housing, which comprises the master control board, and on the other side of the housing are connectors (shown below highlighted in red and blue in Fig. 32 of Koebler below) for connecting the master control board to a lithium power supply. (EX1005, Koebler at [0112]; EX1004, ¶¶121-122.)

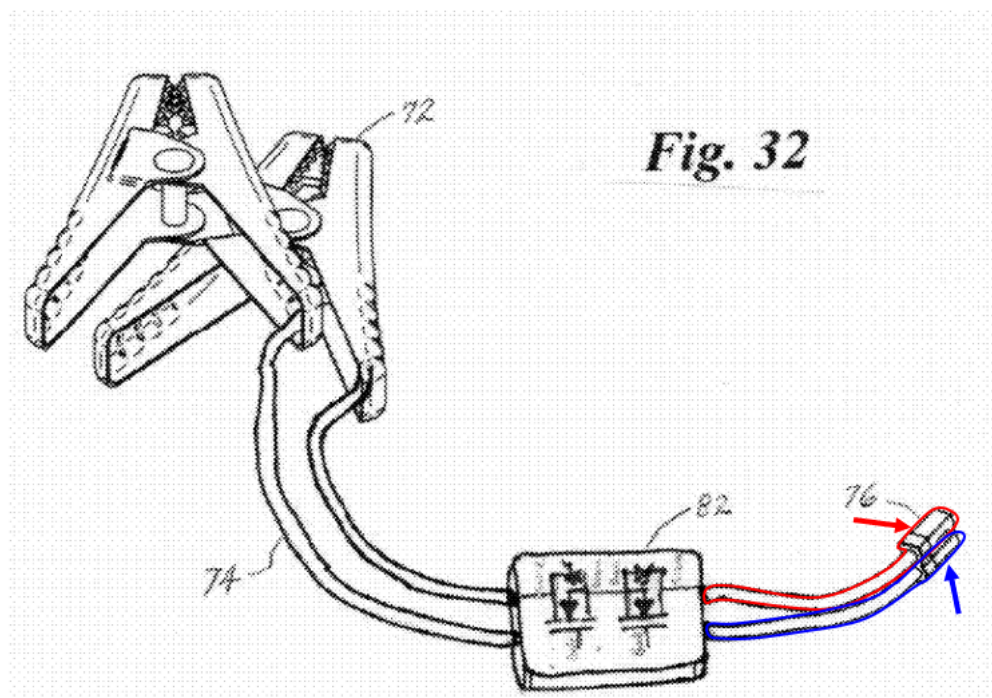


EX1005, Koebler Figure 32

f. Limitation [1.5]

... at least a first and second electrode connectors, which are connected to an external power supply for receiving power, and

Koebler describes cables which can be connected to an external power supply for receiving power through first and second electrode connectors (shown below highlighted in red and blue in Fig. 32 of Koebler). (EX1005, Koebler at [0112]; EX1004, ¶¶123-124.)



EX1005, Koebler Figure 32.

g. Limitation [1.6]

... at least one communication connector connected to the external power supply for receiving status information of the external power

supply, and sending the status information to the master-control board;

Koebler discloses that status information (e.g., temperature) of the external power supply can be monitored and then utilized by the control circuit, but Koebler does not disclose how such status information is communicated from the external power supply to the master control board. (EX1005, Koebler at [0115]; EX1004, ¶125.)

However, if one wanted to monitor supply battery temperature as part of the control circuit in the jumper cables for additional safety, such communication in Koebler would be necessary. It would have been obvious to a POSITA to look to Liu for the structure of the required means to communicate the status signal between the external power supply and the master-control board. (EX1004, ¶126.)

Liu discloses a power supply plug used to communicate both power and status information from a power supply to a control circuit, including in an “intelligent emergency automotive battery jump starter.” (EX1006, Liu at Abstract; EX1004, ¶¶127-129.)

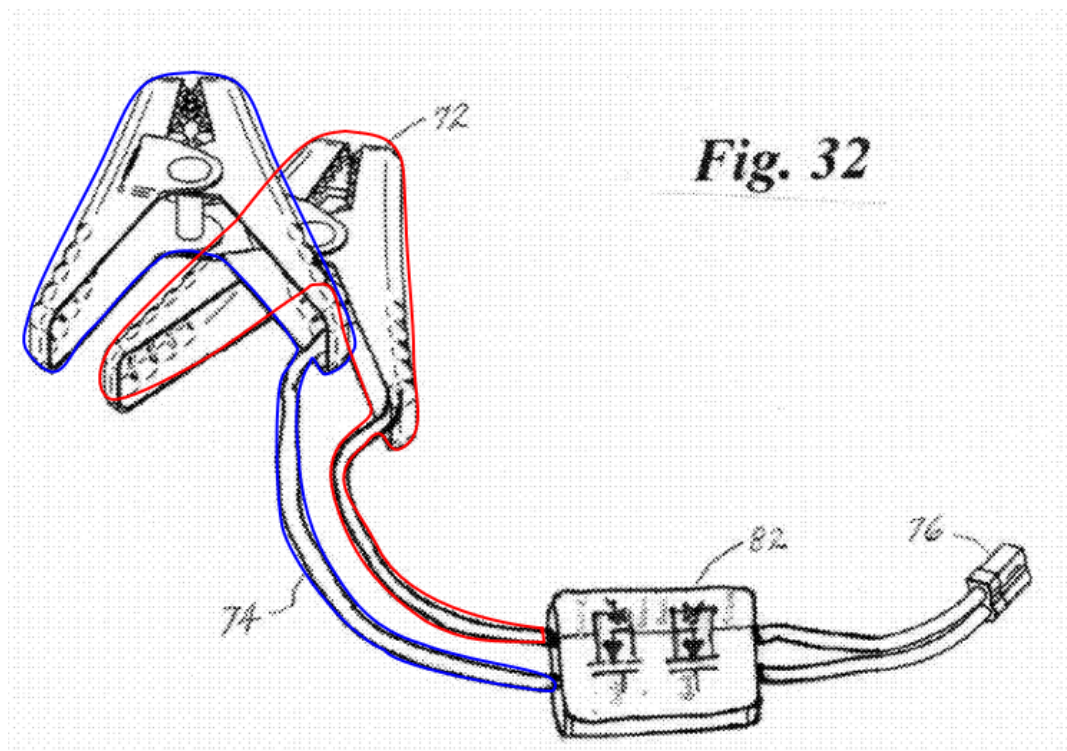
Liu’s connector includes an additional, third terminal, between the electrode terminals, to allow for temperature data from the power supply battery to be shared with the control circuit, to prevent “overheating” and possible “explosion” of the supply battery. (EX1006, Liu at [0026]; EX1004, ¶129.)

It would have been obvious to a POSITA to look to Liu for the required communication connector to transmit status information (e.g., temperature) between the external power supply and the master-control board in the jumper cables. (EX1004, ¶¶130-131.) Indeed, POSITA would have understood adding a third connector to Koebler would have been nothing more than adding another wire and connector – modifications well within the skill and capability of a POSITA. (*Id.*)

h. Limitation [1.7]

... a first and second wire clamps, each having an end configured to receive power from the external power supply via the control device, and another end connected to the external device for supplying power to the external device;

Koebler teaches jumper cables with a first and second wire clamps (red and blue in annotated Fig. 32 below), where one end of each clamp is designed to receive power from an external power supply, and the other end is configured to provide power to an external device. (EX1005, Koebler at [0068]; Figure 32 below; EX1004, ¶¶132-133.)



EX1005, Koebler Figure 32

i. Limitation [1.8]

... wherein the control device is configured to control power supply from the external power supply to the external device based on the status information.

Koebler describes the control device controlling the supply of power from the external power supply to the external device based on status information, including monitoring a voltage and temperature, for determining if these values are outside of the operating range. (EX1005, Koebler at [0116]; EX1004, ¶¶134-135.)

2. Claim 2

a. Limitation [2.0]

... The battery clamp of claim 1, wherein the control device is configured to allow the power supply from the external power supply to the external device when the status information is normal

Koebler describes the control device controlling the power supply from the external power supply to the external device when status information such as temperature is “outside its operating range.” (EX1005, Koebler at [0116]; EX1004, ¶¶136-137.) When the external supply battery is in the normal operating temperature range, the circuit remains closed, allowing the supply of power from the external supply battery to the external device. (*Id.*)

b. Limitation [2.1]

... wherein the status information comprises at least one of the following: temperature, voltage of a battery unit of the external power supply

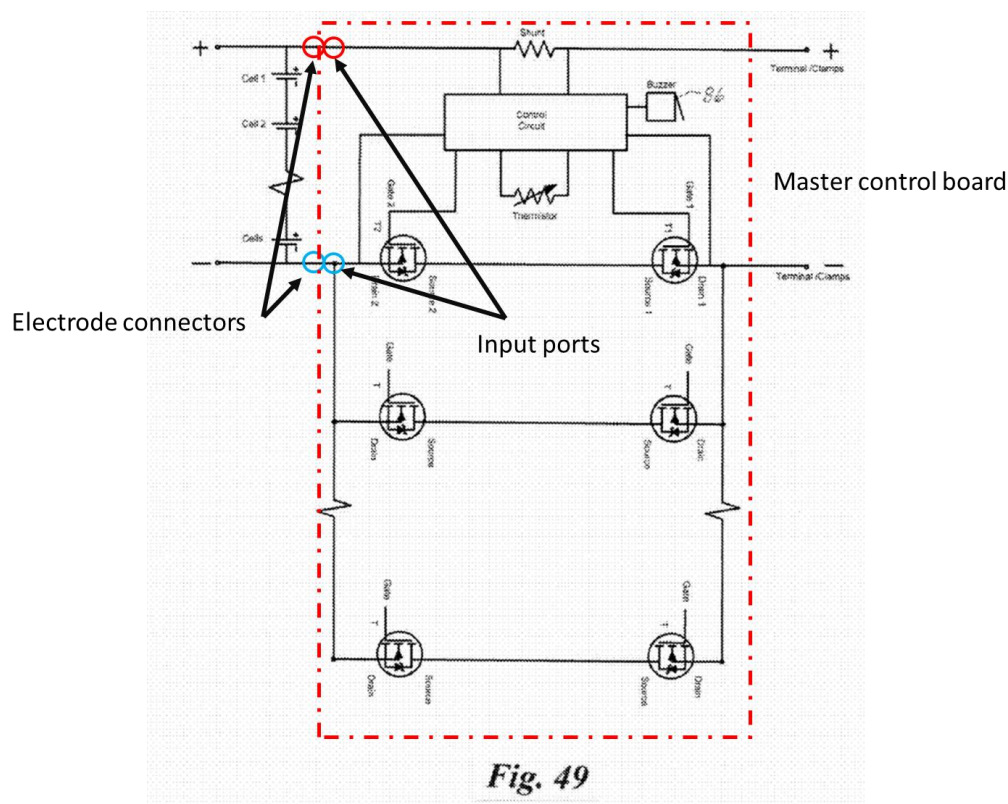
Both Koebler and Liu describe temperature and voltage as “status information.” (EX1005, Koebler at [0116]; EX1004, ¶¶138-139.)

3. Claim 3

a. Limitation [3.0]

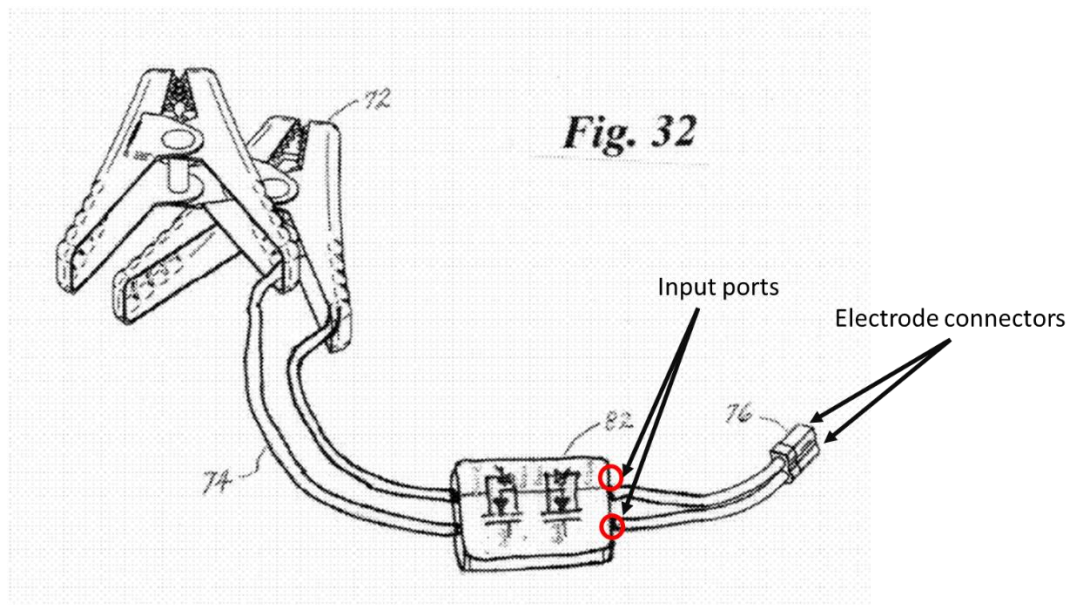
...The battery clamp of claim 1, wherein the master-control board comprises: a first and second voltage input ports electrically connected to the first and second electrode connectors respectively

Koebler discloses an external battery connected to a master-control board but does not expressly show the first and second voltage input ports and first and second electrode connectors. However, a POSITA would understand that they must exist between the external battery and the master-control board as shown below. (EX1004, ¶¶140-144.)



Ex1005, Koebler Figure 49

The voltage input ports and electrode connectors are further illustrated in Figure 32 of Koebler as annotated below. For operation, there must be voltage input ports that connect the electrode connectors 76 to the master-control board in housing 82. A POSITA would understand that these ports could be in the form of solder pads. (EX1004, ¶¶140-144.)



Ex1005, Koebler Figure 32

b. Limitation [3.1]

... a communication port electrically connected to the communication connector

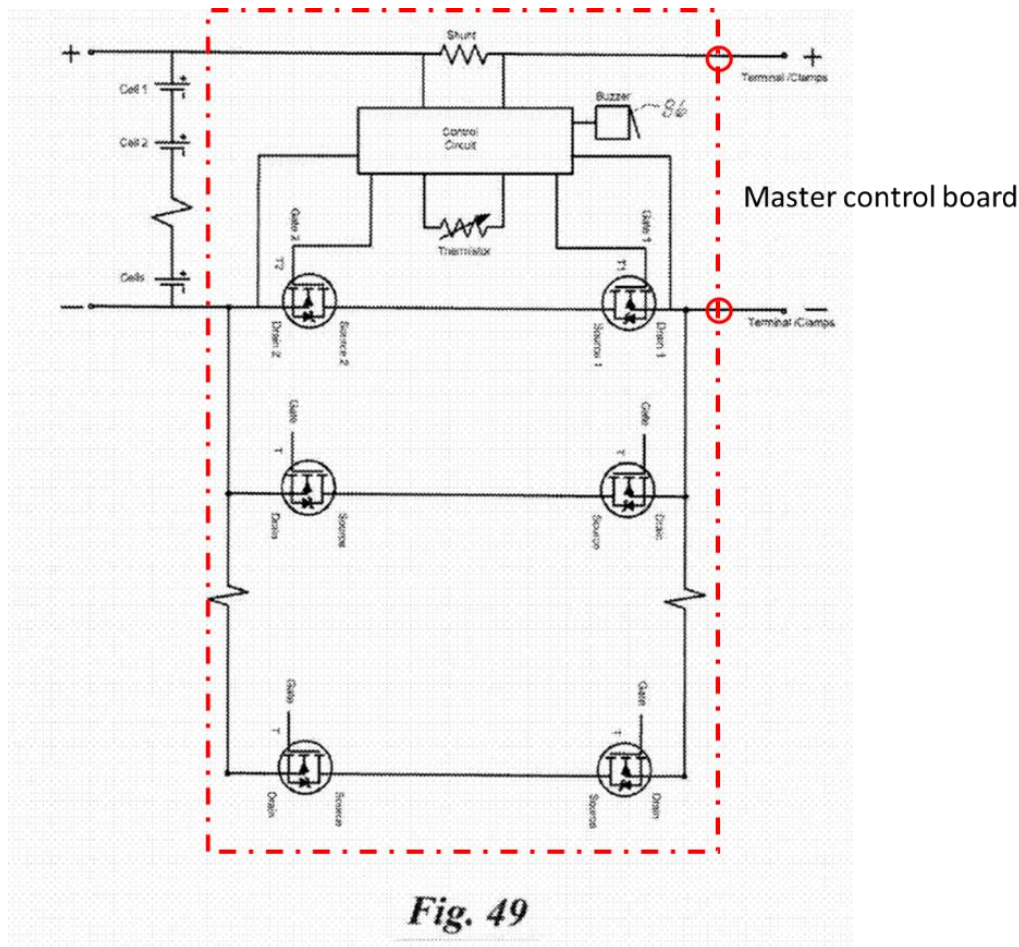
Koebler does not expressly disclose a communication port on the master-control board electrically connected to the communication connector. However, a POSITA would understand such a connector would be required for the disclosed functionality of Koebler – monitoring the status of the external supply

battery and sending the status to control circuit in the jumper cables. (EX1004, ¶¶145-148.) As discussed above, Liu discloses a power supply plug with three ports – two supply power from the external battery to the control circuit and the third port is for communication of status information to the control circuit. (EX1006, Liu at Abstract.) Liu connects to the master-control board through a communication port. (EX1004, ¶¶147-148.)

c. Limitation [3.2]

... a first and second voltage output ports electrically connected to the first and second wire clamps for supplying power to the external device via the first and second wire clamps

Koebler teaches first and second voltage output ports on the master-control board electrically connected to the first and second wire clamps for supplying power to the external device. (EX1005, Koebler at Figs. 45, 49; EX1004, ¶¶149-152.)



Ex1005, Koebler Figure 49

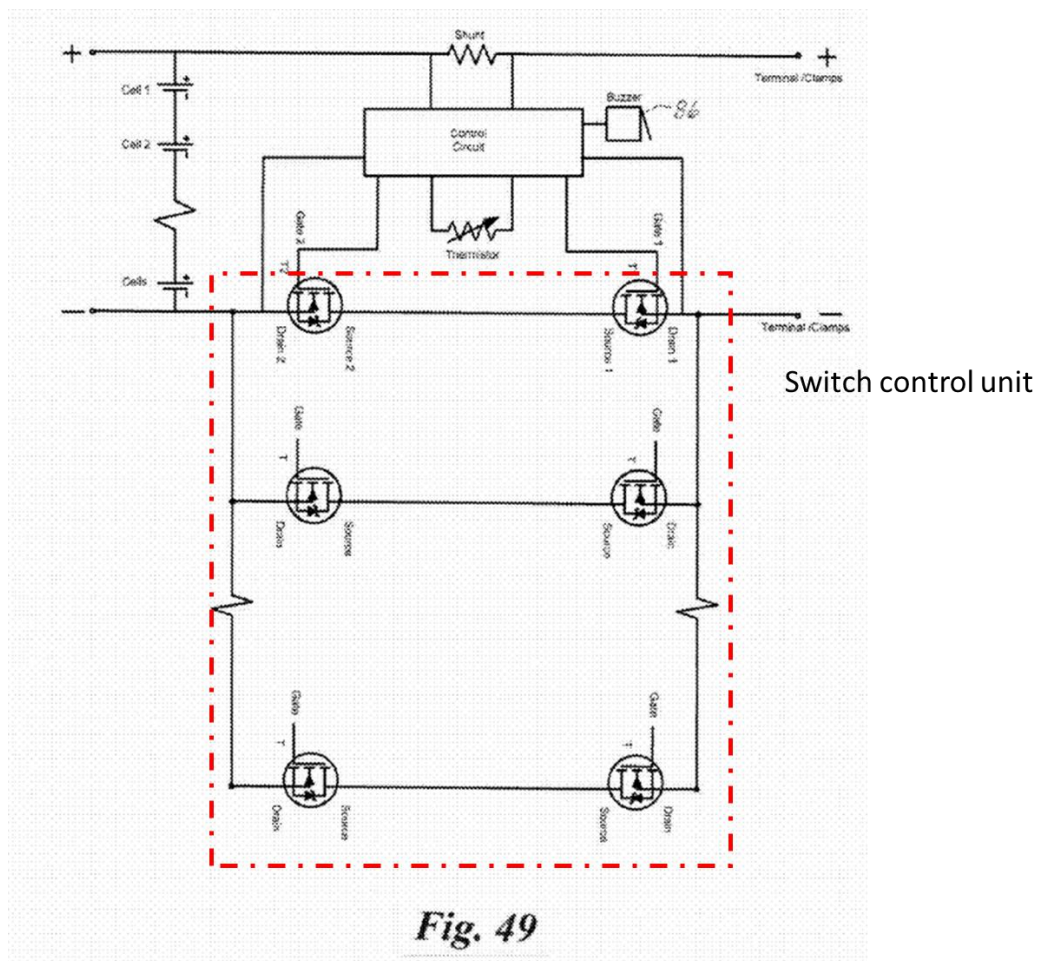
Moreover, to operate, there necessarily must be voltage output ports that connect the wire clamps 72 to the master-control board. These ports would likely be solder pads. (EX1004, ¶152.)

d. Limitation [3.3]

... a switch control unit for controlling connection between the first voltage input port and the first voltage output port; and

Koebler describes a switch-control unit that controls connection between the

first voltage input port and the first voltage output port. (EX1005, Koebler at [0116], *Id.* at Figure 49 below; EX1004, ¶¶153-154.)



Ex1005, Koebler Figure 49

e. Limitation [3.4]

... a master-control circuit unit connected to the communication port for obtaining the status information of the external power supply;

Although Koebler does not expressly disclose a communication port connected to the master-control circuit for obtaining status information from the

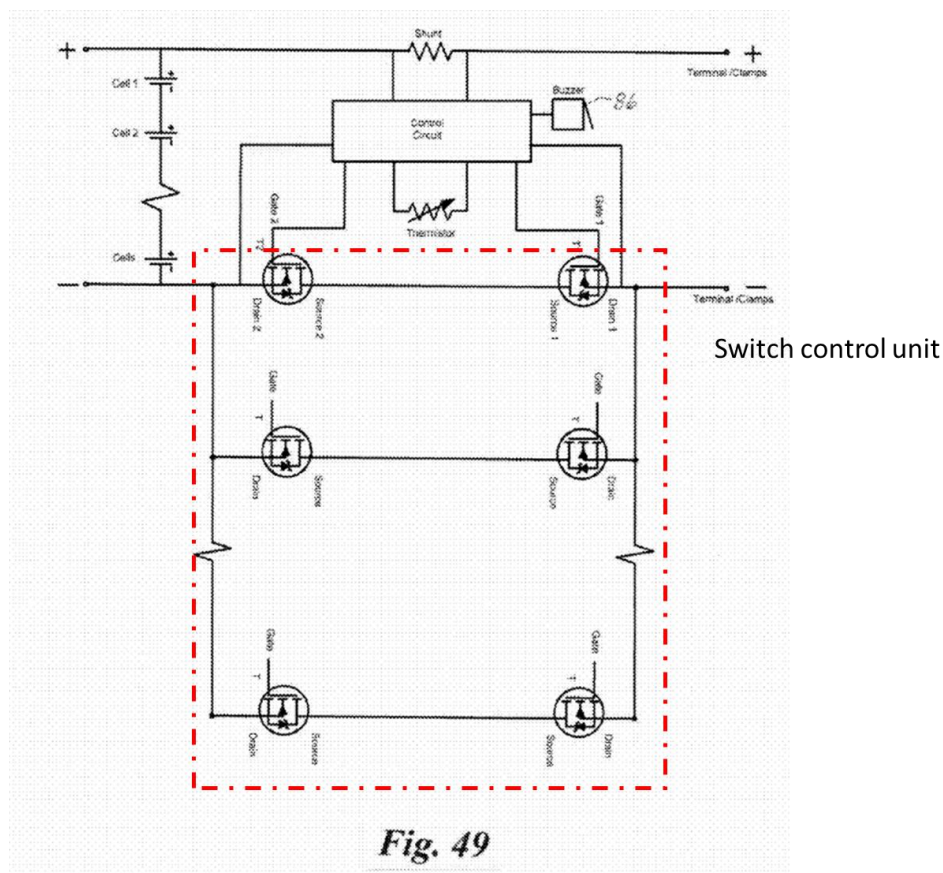
external power supply, it would have been obvious to a POSITA that a communication port would be required for Koebler's disclosed functionality of sending status information from the external power supply to the master control unit. (EX1004, ¶¶155-156.) Liu expressly describes a connector for communicating status information from the external power supply to the master-control unit. (EX1006, Liu at Abstract.) A POSITA would understand that such a communication connector would necessarily connect to the control circuit through a communication port. (EX1004, ¶¶155-156.)

f. Limitation [3.5]

... wherein the master-control circuit unit is configured to control the switch control unit based on the status information of the external power supply, thereby controlling connection on/off between the first voltage input port and the first voltage output port.

Koebler describes a master control circuit which controls a switch control (annotated in red below) to control the power supply from the external power supply to the external device based on status information. (EX1004, ¶¶157-159.) The connection between the first voltage input port and the first voltage output port is controlled by monitoring the status information of the external power supply. (EX1005, Koebler at [0116] ("This circuit will protect against reverse polarity, overvoltage, over-discharge voltage, and excessively high temperature by **opening**

the circuit to terminate the charging.”) (emphasis added), EX1004, ¶158.)



Ex1005, Koebler Figure 49

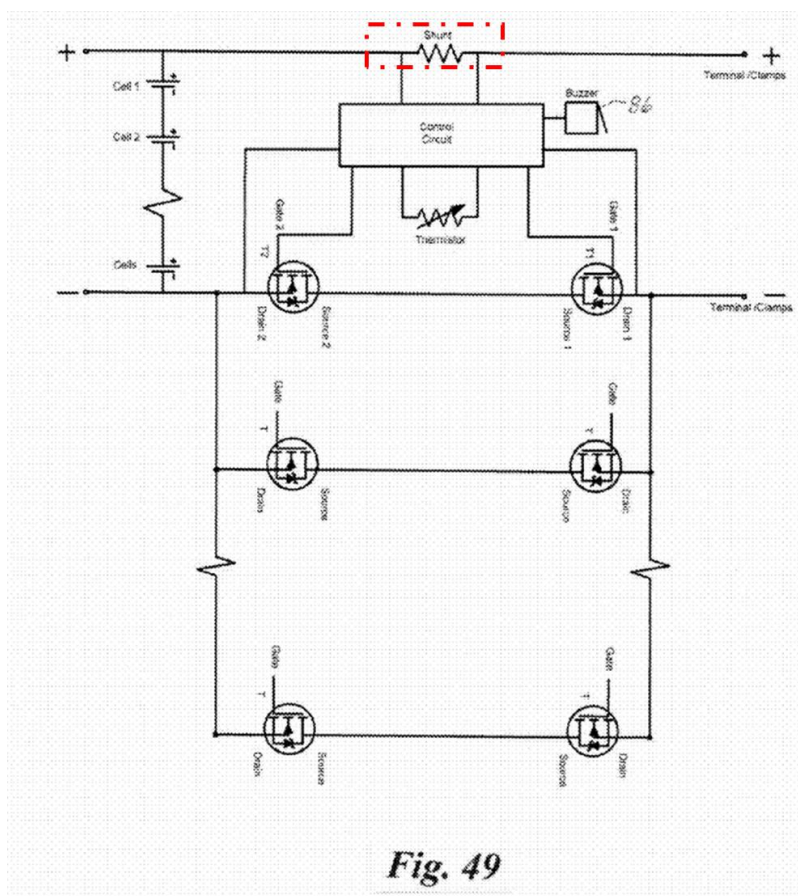
4. Claim 4

a. Limitation [4.0]

... The battery clamp of claim 3, wherein the master-control circuit unit further comprises: an electric current detection unit for detecting electric current from the external power supply to the external device;

Koebler discloses an electric current detection unit for monitoring the current value to compare to a predefined current range, which is used to control the switch control circuit. (EX1005, Koebler at [0104]; EX1004, ¶¶160-163.)

A shunt resistor is placed between the input and output ports. (EX1005, Koebler at Figure 49.) A POSITA would understand that the voltage difference across the shunt is used to detect the electric current as taught by Koebler.



EX1005, Koebler Figure 49

b. Limitation [4.1]

... a voltage detection unit for detecting voltage of the external power supply and the external device; and

Koebler teaches a circuit which detects when the external power supply is outside of a specified voltage range. (EX1005, Koebler at [0116].) Koebler also

discusses monitoring the voltage of the external battery to be charged, or the external device. (*Id.* at [0071].) A POSITA would recognize that detection of the voltage of the external device to be charged is required to allow for protection from reverse polarity. (EX1004, ¶¶164-167.)

c. Limitation [4.2]

... wherein the master-control circuit unit is configured to compare the electric current value and the voltage value with a predefined electric current range and a predefined voltage range respectively, thereby controlling the switch control

Koebler describes a control circuit which monitors both the voltage and current to compare to a predefined current range, which is used to control the switch control circuit. (EX1005, Koebler at [0104] and [0116]; EX1004, ¶¶168-172.) As discussed above, a POSITA would recognize that detection of the voltage of the external device to be charged is required to allow for protection from reverse polarity.

5. Claim 5

a. Limitation [5.0]

... The battery clamp of claim 4, wherein the voltage detection unit comprises: a first voltage detection unit for detecting voltage value of the external power supply; and

Koebler teaches a circuit which can detect when the external power supply is outside of a specified voltage range. (EX1005, Koebler at [0116] (“An audible alarm ... will sound when the lithium base battery is outside its operating range of either voltage or temperature.”); EX1004, ¶¶173-174.)

b. Limitation [5.1]

... a second voltage detection unit for detecting voltage value of the external device.

The control circuit of Koebler allows for reverse polarity protection. (EX1005, Koebler at [0071].) A POSITA would realize that reverse polarity protection requires the detection of the second voltage value. A POSITA would recognize that detection of the voltage of the external device to be charged is required to allow for protection from reverse polarity. (EX1004, ¶¶175-178.)

6. Claim 7

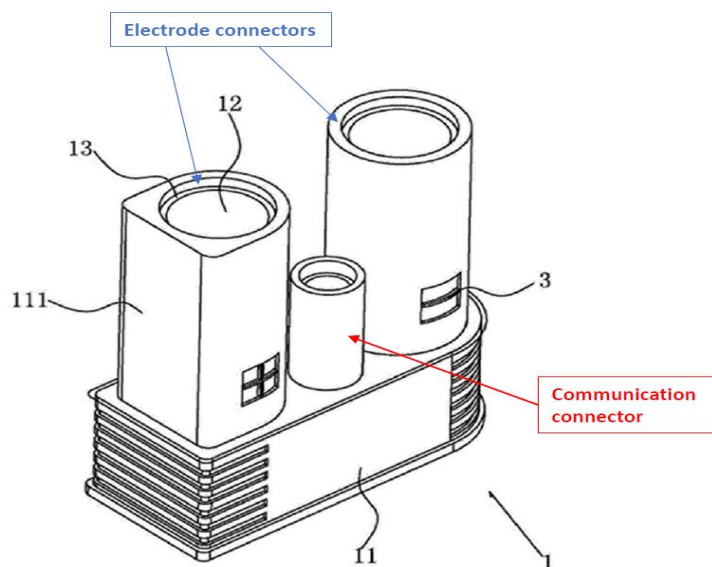
... The battery clamp of claim 4, wherein the master-control circuit unit further comprises: a buzzing circuit unit connected to the master-control chip unit for alerting user about abnormal condition

Koebler describes a buzzer in the control circuit capable of producing an audible alarm. (EX1005, Koebler at [0116]; EX1004, ¶¶179-180.)

7. Claim 8

... The battery clamp of claim 1, wherein the communication connector is disposed between the first and second electrode connectors

As discussed, a POSITA would look to Liu for a communication connector that also provides both power ports. (EX1004, ¶¶181-182.) Liu discloses a communication connector disposed between the first and second electrode connectors. (EX1006, Fig. 1.)



Ex1006, Liu Figure 1.

8. Claim 9

... The battery clamp of claim 1, wherein the housing comprises an upper piece and a lower piece, which are removably connected together, and the master-control board is mounted on the lower piece.

Koebler discloses a master-control board enclosed by a housing, which could be formed using at least two pieces – an obvious and known way to assemble Koebler’s disclosed housing.

Koebler does not disclose whether the master control board is mounted on the lower or upper pieces of the housing. However, a POSITA would understand that the master-control board would necessarily be mounted inside the housing to avoid the board from moving around and potentially being damaged. (EX1004, ¶¶184-185.) Thus, it would be obvious to secure the Koebler board to either the upper or lower pieces of Koebler’s housing. (*Id.*) A POSITA would understand that this is a predictable design choice because it would not modify the operation of any of the references. (*Id.*)

9. Reasons to Combine

A POSITA would be motivated to utilize the communication connector of Liu with the smart jumper cable of Koebler to effectively monitor the temperature of the external supply battery supply and prevent damage to the battery due to overheating. (EX1004, ¶¶186-195.)

Both Koebler and Liu relate to smart jump starter cables for use with external power supplies to jump start vehicles – the same field of endeavor. (EX1005, Koebler at [0002]; EX1006, Liu at Abstract.) Koebler describes a control circuit located either within the battery housing or the cable housing. (EX1005, at [0116].)

Both Koebler and Liu describe the use of monitoring the temperature of supply battery in a jump starter to protect them from overheating. (EX1006, Liu at [0015] (“In addition, when used on an intelligent emergency automotive jump starter power supply, this three-hole starter power supply plug is capable of protecting the battery very effectively to prevent overloading induced explosion of the battery during automotive ignition.”), *see also* EX1005, Koebler at [0093] (“To control the solid state switches, electronic controls are needed for the different voltages, currents and/or temperature with specified parameters in which cells work to prevent damage.”))

However, Koebler does not expressly disclose the communication connector necessary to send both power and status information (e.g., temperature) from the supply battery to the control device.

If a POSITA wanted to implement Koebler such that the controller was in the jumper cables, a POSITA would look to Liu for guidance on the structure of the connector to the battery supply. (EX1004, ¶193.) Indeed, the Liu connector is described for very purpose of sending both power and status information from the external power supply to the master-control board and includes terminals for both the electrodes and the communication of status data. (EX1006, Liu at [0026]; EX1004, ¶194.) As such, claims 1-5 and 7-9 of the '105 Patent are obvious over Koebler in view of Liu.

B. Ground 2 – Claims 1-7 and 9-10 are Obvious in View of Zonesking, Richardson, and Knowledge/Skill of a POSITA

The combination of Zonesking (EX1007) and Richardson (EX1008), in view of a POSITA, renders claims 1-7 and 9-10 obvious. (See EX1004, ¶¶196-310.) Both Zonesking and Richardson disclose smart battery chargers with circuitry to protect the battery from potential hazards that occur during charging. Zonesking's jump starter includes a cable housing containing control circuitry that connects to an external battery. However, Zonesking does not disclose the communication of temperature data from the supply battery to the circuitry through a communication connector. Richardson, however, describes the monitoring of the temperature of the supply battery jump starter and discloses a communication connector for sending temperature data from the supply battery to control circuit, which uses the information in deciding whether to supply power. It would have been obvious to a POSITA at the time of the invention to modify Zonesking in view of Richardson in either of two ways: (1) using the control circuit and communication connector of Richardson in the jumper cable of Zonesking or (2) using the connector of Richardson in the jumper cable of Zonesking and adding functionality to the circuitry of Zonesking to monitor and use temperature data from the supply battery to determine whether to supply power to the device to be charged.

1. Independent Claim 1

a. Limitation [1.0]

... A battery clamp for delivering an instantaneous starting current from an external power supply to an external device, the battery clamp comprising:

To the extent the preamble is limiting, Zonesking discloses a “smart jump starter cable” for delivering an instantaneous starting current from an external power supply to an external device. (EX1007, Zonesking at [0001] [0013] and Figs. 1, 4; EX1004, ¶¶196-200.)

b. Limitation [1.1]

... a control device, comprising:

Zonesking alone or in combination with Richardson discloses a control device. Zonesking discloses a “smart jump starter cable” that includes a “circuit board... equipped with a protection module and a battery detection unit” (i.e., “control device”) that is operable to provide both a protection function and current detection function. (EX1007, Zonesking at [0004]; EX1004, ¶¶201-207.)

Richardson teaches a control circuit and sensors used for providing supplemental power from a “jump starter battery” to the “vehicle to be started.” (EX1008 at Figure 1; *Id* at 2:17-19 (Figures 2A-2D illustrate “a schematic of the portable power source, control circuit and sensors...” Richardson’s “microprocessor

12,” “control circuit,” and “sensors” are a control device.

It would have been obvious to a POSITA to modify Zonesking to include the control functionality of Richardson. (EX1004, ¶207.) Or it would have been obvious to use the “Zonesking” housing and connectors disclosed with Richardson’s additional control circuitry for monitoring operation between an external power source and the battery to be charged. (*Id.*) A POSITA would have it would be desirable to include such functionality within the portable packaging of Zonesking.

c. Limitation [1.2]

... a housing

Zonesking discloses an “adapter element 10,” i.e., a “housing” for the control device. (EX1007, Zonesking at [0012]; Figure 4; EX1004, ¶209.)

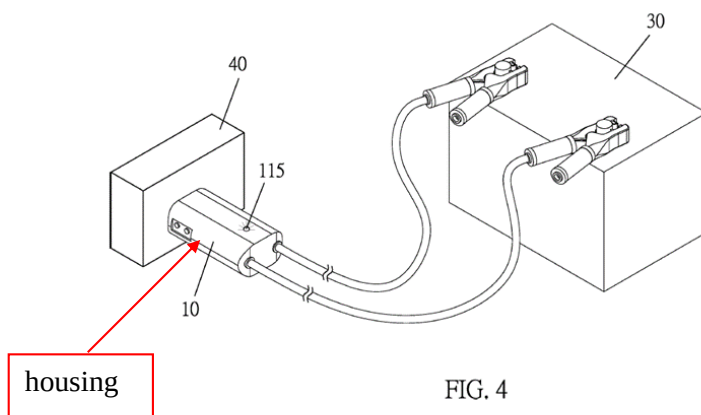


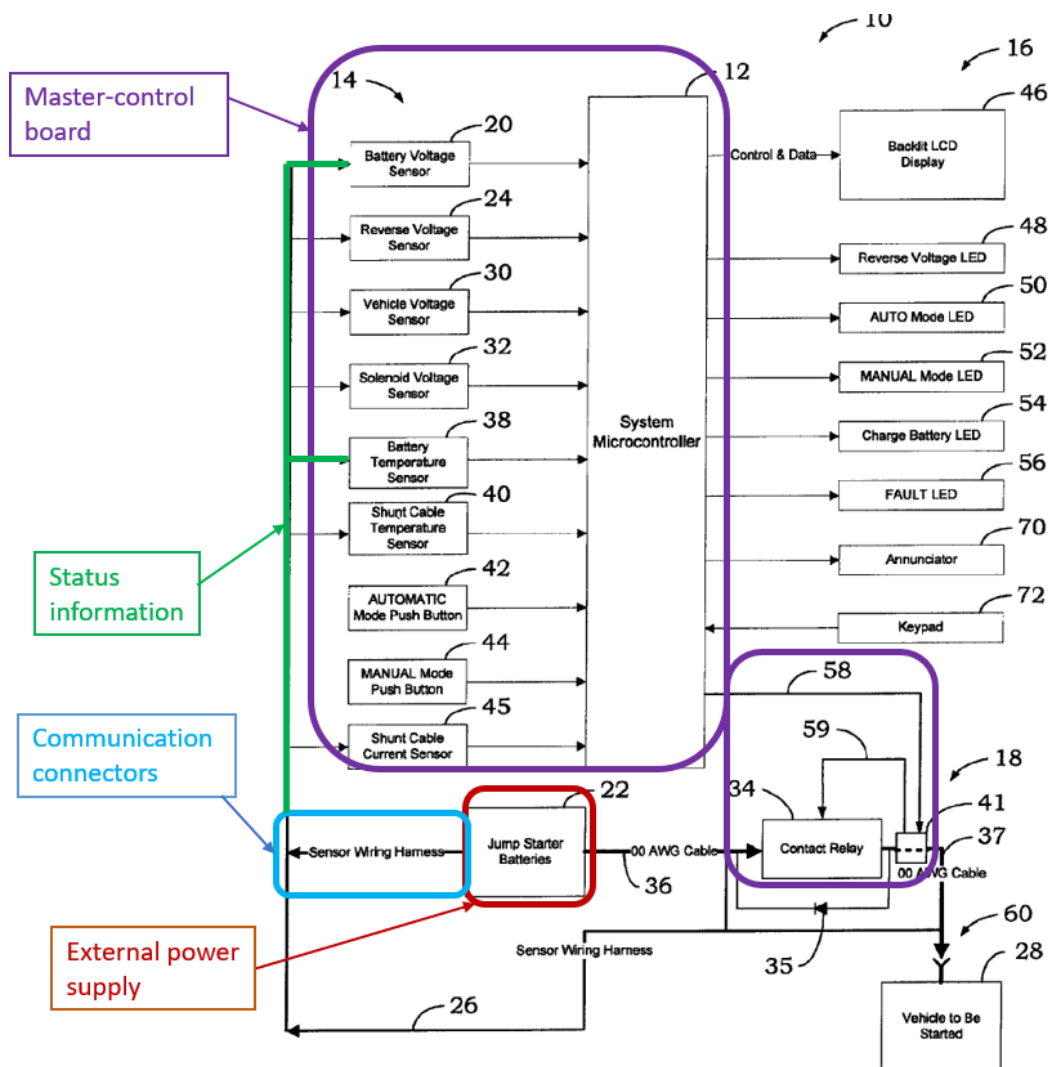
FIG. 4

EX1007, Zonesking at Fig. 4

d. Limitation [1.3]

... a master-control board mounted within the housing; and

Richardson discloses a master-control board but does not illustrate in detail how its control circuitry is housed. (EX1008 at Figure 1 (below); EX1004, ¶211.) But a POSITA would have understood that, for a jump start with an external battery, it would be housed within a similar “adapter element 10” as disclosed by Zonesking. (EX1004, ¶¶213-217.) A POSITA would further understand Zonesking’s “adapter element 10” might require modifications to house the additional control circuitry, but they would be minimal, and well within the skill and knowledge of a POSITA. (*Id.*)



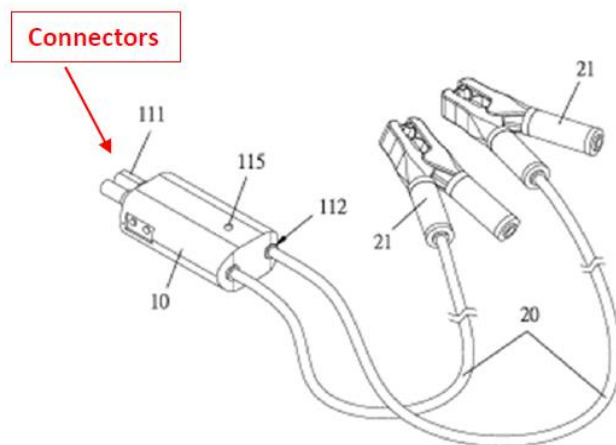
EX1008, Richardson Figure 1.

e. Limitation [1.4]

... connectors disposed at one side of the housing, and being electrically connected to the master control board, comprising:

Zonesking discloses “input terminal 111” (i.e., “connectors”) disposed at one side of the housing – i.e., the “adapter element 10,” which are connected to the master-control board. (See EX1007, **Error! Reference source not found.** (below))

and 2; *Id.* at [0012] (“one end of the protection module 113 can be electrically connected to the input terminal 11”); EX1004, ¶219.)



EX1007, Zonesking at Fig. 1.

A POSITA would have understood that Zonesking’s connectors would still be required for connection to the external power supply even if the control circuitry of Richardson was employed and how to how to make the connection. (EX1004, ¶¶220-222.)

f. Limitation [1.5]

... at least a first and second electrode connectors, which are connected to an external power supply for receiving power, and

Zonesking discloses “input terminal 111” that can be “connected” to a “mobile power supply 40” to “achieve a power supply state by mutual plugging in.” (EX1007, Zonesking [0018], Figures 3 and 4.) A POSITA would understand that the input terminal necessarily includes a first and second electrode connector for

both positive and negative connection to the external mobile power supply 40 to receive power. (EX1007, Zonesking Figures 3 and 4; EX1004, ¶¶223-227.)

g. Limitation [1.6]

... at least one communication connector connected to the external power supply for receiving status information of the external power supply, and sending the status information to the master-control board;

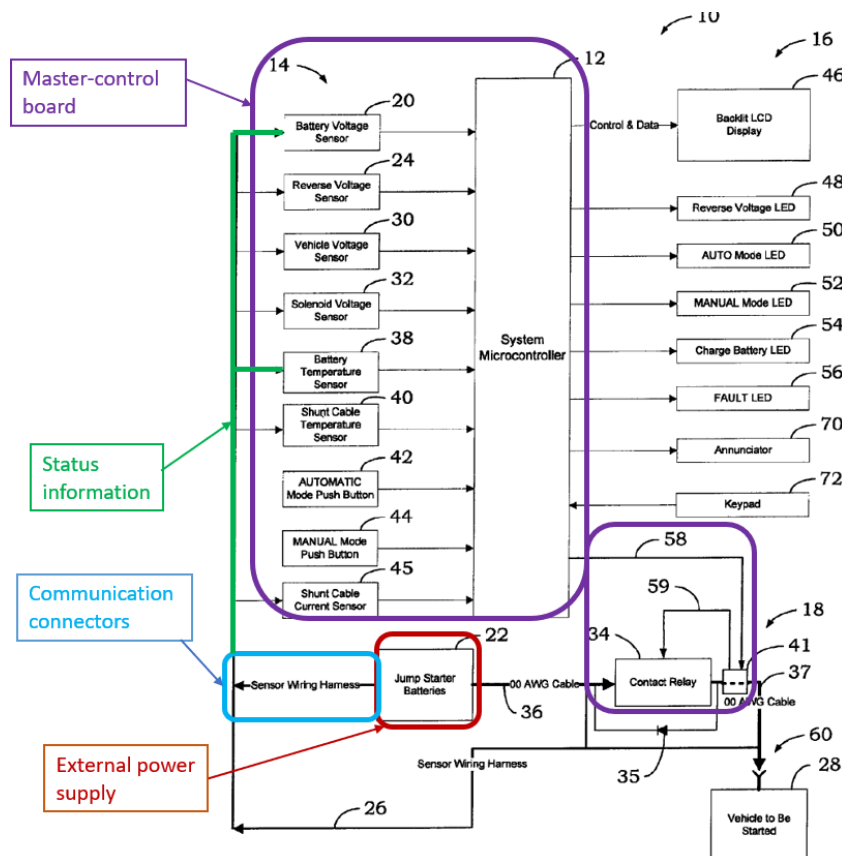
Zonesking discloses a connector to the external battery with electrode terminals but does not describe in detail a communication connector for status information from the external battery. (EX1007, Zonesking [0018].)

Richardson discloses a master-control board wherein there is a communication connector (“sensor wiring harness”) connected to the power supply for receiving status information (e.g., temperature”) of the external power supply and sending the status information to the master-control board. (EX1008, Richardson at 2:64-66, 5:13-19, Figure 1 below; EX1004, ¶¶229-231.) It would have been obvious at the time of the invention to provide the communication connector and control circuitry of Richardson to the Zonesking jump starter cables.

It would have been obvious to a POSITA at the time of the invention to provide a sensor wiring harness between the supply battery and master control unit of Zonesking as taught by Richardson, in order to monitor the temperature of the

jump starter to avoid the battery from overheating due to excess current draw.

(EX1007, Zonesking at [0017], EX1004, ¶¶232-234.)



EX1008, Richardson Figure 1.

h. Limitation [1.7]

... a first and second wire clamps, each having an end configured to receive power from the external power supply via the control device, and another end connected to the external device for supplying power to the external device;

Zonesking discloses first and second wire clamps that receive power from external battery via the control device. (EX1007, Zonesking [0012]; EX1004,

¶¶235-239.)

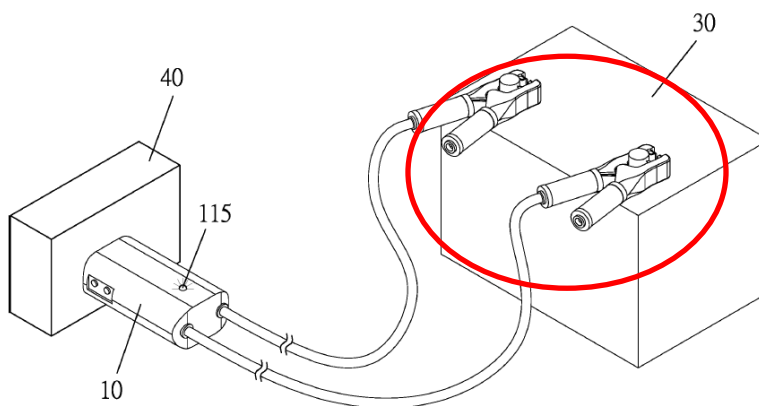


FIG. 4

EX1007, Zonesking at Fig. 4

i. Limitation [1.8]

... wherein the control device is configured to control power supply from the external power supply to the external device based on the status information.

Richardson discloses the control device is configured to control power supply from the power supply to the external device based on the status information. (See Limitation 1.6, EX1008, Richardson Abstract, Figures 1 and 5, and 2:27-35, 3:8-12 (“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.”); EX1004, ¶¶240-245.)

2. Claim 2

c. Limitation [2.0]

... The battery clamp of claim 1, wherein the control device is configured to allow the power supply from the external power supply to the external device when the status information is normal

Richardson discloses that “[a] contact relay control output 58 operates the contact relay 34 through the temperature sensor 41. When the jump starter operation has been successfully initiated, the contact relay 34 is closed and the jump starter batteries 22 are connected to the starter system or batteries of the vehicle to be started.” (EX1008, Richardson at 3:40-43; 5:13-19.) Thus, Richardson teaches that when the status information is normal, such as a normal supply battery temperature, the control device allows the supply battery to supply power to the external device. (*Id.*; EX1004, ¶¶246-250.)

d. Limitation [2.1]

... wherein the status information comprises at least one of the following: temperature, voltage of a battery unit of the external power supply

Richardson discloses temperature and voltage of the external power supply as status information. (EX1008, Richardson at 5:13-21; EX1004, ¶¶251-252.)

3. Claim 3

g. Limitation [3.0]

...The battery clamp of claim 1, wherein the master-control board comprises: a first and second voltage input ports electrically connected to the first and second electrode connectors respectively

Zonesking discloses a master-control board (circuit board in red) with first and second voltage input ports (green), which are electrically connected to the first and second electrode connectors (input terminals 111 in yellow). (EX1007, Zonesking Figures 1, 2 and 4; EX1004, ¶¶253-255.)

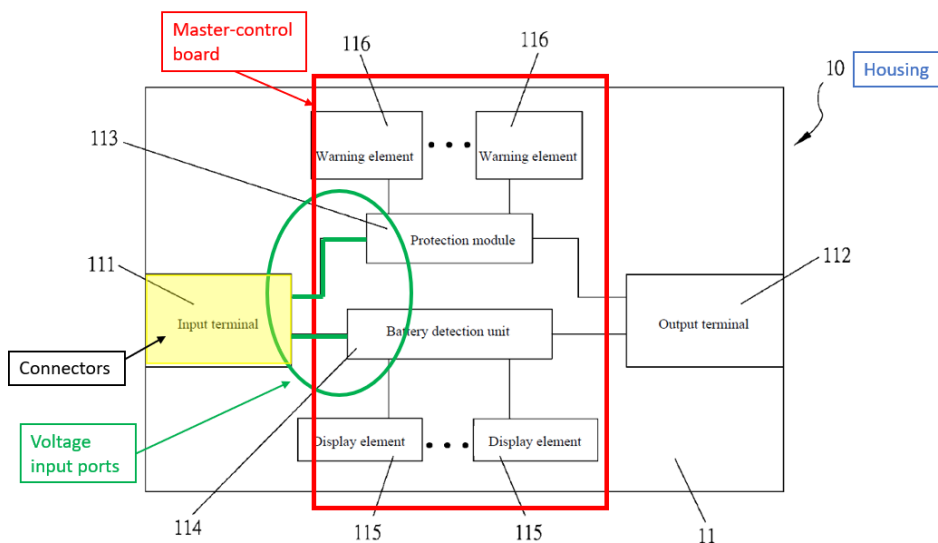
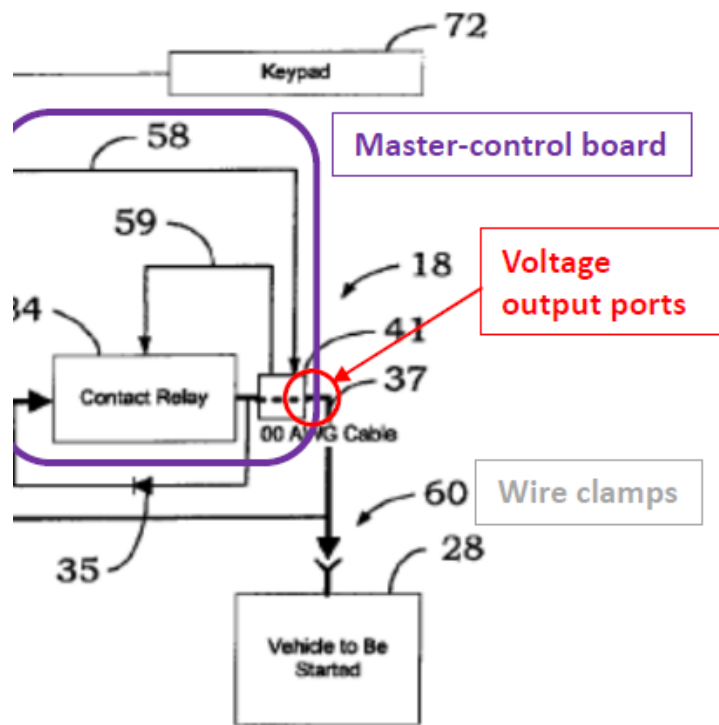


FIG. 2

EX1007, Zonesking at Figure 2.

Richardson also discloses a master control board with first and second voltage output ports (red) for supplying power to the external device (“vehicle to be started”) through first and second wire clamps (ref. no. 60). (See EX1008, Richardson

Annotated Fig. 1 below.) A POSITA would have understood that once modified to include Richardson's control board, Zonesking's voltage output ports would still be electrically connected to the first and second wire clamps (21) via the output terminal 112 to supply power to the external device. (EX1004, ¶¶256-260.)



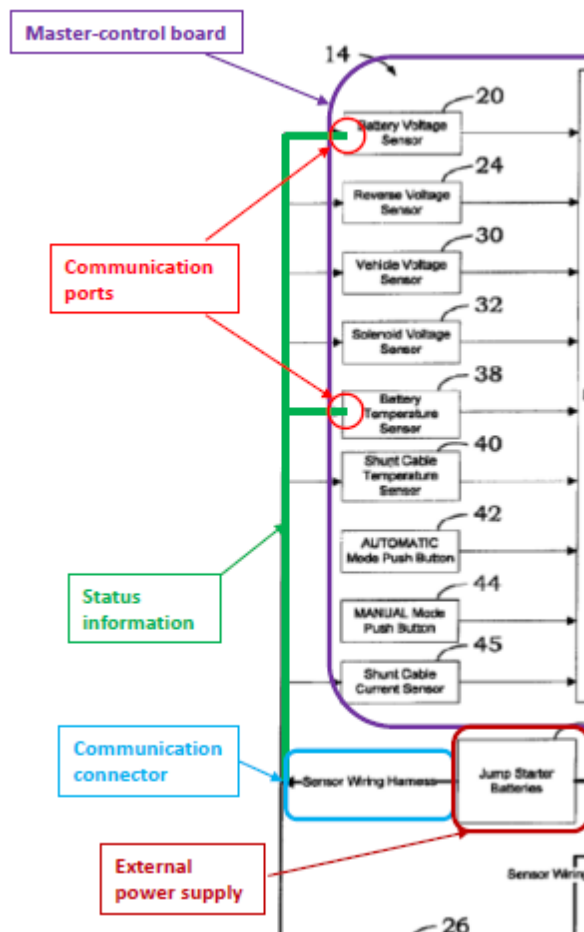
EX1004, Richardson at Figure 1.

h. Limitation [3.1]

... a communication port electrically connected to the communication connector

Richardson discloses a communication connector (sensor wiring harness below in blue) connected to the master control board at the communication port. (See Limitation 1.6 herein; *see also* EX1008, annotated Richardson Fig. 1 below

(communications ports in red.)



EX1004, Richardson at Figure 1.

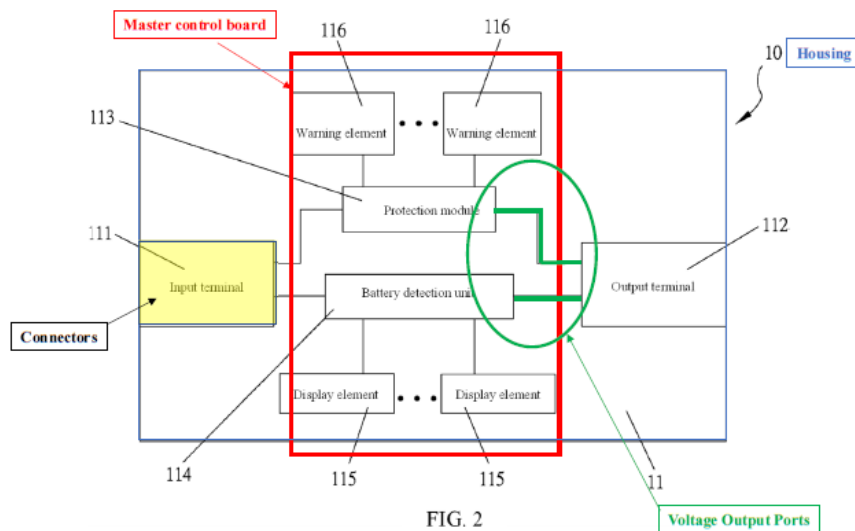
As I discussed in Limitation [1.6], it would have been obvious to provide a sensor wiring harness between the supply battery and master control unit of Zonesking as taught by Richardson. A POSITA would do so to monitor the power supply temperature to avoid damage from overheating due to excess current draw. (EX1007, Zonesking [0017]; EX1004, ¶262.) A POSITA would recognize that modifying Zonesking's controller to receive and process additional data such as

temperature would be contemplated and within the capabilities of a POSITA. (*Id.*)

i. Limitation [3.2]

... a first and second voltage output ports electrically connected to the first and second wire clamps for supplying power to the external device via the first and second wire clamps

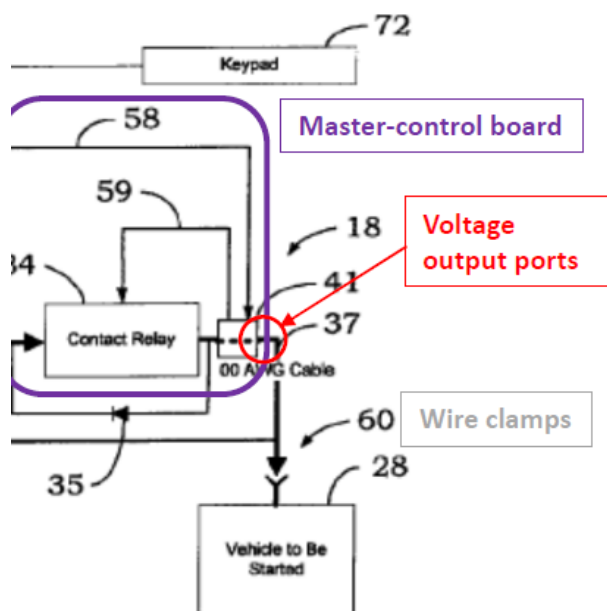
Zonesking discloses a master control board with first and second voltage output ports (green) for supplying power to the external device through the wire clamps. (EX1007, Zonesking Figures 1-4; EX1004, ¶¶263-265.)



EX1007, Zonesking at Fig. 2.

Richardson also discloses a master control board with first and second voltage output ports (red) for supplying power to the external device through first and second wire clamps (ref. no. 60). (See EX1008, Richardson Fig. 1 below; EX1004, ¶266.)

A POSITA would have understood that once modified to include Richardson's control circuit, Zonesking's would still require voltage output ports to electrically connect to the wire clamps (21) for supplying power to the external device. (EX1004, ¶266.)



EX1004, Richardson at Figure 1.

j. Limitation [3.3]

... a switch control unit for controlling connection between the first voltage input port and the first voltage output port; and

Zonesking discloses a protection module that controls the connection between the input and output of the circuit. (EX1007, Zonesking Fig. 2; EX1004, ¶¶267-270.)

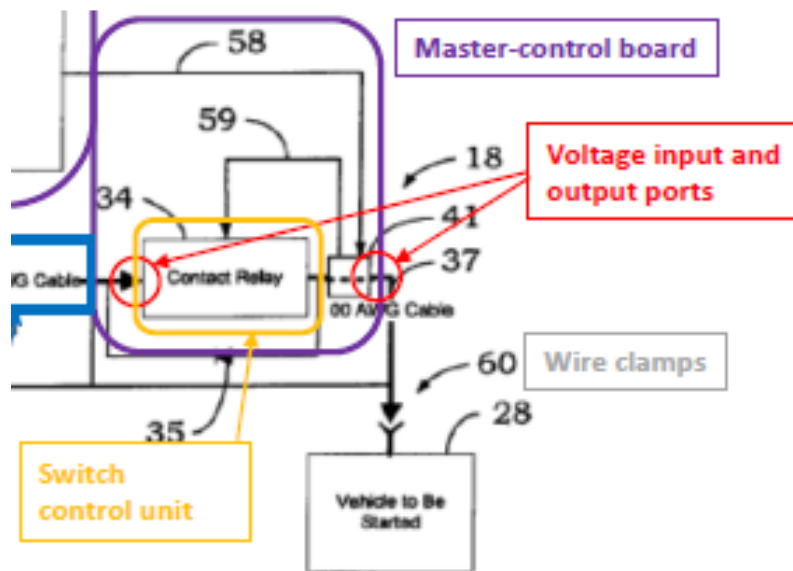


FIG. 2

EX1007, Zonesking Figure 2.

The protection module is connected to the input terminals at one end and “can” be connected to the output terminal at the other end. (EX1007, Zonesking at [0005].) As such, the protection module offers both an opened and a closed state; i.e. switching. (EX1004, ¶270.)

Richardson teaches “[i]f the maximum number of start attempts has not been exceeded 266, the contact relay 34 is closed ... connecting the jump starter's batteries 22 to the vehicle's starting system 28.” (EX1008, Richardson 6:4-9; EX1004, ¶¶271-272.) As shown below, the contact relay 34 (“switch control unit” in yellow) controls the connection between the first voltage input port and first voltage output port.



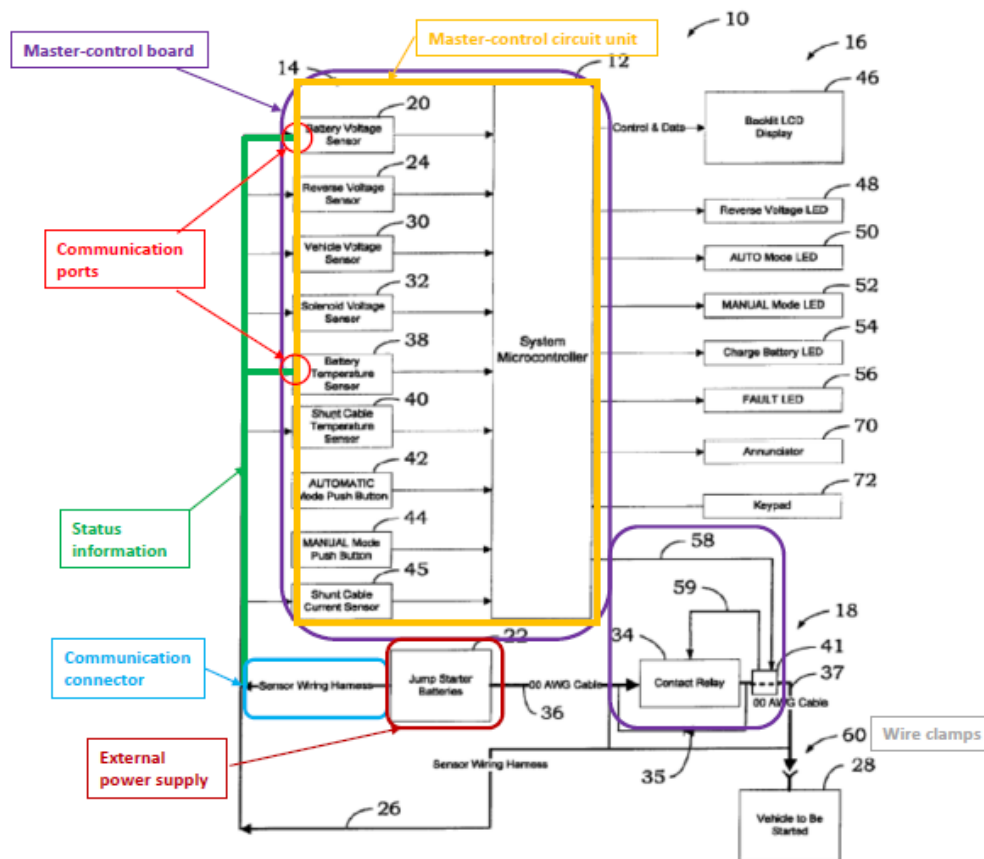
EX1004, Richardson at Figure 1.

k. Limitation [3.4]

... a master-control circuit unit connected to the communication port for obtaining the status information of the external power supply;

Zonesking does not expressly disclose the master-control circuit unit (master control unit “MCU”) connected to a communication port for obtaining the status information of the external power supply. (EX1004, ¶273.)

Richardson discloses a master-control circuit unit (shown below in orange) on the master control board connected to the communication port (shown in red below) for obtaining the status information (green) of the external power supply (maroon). (EX1004, ¶274.)



EX1004, Richardson at Figure 1.

I. Limitation [3.5]

... wherein the master-control circuit unit is configured to control the switch control unit based on the status information of the external power supply, thereby controlling connection on/off between the first voltage input port and the first voltage output port.

Richardson's master-control board operates the contact relay 34 to connect/disconnect the input of power from supply battery to the power output based on status information (e.g., temperature). (EX1008, Richardson at Abstract ("a processor for controlling the relay to selectively apply electrical power to the engine

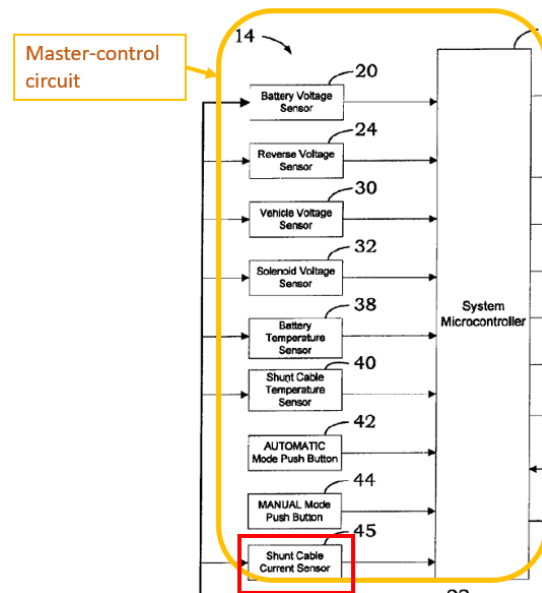
electrical system.”); see also *Id.* at 3:8-12; 3:40-47; EX1004, ¶¶275-277.)

4. Claim 4

d. Limitation [4.0]

... The battery clamp of claim 3, wherein the master-control circuit unit further comprises: an electric current detection unit for detecting electric current from the external power supply to the external device;

Richardson discloses a master-control circuit unit including an electric current detection unit (shunt cable current sensor 45) for measuring the current between source and vehicle batteries. (EX1008, Richardson claim 26; EX1004, ¶278.)



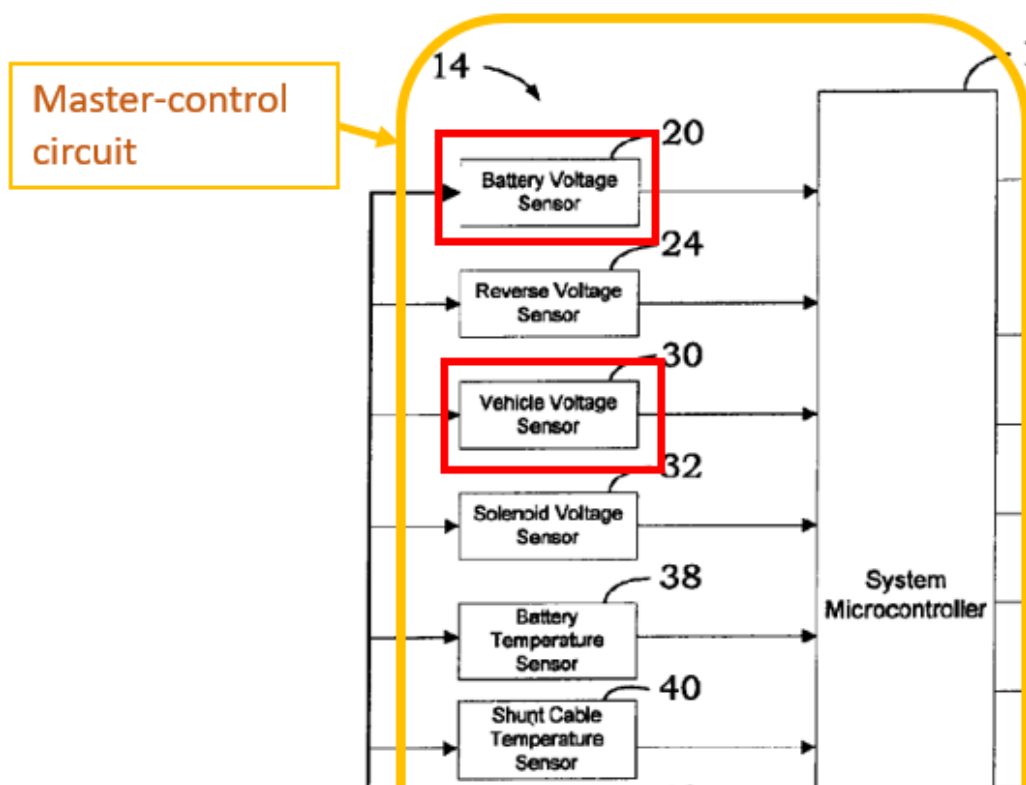
EX1004, Richardson at Figure 1.

e. Limitation [4.1]

... a voltage detection unit for detecting voltage of the external power supply and the external device; and

Zonesking discloses a battery detection unit that may include a microprocessor and a comparator or amplifier for detecting voltage of the external power supply and external device. (See EX1007, Zonesking at [0014], [0018]; EX1004, ¶¶280-281.)

Richardson likewise discloses the battery detection unit that detects voltage of both the external power supply and the external device. (EX1008, Richardson at 2:43-48 (“A battery voltage sensor 20 monitors the voltage level of one or more jump starter batteries 22. ... A vehicle voltage sensor 30 monitors the voltage on line 37 (voltage of the vehicle).”); Richardson Fig. 1; EX1004, ¶282.))



EX1008, Richardson at Figure 1.

f. Limitation [4.2]

... wherein the master-control circuit unit is configured to compare the electric current value and the voltage value with a predefined electric current range and a predefined voltage range respectively, thereby controlling the switch control

Zonesking and Richardson disclose the master-control board monitoring of the current and voltage and comparing it against predefined ranges. (See Limitations [4.0] and [4.1]; *see also*, EX1007, Zonesking at [0014] (“the battery detection unit 114 may be an MCU, a comparator or an amplifier.”); EX1008, Richardson at 6:62-67, 5:10-12; EX1004, ¶¶283-285.))

5. Claim 5

c. Limitation [5.0]

... The battery clamp of claim 4, wherein the voltage detection unit comprises: a first voltage detection unit for detecting voltage value of the external power supply; and

Both Zonesking and Richardson disclose a first voltage detection unit for detecting voltage value of the external power supply. (See Limitation [4.1]; EX1004, ¶¶286-289.)

d. Limitation [5.1]

... a second voltage detection unit for detecting voltage value of the external device.

Both Zonesking and Richardson disclose a second voltage detection unit for detecting voltage value of the external device. (See Limitation [4.1]; EX1004, ¶¶290-291.)

6. Claim 6

... The battery clamp of claim 4, wherein the master-control circuit unit further comprises: an indicator light circuit unit connected to the master-control chip unit for indicating operating status of the control device.

Zonesking describes indicator lights, such as a multi-color LED chip for providing the user information. (EX1007, Zonesking at [0012], [0017]; EX1004, ¶295.)

Richardson describes that the microprocessor includes several outputs to provide a user with information including LEDs. (EX1008, Richardson at 3:20-39, Fig. 1; EX1004, ¶296.)

7. Claim 7

... The battery clamp of claim 4, wherein the master-control circuit unit further comprises: a buzzing circuit unit connected to the master-control chip unit for alerting user about abnormal condition

The '105 Patent states that the “buzzing circuit unit mainly comprises a loudspeaker for alerting a user about abnormal conditions.” (EX1001 at 11:14-16.) Zonesking discloses a buzzing circuit in the form of a “warning element” and “display element”. (EX1007, Zonesking at [0012]; *Id.* at [0015].) A POSITA would understand that a voice announcer would include a loudspeaker that could “buzz” for alerting the user to abnormal conditions. (EX1004, ¶¶297-299.)

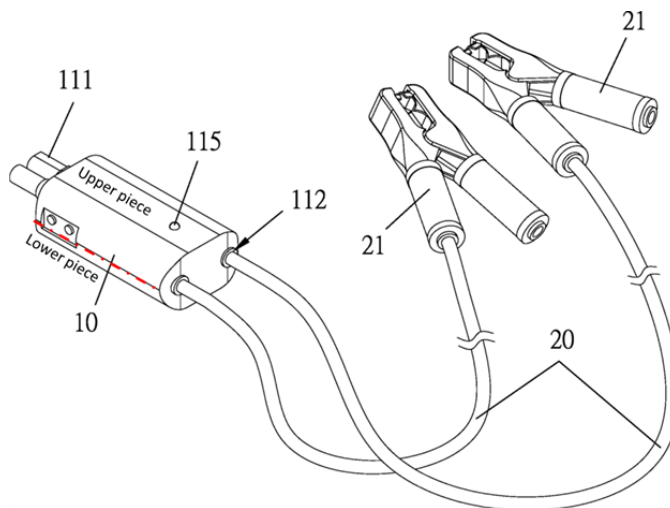
Richardson describes that master control circuit chip (microprocessor) includes several outputs to provide a user with information including audible warnings; which would request a loudspeaker. (EX1008, Richardson at 3:20-39 (“An audible warning may also be provided 70.”; *see also* Fig. 1 (“Annunciator 70”).))

8. Claim 9

... The battery clamp of claim 1, wherein the housing comprises an upper piece and a lower piece, which are removably connected together, and the master-control board is mounted on the lower piece.

As discussed in Limitation [1.2], once modified with Richardson’s control circuitry, Zonesking discloses a master-control board enclosed by a housing wherein

the housing includes pieces that are removably connected. As shown below, it would have been obvious to a POSITA that the housing 10 could be formed of an upper piece and a lower piece. (EX1004, ¶¶300-302.)

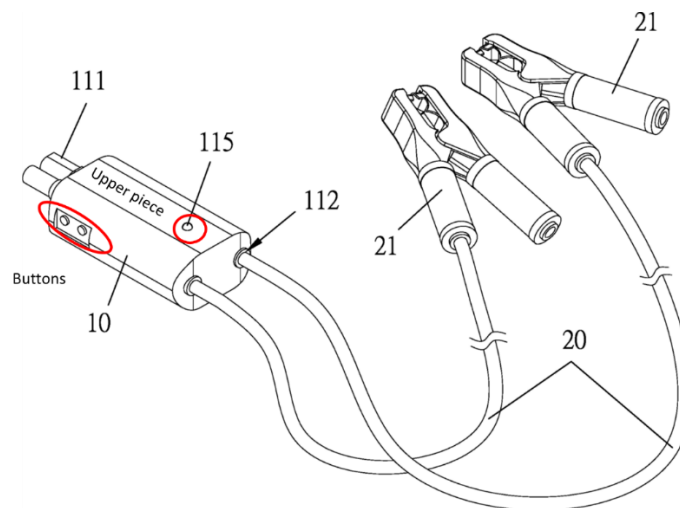


EX1007, Zonesking Figure 1

9. Claim 10

... The battery clamp of claim 9, wherein one side of the upper piece is provided with openings for indicator lights and buttons.

Zonesking discloses a multi-piece housing, where one side of the upper piece of the housing provides openings for indicator lights and buttons. (EX1007, Zonesking at [0015], Zonesking Figure 1 below; EX1004, ¶¶297-299.)



EX1007, Zonesking Figure 1

10. Reasons to Combine Zonesking and Richardson

A POSITA would have been motivated to combine Zonesking and Richardson. Zonesking and Richardson are both in the same field of endeavor and both provide real-time monitoring of various system parameters “to increase the safety and effectiveness of the unit's operation ...” (EX1008, Richardson at 1:60-61; 1:17-20 and 1:64-67; EX1007, Zonesking at [0001], EX1004, ¶¶304-310.) Both Zonesking and Richardson teach circuitry to monitor battery status (e.g., the voltage of the supply batteries) the result of which is used in the decision process of whether to connect the supply battery to the device to be charged. (EX1007, Zonesking at [0014]; *see also* EX1008, Richardson at 2:43-44.)

Both Zonesking and Richardson also describe the potential damage that can occur to the supply batteries if, among other things, there is an improper connection to the vehicle. (EX1007, Zonesking at [0003]; *see also* EX1008, Richardson at 1:40-

53.) Richardson also describes monitoring the temperature of the supply battery “to detect overheating due to excess current draw from the batteries during jump starting.” (EX1008, Richardson at 2:65-66.) To do so, Richardson discloses a communication connector (sensor wiring harness) for communication of temperature data obtained from the supply battery to the master-control board. (EX1008, Richardson at Figure 1.)

Zonesking does not disclose the monitoring and communication of temperature from the supply battery to the master control board through a communication connector. It would have been obvious to a POSITA at the time of the invention to modify Zonesking in view of Richardson in either of two ways: (1) use of the master control board (circuitry) and communication connector of Richardson in Zonesking jump starter cable housing or (2) using the communication connector of Richardson in the jump starter of Zonesking and adding Richardson’s temperature monitoring functionality to Zonesking’s master control board to use this status information to safeguard against overheating of the supply battery. (EX1004, ¶307.)

For the first alternative, using the master control board and communication connector (sensor wiring harness) of Richardson in the jumper cable housing of Zonesking would be clearly contemplated by a POSITA and easily within a POSITA’s capabilities. The circuitry of the master control board of Richardson is

not complex and such a master control board could likely fit into the housing of the adapter element of Zonesking, with little modification. (EX1004, ¶309.)

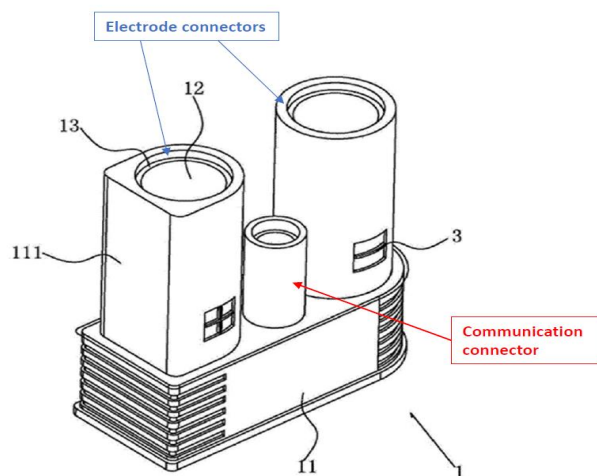
For the second alternative, a POSITA would understand how to design a simple circuit on a master control board to control the output of power from a supply battery to an external device based on temperature status information received from the supply battery. This combination would merely be the use of a known technique to improve similar devices in a similar way. (EX1004, ¶310.)

C. Ground 3 - Claim 8 is obvious in view of Zonesking, Richardson, Liu, and the knowledge/skill of a POSITA

As explained in Section VII.B.10, it was obvious to combine the teachings of Zonesking and Richardson thereby providing a communication connector for the communication of temperature data from the external data supply to the control device. But the proposed combination does not expressly disclose the communication connector being disposed between the first and second electrode connectors. (EX1004, ¶312.)

For instance, Richardson discloses a communication connector (sensor wiring harness), but it does not disclose it being disposed between the first and second electrode connectors. A POSITA, however, would understand a connector could include both power and communication terminals and the position of these connectors in relation to each other is a mere design choice. (EX1004 ¶313.)

Understanding this to be a design choice, a POSITA would have understood one possibility – as taught by Liu – would include a connection with terminals for both power and communication of temperature data for an external power supply. A POSITA would have recognized, as annotated below, connectors existed with two terminals for power (i.e., electrode connectors) and a third communication connector for transfer of data from an external power supply. (EX1006, Liu at Abstract; EX1004, ¶314.)



EX1006, Liu at Figure 1

A POSITA would have understood Liu’s connector is designed for use in a variety of applications including “intelligent emergency automotive battery jump starter.” (EX1006, Liu at Abstract.) And a POSITA would have further understood Liu’s third terminal would “enable connection” to an “automotive battery jump starter power supply” – like those used in Zonesking and Richardson. (EX1006, Liu at [0026].) Once combined, “temperature data” could be “transmitted to the

intelligent emergency automotive battery jump starter power supply through the third terminal.” (*Id.*) And as shown above, Liu’s communication connector is known to be positioned between the first and second electrode connectors of the connector. (EX1004, ¶¶315-317.)

1. Reasons to Combine

As explained in Section VII.B.10, it was obvious to combine Zonesking and Richardson as they both relate to monitoring the temperature of the external power supply to prevent overheating. It would have further been obvious to a POSITA to use Liu’s connector which includes two connectors for receiving power from an external power source and a third connector for receiving temperature data. (EX1006, Liu at Abstract.)

A POSITA would have been motivated to modify Zonesking in light of Richardson in either of two ways: (1) using the master control board and communication connector (sensor wiring harness) of Richardson in the jumper cable of Zonesking or (2) using the sensor wiring harness of Richardson in the jumper cable of Zonesking and adding functionality to the master control board of Zonesking to monitor the temperature of the external supply battery and use this status information to determine whether to connect the supply battery to the device to be charged. (EX1004, ¶¶318-323.) A POSITA would have also understood it is a design choice for how to arrange the terminals of a connector that includes receive

both power and communication. (*Id.*)

Liu discloses one connector design where with the terminal for communication of temperature data is located between the two terminals for power. (EX1006, Liu at Abstract.) It would have been obvious to modify Zonesking and Richardson to include such a design, because Liu describes the disclosed “three-hole starter power supply plug is capable of protecting the battery very effectively to prevent overloading induced explosion of the battery during automotive ignition.” (EX1006, Liu at [0015], [0026].) Beyond being a possible design choice, a POSITA would have therefore recognized Liu’s connector design would provide a safety feature desirable when jump starting a battery. For at least these reasons, a POSITA would be motivated to combine the Liu’s connector with the disclosures of Zonesking and Richardson. (EX1004, ¶¶321-322.)

D. Ground 4: Claims 1-7 and 9-10 Are Obvious in View Nook, Zonesking, and Knowledge/Skill of POSITA

The combination of Nook and Zonesking, in view of a POSITA, renders claims 1-10 obvious. (See EX1004, ¶¶324-422.) Both Nook and Zonesking disclose smart battery chargers with circuitry to protect the battery from potential hazards that occur during charging. Nook discloses the monitoring and use of supply battery temperature by the control circuitry, but Zonesking does not expressly do so.

Nook discloses a jump start with internal supply battery and control circuitry contained in a single housing. In contrast, Zonesking's jump starter includes a cable housing containing control circuitry that connects to an external battery.

Jump starters that have a battery that is external to the control housing (like Zonesking) have the benefit of easy replacement of a depleted, or defective battery without losing usage of the jump starter. Thus, a POSITA would have recognized desirability of having the battery and controller as separate unit and would have been motivated to modify Nook to make the supply battery external to the device. A POSITA would have also understood how to separate the battery and control circuit, as well as make electrical connections between the two.

1. Claim 1⁴

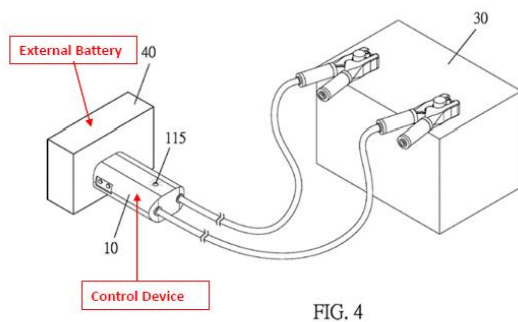
a. Limitation 1.0

To the extent the preamble is limiting, Nook discloses “a handheld device” (battery clamp) that is operable for “jump starting” a vehicle’s “depleted or discharged battery” (external device) using a “rechargeable lithium-ion battery pack” (power supply) and a microcontroller. (EX1009, Nook at Abstract, 1:7-9.) Nook states the handheld device can provide various amounts of jump start current including a “maximum charging current” of up to 8000 mA or 8 Amps. (EX1009,

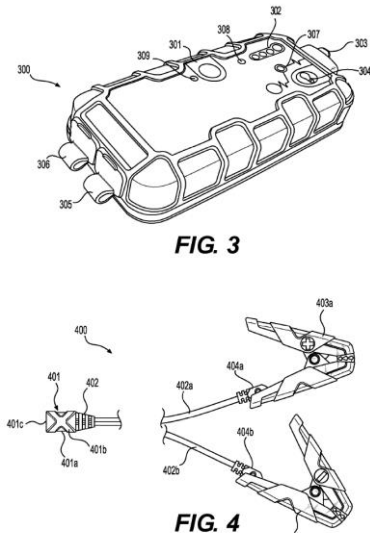
⁴ Ground 4 follows the same breakdown of limitations as used in Grounds 1-3 above.

Nook at 4:7-10; EX1004, ¶¶325-329.)

Nook, however, discloses a power supply located with the control unit in a single housing or enclosure (figure below right). A POSITA would recognize, at the time of the invention, including the power supply and control circuit within a single housing was one of only two design choices. The other known design choice (as shown by Zonesking below left) would be designed with the controller/control circuit being housed within an enclosure. A connector would then be used to connect the controller to an external power source. (EX1004, ¶¶325-329.)



EX1007, Zonesking Figure 4.



EX1009, Nook Figures 3 and 4.

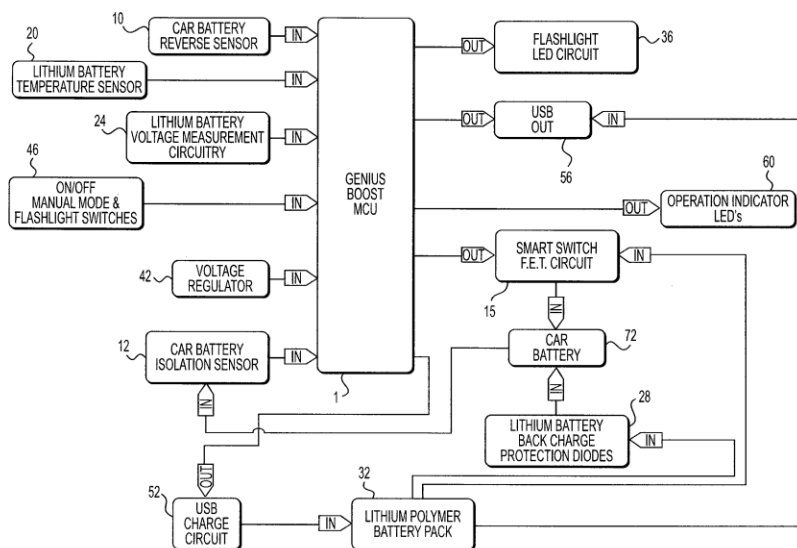
A POSITA would understand the two choices are a mere design choice with each having known benefits. For example, jump starters with a single housing for the battery and controller provide the benefits of less components, which may be easier to carry and there is a less likelihood of losing a component. However, a

downside to this design is the entire jump starter would have to be replaced when the internal battery became defective. (EX1004, ¶¶325-329.)

Jump starters that have a battery that is external to the control housing (like Zonesking) have the benefit of easy replacement of a defective battery without having to discard the controller or cables. A POSITA would have therefore recognized why it is desirable to have a battery and controller as separate units, and a POSITA would have been motivated to modify Nook to make a jump starter in which the battery was external. A POSITA would have also understood how to separate the battery and controller and how to make electrical connections between the two. (EX1004, ¶329.)

b. Limitation 1.1

As shown below, Nook discloses a “microcontroller” and associated circuitry (collectively “control device). (EX1009, Nook at Abstract; 3:16-36.)



EX1009, Nook at Fig. 1

Nook's circuitry (control device) also discloses a "battery temperature sensor" that operates to "monitor[] the temperature of the lithium battery pack 32 to detect overheating due to high ambient temperature conditions and overextended current draw during jump starting." (EX1009, Nook at 4:38-41; EX1004, ¶¶331-332.)

c. Limitation 1.2

As shown below, Nook discloses a housing that encloses the control circuitry.

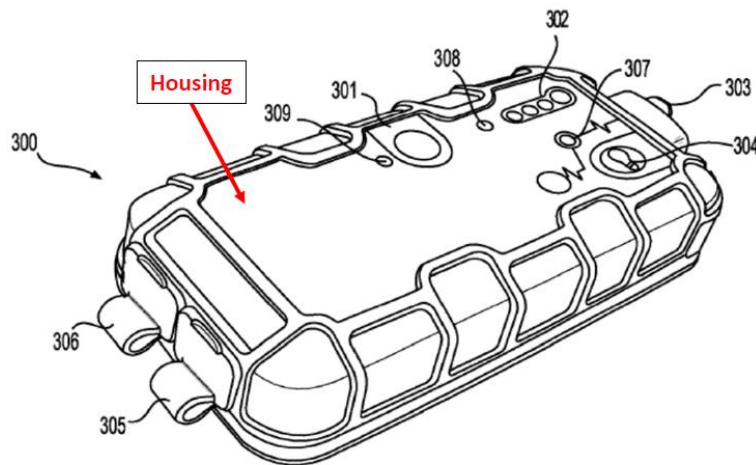
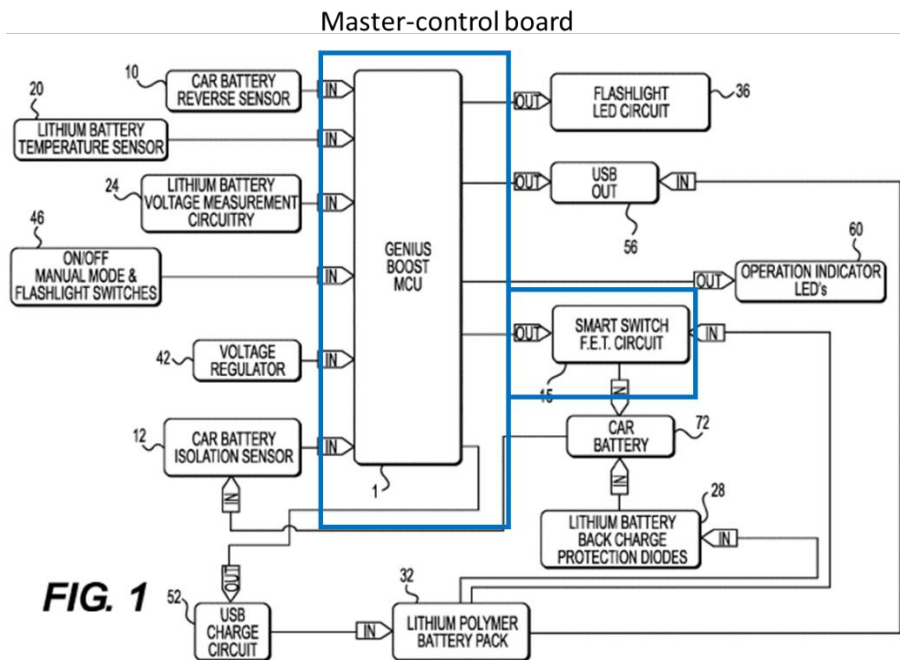


FIG. 3

EX1009, Nook at Figure 3.

d. Limitation 1.3

As annotated below, Nook’s “microcontrol unit (MCU)” and smart switch circuitry are a master-control board that includes a processor as well as other components within a housing. (EX1009, Nook at 4:11-13, 5:17-18; EX1004, ¶¶335-337.)



EX1009, Nook Figure 1.

A POSITA would also have understood it is well-known and commonly understood for circuit boards in consumer devices to be housed within an enclosure. As such a POSITA would understand Nook's master control board would be mounted in the housing shown in limitation 1.2. If not mounted within the housing, a POSITA would understand the circuit board would be free to move and would be at risk for being damaged during use. At a minimum, mounting the circuit board in the housing is a mere design choice that would be motivated, or at least obvious to try, to prevent damage to the circuit board. (EX1004, ¶337.)

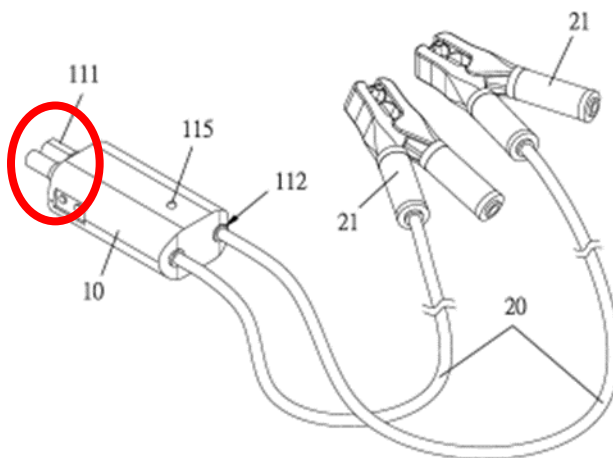
e. Limitation 1.4

Nook recognizes connectors which are electrically connected to the master control board. For instance, Nook discloses numerous sensors and other inputs that

that would include connectors that are electrically connected to the master control board. (EX1009, Nook at 5:16-18, 6:19-24.) Nook even recognizes the use of a “standard micro-USB connector” for electrically connecting the “charge circuit 52” to the “internal lithium battery pack 32” discloses such connectors in the context of recharging the internal battery. (EX1009, Nook at 7:14-16.)

Given Nook’s power source (battery) is included within the housing, Nook does not disclose connectors disposed at one side of the housing. But a POSITA would understand that modifying Nook to move the internal lithium battery to be external to the housing, would require locating the connectors on one side of the housing. Indeed, when transitioning from an internal battery to an external battery, connectors would be required to allow for the power to be transmitted.

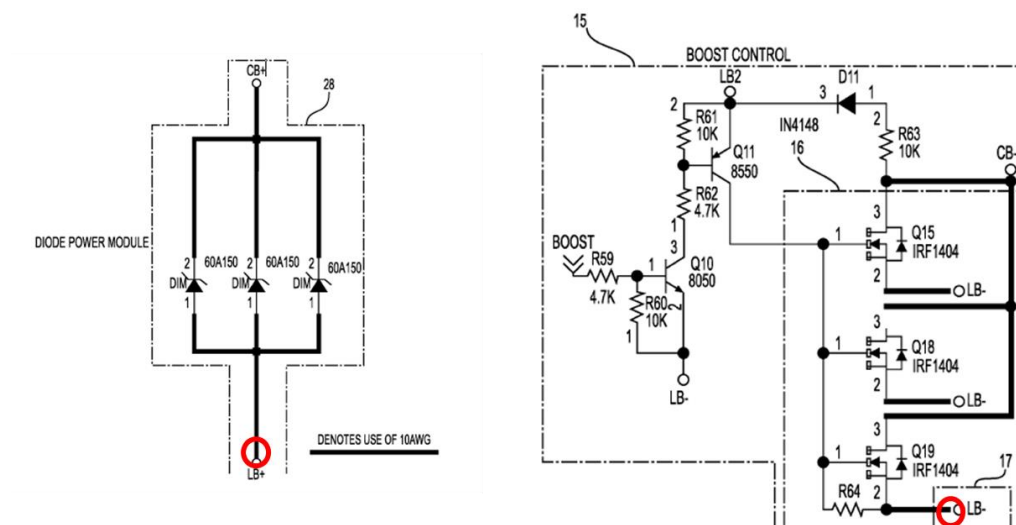
A POSITA modifying Nook to have the power source external the housing would understand (as disclosed by Zonesking) the connectors would be disposed at one end of the housing of the control device. While the most logical location, a POSITA would also understand that the side on which to put the connector is merely a design choice. (EX1004, ¶341.)



EX1007, Zonesking Figure 1.

f. Limitation 1.5

As shown below, Nook discloses a first/second electrode connector respectively connecting to a positive (LB+) and negative (LB-) portions of the internal battery – i.e., power supply. (EX1004, ¶¶342-343.)



EX1009, Nook Figure 2B-1 (left) and Figure 2B-2 (right)

While Nook's battery is internal, a POSITA would understand modifying Nook to have an external battery would require an electrode connector would be necessary to connect the external battery to the control device. (EX1004, ¶344.) Again, Zonesking discloses first/second electrode connectors for connecting control circuitry to an external power supply. Indeed, Zonesking discloses an "input terminal 111" that can be "connected" to a "mobile power supply 40" to "achieve a power supply state by mutual plugging in." (EX1007, Zonesking [0018].)

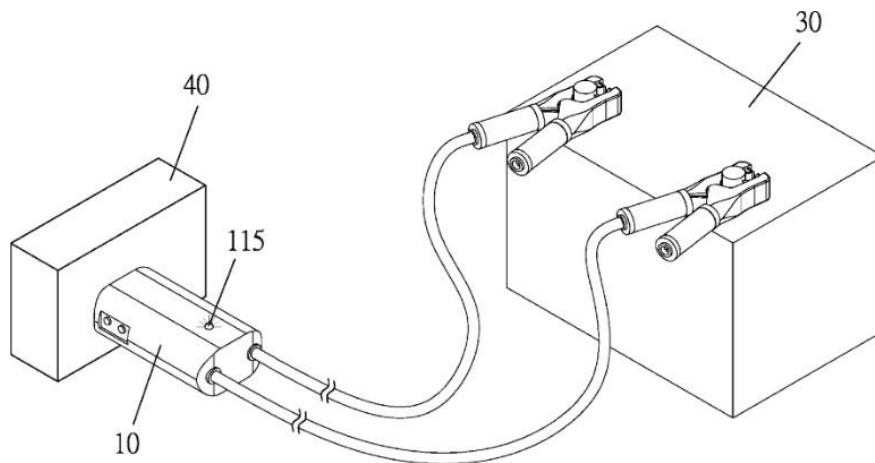


FIG. 4

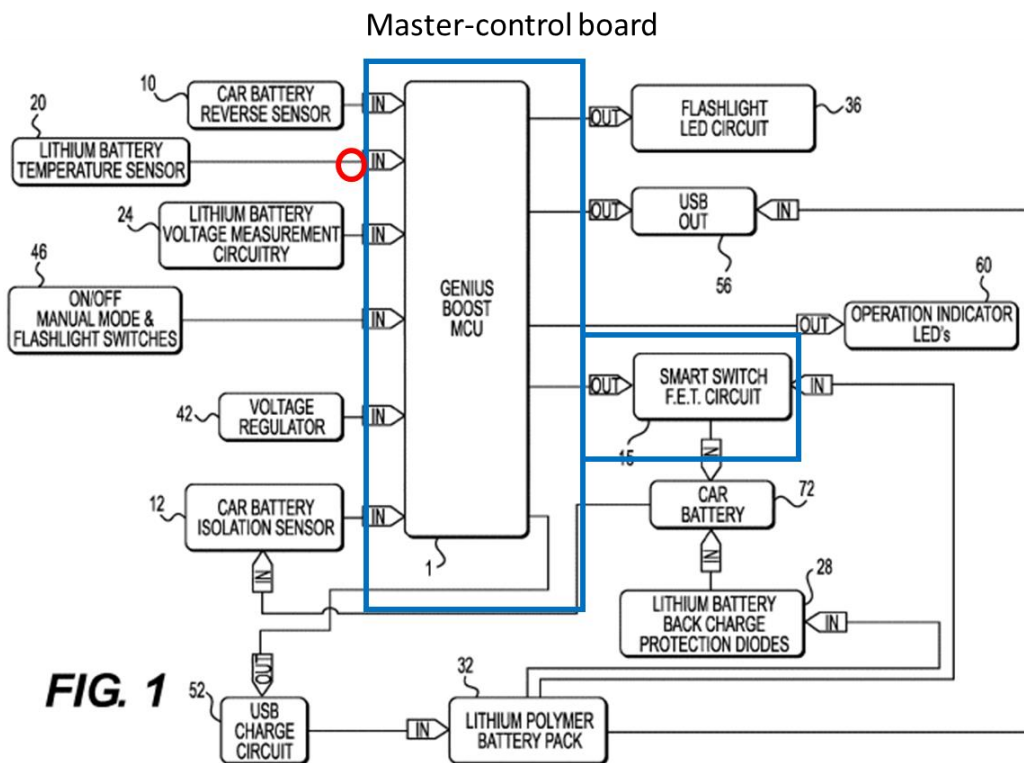
EX1007, Zonesking Figure 4.

A POSITA would also understand Zonesking's input terminal would include a first and second electrode connector for both positive and negative connection to the mobile power supply 40. (EX1007, Zonesking at Figures 3 and 4.) A POSITA would understand a positive and negative connection would be required to provide the positive and negative starting power to the "battery 30" illustrated by Zonesking

at Figure 4. (EX1004, ¶¶347-348.) A POSITA would have further understood that modifying Nook to include an external battery, Zonesking's positive and negative connectors would be required to provide the positive and negative starting power as illustrated by Zonesking's "battery 30." (EX1004, ¶¶347-348.)

g. Limitation 1.6

As shown below, Nook discloses connectors (labeled "IN") to the master control board for receiving status information like the "temperature of the internal lithium battery pack 32." (EX1009, Nook at 6:19-24.)



EX1009, Nook at Figure 1.

A POSITA modifying Nook to utilize an external battery, would understand

electrode connectors (like that used in Zonesking) would be used to connect to the external battery. As Nook already discloses the need to monitor the battery temperature this would require a way to send the status signal to the control circuitry of Nook from an external power supply. (EX1004, ¶¶349-354.)

A POSITA would also recognize that when a controller is implemented for controlling the operation of the jumper cables, modifying the controller to receive and process additional signals such as temperature would be clearly contemplated and easily within the capabilities of one of skill in the art. In the alternative, a POSITA could also simply use the master control board in Nook in place of the connector and microprocessor of the Zonesking smart jumper cables, which would also be clearly contemplated and easily within the capabilities of one of skill in the art. (EX1004, ¶¶353-354.) A POSITA would therefore be motivated to modify Zonesking to include the Nook communication connector to monitor the status information of the supply battery and send the status information to either the Zonesking or Nook master control board to control whether it is safe to provide power to an external device. (*Id.*)

h. Limitation 1.7

Nook discloses and illustrates “[a] pair of cables 402a and 402b” having “battery terminal clamps 403a and 403b.” (EX1009, Nook at 7:49-56.) Nook discloses the ends of the wire clamps are connected to the battery for jump starting.

(EX1009, Nook at 7:61-64; EX1004, ¶¶355-358.)

i. Limitation 1.8

Nook teaches a microcontroller which drives an FET smart switch which determines whether power is supplied from the supply battery to the external device. (EX1009, Nook at 5:55-6:3.) A POSITA would also understand the microcontroller makes operational decisions based on status information (e.g., temperature) from the supply battery. (EX1009, Nook at 6:19-27; EX1004, ¶¶359-362.)

2. Claim 2

a. Limitation 2.0

Nook discloses a smart jump starter wherein the “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.” (EX1009, Nook at Abstract, 4:41-45.)

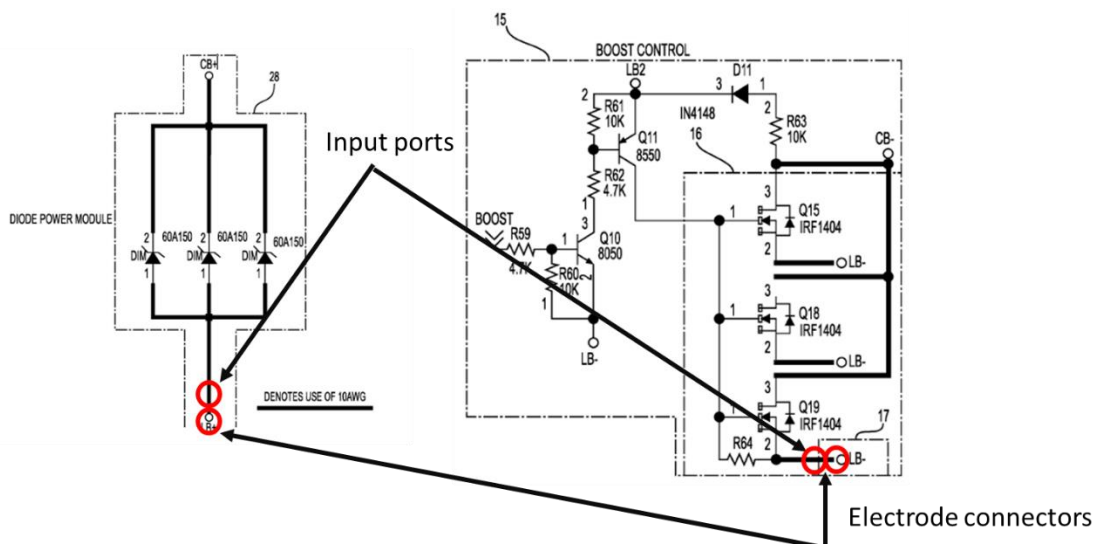
b. Limitation 2.1

Nook discloses: (1) monitoring “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;” and (2) a “temperature sensor 20” for monitoring “the temperature of the lithium battery pack 32.” (EX1009 4:38-45; EX1004, ¶¶366-367.)

3. Claim 3

a. Limitation 3.0

Figures 1 and 2B illustrate the positive and negative connections (i.e., LB+ and LB-) of the lithium polymer battery pack 32 connect to the smart switch FET circuit 15.

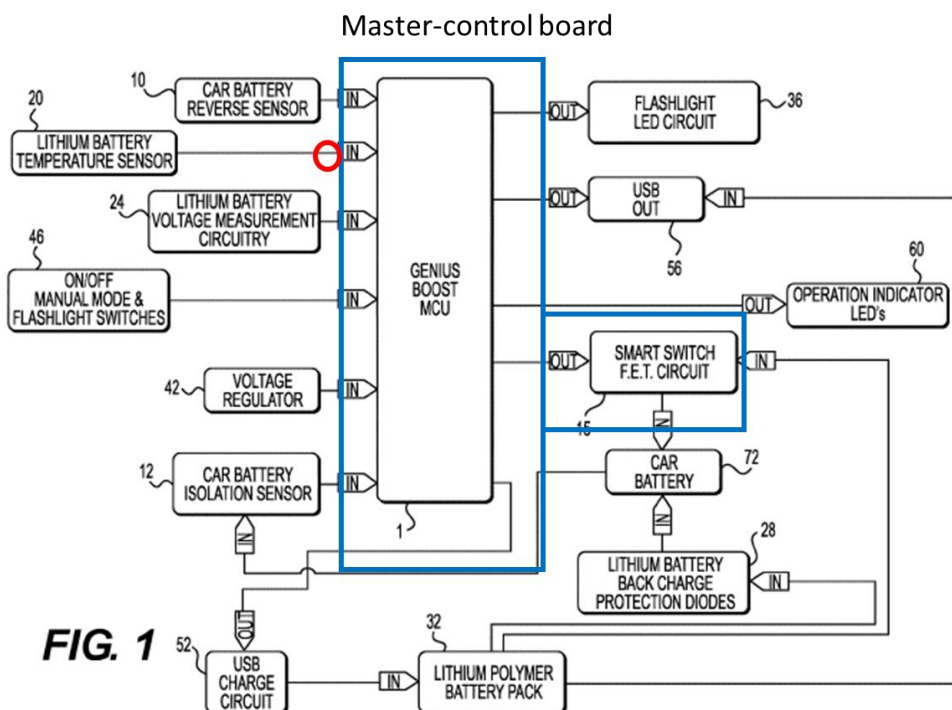


EX1009, Nook Figure 2B-1 (left) and Figure 2B-2 (right)

A POSITA would recognize that ports could take the form of solder pads on the printed circuit board whereas the connectors to the Lithium Battery terminal would be in the form of electrode connectors. (EX1004, ¶¶368-370.)

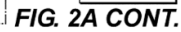
b. Limitation 3.1

As shown below, Nook's temperature sensor connects to the MCU. (EX1004 ¶¶371-373.)



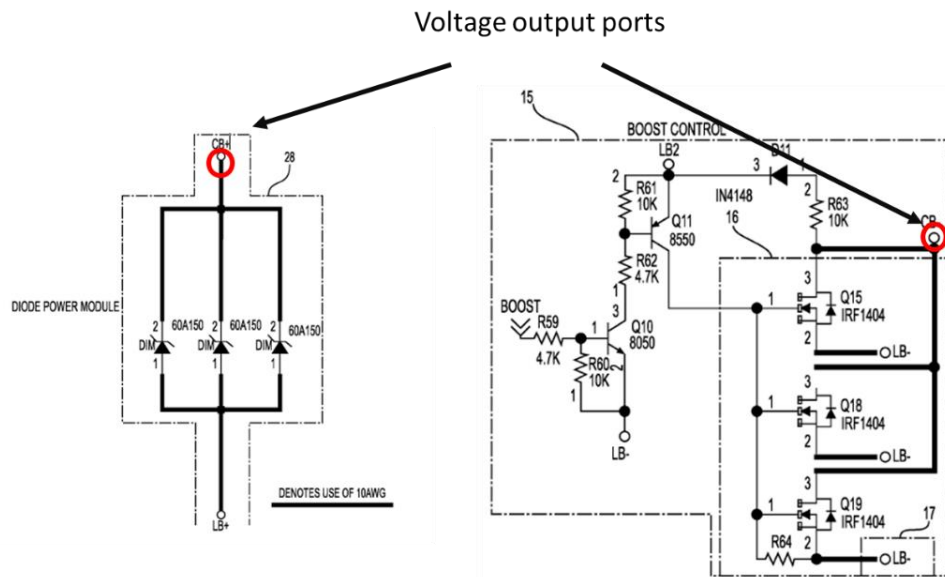
EX1009, Nook Figure 1.

Figures 2A-1 and Fig. 2A-2 further illustrate “unit 20” monitors and provides the temperature of the battery as a signal to the microcontroller. (EX1009, Nook at 4:46-50; EX1004, ¶373.)



c. Limitation 3.2

85



EX1009, Nook Figure 2B.

Figure 4 illustrates the “jumper cable device 400” includes “a plug 401 configured to plug into 12 volt output port 303 of the handheld device 300.” (EX1009, Nook at 7:46-49; EX1004, ¶¶374-376.)

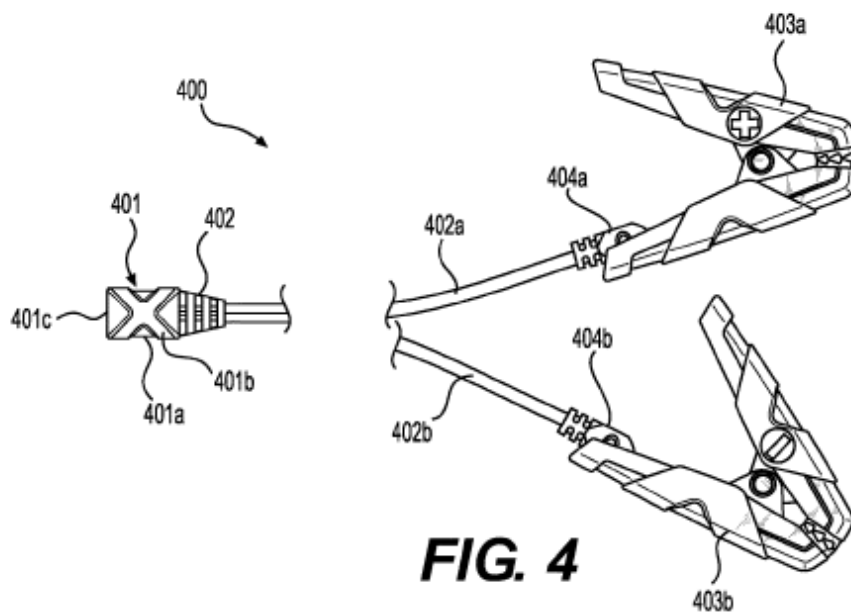


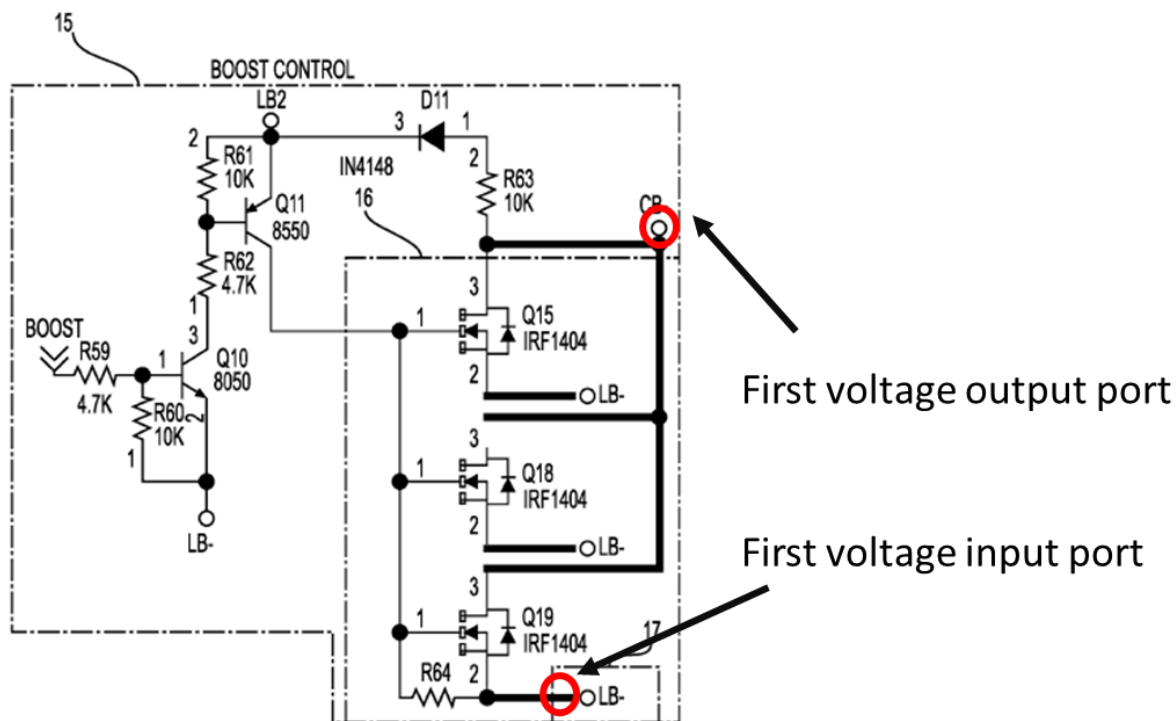
FIG. 4

EX1009, Nook Figure 4.

A POSITA would recognize that to have a functional device the CB+ and CB- connection of Fig. 2B-1 and Fig. 2B-2 must be electrically connected to the first and second wire clamps of Fig. 4. A POSITA would recognize that ports could take the form of posts that connect to plug 401. (EX1004, ¶377.)

d. Limitation 3.3

Figure 2B-2 illustrates the switch control unit includes transistors Q15, Q18 and Q19 which are operated by the microcontroller. (EX1009, Nook at 5:55-57.) As circled in red below, these ports are between the two voltage ports. A POSITA would recognize that ports could take the form of solder pads on the printed circuit board. (EX1004, ¶¶378-381.)



EX1009, Nook Figure 2B-2.

e. Limitation 3.4

As explained in Limitations 3.1 and 1.6, Nook discloses a master-control circuit unit connected to the communication port for obtaining the status information of the external power supply.

f. Limitation 3.5

Nook discloses monitoring and transmitting the “temperature of the internal lithium battery pack 32” (status information) to the microcontroller. (EX1009, Nook at 6:19-27.) The microcontroller will then use this status information to “determine when the internal lithium battery is too hot to allow jump-starting, adding safety to the design.” (*Id.*) Thus, the microcontroller uses the information for controlling (i.e., enabling/disabling jump start operation) between the input and output ports if the temperature is too hot. (EX1004, ¶¶382-384.)

4. Claim 4

a. Limitation 4.0

Nook discloses the control circuit monitors the current using a “shunt cable” to determine “if there is a battery explosion risk.” (EX1009, Nook at 1:55-58.) A POSITA would understand that electric current can be measured via a shunt and relied on as part of the decision process. (EX1004, ¶¶385-387.) Additionally, a POSITA would understand that Zonesking discloses an alternative electric current detection that could likewise be used by Nook’s control circuit. (EX1007, Zonesking

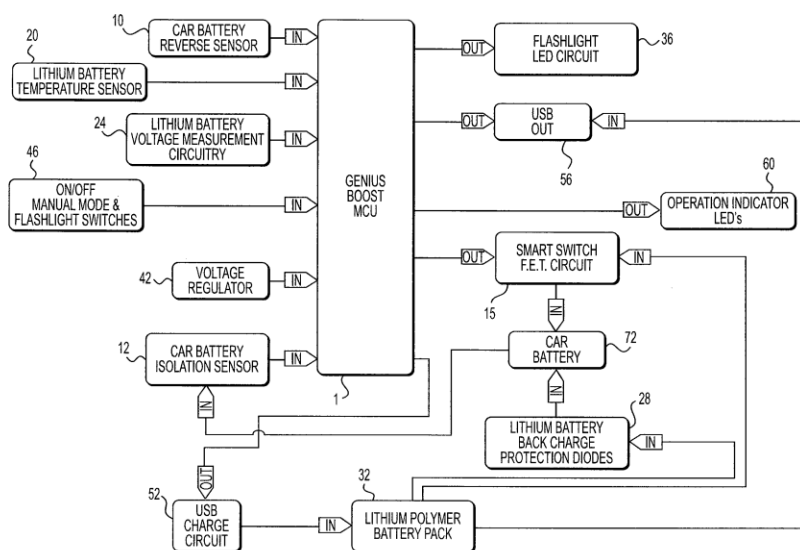
at [0006]; EX1004, ¶388.)

b. Limitation 4.1

Nook describes a voltage detection unit that measures the voltage of the supply lithium battery pack 32. (EX1009, Nook at 2:41-45.) Nook also describes that the control circuit can detect for reverse polarity. (EX1009, Nook at 5:50-54.) A POSITA would recognize the voltage of the external device to be charged is required to allow for protection from reverse polarity. (EX1004, ¶¶389-392.)

c. Limitation 4.2

Again, Nook discloses electrical current detection in the form of a shunt resistor. (EX1009, Nook at 1:55-58.) Nook also describes circuitry for measuring the voltage of the supply lithium battery pack 32. (EX1009, Nook at 4:41-45.)



EX1009, Nook at Fig. 1

Nook's control circuit makes decisions based on input parameters (like voltage and temperature) to control the “smart switch” used to provide jump start charging current. A POSITA would understand that electric current can be measured via a shunt and relied on as part of the decision process. (EX1004, ¶¶393-396.)

5. Claim 5

a. Limitation 5.0

Nook describes a “lithium battery voltage measurement circuitry 24” – i.e., first voltage detection unit. (EX1009, Nook at Fig. 1, 4:41-45; EX1004, ¶¶397-398.)

b. Limitation 5.1

Nook describes a car battery reverse sensor. (EX1009, Nook at 4:20-22.) A POSITA would recognize that this sensor is measuring the voltage of the power supply. (EX1004, ¶¶399-400.)

6. Claim 6

Nook discloses “operation indicator LEDs 60” which are connected to the master-control chip unit for providing an indication of the control device like “visual indication of lithium battery capacity status as well as an indication of smart switch activation status.” (EX1009, Nook at 5:9-13, 7:31-45, Claims 15-18; EX1004, ¶¶401-402.)

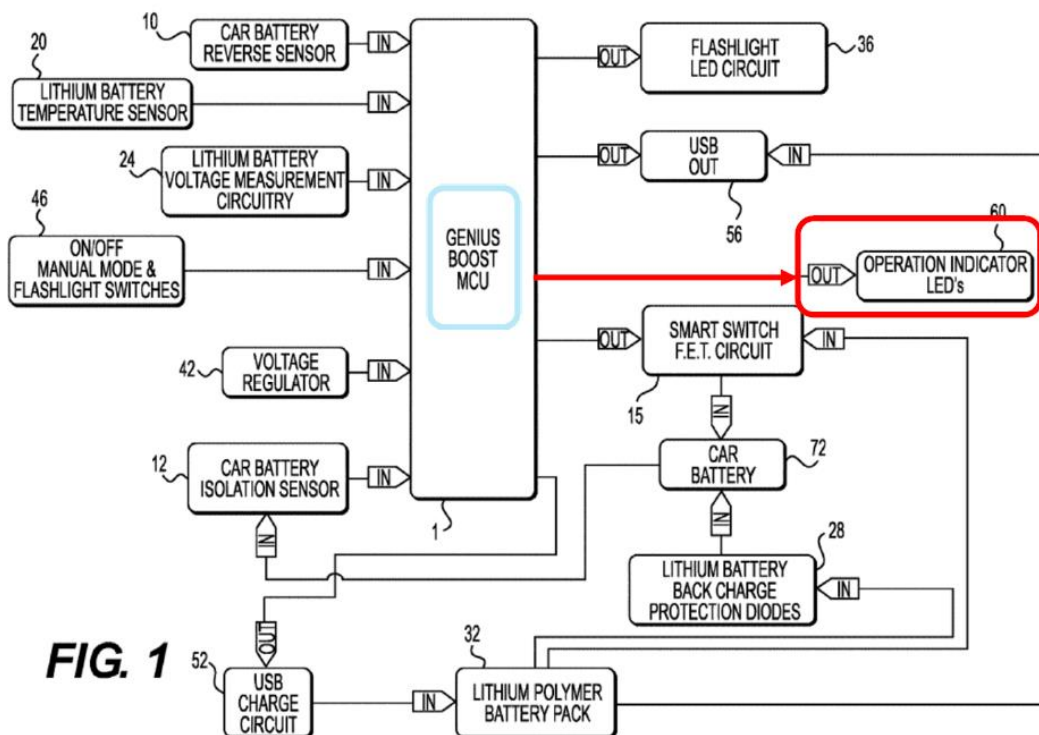


FIG. 1

EX1009, Nook Figure 1

7. Claim 7

As stated in Claim 6, Nook discloses a visual “LED” indicator for alerting a user about abnormal conditions. (EX1009, Nook at 9:8-10.) Zonesking discloses the use of both visible (e.g., light-emitting elements) or audible (e.g., voice announcer) alarms used for notifying a user about abnormal conditions. (EX1007, Zonesking at [0012], [0015]), Figure 2; EX1004, ¶¶403-405.)

A POSITA understood at the time of the invention that using alerts, including visual alerts (e.g., LEDs), audible alerts (e.g., buzzing) and other sensory alerts (e.g., vibration), with jump starters, was well known in the art at the time of the invention.

(EX1004, ¶406.) A POSITA would be motivated to provide both optical and audible alerts to users to warn of potentially hazardous conditions during charging. (*Id.*) A POSITA would also have the knowledge and capability of implementing an audible alert (like Zonesking) within the Nook's control circuit. A POSITA would recognize audible alerts, such as a buzzing circuit, would provide additional safety for the hearing-impaired, or if the charger were used in a loud environment where any audible warning may not be easily heard. (*Id.*)

8. Claim 9

As stated in limitation 1.2, Nook discloses a master-control board enclosed by a housing.

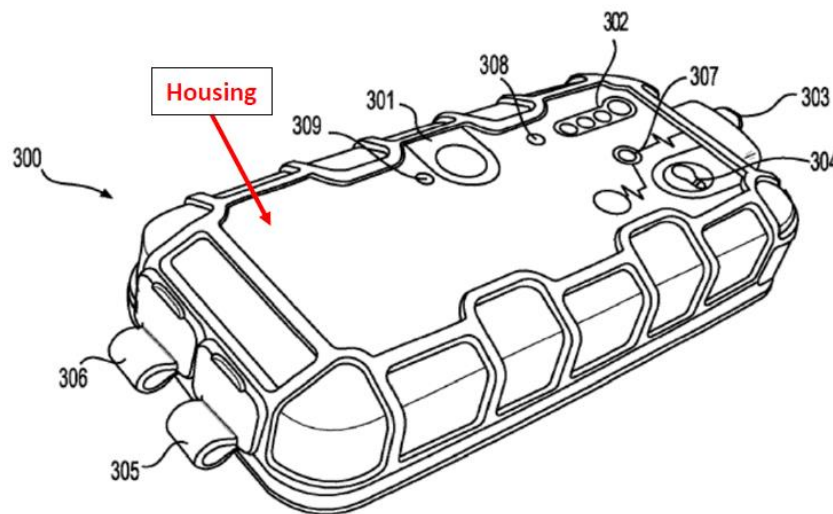


FIG. 3

EX1009, Nook at Figure 3

Nook does not disclose whether the master control board is mounted on the lower or upper pieces of the housing. But a POSITA would understand that the master-control board would necessarily be mounted inside the housing to avoid the components of the board from moving around and potentially being damaged. Thus, it would be obvious to secure the board in Nook to either the upper piece or the lower piece of the housing. A POSITA would understand that this is simply a design choice. (EX1004, ¶¶414-415.)

9. Claim 10

As shown below, Nook illustrates the housing's upper piece includes openings for the “LED” indicator lights. (EX1009, Nook at 7:31-45; EX1004, ¶416.)

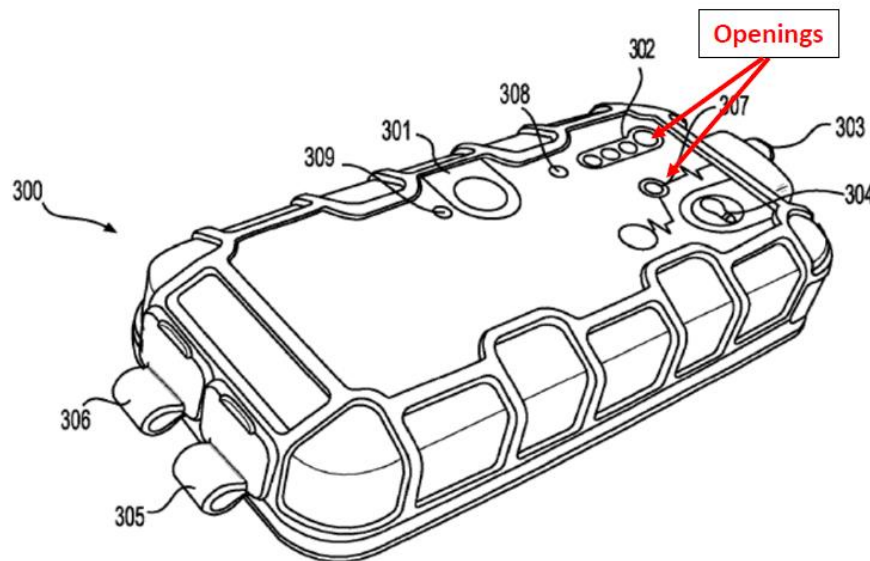


FIG. 3

EX1009, Nook Figure 3

10. Reasons to Combine

A POSITA would have understood Nook and Zonesking both relate to the same field of portable, smart jumper cables for jumpstarting external devices. (EX1009, Nook at 1:8-10; EX1007, Zonesking at [0001]; EX1004, ¶418.) A POSITA would have also understood Nook and Zonesking both describe potential damage that can occur to the supply batteries if, among other things, there is an improper connection to the vehicle. (EX1009, Nook at 1:17-24, EX1007, Zonesking at [0003].) Both references also teach detection circuitry to monitor the voltage of the supply batteries, the result of which is used by a master control board in the decision process of whether to connect the supply battery to the device to be charged. (EX1009, Nook at 4:41-45; EX1004, Zonesking at [0014].)

While both references are in the same field and operate in a similar manner Nook discloses a power supply located with the control unit in a single housing while Zonesking teaches the battery being external to the housing. But a POSITA would recognize, at the time of the invention, where the battery is located is simply a design choice. A POSITA would understand either design choice includes known benefits. For example, jump starters with a single housing for the battery and controller provide the benefits of less components, which may be easier to carry and there is a less likelihood of losing a component. However, a downside to this design is the entire jump starter would have to be replaced when the internal battery became

defective. (EX1004, ¶¶419-421.)

Jump starters that have a battery that is external to the control housing (like Zonesking) have the benefit of easy replacement of a defective battery without having to discard the controller or cables. A POSITA would have therefore recognized why it is desirable to have a battery and controller as separate units, and a POSITA would have been motivated to modify Nook to make a jump starter in which the battery was external. A POSITA would have also understood how to separate the battery and controller and how to make electrical connections between the two. (EX1004, ¶422.)

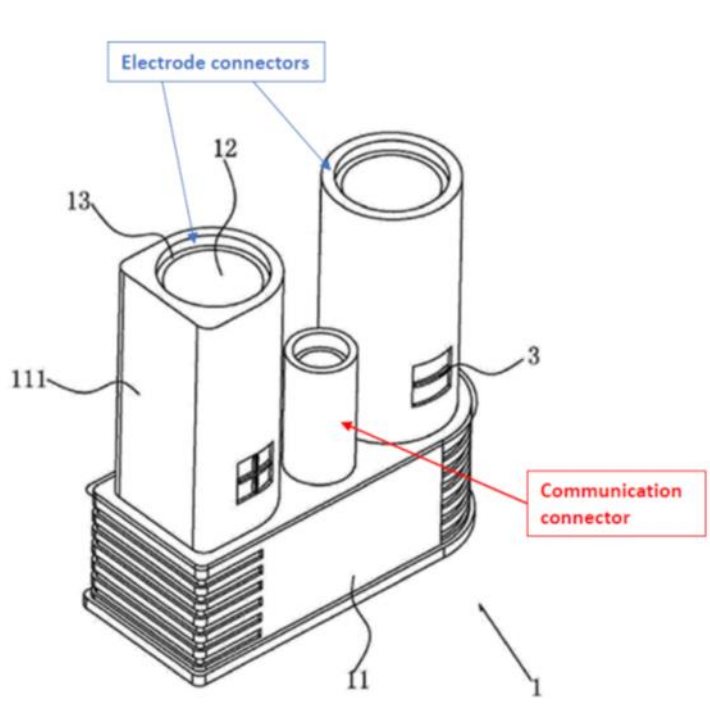
E. Ground 5: Claim 8 is obvious in view of Nook, Zonesking, Liu, and Knowledge/Skill of a POSITA

As discussed in Ground 4/Limitation 1.6, Nook discloses communication connectors which receive status information (e.g., temperature of supply battery) of the power supply battery and send this information to the master control board. (EX1009, Nook at 6:19-24.) Liu discloses a “power supply plug” that can be used in a variety of applications including for connection to an external battery for an “intelligent emergency automotive battery jump starter.” (EX1006, Liu at Abstract.)

Liu describes that these “power supply plugs ... commonly seen on the market usually have two (2) terminals connected to the anode and cathode of a power supply.” (EX1006, Liu at [0025].) A POSITA would understand Liu’s third terminal

is used for a power supply plug to allow connection and communication between the supply battery and the jump starter so that “temperature data can be transmitted.” (EX1006, Liu at [0026]; EX1004, ¶¶407-410.)

As shown below, Liu’s connector includes a third communication terminal disposed between the first and second electrode connectors. (EX1006, Liu at [0025].)



Ex1006, Liu Figure 1.

A POSITA would have recognized Nook, Zonesking and Liu are in the same field of endeavor. (EX1004, ¶¶411-412.) If a POSITA desired a jump starter with the functionality of Nook but instead wished to have the power supply battery outside of the control device for easy replacement, the POSITA would look to

Zonesking and Liu, jump starters with external batteries, for guidance on the connection between the external power supply and the control device. (*Id.*) A POSITA would have reason to include the connector of Liu describe the issues related to the damaging a supply battery. (*Id.*) A POSITA would also understand how to employ Liu's structure of a communication connector and Liu's communication connector between the first and second electrode connectors on similar devices such as those of Nook or Zonesking. (*Id.* at ¶413.)

1. Reasons to Combine

As discussed in Section VII.D.10, it was obvious to combine Nook and Zonesking as both are in the same related field and describe the potential damage that can occur to the supply batteries. (EX1004 at ¶423.) Liu likewise discusses the potential damage that can occur to the supply batteries and describes how its connector can help protect the external supply battery for such hazards. (EX1006, Liu at [0015], [0026]; EX1004, ¶424.)

Nook describes a way to monitor temperature of the internal supply battery. Nook discloses connectors which receives and provides status information (e.g., supply battery temperature) to the master control board. (EX1009, Nook at 6:19-24.) A POSITA would recognize that, at the time of the invention, there were two principal types of smart jump starters, those in which the battery and controller were in a single housing (such as Nook), and those in which the controller was housed in

the jumper cables, which then connected to an external battery (such as in Zonesking). (EX1004, ¶425.) For external power supply's – like Nook - temperature information would need to be provided using a conductor that carries the information from the external battery to the control circuitry. (*Id.*)

It would have been obvious to a POSITA to look to Liu, which also relates to smart jump starters, for the structure of a connector for an external power supply that has terminals for both power and additional data. (EX1006, Liu at Abstract; EX1004, ¶¶426-427.) A POSITA would have understood a connector that includes both power terminals and a communication terminal, the position of the communication terminal in relation to the power terminals would have been a mere design choice. (*Id.*, ¶428.) It would have therefore been obvious and a POSITA would have been motivated to combine the Liu's connector with the disclosures of Nook and Zonesking. (*Id.*, ¶429.)

VIII. DISCRETIONARY DENIAL WOULD BE NEITHER APPROPRIATE NOR EQUITABLE

A. There Are No Grounds for a § 314 Discretionary Denial

The pending district court action involving the '105 patent has been stayed in its early stages by stipulation of the parties, pending a final decision in this IPR. (EX1026.) Indeed, no trial has been scheduled, no claim construction order issued, no dispositive motions have been filed, and no discovery has been conducted.

Moreover, the Petition presents compelling evidence of unpatentability. Thus, none of the factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019 Paper 11, (P.T.A.B. Mar. 20, 2020) (“Fintiv”) support discretionary denial. Thus, the efficiency and integrity of the IPR process is best served by instituting review.

B. There Are No Grounds for a § 325 Discretionary Denial

Factors considered in deciding institution under § 325 favor institution here. *Becton, Dickinson & Co. v. B. Braun Melsungen AG*, IPR2017-01586, Paper 8, 17-18 (Dec. 15, 2017).

Patent Owner filed a reissue proceeding for the ’105 Patent on December 4, 2020, which remains pending. Patent Owner’s reissue application was directed to all ten claims of the ’105 Patent: claims 1-4 and 6-7 were amended and claims 5 and 8-10 were canceled. (EX1003 at 34-38.)

One year later, before any action was taken by the USPTO in the reissue application, Patent Owner sued Petitioner for infringement of the ’105 Patent – asserting original claims 1-3 and 7-9. (EX1025 at ¶29.) Thus, all the asserted claims in the lawsuit were either being amended or canceled in the reissue application.

Because Patent Owner could abandon its reissue application at any time, wherein its original patent would remain in full force, Defendant had to file its IPR Petition within the required one-year window (by December 16, 2022) – or risk waiving its right to challenge the original claims in the reissue. 35 U.S.C. § 252;

M.P.E.P. 1460. Thus, waiting for the conclusion of the reissue application was not an option. As such, discretionary denial here would be highly inequitable because Patent Owner, by suing on its claims pending in reissue, and starting the one-year time bar, put Petitioner in this dilemma.

Moreover, the reissue is in its early stages. There was an initial Office Action in February 2022 which rejected all claims as (1) failing the original patent requirement of § 251 and (2) anticipated or obvious under § 102/103. (EX1003 at 64.) In response, Patent Owner amended or canceled all the pending claims – only amended claims 1-4, 6-7 and new claims 26-29 remained. (EX1003 at 127-129.) On September 9, 2022, the PTO again rejected all claims as (1) failing the original patent requirement of § 251 and (2) numerous as anticipated or obvious under §§ 102/103. (EX1003 at 148.) On September 30, 2022, Patent Owner submitted an IDS identifying ***over 100 new references***. Thus, all claims stand rejected, there has not been a final action, and the Examiner must now consider over 100 new references. (EX1003 at 186-190.)

Moreover, the combinations asserted in this Petition were never seen, nor considered by the USPTO. For Ground 1 (Koebler and Liu), neither Koebler, nor Liu, were cited or considered by the USPTO.

For Grounds 2 (Zonesking and Richardson) and 3 (Zonesking, Richardson and Liu), Zonesking was considered by the Examiners in the original and reissue

applications but was not discussed, nor used, in any claim rejections. Richardson was not cited nor considered in the original application for the claims at issue in this IPR, but was used in a combination with numerous other references in the reissue proceeding for claims **NOT** at issue there. Liu was never cited nor considered. Thus, the combinations of Grounds 2 and 3 have never been considered by the USPTO for the claims at issue here.

For Grounds 4 (Nook and Zonesking) and 5 (Nook, Zonesking and Liu), a parent application of Nook was cited and considered in the original application but was not relied on by the Examiner for any rejections. As such, this Petition should be instituted.

IX. Conclusion

There is a reasonable likelihood that Petitioner will prevail on institution for each of the Grounds and institution should be granted.

Respectfully submitted,

Dated: December 16, 2022

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Certificate of Service

The undersigned hereby certifies that the foregoing **PETITION FOR INTER PARTES REVIEW UNDER 35 U.S.C. §§ 311-319 ET SEQ. AND 37 C.F.R. § 42.100 ET SEQ.**, including all exhibits and supporting evidence, was served by overnight courier in its entirety on **December 16, 2022**, upon the following correspondence address as shown for the '105 Patent:

96568 - Jun He Law Offices P.C. 20380 Town Center Lane Suite 128 Cupertino, CA 95014 UNITED STATES

The undersigned also certifies that on the same date a courtesy copy was served in its entirety on the following parties via electronic service:

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Certificate of Compliance Pursuant to 37 C.F.R. § 42.24

This paper complies with the type-volume limitation of 37 C.F.R. § 42.24. The paper contains 13,785 words, excluding the parts of the paper exempted by §42.24(a).

This paper also complies with the typeface requirements of 37 C.F.R. § 42.6(a)(ii) and the type style requirements of § 42.6(a)(iii)&(iv).

Respectfully submitted,

Dated: December 16, 2022

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