

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Title: PORTABLE BACKUP CHARGER

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**PETITION FOR *INTER PARTES* REVIEW OF UNITED STATES PATENT
NO. 9,643,506 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42**

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EXHIBITS

EX1001	U.S. Patent No. 9,643,506 (“the ’506 patent”)
EX1002	Prosecution History of the ’506 patent
EX1003	Declaration of Dr. Gary Woods
EX1004	Continuation-in-part Parent App. No. 14/298,986
EX1005	Chinese Pub. No. CN102005796A to Chen
EX1006	Certified English Translation of Chinese Pub. No. CN102005796A (“Chen”)
EX1007	U.S. Patent No. 7,279,640 (“White”)
EX1008	U.S. Publication No. 2010/0301800 (“Inskeep”)
EX1009	U.S. Patent No. 4,969,834 (“Johnson”)
EX1010	U.S. Publication No. 2012/0068662 (“Durando”)
EX1011	U.S. Patent No. 7,348,101 (“Gozdz”)
EX1012	PCT Publication No. WO2016/003471 (“Nook”)
EX1013	U.S. Publication No. 2016/0072329 (“Miller”)
EX1014	U.S. Publication No. 2009/0218988 (“Richardson”)
EX1015	U.S. Patent No. 6,404,168 (“Shoji”)
EX1016	<i>Shenzhen Carku Technology Co., Ltd. v. Shenzhen Xinzexing E-commerce Co., Ltd.</i> , Case No. 1-22-cv-03403 (NDIL), Document 1 (Complaint), June 29, 2022

- EX1017 *Shenzhen Carku Technology Co., Ltd. v. Shenzhen Xinzexing E-commerce Co., Ltd.*, Case No. 1-22-cv-03403 (NDIL), Document 19 (Service by Publication), October 4, 2023
- EX1018 PCT Publication No. WO2013/082982 (“predecessor PCT”)
- EX1019 Chinese Pub. No. CN102496985A (“predecessor Chinese application”)
- EX1020 U.S. Publication No. 2007/0285049 (“Krieger”)
- EX1021 U.S. Publication No. 2009/0230783 (“Weed”)
- EX1022 U.S. Publication No. 2010/0102772 (“Smith”)
- EX1023 PCT Publication No. WO2012/075769A1 (“Chen PCT”)

LISTING OF CLAIMS

Claim Element	Language
[1.P]	1. A portable backup charger, comprising:
[1.1]	a battery pack having at least one battery cell;
[1.2]	at least one output port coupled to the battery pack, wherein the battery pack is configured to output a first current through one or more output ports of the at least one output port in a first operating mode;
[1.3]	a pair of output terminals coupled to the battery pack and having a current path to the battery pack different from that of the at least one output port to the battery pack, wherein the battery pack is configured to output a second current capable of starting a vehicle engine through the pair of output terminals in a second operating mode, wherein the second current is higher than the first current;
[1.4]	a first protection circuit coupled to the battery pack and configured to protect the battery pack when the battery pack is working in the first operating mode; and
[1.5]	a second protection circuit coupled to the battery pack and configured to prevent overcurrent condition of the second current when the battery pack is working in the second operating mode.
[2]	2. The portable backup charger of claim 1, wherein when the first protection circuit is configured to prevent overcurrent condition of the first current, and overcharge and

	overdischarge condition of the battery pack.
[3]	3. The portable backup charger of claim 1, wherein the battery pack is further configured to work in a third operating mode for outputting the first current and the second current simultaneously, and in the third operating mode both the first protection circuit and the second protection circuit are active.
[4]	4. The portable backup charger of claim 1, wherein the second protection circuit comprises a fuse.
[5]	5. The portable backup charger of claim 4, wherein the fuse has a rating current of 150 to 250 A.
[6]	6. The portable backup charger of claim 1, further comprising a pair of connecting wires for detachably coupling the pair of output terminals with the battery pack, each connecting wire having a clamp for clamping an electrode of an external vehicle battery.
[7]	7. The portable backup charger of claim 6, wherein the second protection circuit is built into at least one of the pair of connecting wires.
[8]	8. The portable backup charger of claim 6, wherein the pair of connecting wires comprises a reverse connection-proof plug.
[9]	9. The portable backup charger of claim 1, further comprising a switching module operable to switch on or off the second current from the battery pack.
[10]	10. The portable backup charger of claim 9, wherein the switching module is further configured to prohibit the outputting of the second current after a predetermined time

	period has passed.
[11]	11. The portable backup charger of claim 1, further comprising at least one voltage adjusting circuit, each voltage adjusting circuit being coupled between the battery pack and one of the at least one output port and configured to elevate or reduce an output voltage of the battery pack to a predetermined voltage at the respective output port.
[12]	12. The portable back up charger of claim 1, wherein the first current is of 0.5 to 10 A.
[13]	13. The portable backup charger of claim 1, wherein the second current is of 100 to 400 A.
[14]	14. The portable backup charger of claim 1, further comprising a controller configured to control the operating mode of the battery pack.
[15]	15. The portable backup charger of claim 1, wherein the discharge rate of the battery pack is in a range of 20 c to 70 c.
[16]	16. The portable backup charger of claim 1, wherein the at least one output port comprises a universal serial bus (USB) port.
[17]	17. The portable backup charger of claim 1, wherein the at least one output port comprises an output port of a rating voltage of 12V.
[18]	18. The portable backup charger of claim 1, wherein the at least one output port comprises an output port of a rating voltage of 19V.

[19]	19. The portable backup charger of claim 1, wherein the at least one battery cell is lithium based battery cell.
[20]	20. The portable backup charger of claim 1, wherein the pair of output terminals is detachably coupled to the battery pack.
[21.P]	21. A portable backup charger, comprising:
[21.1]	a battery pack having at least one battery cell;
[21.2]	a first current path through which a first current is output by the battery pack when it is working in a first operating mode;
[21.3]	a second current path through which a second current capable of starting a vehicle engine is output by the battery pack when it is working in a second operating mode, wherein the second current is higher than the first current;
[21.4]	a first protection circuit coupled to the battery pack and configured to protect the battery pack when it is working in the first operating mode; and
[21.5]	a second protection circuit coupled in the second current path and configured to prevent overcurrent condition of the second current when it is working in the second operating mode.
[22]	22. The portable backup charger of claim 21, wherein the first protection circuit is configured to prevent overcurrent condition of the first current, and overcharge and overdischarge condition of the battery pack.

[23]	23. The portable backup charger of claim 21, wherein the battery pack is further configured to work in a third operating mode for outputting the first current and the second current simultaneously, and in the third operating mode both the first protection circuit and the second protection circuit are active.
[24]	24. The portable backup charger of claim 21, wherein the second protection circuit comprises a fuse having a rating current of 150 to 250 A.
[25.1]	25. The portable backup charger of claim 21, further comprising: a pair of connecting wires for detachably coupling the battery pack with the vehicle engine to allow the second current flow through the second current path;
[25.2]	wherein the second protection circuit is built into at least one of the pair of connecting wires.
[26]	26. The portable backup charger of claim 21, further comprising a switching module operable to switch on or off the second current path.
[27]	27. The portable backup charger of claim 21, wherein the second current is of 100 to 400 A.
[28]	28. The portable backup charger of claim 21, further comprising a controller configured to control the operating mode of the battery pack.
[29]	29. The portable backup charger of claim 21, wherein the discharge rate of the battery pack is in a range of 20 c to 70 c.
[30]	30. The portable backup charger of claim 21, wherein the at least one output port comprises a universal serial bus (USB)

	port.
[31]	31. The portable backup charger of claim 21, wherein the at least one output port comprises an output port of a rating voltage of 12V.
[32]	32. The portable backup charger of claim 21, wherein the at least one output port comprises an output port of a rating voltage of 19V.
[33]	33. The portable backup charger of claim 21, wherein the at least one battery cell is lithium based battery cell.

Shenzhen Xinxexing E-commerce Co., Ltd. (“Petitioner” or “SXE”) petitions for *Inter Partes* Review (“IPR”) of claims 1-3, 6-23, and 25-33 of Patent No. 9,643,506 (“the ’506 patent”).

I. REQUIREMENTS FOR IPR—37 C.F.R. §42.104

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

Petitioner certifies that the ’506 patent is available for IPR, and Petitioner is not barred or estopped from requesting IPR.

B. Challenge and Relief Requested—37 C.F.R. §42.104(b)

Petitioner requests IPR on Grounds 1A-3E listed below. A declaration from Dr. Gary Woods supports Grounds 1A-3E. *See* EX1003.

Ground	Claims	Basis for Rejection
1A	1, 9, 11-14, 16-19, 21, 26-28, 30-33	§102 – Anticipated by Chen (CN102005796A)
1B	1-2, 6-9, 11-14, 16-22, 25-28, 30-33	§103 – Obvious based on Chen in view of White (US7,279,640)
1C	10	§103 – Obvious based on Chen in view of Richardson (US2009/0218988)
1D	15, 29	§103 – Obvious based on Chen in view of Gozdz (US7,348,101)
2A	1, 3, 6-14, 16-17, 20-21, 23, 25-28, 30-31	§103 – Obvious based on Inskip (US2010/0301800) in view of Johnson (US4,969,834)
2B	19, 33	§103 – Obvious based on Inskip in view of Johnson and Durando (US2012/0068662)
3A	1, 2, 6, 8-16, 19-	§102 – Anticipated by Nook (WO2016/003471)

Ground	Claims	Basis for Rejection
	22, 26-30, 33	
3B	1, 2, 6-16, 19-22, 25-30, 33	§103 – Obvious based on Nook in view of White
3C	3, 23	§103 – Obvious based on Nook in view of Miller (US2016/0072329)
3D	10	§103 – Obvious based on Nook in view of Richardson (US2009/0218988)
3E	17-18, 31-32	§103 – Obvious based on Nook in view of Shoji (US6,404,168)

The '506 patent is not entitled to its earliest alleged priority date in 2011 because the Applicant added many columns of new text and new drawings with the “continuation-in-part” filing date of April 29, 2016, and the claims recite this new matter. *Infra*, Section II.C. All Grounds 1A-3E rely on references that published before the April 29, 2016 filing date—qualifying as prior art under post-AIA §102(a)(1). Regardless, even if the '506 patent was entitled to its earliest alleged priority date of December 9, 2011, Grounds 1A-2B still rely on publications that qualify as prior art under pre-AIA §102(a), (b), or (e):

Reference	Prior Art Status
Chen (CN102005796A)	§102(a) – published April 6, 2011
White (US7,279,640)	§102(b) – published October 9, 2007
Inskeep (US2010/0301800)	§102(b) – published December 2, 2010
Johnson	§102(b) – published November 13, 1990

Reference	Prior Art Status
(US4,969,834)	
Durando (US2012/0068662)	§102(e) – filed September 17, 2010 (published March 22, 2012)
Richardson (US2009/0218988)	§102(b) – published September 3, 2009
Gozdz (US7,348,101)	§102(b) – published March 25, 2008

II. SUMMARY OF THE '506 PATENT

A. Brief Description

The '506 patent describes a portable backup charger having an internal lithium-based battery pack and circuitry to output a first DC current (e.g., 5V USB output to charge “mobile phones”) or a second high instantaneous current (e.g., for jumpstarting a vehicle). EX1001, 3:36-4:7, 4:39-47; 5:30-45. The charger uses first and second “protection circuits” 107 and 111, as shown in FIG. 1:

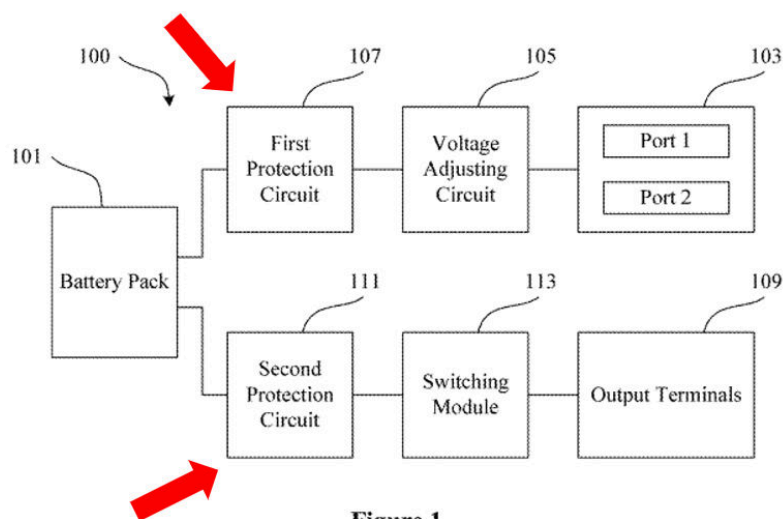


Figure 1

Id., FIG. 1; 1:52-57; EX1003, ¶29.

Regarding the second protection circuit “111,” the preferred embodiment is an ordinary fuse. *Id.*, 6:14-21 (“a fuse”). It is not innovative. It is a basic fuse positioned along the current path to the vehicle battery for cutting off current in the event of a “short-circuit” or “mis-operation.” *Id.*; EX1003, ¶30.

Regarding the first protection circuit “107,” the preferred embodiment includes a “relay or MOS switch” that is connected “between the battery pack 101 and the output ports 103” to cut off output power to the ports 103 (e.g., USB ports). *Id.*, 5:5-17. For example, the first protection circuit 107 might be configured to cut off current to the ports 103 “[u]pon detection of an excess current flowing through the output ports 103.” *Id.*, 5:3-29; EX1003, ¶31.

B. Prosecution of the ’506 Patent

The ’506 patent issued from a “continuation-in-part” application filed on April 29, 2016, and a vast majority of the specification text and figures were entirely new compared to its parent application. *Compare* EX1001, 1:32-33, 1:39-2:7, 3:8-11, 3:27-30, 3:36-7:29, 8:10-12, FIGS. 1-2 and 8-11, *with* EX1004 (lacking all of these previously cited text and figures); *see* EX1018 and EX1019 (similarly lacking such figures); EX1003, ¶¶32-34. The examination of the ’506 patent was terse.

All claims 1-33 were allowed about 10 months later based on a vague reason that “the prior art of record” does not disclose “the circuit configuration and a first protection circuit and second protection circuit as claimed.” EX1002, 145. Oddly,

there was no prior art “of record” during examination, as confirmed by the fact that there are no references cited on the face of the ’506 patent. EX1001, cover; *see generally* EX1002. No IDS was considered by the examiner, nor was prior art cited in any rejection. Nothing.

Worse yet, the examiner overlooked that new matter that was added into specification and claims on April 29, 2016. The examiner mistakenly applied “the pre-AIA” provisions during examination even though Patent Owner already conceded the *post-AIA* statute must apply due to new matter in the claims. *Compare* EX1002, 145 (“under the pre-AIA”), *with* EX1002, 22 (conceding the “AIA” provisions apply because the claimed invention has a later “effective filing date”). Patent Owner never corrected the examiner’s noticeable error.

Rather, Patent Owner seized upon the error, paid the issue fee, and subsequently asserted the ’506 patent in district court—seeking a restraint on commerce of otherwise conventional charger elements. EX1016, 13 (demanding “an injunction”). The public deserves better. The ’506 patent is ripe for review.

C. The ’506 Patent Is Entitled to an Effective Filing Date No Earlier Than April 29, 2016

The evidence here confirms that *at least* each of claims 1-3, 6-10, 21-23, and 26 recite new matter that was added when the many new columns of text and figures were injected into the “continuation-in-part” application on April 29, 2016.

EX1003, ¶¶36-38. Indeed, such new matter is palpable when compared to its stark absence from the earlier parent:

Claim Element	Lack of disclosure in earlier parent application (EX1004)	New matter in '506 patent (EX1001)
[1.2] – “output a first current [singular] through ... <i>ports</i> [plural]”	No mention of a “port” structure, and certainly never one “current” [singular] that is output through “ports” [plural]. Rather, original FIG. 1 depicts only one generic output arrow (not a “port” structure) for each current (19V, 12V, 5V). <i>See</i> EX1004, FIG. 1 and [0023].	Newly added FIG. 1 depicts two “ports” (“Port 1” and “Port 2”) for the first time. New matter at col. 1:43-44, 4:39-42, and 5:4-5 contemplates for the first time one current is output through “ports” [plural].
[1.4] – first protection circuit limited to “ <i>when the battery pack is working in the first operating mode</i> ”	Never mentions any “operating mode” at all and never discloses this particular species of a protection circuit, which is caused to operate “when the battery pack is working in the first operating mode.” Rather, FIG. 1 merely illustrates a charge-discharge protection circuit “11” while the text consists of a generic sentence mentioning the “circuit 11” operates “for overcurrent or overload protection” ([0025]). There is no teaching that this “charge-discharge protection circuit 11” receives feedback or detects any current level from the DC “outputs” 4-6, so there is certainly no disclosure of how the circuit “11” reacts/protects “when the battery pack is	Newly added FIG. 1 depicts a first protection circuit “107” that is connected inline between the battery pack 101 and the first current ports 103. <i>See</i> EX1001, Fig. 1. New matter in column 5 contemplates for the first time a circuit 107 that protects the battery pack “when the current is output through the output ports.” <i>Id.</i> , 5:1-5.

Claim Element	Lack of disclosure in earlier parent application (EX1004)	New matter in '506 patent (EX1001)
	<p>working in the first operating mode.” <i>Tech. Licensing Corp. v. Videotek, Inc.</i>, 545 F.3d 1316, 1332-34 (Fed. Cir. 2008) (affirming that mere “circuit diagrams” without supporting text in an earlier patent are not enough to support later CIP claims); <i>Augustine Med., Inc. v. Gaymar Indus.</i>, 181 F.3d 1291, 1302-03 (Fed. Cir. 1999) (earlier generic sentence of a blanket “up to the chin area” is not enough to support the later CIP claims to the species of a blanket on the “arms and chest”).</p>	
[2] - first protection circuit configured to prevent “overcharge <i>and</i> overdischarge condition”	<p>Vaguely describes the “circuit 11” for “overcurrent <i>or</i> overload protection” (EX1004, [0025]), not overcharge “<i>and</i>” overdischarge condition. As described in [1.4] above, FIG. 1 and the text fail to teach that the “charge-discharge protection circuit 11” receives feedback/detects any DC output current.</p>	<p>New matter in column 5 contemplates for the first time a circuit 107 “to protect overcurrent condition” and “may <i>also</i> be used to protect overcharge condition.” EX1001, 5:18-29.</p>
[3] – outputting the first and second currents “simultaneously”	Silent.	<p>New matter in column 5 contemplates for the first time a “third” mode to output current “simultaneously” through the ports 103 and the terminals 109.</p>

Claim Element	Lack of disclosure in earlier parent application (EX1004)	New matter in '506 patent (EX1001)
		EX1001, 5:58-61.
[6] – pair of output terminals “detachably” couple with the battery pack	<p>Silent regarding “detaching” the “output terminals” <i>from the battery 1</i>, and certainly never describes how “connecting wires” are the structure that performs this “detaching” function.</p> <p>Note that, in claim 6, the claimed “output terminals” are distinct from the recited “clamps” of the “connecting wires.” Claim 6 is also different from claim 25, in which the claimed “detachable” coupling is with the “vehicle engine,” not with the output terminals.</p>	<p>New matter in column 5 expresses for the first time that the pair of output terminals “may be detachably coupled to the battery pack 101,” and likewise, new matter in column 6 contemplates for the first time that the “connecting wires” can “detachably couple” the pair of output terminals to the battery pack 101. EX1001, 5:44-45; 6:22-37.</p>
[7] – depends from 6	Refer to analysis of [6] above.	Refer to analysis of [6] above.
[8] – depends from 6	Refer to analysis of [6] above.	Refer to analysis of [6] above.
[9] – “switching module” for the second current	Silent.	<p>Newly added FIG. 1 depicts a “switching module 113.” EX1001, Fig. 1. New matter in column 6 contemplates for the first time a “switching module 113” that is operable to “switch on or off” the current through the output terminals. <i>Id.</i>, 6:53-7:22.</p>

Claim Element	Lack of disclosure in earlier parent application (EX1004)	New matter in '506 patent (EX1001)
[10] – depends from 9	Refer to analysis of [9] above. Also, no mention of switching based on a “predetermined time period.”	Refer to analysis of [9] above.
[21.4] – first protection circuit limited to protecting the battery pack “ <i>when it is working in the first operating mode</i> ”	Refer to analysis of [1.4] above.	Refer to analysis of [1.4] above.
[22] - first protection circuit configured to prevent “overcharge <i>and</i> overdischarge condition”	Refer to analysis of [2] above.	Refer to analysis of [2] above.
[23] – outputting the first and second currents “simultaneously”	Refer to analysis of [3] above.	Refer to analysis of [3] above.
[26] – “switching module” for the second current path	Refer to analysis of [9] above.	Refer to analysis of [9] above.

See EX1003, ¶¶39-40. Based on these facts and Patent Owner’s above-described admission (EX1002, 22), it is clear new matter was added into the claims on April 29, 2016. Accordingly, Patent Owner bears the burden “to come forward with

evidence to prove entitlement to claim priority to an earlier filing date.” *Tech. Licensing*, 545 F.3d 1328-29.

III. LEVEL OF ORDINARY SKILL

The evidence here confirms that a POSITA would have had at least a Bachelor’s of Science in electrical engineering or physics and at least two years of experience in circuit design for portable electronics. EX1003, ¶17.

IV. CLAIM CONSTRUCTION

All claim terms should be construed according to the *Phillips* standard. *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005); 37 C.F.R. §42.100. Here, given the noticeable overlap between the preferred embodiment of the ’506 patent and the prior art/predictable combinations articulated in Grounds 1A-3E, Petitioner submits that no claim elements need a formal construction for purposes of resolving the controversy in this proceeding. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011); *Google Inc. v. Intellectual Ventures II LLC*, 701 Fed. Appx. 946, 956 (Fed. Cir. 2017) (“do not require construction” for purposes of “resolv[ing] the parties’ patentability arguments”); EX1003, ¶¶41-42.

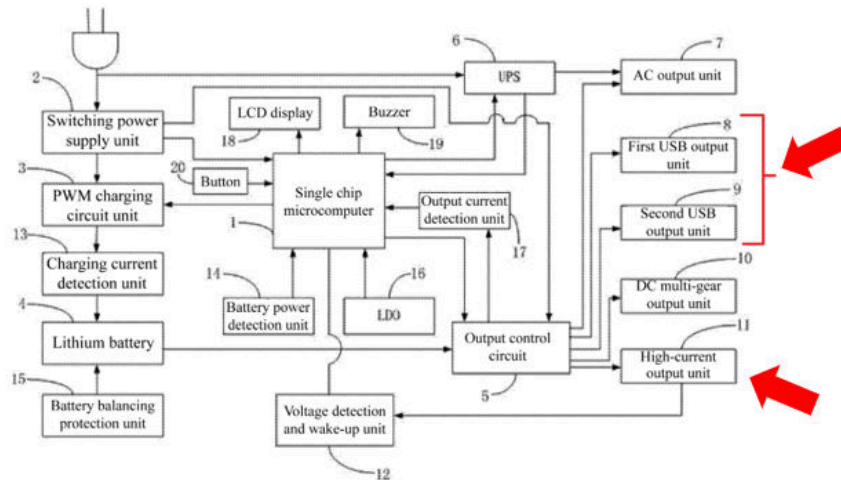
V. DETAILED EXPLANATION OF GROUNDS

A. GROUND 1A: Chen Anticipates Claims 1, 9, 11-14, 16-19, 21, 26-28, 30-33

1. Chen

Much like the ’506 patent, Chen teaches a mobile charger device in which a

lithium battery pack can output a first charging current to “USB” connections and a second charging current to a “car battery” for vehicle ignition:



EX1006, [0022], [0025]-[0026], FIG. 1; EX1003, ¶43.¹ Chen’s “mobile power supply” includes “a single-chip microcomputer, an output control circuit, a lithium battery, and a high-current instantaneous output module.” EX1006, [0004]; [0002]-[0003]. Chen provides both “a DC output module” and “a high-current instantaneous output module (car ignition module).” EX1006, [0022]. Further, the “output control circuit” connects separately to the “single chip microcomputer” and “lithium battery” to control current flow from the lithium battery along different paths to low-current outputs (e.g. “USB” connections) and high-current output (e.g. 200A to a “car battery”) loads. EX1006, [0023]-[0026]; *see* [0011]-[0014].

¹ The Chinese publication of Chen is provided at EX1005. The English translation (EX1006) includes corresponding paragraph numbering and is cited here.

Advantageously, Chen teaches that the mobile charger device “not only ensures the output of high current [for the car battery/car ignition], but also ensures that the lithium battery will not be damaged.” EX1006, [0013]-[0014]. Chen’s device can determine if a load (e.g., the car battery) has been attached to the high current output, determine the voltage necessary with the attached load, and commence the flow of current to the load through the high current circuit. EX1006, [0023]-[0024]; EX1003, ¶44. Once a vehicle engine is started and the voltage of the car battery returns to normal, “relay K1” is turned off to prevent damage to the lithium battery. EX1006, [0025], [0013]-[0014], FIG. 4; EX1003, ¶45. Accordingly, Chen provides a protection circuit that operates when operating in the jumpstart mode—“beneficially achieving ‘high-current output protection, output short-circuit prevention control, automatic identification of connected cars, and automatic shutdown after ignition’ to protect the internal battery 4 and the car battery.” EX1003, ¶46 (quoting EX1006, [0025]).

In another mode, Chen’s mobile charger device can provide the lower-current DC outputs, including the standard 5V “USB” connections. EX1006, [0026], [0011], FIGS. 1 and 5-7; EX1003, ¶47. Each USB and DC direct output are controlled by “output control circuit 5.” *Id.* And here again, Chen teaches another protection circuit—one that operates during this lower current DC mode to beneficially provide “an output power limit control to automatically prevent the

output from being overloaded for a long time.” EX1006, [0026]; EX1003, ¶48.

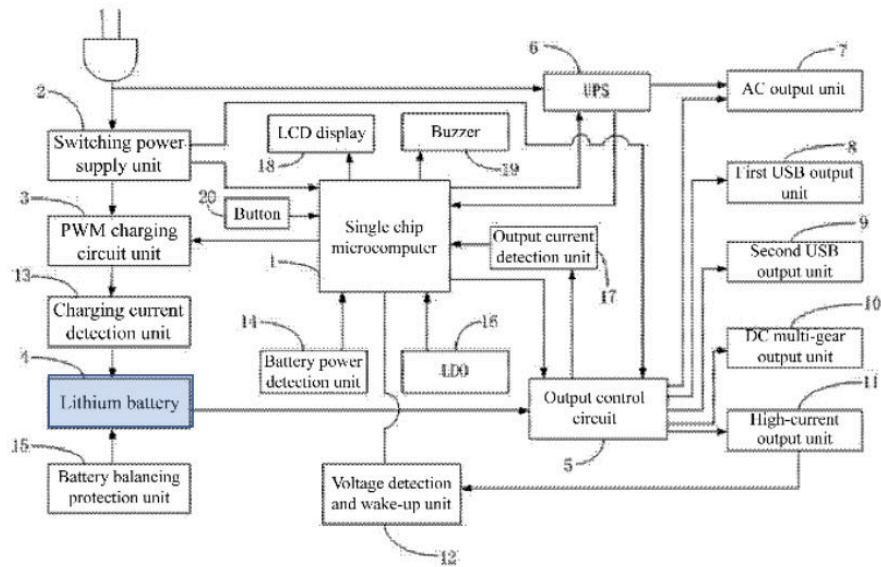
2. Application to Challenged Claims

Element [1.P]

Even if the preamble is treated as a limitation (which Petitioner does not concede), Chen describes a portable backup charger in the form of a “mobile power supply.” EX1006, [0003]-[0004], [0011], [0022]-[0026], FIG. 1; EX1003, ¶49. Chen explains that such a mobile power supply is useful “as a backup power supply for mobile devices.” EX1006, [0034].

Element [1.1]

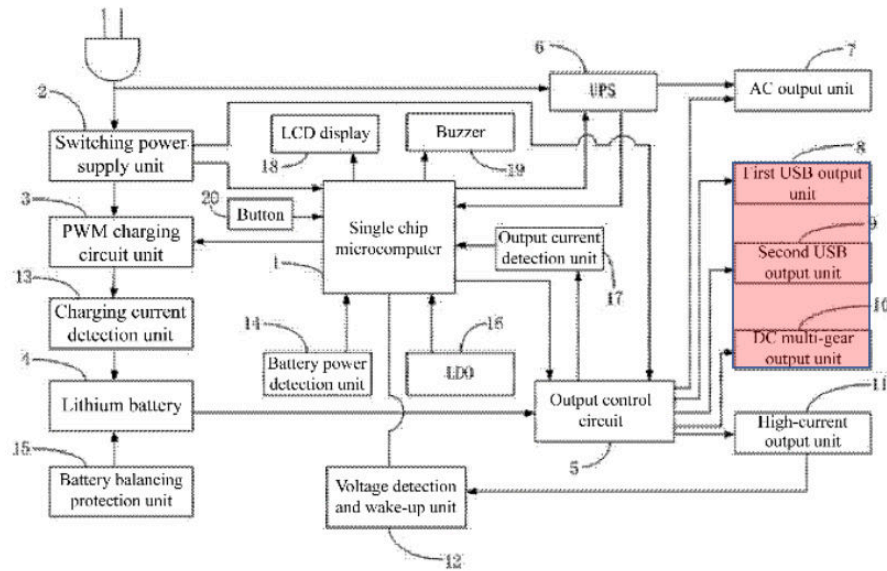
Chen describes the recited structure/functionality of Element [1.1]. EX1003, ¶50. Chen expressly teaches “a **lithium battery**” to serve as a battery pack having at least one battery cell—namely, to provide power to any of a high-current output for jumpstarting a vehicle, “USB” outputs, and a “DC multi-gear unit.” EX1006, [0004], [0011], [0014], [0022]-[0023], [0025]-[0026].



EX1006, Fig. 1 (annotated)

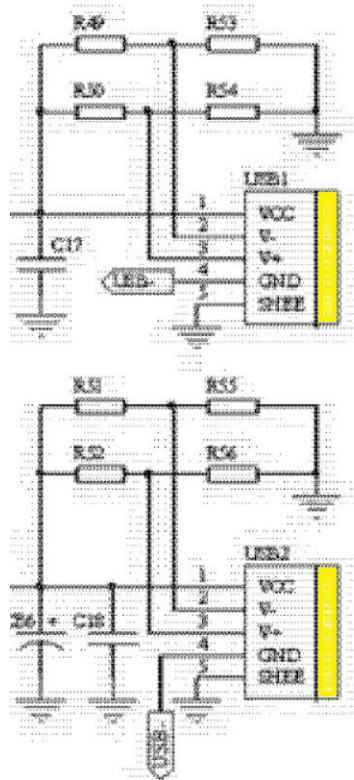
Element [1.2]

Chen describes the recited structure/functionality of Element [1.2]. EX1003, ¶51. In particular, Chen teaches “the mobile power supply further includes a DC power output module connected to the output control circuit 5” that “includes in its outputs a first USB output unit 8, a second USB output unit 9 and a DC multi-gear output unit 10.” EX1006, [0026].



EX1006, Fig. 1 (annotated)

Based on Chen's teaching, the evidence here confirms that at the disclosed "USB output units" provide conventional USB ports for connection with traditional USB cables when acting "as a backup power supply for mobile devices." EX1003, ¶52 (quoting Chen's [0026] and [0034]). Indeed, Chen's FIG. 7 appears to depict the common rectangular USB port slots for each connector "USB1" and "USB2":

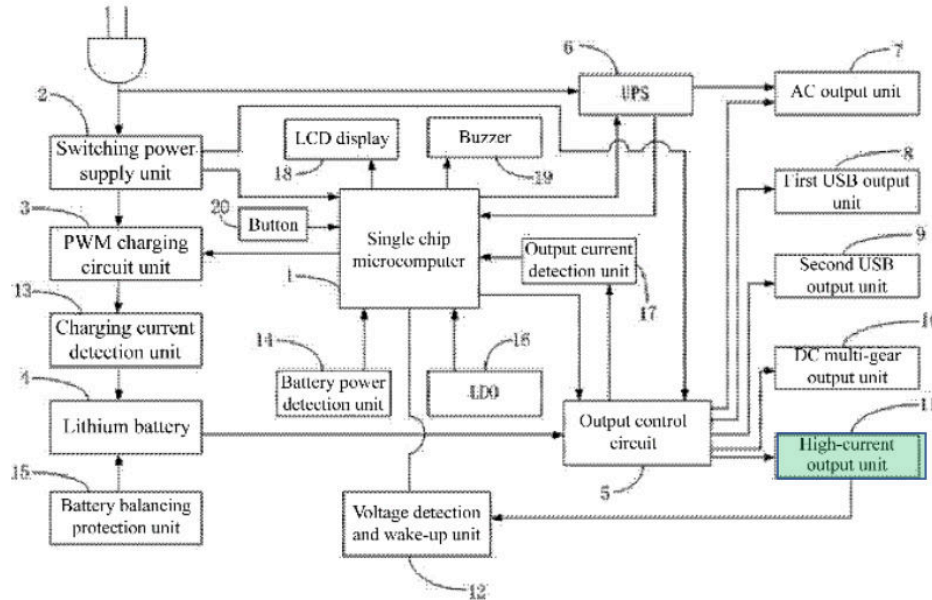


EX1006, FIG. 7 (annotated). Further, Chen teaches that the output control circuit 5 ensures the one or more output ports are configured to operate at a first current during a first mode of operation. EX1006, [0026]; FIGS. 5-7 (“buck output,” “boost output,” and “USB buck output” as described in [0019]-[0021] and [0025]); EX1003, ¶52.

Element [1.3]

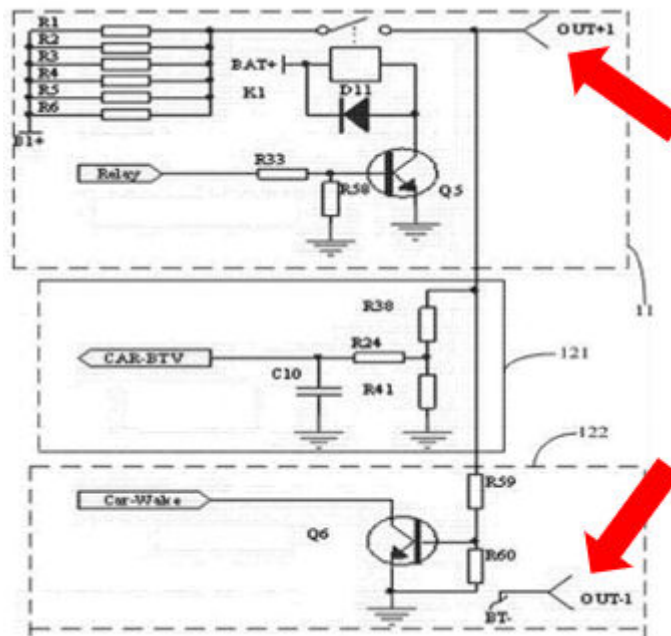
Chen describes the recited structure/functionality of Element [1.3]. EX1003, ¶53. For example, Chen teaches that, “[w]hen the car battery is connected to the high-current output unit 11, the wake-up unit 122 notifies the single-chip microcomputer 1 that the car battery has been connected, the single-chip

microcomputer 1 controls the high-current output unit 11 to instantly output a high current for ignition, and then a battery voltage is detected by means of the electrical device voltage detection unit 121.” EX1006, [0025]; EX1003, ¶53.



EX1006, Fig. 1 (annotated)

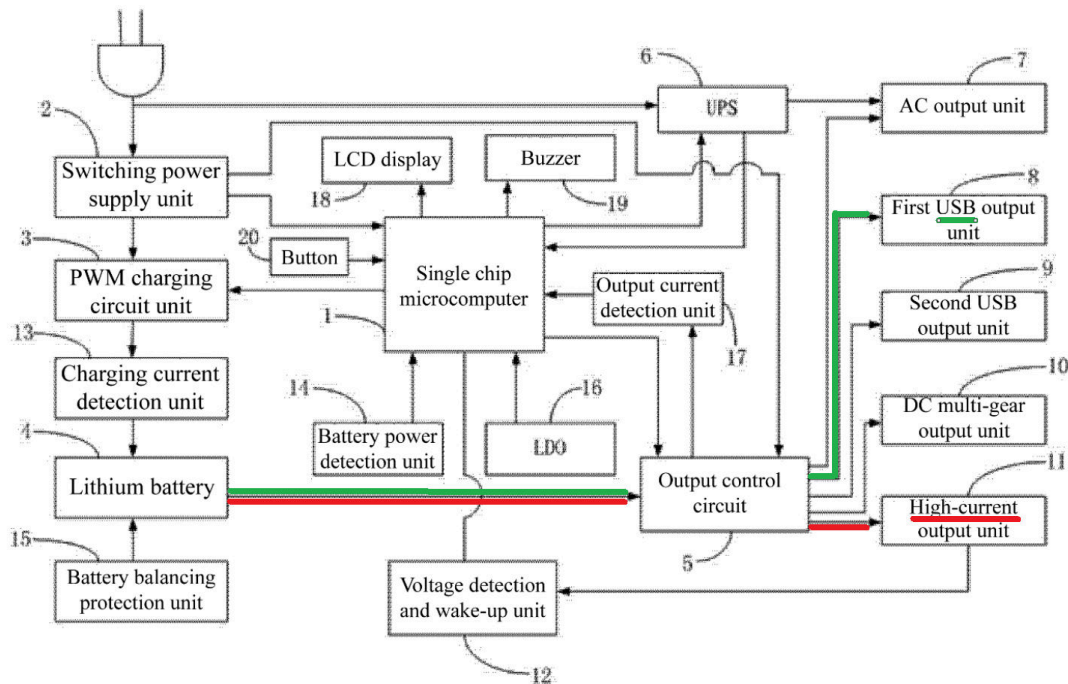
Chen expressly teaches that the high-current output unit 11 “is configured to be connected to an electrical device,” and then further confirms that the electrical device “is a car battery,” thereby indicating that the high-current output unit 11 includes positive and negative terminals for such connection to a conventional car battery. EX1006, [0023] and [0025]. Indeed, Chen’s FIG. 4 depicts the conventional “+” and “-” output connectors for connection with a car battery:



EX1006, FIG. 4 (annotated); EX1003, ¶54.

Accordingly, Chen expressly teaches the pair of output terminals as recited in Element [1.3]. And even if Chen did not expressly disclose this Element, Chen would inherently provide it. In particular, Chen's the high-current output unit 11 "is configured to be connected to an electrical device," which is described as a conventional "car battery." EX1006, [0023] and [0025]. The evidence here confirms that, based on Chen's teachings, this output unit 11 would predictably and necessarily include a positive terminal and negative terminal for the electrical connection to the conventional car battery, which would have been required to "output a high current for ignition" function and for the detection functionality of Chen's "wake-up unit 122." EX1003, ¶54; EX1006, [0025].

Additionally, Chen teaches that the output terminals have a current path to the battery pack that is different from that of the output ports of the USB/DC multi-gear connections. EX1003, ¶¶54-55. Not only are the different current paths shown schematically in FIG. 7 (USB buck output to first and second USB ports) and FIG. 4 (high-current path to output terminals), they are depicted in FIG. 1:



EX1006; FIG.1, [0024]-[0025], [0026] (“separately connected to the output control circuit 5”); EX1003, ¶56 (citing to FIGS. 1, 4, and 7).

Finally, as detailed above, the second current (to Chen’s “high-current output unit 11”) is higher than the first current (to Chen’s “USB” connectors/DC multi-gear output. EX1003, ¶57. First, the unit 11 for the second current labeled as a “high-current” output ([0022]-[0025]) unlike the others, and Chen teaches that

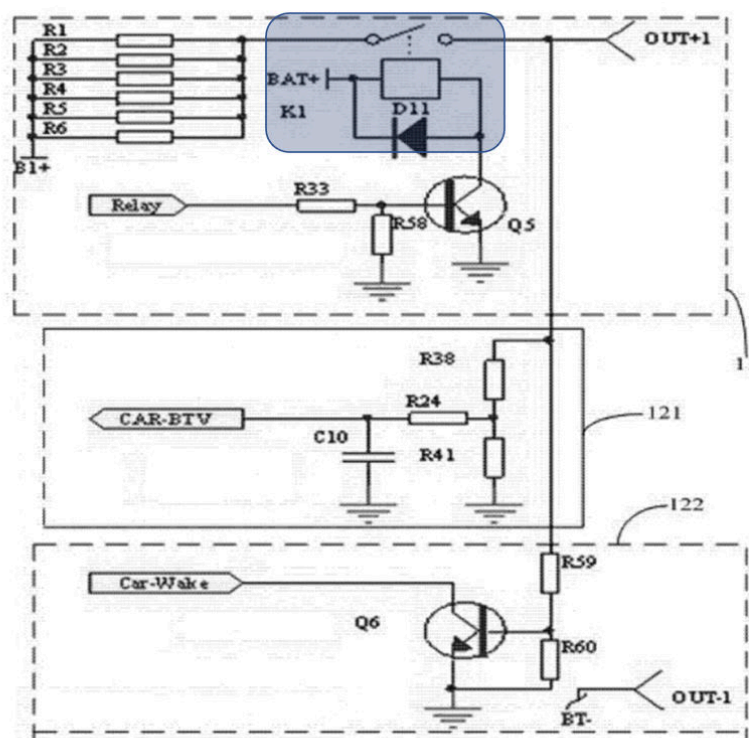
the second current is “200A.” EX1006, [0025]. This, of course, is hundreds of times greater than the first current that is output to Chen’s USB units 8, 9 that achieved the “backup power supply for mobile devices” ([0034]) by outputting according to the ubiquitous “USB” standard (5V/0.5A). EX1006, [0026], [0034]; FIG. 7 (USB buck output); EX1003, ¶57 and ¶26.

Element [1.4]

Chen describes the recited structure/functionality of Element [1.4]. EX1003, ¶58. For example, Chen teaches a first protection circuit coupled to the internal battery 4 that operates in the first mode (DC current to USB output/multi-gear output) “to automatically prevent the output from being overloaded for a long time and damage the machine.” EX1006, [0026]. As shown in FIGS. 5-7, which are connected to provide the buck-boost circuit for all of the 5V, 8.4V, 9.5V, 12V, 16V, 19V, and 24V DC outputs (for DC current to USB outputs/multi-gear output), the first protection circuit is connected to the battery (“BAT+”) and includes at least the electronics of “U3B and D12” to form “an output power limit control.” EX1006, [0026], FIGS. 5-7. The evidence here confirms that this circuit is configured to protect Chen’s internal battery 4 from an overcurrent condition through the USB outputs 8, 9 (or the multi-gear output 10) that might otherwise cause “damage” to Chen’s battery and other electronics. EX1003, ¶¶58-60 (citing to Chen [0026] and FIGS. 5-7).

Element [1.5]

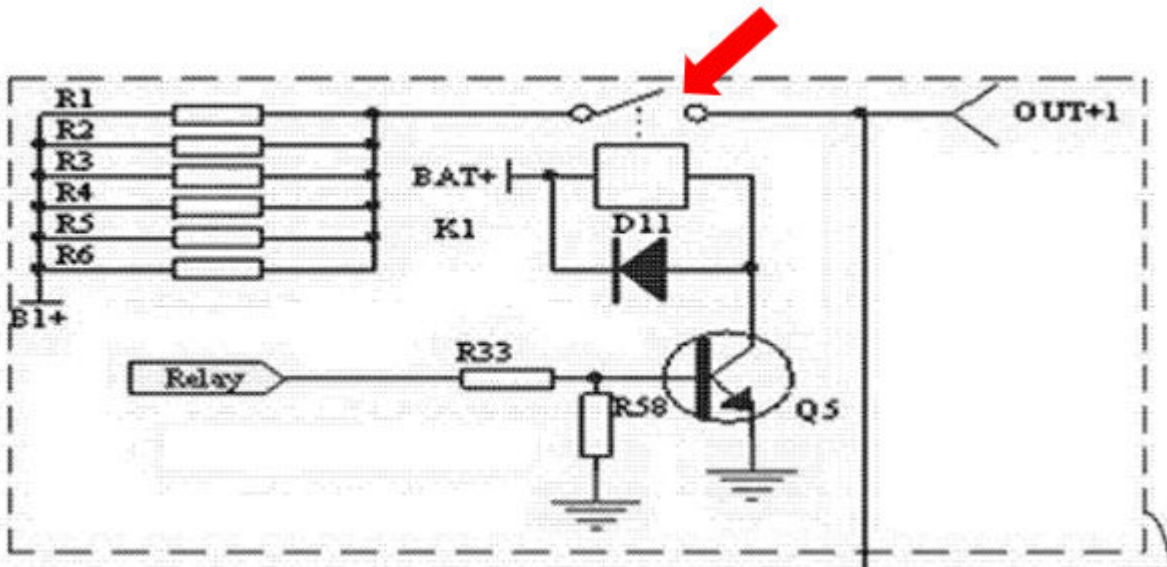
Chen describes the recited structure/functionality of Element [1.5]. EX1003, ¶61. For example, Chen discloses a second protection circuit coupled to the internal battery 4 that operates in the second mode (high-current output to the car battery) “to automatically turn off” the output current and thereby “prevent long-term high-current output from damaging the lithium battery 4.” EX1006, [0025], [0035], FIG. 4. As shown in FIG. 4, which depicts the circuit diagram of the “high-current instantaneous output module” ([0018]), the second protection circuit is connected to the battery (“BAT+”) and includes at least a relay switch. *Id.* Chen teaches “[w]hen the battery voltage returns to normal, the relay K1 is automatically turned off to prevent long-term high-current output from damaging the lithium battery 4” while operating in its “ignition output” mode of operation. EX1006, [0026]; EX1003, ¶¶61-62.



EX1006, Fig. 4 (annotated)

Element [9]

Chen describes the recited structure/functionality of Element [9]. EX1003, ¶63. In a first example, Chen also depicts a literal switch in FIG. 4, which is configured to switch the high-current path on or off:



EX1006, FIG. 4, [0025] (“to instantly output high current for ignition” and “automatic shutdown after ignition”); [0013]-[0014]. Chen teaches that this electronic switch is part of the “[relay K1](#)” that turns on and off, respectively, to dictate current flow from the lithium battery to the car battery. EX1006, [0025], [0035] (“relay K1 to engage”); EX1003, ¶63.

In a second example, to the extent the claimed switching module encompasses a manual switch, Chen teaches that “[s]witching of all functions” is performed using a “button 20” connected to the “microcontroller 1.” EX1006, [0031]; FIG. 1; EX1003, ¶64.

Element [11]

Chen describes the recited structure/functionality of Element [11]. EX1003, ¶65. For example, Chen teaches the claimed voltage adjusting circuit in connection with FIGS. 5-7, which together provide the “DC boost and buck output

control circuits” and the “USB buck output” circuit for the USB output 8, 9 and DC multi-gear output 10. EX1006, [0026], [0019]-[0021], FIGS. 5-7. These voltage adjusting circuits are coupled between Chen’s lithium battery 4 and the output ports 8, 9, and 10 so that together they “complete the multi-gear voltage output of DC 5 V, 8.4 V, 9.5 V, 12 V, 16 V, 19 V and 24V.” EX1006, [0026], FIGS. 5-7; EX1003, ¶65.

Elements [12]

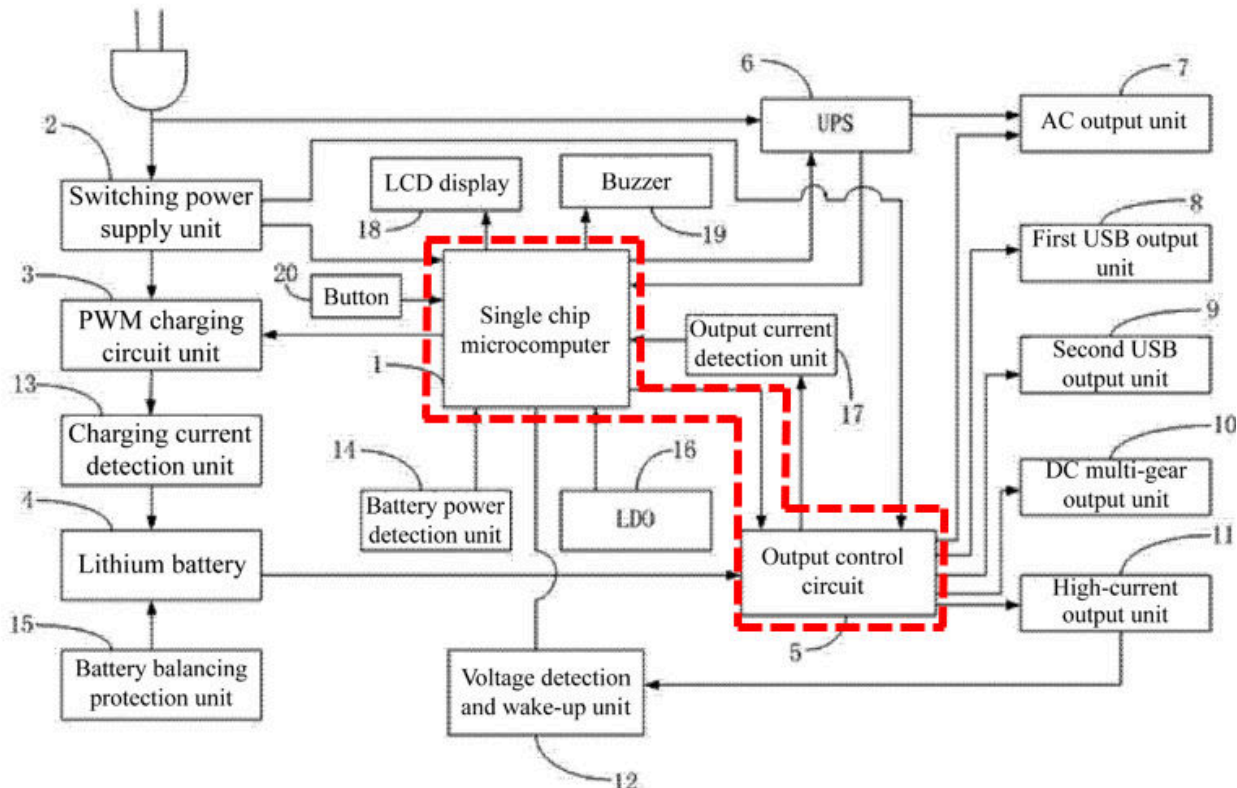
Chen describes the recited structure/functionality of Element [12]. EX1003, ¶66. For example, Chen teaches two of the outputs are conventional “USB” outputs, which is consistent with Chen’s teaching of providing “backup power supply for mobile devices.” EX1006, [0026] and [0034]. Chen’s teaching for conventional “USB” outputs for powering mobile devices is a straightforward teaching for an output in accordance the USB standard (5V/0.5A). EX1006, [0026], [0021] (“USB buck output”), FIG. 7; EX1003, ¶66 and ¶26.

Element [13]

Chen describes the recited structure/functionality of Element [13]. EX1003, ¶67. For example, Chen teaches the second current from the ignition output interface 111 is “200 A.” EX1006, [0025]; EX1003, ¶67.

Element [14]

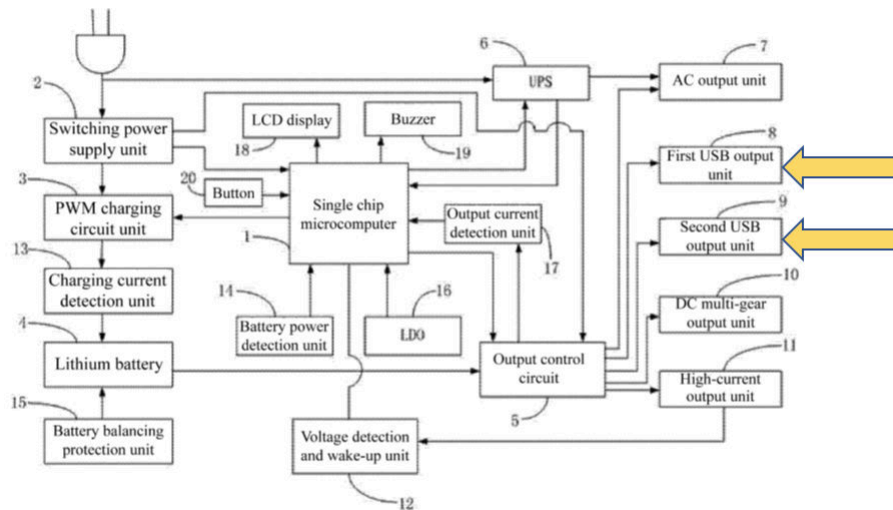
Chen describes the recited structure/functionality of Element [14]. EX1003, ¶68. For example, Chen teaches a controller that includes at least the “output control unit 5” in connection with the “microcomputer 1” to determine whether to output current to any of the ignition output circuit, DC outlet, or USB outlet. EX1006, [0023] (“connected to the single-chip microcomputer 1”), [0025] (“separately connected to the output control circuit 5”), [0028], [0031] (“cyclic switching of various functions” by button 20 connected to microcomputer 1), [0035], FIG. 1; EX1003, ¶¶68-69.



EX1006, Fig. 1 (annotated)

Element [16]

Chen describes the recited structure/functionality of Element [16]. EX1003, ¶70. For example, Chen describes a “USB output unit 8” and “USB output unit 9” that each provide current to a USB port. EX1006, [0026]; EX1003, ¶70; *see also* EX1006, [0029], Figs. 1-2, 7.



EX1006, Fig. 1 (annotated)

Also, as described above for Element [1.2], Chen illustrates the conventional USB port slots in FIG. 7 for the “USB1” and “USB2” connectors, which is consistent with the traditional USB cable connector when acting “as a backup power supply for mobile devices.” EX1003, ¶71 (highlighting the depicted USB port slots in Chen’s FIG. 7 and quoting Chen’s [0026] and [0034]).

Element [17]

Chen describes the recited structure/functionality of Element [17]. EX1003, ¶72. For example, Chen teaches the DC multi-gear output port 10 as providing a rating voltage of “12V.” EX1006, [0026]; EX1003, ¶72.

Element [18]

Chen describes the recited structure/functionality of Element [18]. For example, Chen teaches the DC multi-gear output port as providing a rating voltage of “19V.” EX1006, [0026]; EX1003, ¶73.

Element [19]

Chen describes the recited structure/functionality of Element [19]. For example, Chen teaches that the internal battery 4 is a “lithium” battery. EX1006, [0023], [0004], [0025], FIGS. 1-2; EX1003, ¶74.

Element [21.P]

Even if the preamble is treated as a limitation (which Petitioner does not concede), Chen describes a portable backup charger for the same reasons detailed above. *See* Element [1.P]; EX1003, ¶75.

Element [21.1]

Chen describes the recited structure/functionality of Element [21.1] as detailed above. *See* Element [1.1]; EX1003, ¶76.

Element [21.2]

Chen describes the recited structure/functionality of Element [21.2] as detailed above. *See* Element [1.2]; EX1003, ¶77.

Element [21.3]

Chen describes the recited structure/functionality of Element [21.3] as detailed above. *See* Element [1.3]; EX1003, ¶78.

Element [21.4]

Chen describes the recited structure/functionality of Element [21.4] as detailed above. *See* Element [1.4]; EX1003, ¶79.

Element [21.5]

Chen describes the recited structure/functionality of Element [21.5] as detailed above. *See* Element [1.5]; EX1003, ¶80.

Element [26]

Chen describes the recited structure/functionality of Element [26] as detailed above. *See* Element [9]; EX1003, ¶81.

Element [27]

Chen describes the recited structure/functionality of Element [27] as detailed above. *See* Element [13]; EX1003, ¶82.

Element [28]

Chen describes the recited structure/functionality of Element [28] as detailed above. *See* Element [14]; EX1003, ¶83.

Element [30]

Chen describes the recited structure/functionality of Element [30] as detailed above. *See* Element [16] (referring also to analysis of Element [1.2]); EX1003, ¶84.

Element [31]

Chen describes the recited structure/functionality of Element [31] as detailed above. *See* Element [17]; EX1003, ¶85.

Element [32]

Chen describes the recited structure/functionality of Element [32] as detailed above. *See* Element [18]; EX1003, ¶86.

Element [33]

Chen describes the recited structure/functionality of Element [33] as detailed above. *See* Element [19]; EX1003, ¶87.

B. GROUND 1B: Chen and White Render Obvious Claims 1-2, 6-9, 11-14, 16-22, 25-28, 30-33

1. White

White is similar to Chen (and to the '506 patent) in that they describe connections to a depleted vehicle battery. EX1007, 1:65-67 (“for jump starting a second vehicle”), 2:22-26, 2:55-3:41; EX1006, [0025]. Although Chen does not provide details regarding conventional options for physical cables to connect with the car battery, White does so. EX1003, ¶¶88-91. In particular, White describes the known option in which a jumper cable harness includes battery clamps at one end (for connecting with the car battery) and a “keyed” connector at the other end (for connection with the power supply/host battery):

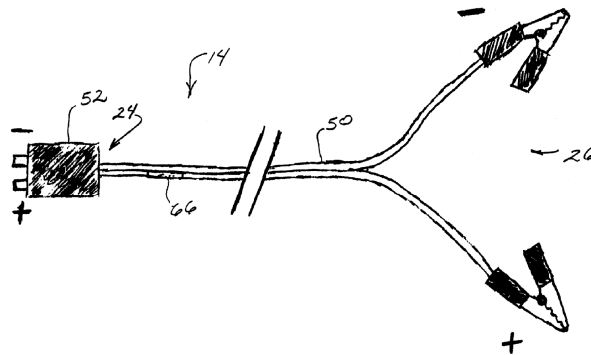


FIG. 9

EX1007, FIG. 9, 2:55-3:16, 2:46-47 (“keyed”). Not only does White teach the benefits of using such a “keyed” connector plug 24 “to ensure proper polarity” in the connection between the power supply battery and the car battery (2:43-51), White further suggests the conventional practice of including a “fuse” along a jumper cable wire. EX1007, 3:25-27 (“fuse 66” along positive wire), 2:51-54 (teaching the use of a fuse “to prevent damage” to either of the batteries); FIG. 9 (fuse “66” (reproduced above)); EX1003, ¶91.

2. The Chen-White Combination

A POSITA would have been motivated to implement Chen’s device in a predictable manner that employs White’s suggested benefits (a jumper cable harness equipped with polarity-protection connector at one end and a fuse along a jumper cable wire) to achieve known benefits. EX1003, ¶¶92-98. Multiple reasons (articulated below) would have prompted such a combination.

First, a POSITA would have been prompted to implement Chen’s device to include White’s suggestion (a jumper cable harness equipped with polarity-protection connector at one end and a fuse along a jumper cable) in order to “advantageously reduce the likelihood of damage” to Chen’s battery and internal electronics. EX1003, ¶93. In particular, Chen teaches that the high-current output unit 11 should connect with the car battery for purposes of delivering 200A (EX1006, [0025] (“to complete the ignition”)), but White suggests at least two independent layers of protection for such a high-current path:

- In a first layer, implementing a jumper cable harness equipped with polarity-protection connector (to releasably mate with Chen’s unit 11) would have provided the additional benefit of “ensur[ing] proper polarity” in the connection between Chen’s battery 4 and the car battery. EX1007, 2:45-51 (“thereby preventing electrical damage”); EX1003, ¶94.
- In a second layer, implementing the improved connection using a jumper

cable harness (as suggested by White) would have provided the additional benefit of a safety fuse along a jumper cable to promptly cut off current in the event of a short circuit or other over current condition during the jumpstart process. EX1007, 2:51-55 (“to prevent damage” to the car battery, the wiring harness, and the host power supply), 3:25-27 (“fuse 66”), FIG. 9 (fuse “66” along positive wire); EX1003, ¶95.

The evidence here also confirms that these layers of protection would have added safety and damage prevention even beyond the internal “relay K1” of Chen—especially during the time before the car battery reaches a normal voltage. EX1003, ¶96. This predictable modification would have protected the system from potential damage due to overcurrent conditions when connecting to the car battery. *Id.*

Second, the POSITA would have been motivated to include White’s suggestion in Chen’s device to achieve more simplified maintenance and repair of the mobile power supply device. EX1003, ¶97. For example, even if the resulting device was exposed to an overcurrent condition, the fuse within the wire harness (or the harness itself) would have been advantageously replaceable without accessing/repairing any of Chen’s internal electronics or the lithium battery. *Id.* Circuit protection systems that protect both the car battery as well as the mobile power supply—doing so in a manner that provides simplified replaceable parts for end users—would have been recognized as a valuable design feature. *Id.*

Finally, both Chen and White are directed to technology for connecting with/jumpstarting a vehicle battery (EX1007, 1:65-67, 2:22-26, 2:55-3:41; EX1006, [0025]), and the evidence here confirms a POSITA was sufficiently skilled to implement such a combination (articulated above) given the predictable structures and relatively advanced state of the art at the time. EX1003, ¶98. Accordingly, for these reasons articulated above, a POSITA would have had a reasonable expectation of success in achieving the Chen-White combination. *Id.*

3. Application to Challenged Claims

Element [1.P]

Chen describes the recited structure/functionality of Element [1.P]. *Supra* Section V.A.2, analysis of Chen at Element [1.P]; EX1003, ¶99.

Element [1.1]

Chen describes the recited structure/functionality of Element [1.1]. *Supra* Section V.A.2, analysis of Chen at Element [1.1]; EX1003, ¶100.

Element [1.2]

Chen describes the recited structure/functionality of Element [1.2]. *Supra* Section V.A.2, analysis of Chen at Element [1.2]; EX1003, ¶101.

Element [1.3]

As described above, Chen teaches that the lithium battery is configured to output a second current capable of starting a vehicle engine through the different

current path in a second operating mode, wherein the second current is higher than the first current. *Supra* Section V.A.2, analysis of Chen at Element [1.3]. Further, even if Chen did not *expressly* disclose the “pair of output terminals,” the predictable Chen-White combination plainly provides this claimed structure.

Supra, Section V.B.2; EX1007, FIG. 9, 2:45-51; EX1003, ¶¶102-104. As previously described, the Chen-White combination would have implemented the jumper cable harness which included a pair of output terminals with the polarity-protection connector at one end to removably mate with a complementary connector along Chen’s output 11 (as suggested by White), and another pair of output terminals the other end of the wire connections into the corresponding clamps:

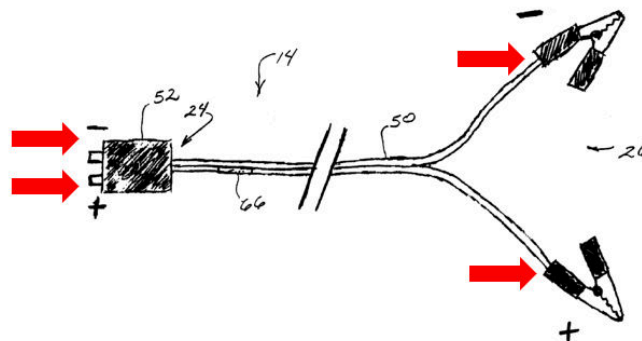


FIG. 9

EX1007, FIG. 9 (annotated), 2:45-51 (suggesting connectors to mate with one another); EX1006, FIG. 4 (high-current output unit 11); EX1003, ¶103. For the same reasons detailed in Ground 1A, the high-current path through the pair of output terminals (in fact, both pairs annotated above) would have been different

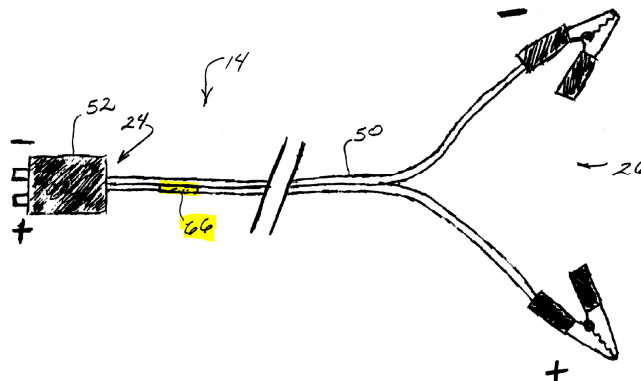
from the lower-current path to Chen’s USB/multi-gear ports. *Supra* Section V.A.2, analysis of Chen at Element [1.3]; EX1003, ¶104.

Element [1.4]

Chen describes the recited structure/functionality of Element [1.4]. *Supra* Section V.A.2, analysis of Chen at Element [1.4]; EX1003, ¶105.

Element [1.5]

Even if Chen did not expressly disclose the “second protection circuit” (which it does as detailed above), the predictable Chen-White combination provides this Element. *Supra*, Section V.B.2; EX1007, 3:25-27, FIG. 9; EX1003, ¶106. As previously described, White suggests the use of a “fuse 66” incorporated along a jumper cable wire of a traditional wiring harness (“extension portion 14”) to protect against overcurrent:



EX1007, Fig. 9 (annotated), 3:25-27; 2:51-55 (“to prevent damage”); EX1003, ¶106. Here, the Chen-White combination would have implemented Chen’s device

in a predictable manner that employs White’s suggested improvement for a protection circuit including a fuse along a jumper cable wire—thereby accomplishing Chen’s goal of connecting with a “car battery” (EX1006, [0025]) with the added safety/protection benefits articulated above. EX1003, ¶106.

Element [2]

The Chen-White combination provides this Element. EX1003, ¶107. As an initial matter Chen describes the “first protection circuit” recited in claim 1 (*supra* Section V.A.2, analysis of Element [1.4] (citing to EX1006, [0026])), and Chen expressly suggests that the microcomputer 1 is also connected with circuit elements for “prevent[ing] overcharge and over-discharge,” which would advantageously “increase the service life of the lithium battery 4.” Based upon Chen’s teaching of a “mobile” power supply and Chen’s teaching that the circuit protection elements are interconnected with microcomputer 1, a POSITA would have been motivated to implement the first protection circuit in a conventional form factor of battery management circuit board that included all of the “output power limit control” components ([0025]) and the charging management circuit components ([0029] (“to prevent overcharge and over-discharge”)) so as to provide the simplified assembly/compact size of such a battery management circuit board. EX1003, ¶107.

Element [6]

The Chen-White combination provides this Element. EX1003, ¶108. As previously described in Elements [1.3] and [1.5], in the predictable combination, the jumper cable harness would have included a pair of output terminals at the polarity-protection connector to removably mate with a complementary connector along the output unit 11 (as suggested by White) and another pair of output terminals at the other end of the jumper cable wires for the terminal connections with the clamps:

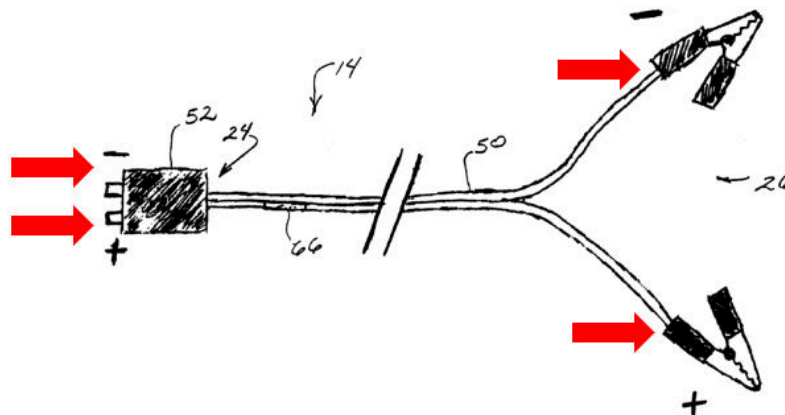


FIG. 9

EX1007, FIG. 9 (annotated), 2:55-3:16, 2:45-51 (suggesting “keyed” connectors).

Accordingly, in the resulting combination, these pairs of output terminals are detachably coupled to Chen’s lithium battery 4 (via removal of the connector), and the jumper cable harness further provides the traditional clamps for connecting with the car battery. *Supra*, Analysis of Elements [1.3] and [1.5]; EX1003, ¶108.

Element [7]

The Chen-White combination provides this Element. EX1003, ¶109. As previously described in Element [1.5], the predictable combination would have included the jumper cable harness equipped with a “fuse” along one of the jumper cable wires. *Supra*, Analysis of Element [1.5]; EX1003, ¶109.

Elements [8]

The Chen-White combination provides this Element. EX1003, ¶110. As previously described in Elements [1.3] and [1.5], the predictable combination would have included the jumper cable harness equipped with the “keyed” connector at one end to prevent a reverse-polarity connection. *Supra*, Analysis of Elements [1.3] and [1.5]; EX1003, ¶110.

Element [9]

Supra Section V.A.2, analysis of Chen at Element [9]; EX1003, ¶111.

Element [11]

Supra Section V.A.2, analysis of Chen at Element [11]; EX1003, ¶112.

Element [12]

Supra Section V.A.2, analysis of Chen at Element [12]; EX1003, ¶113.

Element [13]

Supra Section V.A.2, analysis of Chen at Element [13]; EX1003, ¶114.

Element [14]

Supra Section V.A.2, analysis of Chen at Element [14]; EX1003, ¶115.

Element [16]

Supra Section V.A.2, analysis of Chen at Element [16]; EX1003, ¶116.

Element [17]

Supra Section V.A.2, analysis of Chen at Element [17]; EX1003, ¶117.

Element [18]

Supra Section V.A.2, analysis of Chen at Element [18]; EX1003, ¶118.

Element [19]

Supra Section V.A.2, analysis of Chen at Element [19]; EX1003, ¶119.

Element [20]

The Chen-White combination provides this Element. EX1003, ¶120. As previously described in Elements [1.3] and [6] above, the predictable combination would have included the jumper cable harness having two pairs of output terminals. *Supra*, Analysis of Chen-White at Elements [1.3] and [6]. Each of these pairs of output terminals of the jumper cable harness would be detachably coupled to Chen's lithium battery 4 (via removal of the connector). EX1003, ¶120.

Element [21.P]

Chen describes the recited structure/functionality of Element [21.P]. *Supra* Section V.A.2, analysis of Chen at Elements [1.P] and [21.P]; EX1003, ¶121.

Element [21.1]

Chen describes the recited structure/functionality of Element [21.1]. *Supra* Section V.A.2, analysis of Chen at Elements [1.1P] and [21.1]; EX1003, ¶122.

Element [21.2]

Chen describes the recited structure/functionality of Element [21.2]. *Supra* Section V.A.2, analysis of Chen at Elements [1.2] and [21.2]; EX1003, ¶123.

Element [21.3]

Chen describes the recited structure/functionality of Element [21.3]. *Supra* Section V.A.2, analysis of Chen at Elements [1.3] and [21.3]; EX1003, ¶124.

Element [21.4]

Chen describes the recited structure/functionality of Element [21.4]. *Supra* Section V.A.2, analysis of Chen at Elements [1.4] and [21.4]; EX1003, ¶125.

Element [21.5]

Chen describes the recited structure/functionality of Element [21.5]. *See supra* Section V.A.2, analysis of Chen at Element [21.5]. Further, and to the extent Chen fails to disclose the “second protection circuit,” the predictable Chen-White combination would have provided it for the reasons detailed above in the Analysis of [1.5]. *Supra*, Section V.B.2; EX1007, 3:25-27, FIG. 9; EX1003, ¶126. As previously described, the Chen-White combination would have implemented

Chen's device in a predictable manner that employs White's suggested benefits from a jumper cable harness (having a fuse along a jumper cable wire) to releasably mate with Chen's high-current output unit 11—thereby accomplishing Chen's goal of connecting with a “car battery” (EX1006, [0025]) in a manner that provides added benefits. EX1003, ¶126; *supra*, Analysis of Element [1.5].

Element [22]

The Chen-White combination provides the recited structure/functionality of Element [22]. *Supra*, Analysis of Element [2]; EX1003, ¶127.

Element [25.1]

Chen describes the recited structure/functionality of Element [25.1]. EX1003, ¶128. As previously described in Elements [1.3] and [6], the predictable combination would have included the jumper cable harness equipped with polarity-protection connector at one end and jumper cable wires having a pair of battery clamps at the opposing end:

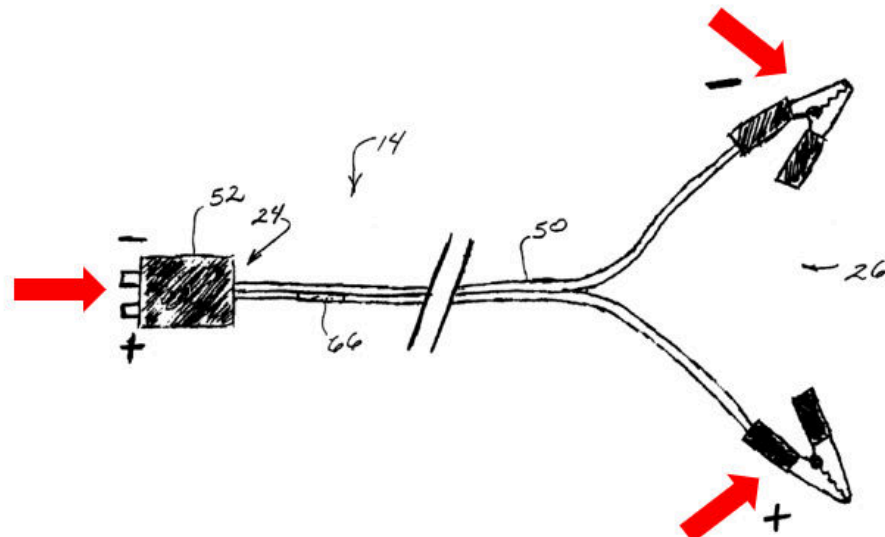
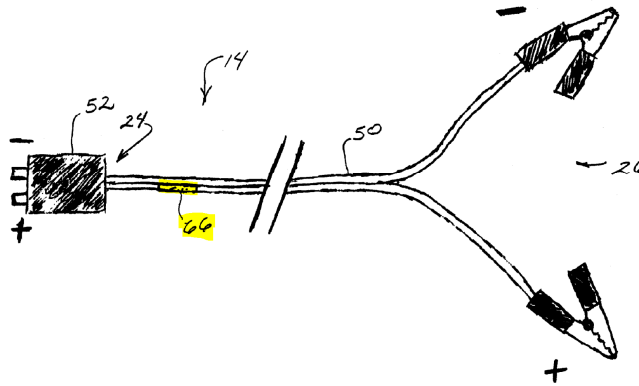


FIG. 9

EX1007, FIG. 9, 2:55-3:16, 2:46-47 (“keyed”). Accordingly, Chen’s lithium battery 4 would have been detachably coupled to the vehicle battery via the conventional clamps of the jumper cable harness and via the polarity-protection connector. *Supra*, Analysis of Element [1.3] and [6]; EX1003, ¶128.

Element [25.2]

Also as previously described in Element [1.5], the predictable combination would have included the jumper cable harness equipped with the “fuse” of the second protection circuit along one of the jumper cable wires:



EX1007, Fig. 9 (annotated); *supra*, Analysis of Element [1.5]; EX1003, ¶129.

Element [26]

Supra Section V.A.2, analysis of Chen at Elements [9] and [26]; EX1003, ¶130.

Element [27]

Supra Section V.A.2, analysis of Chen at Elements [13] and [27]; EX1003, ¶131.

Element [28]

Supra Section V.A.2, analysis of Chen at Elements [14] and [28]; EX1003, ¶132.

Element [30]

Supra Section V.A.2, analysis of Chen at Elements [16] and [30]; EX1003, ¶133.

Element [31]

Supra Section V.A.2, analysis of Chen at Elements [17] and [31]; EX1003, ¶134.

Element [32]

Supra Section V.A.2, analysis of Chen at Elements [18] and [32]; EX1003, ¶135.

Element [33]

Supra Section V.A.2, analysis of Chen at Elements [19] and [33]; EX1003, ¶136.

C. Ground 1C: Chen and Richardson Render Obvious Claim 10

1. The Chen-Richardson Combination

Richardson is akin to Chen in that they both describe portable power source for starting a vehicle engine. EX1014, [0002], [0007]; EX1007, [0025].

Richardson suggests the conventional practice of monitoring the time that the jumpstarting current is output (e.g., “500 ms” for a “preset maximum” or “15 seconds” for another “predetermined current”) and cutting off the jumpstarting current if the time limit is exceeded. EX1014, [0037], FIG. 7, [0007]. A POSITA would have been motivated to implement Chen’s relay K1 (Ground 1A, Element [9]) so that the switching module ceases the jumpstarting current after a

predetermined time period (as suggested by Richardson) to provide an added safety layer that advantageously avoids over-exhaustion of the internal lithium battery capacity due to jumpstarting current delivery during an extended time period. EX1003, ¶¶137-139.

2. Application to Challenged Claims

Element [10]

The predictable Chen-Richardson combination would have implemented Chen to provide a switching module in accordance with Richardson's suggestion to cut off the jumpstarting current after a predetermined period of time. EX1014, [0037], FIG. 7; EX1003, ¶140.

D. Ground 1D: Chen in view of Gozdz Renders Obvious Claims 15 and 29

1. Durando and the Inskeep-Johnson-Durando Combination

Much like Chen, Gozdz describes the conventional use of lithium-based batteries in portable devices. EX1011, 2:52-3:7, 1:15-22. Gozdz expressly suggests improved lithium-ion battery that "discharged at 20C rate" to achieve several benefits. EX1011, 3:3-7, 2:52-57; EX1003, ¶¶141-143. The evidence here confirms a POSITA would have been motivated to implement the Chen's device (Ground 1A) utilizing the improved lithium-ion battery (as suggested by Gozdz) to advantageously provide a battery that "is 'capable of repeated, safe, and stable

charge and discharge at exceptionally high rates’ while also being ‘inexpensive to make’ and ‘having high energy and power capacity.’” EX1003, ¶143 (quoting EX1008, 2:52-3:7, 9:54-61, 10:12-14).

2. Application to Challenged Claims

Element [15]

The Chen-Gozdz combination provides the recited structure/functionality of Element [15]. Here, the combination would have implemented Gozdz’s suggestion (improved lithium-ion battery that “discharged at 20C rate”) in Chen’s device to achieve the advantages articulated above. EX1008, 2:52-3:7; EX1003, ¶144.

Element [29]

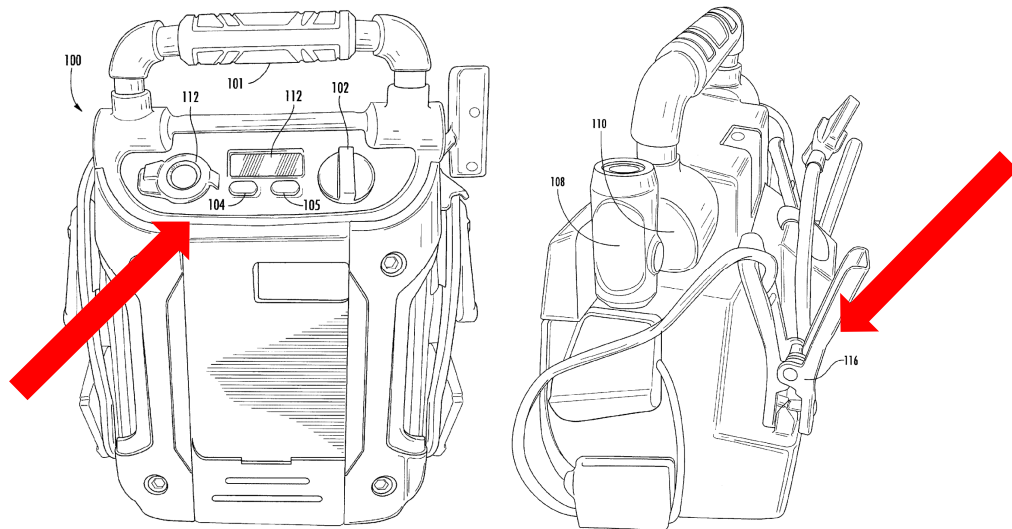
Supra analysis of Chen-Gozdz at Element [15]; EX1003, ¶145.

E. GROUND 2A: Inskeep and Johnson Render Obvious Claims 1, 3, 6-14, 16-17, 20-21, 23, 25-28, 30-31

1. Inskeep

Similar to the ’506 patent, Inskeep discloses “[a] multi-purpose battery jump starter” that can be used “for boosting the power of a battery for use in jump starting an internal combustion engine.” EX1008, [0002], [0007]-[0010], [0024]-[0025], [0027]-[0028]; EX1003, ¶146. Inskeep also similarly includes a USB port and a DC port for low-current power supply to compatible devices. EX1008, [0025]; *see also* [0008], [0027], [0034]. Thus, Inskeep teaches the conventional use of a portable

charger device that provides a first current path for supplying power to USB-connected devices (or 12V DC devices) and a second (higher-current) path for supplying power to jumper cables to jumpstart a vehicle engine:



EX1008, FIGS. 4 and 6, [0025].

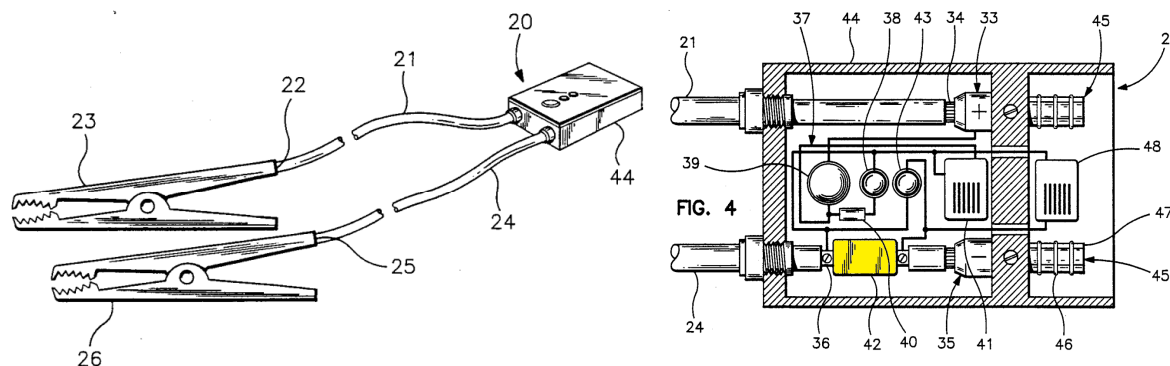
Regarding the low-current DC path (e.g., through the USB port), Inskeep describes a traditional protection circuit—a “low voltage protection circuit”—to protect against short circuits or other conditions that might cause a voltage drop when operating in the first mode to supply the low-current power. EX1008, [0032], cl. 3, FIG. 3; EX1003, ¶147. For example, the low voltage protection circuit should “prevent operation of the USB port at voltages below 5 volts.” EX1008, [0032]. Additionally, Inskeep teaches that the 12V DC power port includes a protection circuit having a fuse “F2,” which would cutoff current in the event of an overcurrent condition through that low-current path. EX1008, FIG. 3 (“F2” at the DC output

port); EX1003, ¶147.

Regarding the jumpstarting current path, Inskeep teaches that the device should be equipped with another protection circuit that cuts off the jumpstarting current after a 5-second period—achieving “500A instantaneous-on, 5 seconds 300 A-off.” EX1008, [0025], FIG. 3; EX1003, ¶148. Moreover, Inskeep suggests a reverse polarity protected coupler to protect against the scenario where “the cables are attached improperly so that a reverse polarity might accrue, for example attaching a negative connector to the positive terminal of a battery.” EX1008, [0028], [0035], FIG. 3; EX1003, ¶148.

2. Johnson

Johnson is akin to Inskeep in that both references describe a jumper cable connection to a car battery. EX1009,1:6-13; EX1008, [0002]. Although Inskeep does not expressly describe the mechanical details of how the jumper cables attaches to Inskeep’s “terminal block” ([0028]), Johnson details the common practice of using a jumper cable wiring harness having a removable connector at one end with improved safety/protection features built therein:



EX1009, FIG. 8 (cropped), FIG. 4 (annotated to highlight circuit breaker/fuse 42 built into the wiring harness), 4:36-65, 1:44-48, 2:20-29, 5:54-64; EX1003, ¶149. For example, Johnson suggests that such a wiring harness can advantageously include a “thermally-activated circuit breaker” (e.g., a resettable fuse) that cuts off the jumpstarting current in the unsafe event where “the battery of the vehicle being assisted has developed an internal short circuit.” EX1009, 4:36-65; EX1003, ¶149. Additionally, Johnson suggests such a removable harness can be used to provide a beneficial “press-to-test” option that provides the user with an opportunity to test the harness-to-car battery connection before joining the connector plug (at the other end of the harness) to complete the jumpstarting circuit. EX1009, 4:3-18; 5:7-8 and 6:2-5 (describing “male alignment boss” and “female slot” for mutual alignment), EX1003, ¶149.

3. The Inskeep-Johnson Combination

A POSITA would have been motivated to implement Inskeep in a predictable manner that employs Johnson’s suggested benefits for a jumper cable harness device

that provides additional safety and electronic protection advantages. EX1003, ¶¶150-156. Indeed, multiple reasons would have prompted a POSITA to implement such a combination.

First, a POSITA would have understood that implementing Inskeep's portable charger device to include a jumper cable harness having a circuit breaker/resettable fuse built therein (as suggested by Johnson) would have provided "improved user safety." EX1003, ¶151. Indeed, Johnson expressly suggests that such a protection circuit having a circuit breaker/fuse in the jumper cable harness can prevent unsafe delivery of jumpstarting current when the car battery "has developed an internal short circuit" (e.g., during the jumpstarting process) and would further enhance user safety by emitting a light/alarm at the harness connector for the end user to know that "[t]he battery may need replacement and it would be dangerous to continue attempting to charge such a battery." EX1009, 4:36-65; EX1003, ¶151.

Second, a POSITA would have been motivated to implement Inskeep in a predictable manner that employs Johnson's suggestion for a jumper cable harness device (having a circuit breaker/resettable fuse built therein) to "advantageously add a layer of protection against electric damage to the portable charger device (and the internal battery therein)." EX1003, ¶152 (citing EX1009, 4:36-49 ("interrupts the flow of current")). In particular, this predictable modification would have improved the reliability of the portable charger device by using the circuit breaker/resettable

fuse (external to the portable charger housing) to cutoff the overcurrent/short circuit condition before electrical damage is imparted to the internal battery and electronics. EX1003, ¶152.

Third, a POSITA would have been motivated to implement this Inskeep-Johnson combination because, in accordance with Johnson’s suggestion, the jumper cable harness device could be connected to car battery to advantageously provide a “press-to-test” feature *before* connecting the connector plug to Inskeep’s portable charger device—thereby adding a further layer of protection against electrical damage to the internal battery. EX1009, 4:3-35 (“interrupts the flow of current”); EX1003, ¶153.

Fourth, the POSITA would have been motivated to modify Inskeep’s charger device to include a removable jumper cable harness (as suggested by Johnson) to provide more simplified maintenance and repair. EX1003, ¶154. In particular, to the extent the resulting system is exposed to an overcurrent condition and the circuit breaker is tripped (preventing the aforementioned damage), the user would have the opportunity to advantageously reset the circuit breaker of external cable harness prior to the next use without the need to access or repair the internal electronics/battery of the portable charger device. EX1003, ¶154. Or, even if the overcurrent condition damage to the protection circuit of jumper cable harness (while protecting the internal battery/electronics), the user would have the

opportunity to more easily replace the circuit breaker (or the external harness itself) without the need to access or repair the internal electronics/battery of the portable charger device. EX1003, ¶155.

Finally, both Inskeep and Johnson are directed to vehicle battery charging systems for similar types of vehicles, and the evidence here confirms that a POSITA would have been sufficiently skilled to implement such a combination given the predictable mechanical/electrical components and the relatively advanced state of the art at the time. EX1003, ¶156. Accordingly, for these reasons articulated above, a POSITA would have had a reasonable expectation of success in effectuating the Inskeep-Johnson combination in the manner described below. *Id.*

4. Application to Challenged Claims

Element [1.P]

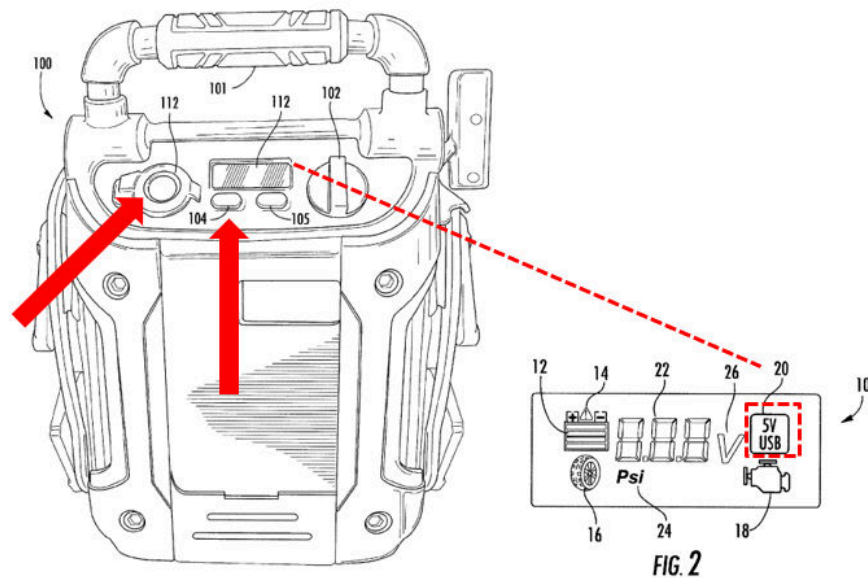
Even if the preamble is treated as a limitation (which Petitioner does not concede), Inskeep describes “[a] multi-purpose battery jump starter” that provides “a portable battery booster for jump starting an engine.” EX1008, [0002]; *see also* [0007]-[0010], [0024]-[0025], [0027]-[0028], FIGS. 4-6; EX1003, ¶157.

Element [1.1]

Inskeep describes the recited structure/functionality of Element [1.1]. EX1003, ¶158. For example, Inskeep discloses “[a] rechargeable internal battery.” EX1008, [0026]-[0027], [0029], [0032], Abst., Fig. 3.

Element [1.2]

Inskeep describes the recited structure/functionality of Element [1.2]. For example, Inskeep expressly teaches that each of a “USB power port” and a “DC power port” are connected to the internal battery, each of which provide the recited first operating mode used for outputting the low-current DC power to compatible devices. EX1008, [0025], [0027], [0032], [0034], FIGS. 3-4; *see also id.*, [0002], [0007]-[0008], [0010], [0024], EX1003, ¶159. For example, the portable charger device includes a conventional “USB” port to supply power to receive a USB charger cable for a mobile device and a DC 12V power supply for mating with a charger cable having “a conventional cigarette style plug”:

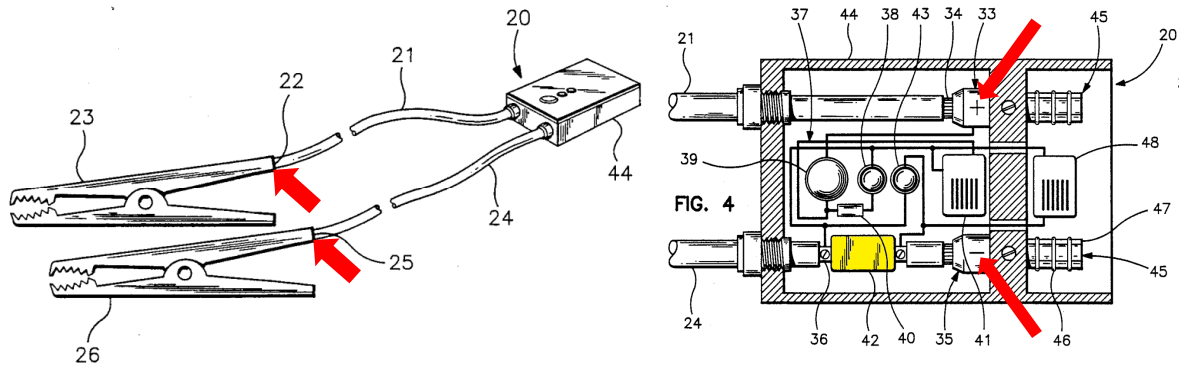


EX1008, FIGS 2 and 4 (annotated); [0025], [0027], [0032], [0034]; EX1003, ¶159. These accessories are, among other things, connected to the battery pack and set to operate at certain standard voltages to “further provide a device that can be used in

an emergency when a loss of power occurs.” EX1008, [0025], FIG. 3. For example, the DC outlet is set for “12 DC power” and the USB port provides power in accordance with the USB standard (“5 volt level”). EX1008, [0025], [0032]; EX1003, ¶159.

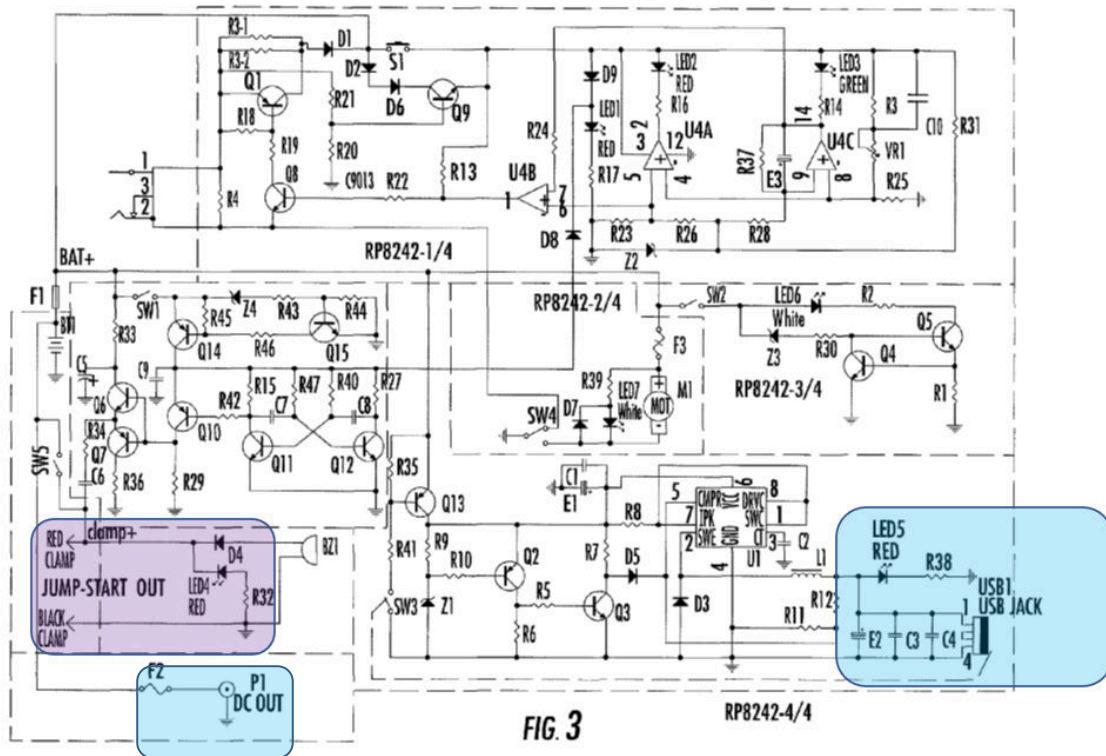
Element [1.3]

The predictable Inskeep-Johnson combination provides the recited structure/functionality of Element [1.3]. As an initial matter, both Inskeep and Johnson teach the using of jumper cable connections to the car battery, thereby teaching the use of positive and negative output terminals to provide the high-current path for jumpstarting a vehicle engine. EX1008, [0028]; EX1009, 1:6-13, 4:36-65, 5:54-64; EX1003, ¶160. Inskeep mentions that jumper cables can “connect” to “the terminal block” of Inskeep’s device ([0028]) without expressly detailing the mechanical details of such connection, yet Johnson suggests the common practice of using a jumper cable wiring harness having a removable connector at one end with improved safety/protection features built therein. EX1009, 4:3-65, 1:44-48, 2:20-29, 5:54-64; EX1003, ¶160. In the resulting combination (articulated above), the jumper cable harness would have included a first pair of output terminals at the keyed connector (as suggested by Johnson), and another pair of output terminals the other end of the jumper cable wires at the output junctions into the corresponding clamps:



EX1009, FIG. 8 (cropped, annotated), FIG. 4 (annotated); EX1003, ¶160.

Regarding the “different” current path, Inskeep teaches the jumpstarting current path should be different than the lower-current path to the USB port 104 and the DC port 112:



EX1008, Fig. 3 (annotated), FIGS. 4-6 (showing the low-current ports 104 and 112)

are different from the jumper cable path); EX1003, ¶161. Also, based on the Inskip teaching, the second current (to the jumper cables) is higher than the first current (to either of Inskip's "USB" port 104 or 12V cigarette-plug port output 122). EX1003, ¶161. Indeed, Inskip teaches the second current path should output "500A instantaneous-on, 5 seconds 300 A-off, 12 VDC" (EX1008, [0025]). The evidence here confirms this jumpstarting current is significantly greater than the first current that is output to Inskip's USB port 104 that output according to the traditional "USB" standard (5V/0.5A) and furthermore indicates an amperage far exceeding Inskip's normal "conventional cigarette style plug" of the 12V DC output 112. EX1009, [0032], [0034]; FIG. 3; EX1003, ¶161 and ¶26.

Element [1.4]

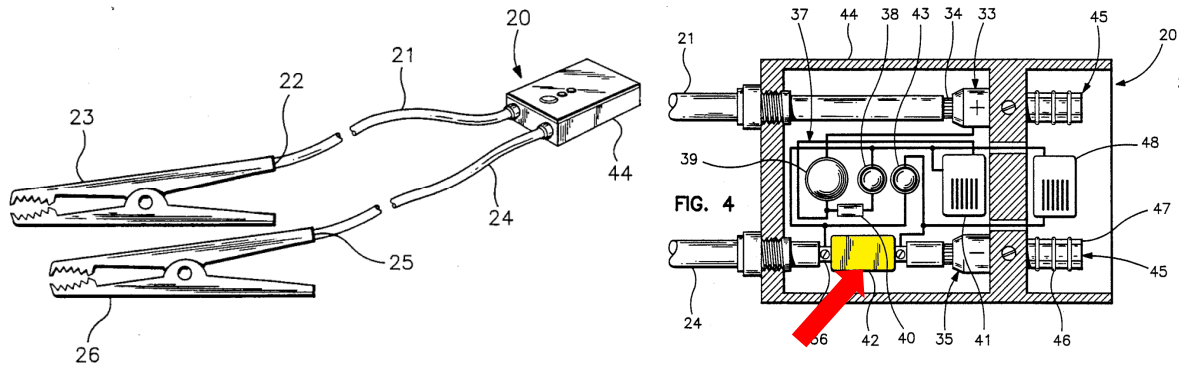
Inskip describes the recited structure/functionality of Element [1.4]. In a first example, Inskip discloses a "low voltage protection circuit" responsible for cutting off current to the USB port when voltage drops below a predetermined setpoint. EX1008, [0032] ("prevent operation of the USB port at voltages below 5 volts"); EX1003, ¶162. This protects the internal battery/circuitry against a short circuit or other conditions that might cause a voltage drop when operating in the first mode to supply the USB power. EX1008, [0032], cl. 3, FIG. 3; EX1003, ¶162. In a second example, Inskip teaches that the 12V DC power port 112 includes a protection circuit having a fuse "F2," which would cutoff current and protect the

internal battery in the event of a short circuit/overcurrent condition through the port 112. EX1008, FIG. 3 (“F2” at the DC output port), [0034] (“coupling of 12V accessories”); EX1003, ¶162.

Element [1.5]

The predictable Inskeep-Johnson combination provides the recited structure/functionality of Element [1.5]. EX1003, ¶163. First, Inskeep teaches that the second current path (jumpstarting current) should be implementing with a protection circuit with specific cutoff limit at “5 seconds” to avoid overextending jumpstarting current delivery—namely, “500A instantaneous-on, 5 seconds 300 A-off, 12 VDC”—thereby protecting both the internal battery and the car battery from overcurrent/overheating. EX1008, [0025]; EX1003, ¶163.

Second, even if this Element is not expressly disclosed by Inskeep, the predictable Inskeep-Johnson combination would have provided the claimed second protection circuit. Again, the Inskeep-Johnson combination would have implemented Inskeep in a predictable manner that employs Johnson’s suggestion for a jumper cable harness device (having a circuit breaker/resettable fuse built therein) to advantageously achieve the multiple known benefits articulated above:



EX1009, FIG. 8 (cropped, annotated), FIG. 4 (annotated); EX1003, ¶164. Thus, the resulting combination would have provided a second protection circuit to cut off the jumpstarting current in the event of an overcurrent condition (e.g., when “the battery of the vehicle being assisted has developed an internal short circuit”). EX1009, 4:36-49; EX1003, ¶164.

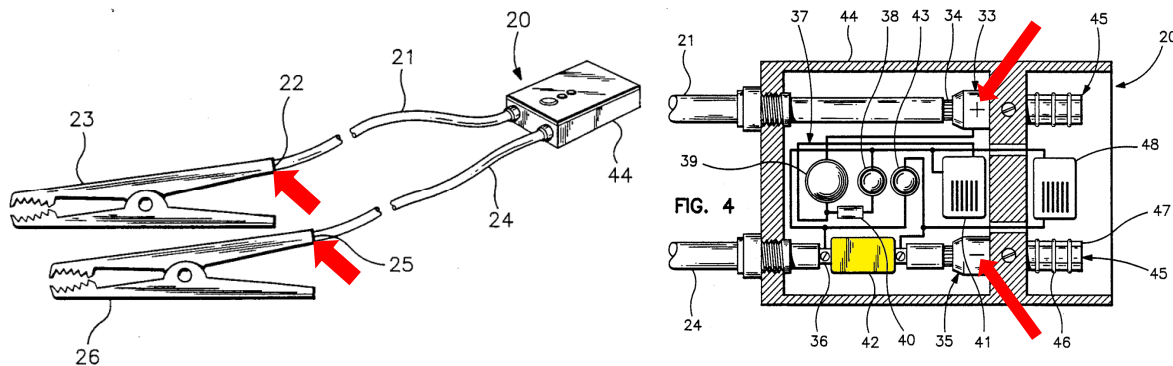
Element [3]

The Inskeep-Johnson combination provides the structure/functionality of Element [3]. EX1003, ¶165. For example, Inskeep discloses or suggest for the device provides “multiple functions” to achieve “safe starting of a vehicle battery, *and further provide* a device that ca be used in an emergency when a loss of power occurs.” EX1008, [0025]; [0027] (describing FIG. 2’s display of both the “engine icon 18” (depicted “when the jump starter circuit is activated”) and the “USB icon 20” (depicted “when the USB port is available for use”)). Additionally, Inskeep FIG. 3 confirms that the “USB JACK” is connected to the battery power supply in parallel with the jumpstarting output (“JUMP-START OUT”), thereby further

confirming the conventional option of simultaneously outputting both the USB current and the jumpstarting current. EX1003, ¶165 (citing to EX1008, FIG. 3).

Element [6]

The Inskeep-Johnson combination provides the structure/functionality of Element [6]. EX1003, ¶166. As previously described in Elements [1.3] and [1.5], in the predictable combination, the jumper cable harness would have included a pair of output terminals at the removable connector (as suggested by Johnson) and another pair of output terminals at the other end of the jumper cables wires for the terminal connections with the clamps:



EX1009, FIG. 8 (cropped, annotated), FIG. 4 (annotated), 5:7-8 and 6:2-6 (suggesting mating connector structures); EX1003, ¶166. Accordingly, in the resulting combination, these pairs of output terminals of the jumper cable harness are all detachably coupled to Inskeep's internal battery (via removal of the connector), and the jumper cable harness further provides the traditional clamps for

connecting with the car battery. *Supra*, Analysis of Elements [1.3] and [1.5];
EX1003, ¶166.

Element [7]

The Inskeep-Johnson combination provides the structure/functionality of Element [7]. EX1003, ¶167. As previously described, Johnson plainly suggests the second protection circuit having the “thermally activated circuit breaker 42” built into one of the harness wires. EX1009, 4:36-65, FIG. 4.

Elements [8]

The Inskeep-Johnson combination provides the structure/functionality of Element [7]. EX1003, ¶168. As previously described, Johnson teaches that the connector (FIG. 4) should have a “male alignment boss” that mates with a corresponding slot to prevent a reverse-polarity connection. EX1009, FIG. 4, 5:7-8 and 6:2-6 (“mutual alignment”), FIGS. 2 and 7.

Element [9]

Inskeep discloses the recited structure/functionality of Element [9]. EX1003, ¶169. In a first example, Inskeep teaches the “control system determines positioning of a switch” that is used to switch on or off the second mode (for jumpstarting current):

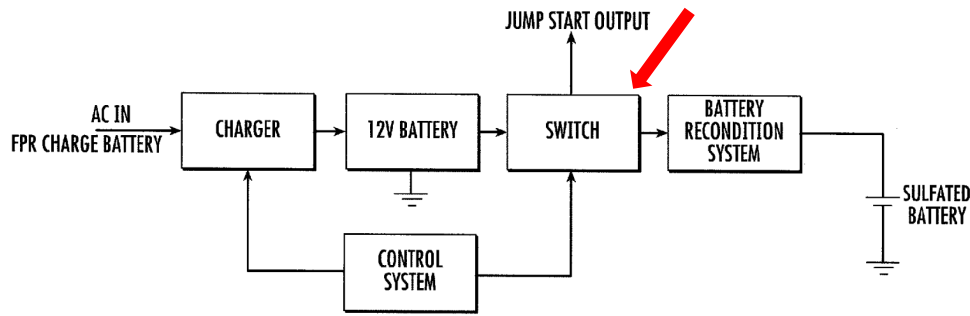


FIG. 1

EX1008, FIG. 1, [0026], [0030] (“switch SW1”), [0031] (“switch 105”), cl. 1 (“battery switching means”); EX1003, ¶169. In a second example, Inskeep’s FIG. 3 illustrates multiple switch elements that dictate whether the jumpstarting current is on or off and furthermore teaches that the jumpstarting current should be automatically switched off after “5 seconds.” EX1008, [0025] (“5 seconds 300A-off, 12 VDC”), FIG. 3 (S1, SW3, SW4, and SW5); EX1003, ¶169.

Element [10]

Inskeep discloses the recited structure/functionality of Element [10]. EX1003, ¶170. Inskeep teaches that the jumpstarting current should be automatically switched off after “5 seconds.” EX1008, [0025] (“5 seconds 300A-off, 12 VDC”), FIG. 3 (S1, SW3, SW4, and SW5).

Element [11]

Inskeep discloses the recited structure/functionality of Element [11]. EX1003, ¶171. For example, Inskeep teaches the “USB” output port is connected with a voltage adjusting circuit so that “a 5 volt level is maintained” at the USB

output (adjusted down from the internal battery a voltage of about 12V). EX1008, [0032], [0027], FIG. 3; EX1003, ¶171.

Element [12]

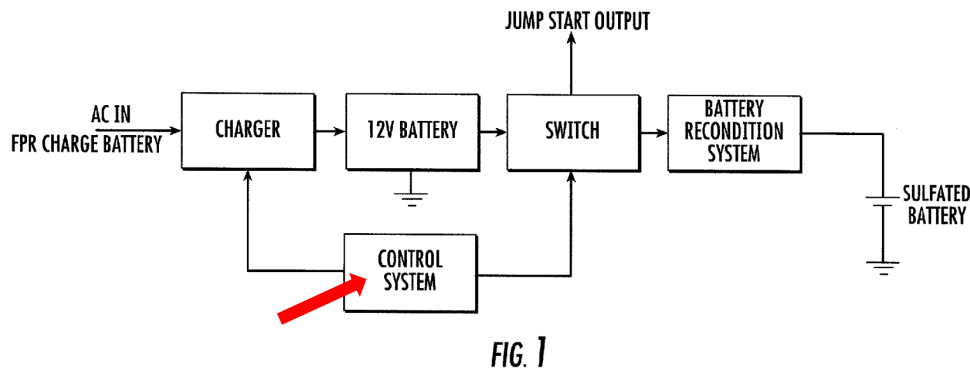
Inskeep teaches or suggests the recited structure/functionality of Element [12]. EX1003, ¶172. For example, Inskeep teaches the conventional “USB” port, which was a straightforward teaching for an output in accordance with the USB standard (5V/0.5A output). EX1008, [0025], [0032], FIG. 3 (“USB jack”); EX1003, ¶172 and ¶26.

Element [13]

Inskeep describes the recited structure/functionality of Element [13]. EX1003, ¶173. Inskeep teaches the second current in the range of 300A during the preferred output of “500A instantaneous-on, 5 seconds 300 A-off, 12 VDC” for jumpstarting the vehicle. EX1008, [0025]; EX1003, ¶173.

Element [14]

Inskeep discloses the recited structure/functionality of Element [14]. EX1003, ¶174. Inskeep teaches a “control system” that is responsible for switching the operating mode of the portable charger device:



EX1008, FIG. 1 (annotated), [0026], [0031]-[0035], FIG. 3; EX1003, ¶174.

Element [16]

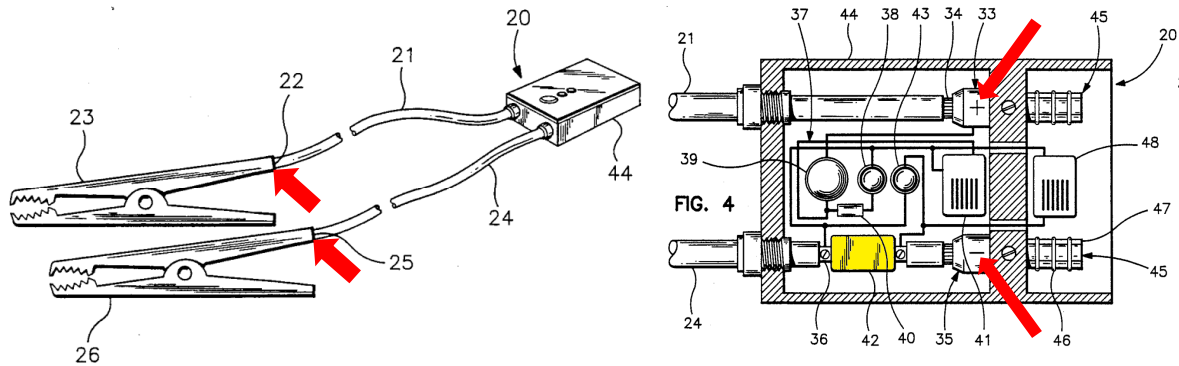
Inskeep discloses the recited structure/functionality of Element [16] because it teaches the “USP power port 104.” EX1008, [0025], [0027], [0032], FIG. 4; EX1003, ¶175.

Element [17]

Inskeep and Johnson describe the recited structure/functionality of Element [17] because Inskeep teaches that a “DC power port 112” is a “12V” outlet to power 12V accessories. EX1008, [0034], FIGS. 3-4, [0025]; EX1003, ¶176.

Element [20]

The Inskeep-Johnson combination provides the structure/functionality of Element [20]. As previously described in Elements [1.3] and [6] above, each of the pairs of output terminals of the jumper cable harness is detachably coupled to Inskeep’s internal battery (via removal of the harness connector):



Supra Analysis of Elements [1.3] and [6]; EX1003, ¶177.

Element [21.P]

Supra Analysis of Element [1.P]; EX1003, ¶178.

Element [21.1]

Supra Analysis of Element [1.1]; EX1003, ¶179.

Element [21.2]

Supra Analysis of Element [1.2]; EX1003, ¶180.

Element [21.3]

Supra Analysis of Element [1.3]; EX1003, ¶181.

Element [21.4]

Supra Analysis of Element [1.4]; EX1003, ¶182.

Element [21.5]

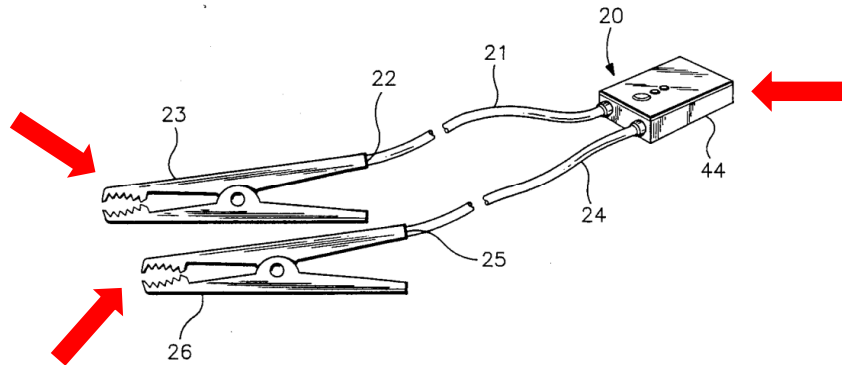
Supra Analysis of Element [1.5]; EX1003, ¶183.

Element [23]

Supra Analysis of Element [3]; EX1003, ¶184.

Element [25.1]

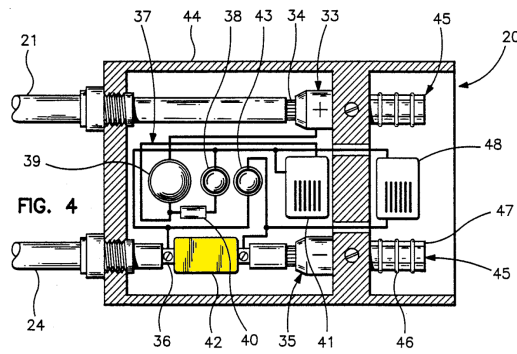
The Inskeep-Johnson combination provides the structure/functionality of Element [25.1]. EX1003, ¶185. As previously described in Element [1.5], the predictable combination would have included the jumper cable harness equipped with removable connector at one end and a pair of battery clamps at the other end:



EX1009, FIG. 8 (cropped, annotated); EX1003, ¶185. Accordingly, Inskeep's internal battery would have been detachably coupled to the vehicle battery via the conventional clamps of the jumper cable harness and via the removable connector. *Supra*, Analysis of Element [1.5].

Element [25.2]

Also as previously described in Element [1.5], the predictable combination would have included the jumper cable harness equipped with the circuit breaker/resettable fuse of the second protection circuit along one of the jumper cable wires:



EX1009, FIG. 4 (annotated), 4:36-65; *supra*, Analysis of Element [1.5]; EX1003, ¶186.

Element [26]

Supra Analysis of Element [9]; EX1003, ¶187.

Element [27]

Supra Analysis of Element [13]; EX1003, ¶188.

Element [28]

Supra Analysis of Element [14]; EX1003, ¶189.

Element [30]

Supra Analysis of Element [16]; EX1003, ¶190.

Element [31]

Supra Analysis of Element [17]; EX1003, ¶191.

**F. Ground 2B: Inskeep in view of Johnson and Durando
Renders Obvious Claims 19 and 33**

1. Durando and the Inskeep-Johnson-Durando Combination

Much like the '506 patent, Durando discloses a “[a] portable battery booster,” and Durando expressly suggests the common use and known benefits of lithium-based battery cells for such devices. EX1010, [0008], [0016], [0020]. A POSITA would have been motivated to implement the Inskeep-Johnson combination (articulated above in Ground 2A) utilizing lithium-based battery cells (as suggested by Durando) in order to achieve any or all of the Durando’s stated advantages of “fast charging, small size, and high performance.” EX1008, [0008]; EX1003, ¶192. Additionally, by the relatively late time frame leading up to December 2011, a POSITA would have implemented such an improvement (lithium-based battery cells as suggested by Durando) to provide a portable charger device having a “longer useful life when subjected to repeated recharges.” *Id.*

2. Application to Challenged Claims

Element [19]

The Inskeep-Johnson-Durando combination provides the recited structure/functionality of Element [19]. Here, the combination would have implemented Durando’s suggestion for using “one or more batteries having the type of primary lithium-metal, rechargeable lithium-ion, and/or lithium polymer”

in Inskeep’s portable charger device so as to achieve the advantages articulated above. EX1010, [0008], [0016]; EX1003, ¶193.

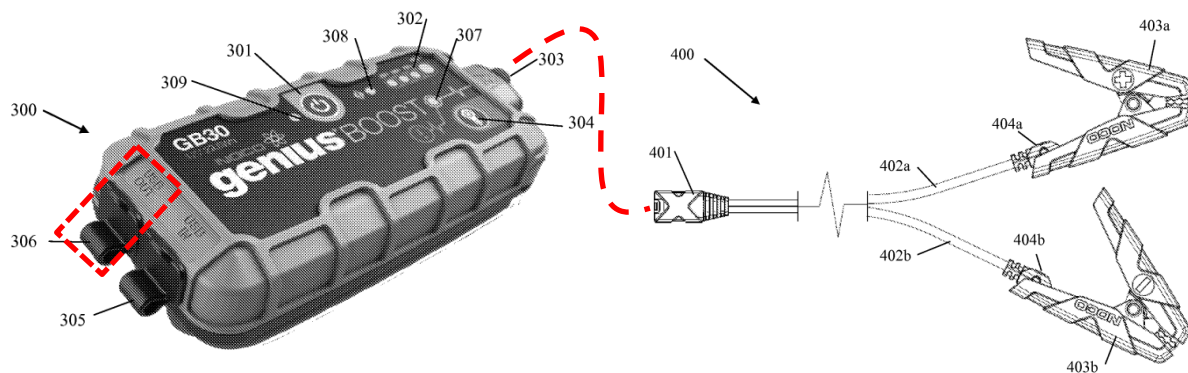
Element [33]

Supra Analysis of Inskeep-Johnson-Durando at Element [19]; EX1003, ¶194.

G. GROUND 3A: Nook Anticipates Claims 1, 2, 6, 8-16, 19-22, 26-30, 33

1. Nook

Nook describes “[a] handheld device” in which a lithium-based battery supplies power to a “USB” port for charging smartphones and to a “jumper cable” harness for jump starting a vehicle engine:



EX1012, FIGS. 3-4 (annotated), 4-6 (“handheld battery booster”), 10 (“USB output”), 11 (“jumper cable device”); EX1003, ¶195.² Again, Nook was filed

² Note: citations to EX1012 refer to the exhibit page number, which is one greater than Nook’s original page numbering.

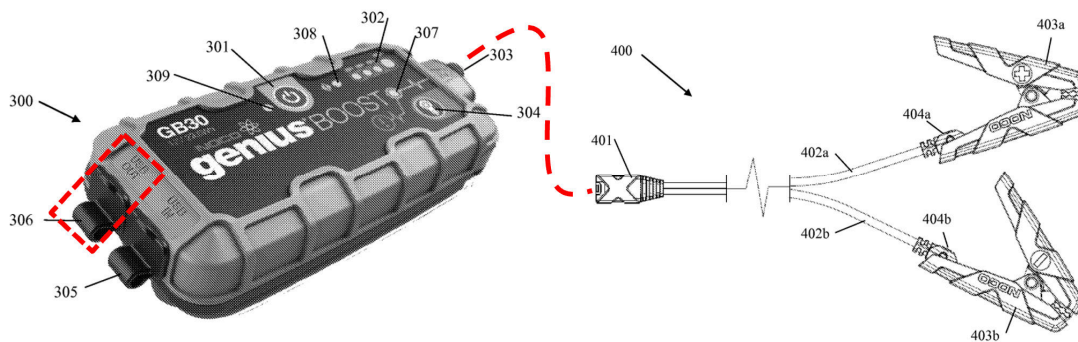
nearly two years before (and published months before) Patent Owner injected new matter into the April 29, 2016 application. *Supra*, Section II.B-C. In other words, Nook demonstrates that, before Patent Owner’s new matter, portable charger devices in the public domain often included features such as “a lithium polymer battery pack 32,” a “programmable microcontroller unit (MCU) 1,” a “car battery reverse sensor 10,” a “car battery isolation sensor 12,” a “smart switch FET circuit 15,” a “USB charge circuit 52,” a “USB output 56,” and “lithium battery back-charge protection diodes 28.” EX1012, 6-7, FIG. 1; EX1003, ¶¶195-197.

The new matter injected by Patent Owner was not innovative or worthy of patent exclusivity. It was old.

2. Application to Challenged Claims

Element [1.P]

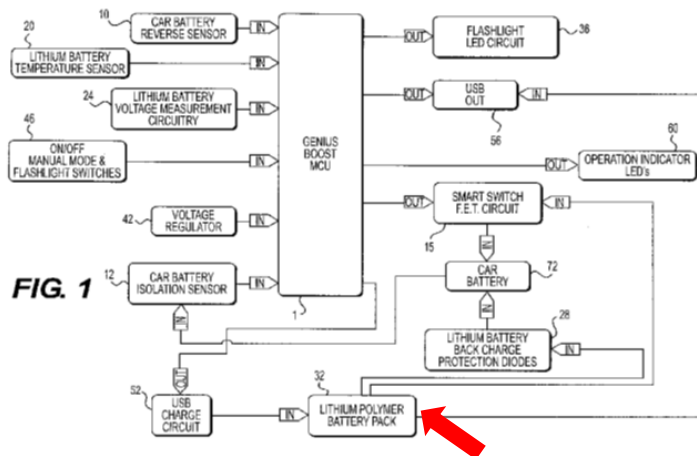
Even if the preamble is treated as a limitation (which Petitioner does not concede), Nook describes Element [1.P]. For example, Nook discloses “[a] handheld device for jump starting a vehicle engine”:



EX1012, FIGS. 3-4 (annotated), 7-9 (“a mobile power supply”); EX1003, ¶198.

Element [1.1]

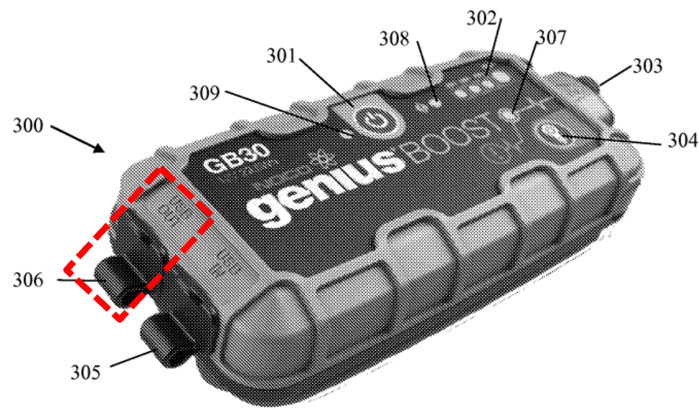
Nook describes the recited structure/functionality of Element [1.1]. EX1003, ¶199. For example, Nook discloses “a lithium polymer battery pack 32”:



EX1012, FIG. 1 (annotated), 6-8; EX1003, ¶199.

Element [1.2]

Nook describes the recited structure/functionality of Element [1.2]. For example, Nook discloses a “USB output 56” configured to output a standard USB current through a “standard USB connector 58” in a first operating mode for “charging portable electronic devices such as smartphones.” EX1012, 11, 8; EX1003, ¶200. Nook depicts the traditional rectangular port for the “USB out” to connect with an ordinary USB-compatible cable:

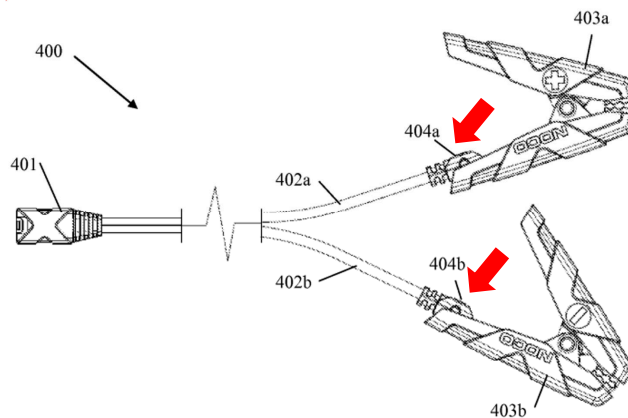


EX1012, FIG. 3 (annotated); EX1003, ¶200.

Element [1.3]

Nook describes the recited structure/functionality of Element [1.3].

EX1003, ¶201. For example, Nook discloses a jumper cable harness 400 having a pair of “terminals 404a and 404b” at the output junction from the positive/negative cables to the clamps 403a and 403b:



EX1012, FIG. 4 (annotated), 12, 5-6 (“positive and negative polarity outputs”);

EX1003, ¶201. Nook further discloses that the battery pack 32 is configured to output the claimed second current second current through this pair of output

terminals of the jumper cable device 400. EX1012, 67 (“to jump start a vehicle engine”), 9 (“thereby connecting”); 11; EX1003, ¶202. Also, Nook teaches that the second current (for jumpstarting) is “200A” or a burst average of “400A” (EX1012, 7), which is far higher than the first current from Nook’s “standard USB connector” (EX1012, 11) used to charge smartphones according to the USB standard (5V/0.5A). EX1012, 7, 11, FIG. 2C (“56” and “58”); EX1003, ¶¶202 and 26.

Element [1.4]

Nook describes the recited structure/functionality of Element [1.4]. For example, Nook discloses a protection circuit that includes “[c]ontrol circuit 57 from the microcontroller 1 allows the USB output 56 to be turned on and off by software control to prevent the internal lithium battery getting too low in capacity.” EX1012, 1011 (referring to FIG. 2C); EX1003, ¶203. Thus, based on Nook’s teaching, in the event the battery capacity falls to a low threshold while the USB output is operating (e.g., for charging a “smartphone”), the protection circuit will cut off the first current to protect the lithium battery from critical-level exhaustion. EX1012, 11; EX1003, ¶203.

Element [1.5]

Nook describes the recited structure/functionality of Element [1.5]. EX1003, ¶204. IN fact, Nook discloses at least three examples of the claimed

second protection circuit. In a first example, Nook teaches that a reverse battery sensor 10 and battery isolation sensor 12 interact with the microcontroller unit 1 (“MCU”) to achieve a protection circuit that can detect unsafe conditions and prevent an overcurrent condition between the lithium battery pack to the jumper terminals—“thus prevent[ing] sparking/short circuiting of the lithium battery pack.” EX1012, 7-9, FIGS. 1-2A (MCU “1” and circuit elements “10” and “12”). Based on these inputs from the isolation sensor 12 and the reverse battery sensor 10, the MCU 1 “can determine when it is safe to turn on the smart switch FET 15” and, if not, “the MCU 1 can keep the smart switch FET 15 from being turned on” (thereby preventing an overcurrent condition). EX1012, 9; EX1003, ¶204.

In a second example, Nook teaches that a temperature sensor 20 interacts with the MCU 1 to achieve a protection circuit that cuts off the jumpstarting current to prevent overheating from an “overextended current draw during jump starting.” EX1012, 7-8, FIGS. 1-2A (MCU “1” and circuit element “20”); EX1003, ¶205. In particular, the temperature sensor 20 provides feedback to the MCU 1 to signal when the lithium battery temperature is overheating (e.g., from “overextended” current), and the MCU will then “not allow jumpstarting, adding safety to the design.” EX1012, 10; EX1003, ¶205.

In a third example, Nook teaches a protection circuit that includes a set of “charge protection diodes 28” that operate during the jumpstarting process to

prevent an overcurrent back toward the “internal lithium battery.” EX1012, 10, FIGS. 1 and 2B; EX1003, ¶206. As such, even if the car’s alternator generated an excess voltage/current, this protection circuit prevents any overcurrent “from the car battery to the internal lithium battery.” EX1012, 10 (“it cannot back-charge (and thereby damage) the internal lithium battery”); EX1003, ¶206.

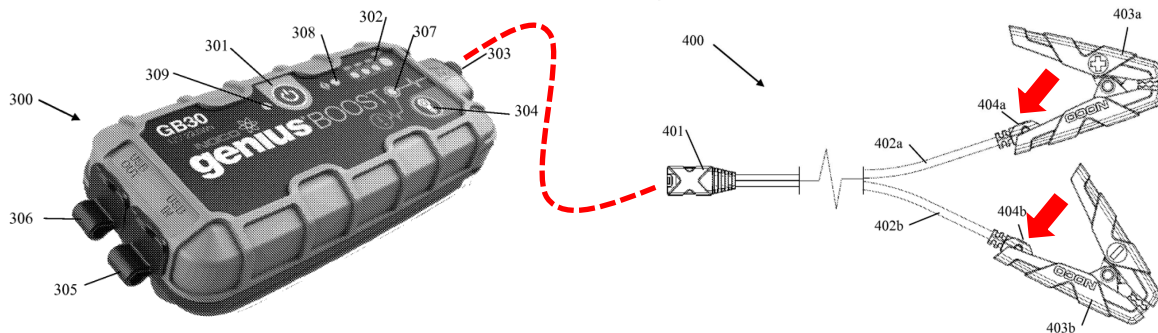
Element [2]

Nook describes the recited structure/functionality of Element [2]. EX1003, ¶207. For example, Nook discloses “[i]n this way, the microcontroller software can turn the charge off if the battery voltage is measured to be too high by the A/D input 22.” EX1012, 10. Nook further discloses “[a]dditional safety is provided for helping to eliminate overcharge to the internal lithium battery using a lithium battery charge controller 50 that provides charge balance to the internal lithium battery cells 51.” *Id.* Finally, Nook discloses “[t]his controller also provides safety redundancy for eliminating over discharge of the internal lithium battery.” *Id.*

Element [6]

Nook describes the recited structure/functionality of Element [6] for the same reasons previously described in Element [1.3]. EX1003, ¶208. Nook teaches that a jumper cable device 400 (FIG. 4) provides the claimed pair of connecting wires. EX1012, 12, FIG. 4; EX1003, ¶208. Nook explains that the device 400

detachably couples the pair of “terminals 404a and 404b” with the internal battery via the removable plug 401:



EX1012, FIGS. 3-4 (annotated), 12 (“to plug into 12 volt output port 303), 5-6; EX1003, ¶208. As shown above, the device 400 includes battery clamps 403a-403b. EX1012, FIGS. 4, 12; EX1003, ¶208.

Element [8]

Nook describes the recited structure/functionality of Element [8]. Nook discloses “the plug 401 will only fit into the port 303 in a specific orientation” to ensure the proper “polarity.” EX1012, 11; EX1003, ¶209.

Element [9]

Nook describes the recited structure/functionality of Element [9]. EX1003, ¶210. In a first example, Nook describes “a smart switch FET circuit 15” that “electrically switches the handheld battery booster lithium battery to the vehicle's electric system only when the vehicle battery is determined by the MCU 1 to be

present.” EX1012, 7, FIGS. 1 and 2B (switch “15”). In a second example, a Nook discloses “301 is a power on switch” that can be activated so indicator “307” shows “power is being provided to the 12V output port.” EX1012, 11, 10 (“main power on switch 46”), FIGS. 2A and 3.

Element [10]

Nook describes the recited structure/functionality of Element [10]. Nook discloses MCU software also includes “a timer” is configured to turn off the power after “a predefined period of time.” EX1012, 9-10; EX1003, ¶211.

Element [11]

Nook describes the recited structure/functionality of Element [11]. Nook discloses “[t]he main voltage regulator circuit 42 is designed to convert internal lithium battery voltage to a regulated 3.3 volts.” EX1012, 9; EX1003, ¶212. Additionally or alternatively, Nook teaches that USB output 56 acts as a “portable charger for charging smartphones” (EX1012, 8) via the “standard USB connectors 58” (EX1012, 11) thereby adjusting the voltage of the internal battery voltage “11.1V” (EX1012, 7) down to the USB standard (5V) using the conventional USB buck circuit in FIG. 2C. EX1003, ¶212.

Element [12]

Nook describes the recited structure/functionality of Element [12]. Nook discloses the “USB output” and the “standard USB connector,” which are disclosed to provide power to “other portable devices such as smartphones.” EX1012, 11, FIG. 3. Nook’s description for this “standard USB connector” is a plain teaching for an output in accordance the USB standard (5V/0.5A). EX1003, ¶213 and ¶26.

Element [13]

Nook describes the recited structure/functionality of Element [13]. Nook discloses a jumpstarting current of “25C (or 200 amps), and burst discharge current is 50C (or 400 amps).” EX1012, 7; EX1003, ¶214.

Element [14]

Nook describes the recited structure/functionality of Element [14]. Nook discloses that the MCU 1 “controls outputs” of the handheld device. EX1012, 7. For example, the MCU 1 interacts with the “smart FET switch 15” to controllably switch the lithium battery into connection with the vehicle’s battery under particular conditions. EX1012, 7; EX1003, ¶215.

Element [15]

Nook describes the recited structure/functionality of Element [15]. Nook discloses the preferred discharge rate of “25C” and a burst discharge current of “50C.” EX1012, 7; EX1003, ¶216.

Element [16]

Nook describes the recited structure/functionality of Element [16]. Nook depicts the USB port (FIG. 3) “for charging smartphones, tablets, and other rechargeable electronic devices.” EX1012, 8, 11, FIG. 3; EX1003, ¶217.

Element [19]

Nook describes the recited structure/functionality of Element [19]. Nook teaches “lithium power battery pack 32” that provides power for jumpstarting a vehicle battery. EX1012, 6-7, FIG. 1; EX1003, ¶218.

Element [20]

Nook describes the recited structure/functionality of Element [20], for the same reasons detailed above. *Supra*, analysis of Nook at Elements [1.3] and [6]; EX1003, ¶219.

Element [21.P]

Supra, analysis of Nook at Element [1.P]; EX1003, ¶220.

Element [21.1]

Supra, analysis of Nook at Element [1.1]; EX1003, ¶221.

Element [21.2]

Supra, analysis of Nook at Element [1.2]; EX1003, ¶222.

Element [21.3]

Supra, analysis of Nook at Element [1.3]; EX1003, ¶223.

Element [21.4]

Supra, analysis of Nook at Element [1.4]; EX1003, ¶224.

Element [21.5]

Supra, analysis of Nook at Element [1.5]; EX1003, ¶225.

Element [22]

Supra, analysis of Nook at Element [2]; EX1003, ¶226.

Element [26]

Supra, analysis of Nook at Element [9]; EX1003, ¶227.

Element [27]

Supra, analysis of Nook at Element [13]; EX1003, ¶228.

Element [28]

Supra, analysis of Nook at Element [14]; EX1003, ¶229.

Element [29]

Supra, analysis of Nook at Element [15]; EX1003, ¶230.

Element [30]

Supra, analysis of Nook at Element [16]; EX1003, ¶231.

Element [33]

Supra, analysis of Nook at Element [19]; EX1003, ¶232.

H. Ground 3B: Nook and White Render Obvious Claims 1, 2, 6-16, 19-22, 25-30, 33

1. The Nook-White Combination

A POSITA would have been motivated to implement Nook’s device (Ground 3A) with a fuse built into a jumper cable wire (as suggested by White) to provide a number of known benefits. EX1003, ¶233. **First**, White suggests that implementing a fuse along the jumper cable can advantageously “prevent damage to the wiring harness” and the host battery in the event of an overcurrent condition, and a POSITA would have been motivated to provide this type of added protection to Nook’s wiring harness 400 and internal battery. EX1007, 2:51-54, FIG. 8 (fuse “48”), FIG. 9 (fuse “66”), EX1012, FIG. 4; EX1003, ¶233. **Second**, White further suggests that using a fuse along the jumper cable can advantageously “prevent damage” to the car battery (“the load”) if the wiring harness experiences an overcurrent condition, thereby improving user safety (e.g., avoiding battery heating/explosion/damage). EX1007, 2:51-54; EX1003, ¶233.

2. Application to Challenged Claims

Element [1.P]

Supra Section V.G.2, analysis of Nook at Element [1.P]; EX1003, ¶234.

Element [1.1]

Supra Section V.G.2, analysis of Nook at Element [1.1]; EX1003, ¶235.

Element [1.2]

Supra Section V.G.2, analysis of Nook at Element [1.2]; EX1003, ¶236.

Element [1.3]

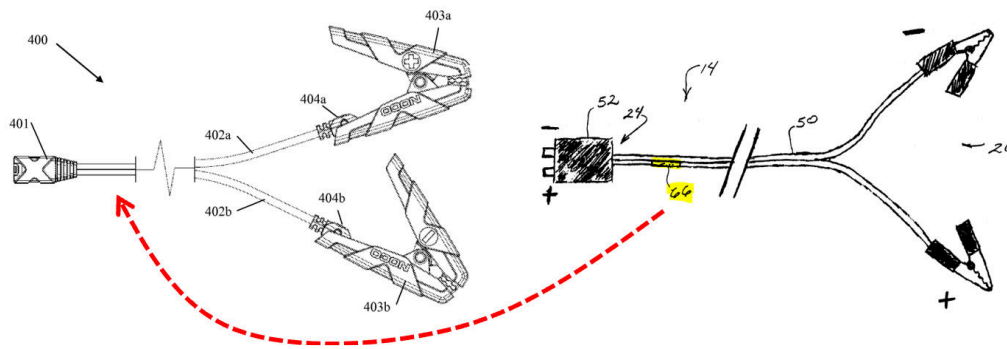
Supra Section V.G.2, analysis of Nook at Element [1.3]; EX1003, ¶237.

Element [1.4]

Supra Section V.G.2, analysis of Nook at Element [1.4]; EX1003, ¶238.

Element [1.5]

Even if Nook did not expressly disclose the “second protection circuit” (which it does as detailed above), the predictable Nook-White combination provides this Element. EX1003, ¶239. Again, White suggests the use of a “fuse” incorporated along a jumper cable wire of a traditional wiring harness (“extension portion 14”) to protect against overcurrent:



EX1007, Fig. 9 (annotated), 3:25-27; 2:51-55 (“to prevent damage”). Here, the Nook-White combination would have modified Nook’s jumper cable harness to include a fuse (as suggested by White) to achieve the added safety/protection benefits articulated above. EX1003, ¶239.

Element [2]

Supra Section V.G.2, analysis of Nook at Element [2]; EX1003, ¶240.

Element [6]

Supra Section V.G.2, analysis of Nook at Element [6]; EX1003, ¶241.

Element [7]

The Nook-White combination provides this Element for the same reasons described in Element [1.5] above. *Supra* Section V.H.2, Element [1.5]; EX1003, ¶242.

Elements [8]

Supra Section V.G.2, analysis of Nook at Element [8]; EX1003, ¶243.

Element [9]

Supra Section V.G.2, analysis of Nook at Element [9]; EX1003, ¶244.

Element [10]

Supra Section V.G.2, analysis of Nook at Element [10]; EX1003, ¶245.

Element [11]

Supra Section V.G.2, analysis of Nook at Element [11]; EX1003, ¶246.

Element [12]

Supra Section V.G.2, analysis of Nook at Element [12]; EX1003, ¶247.

Element [13]

Supra Section V.G.2, analysis of Nook at Element [13]; EX1003, ¶248.

Element [14]

Supra Section V.G.2, analysis of Nook at Element [14]; EX1003, ¶249.

Element [15]

Supra Section V.G.2, analysis of Nook at Element [15]; EX1003, ¶250.

Element [16]

Supra Section V.G.2, analysis of Nook at Element [16]; EX1003, ¶251.

Element [19]

Supra Section V.G.2, analysis of Nook at Element [19]; EX1003, ¶252.

Element [20]

Supra Section V.G.2, analysis of Nook at Element [20]; EX1003, ¶253.

Element [21.P]

Supra Section V.G.2, analysis of Nook at Elements [1.P] and [21.P];
EX1003, ¶254.

Element [21.1]

Supra Section V.G.2, analysis of Nook at Elements [1.1] and [21.1];
EX1003, ¶255.

Element [21.2]

Supra Section V.G.2, analysis of Nook at Elements [1.2] and [21.2];
EX1003, ¶256.

Element [21.3]

Supra Section V.G.2, analysis of Nook at Elements [1.3] and [21.3];
EX1003, ¶257.

Element [21.4]

Supra Section V.G.2, analysis of Nook at Elements [1.4] and [21.4];
EX1003, ¶258.

Element [21.5]

Supra, Section V.H.1 and Section V.H.2, Nook-White combination at Element [1.5]; EX1003, ¶259.

Element [22]

Supra Section V.G.2, analysis of Nook at Elements [2] and [22]; EX1003, ¶260.

Element [25.1]

Supra Section V.G.2, Elements [1.3] and [6] (citing Nook's FIG. 4); EX1003, ¶261.

Element [25.2]

Supra, Section V.H.1 and Section V.H.2, Nook-White combination at Elements [1.5] and [7]; EX1003, ¶262.

Element [26]

Supra Section V.G.2, analysis of Nook at Elements [9] and [26]; EX1003, ¶263.

Element [27]

Supra Section V.G.2, analysis of Nook at Elements [13] and [27]; EX1003, ¶264.

Element [28]

Supra Section V.G.2, analysis of Nook at Elements [14] and [28]; EX1003, ¶265.

Element [29]

Supra Section V.G.2, analysis of Nook at Elements [15] and [29]; EX1003, ¶266.

Element [30]

Supra Section V.G.2, analysis of Nook at Elements [16] and [30]; EX1003, ¶267.

Element [33]

Supra Section V.G.2, analysis of Nook at Elements [19] and [33]; EX1003, ¶268.

I. Ground 3C: Nook and Miller Render Obvious Claims 3 and 23

1. Miller and the Nook-Miller Combination

Miller is similar to Nook in that they both describe portable power source for jumpstarting a vehicle and for outputting to USB-connected devices. EX1013, [0013], [0015]-[0018], FIGS. 2-4; EX1012, 6-8, FIGS. 3-4. Miller suggests the conventional practice of charging various devices (“including jump starting a car battery” and “charging laptop computers and a variety of electronic devices”) “either individually *or simultaneously*.” EX1013, [0012]-[0013] (“that improves upon conventional power chargers”). A POSITA would have been motivated to implement Nook’s device (Ground 3A) to provide the conventional “simultaneous”

(third) option for supply power to *both* the USB port and the jumper cable harness (as suggested by Miller) to advantageously continue powering the user's smartphone during the jump starting process (critical minutes in an emergency where the smartphone would contact emergency services). EX1013, [0012]-[0013], [0039], [0050]-[0057] (“as well as”); EX1003, ¶269.

2. Application to Challenged Claims

Element [3]

The predictable Nook-Miller combination would have implemented Nook to provide a “simultaneous” (third) mode of operation, as suggested by Miller, to achieve this aforementioned benefit. EX1013, [0037], FIG. 8; EX1003, ¶270.

Element [23]

Supra analysis of Nook-Miller at Element [3]; EX1003, ¶271.

J. Ground 3D: Nook and Richardson Render Obvious Claim 10

1. The Nook-Richardson Combination

Richardson and Nook both describe a portable power source for starting a vehicle engine. EX1014, [0002], [0007]; EX1012, 6-8, FIGS. 3-4; EX1003, ¶272. Richardson suggests the known benefits of monitoring the time that the jumpstarting current is output and cutting off the jumpstarting current if the time limit is exceeded. EX1014, [0037] (“500 ms” or “15 seconds”), FIG. 8, [0007].

A POSITA would have been motivated to implement Nook's device (Ground 3A) so that the switching module ceases the jumpstarting current after a predetermined time period (as suggested by Richardson) to provide "an added safety layer that to prevent an 'overheating condition' in the car battery." EX1003, ¶273 (quoting EX1014, [0007]). Also, a POSITA would have been motivated do so for advantageously avoiding critical over-exhaustion of the internal battery from high current over an extended time. *Id.*

2. Application to Challenged Claims

Element [10]

The predictable Nook-Richardson combination would have implemented Nook to provide a switching module in accordance with Richardson's suggestion to cut off the jumpstarting current after a predetermined period of time. EX1014, [0037], FIG. 8; EX1003, ¶274.

K. Ground 3E: Nook and Shoji Render Obvious Claims 17-18 and 31-32

1. The Nook-Shoji Combination

Shoji and Nook similarly relate to portable charger devices for powering mobile electronic devices. EX1015, 1:52-61, 4:62-5:7, 6:6-29, FIGS. 1-3; EX1003, ¶275. Shoji suggests the known benefits of providing multiple DC output options beyond the low-voltage 5V option, such as high-voltage outputs of "12V,

15V, and 19V.” EX1015, 5:2-5:7, 6:6-29. A POSITA would have been motivated to implement Nook’s device (Ground 3A) so as to include additional DC output options (such as one or more of the high-voltage outputs of “12V, 15V, and 19V,” as suggested by Shoji) for “advantageously allowing connections with a wider variety of ‘portable devices such as a notebook PC, cellular phone, or PDAs,’ for beneficially allowing recharging of ‘two or more portable devices at the same time,’ and for avoiding a need to carry different auxiliary batteries for different portable devices.” EX1003, ¶275 (quoting EX1015, 5:2-5:7, 6:6-29).

2. Application to Challenged Claims

Element [17]

As described above, the predictable Nook-Shoji combination provides the claimed output port of a rating voltage of 12V. EX1015, 5:2-5:7; EX1003, ¶276.

Element [18]

As described above, the predictable Nook-Shoji combination provides the claimed output port of a rating voltage of 19V. EX1015, 5:2-5:7; EX1003, ¶277.

Element [31]

Supra, analysis of Nook-Shoji combination at Element [17]; EX1003, ¶278.

Element [32]

Supra, analysis of Nook-Shoji combination at Element [18]; EX1003, ¶279.

VI. DISCRETIONARY DENIAL IS NOT JUSTIFIED

A. The Petition’s New Prior Art and Errors Made During Prosecution Warrant Institution—35 U.S.C. § 325(d)

This Petition does not present a situation where “the same or substantially the same prior art or arguments” were previously presented. 35 U.S.C. § 325(d); *Advanced Bionics, LLC v. MED-EL Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 (Feb. 13, 2020). Indeed, during prosecution, there were no prior art references cited in any IDS or office action at all. *See generally* EX1002. Moreover, this Petition specifically identifies “material errors” in the examiner’s flawed statements/assumptions in the Notice of Allowance. *Supra*, Section II.B.

B. The Fintiv Factors Weigh in Favor of Institution—35 U.S.C. § 314(a)

In *Apple Inc. v. Fintiv, Inc.*, the Board enumerated six factors that provide a “holistic view” as to “whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in [a] parallel proceeding.” IPR2020-00019, Paper 11, 2-3 (PTAB “precedential” Mar. 20, 2020). Virtually all of these factors weigh against exercising discretionary denial. The related litigation is in its infancy. Critically, the service date of the litigation complaint did not occur until October 2023. *See* EX1017, 2-3.

As such, the Answer was only recently filed—in the same month as this Petition. No scheduling order has been entered, no discovery has initiated, and no trial date has been scheduled at this time. Petitioner diligently filed this Petition

even *before* receiving infringement contentions from Patent Owner. Moreover, the above-described flaws and defective priority claim during examination of the '506 patent raise significant questions, and the merits of the prior art grounds in this Petition are particularly strong—presenting both §102 and §103 grounds. *See* USPTO Memorandum, Interim Procedure for Discretionary Denials, 9 (June 21, 2022). Under these facts, discretionary denial would be unjust and unwarranted.

VII. PAYMENT OF FEES—37 C.F.R. §42.103

Petitioner authorizes the Patent and Trademark Office to charge any fees to Deposit Account No. 06-1050.

VIII. MANDATORY NOTICES—37 C.F.R §42.8(a)(1)

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

Shenzhen Xinzexing E-commerce Co., Ltd. (“SXE”) is both the Petitioner and a real party-in-interest. Additionally, Guangdong Boltpower Energy Co., Ltd. is a real party-in-interest.

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

Petitioner is not aware of any disclaimers, reexamination certificates, or other petitions for IPR of the '506 patent. The '506 patent is the subject of civil action captioned *Shenzhen CAR KU Technology Co., Ltd. v. Shenzhen Xinzexing E-commerce Co., Ltd.*, 1:22-cv-03403 (NDIL).

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

Petitioner provides the following designation of counsel.

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D. Service Information

Please address all correspondence and service to the address listed above.

Petitioner consents to electronic service by email at IPR56964-0002IP1@fr.com.

Respectfully submitted,

Dated November 21, 2023

/Michael T. Hawkins/
Michael T. Hawkins, Reg. No. 57,867

(Case No. IPR2024-00222)

Attorney for Petitioner

CERTIFICATION UNDER 37 CFR § 42.24

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter partes* Review totals 13,858 words, which is less than the 14,000 allowed under 37 CFR § 42.24.

Dated November 21, 2023

/Michael T. Hawkins/
Michael T. Hawkins, Reg. No. 57,867

Attorney for Petitioner

CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on November 21, 2023, a complete and entire copy of this Petition for *Inter partes* Review, Power of Attorney, and all supporting exhibits were provided via Federal Express, to the Patent Owner by serving the correspondence address of record as follows:

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