

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SHENZHEN XINZEXING E-COMMERCE CO., LTD.,

Petitioner,

v.

SHENZHEN CARKU TECHNOLOGY CO., LTD.,

Patent Owner.

PTAB Case No. IPR2024-00222

Patent No. 9,643,506 B2

PATENT OWNER'S RESPONSE

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EXHIBIT LIST

Exhibit	Description
2001	Declaration of Dr. David S. Ricketts in Support of Patent Owner's Response ("Ricketts Decl." or "Ricketts")
2002	Chinese Patent Application No. 201110409190.9, filed December 9, 2011
2003	Certified English Translation of Chinese Patent Application No. 201110409190.9, filed December 9, 2011
2004	Chinese Patent Publication No. CN 102496985 B, published May 28, 2014
2005	Certified English Translation of Chinese Patent Publication No. CN 102496985 B, published May 28, 2014
2006	International PCT Publication No. WO 2013/082982 A1, published June 13, 2013
2007	Certified English Translation of International PCT Publication No. WO 2013/082982 A1, published June 13, 2013
2008	U.S. Patent No. 9,496,728, issued November 15, 2016

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.

I. INTRODUCTION

Patent Owner, Shenzhen Carku Technology Co. Ltd., hereby submits its Response under 35 U.S.C. § 316(a)(8) and 37 C.F.R. § 42.120 to the Petition filed by Shenzhen Xinxing E-commerce Co., Ltd. (“Petitioner”), challenging Claims 1-3, 6-23, and 25-33 of U.S. Patent No. 9,643,506 (the “’506 Patent”) (Ex. 1001). *Inter partes* review of the ’506 Patent was instituted by decision of the Board dated July 31, 2024 (Paper 9). The Board instituted trial on claims 1–3, 6–23, and 25–33 of the ’506 Patent.

The Petition as originally filed uses 10 different references to build up 11 different combinations of cited references under 35 U.S.C. §§ 102 and 103 grounds against the challenged claims. Each of the 11 different combinations of cited references, however, are fatally defective in under 35 U.S.C. §§ 102 and 103 for multiple reasons, including lack of relevant technical disclosure in each cited reference with respect to claimed limitations, lack of reasons or basis for properly combining the different cited references, or contended combinations in contradiction with the teachings in the cited references. Notably, the Petition and the Petitioner’s expert declaration gloss over requirements of the claimed subject matter in claim limitations and their relationships in the challenged claims and fail to identify relevant prior art teaching with respect to each and every claim limitation in the challenged claims as required under 37 CFR §§ 42.104(3) and 42.104(4).

For example, the Petition fails to establish the required first protection circuit by misidentifying circuitry that is not associated with the USB output port relied on by the Petitioner. In another example, the Petition fails to identify or analyze the first and second output modes for Grounds based on the Inskeep or Nook references under the proper construction of those terms based on claim differentiation and support in the specification and priority applications. In yet another example, the Petition ignores the teachings of the priority application to allege that the Nook reference is prior art, when it is clearly not with respect to nearly all challenged claims.

As a result of the above and other failures in the Petition as originally filed, the evidence and analyses of the Petition are fatally flawed and, consequently, fail to make out a *prima facie* case for the unpatentability of the challenged claims. Such failures in the originally filed evidence and analyses in the Petition cannot be cured by presenting new arguments in this proceeding. See Consolidated Trial Practice Guide November 2019 at 74-75. As demonstrated by the analyses by Patent Owner and its expert, the failures in the Petition is tantamount to Petitioner's failure to meet its statutorily mandated ultimate burden of persuasion under 35 U.S.C. § 316(e) to prove unpatentability of the challenged claims by a preponderance of the evidence.

In addition to this paper, Patent Owner concurrently files Ex. 2001, a

supporting expert Declaration of Dr. David Ricketts, and supporting Exs. 2002-08.

II. BACKGROUND OF THE CHALLENGED PATENT

A. The '506 Patent

The '506 Patent discloses a portable backup charger with an internal battery pack with lithium-based batteries, and DC-DC conversion circuitry to output a first DC current controlled by the user via MCU (such as 5V, 12V, or 19V output ports) and/or a second large current output at output terminals (e.g., for jumpstarting a vehicle). Ex. 1001, Fig. 3, 3:36-4:7, 4:39-47; 5:30-45, see generally 3:48-7:41.

Ricketts ¶ 60.

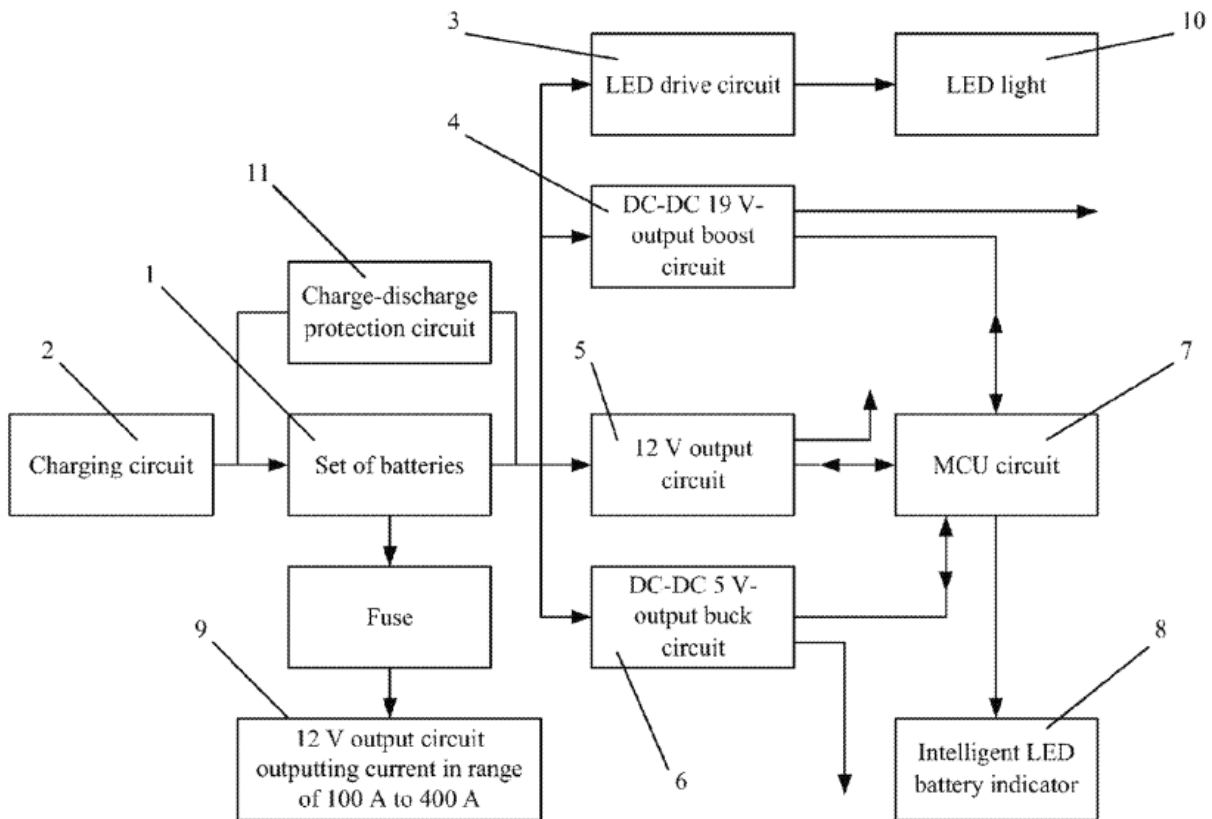


Figure 3

Fig. 3 and the corresponding description of the circuit appears in the priority application CN 201110409190.9 filed in December 2011. Another embodiment of portable charger is in Fig. 1, and the specification of the '506 Patent explains the correspondence between the elements of Fig. 3 and the elements of Fig. 1. Ex. 1001 3:48-7:41, Ricketts ¶ 61.

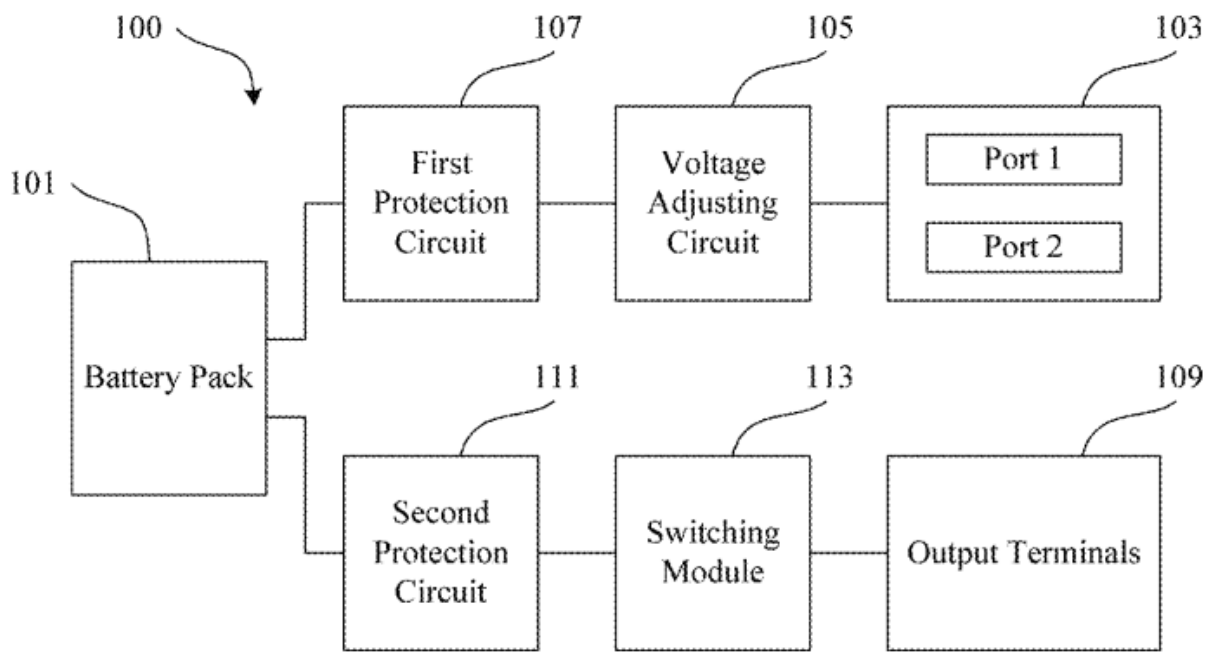


Figure 1

The charger uses first and second “protection circuits” 107 and 111 shown in Fig. 1, or shown as reference 11 and the fuse (not labeled with a reference number) in Fig. 3. Ex. 1001 at Fig. 1; 1:52-57, Fig. 3; 5:1-3, 6:7-21, 6:38-52. Ricketts ¶ 62.

The '506 Patent discloses that the first protection circuit that “may also be used to protect overcurrent condition of the current outputting through the output

ports 103.” Ex. 1001, Fig. 1, Fig. 3, Col. 5:1-20-29, Ricketts ¶ 63.

The '506 Patent discloses that the second protection circuit “is used to protect against an overcurrent condition” when outputting a second current to the output terminals, and may comprise a fuse that would “cut off the current path from the battery pack [] to the pair of output terminals []” in the event of an overcurrent condition caused a short-circuit of the output terminals or other reasons.” Ex. 1001, Col. 6:7-21, 6:38-52, Ricketts ¶ 64.

The '506 Patent discloses that at direction of the user, the microcontroller can selectively enable the 19V, 12V, or 5V output to supply a first current for a particular device connected to the charger. Ex. 1001, Col. 7:30-39, Ricketts ¶ 65.

A POSITA would understand that through these disclosures of the output circuits, the following output configurations or operating modes are possible (using one of the DC outputs – the 5V output – as an example):

Configuration / Operating Mode	5V Output (Fig. 3 Ref. 6)	12V 100-400A Output (Fig. 3 Ref. 9)
1	Enabled by user	Disabled because fuse is blown
2	Disabled by user	Enabled because fuse is not blown
3	Enabled by user	Enabled because fuse is not blown
4	Disabled by user	Disabled because fuse is blown

Ricketts ¶ 66.

The specification of the '506 Patent has an express, additional text

description of the first operating mode (Col. 4:30-33; see generally Col. 4:30-5:29), second operating mode (Col. 5:30-33; see generally Col. 5:30-57), and third operating mode (Col. 5:58-62; see generally Col. 5:58-67) consistent with the original disclosure in CN 201110409190.9. Ricketts ¶ 67.

There are multiple advantages of a mode where the output port's first current and the output terminals' second current are enabled one at a time in the first and second modes, respectively. Ricketts ¶ 68. For example, when second current output to the second terminals, inhibiting power to the other ports may maximize the power available for a jumpstart. *Id.* In another example, when using the 5V output to charge a cell phone over a period of hours, inhibiting power to the output terminals may improve the safety of the device when left unattended, improving safety. *Id.* Allowing a third operating mode where the output terminals and output ports are configured to output currents improves the utility of the devices in certain use cases, such as emergency situations when jumpstarting and charging another device such as a cell phone.

B. The '506 Patent Prosecution History

Petitioner claims that “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, 4-5. This is incorrect. A dozen references were cited in the parent application (U.S. App. Ser. No. 14/298,986, which issued as U.S. Pat. No.

9,496,728, EX2008), and the grandparent PCT/CN2012/083793 application considered six references (Ex. 2006, 16). Under MPEP 609.02, “examiner of the continuing application will consider information which has been considered by the Office in the parent application” without filing an IDS.

C. Priority Date

1. Claims 1–3, 6–8, 11-23, 25, 27–33 have a priority date of December 9, 2011

Contrary to Petitioner's assertions, as shown in the table below, Claims 1–3, 6–8, 11-23, 25, 27–33 are supported by priority document China patent application number 201110409190.9 cited on the face of the '506 Patent, and thus are entitled to a priority date of December 9, 2011. Ricketts ¶¶7,100-150.

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
[1.P]	“The present invention relates to the field of DC power supplies, specifically to a portable backup power supply capable of providing DC power to various devices.”	Ricketts ¶¶101-106. As explained in Section II.A, the concept of operating modes is disclosed in Fig. 3, which is Fig. 1 of the priority application.
[1.1]	“A portable backup power supply that includes a battery pack comprises lithium iron phosphate or lithium cobalt oxide batteries ...” “This portable backup power supply uses lithium iron phosphate or lithium cobalt oxide batteries as the battery	Ricketts ¶¶101-106

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	pack ...”	
[1.2]	“The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7.” “...4. DC-DC 19 V boost output circuit; 5. 12 V output circuit; 6. DC-DC 5 V buck output circuit; 7. MCU microcomputer control circuit;...” Fig. 1, refs. 4, 5, 6. “As shown in FIG. 1, the schematic structure of the portable backup power supply described in this invention is provided. The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6.	Ricketts ¶¶101-106. A POSITA would understand that an output circuit connectable to a smartphone, tablet has a port to facilitate such a connection.

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7. Through the MCU microcomputer control circuit 7, users can flexibly select the desired voltage output to meet the outdoor power supply requirements for devices such as mobile phones, computers, and digital cameras.”	
[1.3]	“Since this power supply uses the lithium iron phosphate or lithium cobalt oxide battery pack 1 as an energy storage device, it has the advantages of being lightweight, compact, durable, having a high instantaneous discharge current, and being able to be recharged repeatedly.. ... It is also connected to a 12V high-current output circuit 9 that can provide a current output of 100 A 400 A at 12 V, which can be used as an emergency power supply to start a car.” Fig. 1, refs. 9. “...this invention provides a portable backup power supply that not only has charging capabilities and offers multiple voltage-level DC outputs, but	Ricketts ¶¶101-106

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	also features high-current output capability, making it suitable as a car starter power supply”	
[1.4]	“11. protection circuit” Fig. 1, ref. 11. “To ensure safe charging and discharging of the battery pack, the lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to a protection circuit 11 that provides overcurrent and overload protection.” “...said battery pack is connected to a charging and discharging protection circuit ...” “The high-current output for starting cars is connected directly across the battery pack without passing through the discharge protection circuit.”	Ricketts ¶¶101-106
[1.5]	“It is also connected to a 12V high-current output circuit 9 that can provide a current output of 100 A 400 A at 12 V, which can be used as an emergency power supply to start a car. The high-current	Ricketts ¶¶101-106

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	output for starting cars is connected directly across the battery pack without passing through the discharge protection circuit. To prevent the battery from overheating due to short-circuiting or reverse connection of the positive and negative clips during emergency car starting, a 150 A to 250 A fuse is included in the circuit. To reduce the probability of short-circuiting due to collisions between the two battery clips during emergency starting, a 150A 250A fuse is also included in the high-current output circuit for car starting. The output end uses an anti-reverse connection plug, and the positive and negative external connection wires are made of silicone wires of different lengths.” “In particular, in order to reduce the probability of short-circuiting due to collision of two battery clips during emergency starting, the high-current output circuit for car starting is connected in series with a 150 A to 250 A fuse.”	
[2]	“...battery pack is equipped with a charge and discharge protection circuit.”	Ricketts ¶¶107-112

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	Fig. 1, Ref. 11. “To ensure safe charging and discharging of the battery pack, the lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to a protection circuit 11 that provides overcurrent and overload protection..” Fig. 1 (showing a MP2612 connected between charging input J1 and the internal battery) Fig. 5 (showing a MP4462 connected between the internal battery and the USB connector J4)	
[3]	See disclosure of Claim 1.	Ricketts ¶¶113-14. As explained in Section II.A, the concept of operating modes is disclosed in Fig. 3, which is Fig. 1 of the priority application.
[6]	“To prevent the battery from overheating due to short-circuiting or reverse connection of the positive and negative clips during emergency car starting, a 150 A to 250 A fuse is included in the circuit.”	Ricketts ¶¶115-16

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	“The output end uses a reverse connection-proof plug,...” “The output end uses an anti-reverse connection plug, and the positive and negative external connection wires are made of silicone wires of different lengths.” “The output end uses an anti-reverse connection plug, ...”	
[7]	See disclosure for claim 6. “To prevent the battery from overheating due to short-circuiting or reverse connection of the positive and negative clips during emergency car starting, a 150 A to 250 A fuse is included in the circuit. To reduce the probability of short-circuiting due to collisions between the two battery clips during emergency starting, a 150A 250A fuse is also included in the high-current output circuit for car starting.” “In particular, in order to reduce the probability of short-circuiting due to collision of two battery clips during	Ricketts ¶¶117-18

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	emergency starting, the high-current output circuit for car starting is connected in series with a 150 A to 250 A fuse.” “The fuse is connected in series with either the positive or negative wire of the external connection cable.”	
[8]	“The output end uses an anti-reverse connection plug, and the positive and negative external connection wires are made of silicone wires of different lengths..” “The output end uses a reverse connection-proof plug, and the external connection cables use silicone wires of different lengths for the positive and negative wires..”	Ricketts ¶¶119-20
[11]	Fig. 1, reference 6 (showing (6) DC-DC 5V buck output circuit) “(6) DC-DC 5V buck output circuit;” Fig. 5 (showing a MP4462 connected between the internal battery and the USB connector J4) “...battery pack 1 is connected	Ricketts ¶¶123-24

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7....” “As shown in FIG. 1, the schematic structure of the portable backup power supply described in this invention is provided. The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7. Through the MCU microcomputer control circuit 7, users can flexibly select the desired voltage output to meet the outdoor power supply requirements for devices such as mobile phones, computers, and digital cameras.”	

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	“The battery pack connects to various voltage regulation circuits and, through the MCU microcomputer control circuit, can provide outdoor power supply for devices such as mobile phones, computers, and digital cameras”	
[12]	Fig. 5 (showing a MP4462 connected between the internal battery and the USB connector J4) “...battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7....” “As shown in FIG. 1, the schematic structure of the portable backup power supply described in this invention is provided. The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-	Ricketts ¶¶125-27

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7. Through the MCU microcomputer control circuit 7, users can flexibly select the desired voltage output to meet the outdoor power supply requirements for devices such as mobile phones, computers, and digital cameras.” “The battery pack connects to various voltage regulation circuits and, through the MCU microcomputer control circuit, can provide outdoor power supply for devices such as mobile phones, computers, and digital cameras.”	
[13]	“ Preferably, the output voltage of said high-current output circuit for vehicle starting is 12 V DC, and the instantaneous current is 100 A to 400 A.” “It is also connected to a 12V high-current output circuit 9 that can provide a current output of 100 A 400 A at 12 V, which can be used as an emergency power supply to start a car.”	Ricketts ¶128

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	See Fig. 1 reference 9 (“12V LARGE CURRENT OUTPUT CIRCUIT (100A-400A)”)	
[14]	“Through the MCU microcomputer control circuit 7, users can flexibly select the desired voltage output to meet the outdoor power supply requirements for devices such as mobile phones, computers, and digital cameras.” “The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7.” Fig 1 (showing connection between the MCU (Ref. 7) and 19V, 12V, 5V output circuits (Refs. 4, 5, 6)).	Ricketts ¶¶129-30
[15]	“The lithium iron phosphate or lithium cobalt oxide batteries are designed for high power, with a discharge rate reaching 20 c to 70 c.”	Ricketts ¶131
[16]	See Fig. 6, J4 (showing USB connector)	Ricketts ¶132

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	Fig. 1, reference 6 (showing (6) DC-DC 5V buck output circuit) “(6) DC-DC 5V buck output circuit;” Fig. 5 (showing a MP4462 connected between the internal battery and the USB connector J4) “The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7” “As shown in FIG. 1, the schematic structure of the portable backup power supply described in this invention is provided. The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-	

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7. Through the MCU microcomputer control circuit 7, users can flexibly select the desired voltage output to meet the outdoor power supply requirements for devices such as mobile phones, computers, and digital cameras.” “The battery pack connects to various voltage regulation circuits and, through the MCU microcomputer control circuit, can provide outdoor power supply for devices such as mobile phones, computers, and digital cameras.”	
[17]	Fig. 1, ref. 5 (showing 12V output circuit). “The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer	Ricketts ¶¶133-34

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	control circuit 7” “As shown in FIG. 1, the schematic structure of the portable backup power supply described in this invention is provided. The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7. Through the MCU microcomputer control circuit 7, users can flexibly select the desired voltage output to meet the outdoor power supply requirements for devices such as mobile phones, computers, and digital cameras.” “The battery pack connects to various voltage regulation circuits and, through the MCU microcomputer control circuit, can provide outdoor power supply for devices such as mobile phones, computers, and digital cameras.”	

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
[18]	Fig. 1, ref. 4 (showing 19V output circuit). “The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7” “As shown in FIG. 1, the schematic structure of the portable backup power supply described in this invention is provided. The lithium iron phosphate or lithium cobalt oxide battery pack 1 is connected to multiple DC-DC voltage regulation circuits, namely the DC-DC 19 V boost output circuit 4, the 12V output circuit 5, and the DC-DC 5 V buck output circuit 6. Each of these DC-DC regulation circuits is connected to the MCU microcomputer control circuit 7. Through the MCU microcomputer control circuit 7, users can flexibly select the desired voltage output to meet the outdoor	Ricketts ¶¶135-36

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
	power supply requirements for devices such as mobile phones, computers, and digital cameras.” “The battery pack connects to various voltage regulation circuits and, through the MCU microcomputer control circuit, can provide outdoor power supply for devices such as mobile phones, computers, and digital cameras.”	
[19]	“A portable backup power supply that includes a battery pack comprises lithium iron phosphate or lithium cobalt oxide batteries”	Ricketts ¶137
[20]	See the analysis for claim 6.	Ricketts ¶138
[21.P]	See analysis of limitation [1.P].	Ricketts ¶139
[21.1]	See analysis of limitation [1.1].	Ricketts ¶139
[21.2]	See analysis of limitation [1.2].	Ricketts ¶139
[21.3]	See analysis of limitation [1.3].	Ricketts ¶139
[21.4]	See analysis of limitation [1.4].	Ricketts ¶139
[21.5]	See analysis of limitation [1.5].	Ricketts ¶139
[22]	See analysis of Claim 2.	Ricketts ¶140
[23]	See analysis of Claim 3.	Ricketts ¶141
[25.1]	See analysis of Claim 6.	Ricketts ¶142
[25.2]	See analysis of Claim 7.	Ricketts ¶142
[27]	See analysis of Claim 13.	Ricketts ¶144
[28]	See analysis of Claim 14.	Ricketts ¶145
[29]	See analysis of Claim 15.	Ricketts ¶146
[30]	See analysis of Claim 16.	Ricketts ¶147
[31]	See analysis of Claim 17.	Ricketts ¶148

Element No.	Support in China Patent Application Number 201110409190.9	Remarks
[32]	See analysis of Claim 18.	Ricketts ¶149
[33]	See analysis of Claim 19.	Ricketts ¶150

2. Claims 9, 10, 26 have a priority date of April 29, 2016

As shown in the table below, Claims 9, 10, 26 are supported by U.S. patent application number 15/141,841, resulting in the '506 Patent, and thus are entitled to a priority date of April 29, 2016 Ricketts ¶¶8,100-150.

Element No.	Support in U.S. Application Ser. No. 15/141,841	Remarks
[9]	Ex. 1001, Fig. 1, Ref. 113. “The switching module 113 is operable to switch on or off the current from the battery pack 101 through the pair of output terminals 109,” Ex. 1001, Col. 6:55-58. <i>See generally</i> Ex. 1001, Col. 6:53-7:22.	Ricketts ¶121
[10]	“For example, the switching module 113 may prohibit the outputting of the starting current after a predetermined time period from the outputting of the current, because the starting current is of a big amplitude Such as 100 A or even higher. Timely switching	Ricketts ¶122

Element No.	Support in U.S. Application Ser. No. 15/141,841	Remarks
	off the switching module 113 helps to reduce the power consumption of the engine starting as well as increase the lifetime of the battery pack 101.” Ex. 1001, Col. 6:60-66.	
[26]	See analysis of Claim 9.	Ricketts ¶143

D. Claim Construction

1. “first operating mode” (Claims 1, 21)

The proper construction for “first operating mode” is “an operating mode of the portable backup charger wherein the battery pack is configured to output a first current through one or more output ports of the at least one output port, and outputting a second current capable of starting a vehicle engine through the pair of output terminals is inhibited.”

The claims of the '506 Patent claim three operating modes, each of which are defined by the current output by the device during that mode.

Claim 1 recites “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.” EX1001 Col. 8:25-27. Claim 1 further recites “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.” *Id.* Col. 8:31-35. 77. Claim 3 depends on Claim 1, further reciting “wherein the battery

pack is further configured to work in a third operating mode for outputting the first current and the second current simultaneously.” *Id.* Col. 8:47-52.

In accordance with the principles of claim differentiation, if the battery pack could output the first current and the second current simultaneously in the first operating mode, then there would be no difference between the claimed first operating mode and the claimed third operating mode. In other words, by claiming a third operating mode for outputting the first current and the second current simultaneously, in the first operating mode, the first current can be output and outputting of a second current is inhibited. Ricketts ¶¶78,80. The construction is consistent with the specification, describing output ports or output terminals which can output a current in each operating mode. Ex. 1001 Col. 4:30-33 (first operating mode), Col. 5:30-33 (second operating mode), Col. 5:58-62 (third operating mode). Ricketts ¶79. These modes are also consistently disclosed in the priority application, albeit without the use of the term mode, as described above Section II.A. Ricketts ¶81.

Taken together, these disclosures indicate that in the first operating mode, the device cannot output a second current to the output terminals. This is further supported by the '506 Patent specification disclosure that that operation in the first operating mode and second operating mode are alternatives to one another: “the portable battery charger 100 can work in a first operating mode or in a second

operating mode.” Col. 4:18-20. In other words, the first operating mode and second operating mode are alternatives for outputting the first current or second current, respectively, but not both simultaneously. Ricketts ¶¶80.

2. “second operating mode” (Claims 1, 21)

The proper construction for “second operating mode” is “an operating mode of the portable backup charger wherein the battery pack is configured to output a second current capable of starting a vehicle engine through the pair of output terminals, and outputting a first current through one or more output ports of the at least one output port is inhibited.” Ricketts ¶¶83-91. The reasoning for this construction is the same as for the first operating mode. Under the principles of claim differentiation, if the battery pack could output the first current and the second current simultaneously in the first operating mode, then there would be no difference between the claimed second operating mode and the claimed third operating mode. Ricketts ¶¶84-88. As explained above, this construction is supported by the specification. Ricketts ¶¶89-90.

3. “a current path to the battery pack different from that of the at least one output port to the battery pack” (Claim 1)

The proper construction for “a current path to the battery pack different from that of the at least one output port to the battery pack” is “a current path between the output terminals and the battery pack that does not overlap with a current path between the at least one output port and the battery pack.” Ricketts ¶¶92-99.

Claim 1 recites 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*.” Col. 8:28-30 (emphasis added). In other words, the path the current takes from the output terminals to the battery pack is different than the path the current takes from the output port to the battery pack. If the paths were partially or completely the same, the paths would not be different paths to the battery pack as the claim requires. Ricketts ¶94.

Figure 1 of the ‘506 Patent, shown below) shows separate, non-overlapping current paths between 1) the battery pack 101 and output terminals 109 (highlighted in green) and 2) the battery pack 101 and ports 103 (highlighted in red). Ricketts ¶95.

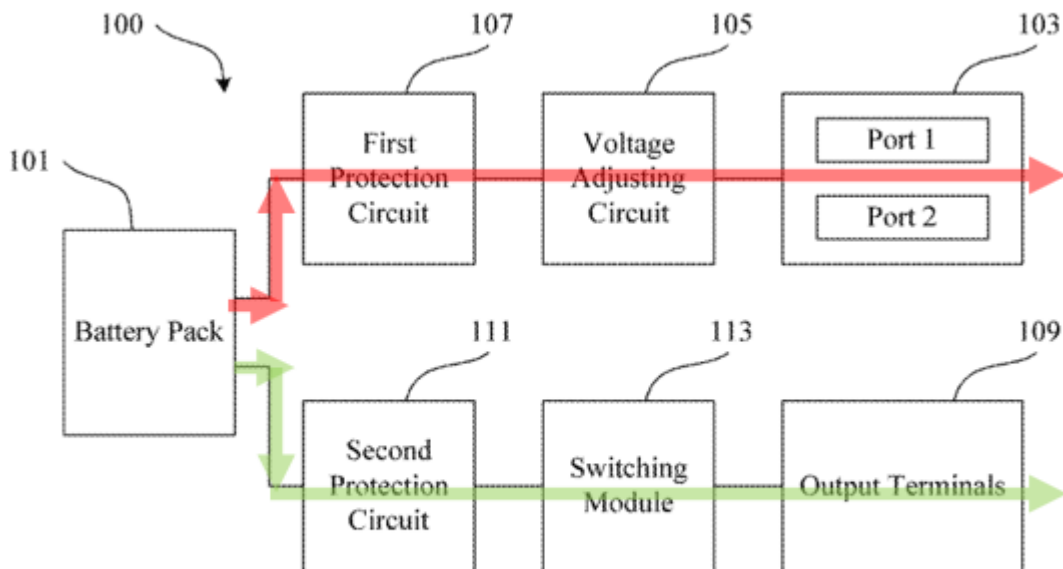


Figure 1

Figure 3 of the '506 Patent (below) shows separate, non-overlapping current paths between 1) the battery pack 1 and output terminals 9 (green) and 2) the battery pack 1 and 5V output port 6 (red). Ricketts ¶96.

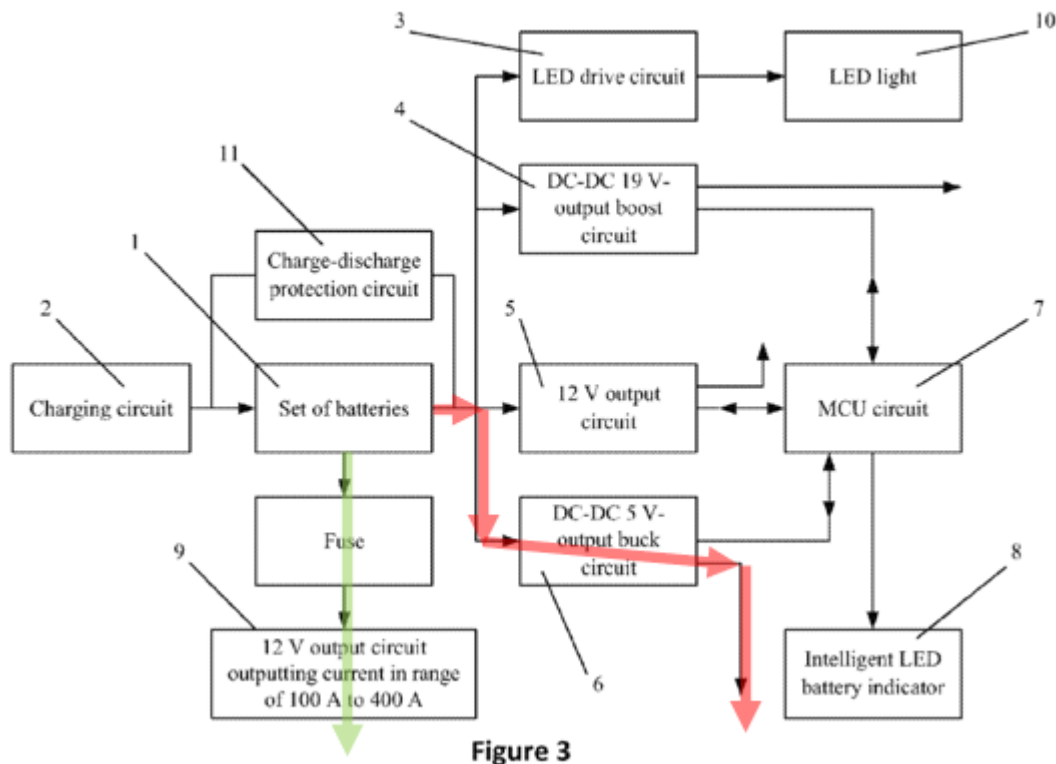


Figure 3

The specification supports the construction: “The pair of output terminals 109 provides a *current path different and separate* from the current path from the battery pack 101 to the output ports 103.” Ex. 1001 Col. 5:46-48 (emphasis added). Ricketts ¶97.

Moreover, a construction allowing for partial overlap of the current paths is inconsistent with the language of the claim, and would impermissibly render the limitation into surplusage. Since the termination points of the first and second

current paths are the output port and the output terminals, respectively, it follows that the current paths are already at least partially different from each other. If that partial difference was all this claim limitation required, all possible first and second current paths would be different, and the additional claim language would be rendered mere surplusage, which cannot be correct. Rather, the specification and claim language make it clear that no portion of the current path between the output terminals and battery pack should be shared or overlap with the current path between the output port and battery pack. Ricketts ¶¶97.

Finally, Claim 1's recitation of a second protection circuit responsive to an overcurrent condition of the second current requires a separate, independent path in order to detect an overcurrent condition. EX1001, Col. 6:7-21; Ricketts ¶¶98.

E. Level of Skill in the Art

The '506 Patent to be in the general technological field of power management supply, particularly an automobile battery charger. Ricketts ¶¶55. The "Abstract" describes "[a] portable backup charger" with certain technical features. The "Technical Field" of the '506 Patent is "a portable backup power supply capable of providing DC power to various devices." Col. 1:17-18. The '506 Patent describes "provid[ing] a portable backup charger which is able to provide DC-current outputs in various-level voltages, and is able to output a large current source as the start-up source of the automobile." Col. 1:28-31. Ricketts ¶¶55.

A person having ordinary skill in the art (“POSA” or “POSITA”) with respect to the ’506 Patent by the time of its earliest effective filing date (December 9, 2011) would have at least a Bachelor’s Degree in Electrical Engineering and at least two years of experience in the field of electrical engineering and specifically power supply management such as battery charging system design. Ricketts ¶56. Further education could also suffice in lieu of experience in the field or significant experience in the field could substitute for formal education. *Id.*

III. PATENTABILITY OF THE CHALLENGED ’506 PATENT CLAIMS

In this section, Patent Owner responds to each ground raised in the IPR Petition, with reference to the Ground labels/number assigned in the Petition. Paper 2, 1-2.

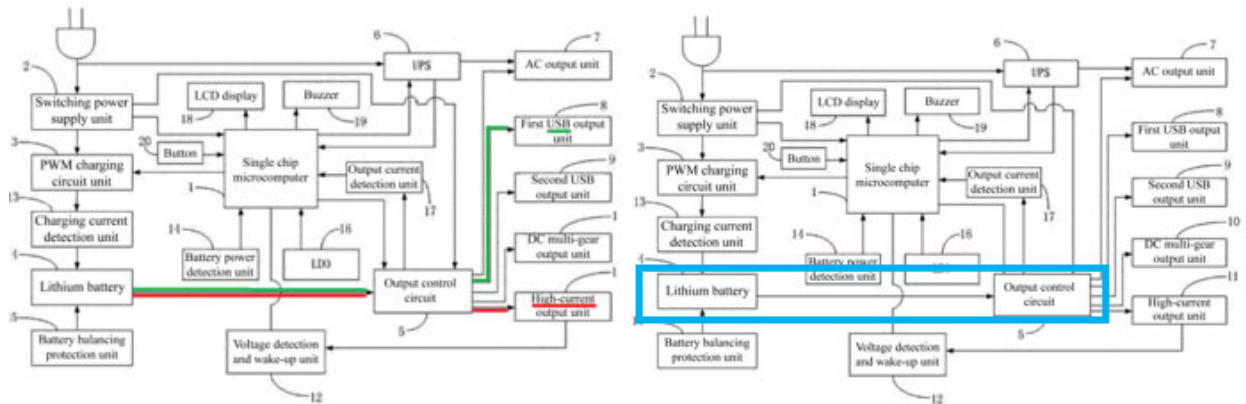
A. Ground 1A: §102 – Chen (CN102005796A)

- 1. Chen does not disclose a different current path from the output terminals to the battery pack that is different from the current path from the output port to the battery pack (Limitation [1.3] / [21.2]/[21.3])**

Limitation [1.3] recites in part “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.” EX1001, 1:28-30. Limitations [21.2]/[21.3] impose a similar requirement by separately reciting “a first current path” and “a second current path” in separate limitations. EX1001, 9:40-47.

The Petition’s cited current paths Chen overlap between the lithium battery 4

and output control circuit 5. Without the highlighting added by Petitioner in the IPR Petition to the line connecting lithium battery 4 and output control circuit 5 in Chen Fig. 1, it is clearer that this is a single current path shared by the high current output unit 11, DC multi-gear output 10, and USB outputs 8 and 9. Ricketts ¶152.



In fact, the Petitioner's cited paths only diverge when making the connection to the output control circuit for these respective outputs. As explained in Section II.D.3 when construing this term, such as difference is insufficient to meet the claim requirement of different paths. Ricketts ¶153.

Therefore, limitation [1.3] is not met because the Chen current paths relied upon in the Petition are not "different" current paths to the battery pack as required by the plain language of this limitation and proper construction of this limitation, and in fact share the same current path to the battery pack. Ricketts ¶154.

Limitations [21.3] and [21.4] recite separate structures in different claim elements for the first current path and second current path. Despite this, the IPR petition relies in part on the same structure (the current path between lithium

battery 4 and output control circuit 5 in Chen Fig. 1) to meet the requirements of both limitations [21.3] and [21.4], each of which recite current paths output from the battery pack. “Where a claim lists elements separately, ‘the clear implication of the claim language is that those elements are ‘distinct component[s]’ of the [claimed] invention.” *Becton, Dickinson and Co. v. Tyco Healthcare Gr., LP*, 616 F.3d 1249, 1254 (Fed. Cir. 2010). As such, relying on the same structure to meet both limitations is improper. Ricketts ¶155.

2. The Petition Does Not Identify the Claimed First Protection Circuit (Limitation [1.4] / [21.4])

Limitation [1.4] recites “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.” Limitation [21.4] similarly recites “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.” Ricketts ¶156.

These limitations require that the first protection circuit protects the battery pack when the device is working in the first operating mode, e.g. when “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” as recited in limitation [1.2] and similarly, when “a first current is output by the battery pack when it is working in a first operating mode” through “a first current path” as recited in limitation [21.2]. Ricketts ¶157.

Petitioner pointed to two alternative output ports in Chen to meet claim limitations [1.2]/[21.2] and [1.4]/[21.4]: 1) multi-gear output 10 or 2) one of USB outputs 8, 9. However, limitation [1.3] also imposes a requirement that the output port's first current is less than the second current output through the output terminals. Whether the Petitioner chose the 1) multi-gear output 10 or 2) one of USB outputs 8, 9, a showing in limitations [1.2]/[21.2], [1.3]/[21.3] and [1.4]/[21.4] must be made for the chosen output port. Mixing and matching teachings of different output ports for limitations [1.2]/[21.2], [1.3]/[21.3] and [1.4]/[21.4] fail to show that all the requirements of an output port. Ricketts ¶157.

In the IPR petition, Petitioner only explained why the USB port met limitations [1.3]'s requirement that the second current is greater than the first current requirement. Paper 2, 20. Therefore, Petitioner can not rely on the multi-gear output 10 as the output port in Claims 1/21. Ricketts ¶159.

With respect to limitation [1.4], Petitioner has failed to identify the required protection circuit for the USB output port. The petitioner pointed to Chen paragraph 26 and the electronics “‘U3B and D12’ to form ‘an output power limit control’,” stating 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.” IPR Petition at 20. This is incorrect. Chen Figs. 6 and 7 show that

U3B and D12 (highlighted in blue below) are not connected to the USB outputs (highlighted in orange below) and have no role in providing a “power limit control” or other protection of those USB outputs. Ricketts ¶158.

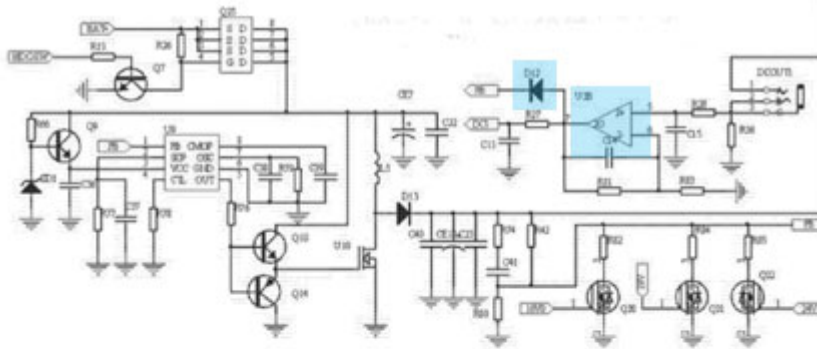
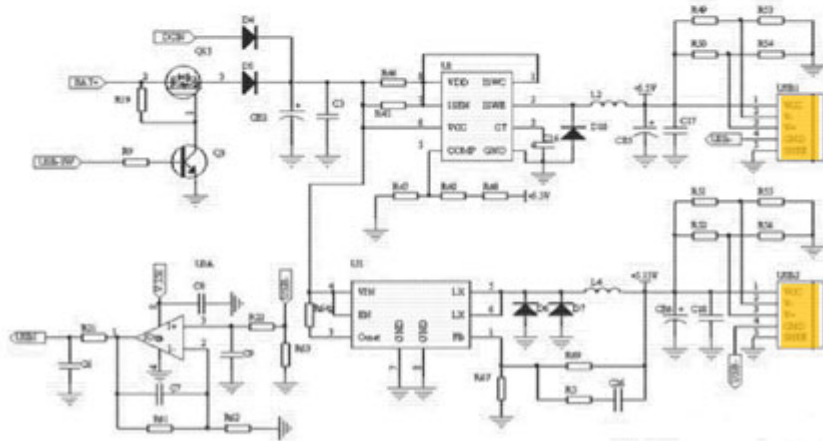


FIG. 6



The IPR Petition apparently relies only on the USB output ports for limitations [1.3], as those ports are the only ports analyzed in limitation [1.3] for the requirement that the second current is higher than the first current. Ricketts ¶159.

Stated another way, the IPR petition does not analyze whether the multi-gear output 10 has a current less than the first current as required by limitation [1.3],

and the IPR petition does not identify a first protection circuit for the USB outputs 8, 9 as required by limitation [1.4]. As such, Petitioner has failed to show that one output port meets all the requirements of limitations [1.2], [1.3], and [1.4], and thus has failed to show that Chen anticipates Claim 1. Ricketts ¶160.

For limitations [21.2], [21.3], [21.4], the IPR petition on page 28 simply refers to the analysis and evidence cited in limitations [1.2], [1.3], [1.4], and thus fails to address the requirements of Claim 21 for the same reason. Ricketts ¶161.

3. Chen does not disclose a second protection circuit that prevents an overcurrent condition (Limitation [1.5] / [21.5])

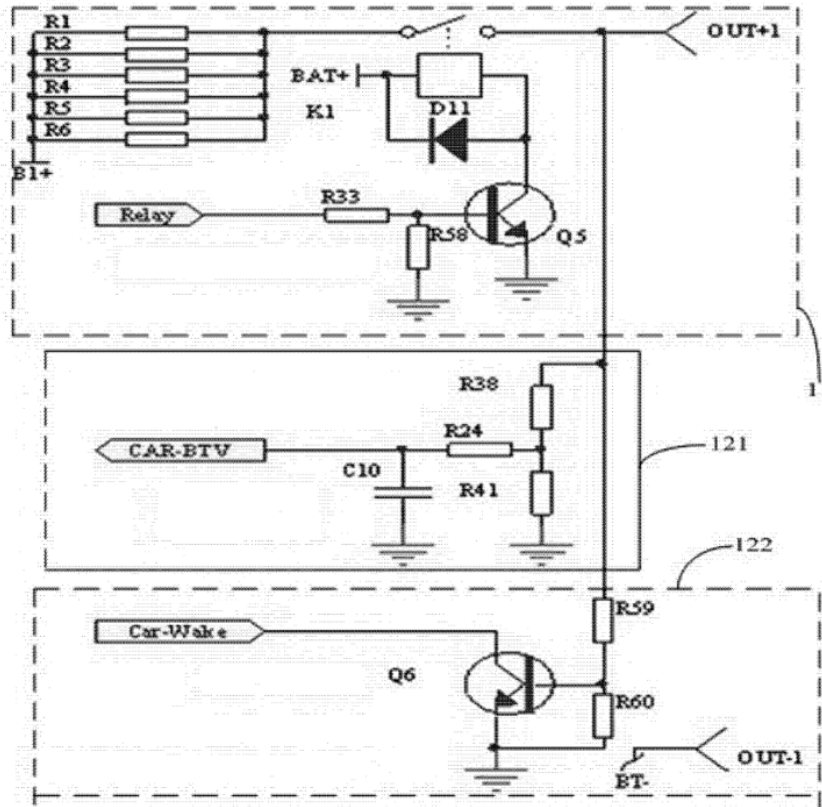
Limitation [1.5] recites “a second protection circuit coupled to the battery pack and configured to prevent overcurrent condition of the second current when the battery pack is working in the second operating mode.” Limitation [21.5] similarly recites “a second protection circuit coupled in the second current path and configured to prevent overcurrent condition of the second current when it is working in the second operating mode.” Thus, both limitations require the second protection circuit to prevent an overcurrent condition when the device is configured to output a second current in the second operating mode. Ricketts ¶162.

The IPR Petition at page 21 identifies the “high-current output unit 11” as providing this protection. However, the operation of this circuit measures voltages to determine when to output a high current for ignition, and uses a detection of a voltage returning to normal to determine that the high current for ignition should

be turned off, as explained below in Paragraph 25 of Chen relied upon by the Petitioner, with reference to Fig. 4:

“When 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. If the battery voltage returns to normal, the high-current instantaneous output module is turned off. That is, when the mobile power supply is connected to the car battery, sampling is performed by means of the voltage dividing resistors R59 and R60 of the wake-up unit 122, and the transistor Q6 is controlled to turn on, and the single-chip microcomputer 1 is notified that the car battery has been connected. When the car ignites, high-current control components R1 to R6 instantly output a large current to complete the ignition. When the car starts, the voltage of the car battery is divided and detected by means of the detection resistors R38 and R41. When 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.”

Ex. 1006 at Paragraph 26.



Ex. 1006 at Fig. 4. Ricketts ¶163.

Paragraph 35 of Chen, also cited in the IPR petition, does not provide any additional technical disclosure or description of other circuitry. Ricketts ¶164.

A POSITA would understand from the description of the circuits, and from the circuits themselves (i.e. the circuit including the voltage dividing resistors R59 and R60 of the wake-up unit 122, and the voltage detecting circuit including detection resistors R38 and R41) that these circuits are voltage detection circuits, and not current detection circuits. Ricketts ¶165. Stated another way, these circuits do not detect a current or protect against an overcurrent condition – that is, detect that the second current being provided in the second path is exceeding a

maximum current value, and take an action in response to that detection -- as required by the claims. Id. Rather, the circuit detects voltages to determine when a jumpstarting operation is completed. Id.

For limitation [21.5], the IPR petition on page 28 simply refers to the analysis and evidence cited in limitation [1.5], and thus fails to disclose the limitation for the same reason. Ricketts ¶166.

4. Dependent Claims 9, 11-14, 16-19, 26-28, 30-33

Claims 9, 11-14, 16-19, 26-28, 30-33 depend on either independent claim 1 or claim 21, and thus, are not invalid for the same reasons above explaining why claims 1 and 21 are valid in view of Chen. Ricketts ¶167.

B. Ground 1B: §103 –Chen in view of White (US7,279,640)

1. Claims 1-2, 6-9, 11-14,16-22, 25-28, 30-33

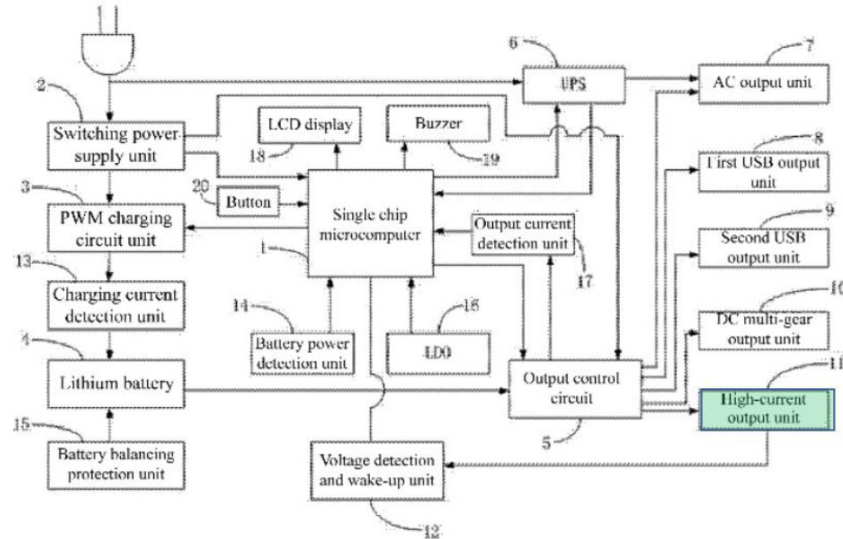
Petitioner's Ground 1B contends a combination of Chen and White under 35 U.S.C. § 103. Ricketts ¶168.

This combination fails to invalidate Claims 1-2, 6-9, 11-14,16-22, 25-28, 30-33 at least for the reason that Chen fails to disclose all of the requirements of independent claims 1 and 21, as explained in Section III.A, and this ground does not rely on any additional teachings of White to address all of these deficiencies. Ricketts ¶169.

Moreover, this contended combination of Chen and White is improper because the teachings in Chen and White refute making such a combination.

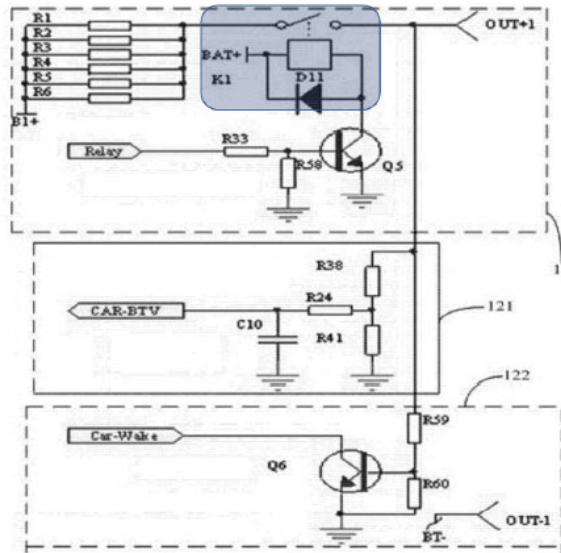
Ricketts ¶170.

Chen discloses a mobile power supply with a high-current output unit 11 as a high-current instantaneous output module (car ignition module). Petitioner's annotated FIG. 1 of Chen is reproduced below. Ricketts ¶171.



EX1006, FIG. 1 (annotated)

Petitioner acknowledges that the high-current output unit 11 in Chen includes at least a relay K1 as shown in FIG. 4 of Chen. Petition at 21-22; EX1003 at ¶62. Ricketts ¶172.



EX1006, Fig. 4 (annotated)

Chen teaches that the single-chip microcomputer 1 controls the relay K1 to engage to produce an instantaneous output of a high current by the high-current output unit 11. When 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. Chen at [0022]-[0025] and FIGS. 1 and 2. Ricketts ¶173.

Patent Owner notes that Chen's device provides a built-in relay K1 in the high-current output unit 11 to turn on or off the high current output in connection with the electrical device voltage detection unit 121 and the wake-up unit 122 to control the relay K1 via the single-chip microcomputer 1. Ricketts ¶174.

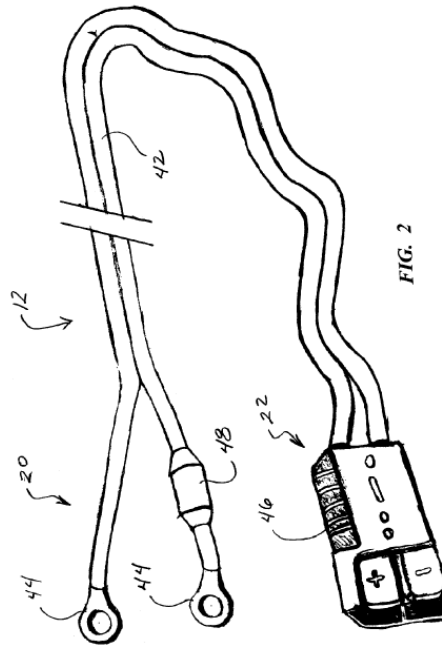
White, on the other hand, discloses a wiring harness 10 that includes a main extension portion 12 and a utility extension portion 14 for trailer light connection systems that can be adapted to electrically couple the brake lights and back-up lights of a towing vehicle to that of the towed vehicle. See FIG. 1 in White. The main extension portion 12 connects to the electrical system 16 (such as to the terminals of a battery) of a host vehicle 18 at a first end 20 thereof. A second end 22 of the main extension portion 12 connects to one end 24 of the utility extension portion 14. The other end 26 of the utility extension portion 14 is adapted to connect to an electric load 30. The electric load 30 may be any type of electric load, including, for example, another battery, an electrical appliance, or any other accessory that requires or draws electric current. Ricketts ¶175.

White's wiring harness 10 for trailer light connection systems is different from Chen's mobile power supply with the high-current output unit 11 in that White's wiring harness 10 lacks a built-in relay K1 in Chen's high-current output unit 11 and does not contain Chen's single-chip microcomputer 1, electrical device voltage detection unit 121 and wake-up unit 122 for controlling the relay K1 to turn on or off the high current path. Notably, White wiring harness 10 adopts a fuse 48 in the main extension portion 12 to prevent damage to the wiring harness 10, the load 30 or to the host vehicle's electrical system 16. White at 2:10-63 and FIGS. 1 and 2. This fuse 48 in White is a one-time protection device and is not

¶176.

U.S.C. § 103. Ricketts ¶177.





C. Ground 1C: §103 –Chen in view of Richardson (US2009/0218988)

1. Claim 10

Claims 10, which depends on independent claim 1, is not rendered obvious at least for the reason that Chen fails to disclose all of the requirements of independent claim 1, as explained in Section III.A, and this ground does not rely on any additional teachings of Richardson to address these deficiencies. Ricketts ¶178.

Claim 10 is a dependent claim of Claim 9 which depends on Claim 1 of the ‘506 Patent. Claim 1 recites “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.” Ricketts ¶179.

However, Chen alone does not disclose or suggest “a second protection circuit coupled to the battery pack and *configured to prevent overcurrent condition of the second current.*” Ricketts ¶180.

Chen discloses control of its built-in relay K1 in the high-current output unit 11 by the single-chip microcomputer 1 in connection with detection by the electrical device voltage detection unit 121 for sensing the voltage of a connected device and by operation of wake-up unit 122 to close the relay K1. Chen at [0023] and [0025]. Nothing in Chen discloses detection of the current amplitude to control the relay K1 to prevent an overcurrent condition. Therefore, the Petition fails to identify any teaching in Chen to disclose or suggest “a second protection circuit coupled to the battery pack and *configured to prevent overcurrent condition of the second current*” in Claims 1, 9 and 10. Ricketts ¶181.

More specifically, the Petition relies on Chen's teaching on detection by the electrical device voltage detection unit 121 for sensing the voltage of a connected device for controlling the relay K1 in its analysis of claimed element [1.5]. See Petition at 21-22 and EX1003 at ¶¶61-62. Ricketts ¶182.

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.

In Petitioner's contended combination of Chen and Richardson against Claim 10, the entirety of Petitioner's cited teachings (including a portion of FIGS. 2C¹ and 7) in Richardson to combine with Chen is within EX1003 at 138-139 and Petition at 44-45:

¹ Petitioner incorrectly labels “FIG. 2B” for the cited upper portion of FIG. 2C in Richardson including relay 34, temperature sensor 41 and jump cables 60.

Richardson (EX1014)

138. Richardson, like Chen, also describes technologies for a portable power source that can jumpstart a vehicle engine. EX1014, [0002], [0007]; EX1007, [0025]. Richardson suggests the conventional practice of monitoring the time that the jumpstarting current is output and cutting off the jumpstarting current if the time limit is exceeded. EX1014, [0037]. In particular, Richardson suggests cutting off the current after “500 ms” for a “preset maximum” and outputting an “Over MAX” error, and also suggests cutting off the jumpstarting current if the jumpstarting current exceeds a different (lower) threshold amperage for an extended “predetermined period of time such as 15 seconds”:

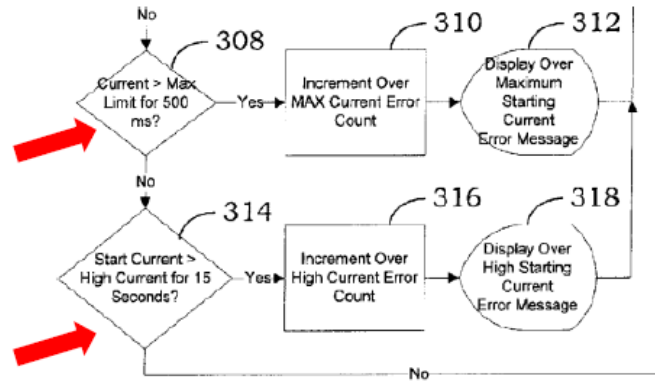
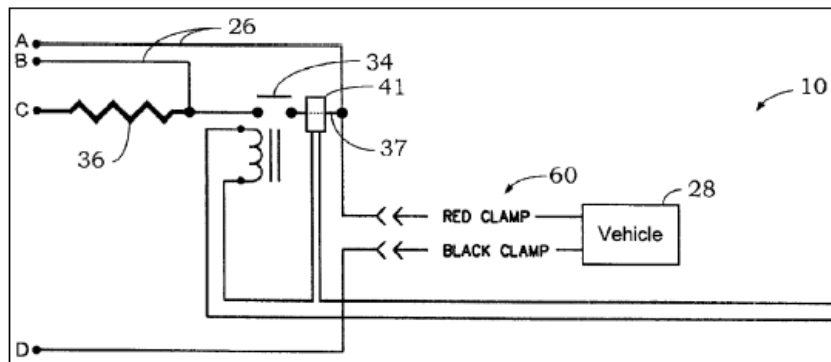


Fig. 7

Predictable Combination of Chen and Richardson

139. As I previously noted in my analysis of Element [9] (Ground 1A), Chen teaches the use of a “relay” to cut off the jumpstarting current when the car battery returns to a normal voltage. Additionally, a POSITA would have been motivated to implement Chen’s relay K1 (Ground 1A, Element [9]) in accordance with Richardson’s suggested safety monitoring/time limits to avoid damage or critical exhaustion of the internal lithium battery—especially for the scenario in which the car battery does not immediately return to a normal voltage. For example, a POSITA would have been prompted to implement Chen’s relay so that the switching module ceased the jumpstarting current after a predetermined time period (as suggested by Richardson), which would avoid the unsafe scenario of the high-amperage current being output over an extended time period, thereby preserving the internal lithium battery and avoiding an overheating condition (e.g., at the connection or in the car battery).



Ricketts ¶183.

Under Petitioner’s combination of Chen and Richardson, Petitioner has cited circuits in FIGS. 1, 2 and 4 of Chen to combine with the cited upper portion of FIG. 2C in Richardson including relay 34, temperature sensor 41 and jump cables

60. Under this combination, the Petition fails to explain how the cited upper portion of FIG. 2C in Richardson may be used to modify circuits in FIGS. 1, 2 and 4 of Chen in its contended combination to the claimed invention in Claim 10. The Petition provides no explanation how relay 34, temperature sensor 41 and jump cables 60 in cited upper portion of FIG. 2C in Richardson to connect with circuit elements in FIGS. 1, 2 and 4 of Chen. Ricketts ¶184.

Neither does the IPR Petition explain how the hardware circuit elements in both the cited upper portion of FIG. 2C in Richardson and FIGS. 1, 2 and 4 of Chen can be combined to perform the functions or operations of the cited portion of FIG. 7 in Richardson. Specifically, there is no current sensor in any part of the cited upper portion of FIG. 2C in Richardson and FIGS. 1, 2 and 4 of Chen. Therefore, the Petitioner's proposed combination of the cited upper portion of FIG. 2C in Richardson and FIGS. 1, 2 and 4 of Chen would not be able to measure or monitor the amplitude of a current to determine whether a particular threshold amperage is reached by the current in order to perform the functions or operations in the cited portion of the flowchart in FIG. 7 in Richardson. Ricketts ¶185.

Therefore, Petitioner has not demonstrated a challenged claim is unpatentable. Ricketts ¶186.

D. Ground 1D: §103 –Chen in view of Gozdz (US7,348,101)

1. Claims 15 and 29

Claims 15 and 29, which depend on independent claims 1 and 21, are not rendered obvious at least for the reason that Chen fails to disclose all of the requirements of independent claims 1 and 21, as explained in Section III.A, and this ground does not rely on any additional teachings of Gozdz to address these deficiencies.

E. Ground 2A: 35 U.S.C. §103 over Inskeep in view of Johnson

1. Claims 1 and 21 over Inskeep in view of Johnson

Petitioner's Ground 2A based on Inskeep and Johnson is defective for failing to disclose or suggest at least Claim Elements [1.2], [1.3] and [1.4] (and similar elements [21.2], [21.3] and [21.4]). Ricketts, ¶188.

Under Claim Elements [1.2] and [1.3], each claimed output port in the first operating mode of “one or more output ports of the at least one output port in a first operating mode” outputs a first current, and that a second current capable of starting a vehicle engine through the pair of output terminals in a second operating mode is higher than the first current. Ricketts, ¶189.

The Petition cites the USB port and the DC 12V port P1 in FIG. 3 and FIGS. 2 and 4 in Inskeep as claimed “one or more output ports of the at least one output port in a first operating mode” in Claim 1. However, only the USB port in Inskeep appears to meet the Claim Elements [1.2] and [1.3] in Claim 1 where the USB port

outputs a first current of 0.5A which is less than the second current of 500A output by the pair of output terminals. Petition at 53-56 and EX1003 at ¶¶159-161; Ricketts, ¶90. Specifically, the Petition fails to show whether the current via the DC 12V port P1 in Inskeep is greater or less than the second current of 500A output by the pair of output terminals. Petition at 56; EX1003 at ¶161; Ricketts, ¶190.

Therefore, the disclosure of the DC 12V port P1 in Inskeep fails to meet the claim limitations for the “one or more output ports of the at least one output port in a first operating mode” of Claim Elements [1.2] and [1.3], and, accordingly, is dropped for further evaluation with respect to Claim 1. Ricketts, ¶191. As a result, only the disclosure of the USB port in Inskeep is further analyzed below with respect to the Claim Element [1.4] and other limitations of Claim 1.

Claim Element [1.4] recites “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” (emphasis added). The Petition cites the disclosed “low voltage protection circuit” for the USB port (USB1) in [0032] of Inskeep as the disclosure for the “first protection circuit.”

[0032] The apparatus is formed in a stylized housing **100** having a handle **101** for ease of portability and a panel **102** including accessories outputs namely the USB port (USB1) **104** that is electrically coupled to the internal battery BT1. The USB port has a low voltage protection circuit to prevent operation of the USB port at voltages below 5 volts. The output voltage level can be made adjustable, however, in the preferred embodiment a 5 volt level is maintained by use of step-down transformer L1 with the signal stabilized by capacitors C3 and C4.

;

However, [0032] of Inskip teaches that the low voltage protection circuit for the USB port is “to prevent operation of the USB port at voltages below 5 volts” and, additionally, the output voltage level “can be made adjustable, however, in the preferred embodiment a 5 volt level is maintained by use of step-down transformer L1 with the signal stabilized by capacitors C3 and C4.” See the lower right-hand portion of the circuitry in FIG. 3 of Inskip. Ricketts, ¶193.

The above teaching in [0032] and FIG. 3 in Inskip constitutes the entire evidence cited by the Petition on the claimed first protection circuit. This teaching in Inskip, however, is directed to a circuit for maintaining the USB port output voltage only and does not suggest any feature or function with respect to “to protect the battery pack” when the battery pack is working in the first operating mode.” Ricketts, ¶194.

Therefore, the low voltage protection circuit for the USB port as disclosed by Inskip fails to disclose or renders obvious Claim Element [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”. Ricketts, ¶195.

In the contended combination of Inskip and Johnson, the Petition does not rely on any teaching in Johnson with respect to the claimed “one or more output ports of the at least one output port in a first operating mode” and the claimed “first protection circuit” in Claim Elements [1.2], [1.3] and [1.4]. Therefore, the combination of Inskip and Johnson as presented in the Petition remains to be deficient in disclosing the above-discussed features that are missing from Inskip because Johnson is not relied upon in the Petition to fill the voids in the disclosure of Inskip. Ricketts, ¶196.

Therefore, under 35 U.S.C. §103, the Petition fails to demonstrate that the combination of Inskip and Johnson discloses or renders obvious of Claim Elements [1.2]-[1.4]. Accordingly, Claim 1 and its dependent claims are patentable over the combination of Inskip and Johnson as presented in the Petition. Ricketts, ¶¶197-198.

Claims [21.2]-[21.4] rely on the same evidence and recite similar limitations, and thus are not met for the same reasons. Thus, the Petition does not show that independent Claim 21 and its dependent claims are obvious over the combination of Inskip and Johnson. Ricketts, ¶199.

Moreover, the Petition does not explain all how the Inskip/Johnson combination meets all the requirements of the “first operating mode” / “second

operating mode” recited in limitations [1.2]/[1.3] and limitations [21.2]/[21.3].

Specifically, as explained above, a “first operating mode” is construed as “an operating mode of the portable backup charger wherein the battery pack is configured to output a first current through one or more output ports of the at least one output port, and outputting a second current capable of starting a vehicle engine through the pair of output terminals is inhibited.” A “second operating mode” is construed as “an operating mode of the portable backup charger wherein the battery pack is configured to output a second current capable of starting a vehicle engine through the pair of output terminals, and outputting a first current through one or more output ports of the at least one output port is inhibited.” Ricketts, ¶201.

The Petition describes USB output port functionality with respect to limitations [1.2] and [21.2] without identifying any disclosure in Innskeep or Johnson with respect to what the output terminals are configured to do or capable of doing when operated in the “first operating mode.” Similarly, the Petition describes output terminal functionality with respect to limitations [1.3] and [21.3] without identifying any disclosure in Innskeep or Johnson with respect to what the identified USB port is configured to do or capable of doing when operated in the “second operating mode.” Ricketts, ¶202.

As such, the Petition does not account for all of the requirements of the “first

operating mode” and “second operating mode” under the proper construction of those limitations and is defective in meeting the Petitioner’s burden of proof of unpatentability of the challenged claims. Ricketts, ¶202.

2. Dependent Claims 3, 6-14, 16-17, 20, 23, 25-28, 30-31 over Inskeep in view of Johnson

Claims 6-14, 16-17, 20, 23, 25-28, 30-31 depend on either independent claim 1 or claim 21, and thus, are not invalid for the same reasons above explaining why claims 1 and 21 are valid in view of Inskeep and Johnson. Ricketts, ¶206.

F. Ground 2B: 35 U.S.C. §103 over Inskeep in view of Johnson and Durando

1. Claims 19 and 33 over Inskeep, Johnson and Durando

This combination fails to invalidate Claims 19 and 33 at least for the reason that the combined teaching of Inskeep and Johnson fails to disclose or suggest all of the requirements of independent claims 1 and 21, as explained in Section III.E, and this ground does not rely on any additional teachings of Durando to address all of these deficiencies discussed above. Ricketts, ¶204.

Durando is cited for its suggestion for using “one or more batteries having the type of primary lithium-metal, rechargeable lithium-ion, and/or lithium polymer” in the combination of Inskeep and Johnson. Durando does not cure the above discussed defects in the combination of Inskeep and Johnson. Claims 19 and 33 depend on Claims 1 and 21, respectively. In light of the above analyses, the

combination of Inskip, Johnson and Durando does not render Claims 19 and 33 obvious. Ricketts, ¶205.

G. Ground 3A under 35 U.S.C. §102 over Nook

1. Nook is not prior art for Claims 1, 2, 6, 8, 11-16, 19-22, 27-30, 33

As discussed above in Section **Error! Reference source not found.**, challenged claims 1–3, 6–8, 11-23, and 25, 27–33 of the '506 Patent are entitled to the December 9, 2011 priority date of China patent application number 201110409190.9 cited on the face of the '506 Patent, which predates the prior art date of Nook. Ricketts, ¶206.

Therefore, Nook does not qualify as prior art against claims 1, 2, 6, 8, 11-16, 19-22, 27-30, 33 presented in this ground, and accordingly, cannot be used to invalidate these claims. Ricketts, ¶207.

2. The Petition Does Not Identify a “First Operating Mode” / “Second Operating Mode” in Nook (Limitations [1.2]/[1.3], Limitations [21.2]/[21.3])

The Petition's analysis of limitations [1.2] and [1.3], and [21.2] and [21.3], appear on pages 70-71 and 79, respectively. However, under the Patent Owner's construction of the “first operating mode” and “second operating mode” presented above, the Petition describes USB output port functionality with respect to limitations [1.2] and [21.2] without identifying any disclosure in Nook that describes what the output terminals are configured to do or capable of doing when

operated in the “first operating mode.” Ricketts, ¶¶208-209. Similarly, the Petition describes output terminal functionality with respect to limitations [1.3] and [21.3] without identifying any disclosure in Nook that describes what the identified USB port is configured to do or capable of doing when operated in the “second operating mode.” Ricketts, ¶209.

As such, the Petition does not account for all of the requirements of the “first operating mode” and “second operating mode” and fails to present relevant prior art teachings for those limitations. Such defects in the Petition and presented prior art evidence lead to Petitioner's failure to meet its burden of proof of unpatentability of the challenged claims. Ricketts, ¶209.

Moreover, the disclosure of Nook concerning the USB port indicates that the port is always enabled to output a current unless the battery voltage is too low, in which case the USB port is disabled. Ex. 1012 at 11 (“Control circuit 57 from the microcontroller 1 allows the USB Out 56 to be turned on and off by software control to prevent the internal lithium battery getting too low in capacity.”). In this circumstance of low battery voltage, switch closure is prevented to prevent current from flowing to the output terminals, preventing over-discharge of the lithium battery. Ex. 1012 at 8 (“A lithium battery voltage measurement circuit 24 monitors the voltage of the lithium battery pack 32 to prevent the voltage potential from rising too high during a charging operation and from dropping too low during a

discharge operation.”); Ricketts, ¶210. In accordance with this disclosure, Nook could not disclose a second operating mode, because the USB port is always active whenever the jumpstart output terminals can output a second current. Ricketts, ¶210.

3. The Petition fails to identify claimed current paths, and fails to explain how the current path from the output terminals to the battery pack different from the current path from the output port to the battery pack (Limitation [1.3] / [21.2]/[21.3])

Limitation [1.3] recites in part “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.” EX1001, 1:28-30. Limitations [21.2]/[21.3] impose a similar requirement by separately reciting “a first current path” and “a second current path” in separate limitations. EX1001, 9:40-47.

The Petition fails to specifically identify 1) the current path from the output terminals to the battery pack and 2) the current path from the identified output port (i.e. the USB port) to the battery pack. Petition at 70-72 (containing analysis for limitation [1.2] and [1.3]. Because of these failures, Petitioner failed to establish that the two aforementioned current paths are different, as required by limitation [1.3]. Id. Similarly, because limitations [21.3] and [21.4] recite separate structures in different limitations, the Petition should have, but failed, to identify the first and second current paths, and how these current paths were separate

structures. As such, Petitioner has failed to establish Nook anticipates Claims 1 or 21.

4. Nook does not disclose a “ a second protection circuit ... configured to prevent overcurrent condition when the battery pack is working in the second operating mode” (Limitations [1.5]/[21.5])

Limitation [1.5] recites “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” and limitation [1.3] explains that “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.”

The Petition identifies three possible second protection circuits, none of which meet the requirements of the claim limitation. Ricketts, ¶212. The Petition on page 73 first describes a MCU “1” and circuit elements “10” and “12” that work together to prevent switch closure and thus outputting of a second current, thus avoiding an overcurrent condition. However, does not measure any current, and thus cannot constitute a prevention of an overcurrent. Moreover, this circuit operates before the device configured to output a second current to the output terminals (because the switch remains turned off) and thus is inapplicable. Ricketts, ¶212.

The Petition then cites a temperature sensor 20 that “that cuts off the

jumpstarting current to prevent overheating from an ‘overextended current draw during jump starting.’” Petition at 73 (citing EX1012, 7-8). However, this circuit does not detect a current or protect against an overcurrent condition -- the second current being provided in the second path exceeding a maximum current value -- as required by the claims; rather, the circuit detects a temperature to determine whether the battery is too hot, a condition associated with the battery providing a unknown jumpstart current for too long of a period of time. Ricketts, ¶213.

The Petition then cites “charge protection diodes 28,” but these devices do not provide an overcurrent when the battery is “*output[ing]* a second current capable of starting a vehicle engine” in a second operating mode, as described in limitations [1.3] and [1.5], but rather, as admitted in the IPR petition act to protect against an *input of current to the battery* (that would charge the battery in a potentially dangerous, unregulated manner) during a jumpstart operation after a vehicle has started and a vehicle alternator voltage may be higher than the jumpstarter voltage, causing current to flow in the opposite direction. Ex. 1012 at 10; Ricketts, ¶214. Again, backcharging is not an overcurrent condition associated with the battery *outputting* a current to the output terminals as required by the claim limitations, but the exact opposite – a condition where current is flowing *into* the battery via the output terminals. Ricketts, ¶214. As such this is not the required protection circuit either. *Id.*

5. Dependent Claims 2, 6, 8-16, 19-20, 22, 26-30, 33 over Nook

Claims 9, 11-14, 16-19, 26-28, 30-33 depend on either independent claim 1 or claim 21, and thus, are not unpatentable for the same reasons above explaining why claims 1 and 21 are not unpatentable in view of Nook.

H. Ground 3B: 35 §103 over Nook in view of White

1. Nook is not prior art for Claims 1, 2, 6, 8, 11-16, 19-22, 27-30, 33

As discussed above in Section **Error! Reference source not found.**, challenged claims 1–3, 6–8, 11-23, and 25, 27–33 of the '506 Patent are entitled to the December 9, 2011 priority date of China patent application number 201110409190.9 cited on the face of the '506 Patent.

Thus, Nook does not qualify as prior art against claims 1, 2, 6, 8, 11-16, 19-22, 27-30, 33 presented in this ground, and thus, cannot be used in a Ground to invalidate these claims.

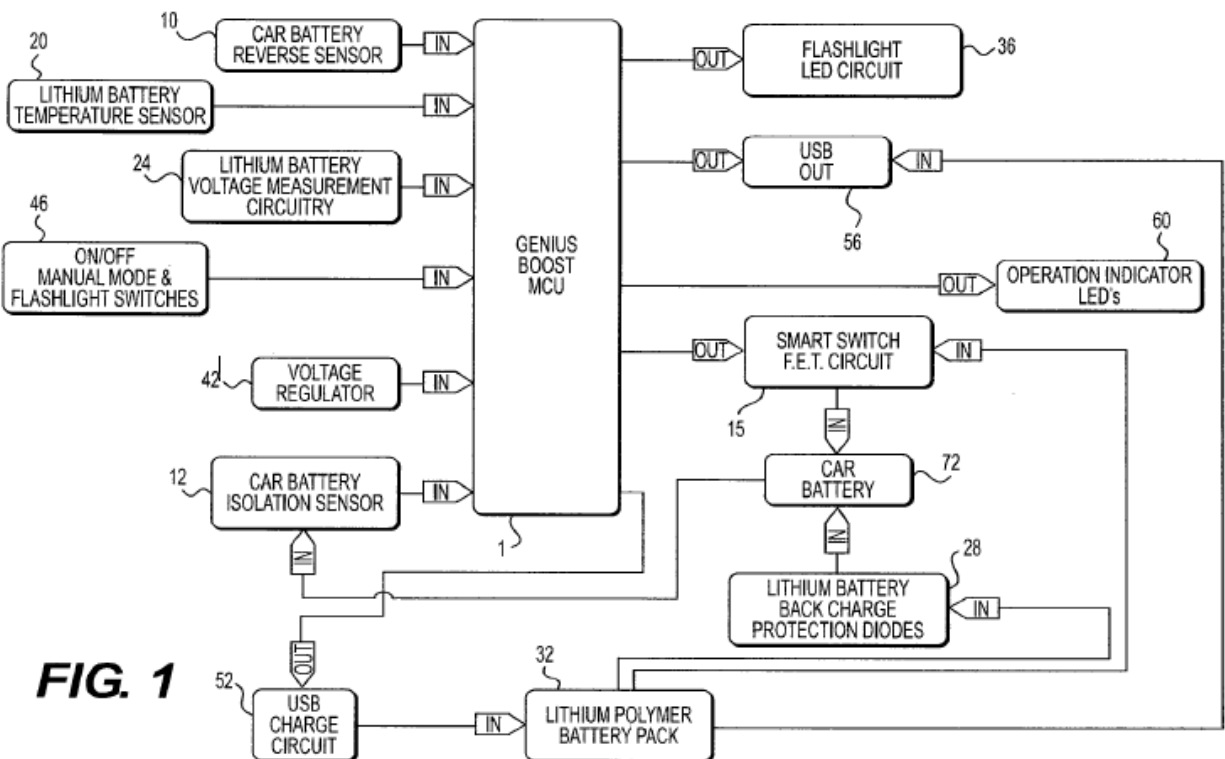
2. Claims 1, 2, 6-16, 19-22, 25-30, 33 over Nook in view of White

Petitioner's Ground 1B contends a combination of Nook and White under 35 U.S.C. §103.

This combination fails to invalidate Claims 1, 2, 6-16, 19-22, 25-30, 33 at least for the reason that Nook fails to disclose all of the requirements of independent claims 1 and 21, as explained in Section III.G, and this ground does not rely on any additional teachings of White to address all of these deficiencies.

Moreover, this contended combination of Nook and White is improper because the teachings in Nook and White refute such combination. Ricketts, ¶220.

Nook discloses a mobile power supply a smart FET switch 15 that selectively connects power from the lithium battery to 32 to car battery 72 connected to the device via a clamp assembly, as shown in Fig. 1 below.



Petitioner acknowledges this functionality in the Petition at pages 75-76.

Nook teaches that the MCU 1 controls the smart switch 15 to connect or disconnect power (and the flow of current) between the lithium battery pack 32 and the clamps of the device, and describes the circumstances in which the switch is opened and closed in response to sensor input. Ex. 1012 at 8-10.

White, on the other hand, discloses a wiring harness 10 that includes a main extension portion 12 and a utility extension portion 14 for trailer light connection systems that can be adapted to electrically couple the brake lights and back-up lights of a towing vehicle to that of the towed vehicle. See FIG. 1 in White. The main extension portion 12 connects to the electrical system 16 (such as to the terminals of a battery) of a host vehicle 18 at a first end 20 thereof. Ricketts, ¶224. A second end 22 of the main extension portion 12 connects to one end 24 of the utility extension portion 14. The other end 26 of the utility extension portion 14 is adapted to connect to an electric load 30. The electric load 30 may be any type of electric load, including, for example, another battery, an electrical appliance, or any other accessory that requires or draws electric current. Ricketts, ¶224.

White's wiring harness 10 for trailer light connection systems is different from Nook's mobile power supply in that White's wiring harness 10 lacks a built-in smart switch 15 in Nook's jumpstarter device and does not contain Nooks MCU 1 and sensors 10 and 12 for controlling the smart switch 15 to turn on or off internal battery power to the clamps. Ricketts, ¶225. Notably, White wiring harness 10 adopts a fuse 48 in the main extension portion 12 to prevent damage to the wiring harness 10, the load 30 or to the host vehicle's electrical system 16. White at 2:10-63 and FIGS. 1 and 2. This fuse 48 in White is a one-time protection device and is not redundant and unnecessary in Nook's mobile power supply due to

Nook's use of a built-in switch 15 based on the control by the MCU 1 in connection with operation of the device. Ricketts, ¶225.

Therefore, Petitioner's contended combination of Nook and White contradicts express teachings of Nook and White and thus is improper under 35 U.S.C. §103. Ricketts, ¶226.

I. Ground 3C: 35 U.S.C. § 103 over Nook in view of Miller (US2016/0072329)

1. Nook is not prior art for Claims 3, 23

As discussed above in Section **Error! Reference source not found.**, challenged claims 1–3, 6–8, 11–23, and 25, 27–33 of the '506 Patent are entitled to the December 9, 2011 priority date of China patent application number 201110409190.9 cited on the face of the '506 Patent.

Thus, Nook does not qualify as prior art against claims 3, 23 presented in this ground, and thus, cannot be used in a Ground to invalidate these claims.

2. Claims 3, 23 over Nook in view of Miller

This combination fails to invalidate Claims 3 and 23 at least for the reason that Nook fails to disclose all of the requirements of independent claims 1 and 21, as explained in Section III.G, and this ground does not rely on any additional teachings of White to address all of these deficiencies. Specifically, the Petition only relies on Miller's disclosure allegedly relevant to the additional requirements of Claims 3 and 23.

J. Ground 3D: 35 U.S.C. § 103 over Nook in view of Richardson

1. Nook is not prior art for Claim 10

As discussed above in Section **Error! Reference source not found.**, challenged claims 1–3, 6–8, 11-23, and 25, 27–33 of the '506 Patent are entitled to the December 9, 2011 priority date of China patent application number 201110409190.9 cited on the face of the '506 Patent.

Thus, Nook does not qualify as prior art against claim 10 presented in this ground, and thus, cannot be used in a Ground to invalidate these claims.

2. Claim 10 over Nook in view of Richardson

This combination fails to invalidate Claim 10 at least for the reason that Nook fails to disclose all of the requirements of independent claims 1 and 21, as explained in Section III.G, and this ground does not rely on any additional teachings of Richardson to address all of these deficiencies.

K. Ground 3E: 35 U.S.C. § 103 over Nook in view of Shoji

1. Nook is not prior art for Claims 17-18, 31-32

As discussed above in Section **Error! Reference source not found.**, challenged claims 1–3, 6–8, 11-23, and 25, 27–33 of the '506 Patent are entitled to the December 9, 2011 priority date of China patent application number 201110409190.9 cited on the face of the '506 Patent.

Thus, Nook does not qualify as prior art against claim 17-18, 31-32 presented in this ground, and thus, cannot be used in a Ground to invalidate these

claims.

2. Claims 17-18, 31-32 over Nook in view of Shoji

This combination fails to invalidate Claims 17-18, 31-32 at least for the reason that Nook fails to disclose all of the requirements of independent claims 1 and 21, as explained in Section III.G, and this ground does not rely on any additional teachings of Shoji to address all of these deficiencies.

IV. CONCLUSION

Claims 1–3, 6–23, and 25–33 are valid and should not be canceled.

Dated: October 30, 2024

Respectfully submitted,

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CERTIFICATION OF WORD COUNT UNDER 37 CFR § 42.24(d)

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing PATENT OWNER'S RESPONSE totals 12,052 words, excluding the parts exempted by 37 C.F.R. § 42.24(a). This word count was made by using the built-in word count function tool in the Microsoft Word 365 software used to prepare the document.

Dated: October 30, 2024

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that true copies of the foregoing PATENT OWNER'S RESPONSE and EXHIBITS 2001-2008 were served in their entirety this 30th of October, 2024 by electronic mail on the Patent Owner via its attorneys of record:

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