

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

THE NOCO COMPANY, INC.,
Petitioner,

v.

PILOT, INC.,
Patent Owner.

IPR2023-00167
Patent 11,235,673 B2

Before JEFFREY W. ABRAHAM, JULIA HEANEY, and
STEVEN M. AMUNDSON, *Administrative Patent Judges*.

HEANEY, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes Review*
35 U.S.C. § 314

I. INTRODUCTION

The Noco Company, Inc. (“Petitioner”) filed a petition to institute an *inter partes* review challenging claims 1–24 of U.S. Patent No. 11,235,673 B2 (Ex. 1001 (“the ’673 patent”)). Paper 1 (“Petition” or “Pet.”). Pilot Inc. (“Patent Owner”) did not file a Preliminary Response.

Institution of an *inter partes* review is authorized by statute when “the information presented in the petition . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018). Upon consideration of the Petition and the evidence of record, we determine the Petitioner has established a reasonable likelihood that it would prevail in showing the unpatentability of at least one claim challenged in the Petition. Accordingly, we institute an *inter partes* review of all claims and all grounds asserted in the Petition.¹

A. *Related Proceedings*

The parties identify the following litigation involving the ’673 patent: *Pilot, Inc. v. The NOCO Company, Inc.*, No. 2:22-cv-00389 (D. Ariz.). Pet. 75; Paper 3, 2. Petitioner also indicates that it filed a petition requesting review of U.S. Patent No. 11,124,077 in IPR2022-01237, which includes claims that are substantially similar to the claims of the ’673 patent. Pet. 75.

¹ *Guidance on the Impact of SAS on AIA Trial Proceedings* (Apr. 26, 2018), <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial>; see also *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1359–60 (2018).

B. The '673 Patent

The '673 patent, titled “Automobile Charger,” is directed to “a novel automobile charger with a safe power supply charging quickly.” Ex. 1001, code (54), 1:24–25. The '673 patent explains that prior art automobile charging devices, i.e., devices for jump starting vehicles, suffered from various problems, including an inability to automatically detect whether a load (e.g., an automobile storage battery) is connected, whether an electrode is connected with an automobile storage battery reversely, whether an automobile engine or storage battery has a reverse current, and whether the battery state is suitable for heavy power generation. *Id.* at 1:30–36. The '673 patent aims to solve these problems, and depicts one solution in Figure 1, reproduced below.

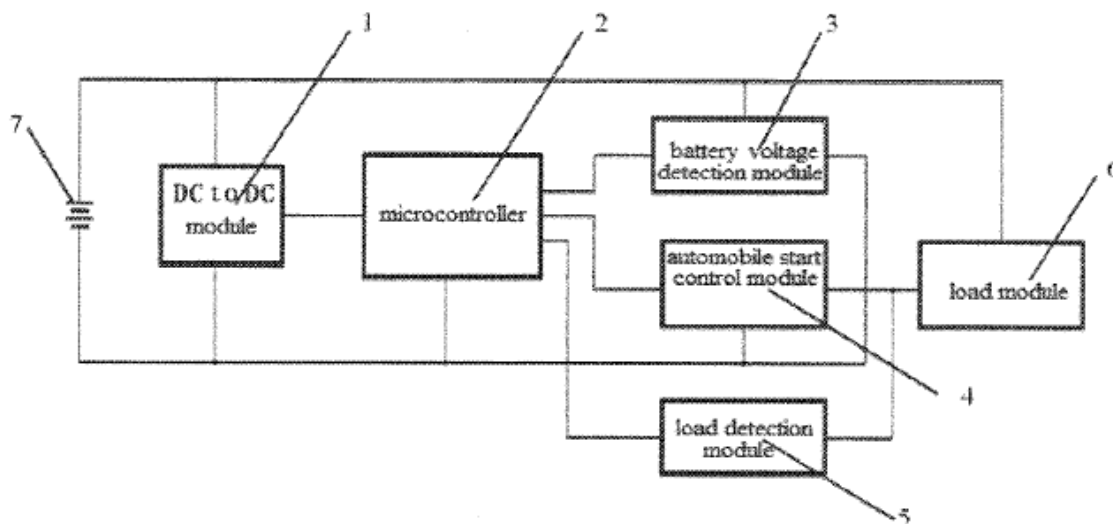


Figure 1 is a block diagram showing an embodiment of the automobile charger, including DC-to-DC module 1, microcontroller 2, voltage detection module 3, automobile start control module 4 (an electronic switch), load detection module 5, load module 6 (comprising the automobile battery and engine), and direct current power supply 7 (the jump starter battery).

Id. at 2:32, 3:1–4, 3:35–37.

The '673 patent explains that the DC-to-DC module provides “the stable voltage for the microcontroller which collects relevant data” and the microcontroller “determines whether the automobile storage battery is connected with the automobile engine through the load detection module.” Ex. 1001, 4:16–21, 4:25–27. The positive pole of the direct current power supply is connected with one lead of the DC-to-DC module, one end of the battery voltage detection module and one end of the load module; the negative pole of the direct current voltage is connected with the other end of the DC-to-DC module, one end of the microcontroller, one end of the automobile start control module and the other end of the battery voltage detection module. *Id.* at 3:18–26. When the load is correctly connected, the automobile start control module is automatically activated, and the battery starts to supply power to the load module. *Id.* at 4:22–24. If the load is not connected, or positive and negative polarities are reversed, the automobile start control module is automatically deactivated, and the battery stops supplying power to the load module. *Id.* at 4:25–35.

The '673 patent further explains that the automobile start control module conducts the power supply for the load module through the microcontroller (Ex. 1001, 2:7–11), which collects relevant data to conduct the corresponding control (*id.* at 2:4–6). In a standby mode, the microcontroller closes all outputs when the voltage of the direct current power supply is lower than that of the state being able to supply power and then recovers when it is higher than that of the state being able to supply power. *Id.* at 2:25–30; *see also id.* at 4:36–38 (“the microcontroller closes all outputs when the battery voltage is lower than 9V, and recovers the normal operation only when the battery voltage is larger than 10V”).

The '673 patent states that its automobile charger provides benefits over prior art devices, including, *inter alia*, (1) controlling the supply power for the load, which “can offer more protection for the product, and reduce the product size and material cost,” (2) providing low voltage protection to prevent damage caused by over-discharging the battery, (3) preventing improper operations by the user, such as reversed polarity, which can cause damage to the automobile or direct current power supply, and (4) employing voltage backflow protection for an abnormal load, wherein the automobile start line is closed to protect the battery when an abnormal voltage is detected. Ex. 1001, 2:7–49.

The '673 patent's Figure 2 (reproduced below) depicts a circuit diagram for an automobile charger:

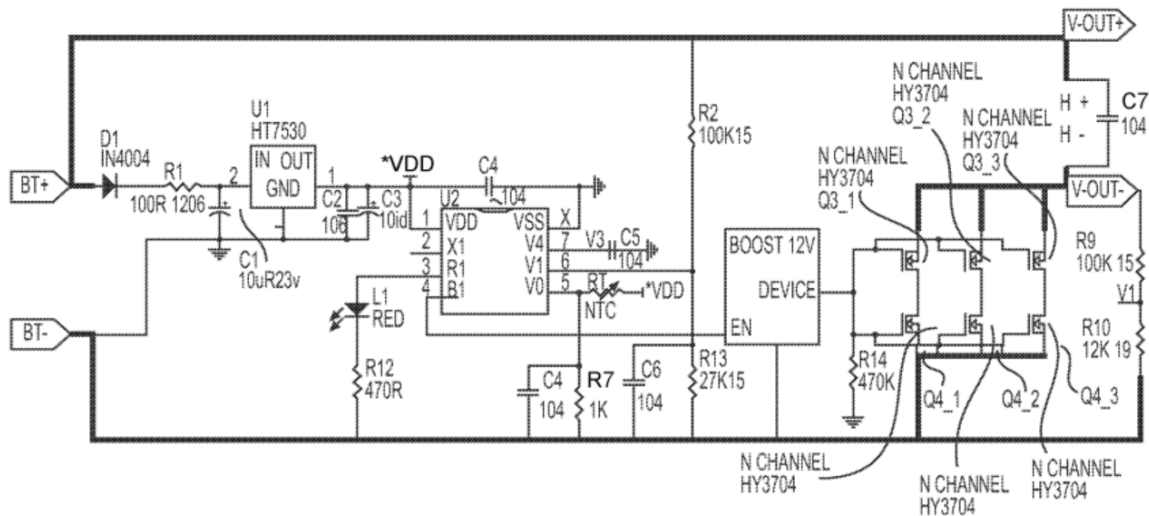


Figure 2

Figure 2 illustrates an automobile charger including microcontroller U2 and the modules illustrated in Figure 1, except the load module (the automobile storage battery and the automobile engine). See Ex. 1001, 2:64–65, 3:36–4:12, Figs. 1–2.

As an example, the DC-to-DC module in Figure 2 comprises “a diode D1, a resistor R1, capacitor C1, a HT7530 voltage stabilizing tube, [and] capacitors C2 and C3.” Ex. 1001, 3:39–40, Fig. 2. As another example, the battery voltage detection module in Figure 2 comprises “resistors R2, R13 and capacitor C6.” *Id.* at 4:9, Fig. 2. As another example, the load detection module in Figure 2 comprises “capacitor C7, resistors R9, 10, a capacitor C6 and a resistor R13.” *Id.* at 4:2–3, Fig. 2.

Additionally, Figure 2 depicts electronic switching circuitry comprising a plurality of n-channel transistors identified as Q3_1, Q3_2, Q3_3, Q4_1, Q4_2, and Q4_3. Ex. 1001, Fig. 2; *see id.* at 2:13–15, 2:32, 4:42. Further, Figure 2 shows Q3_1, Q3_2, and Q3_3 connected to a negative terminal (V-OUT-) of a depleted battery and Q4_1, Q4_2, and Q4_3 connected to a negative terminal (BT-) of a power-supply battery. *Id.* at Fig. 2.

C. *The Challenged Claims*

Petitioner challenges claims 1–24 of the ’673 patent. Pet. 1. Claim 1 is the sole independent claim. Ex. 1001, claims 1–24 (5:15–6:41). Claims 2–24 depend from claim 1. *Id.* Claim 1, reproduced below, is illustrative of the challenged claims and recites as follows (with additional formatting and numbers for reference purposes):²

1. A charger comprising:
 - [1(a)] a microcontroller;
 - [1(b)(i)] a battery connected to a voltage regulator,

² We use the numbers set forth in the Petition to identify the claim elements. *See* Pet. 21–29.

[1(b)(ii)] the battery capable of supplying power, via the voltage regulator, to the microcontroller,

[1(b)(iii)] the battery also capable of supplying power to an automobile battery when the battery has a predetermined voltage;

[1(c)(i)] a load detector circuit, connected to the microcontroller, to detect when the charger is correctly connected to the automobile battery,

[1(c)(ii)] and the microcontroller generating an output signal, when the charger is correctly connected the automobile battery; and

[1(d)] switching circuitry, including at least one switch, to operatively connect the battery to the automobile battery when the microcontroller generates the output signal to supply a charge to the automobile battery.

Id. at 5:15–30.

D. Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability (Pet. 6–7):

Ground No.	Challenged Claim(s)	35 U.S.C. § ³	Reference(s)/Basis
1	1, 2, 4–7, 12–14, 18–22	103	Krieger ⁴
2	23	103	Krieger, Baxter ⁵
3	16, 17	103	Krieger, Tracey ⁶

³ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the challenged claims have an effective filing date after March 16, 2013, we apply the AIA versions of the statutory bases for unpatentability.

⁴ US 2004/0130298 A1 to Krieger et al., published July 8, 2004 (Ex. 1005).

⁵ US 2010/0173182 A1 to Baxter et al., published July 8, 2010 (Ex. 1006).

⁶ WO 2012/080996 A1 to Tracey et al., published June 21, 2012 (Ex. 1007).

Ground No.	Challenged Claim(s)	35 U.S.C. § ³	Reference(s)/Basis
4	1–10, 12–15, 18–22, 24	103	Richardson ⁷
5	11	103	Richardson, Lai ⁸
6	16, 17	103	Richardson, Tracey
7	13, 14, 18–22	103	Richardson, Krieger
8	23	103	Richardson, Krieger, Baxter

Petitioner relies on the Declaration of Jonathan R. Wood, Ph.D. (Ex. 1003).

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, we construe claim terms according to the standard set forth in *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b) (2022). Under *Phillips*, claim terms are afforded “their ordinary and customary meaning.” *Phillips*, 415 F.3d at 1312. “[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention.” *Id.* at 1313. “Importantly, the person of ordinary skill in the art is deemed to read the claim term not only in the context of the particular claim in which the disputed term appears, but in the context of the entire patent, including the specification.” *Id.*

Petitioner argues that in the ’673 patent, “[a]ll of the claim terms are given their plain meaning, as understood by the [person of ordinary skill in the art], unless indicated otherwise.” Pet. 7.

⁷ US 2013/0154543 A1 to Richardson et al., published June 20, 2013 (Ex. 1004).

⁸ US 8,232,772 B2 to Lai et al., issued July 31, 2012 (Ex. 1008).

We determine that we do not need to explicitly construe any claim term for purposes of this Decision. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (stating “we need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy,’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

B. Level of Ordinary Skill in the Art

Factors pertinent to a determination of the level of ordinary skill in the art include “(1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field.” *Envtl. Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696–97 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case. *Id.*

Petitioner argues a person of ordinary skill in the art at the time of the invention “would have been a person having at least a Bachelor’s Degree in a relevant engineering discipline such as electrical engineering and at least two years of relevant experience in the design and/or development of automotive electrical systems, or a Masters or more advanced degree in a relevant engineering discipline such as electrical engineering.” Pet. 5 (citing Ex. 1003 ¶ 46).

In light of the record before us, and for purposes of this Decision, we adopt Petitioner’s description of the level of ordinary skill in the art, as consistent with the ’673 patent and the asserted prior art.

C. Principles of Law

A claim is unpatentable under 35 U.S.C. § 103 if “the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.” 35 U.S.C. § 103. The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, evidence such as commercial success, long felt but unsolved needs, and failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *see KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 407 (2007) (“While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.”).

The Supreme Court made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. Reaching this conclusion, however, requires more than merely showing that the prior art includes separate references covering each separate limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires that a person of ordinary skill at the time of the invention “would have selected and combined those prior art elements in the

normal course of research and development to yield the claimed invention.”
Id.

D. Alleged Obviousness Based on Krieger (Ground 1)

Petitioner argues that claims 1, 2, 4–7, 12–14, and 18–22 are obvious over Krieger. Pet. 21–39.

1. Krieger (Ex. 1005)

Krieger is titled “Microprocessor Controlled Booster Apparatus with Polarity Protection,” and published on July 8, 2004. Ex. 1005, codes (43), (54). Krieger describes “a booster device used for boosting a depleted battery” that includes a polarity-protection circuit for preventing current flow to the depleted battery “unless proper polarity is achieved.” *Id.* ¶¶ 2, 10, 11, 28, Abstract.

Krieger describes problems with conventional booster devices. *See* Ex. 1005 ¶¶ 4–9. For example, Krieger explains that connecting a boosting battery’s terminals to a depleted battery’s terminals “can be very dangerous if the batteries are connected incorrectly.” *Id.* ¶ 5. A “large current passes through the electric wires” even when “the two batteries are connected correctly.” *Id.* But when “the two batteries are connected erroneously, a current which passes through the electric wires is 10 to 20 times larger than the current existing on the electric wires when the batteries are correctly connected.” *Id.* Further, an “incorrect connection may result in one or both of the batteries being short-circuited,” and “in some cases, an explosion, fire and damage to the vehicle or to a person may result.” *Id.*

To address those issues, Krieger discloses a booster device that “can be used to ensure that the connection of the two batteries is made correctly

and in a safe manner.” Ex. 1005 ¶¶ 6, 10. Krieger’s Figure 1, depicting a booster device including a polarity-protection circuit, is reproduced below.

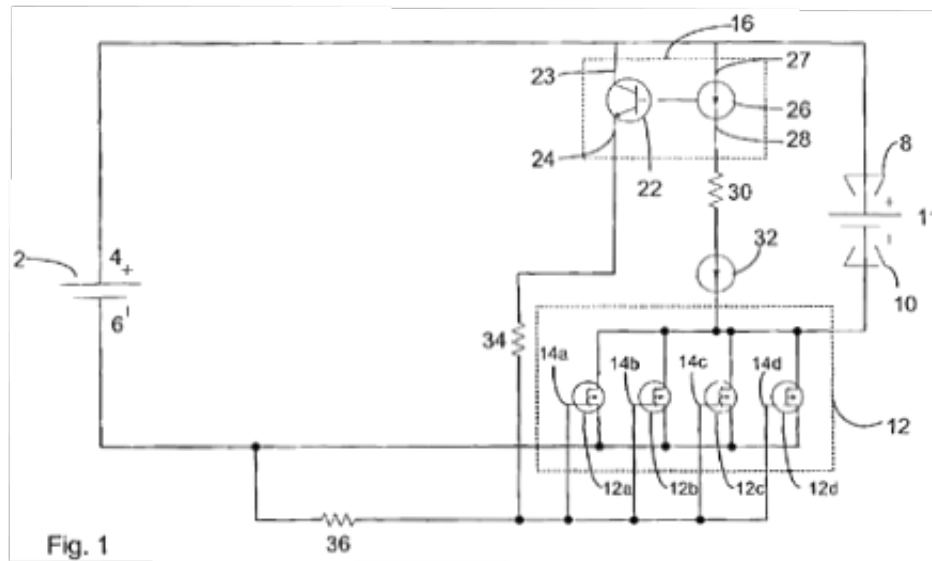


Figure 1 is a circuit schematic illustrating a booster device including boosting battery 2 with positive terminal 4 and negative terminal 6, switch 12 comprising field-effect transistors 12a–12d, and polarity-sensing circuit (opto-isolator) 16 coupled to boosting battery 2 and depleted battery 11. Ex. 1005 ¶¶ 22, 28–31, Fig. 1. “The positive terminal 4 of the boosting battery 2 is coupled to one of a pair of alligator clamps 8, 10 to be connected to” depleted battery 11 “via a wire or battery cable.” *Id.* ¶ 28, Fig. 1. “The negative terminal 6 of the boosting battery 2 is connected to the other of the alligator clamps 8, 10 to be connected to” depleted battery 11 “via a wire or battery cable.” *Id.* ¶ 28, Fig. 1.

“The switch 12 is activated to complete a boosting circuit between the boosting battery 2 and the depleted battery 11 only when a correct polarity connection between the batteries is attained.” Ex. 1005 ¶ 29. The polarity-protection circuit preferably includes solid-state components rather than “mechanical or electro-mechanical devices, such as solenoids,” and

“[t]he switch 12 is preferabl[y] a solid state device, such as a transistor, diode, field effect transistor (FET), etc.” *Id.* ¶¶ 10, 13–14, 30, 33. Krieger’s Figure 1 depicts switch 12 as FETs 12a–12d connected in parallel with each other. *Id.* ¶ 30. “The switch 12 is activated by a polarity sensing circuit 16 to allow current flow from the boosting battery 2 to the depleted battery 11.” *Id.* ¶ 31.

Polarity-sensing circuit (opto-isolator) 16 includes phototransistor 22 and light emitting diode (LED) 26. Ex. 1005 ¶ 32, Fig. 1. “The opto-isolator 16 only turns on when it is properly biased as a result of a correct polarity connection being made between the boosting battery 2 and the depleted battery 11.” *Id.* ¶ 33.

Krieger’s Figure 5 (reproduced below) depicts a microprocessor-controlled booster system:

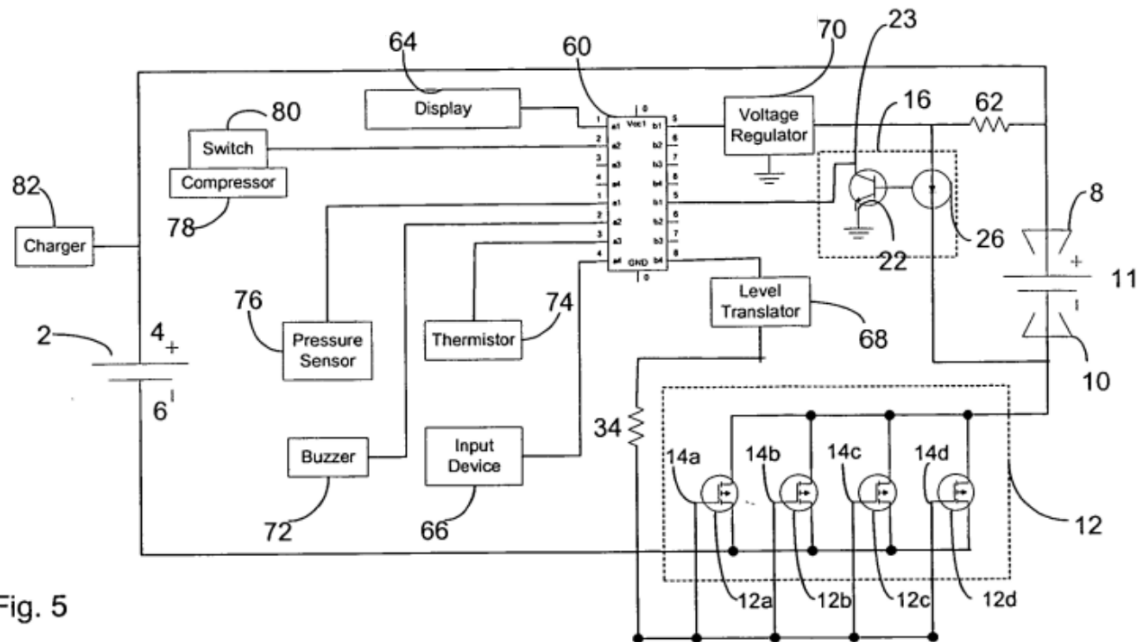


Fig. 5

Figure 5 illustrates a booster system including boosting battery 2 with positive terminal 4 and negative terminal 6, switch 12 comprising field-

effect transistors 12a–12d, opto-isolator 16, microprocessor 60, display 64, and voltage regulator 70. Ex. 1005 ¶¶ 26, 28, 43–46, Fig. 5.

Microprocessor 60 may “perform essentially all of the control functions needed for operation of the jump starter.” Ex. 1005 ¶ 43. With “a feedback circuit or other means,” microprocessor 60 may monitor (1) “the voltage and/or current being supplied to the depleted battery 11 from the booster battery 2” and (2) “the voltage and/or current of the battery 11.” *Id.* ¶ 44. By doing so, microprocessor 60 may detect “short circuits or other faults.” *Id.* “A resistive divider may be used to provide the voltage and current measurements to the microprocessor’s A/D input.” *Id.* Further, microprocessor 60 receives a “low voltage power supply,” e.g., 5 volts, from boosting battery 2 via voltage regulator 70. *Id.* ¶ 46, Fig. 5.

Voltage regulator 70 is “coupled to the boosting battery 2 and the depleted battery 11 for detecting their charge levels.” Ex. 1005 ¶ 52, Fig. 5. Voltage regulator 70 “produces a voltage proportional to the voltage of the boosting battery 2.” *Id.* ¶ 53. Microprocessor 60 detects “when the voltage of the boosting battery 2 falls below a predetermined level, for example, about 80% of its rated value.” *Id.* Voltage regulator 70 also “produces a voltage proportional to the voltage of the depleted battery 11.” *Id.* ¶ 54. Microprocessor 60 “receives this signal from” voltage regulator 70 and “determines and displays the voltage of the depleted battery 11 on display 64.” *Id.*

2. Analysis of Claim 1

Preamble

Claim 1 recites “[a] charger.” Ex. 1001, 5:15.

Petitioner contends that Krieger discloses claim 1's preamble because Krieger discloses a microprocessor-controlled charger and Krieger's Figure 5 depicts that system. Pet. 21 (citing Ex. 1005 ¶ 43).

Generally, a preamble does not limit a claim. *Allen Eng'g Corp. v. Bartell Indus., Inc.*, 299 F.3d 1336, 1346 (Fed. Cir. 2002). We need not decide whether claim 1's preamble limits the claim because Petitioner establishes sufficiently for purposes of institution that Krieger discloses claim 1's preamble. See Pet. 21; Ex. 1003 ¶¶ 49, 74. Specifically, Krieger discloses a microprocessor-controlled charger system. Ex. 1005 ¶ 43, Fig. 5; see Ex. 1003 ¶¶ 49, 74. Krieger explains that the microprocessor may “perform essentially all of the control functions needed for operation of the jump starter.” Ex. 1005 ¶ 43; see Ex. 1003 ¶ 51.

(a) *Limitation 1(a)*

Claim 1 recites “a microcontroller.” Ex. 1001, 5:16.

Petitioner contends that Krieger discloses this limitation because Krieger's Fig. 5 discloses microcontroller 60 within a jump-starter system. Pet. 22 (citing Ex. 1005 ¶ 43, Fig. 5). Dr. Wood's testimony as to limitation 1(a) supports the Petition. See Ex. 1003 ¶ 76.

(b) *Limitation 1(b)(i)*

Claim 1 recites “a battery connected to a voltage regulator.” Ex. 1001, 5:17.

Petitioner contends that Krieger discloses limitation 1(b)(i) because Krieger's microprocessor-controlled jump-starter system includes voltage regulator 70 coupled to boosting battery 2 through resistor 62. Pet. 22 (citing Ex. 1005 ¶ 52, Fig. 5). Dr. Wood's testimony as to limitation 1(b)(i) supports the Petition. See Ex. 1003 ¶ 77.

(c) Limitation 1(b)(ii)

Claim 1 recites “the battery capable of supplying power, via the voltage regulator, to the microcontroller.” Ex. 1001, 5:17–19.

Petitioner contends that Krieger discloses limitation 1(b)(ii) because the voltage regulator in Krieger’s microprocessor-controlled jump-starter system supplies the microprocessor with a “low voltage power supply (e.g., 5 volts) from battery 2 via voltage regulator 70.” Pet. 23 (citing Ex. 1005 ¶ 46, Fig. 5). Dr. Wood’s testimony as to limitation 1(b)(ii) supports the Petition. *See* Ex. 1003 ¶ 78.

(d) Limitation 1(b)(iii)

Claim 1 recites “the battery also capable of supplying power to an automobile battery when the battery has a predetermined voltage.” Ex. 1001, 5:19–21.

Petitioner contends that Krieger discloses limitation 1(b)(iii) because Krieger’s boosting battery 2 is “coupled to a pair of alligator clamps 8, 10 to be connected to a vehicle battery to be charged.” Pet. 24 (citing Ex. 1005 ¶ 28, Fig. 5). Petitioner also contends that Krieger discloses:

- (1) monitoring the boosting battery “to detect when the battery falls below a predetermined voltage needed for supplying power to” the automobile battery; and
- (2) notifying the operator when the boosting battery “is low and needs to be recharged,” e.g., when the microprocessor detects that “the boosting battery has fallen below ‘a predetermined level, for example, about 80% of its rated value.’”

Id. at 24 (quoting Ex. 1005 ¶¶ 44, 53).

According to Petitioner, “the boosting battery is ‘capable’ of supplying power to an automobile battery when the [boosting] battery has at

least a predetermined voltage, i.e., the boosting battery is above the ‘predetermined level.’” Pet. 24–25.

Dr. Wood’s testimony as to limitation 1(b)(iii) supports the Petition. See Ex. 1003 ¶¶ 79–82.

(e) Limitation 1(c)(i)

Claim 1 recites “a load detector circuit, connected to the microcontroller, to detect when the charger is correctly connected to the automobile battery.” Ex. 1001, 5:21–23.

Petitioner contends that Krieger discloses limitation 1(c)(i) because Krieger’s microprocessor-controlled jump-starter system includes “a feedback circuit or other means” for permitting the microprocessor to monitor “the voltage and/or current” of the automobile battery. Pet. 26 (quoting Ex. 1005 ¶ 44). Petitioner contends that Krieger discloses using “[a] resistive divider” to “provide the voltage and current measurements to the microprocessor’s A/D input.” *Id.* (quoting Ex. 1005 ¶ 44). Petitioner also contends that the microprocessor uses “the monitored voltage and/or current” to detect both (1) “that the automobile battery is connected” and (2) “that the positive and negative polarities of the automobile battery are not reversed,” i.e., “that the charger is ‘correctly connected to the automobile battery.’” *Id.* at 27.

Dr. Wood’s testimony as to limitation 1(c)(i) supports the Petition. See Ex. 1003 ¶¶ 83–85.

(f) Limitation 1(c)(ii)

Claim 1 recites “the microcontroller generating, when the charger is correctly connected to the automobile battery, an output signal.” Ex. 1001, 5:24–25.

Petitioner contends that Krieger discloses limitation 1(c)(ii) because the microprocessor in Krieger’s microprocessor-controlled charger system:

- (1) controls switch 12 “to supply power from the boosting battery 2 to the depleted automobile battery 11 when the microprocessor determines that the automobile battery is ‘correctly connected’”;
- (2) “provides output signals to activate the switch 12 into a conducting state”; and
- (3) “can deactivate switch 12 to terminate the jump starting process when a fault is detected.”

Pet. 27–28 (quoting Ex. 1005 ¶ 45).

Dr. Wood’s testimony supports the Petition as to limitation 1(c)(ii).
See Ex. 1003 ¶ 86.

(g) Limitation 1(d)

Claim 1 recites “switching circuitry, including at least one switch, to operatively connect the battery to the automobile battery when the microcontroller generates the output signal to supply a charge to the automobile battery.” Ex. 1001, 5:27–30.

Petitioner contends that Krieger discloses limitation 1(d) because Krieger’s microprocessor-controlled charger system includes FET-based switch 12 that the microprocessor activates “to complete a boosting circuit between the boosting battery 2 and the depleted battery 11.” Pet. 28–29 (quoting Ex. 1005 ¶ 29). Further, Petitioner asserts that “the switch may include ‘a number [of] FETs 12a–12d connected in parallel with each other.’” *Id.* at 29 (quoting Ex. 1005 ¶ 30).

Dr. Wood’s testimony as to limitation 1(d) supports the Petition. *See* Ex. 1003 ¶ 87.

Conclusion as to Claim 1

As discussed above, Petitioner's analysis explains how Krieger teaches claim 1's subject matter. At this stage of the proceeding, Patent Owner does not dispute or otherwise challenge Petitioner's information and analysis. Based on the current record and for the reasons advanced by Petitioner and supported by Dr. Wood's testimony, Petitioner establishes sufficiently for purposes of institution that Krieger teaches or suggests all of the limitations of claim 1, and thus demonstrates a reasonable likelihood of prevailing in proving claim 1 unpatentable under § 103 as obvious over Krieger.

3. Claims 2, 4–7, 12–14, and 18–22

Claims 2, 4–7, 12–14, and 18–22 depend directly or indirectly from claim 1. Petitioner's analysis explains how Krieger teaches or suggests the subject matter of claims 2, 4, 6–7, 12–14 and 18–22⁹. *See* Pet. 30–39. Dr. Wood's testimony supports Petitioner's analysis. *See* Ex. 1003 ¶¶ 89–114.

After reviewing the undisputed evidence and arguments in the Petition, we are persuaded for the reasons advanced in the Petition and supported by Dr. Wood's testimony that Petitioner establishes sufficiently for purposes of institution that Krieger teaches or suggests the subject matter of claims 2, 4, 6–7, 12–14 and 18–22. *See* Pet. 29–39; Ex. 1003 ¶¶ 89–114. Thus, Petitioner demonstrates a reasonable likelihood of prevailing in proving claims 2, 4, 6–7, 12–14 and 18–22 unpatentable under § 103 as obvious over Krieger.

⁹ The Petition does not include analysis of Krieger's teaching as to claim 5.

4. Conclusion

For the foregoing reasons, we determine Petitioner has demonstrated a reasonable likelihood of prevailing with respect to its argument that claims 1, 2, 4, 6–7, 12–14 and 18–22 are unpatentable as obvious in view of Krieger.

III. CONCLUSION

Based on the arguments in the Petition and the evidence of record, we determine that Petitioner has established a reasonable likelihood of prevailing in showing at least claims 1, 2, 4–7, 12–14, and 18–22 of the ’673 patent are unpatentable. Accordingly, we institute an *inter partes* review on all of the challenged claims and on all of the grounds presented in the Petition. *See PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018) (interpreting the statute to require “a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition”).

Our factual findings, conclusions of law, and determinations at this stage of the proceeding are preliminary, and based on the evidentiary record developed thus far. This is not a final decision as to the patentability of claims for which *inter partes* review is instituted. Our final decision will be based on the record as fully developed during trial.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that an *inter partes* review of all challenged claims of the ’673 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(a), *inter partes* review of the '673 patent is hereby instituted commencing on the entry date of this Decision, and pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial.

PETITIONER:

Joseph M. Sauer
Matthew W. Johnson
David B. Cochran
Marlee R Hartenstein
JONES DAY
jmsauer@jonesday.com
mwjohnson@jonesday.com
dcochran@jonesday.com
mhartenstein@jonesday.com

PATENT OWNER:

Alex W. Ruge
Robert R. Brunelli
SHERIDAN ROSS P.C.
aruge@sheridanross.com
rbrunelli@sheridanross.com