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Paper 45
Date: September 22, 2021

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AXONICS, INC.,
Petitioner,

v.

MEDTRONIC, INC.,
Patent Owner.

IPR2020-00680
Patent 8,457,758 B2

Before JAMES A. TARTAL, ERIC C. JESCHKE, and ALYSSA A. FINAMORE, *Administrative Patent Judges.*

TARTAL, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision
Determining No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

We have jurisdiction to conduct this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) (2018) and 37 C.F.R. § 42.73 (2019). For the reasons discussed below, we determine Petitioner has not shown by a preponderance of the evidence the unpatentability of any of claims 1, 2, 4–6, 8–10, and 12 of U.S. Patent No. 8,457,758 B2 (Ex. 1001, "the '758 patent").

I. INTRODUCTION

A. Summary of Procedural History

Axonics, Inc. ("Petitioner")[1] filed a Petition pursuant to 35 U.S.C. §§ 311–319 requesting an *inter partes* review of claims 1–12 ("the Challenged Claims") of the '758 patent. Paper 1 ("Pet."). We instituted an *inter partes* review of the Challenged Claims on all grounds of unpatentability asserted in the Petition. Paper 8 ("Inst. Dec."). Medtronic, Inc. ("Patent Owner")[2] filed a Patent Owner Response. Paper 15 ("PO Resp."). In its Response, Patent Owner states that it has disclaimed claims 3, 7, and 11. PO Resp. 1 (citing Ex. 2007 (a copy of a "Disclaimer in Patent Under 37 CFR 1.321(a)" providing that the patentee, Medtronic, Inc., disclaims claims 3, 7, and 11 of the '758 patent, dated December 22, 2020) (the "Disclaimer")).

[1] During the trial, the name of Petitioner when the Petition was filed, Axonics Modulation Technologies, Inc., was changed to Axonics, Inc. *See* Paper 32. Petitioner identifies no additional real parties in interest. Pet. 107.

[2] Patent Owner states that it is the real party in interest, that "Medtronic plc is the ultimate parent of Medtronic, Inc.," and that "Medtronic, Inc. has granted certain rights with respect to the patent-at-issue to Medtronic Puerto Rico Operations Co., which in-turn has granted certain rights to Medtronic Logistics, LLC, which in-turn has granted certain rights to Medtronic USA, Inc." Paper 4, 1 n.1.

Petitioner filed a Reply to the Patent Owner Response (Paper 19, "Pet. Reply"), and Patent Owner filed a Sur-reply (Paper 34, "PO Sur-reply"). Patent Owner filed a list of allegedly improper arguments and evidence from Petitioner's Reply (Paper 23), to which Petitioner responded (Paper 26). Petitioner filed a list of allegedly improper arguments and evidence from Patent Owner's Sur-reply (Paper 37), to which Patent Owner responded (Paper 38).

Oral argument was held and a transcript of the hearing appears in the record. Paper 44 ("Tr."). Petitioner bears the burden of proving unpatentability of each claim challenged by a preponderance of the evidence, and the burden of persuasion never shifts to Patent Owner. *See* 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d); *Dynamic Drinkware, LLC v. Nat'l Graphics, Inc*., 800 F.3d 1375, 1378 (Fed. Cir. 2015).

B. Related Proceedings

The parties identify the '758 patent as a subject of *Medtronic, Inc. v. Axonics Modulation Technologies, Inc.*, Case No. 8:19-cv-02115-DOC-JDE (C.D. Cal.). Pet. 107; Paper 4, 2. The parties also identify as related matters IPR2020-00678, concerning U.S. Patent No. 7,774,069 B2 ("the '069 patent"), and IPR2020-00712, concerning U.S. Patent No. 8,738,148 B2 ("the '148 patent"). Pet. 107; Paper 4, 2. The '758 patent issued from an application that was a continuation of an application that was a division of an application that issued as the '069 patent. Ex. 1001, code (60). The '148 patent issued from an application that was a continuation of the application that issued as the '758 patent. *Id.* The oral argument in this proceeding was consolidated with oral argument in IPR2020-00678 and IPR2020-00712. Tr. 4:9–15.

C. Effect of the Disclaimer

After institution of *inter partes* review, Patent Owner filed the Disclaimer disclaiming claims 3, 7, and 11 of the '758 patent. PO Resp. 1; Ex. 2007; *see also* 35 U.S.C. § 253(a) (providing that a patentee may "make disclaimer of any complete claim" in writing with the Patent and Trademark Office, and such disclaimer "shall thereafter be considered as part of the original patent"). Patent Owner asserts that in light of the Disclaimer, claims 3, 7, and 11 are to be "treated as though they never existed." PO Resp. 14 n.4 (citations omitted). Patent Owner further argues that we should "not address the disclaimed claims in the Final Written Decision." *Id.* Petitioner does not dispute the effect of the Disclaimer. *See* Pet. Reply 13–26 (arguing that the Challenged Claims not disclaimed are unpatentable).

We agree with Patent Owner that we should not address the patentability of claims 3, 7, and 11 in this Decision. *See* PO Resp. 14 n.4. Rather, we treat claims 3, 7, and 11 as if they never existed. *See Gunn v. Kopf*, 96 F.3d 1419, 1422 (Fed. Cir. 1996) ("A statutory disclaimer under 35 U.S.C. § 253 has the effect of canceling the claims from the patent and the patent is viewed as though the disclaimed claims had never existed in the patent."). We address the patentability only of the Challenged Claims not disclaimed. *See Intel Corp. v. VLSI Tech. LLC*, IPR2018-01040, Paper 36, 16 (PTAB Feb. 12, 2020) ("Consistent with other Board decisions in which some, but not all, challenged claims have been disclaimed after institution, we address the patentability only of the remaining claims." (collecting decisions)).

D. The '758 Patent

The '758 patent issued June 4, 2013, from an application filed on August 16, 2011, and is directed to a "[s]ystem for transcutaneous energy

transfer." Ex. 1001, codes (22), (45), (57). As background to the invention, the '758 patent explains that "[s]everal systems and methods have been used for transcutaneously inductively recharging a rechargeable used in an implantable medical device," including "the use of inductive coupling involv[ing] the placement of two coils positioned in close proximity to each other on opposite sides of the cutaneous boundary." *Id.* at 1:65–67, 2:16–19. According to the '758 patent, "[f]or implanted medical devices, the efficiency at which energy is transcutaneously transferred is crucial." *Id.* at 2:66–67. The '758 patent further explains that inductive coupling "has a tendency to heat surrounding components and tissue," which limits "the amount of energy transfer which can be accomplished per unit time"; that a patient's mobility is impaired during charging; and that the amount of charging "can be limited by the amount of time required for charging," thereby limiting "the size of the internal power source." *Id.* at 2:67–3:25.

The '758 patent states that "[a]lignment of an external primary coil with the internal secondary coil is important in achieving efficiency in transcutaneous energy transfer" and that "it is not always easy for the user to know when the primary and secondary coils are properly aligned." *Id.* at 3:33–37. The '758 patent further states that, even when aligned, "the physical package containing the primary coil with the protrusion of the implanted medical device may not result in optimum alignment of the primary and secondary coils," because the coils may not be centered in the package and "even perfect alignment of the packages may result in actual misalignment of the primary and secondary coils." *Id.* at 3:37–48. According to Patent Owner, the '758 patent solved the problem of proper alignment "through an inventive system including an external power source that, among other things, automatically varies the power output of the

external charging device to generate a predetermined current through the internal power source as a function of a value associated with the current passing through the internal power source." PO Resp. 3–4 (citing Ex. 1001, 3:52–4:12, 20:63–22:15, Fig. 19).

Figure 3 of the '758 patent is reproduced below.

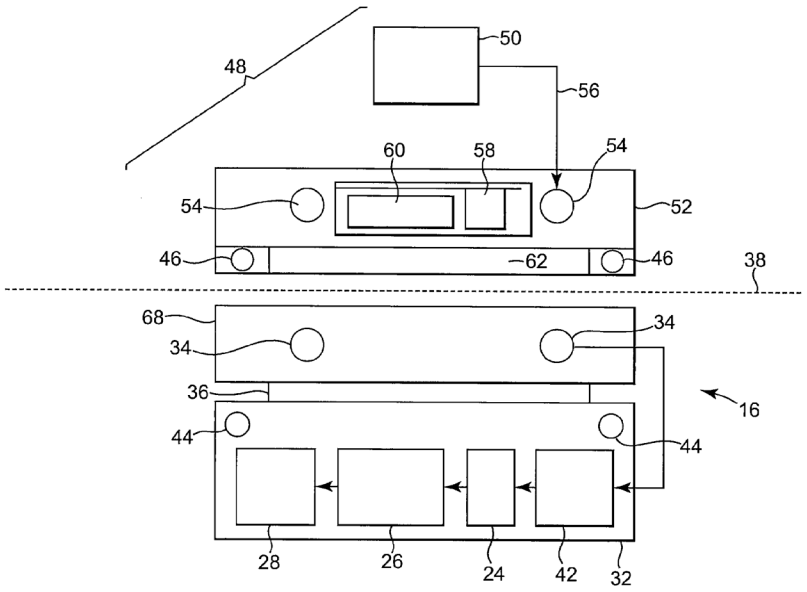

Fig. 3

Figure 3 illustrates implantable medical device 16, situated under cutaneous boundary 38, and associated external charging device 48. *Id.* at 6:1–4, 7:55–56, 8:19–21. Implantable medical device 16 includes rechargeable power source 24, which powers electronics 26 and therapy module 28 "in a conventional manner," charging regulation module 42, and internal telemetry coil 44. *Id.* at 7:31–34, 7:57–8:1. External charging device 48, including external telemetry unit 46, charging unit 50, and external antenna 52, is used to charge rechargeable power source 24 of implantable medical device 16 while implantable medical device 16 is in place in a patient. *Id.* at 7:60–8:1, 8:19–8:23. "[I]nternal telemetry coil 44 [is] configured in [a] conventional manner to communicate through external

telemetry coil 46 to an external programming device (not shown), charging unit 50 or other device in a conventional manner in order to both program and control [the] implantable medical device and to externally obtain information from implantable medical device 16 once implantable medical device has been implanted." *Id.* at 7:60–8:1. "Charging unit 50 contains the electronics necessary to drive primary coil 54 with an oscillating current in order to induce current in secondary coil 34 when primary coil 54 is placed in the proximity of secondary coil 34." *Id.* at 8:23–26.

Figure 19 of the '758 patent is reproduced below.

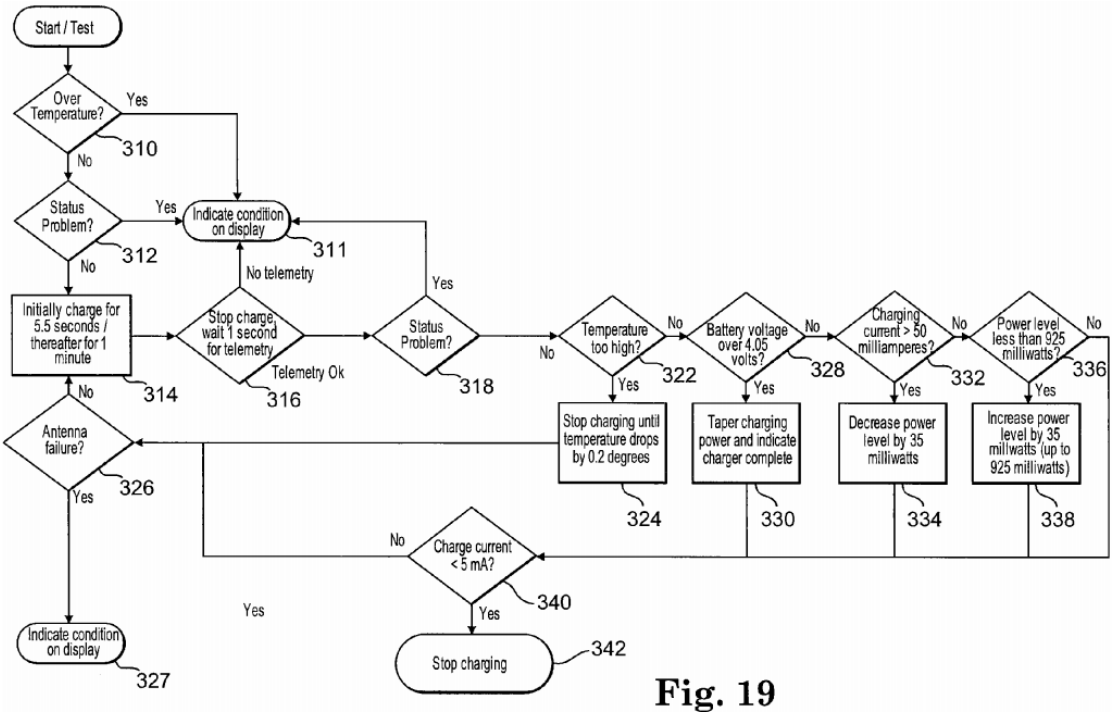

Fig. 19

Figure 19 is a flow chart illustrating the operation of charging unit 50 to charge an implantable medical device. *Id.* at 6:42–43, 21:24–25. The steps shown in Figure 19 are described in the '758 patent as follows:

- at step 310, charging unit 50 determines "whether external antenna 52 is over the temperature limit set for charging operation,"

where the "temperature limit can help prevent patient 18 from being exposed to temperatures that are higher than desired";

● at steps 311 to 313, "[i]f external antenna 52 of charging unit 50 is over temperature, an alert condition is indicated," "[i]f external antenna [52] is not over the temperature limit, charging unit 50 then checks . . . for a status problem with charging unit 50," and "[i]f a status problem is found, an alert condition is indicated";

● at steps 314 and 316, "[i]f a status problem is not found, charging unit 50 initially charges . . . rechargeable power source 24 of implantable medical device 16 for 5.5 seconds," and "[c]harging unit 50 then stops charging and waits . . . one second to check for reception of a telemetry signal from implantable medical device 16," such as "the value of the current flowing through secondary coil 34," and "[i]f no telemetry signal is detected, an alert condition is indicated," returning the operation to step 311;

● at step 318, "[i]f telemetry is received, charging unit 50 then checks . . . for a status problem with implantable medical device 16," and "[i]f a status problem is detected, an alert condition is indicated," returning the operation to step 311;

● at step 322, "[i]f no status problem exists, charging unit 50 checks . . . to determine if the temperature is too high," and "[i]f an over temperature condition is detected, charging is stopped and a status indication is displayed until the temperature drops below a predetermined level";

● at step 328, "[i]f no over temperature condition exists, charging unit 50 checks . . . to determine if the voltage across rechargeable power

source 24 is over a voltage at which the charging rate should begin to decrease, e.g., 4.05 volts";

- at steps 330 and 332, "[i]f the voltage across rechargeable power 24 is greater than 4.05 volts, then charging unit 50 begins to taper charging power," but "[i]f the voltage across rechargeable power source 24 is not over 4.05 volts, charging unit 50 checks . . . to determine whether the charging current through rechargeable power source 24 is over a current rate that is not desirable, e.g., 50 milliamperes";
- at step 334, "[i]f the charging current is over 50 milliamperes, then the charging power level is decreased . . . by an appropriate [amount], e.g., by 35 milliwatts";
- at steps 336 and 338, "[i]f the charging current is not over 50 milliamperes, charging unit 50 checks . . . to determine if the charging power level is less than [an] appropriate amount, e.g., 925 milliwatts," and "[i]f the power level is less than 925 milliwatts, the charging power level is increased . . . by 35 milliwatts, up to a maximum of 925 milliwatts";
- at steps 340 and 342, "[i]f the charge current is below . . . five (5) milliamperes, then charging unit 50 stops . . . charging and indicates that charging is complete, e.g., by lighting the charging complete indicator light," and "[i]f not, [operation returns to step 314 and] charging unit 50 then charges . . . rechargeable power source for one (1) minute and then conducts the aforementioned tests, checks and actions as performed after the initial 5.5 second charge."

Id. at 21:24–22:14.

E. Illustrative Claim of the '758 Patent

Each of claims 1, 2, 4–6, 8–10, and 12 of the '758 patent is independent. Ex. 1001, 22:25–67, 23:25–24:18, 24:42–25:26, 26:15–30. Claims 1, 2, and 4 are directed to a "system for transcutaneous energy transfer," claims 5, 6, and 8 are directed to an "external power source," and claims 9, 10, and 12 are directed to a "method of transcutaneous energy transfer." *Id.* Claim 1 is illustrative of the claimed subject matter and is reproduced below.

> 1. A system for transcutaneous energy transfer, comprising:
> an implantable medical device having componentry for providing a therapeutic output, said implantable medical device having an internal power source and a secondary coil operatively coupled to said internal power source, said implantable medical device adapted to be implanted in a patient; and
> an external power source having a primary coil, said external power source providing energy to said implantable medical device when said primary coil of said external power source is placed in proximity of said secondary coil of said implantable medical device and thereby generating a current, having a value, passing through said internal power source;
> wherein said external power source automatically varies its power output based on a value associated with said current passing through said internal power source:
> wherein said external power source automatically varies its power output based on a measured current associated with said current passing through said internal power source.

Id. at 1001, 22:25–46.

F. References and Testimony

Below we provide an abbreviated summary of the qualifications of Dr. Dorin Panescu, who provides testimony in support of Petitioner, and Dr. Richard T. Mihran, who provides testimony in support of Patent Owner. We also provide a table identifying the primary references relied upon by

Petitioner, as well as the exhibits corresponding to the declarations and deposition testimony in the record for Dr. Panescu and Dr. Mihran.[3]

Petitioner's contentions are primarily supported by Dr. Panescu.[4] Dr. Panescu has a Bachelor of Science degree in Electronics and Telecommunications, as well as Master of Science and Doctorate degrees in Electrical and Computer Engineering. Ex. 1003 ¶ 4; Ex. 1004 (*curriculum vitae* of Dr. Panescu). Dr. Panescu is Chief Scientific Engineer at Biotronik and indicates his work there concerns the "[d]evelopment of novel catheters and systems for treatment of cardiac arrhythmias." Ex. 1004, 1. Dr. Panescu states that he has "over 25 years of direct technical experience in electrical medical device technology including systems with implantable medical devices"; that he is "an inventor on over 175 issued U.S. patents," including over 20 patents related to medical implants; and that he is "the author of over 200 industry publications." Ex. 1003 ¶¶ 4, 5; Ex. 1004, 1–9.

Patent Owner's arguments are primarily supported by Dr. Mihran. Dr. Mihran has a Bachelor of Science degree in Electrical Engineering and Applied Physics, a Master of Science degree in Electrical and Computer Engineering, and a Doctorate in Electrical Engineering. Ex. 2002 ¶ 8; Ex. 2003 (*curriculum vitae* of Dr. Mihran). Dr. Mihran states that he is "a Professor Adjunct in the Department of Electrical, Computer and Energy Engineering at the University of Colorado at Boulder," where he has "been on the faculty since 1990." Ex. 2002 ¶ 6. Dr. Mihran further states that he

[3] The table provided identifies only a select number of documents. A complete identification of the papers and exhibits that form the record of this case is available in the docket of this proceeding.

[4] Petitioner also provides a Declaration of Rachel J. Watters (Ex. 1008) concerning the availability of Exhibit 1006.

has taught and performed research "pertaining to the development of electronic, optical and ultrasonic devices and systems for medical and other applications for over 35 years"; that he has "authored numerous publications addressing cardiac and nerve cell electrophysiology"; and that he has "consulted extensively in the area of inductively-powered RFID devices and networks for over twenty-five years." *Id.* ¶¶ 6, 9, 13. Dr. Mihran also states that he has "served as an expert witness in many patent litigation matters in the areas of implantable medical devices, including spinal cord stimulation, vagal nerve stimulation, pacemakers, implantable cardioverter/defibrillators (ICDs), syringe-implantable RFID devices, orthopedic implants, RF tissue ablation, and stereotactic medical imaging" as well as "other technology areas, including wired and wireless telecommunications, radio frequency identification systems, power management in portable devices, computers and computer networks, and others." *Id.* ¶ 14.

References and Witness Testimony	Date	Ex. No.
U.S. Patent No. 3,942,535 ("Schulman")	Mar. 9, 1976	Ex. 1005
Fischell et al., *A Long-Lived, Reliable, Rechargeable Cardiac Pacemaker*, *Engineering in Medicine*, 357 (Schaldach et al. eds., 1975) ("Fischell Article")	1975	Ex. 1006
U.S. Patent No. 6,227,204 B1 ("Baumann")	May 8, 2001	Ex. 1007
Declaration of Dorin Panescu	Mar. 2, 2020	Ex. 1003
Supplemental Declaration of Dorin Panescu	Mar. 19, 2021	Ex. 1012
Deposition Transcript of Dorin Panescu	Nov. 19, 2020	Ex. 2004
Declaration of Richard T. Mihran	Dec. 22, 2020	Ex. 2002
Deposition Transcript of Richard T. Mihran	Feb. 25, 2021	Ex. 2008

G. Asserted Grounds of Unpatentability

Subsequent to the Disclaimer as applied to claims 3, 7, and 11, Petitioner alleges unpatentability of claims 1, 2, 4–6, 8–10, and 12 on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 5, 9	102	Schulman
1, 5, 9	102	Fischell Article
1, 2, 4–6, 8–10, 12	102	Baumann
2, 4, 6, 8, 10, 12	103	Schulman, Baumann
2, 4, 6, 8, 10, 12	103	Fischell Article, Baumann

Pet. 9–10.[5]

II. ANALYSIS OF PATENTABILITY

A. Principles of Law

Petitioner contends under three grounds that claims of the '758 patent are unpatentable based on anticipation. Pet. 9–10. A claim is anticipated if a single prior art reference either expressly or inherently discloses every limitation of the claim. *Orion IP, LLC v. Hyundai Motor Am.*, 605 F.3d 967, 975 (Fed. Cir. 2010). "A single prior art reference may anticipate without disclosing a feature of the claimed invention if such feature is necessarily present, or inherent, in that reference." *Allergan, Inc. v. Apotex Inc.*,

[5] The Leahy-Smith America Invents Act ("AIA") included revisions to 35 U.S.C. §§ 102, 103 that became effective on March 16, 2013. Pub. L. No. 112-29, §§ 3(b)–3(c), 3(n)(1), 125 Stat. 284, 285–87, 293 (2011). Because there is no dispute that the '758 patent claims have an effective filing date before March 16, 2013, we apply the pre-AIA versions of these statutes.

754 F.3d 952, 958 (Fed. Cir. 2014) (citing *Schering Corp. v. Geneva Pharm.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003)).

Petitioner contends under two grounds that claims of the '758 patent are unpatentable based on obviousness. Pet. 10. As set forth in 35 U.S.C. § 103(a),

> [a] patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

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 in evidence, objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). An obviousness analysis "need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007); *accord In re Translogic Tech., Inc.*, 504 F.3d 1249, 1259 (Fed. Cir. 2007). However, Petitioner cannot satisfy its burden of proving obviousness by employing "mere conclusory statements." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016). Instead, Petitioner must articulate a reason why a person of ordinary skill in the art would have combined the prior art references. *In re NuVasive*, 842 F.3d 1376, 1382 (Fed. Cir. 2016).

B. Level of Ordinary Skill in the Art

In determining whether an invention would have been obvious at the time it was made, 35 U.S.C. § 103 requires us to resolve the level of ordinary skill in the pertinent art at the time of the invention. *Graham*, 383 U.S. at 17. The person of ordinary skill in the art is a hypothetical person who is presumed to have known the relevant art at the time of the invention. *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995). In determining the level of ordinary skill in the art, various factors may be considered, including the "type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field." *Id.* (citation omitted).

Petitioner contends that a person of ordinary skill in the art at the time of the invention "would have had at least a bachelor's degree in electrical engineering or an equivalent as well as at least five years of experience in the industry working with implantable medical devices such as cardiac pacemakers or defibrillators." Pet. 7. Patent Owner argues that a person of ordinary skill "would have had at least a bachelor's degree in a relevant field (e.g., electrical, mechanical, or biomedical engineering) with at least two years of experience with the design of components (e.g., circuitry) for implantable medical devices and associated external devices (e.g., a charging unit)," and that "[m]ore education can substitute for practical experience and *vice versa*." PO Resp. 5 (citing Ex. 2002 ¶¶ 21, 22). Patent Owner further disagrees with Petitioner's proposed level of skill because it does not specify "experience and background with electronics and circuitry." *Id.* at 6. Patent Owner, however, further concedes that the result of this proceeding "would not be different even if Petitioner's level of skill were to

apply." *Id.* (citing Ex. 2002 ¶¶ 23, 24). The parties did not further address this issue at trial. *See generally* Pet. Reply; PO Sur-reply.

Patent Owner fails to provide any rational explanation or support to show that Petitioner's proposed level of ordinary skill—a person having a "bachelor's degree in electrical engineering or an equivalent as well as at least five years of experience in the industry working with implantable medical devices such as cardiac pacemakers or defibrillators"—corresponds to a person who lacks "experience and background with electronics and circuitry." Further, we discern no substantial difference between the parties' proposed definitions of a person of ordinary skill in the art that impacts our determination in this Decision. We, therefore, agree with Patent Owner that our analysis in this case does not turn on which of the parties' competing definitions of ordinary skill is applied and apply the level of ordinary skill in the art proposed by Petitioner, consistent with the Decision on Institution. *See* Inst. Dec. 11–12 (stating that "the '758 patent and the cited prior art references reflect the appropriate level of skill at the time of the claimed invention and that the level of appropriate skill reflected in these references is consistent with the definition of a person of ordinary skill in the art proposed by Petitioner" (citing *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001)).

C. Claim Construction

"In an *inter partes* review proceeding, a claim of a patent . . . shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b)." 37 C.F.R. § 42.100(b). That standard "includ[es] construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the

patent." *Id.*; *see also Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). "When a patentee explicitly defines a claim term in the patent specification, the patentee's definition controls." *Martek Biosciences Corp. v. Nutrinova, Inc*., 579 F.3d 1363, 1380 (Fed. Cir. 2009).

In the Petition, Petitioner proposes no express construction for any claim term. Pet. 6. Petitioner asserts that "all claim terms should be given their plain and ordinary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention, in light of the language of the claims, the specification, and the prosecution history." *Id.* In response, Patent Owner argues that certain claims include "two distinct 'wherein' clauses," which require "two separate inputs to the external power source for automatic variation of the power output" that cannot be satisfied "by a single disclosure in the prior art." PO Resp. 7. We agree with Patent Owner for the reasons provided in our detailed discussion below. We further find that no additional claim terms require express construction.

1. "a value associated with said current" and "a measured current associated with said current" (claims 1, 5, and 9)

Claim 1 is directed to "[a] system for transcutaneous energy transfer" and recites, in relevant part, as follows:

> an external power source . . .
>
> wherein said external power source automatically varies its power output based on *a value associated with said current* passing through said internal power source [(the "Value Limitation")];
>
> wherein said external power source automatically varies its power output *based on a measured current associated with said current* passing through said internal power source [(the "Measured Current Limitation")].

Ex. 1001, 22:25–46 (emphases added). Claim 5 is directed to "[a]n external

power source" and includes an identical Value Limitation and Measured Current Limitation. *Id.* at 23:46–65. Claim 9 is directed to "[a] method of transcutaneous energy transfer," and includes the same disputed claim language, reciting, in relevant part, as follows:

> said charging unit automatically varying its power output based on *a value associated with said current* passing through said internal power source;
>
> wherein said automatically varying step automatically varies its power output based on *a measured current associated with said current* passing through said internal power source.

Id. at 24:61–25:10 (emphases added). The Specification of the '758 patent states that "an alignment measurement may be made by measuring a value, e.g., current or voltage, associated with, e.g., proportional to, the current passing through [the] rechargeable power source." *Id.* at 20:67–21:3. We therefore find that the Specification expressly identifies "current or voltage" as examples of "a value." *Id.*

Although not presented as a claim construction issue in the Petition, Petitioner contends that the recited "measured current associated with said current" limitation "simply narrows the 'value' of [the recited 'value associated with said current' limitation] to 'measured current,' and does not require a separate measurement." Pet. 19–20. Patent Owner, by contrast, argues that claims 1 and 5 should be construed to require "two separate inputs to the external power source for automatic variation of the power out." PO Resp. 7. Similarly, Patent Owner argues that claim 9 should be construed to require "two separate inputs used by the charging unit for automatic variation of the power output." *Id.* at 8. In short, according to Patent Owner, claims 1, 5, and 9 should be construed such that "a value

associated with said current" and "a measured current associated with said current" may not be one and the same, as Petitioner asserts. *Id.*

In support of its interpretation of the claim language, Petitioner offers two arguments in the Petition. Pet. 19–20, 35–36, 40, 44–45. With reference to claim 1, Petitioner asserts that (1) during prosecution, the Applicant "appended the body of then-pending claim 1 in front of [the Measured Current Limitation] to secure allowance," and (2) the Specification "does not describe two separate measurements." *Id.* at 19–20, 35–36; *see also id.* at 40 (making the same arguments in regard to claim 5), 44–45 (making the same arguments in regard to claim 9).

As to Petitioner's first argument based on the prosecution history, Patent Owner argues that although "the inclusion of [the Measured Current Limitation] during prosecution certainly narrowed the scope of the original independent claim (*i.e.* by requiring a second input), there is no evidence cited by the Petitioner of an intent to narrow [the Value Limitation] to 'measured current.'" PO Resp. 13. We agree with Patent Owner. Petitioner fails to cite any evidence in the Petition in support of its contention that the addition of the Measured Current Limitation merely narrowed the Value Limitation to a "measured current," as opposed to having been added during prosecution to require a second input as Patent Owner suggests. *See* Pet. 19–20, 35–36, 40, 44–45 (failing to cite any prosecution history in support of its argument). In support of the Petition, Dr. Panescu states in regard to claim construction little more than that in rendering his opinions, he "applied what one of ordinary skill in the art would consider to be the plain and ordinary meaning of such terms as informed by the specification and prosecution history." Ex. 1003 ¶ 42. Specifically with regard to the prosecution history as it pertains to the Value Limitation and the Measured

Current Limitation, Dr. Panescu provides no citation to support his view that the Measured Current Limitation "simply narrows" the Value Limitation. *See*, *e.g.*, *id.* at 82–86.

In its Reply, Petitioner directs us for the first time to portions of the prosecution history to purportedly show that the Examiner rejected independent claims with a "value" limitation, as well as dependent claims that "included additional wherein clauses requiring 'a signal proportional to said current,' 'a current proportional to said current,' and 'a voltage proportional to said current,' . . . based on the same disclosure," purportedly suggesting that a single input could meet multiple limitations. Pet. Reply 6–7 (emphasis omitted). According to Petitioner, the Applicant did not dispute that the voltage input taught by the reference applied by the Examiner could satisfy multiple input limitations. *Id.* Petitioner further argues that under Patent Owner's construction certain claims "required varying the power output of the external power source based on three distinct inputs, and that Patent Owner "never suggested that the original claims required two or three inputs." *Id.* at 7. Patent Owner's arguments in its Reply based on the prosecution history are unsupported by Dr. Panescu. *See* Ex. 1012 ¶¶ 11, 21, 30 (Dr. Panescu stating that he disagrees that two inputs are required by the claims "at least for the reasons set forth in my prior declaration").

We agree with Patent Owner that the arguments raised by Petitioner in its Reply based on the prosecution history fail to show a clear disavowal or disclaimer and instead reflect unsupported speculation as to what the Examiner and Applicant allegedly understood, premised on "what Applicant did not do during prosecution," not any affirmative position taken by the Applicant. PO Sur-reply 5 (emphasis omitted). Petitioner fails to show that arguments *not made* by the Applicant during prosecution support

Petitioner's construction of the claims. *See Schwing GmbH v. Putzmeister Aktiengesellschaft*, 305 F.3d 1318, 1324 (Fed. Cir. 2002) ("Although prosecution history can be a useful tool for interpreting claim terms, it cannot be used to limit the scope of a claim unless the applicant took a position before the PTO that would lead a competitor to believe that the applicant had disavowed coverage of the relevant subject matter."). Patent Owner further asserts that "the fact that Applicant did not merge the two wherein clauses [(i.e., the Value Limitation and the Measured Current Limitation)] into a single wherein clause with only a single input during prosecution supports the opposite of Petitioner's argument, i.e., it actually supports the conclusion that two separate inputs are intentionally specified in the claims." PO Sur-reply 5. We agree with Patent Owner that by including two limitations the Applicant is presumed to have intended each to carry patentable weight, as discussed below.[6]

As to Petitioner's second argument that the Specification does not describe two separate measurements, Petitioner again provides no evidence or analysis in support of its contentions in the Petition. *See* Pet. 19–20, 35–36, 40, 44–45. In support of the Petition, Dr. Panescu likewise offers no explanation or citation in support other than to similarly state that the Specification "does not describe two separate measurements" with regard to the Value Limitation and the Measured Current Limitation. Ex. 1003, 85, 101.

[6] Patent Owner's additional citations to cases for the proposition that different claim terms are presumed to have different meanings do not support its arguments. PO Resp. 9 (citations omitted). As Petitioner notes, there is no dispute that "value" and "measured current" have different meanings. Pet. Reply 4. The issue is whether a single input can satisfy both limitations at issue.

In its Response, Patent Owner shows that the Specification expressly describes that "two separate inputs are considered in determining how to vary the power output of the external power source 50: (1) the voltage across rechargeable power source 24; and (2) the charging current through rechargeable power source 24." PO Resp. 10–11; *see also* Ex. 1001, 21:55–67 (describing what Patent Owner summarizes); Ex. 2002 ¶ 33. Patent Owner further reasons as follows:

> As described in the passage above [(i.e., Ex. 1001, 21:55–67)], both a voltage across the rechargeable power source and a current through the rechargeable power source are utilized to control the operation of the external charging device. A [person of ordinary skill in the art] would understand that each of these two inputs is associated with a current passing through the internal power source. Thus, the specification provides support for the use of multiple inputs as a basis to vary the power output of the external power source as claimed in claims 1, 5, and 9, (Ex. 2002 at ¶ 33), and Petitioner does not consider the specification's teachings in this regard. *See also Becton, Dickinson & Co.* [*v. Tyco Healthcare Grp., LP*, 616 F.3d 1249,] 1255 [(Fed. Cir. 2010)] (finding that the patent specification comports with the plain language of the claims to support conclusion that two claim limitations are separate from each other) (citing *Astrazeneca AB v. Mut. Pharm. Co*., 384 F.3d 1333, 1336 (Fed. Cir. 2004) ("A long line of cases indicates that evidence intrinsic to the patent--particularly the patent's specification, including the inventors' statutorily-required written description of the invention--is the primary source for determining claim meaning."); *Vitronics Corp. v. Conceptronic, Inc*., 90 F.3d 1576, 1582 (Fed. Cir. 1996) (The specification is "is the single best guide to the meaning of a disputed [claim] term.")); *see also Intel Corp. v. VLSI Tech. LLC* IPR2018-01040, Paper 36 at 19–25, 30 (February 12, 2020) (finding that the plain language of the claims and specification support that two separately recited claim elements are distinct components of the claim).

PO Resp. 11–12 (fourth alteration in original). Patent Owner's argument is persuasively supported by Dr. Mihran, who explains that a person of ordinary skill in the art would have understood that the claim language requires two inputs, in part, because the Specification of the '758 patent "provides support for the use of multiple inputs as a basis to vary power output of the power source as claimed." Ex. 2002 ¶¶ 31, 33, 34. In support of its proposed construction, Patent Owner further argues that the Measured Current Limitation does not refer back to the "value" recited in the Value Limitation, and that "[c]laims must be interpreted with an eye toward giving effect to all terms in the claim."

In its Reply, Petitioner abandons its argument in the Petition that the Specification "does not describe two separate measurements," stating instead the *opposite*: "Petitioner does not dispute that there are embodiments [in the '758 patent] where power output would vary based on two different values associated with a current passing through the internal power source." Pet. Reply 8. Thus, there is no dispute that the Specification provides support, at least under some embodiments, for Patent Owner's interpretation that the Value Limitation and the Measured Current Limitation each require a distinct input. Given the opportunity to address this admission by Petitioner in his Supplemental Declaration, Dr. Panescu instead maintains that he disagrees that two inputs are required by the claims "at least for the reasons set forth in my prior declaration," which, as noted above, included that the Specification "does not describe two separate measurements." Ex. 1003, 85, 101; Ex. 1012 ¶¶ 11, 21, 30. We find Dr. Panescu's continued support for an argument that Petitioner has abandoned in light of the contrary express disclosures of the '758 patent diminishes the weight we accord his testimony. For the foregoing reasons, we find Petitioner's

reliance on the prosecution history and Specification to support its interpretation of the claim language to be insufficient and unpersuasive.

In its Reply, Petitioner argues that the Specification teaches "that 'value' could be current or voltage," or something else. Pet. Reply 2. Indeed, as noted above, the Specification states that examples of "a value" include "current or voltage." Ex. 1001, 20:67–21:3. We do not find that to be in dispute, but it does not resolve whether a single input may satisfy both the Value Limitation and the Measured Current Limitation. Petitioner further reasons that "while there is a presumption that different terms have different meanings, there is no presumption that different terms require different features." Pet. Reply 3 (emphasis omitted) (citing *Applied Med. Res. Corp. v. U.S. Surgical Corp.*, 448 F.3d 1324, 1333 n.3 (Fed. Cir. 2006)). Thus, according to Petitioner, the claim construction issue presented is "whether a single feature taught in the prior art or found in an accused product can satisfy separate claim limitations." *Id.* (quoting *Applied Med.*, 448 F.3d at 1333 n.3).

We disagree with Petitioner's framing of the issue, which fails to reflect Petitioner's argument that the limitations at issue are not "separate claim limitations," because a disclosure of one is necessarily a disclosure of the other. Specifically, according to Petitioner, the Value Limitation merely recites "value" as a genus, and the Measured Current Limitation recites "current" as a species. Pet. Reply 2, 4. Thus, Petitioner concedes its proposed construction renders the Value Limitation superfluous, because, as Petitioner recognizes, under its proposal "when the external power source automatically varies its power output based on 'a measured current,' it is also varying its power output based on 'a value.'" *Id.* at 4–6. Petitioner is not relying on a single disclosure to satisfy two "separate claim limitations;"

rather, Petitioner is asserting two separate claim limitations should be construed as requiring only a single feature.

Petitioner raises several additional arguments against Patent Owner's construction. According to Petitioner, Patent Owner seeks to improperly import a two-input requirement from particular embodiments into the claim language (Pet. Reply 7–8 (citing *Superguide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004))) and Patent Owner's proposed construction would exclude a preferred embodiment that requires only a single input, which is "rarely, if ever, correct" (*id.* at 8–9 (quoting *PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC*, 815 F.3d 747, 755 (Fed. Cir. 2016))). Contrary to Petitioner's arguments, the claim language expressly includes two limitations, such that there is no improper importation of requirements from the Specification. We also find, as explained above, that the Specification expressly supports a two-input embodiment, and Petitioner directs us to no persuasive support for the notion that every claim must be construed to encompass every preferred embodiment disclosed in the Specification.

In its Sur-reply, Patent Owner identifies where we view the focus of the dispute to be, explaining that "Petitioner's argument that one value that is a measurement of the current can satisfy both limitations would render the first wherein clause that recites the 'value' input [(i.e., the Value Limitation)] superfluous." PO Sur-reply 8 (citing *Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.*, 853 F.3d 1272, 1288 (Fed. Cir. 2017) ("It is highly disfavored to construe terms in a way that renders them void, meaningless, or superfluous.")); *see also PO Resp.* 9 (arguing that "[c]laims must be interpreted with an eye toward giving effect to all terms in the claim" (quoting *Becton, Dickinson*, 616 F.3d at 1257)).

Although the '758 patent makes clear that "a value" may include "current," we agree with Patent Owner that the two independent limitations should be construed such that the Value Limitation does not render superfluous the Measured Current Limitation. Our determination is further supported, as explained above, by Petitioner's failure to show that its proposed construction is supported by the Specification or the prosecution history. Patent Owner has shown that if the Measured Current Limitation does no more than further limit the Value Limitation, as Petitioner contends, then the Value Limitation is rendered superfluous. Accordingly, we conclude that Petitioner has not sufficiently supported its proposed construction and determine that the Value Limitation and the Measured Current Limitation require two separate inputs to the external power source.

2. Additional Claim Terms

Claims 2, 6, and 10 recite "wherein said current passing through said internal power source declines as said voltage of said internal power source increases during a charging cycle." Ex. 1001, 22:47–67, 23:67–24:17, 25:11–26. We address below Petitioner's contentions with regard to the construction of this claim language in our analysis of alleged anticipation by Baumann. *See infra* § II.F. We find no additional claim term requires express construction. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) ("[W]e 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))).

D. Scope and Content of the Prior Art

To demonstrate the unpatentability of claims 1, 2, 4–6, 8–10, and 12 of the '758 patent, Petitioner relies on Schulman, the Fischell Article, and

Baumann. Pet. 8–10. A brief summary of each of these references, focused on the teachings relied upon by Petitioner, is provided below.

1. Summary of Schulman

Schulman, titled Rechargeable Tissue Stimulating System, generally "relates to a rechargeable tissue stimulating system for providing a charge to a voltage source implanted in a living being, and for regulating recharging of the voltage source through the use of a telemetry circuit." Ex. 1005, 1:7–11. Schulman describes the use of an induction coil external to the patient that "is used to induce current flow in a charging circuit located beneath the skin of the patient" and "external means" that "modulate the strength of the charging magnetic field, as well as provide visual or audio indication of proper charging as well as the proper positioning of the external power source with respect to the implanted charging circuit, completion of the proper charging interval to restore the amount of current used, and improper charging." *Id.* at code (57).

Figure 1 of Schulman is reproduced below.

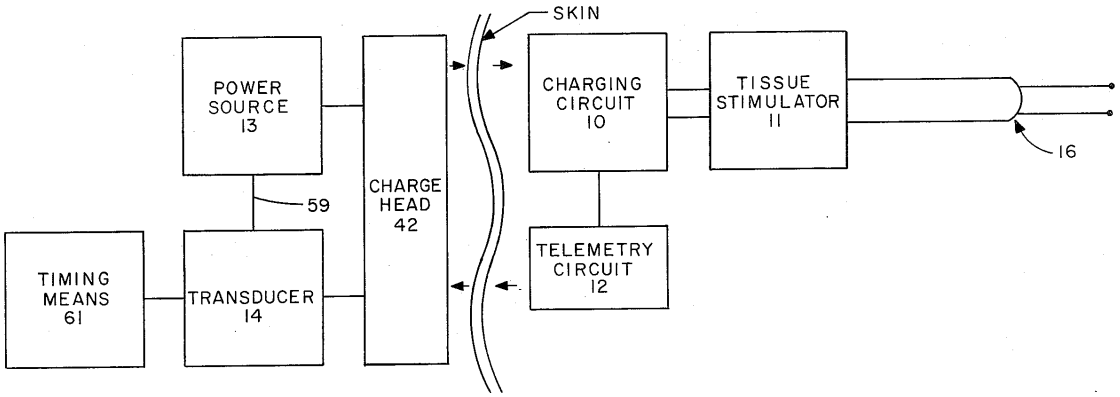

FIG. 1

Figure 1 is a block diagram of a rechargeable tissue stimulating system of Schulman. *Id.* at 3:16–17, 3:42–46. The system includes charging circuit 10, with telemetry circuit 12 and tissue stimulator 11, for

implantation in the body. *Id.* at 3:42–46. External to the patient, the system further includes power source 13 with transducer 14 "in the form of a detector circuit for recharging and for verifying the charging condition of the implanted portions of the tissue stimulating system," charge head 42, and timing means 61. *Id.* at 3:47–53. "The output of transducer 14 is used to control the power oscillator output energy and is used to drive the timing means 61, which includes a timing and indicator circuit." *Id.* at 3:55–58.

2. Summary of the Fischell Article

The Fischell Article, titled "A Long-lived, Reliable, Rechargeable Cardiac Pacemaker," describes a cardiac pacemaker system with a "rechargeable cell specifically adapted for use at body temperature." Ex. 1006, 357. The system includes an external device with a charger head that transfers energy to a pickup coil in the implant in order to recharge the battery. *Id.* at 372 (disclosing "the external charger applies an alternating magnetic field which is picked up through the intact skin by the pulse generator's pickup coil"), Fig. 8.

Figure 8 of the Fischell Article is reproduced below.

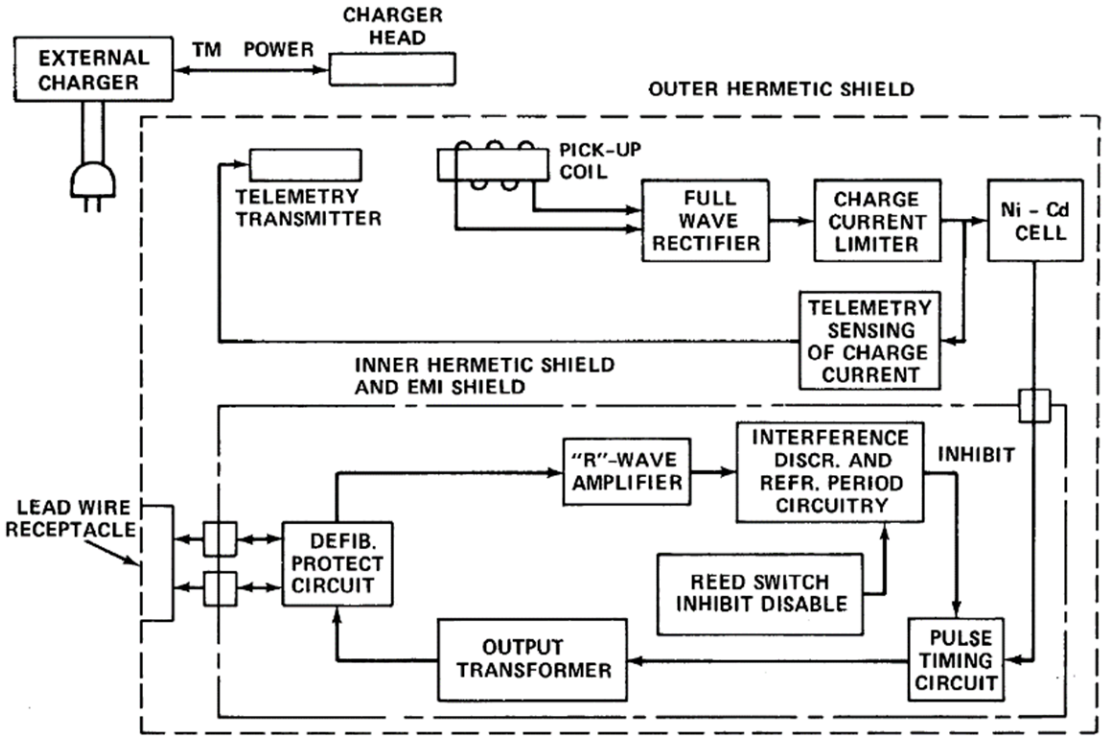

Fig. 8 Block diagram of rechargeable demand pacemaker

Figure 8 of the Fischell Article is a block diagram of the rechargeable cardiac pacemaker system described in the Fischell Article. *Id.* at 369. Petitioner describes the system shown in Figure 8 as follows:

> a block diagram of a rechargeable pacemaker system showing an "external charger" and a hermetically sealed rechargeable pacemaker or "pulse generator" that is implanted beneath the skin of the patient. The implantable device includes a "pick-up coil" that interfaces with an induction coil in the "charger head" of the external device, circuitry to convert the magnetic energy to current for charging an internal rechargeable battery, a "Ni-Cd cell," a block titled "telemetry sensing of charge current" that is coupled between the battery and a "telemetry transmitter" that transmits information back to the external charger. "When the external charger applies an alternating magnetic field which is picked up through the intact skin by the pulse generator's pickup coil, a telemetry system is powered whose output frequency from the pacer is proportional to the charge current in the battery." Ex. 1006 at 372–373. The charger head of the external charger

> detects this frequency and "closed-loop controls the battery charge current" to bring it to a desired value (e.g., 40 mA). Ex. 1006 at 373.

Pet. 28–29.

A telemetry transmitter in the Fischell Article communicates back to the external device the charge current in the battery. Ex. 1006, 370–373 (disclosing "a telemetry system is powered whose output frequency from the pacer is proportional to the charge current in the battery"), Fig. 8 (noting a box for telemetry sensing of charge current), Table 3 (noting a "Battery charge current telemetry" item). If the battery is not charging properly due to misalignment (i.e., the current level is too low), the user is made aware by a beeping sound and flashing lights on the external device. *Id.* at 377–378. If the battery is receiving too much current, a feedback control system maintains charge at the appropriate level. *Id.* at 367 ("The charging circuit for the rechargeable pacer limits the charge (and overcharge) current into the battery to 40 mA."), 372 (disclosing "telemetry . . . to measure and control charge current into the battery"), 373 ("The external charg[ing] detects [the telemetry] and closed-loop controls the battery charge current to a value of 40 mA."), 378 ("A feedback control system in the charger maintains the battery charge current at the proper 40 mA level.").

3. Summary of Baumann

Baumann, titled Device and Process for Charging of Rechargeable Batteries of Implants, generally "relates to a charging device for charging of rechargeable NiCd, Ni-metal hydride or lithium batteries of implants . . . by transcutaneous transmission of electric power from an external power transmission part to a power receiving part which forms a part of the implant." Ex. 1007, 1:7–19. Baumann explains that "[w]hen a battery is

charged, only one part of the supplied electric power is converted into charge," that "[a]nother part of this power is converted into heat on the internal resistance of the battery and is lost for charging," and that the "power loss can lead to an impermissible temperature rise of the implant housing, and thus, to damage of the surrounding tissue." *Id.* at 1:29–34. Baumann seeks to avoid such problems and further describes a process for charging implanted batteries where, in a first charging phase, "a relatively high charging current flows," and "after the cell voltage of the battery has reached a predetermined limiting charging voltage, in a second charging phase, the charging current is reduced compared to the charging current flowing at the end of the first charging phase." *Id.* at 1:20–27.

Figure 1 of Baumann is reproduced below.

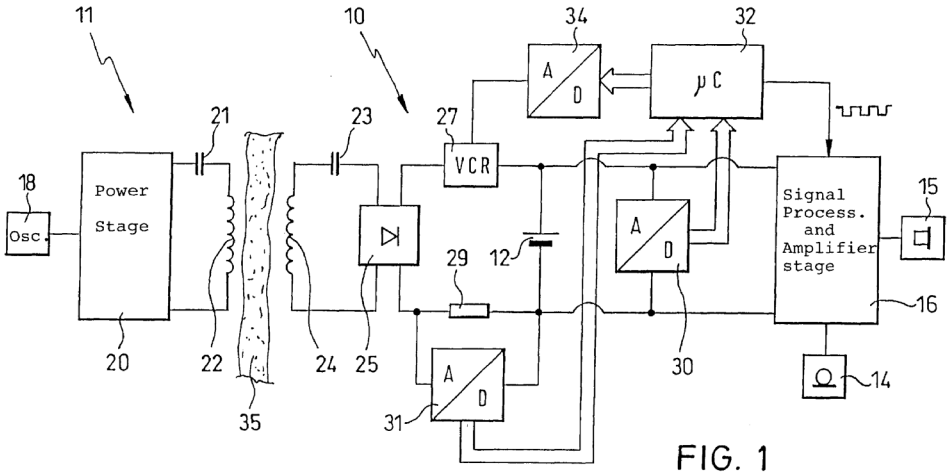

FIG. 1

Baumann Figure 1 "shows a schematic circuit diagram of an electronic hearing implant with a charging device." *Id.* at 3:47–49. The charging device illustrated in Figure 1 includes implantable power receiving part 10, external power transmission part 11, and rechargeable battery 12. *Id.* at 3:60–65. Baumann further explains the following:

> A charging process begins with the external field coil 22 being placed on the outside of the skin 35 of the implant wearer such that it is aligned at least approximately with the implant coil 24. The electronic power stage 18, in interaction with the oscillator 18, . . . an alternating current supplies to the field coil 22 which has a frequency in the range from 40 kHz to 50 MHz. The alternating electromagnetic field produced by the field coil 22 transcutaneously induces in the implant coil 24 an alternating current which is rectified in the rectifier stage 25. The battery 12 is charged with the rectified charging current I_L, via the VCR 27 which is in series with the output of the rectifier stage 25, the instantaneous resistance value of the VCR 27, which is controlled by the microcontroller 32 via the D/A converter 34, determining the charging current I_L supplied to the battery from the rectifier stage 25. The size of the charging current I_L is determined from the voltage drop on the current measuring resistor 29, and a corresponding measured quantity travels to the microcontroller 32 via the A/D converter 31.

Id. at 4:36–55. Additionally, Baumann states that "[t]he means necessary to set the charging current I_L . . . can . . . be housed in an implantable power receiving part 10," or "it can also be in the external power transmission part 11 or distributed between both parts 10 and 11." *Id.* at 5:59–64. According to Baumann, battery charging "is regulated depending on the internal resistance of the battery," such that "the cell is charged only with as much energy as the electrochemical state allows, without excess gassing or heating of the cell occurring." *Id.* at 2:33–37. Baumann also discloses that when the voltage reaches a certain level it "sets back," or lowers, the current. *Id.* at 5:14–22 ("When monitoring of the cell voltage U_Z . . . indicates that the cell voltage has reached a limiting [value] U_G, the microcontroller 32 . . . sets back the charging current I_L for a second charging phase T2.").

Figure 3 of Baumann is reproduced below:

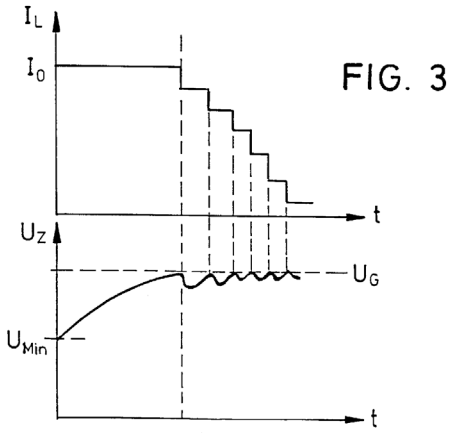

FIG. 3

Figure 3 depicts two graphs showing the relationship between charge current I_L over time, and battery voltage U_Z over time. *See id.* at 4:63–5:35. As shown in Figure 3, after the voltage U_Z hits a threshold value U_G, current I_L is varied in a stepwise function over time. *Id.* at 5:14–22.

E. Alleged Anticipation of Claims 1, 5, and 9 by Schulman, by the Fischell Article, and by Baumann

Petitioner contends that claims 1, 5, and 9 of the '758 patent are anticipated by Schulman, by the Fischell Article, and by Baumann. Pet. 12–70. We focus our discussion on Petitioner's argument with regard to the Value Limitation and Measured Current Limitation, because it is dispositive.

As to each asserted anticipatory reference, Petitioner contends that the Measured Current Limitation of each claim "simply narrows the 'value' of" the Value Limitation and that both the Value Limitation and the Measured Current Limitation are satisfied by the same disclosure of a single input. Pet. 19, 20, 23, 24, 26, 27, 35, 36, 40, 44, 45, 52–56, 64, 65, 69, 70. Petitioner does not contend in the Petition that Schulman, the Fischell Article, or Baumann discloses an external powers source that automatically varies its power output based on two inputs, one corresponding to the Value Limitation and another to the Measured Current Limitation. *See id.* For the

reasons provided in our claim construction discussion above, *supra* § II.C.1, we reject Petitioner's contention that a single input disclosed by each of the asserted references may satisfy both the Value Limitation and the Measured Current Limitation of claims 1, 5, and 9, which require two separate inputs to the external power source. Thus, Petitioner fails to show by a preponderance of the evidence that a single input taught by Schulman, the Fischell Article, or Bauman discloses both the Value Limitation and the Measured Current Limitation, as required by claims 1, 5, and 9.

Belatedly, Petitioner seeks to argue in its Reply that "[e]ven if the Board adopts [Patent Owner's] understanding that the claims require a separate input for 'a value' and 'a measured current,'" each of Schulman, the Fischell Article, and Baumann "still anticipates claims 1, 5, and 9." Pet. Reply 10, 12, 13. Petitioner then proceeds to argue for the first time that features of each of the asserted references correspond to a second input that automatically varies the power output of the external power source. *Id.* at 10–14. In so doing, Petitioner fails to meet its burden to show in the Petition "[h]ow the challenged claim is to be construed," but instead relies on Patent Owner to show in its Response to the Petition the proper construction. 37 C.F.R. § 42.104(b)(3). Petitioner's Reply is not an opportunity to advance new arguments based on new testimony in an effort to show that challenged claims are unpatentable where the proper claim construction requires additional features, such as two inputs instead of one input as Petitioner alleged. *See SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1356 (2018) (stating in regard to *inter partes* review that "petitioner's petition . . . is supposed to guide the life of the litigation"); *see also Sirona Dental Sys. GmbH v. Institut Straumann AG*, 892 F.3d 1349, 1356 (Fed. Cir. 2018) (stating that "[b]ecause an IPR must proceed '[i]n accordance

with' or 'in conformance to' the petition," it would "not be proper for the Board to deviate from the grounds in the petition") (quoting *SAS Inst.*, 138 S. Ct. at 1357)).

Patent Owner argues, and we agree, that consideration of arguments raised improperly by Petitioner for the first time in its Reply is unwarranted. PO Sur-reply 9–11 (citing Consolidated Trial Practice Guide (November 2019) ("CTPG") 73 ("Petitioner may not submit new evidence or argument in reply that it could have presented earlier, e.g. to make out a prima facie case of unpatentability."), 74 ("'Respond,' in the context of 37 C.F.R. § 42.23(b), does not mean proceed in a new direction with a new approach as compared to the positions taken in a prior filing. While replies and sur-replies can help crystalize issues for decision, a reply or sur-reply that raises a new issue or belatedly presents evidence may not be considered.") (citing *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369–70 (Fed. Cir. 2016))). Moreover, Patent Owner identified the new arguments advanced by Petitioner, and Petitioner had the opportunity to show where the arguments were raised prior to its Reply. Paper 23, 2; Paper 26, 1–2. Instead of identifying a specific location where the argument was raised in the Petition, Petitioner broadly cites to fifty-five pages of the Petition, none of which suggest in any way that Petitioner contended that claims 1, 5, and 9 required a separate input for "a value" and "a measured current," much less that any of the asserted references disclosed the same.

In considering whether Petitioner could have presented its arguments earlier in its Petition, we find that Petitioner chose to interpret the claims as requiring only a single input, going so far as to affirmatively assert in the Petition that the Specification of the '758 patent "does not describe two separate measurements." Pet. 19. As discussed above, Petitioner in its

Reply abandons that argument, conceding instead that "Petitioner does not dispute that there are embodiments [in the '758 patent] where power output would vary based on two different values associated with a current passing through the internal power source." Pet. Reply 8. Thus, Petitioner had an adequate opportunity to assess the '758 patent and to understand that it disclosed support for two separate measurements, but failed to do so. Petitioner's apparent misapprehension of what is disclosed in the '758 patent in its Petition does not afford Petitioner the opportunity to present new arguments in Reply in an attempt to show for the first time that claimed features are disclosed by other elements of the asserted references. Petitioner may respond to arguments raised in the Patent Owner Response in its Reply; however, its Reply may not offer an entirely new rationale based on a new combination of elements in the asserted references to show unpatentability based on what amounts to a new ground not set forth in the Petition. *See* CTPG 73–74.

We further find Petitioner's need to file a supplemental declaration from Dr. Panescu, who maintains that two inputs are not required by the claims, but further opines for the first time that if two inputs are required by the claims, each of the asserted references still anticipates claims 1, 5, and 9, supports our determination that Petitioner improperly seeks to advance new arguments in its Reply. Ex. 1012 ¶¶ 11–38. Such testimony is not offered in support of the arguments advanced in the Petition, but to instead present a new rationale based on new features that go well beyond proper supplemental testimony. *See, e.g.*, *id.* ¶ 13 (Dr. Panescu stating that he disagrees "at least for the reasons set forth" in his prior declaration that two inputs are required). Accordingly, we find Petitioner's arguments that each of the asserted references discloses two inputs are improper reply arguments

based on improper reply testimony, and we do not give them weight. For the foregoing reasons, we conclude that Petitioner fails to show by a preponderance of the evidence that any of claims 1, 5, and 9 are anticipated by any of Schulman, the Fischell Article, or Baumann.[7]

F. Alleged Anticipation of Claims 2, 6, and 10 by Baumann

Petitioner contends that claims 2, 6, and 10 of the '758 patent are anticipated by Baumann. Pet. 45–58, 62–65, 67–70. Each of claims 2, 6, and 10 recites, among other limitations, "wherein said current passing through said internal power source declines *as* said voltage of said internal power source increases during a charging cycle" (the "Declines Limitation"). Ex. 1001, 22:47–67, 23:67–24:17, 25:11–26 (emphasis added). We focus our discussion on the parties' dispute over the Declines Limitation, which we find dispositive in favor of Patent Owner.

[7] In its Sur-reply, Patent Owner further disputes the merits of Petitioner's Reply arguments, asserting that Schulman, the Fischell Article, and Baumann do not disclose that an external power source automatically varies its power output based on two inputs. PO Sur-reply 11–15. However, as Patent Owner states, the record is incomplete because "allowing Petitioner to raise such new arguments and evidence at this late stage is highly prejudicial to [Patent Owner] given it does not get an opportunity to rebut such new allegations with its own evidence (e.g., expert testimony), which [Patent Owner] would have submitted if it were allowed to do so." *Id.* at 10–11. To be clear, Patent Owner did not seek leave to submit additional expert testimony. Nevertheless, we agree with Patent Owner that new evidence is not typically permitted in support of a sur-reply. *See* 37 C.F.R. § 42.23(b) ("A sur-reply . . . may not be accompanied by new evidence other than deposition transcripts of the cross-examination of any reply witness."). Moreover, we agree with Patent Owner that it would be prejudicial to Patent Owner to be required to refute what amounts to a new ground of unpatentability not raised in the Petition, but instead asserted for the first time by Petitioner in its Reply. Thus, reaching the merits of the new arguments raised by Petitioner on an incomplete record is unwarranted.

> In regard to the Declines Limitation, Petitioner argues as follows:
>
> > The use of the term "as" in the claim, at first glance, suggests an inverse relationship between the change in battery voltage and battery current that is continuous in the course of the change. However, the only instance where it could be argued the '758 Patent describes the relationship between the battery charging current and battery voltage with any specificity is, with reference to the flow diagram in FIG. 19, at column 21, [lines 55 to 60].

Pet. 57 (emphasis omitted).[8] Petitioner appears to recognize that the ordinary meaning (i.e., "at first glance") of the recited current that declines "as" voltage increases corresponds to an "inverse relationship" between voltage and current. *See id.* Petitioner seeks to depart from this ordinary meaning by directing us to a portion of the Specification of the '758 patent that Petitioner refers to as "the only instance where it could be argued" that the relationship required by the Declines Limitation is described. Petitioner, however, fails to show that the portion of the Specification it relies on describes the Declines Limitation.

The portion of the Specification relied on by Petitioner states as follows:

> If no over temperature condition exists, charging unit 50 checks (328) to determine if the voltage across rechargeable power source 24 is over a voltage at which the charging rate should begin to decrease, e.g., 4.05 volts. If the voltage across rechargeable power [source] 24 is greater than 4.05 volts, then charging unit 50 begins to taper charging power (330).

Id. at 57–58 (quoting Ex. 1001, 21:55–60) (emphasis omitted). Figure 19 of the '758 patent is reproduced and described above. *See supra* § I.D.

[8] In the Petition, Petitioner incorrectly identifies the excerpt of the '758 patent quoted as corresponding to column 21, lines 38 to 43, which we understand was intended to be lines 55 to 60. *See* Pet. 57–58; Ex. 1001, 21:55–60.

According to Petitioner, this portion of the Specification discloses that "charging current does not decrease in a continuous manner as the battery voltage increases during charging, and instead 'begins to taper' only after it is determined that the increasing battery voltage has reached a level that 'is greater than 4.05 volts.'" Pet. 58 (emphasis omitted). Petitioner contends that "[t]his is precisely how Baumann's 'charging current detector' operates." *Id.* (citing Ex. 1003 ¶ 104) (emphasis omitted). Thus, Petitioner's contention that Baumann anticipates claims 2, 6, and 10 turns on whether Petitioner's construction of the Declines Limitation is correct. Patent Owner argues that Petitioner's contentions reflect an "attempt to reinterpret the relevant claim language and ignore their plain language." PO Resp. 29.

Petitioner's argument is fundamentally flawed because the portion of the Specification it relies on has not been shown to be a description of what is required by the Declines Limitation. The portion of the Specification Petitioner relies on does not disclose the voltage of the internal power source (i.e., rechargeable power source 24) *increasing*, as required by the Declines Limitation. Instead, it discloses assessing whether the voltage across the internal power source "is greater than" a certain value and it discloses the possibility of external charging unit 50 beginning to taper its charging power. *See* Ex. 1001, 21:55–60. Neither Petitioner nor Dr. Panescu has adequately explained how the portion of the Specification of the '758 patent relied upon by Petitioner discloses, corresponds to, or is connected to what is recited in the Declines Limitation. *See* Pet. 53 (citing Ex. 1003 ¶ 104).

Thus, Petitioner fails to show any support from the Specification that the Declines Limitation *includes* within its scope instances in which the current in an internal power source declines "only after" the voltage of the

internal power source increases during a charging cycle. Pet. 58 (citing Ex. 1003 ¶ 104); *see also* Ex. 1003 ¶ 104 (Dr. Panescu stating in regard to the Declines Limitation that it "requires that current declines as a result of, or following, an increase of battery voltage by an amount during a charging current" (emphasis omitted)).

Petitioner also argues that Patent Owner's proposed construction of the Declines Limitation would exclude the embodiment described in the Specification of the '758 patent relied upon by Petitioner. *See* Pet. Reply 15–16 (citing *Nobel Biocare Servs. AG v. Instradent USA, Inc.*, 903 F.3d 1365, 1381 (Fed. Cir. 2018)). We, however, need not address Patent Owner's proposed construction to ascertain whether Petitioner has shown that Baumann discloses the Declines Limitation. Petitioner's argument that Baumann discloses the Declines Limitation is based on Petitioner's proposed construction, which we reject for the reasons provided above. *See also* PO Resp. 31 (noting that "Petitioner repeatedly acknowledges that its analysis of Baumann with respect to [the Declines Limitation] relies on the battery current declining only after the battery voltage reaches a predetermined limiting charging voltage UG, which then remains roughly constant" (citing Pet. 57–58, 65, 70; Ex. 1003 ¶¶ 103–105)). Petitioner has not demonstrated by a preponderance of the evidence that Baumann discloses the Declines Limitation for the preceding reason. Accordingly, Petitioner fails to show by a preponderance of the evidence that Baumann anticipates claims 2, 6, and 10.

G. Alleged Anticipation of Claims 4, 8, and 12 by Baumann

Petitioner contends that claims 4, 8, and 12 of the '758 patent are anticipated by Baumann. Pet. 48–55, 60–64, 67–69, 71, 72. Each of claims 4, 8, and 12 recites, among other limitations, "wherein said external

power source terminates its power output if said current passing through said internal power source is below a minimum amount" (the "Terminates Limitation"). Ex. 1001, 23:25–45, 24:42–60, 26:15–30. We focus our discussion on the parties' dispute over the Terminates Limitation, which we find dispositive in favor of Patent Owner.

Petitioner contends that Baumann discloses the Terminates Limitation by providing that the charging process ends when "the time change of the charging current" is "less than a stipulated minimum value."[9] Pet. 60 (quoting Ex. 1007, 5:36–45 (further stating that the time change of the charging current "can then be performed directly by acquiring the voltage which drops on the current measuring resistor 29 via the A/D converter 31") (emphasis omitted)). Petitioner suggests that Baumann discloses that when the current is below a minimum amount, the "time change of the charging current" is less than a minimum value and the charging process ends. *Id.* at 61 (citing Ex. 1003 ¶ 116). Petitioner, however, offers no persuasive explanation and identifies no evidence in the Petition to show that termination of the charging process when "the time change of the charging current" is less than a minimum value, as disclosed by Baumann, is the same as termination of the charging process when the current passing through the internal power source is below a minimum amount, as required by claims 4, 8, and 12. *See*, *e.g.*, Pet. 60–63; *see also* Ex. 1003 ¶ 116 (providing the same explanation that appears in the Petition).

[9] The parties variously refer to "the time change of the charging current," "the slope of the charging current curve," "the time derivative of the charging current," "$\Delta I_L/\Delta t$" where "I_L" is current and "t" is time, and "the derivative of I_L" as meaning the same thing. *See* Pet. 60–62; PO Resp. 32–35. For consistency, we will always use "the time change of the charging current."

Patent Owner argues that Baumann fails to disclose the Termination Limitation. PO Resp. 31–35. According to Patent Owner, "the time change of the charging current" is not the charging current, and "does not indicate the amount of current passing through the battery 12 at any given time," because it "can only indicate the rate of change of the current at that time." *Id.* at 33. Patent Owner reasons that it is possible to have a high current when "the time change of the charging current" is low or zero, or to have a low current when "the time change of the charging current" is high. *Id.* at 33–35. Patent Owner maintains that "the time change of the charging current" "at any given time is clearly not indicative of the amount of charging current (I_L) passing through the battery." *Id.* at 35 (citations omitted).

In its Reply, Petitioner argues that "Baumann discloses terminating the power output of the external power source *based on* an amount of current as required in claims 4, 8, and 12." Pet. Reply 16 (emphasis added). Petitioner attempts to reason that "the time change of the charging current" is "directly determined from the known voltage, and thus, through Ohm's law, the known charging current." *Id.* at 17. Petitioner also argues in its Reply that when "the time change of the charging current" is "below a minimum value, the charging current I_L is also below a minimum value." *Id.* (citing Ex. 1003 ¶ 116). Petitioner's assertion disregards the express language of the Termination Limitation of claims 4, 8, and 12, which requires termination when the "current passing through" the internal power source "is below a minimum amount." Merely showing that termination occurs "based on" an amount of current is beyond the scope of the Termination Limitation.

Petitioner also faults Patent Owner for "focusing only on the slope" in its understanding of Baumann, suggesting that Baumann would be nonfunctional and that "it cannot be that only the slope of the charging current determines when charging terminates" in Baumann. *Id.* at 17–18. The burden, however, is not on Patent Owner to explain how Baumann operates, and Petitioner's suggestion that termination in Baumann must somehow be "based on" something other than only "the time change of the charging current" is unsupported, unexplained, and unpersuasive. *See* Pet. Reply 18. We agree with Patent Owner that Petitioner's assertions are speculative and unsupported by the express statements in Baumann. PO Sur-reply 18–19 (citing, e.g., Ex. 1007, 5:36–42). Thus, as Patent Owner notes, even if the current value is used in determining "the time change of the charging current," Petitioner still fails to show how Baumann discloses terminating charging based on the current value itself being below some minimum. *Id.* at 19.

Petitioner fails to show that the Termination Limitation merely requires termination "based on" an amount of current. Petitioner also fails to show that Baumann's termination based on "the time change of the charging current" discloses termination when the current is below a minimum amount, as required by claims 4, 8, and 12. Accordingly, for the preceding reasons, we determine that Petitioner fails to show by a preponderance of the evidence that Baumann anticipates claims 4, 8, and 12.

H. Alleged Obviousness over the Combination of Schulman and Baumann

Petitioner asserts the subject matter of claims 2, 4, 6, 8, 10, and 12 of the '758 patent would have been obvious over Schulman and Baumann. Pet. 72–90. Petitioner's contentions are supported by Dr. Panescu. Ex. 1003

¶¶ 117–130, Ex. B. Petitioner provides claim charts that in large part do no more than direct us to other portions of the Petition where Petitioner contends certain limitations are anticipated by Schulman or Baumann. Pet. 75–90.

1. Claims 2, 6, and 10

Each of claims 2, 6, and 10 includes the Declines Limitation, which Petitioner only contends is taught by Baumann based on the same arguments Petitioner advances in support of its contention that Baumann anticipates claims 2, 6, and 10. Pet. 78, 84, 88. For the reasons provided above, Petitioner fails to show that Baumann discloses or teaches the Declines Limitation. *See*, *supra* § II.F. Accordingly, Petitioner fails to show by a preponderance of the evidence that any of claims 2, 6, or 10 would have been obvious over the combination of Schulman and Baumann.

2. Claims 4, 8, and 12

Each of claims 4, 8, and 12 includes the Terminates Limitation, which Petitioner only contends is taught by Baumann based on the same arguments Petitioner advances in support of its contention that Baumann anticipates claims 4, 8, and 12. Pet. 80, 81, 86, 90. For the reasons provided above, Petitioner fails to show that Baumann discloses or teaches the Terminates Limitation. *See supra* § II.G. Accordingly, Petitioner fails to show by a preponderance of the evidence that any of claims 4, 8, or 12 would have been obvious over the combination of Schulman and Baumann.

I. Alleged Obviousness over the Combination of the Fischell Article and Baumann

Petitioner asserts the subject matter of claims 2, 4, 6, 8, 10, and 12 of the ’758 patent would have been obvious over the Fischell Article and Baumann. Pet. 90–107. Petitioner’s contentions are supported by

Dr. Panescu. Ex. 1003 ¶¶ 131–146, Ex. B. Petitioner provides claim charts that in large part do no more than direct us to other portions of the Petition where Petitioner contends certain limitations are anticipated by the Fischell Article or Baumann. Pet. 75–90.

1. Claims 2, 6, and 10

Each of claims 2, 6, and 10 includes the Declines Limitation, which Petitioner only contends is taught by Baumann based on the same arguments Petitioner advances in support of its contention that Baumann anticipates claims 2, 6, and 10. Pet. 96, 100, 101, 105. For the reasons provided above, Petitioner fails to show that Baumann discloses or teaches the Declines Limitation. *See supra* § II.F. Accordingly, Petitioner fails to show by a preponderance of the evidence that any of claims 2, 6, or 10 would have been obvious over the combination of the Fischell Article and Baumann.

2. Claims 4, 8, and 12

Each of claims 4, 8, and 12 includes the Terminates Limitation, which Petitioner only contends is taught by Baumann based on the same arguments Petitioner advances in support of its contention that Baumann anticipates claims 4, 8, and 12. Pet. 97, 98, 102, 106, 107. For the reasons provided above, Petitioner fails to show that Baumann discloses or teaches the Terminates Limitation. *See supra* § II.G. Accordingly, Petitioner fails to show by a preponderance of the evidence that any of claims 4, 8, or 12 would have been obvious over the combination of the Fischell Article and Baumann.

III. CONCLUSION

Claims 1–12 of the '758 patent were challenged in the Petition; however, claims 3, 7, and 11 were subsequently disclaimed by Patent Owner. The remaining claims challenged were not shown to be

unpatentable by a preponderance of the evidence, as summarized in the table below.

Claim(s)	35 U.S.C. §	Reference(s)	Claim(s) Shown Unpatentable	Claims Not Shown Unpatentable
1, 5, 9	102	Schulman		1, 5, 9
1, 5, 9	102	Fischell Article		1, 5, 9
1, 2, 4–6, 8–10, 12	102	Baumann		1, 2, 4–6, 8–10, 12
2, 4, 6, 8, 10, 12	103	Schulman, Baumann		2, 4, 6, 8, 10, 12
2, 4, 6, 8, 10, 12	103	Fischell Article, Baumann		2, 4, 6, 8, 10, 12
Overall Outcome				1, 2, 4–6, 8–10, 12

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that claims 1, 2, 4–6, 8–10, and 12 of the ’758 patent have not been proven by a preponderance of the evidence to be unpatentable; and

FURTHER ORDERED that, as this is a Final Written Decision, a party seeking judicial review of the Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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