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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

NEVRO CORP.,
Petitioner,

v.

BOSTON SCIENTIFIC NEUROMODULATION CORP.,
Patent Owner.

Case No. IPR2017-01899
Patent No. 7,587,241 B2

Before HUBERT C. LORIN, MICHAEL W. KIM, and AMANDA F. WIEKER, Administrative Patent Judges.

LORIN, *Administrative Patent Judge*.

DECISION
Institution of *Inter Partes* Review
35 U.S.C. § 314 and 37 C.F.R. § 42.108

I. INTRODUCTION

A. Background

Nevro Corp. ("Petitioner") filed a Petition requesting *inter partes* review of claims 1–20 of U.S. Patent No. 7,587,241 B2 (Ex. 1001, "the '241 patent") pursuant to 35 U.S.C. §§ 311–319. Paper 2 ("Pet."). Boston

Scientific Neuromodulation Corp. ("Patent Owner") filed a Preliminary Response to the Petition (Paper 9, "Prelim. Resp.").

We have jurisdiction under 35 U.S.C. § 314.

Upon consideration of the arguments and evidence presented by Petitioner and Patent Owner, we are persuaded that Petitioner has demonstrated, under 35 U.S.C. § 314(a), a reasonable likelihood that it would prevail in showing the unpatentability of the challenged claims. Accordingly, we grant Petitioner's request and institute an *inter partes* review of claims 1–20 of the '241 patent.

B. Related Proceedings

Petitioner notifies us that "[t]he '241 patent is the subject of one civil action: *Boston Scientific Corporation et al. v. Nevro Corp.*, Case No. 1:16-cv-01163 [(D. Del)], filed December 9, 2016." Pet. 71; *see also* Paper 5, 2 (indicating the same).

C. The '241 patent (Ex. 1001)

1. Effective Filing Date

Petitioner indicates that "June 28, 2002" is the earliest priority date of '241 patent. Pet. 7. This is in accord with the information recited on the cover of the '241 patent.

2. Disclosure

The '241 patent, titled "Method For Controlling Telemetry In An Implantable Medical Device Based On Power Source Capacity," is directed

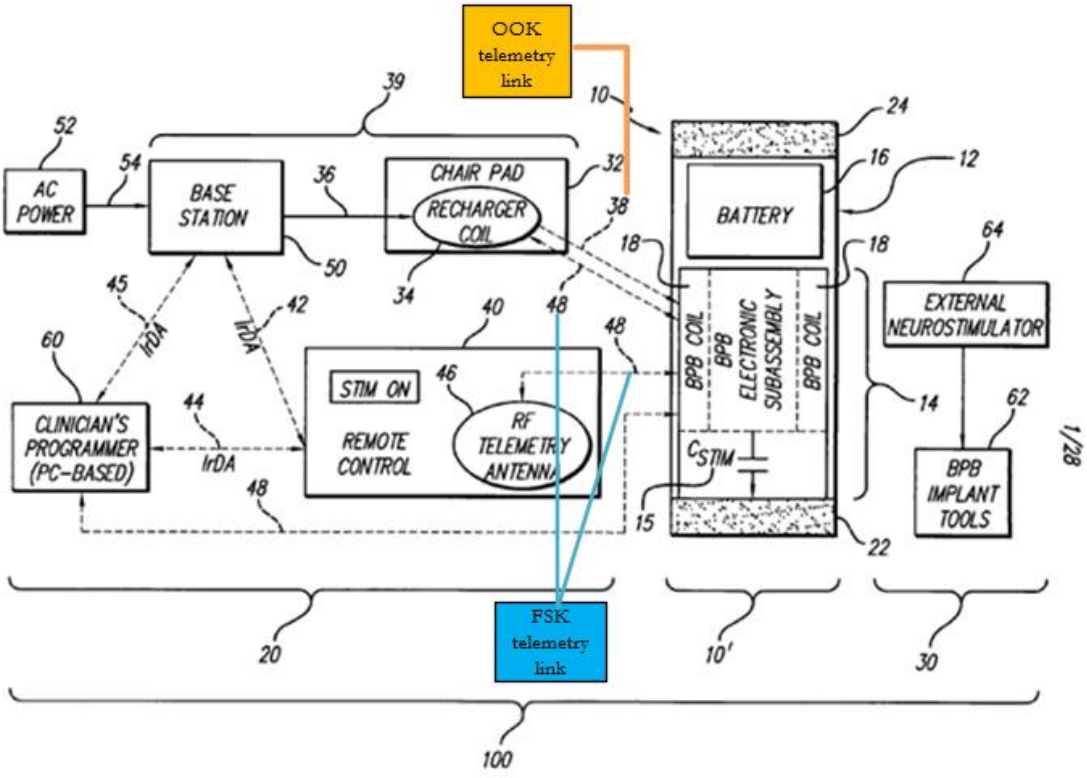
to a microstimulator device incorporating a self-contained power source.

Ex. 1001, (57). According to the patent,

> [d]espite the various types of microstimulators known in the art, . . . , significant improvements are still possible and desirable, particularly relative to a microstimulator with a self-contained primary or rechargeable battery that: (a) can accommodate the various needs of a microstimulator; (b) can accommodate various locations in the implanted site; and/or (c) can allow the microstimulator to operate longer between charges or replacement.

Ex. 1001, 2:53–60.

The improved microstimulator is illustrated as element 10 in FIG. 1, and is reproduced below, with colored annotations added by the panel.



> "FIG. 1 is a block diagram for an exemplary battery-powered BION (BPB) system made in accordance with the present invention." Ex. 1001, 4:31–33.

Microstimulator 10, as shown in FIG. 1, is

> [a] fully assembled battery-powered microstimulator (also referred to as a BION® microstimulator, or battery-powered BION ("BPB") device) made in accordance with the present invention [that] may operate independently, or in a coordinated manner with other implanted devices, or with external devices.

Ex. 1001, 5:46–51. It is composed of (a) battery 16, which is rechargeable via external battery charging system 39 (Ex. 1001, 8:36–37), and (b) electronic subassembly 14. The two components are hermetically-sealed within case 12.

> The BPB device 10 includes a processor and other electronic circuitry that allow it to generate stimulating pulses that are applied to a patient through electrodes 22 and 24 in accordance with a program stored in programmable memory located within the electronic subassembly 14.

Ex. 1001, 11:29-33.

Microstimulator 10 contains inductive coil 18, which receives power and telemetry messages through OOK (On-Off Keying) telemetry link 38. Ex. 1001, 10:1–13, 13:55–57; *see also* Ex. 1001, FIG. 1 set forth above (orange annotation added by panel). Charging system 39 communicates with control device 10 via OOK telemetry link 38. Ex. 1001, 13:63–66.

Microstimulator 10 also receives "commands and data" from remote control 40 and/or clinician's programmer 60 (or charging system 39) via "FSK (frequency shift keying) telemetry link 48." Ex. 1001, 9:55–58 *see also* Ex. 1001, FIG. 1 set forth above (blue annotation added by panel). FSK telemetry link 48 is bidirectional. Ex. 1001, 14:1. Thus, "[r]everse

telemetry is also available through the FSK telemetry link 48. The reverse FSK telemetry link 48, allows information to be reported by the BPB device 10 to the clinician's programmer 60, the remote control 40, and/or the charging system 39." Ex. 1001, 10:14–18.

3. Claims

The '241 patent has 20 claims, all of which are challenged.

Independent claim 1 is illustrative.

> 1. A method for controlling an implantable medical device, comprising:
>
> monitoring a voltage of a power source within the implantable medical device;
>
> if the voltage is above a first threshold, enabling the following functions:
>
> listening for a first type of telemetry from a first external component;
>
> listening for a second type of telemetry from an external charging component, wherein the external charging component is used to wirelessly charge the power source; and
>
> providing stimulation to device electrodes using the power source; and
>
> if the voltage falls below the first threshold, discontinuing listening for the first type of telemetry from the first external component and discontinuing providing stimulation to device electrodes using the power source, while continuing listening for the second type of telemetry.

There are three independent claims: claims 1, 8, and 14, all to methods "for controlling an implanatable medical device." They generally parallel each other, except that claim 14 provides "therapy to [a] patient" rather than "stimulation to device electrodes using the power source"

(claims 1 and 8), and claim 8 includes a limitation "wherein the first external component is used to program stimulation parameters for the implantable medical device," further limits the stimulation-providing to be "in accordance with the stimulation parameters," and further limits the "while continuing listening for the second telemetry type" "so that the power source can be recharged."

Claims 2–7 depend from claim 1; claims 9–13 depend from claim 8; and claims 15–18 depend from claim 14.

D. References

Petitioner relies on the following references:

Name	Reference	Ex. No.
Torgerson '198	U.S. 6,453,198 B1, granted Sept. 17, 2002	1005
Torgerson '756	U.S. 7,167,756 B1, granted Jan. 23, 2007	1006
Torgerson '883	U.S. 6,456,883 B1, granted Sept. 24, 2002	1007
Abrahamson	U.S. 6,647,298 B2, granted Nov. 11, 2003	1008

E. Grounds Asserted

Petitioner contends that claims 1–20 of the '241 patent are unpatentable under the following two grounds (Pet. 7):

Ground	Basis	Prior Art	Claims
I	§ 103	Torgerson '198, Torgerson '756, and Torgerson '883	1, 3–8, 10–14, and 16–20
II	§ 103	Torgerson '198, Torgerson '756, Torgerson '883, and Abrahamson	2, 9, and 15

Petitioner also relies on the Declaration of Dr. Mark W. Kroll (Ex. 1003) as support for the above contentions.

II. ANALYSIS

A. Level of Ordinary Skill in the Art

With regard to the level of ordinary skill in the art, we determine that no express articulation is necessary based on the record before us in this case. The level of ordinary skill in the art is reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

B. Claim Construction

In an *inter partes* review, "[a] claim in an unexpired patent that will not expire before a final written decision is issued shall be given its broadest reasonable construction in light of the specification of the patent in which it appears." 37 C.F.R. § 42.100(b); *see also Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–46 (2016) (upholding the use of the broadest reasonable interpretation standard). Under the broadest reasonable interpretation standard, claim terms are generally given their ordinary and customary meaning in view of the specification, as would be understood by one of ordinary skill in the art at the time of the invention. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Furthermore, only those terms that are in controversy need to be construed, and only to the extent

necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Petitioner has not proposed any claim constructions.

Patent Owner proposes that we adopt a construction of the patent claim term "telemetry" to mean "transmission of data or information." Prelim. Resp. 4. According to Patent Owner, this proposed construction

> is consistent with the intrinsic evidence. For example, the '241 Patent provides two examples of "telemetry links," an FSK telemetry link and an OOK telemetry link. Ex. 1001 at 9:55–10:13. The specification explains that the telemetry links transmit "commands and data." *Id*.

Prelim. Resp. 6.

We agree that "the '241 patent provides two examples of 'telemetry links': an FSK telemetry link and an OOK telemetry link." Prelim. Resp. 6; *see also* Ex. 1001, FIG. 1 set forth above (orange and blue annotations added by panel). "[OOK] telemetry link 38 . . . *allows commands and data* to be sent by the charging system 39 to the BPB device 10" (Ex. 1001, 10:1–2; emphasis added), as does the FSK telemetry link 48. Ex. 1001, 9:55–58.

Also, Patent Owner "believes 'telemetry' should be given its ordinary and customary meaning." Prelim. Resp. 5. To that end, Patent Owner has submitted dictionary definitions from five sources (Exs. 2001–2005). We find that they define "telemetry" as involving the transmission of "data." *See e.g.*, Ex. 2001 (Newton's Telecom Dictionary defines telemetry as "communications system for the transmission of digital or analog data . . . .").

Based on the above, we are persuaded that "telemetry" should be construed as covering the "transmission of data or information." We are

unpersuaded, however, that "telemetry" can be properly construed as limited to the "transmission of [only] data or information."

Specifically, in the analysis of the prior art, Patent Owner attempts to rebut Petitioner's contention that the claims are unpatentable by narrowing certain recitations of "telemetry" (e.g., "second type of telemetry," as recited in each of independent claims 1, 8, and 14) to *only* include data or information, and, thereby, implicitly to exclude "energy" from the scope of "telemetry." We are unpersuaded that the aforementioned intrinsic evidence, and the submitted dictionary definitions, provide a sufficient basis for this more narrow construction.

More specifically, the Specification states that the telemetry links "allow[ ] commands and data" to be transmitted. Ex. 1001, 10:1–2. Patent Owner does not explain, and we are unable to ascertain independently, why the term "commands" would exclude "energy," for example. Furthermore, we have reviewed the supporting evidence cited by Patent Owner, but are still unable to identify a sufficient evidentiary basis for Patent Owner's narrow construction. For example, Stedman's Medical Dictionary defines "telemetry" as "[t]he science of measuring a quantity, then transmits the results by radio signals to a distant station for recording and interpretation." Ex. 2004, 5. We understand "radio signals" as encompassing, and not excluding, "energy".

C. Overview of the Prior Art References

1. Torgerson '198 (Ex. 1005)

Torgerson '198 discloses an implantable medical device [Implantable Neuro Stimulator (INS) 14]. The neurostimulation system includes lead 12,

which may have electrodes, which is "implanted and positioned to stimulate a specific site in the spinal cord or the brain." Ex. 1005, 4:59–60. The neurostimulation system further includes External Neuro Stimulator 25, physician programmer 30, and patient programmer 35. Ex. 1005, FIG. 1 (reproduced below); 4:29–31. "The physician programmer 30 . . . uses telemetry to communicate with implanted INS 14." Ex. 1005, 5:15–17.

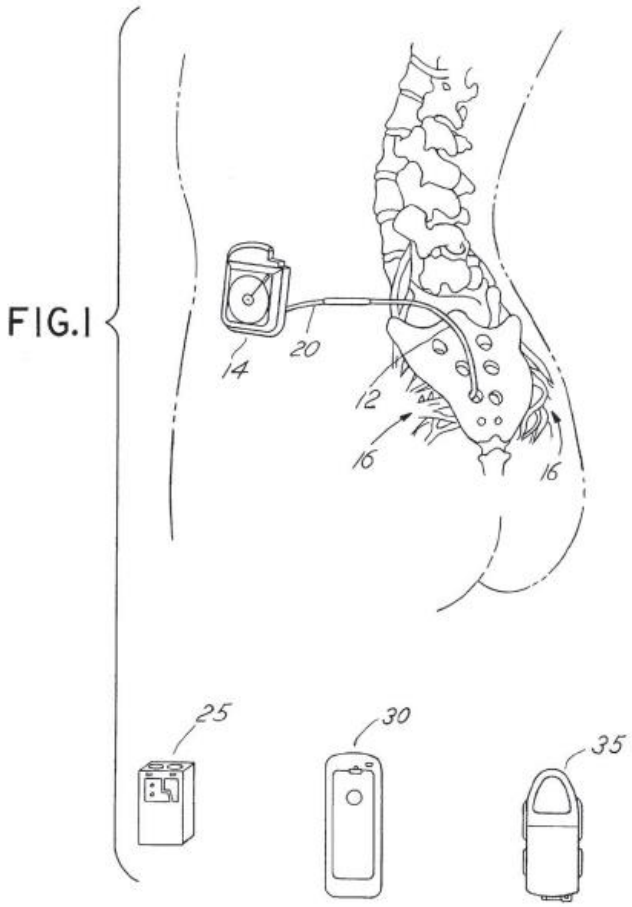


FIG. 1 depicts an implantable medical device [Implantable Neuro Stimulator (INS) 14] as implanted in a human body. Ex. 1005, 4:26–28.

"The implantable medical device generally includes a processor 335 with an oscillator 330, a calendar clock 325, memory 340, and system reset 345, a telemetry module 305, a recharge module 310, a power source 315, a power management module 320, a therapy module 350, and a therapy measurement module 335." Ex. 1005, FIGURE 3 (reproduced below); 6:14–20.

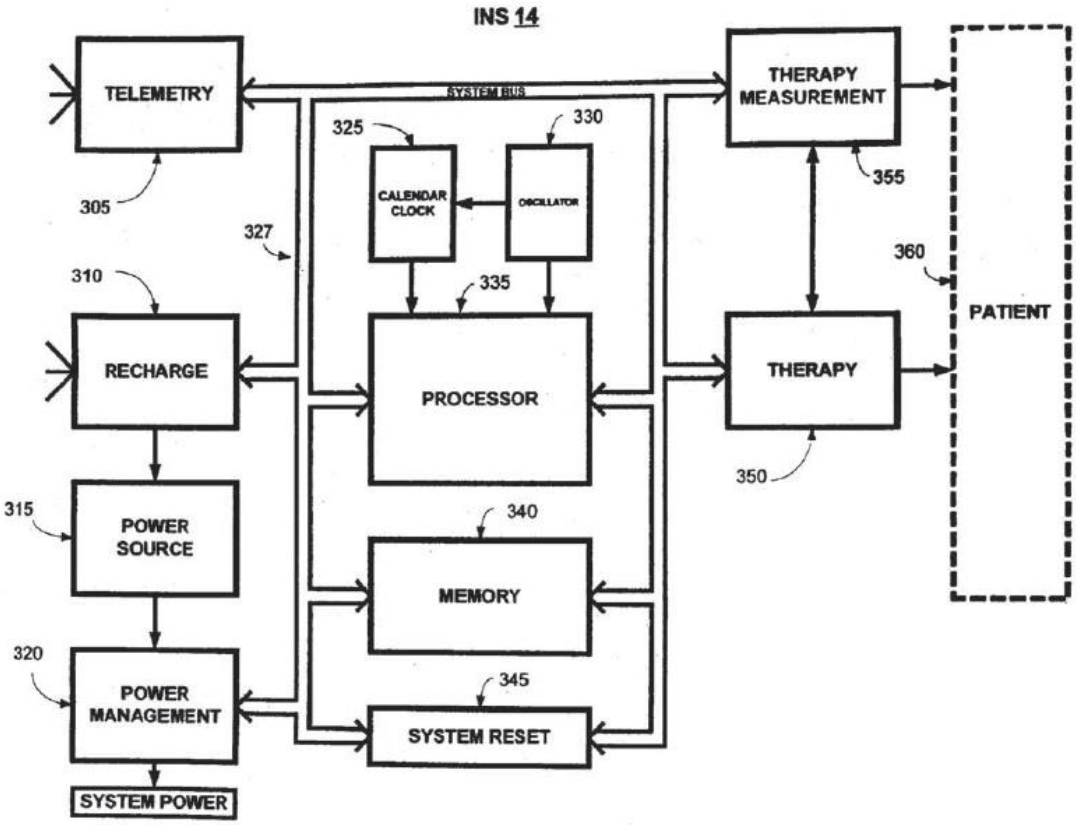


FIGURE 3

FIGURE 3 depicts a schematic block diagram of an INS. Ex. 1005, 3:62–64.

2. Torgerson '756 (Ex. 1006)

Torgerson '756 discloses an INS similar to that disclosed in Torgerson '198, and includes the same block diagram depicted in FIGURE 3 of Torgerson '198 showing, *inter alia*, recharge module 310. Ex. 1006, Fig. 3.

Torgerson '756 further includes a diagram, shown as FIG. 5, illustrating recharge module 310 of INS 14, which serves to regulate the charging rate of power source 315. Ex. 1006, Fig. 5 (reproduced below), 7:26–33.

Torgerson '756 discloses that recharge regulation control unit 525 of recharge module 310 communicates with an external component via telemetry unit 305, but "[t]hose skilled in the art will appreciate that other communication techniques may be implemented." Ex. 1006, 9:48–49.

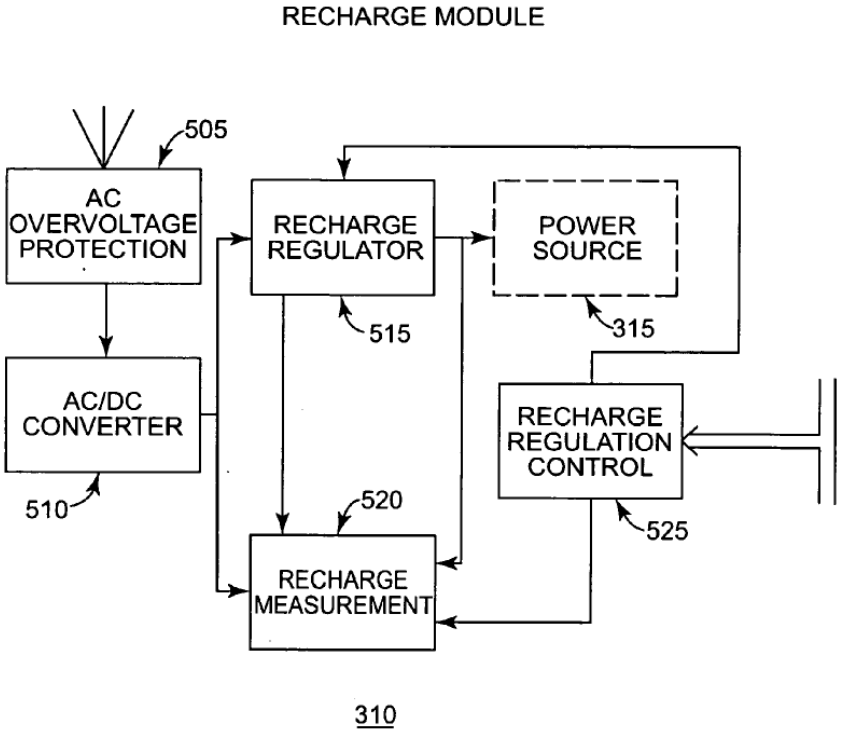


Fig. 5

FIG. 5 depicts a schematic block diagram of the recharge module 310. Ex. 1006, 3:61–63.

3. Torgerson '883 (Ex. 1007)

Torgerson '883 discloses implantable medical devices similar to those disclosed in Torgerson '198 and Torgerson '756.

Torgerson '883 discloses "a telemetry signal 10 [that] interacts directly with a charging circuit 20 and a controller 90. Electromagnetic energy in the telemetry signal 10 allows the charging circuit 20 to charge up the supplemental power source 25. The telemetry signal 10 also interacts with the controller 90 to deliver and receive patient and device data." Ex. 1007, 5:17-24; *see also* FIG. 2 (reproduced below).

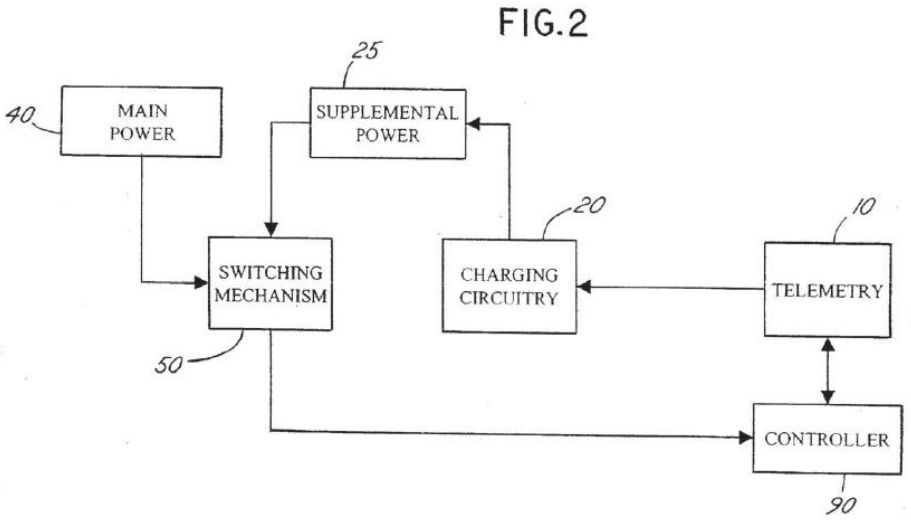


FIG. 2 depicts a block diagram of certain components of the implantable medical device. Ex. 1007, 4:45–46.

4. Abrahamson (Ex. 1008)

Abrahamson discloses implantable medical devices and a system to communicate with them. Ex, 1008, (57). Abrahamson discloses that in a commonly employed RF coupled system, the "carrier signal is modulated with the data that are to be transmitted using an appropriate modulation scheme, such as . . . frequency shift keying (FSK)." Ex. 1008, 1:14–21. Abrahamson also discloses using "On Off Keying (OOK)." Ex. 1008, 5:9–15.

E. Ground I

Petitioner challenges claims 1, 3–8, 10–14, and 16–20 as obvious under 35 U.S.C. § 103(a) over Torgerson '198, Torgerson '756, and Torgerson '883. Pet. 16–68.

1. Independent claim 1

Claim 1 is directed to controlling an implantable medical device that comprises "monitoring a voltage of a power source within the implantable medical device [and] if the voltage is above a first threshold, enabling . . . listening for a first type of telemetry from a first external component; listening for a second type of telemetry from an external charging component, wherein the external charging component is used to wirelessly charge the power source; . . . ." Accordingly, claim 1 calls for two types of telemetry.

Petitioner contends that Torgerson '198 discloses all that is claimed, except for the claim limitation of "a second type of telemetry from an external charging component." Petitioner contends that Torgerson '756 and Torgerson '883 collectively disclose the missing limitation.

Torgerson '198 discloses "telemetry unit 305." Ex. 1005, FIGURE 3. According to Petitioner, telemetry unit 305 corresponds to the recited first type of telemetry. Pet. 19–20. Also according to Petitioner, Torgerson '198 further discloses an implantable medical device comprising a recharge module (Ex. 1005, 6:12–20 ("The implantable medical device generally includes . . . a recharge module 310 . . . .")). Pet. 47.

Along those lines, Torgerson '756 shows a recharge module that includes recharge regulation control unit 525 (Ex. 1006, 7:41–45 ("The recharge module 310 generally comprises . . . a recharge regulation control unit 525."). Pet. 47.

Given this disclosure, the relevant question is whether recharge module 525 disclosed by Torgerson '756 communicates with an external charging component via a "second type of telemetry" (claim 1) rather than a first type of telemetry (i.e., via telemetry unit 305). In that regard, Petitioner states that

> Torgerson756 explains that while recharge regulation control unit 525 can communicate with an "external component via telemetry unit 305," a POSA would have appreciated that other communication techniques may be implemented for such a purpose. *Id.*; Ex. 1006, 9:35–53.
>
> Torgerson756 further discloses that recharge module 310 (via its recharge regulation control unit 525) communicates with an external component such as a physician programmer 30 or a patient programmer 35 to recharge the INS 14's internal power source 315 using a wireless magnetic field. Ex. 1006, 8:40–61, 9:23–34, 9:35–53; Ex. 1003, ¶ 111.

Pet. 47. Specifically, Petitioner relies on Torgerson '756 for its disclosure that "[t]hose skilled in the art will appreciate that other communication

techniques may be implemented," (Ex. 1006, 9:48–49), where the "other communication techniques" are those "other" than via telemetry unit 305.

> Thus, Torgerson198 and Torgerson756 disclose (1) that the recharge module 310 of INS 14 communicates with an external device using a second telemetry technique that is different from the one utilized by telemetry unit 305, and (2) that the external device includes a physician programmer 30 and a patient programmer 35, which are used to wirelessly charge INS 14's internal power source 315. Ex. 1003, ¶ 112.

Pet. 47–48.

Furthermore, Petitioner acknowledges that although Torgerson '756 suggests that "other communication techniques" (i.e., other than via telemetry unit 305) may be used to communicate with an external charging component, Torgerson '756 does not explicitly disclose that the "other communication technique[ ]" is a second "telemetry" (as claim 1 requires).

In that regard, Petitioner cites Torgerson '883.

> Torgerson883 discloses a charging circuit 20 that can receive telemetry signals from an external device and charge a supplemental power source 25 when the IMD's main power source has been depleted. *Id.*, ¶ 115; Ex. 1007, 5:17–57, 7:24–48, 12:53–65. By charging the supplemental power source 25, the charging circuit 20 allows the IMD to have sufficient power to perform bi-directional communications with an external device even when its main power source has been depleted. Ex. 1007, 5:17–57, 7:24–48, 12:53–65; Ex. 1003, ¶ 115. Torgerson883 discloses that it is advantageous for an IMD to have a bi-directional communication system that can function even when its main power source is depleted so that medical personnel can always interrogate the IMD and obtain crucial information from the device. Ex. 1003, ¶ 115; Ex. 1007, 2:24–39, 10:62–67.

Pet. 48–49.

> Thus Torgerson198 and Torgerson756 in view of Torgerson883 disclose an INS 14 that includes a recharge module 310 that performs bi-directional communications with (which includes receiving or listening for communications from) an external charging component (such as physician programmer 30 or patient programmer 35) using a second telemetry technique that differs from the one used by telemetry unit 305. Ex. 1003, ¶ 117.

Pet. 49.

Patent Owner disagrees with Petitioner's above analysis for several reasons (Prelim. Resp. 16–21), each of which will be addressed below.

Patent Owner first argues that "Torgerson198 and Torgerson756 [d]o [n]ot [d]isclose 'listening for a second type of telemetry from an external charging component, wherein the external charging component is used to wirelessly charge the power source.'" Prelim Resp. 16. The argument is misplaced, however, as Petitioner is not contending that Torgerson '198 and Torgerson '756 disclose "listening for a second type of telemetry from an external charging component, wherein the external charging component is used to wirelessly charge the power source." Principally, Patent Owner omits Petitioner's additional reliance on Torgerson '883 for this claim limitation. As noted above, Petitioner is contending that it would have been obvious to one of ordinary skill in the art to reach the subject matter of said claim limitation given the *combined* disclosures of Torgerson '198, Torgerson '756, *and Torgerson '883*. Pet. 48–49.

Patent Owner next argues that "Torgerson883 [d]oes [n]ot [d]isclose a 'second type of telemetry'." Prelim Resp. 18. According to Patent Owner, "Petitioner asserts that Torgerson883 discloses a charging circuit 20 that can receive telemetry signals from an external device and charge a supplemental

power source 25 when the IMD's main power source has been depleted." Prelim. Resp. 18. Patent Owner contends that,

> Petitioner is incorrect that charging circuit 20 uses telemetry. Rather, Torgerson883 discloses charging circuit 20 can be used to receive power, which is separate and distinct from data or information.
>
> Torgerson883 states:
>
> > "**Electromagnetic energy** in the telemetry signal 10 allows the charging circuit 20 to charge up the supplemental power source 25. . . . When the main power source 40 is depleted, a telemetry signal 10 **can deliver sufficient energy** to the supplemental power source 25, through the charging circuit 20, to temporarily revive the inoperable implantable medical device 5." Ex. 1007 at 5:17–43 (emphasis added).

Prelim. Resp. 18–19. "Telemetry requires the 'transmission of data or information.' Torgerson '883's charging circuit 20 *only* receives 'energy' via telemetry signal 10, it does not receive any data or information." Prelim. Resp. 20 (emphasis added).

Patent Owner's above arguments are premised on both (a) construing the claimed "second telemetry" as limited to the transmission of only data or information, excluding energy, and (b) interpreting telemetry signal 10 of Torgerson '383 to be transmitting only energy, excluding data and information. In summary, we disagree with each premise.

Regarding premise (a), concerning the claimed "second telemetry," as we explained above, we are unpersuaded that a proper construction of "telemetry" is limited to the "transmission of data or information," to the exclusion of energy.

Regarding premise (b), concerning Torgerson '883, the passage upon which Patent Owner relies (Ex. 1007, 5:17–43) includes the statement: "The

telemetry signal 10 also interacts with the controller 90 *to deliver and receive patient and device data*." Ex. 1007, 5:23–24 (emphasis added). Accordingly, we find that the telemetry signal disclosed by Torgerson '383 cannot be only "energy"; it must also comprise data.

Patent Owner states that

> [a]lthough power can also be transferred inductively, "telemetry" denotes the "data or information" that is transferred inductively or by radio-frequency through a "telemetry link." The '241 Patent draws this distinction, explaining that "[t]he BPB device 10 contains an inductive coil 18 utilized for receiving power and telemetry messages through an inductive telemetry link 38." *Id.* at 13:55-57 (emphasis added). Thus, "telemetry messages" are distinct from the "power" that may be transferred by a "telemetry link."

Prelim. Resp. 6.

Although we acknowledge that inductive coil 18 disclosed by the '241 patent is utilized to receive telemetry messages through inductive telemetry link 38, we are unpersuaded that this precludes inductive coil 18 from also receiving "energy" via inductive telemetry link 38. As Patent Owner admits, power can be transferred inductively (e.g., via an electromotive force), and we are unpersuaded that the '241 patent draws a sufficient distinction between "power" and "data or information" that may be transferred by a "telemetry link" (i.e., OOK telemetry link 38).

On this record, and at this stage of the proceeding, we are persuaded that Torgerson '383's express disclosure of a "*telemetry* signal 10 [interacting] directly with a charging circuit" (Ex. 1007, 5:19–20, emphasis added) reads on what is claimed ("second *telemetry* from an external charging component, wherein the external charging component is used to wirelessly charge the power source" (claim 1, emphasis added)).

Patent Owner further argues that "[t]he [a]sserted [p]rior [a]rt [r]eferences [d]o [n]ot [d]isclose 'if the voltage falls below the first threshold, . . . continuing listening for the second type of telemetry'." Prelim Resp. 20–21. In doing so, however, Patent Owner only refers back to previous arguments, which are unpersuasive for the reasons set forth above. Indeed, when we consider Petitioner's positions for these claim limitations, they are persuasive for the reasons that follow.

For this claim limitation, Petitioner primarily relies on Table B of Torgerson '198 (Ex. 1005, 9:34–59), reproduced below. Pet. 50.

TABLE B

State of Operation	Components On	Components Off
Normal Operation	All	None
Low Power	Power Management 320	Therapy 350
	Recharge 310	Measurement 355
	Telemetry 305	Permanent Memory
	Oscillator 330	Non-volatile Memory
	Calendar Clock 325	EEPROM
	Volatile Memory	Memory Management
	High Freq Protection Circuit	System Bus 327
	High Energy Protection Circuit	Processor 335
	System Shutdown/ POR 345	
Power Off	Recharge 310	Therapy 350
	High Freq. Protection Circuit	Measurement 355
	High Energy Protection Circuit	Permanent Memory
		Non-volatile Memory
		EEPROM
		Memory Management
		System Bus 327
		Processor 335
		Power Management 320
		Telemetry 305
		Oscillator 330
		Calendar Clock 325
		Volatile Memory
		System Shutdown/POR 345

Table B lists components of INS 14 that are active and inactive during each of three states of operation. Ex. 1005, 9:31–33.

Consistent with what Torgerson '198 discloses, Petitioner also points out that Torgerson '198 discloses "transition points T1 and T2 [which] provide boundaries for the three states of operation: (1) normal operation state; (2) low power state; and (3) power off state" of INS 14. Ex 1005,

9:14–19." Pet. 27. This is shown in Petitioner's marked-up version of Table B below:

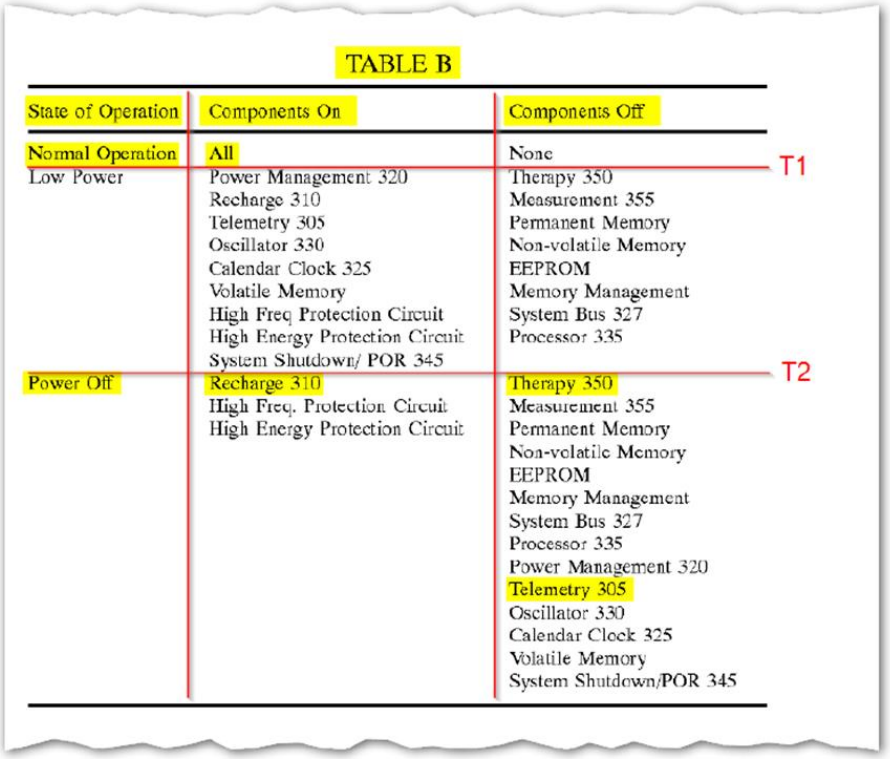


TABLE B

State of Operation	Components On	Components Off
Normal Operation	All	None
Low Power	Power Management 320 Recharge 310 Telemetry 305 Oscillator 330 Calendar Clock 325 Volatile Memory High Freq Protection Circuit High Energy Protection Circuit System Shutdown/ POR 345	Therapy 350 Measurement 355 Permanent Memory Non-volatile Memory EEPROM Memory Management System Bus 327 Processor 335
Power Off	Recharge 310 High Freq. Protection Circuit High Energy Protection Circuit	Therapy 350 Measurement 355 Permanent Memory Non-volatile Memory EEPROM Memory Management System Bus 327 Processor 335 Power Management 320 Telemetry 305 Oscillator 330 Calendar Clock 325 Volatile Memory System Shutdown/POR 345

T1

T2

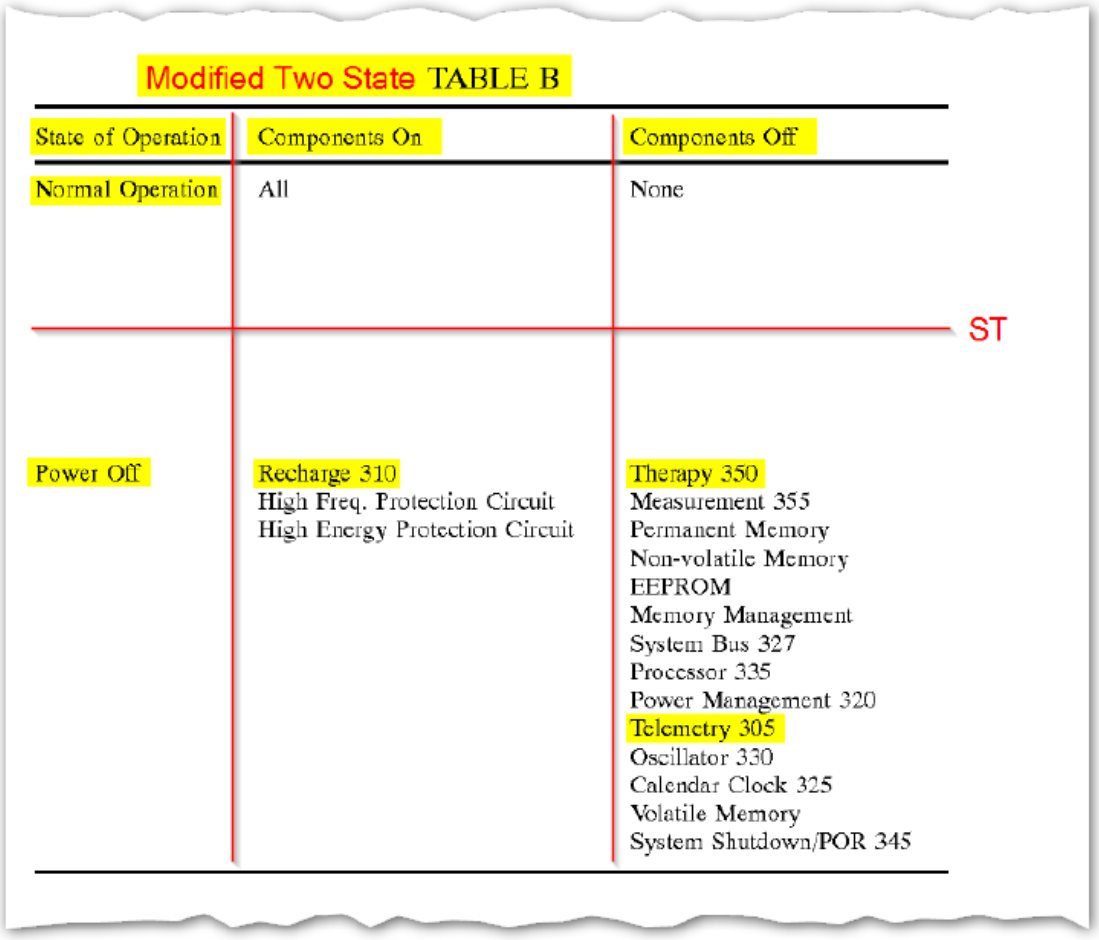
Pet. 51, 56.

Concerning those disclosures, Petitioner takes two alternative, but similar, positions with respect to the aforementioned claim limitation.

The first position views the voltage falling below both T1 and T2, and from "Normal Operation" to "Power Off," as representing a "falling below" a "first threshold." Specifically, Petitioner asserts that "Torgerson198 discloses that if the voltage of power source 315 falls below both transition points T1 and T2 [T1/T2], INS 14 is made to operate in the 'power off' state. Ex. 1005, 8:30–9:16; Ex. 1003, ¶ 121." Pet. 51.

The second view is similar. Petitioner asserts that a single transition point is drawn between "Normal Operation" and "Power Off," which Petitioner calls "Torgerson198's obvious two-state method of operating INS

14." Pet. 52. This transition point is identified as "ST," in a different marked-up version of Table B, provided by Petitioner at page 52 of the Petition. Pet. 52, reproduced below.



Modified Two State TABLE B

State of Operation	Components On	Components Off
Normal Operation	All	None
		ST
Power Off	Recharge 310 High Freq. Protection Circuit High Energy Protection Circuit	Therapy 350 Measurement 355 Permanent Memory Non-volatile Memory EEPROM Memory Management System Bus 327 Processor 335 Power Management 320 Telemetry 305 Oscillator 330 Calendar Clock 325 Volatile Memory System Shutdown/POR 345

According to Petitioner, falling below either T1/T2 (i.e., falling below T1 and T2) or ST (i.e., falling below ST), and into the "Power Off" mode, satisfies the claim requirement for "the voltage [to] fall below [a] *first threshold*" (claim 1, emphasis added). Pet. 51–53. We agree.

Based on the first position, assuming "telemetry unit 305 listens for a first type of telemetry, recharge module 310 listens for a second type of

telemetry, and therapy module 350 provides stimulation" (Pet. 51), an assumption with which we agree, it logically follows that "if the voltage of power source 315 falls below the claimed 'first threshold' [i.e., falls below T1 and T2 and into the "Power Off" state], INS 14 discontinues listening for a first type of telemetry and discontinues providing stimulation while continuing to listen for a second type of telemetry." Pet. 51–52. This can be seen in Table B, shown at pages 51 and 56 of the Petition, which shows telemetry unit 305 and recharge module 310 as "On" in the "Normal Operation" state, but shows telemetry unit 305 as "Off" and recharge module 310 as "On" in the "Power Off" state. The same is true under the second view, when voltage falls below ST. *See* Pet. 52.

Accordingly, on this record, we are persuaded that Torgerson '198 discloses that "if the voltage falls below the first threshold [i.e., falls into the "Power Off" state], . . . continuing listening for the second type of telemetry [i.e., recharge module 310 is 'On']," as claimed.

We have reviewed the information provided by Petitioner, including the supporting Declaration of Dr. Mark Kroll (Ex. 1003), as well as Patent Owner's arguments, and for the reasons set forth above, we are persuaded that, based on the current record, Petitioner has demonstrated a reasonable likelihood of prevailing on its obviousness challenge to claim 1 over Torgerson '198, Torgerson '756, and Torgerson '883.

2. Independent claims 8 and 14

Patent Owner relies on the same arguments, rebutting the challenge as to claim 1, to rebut the challenge as to claims 8 and 14. Prelim. Resp. 29 and 30. Patent Owner's arguments rebutting the challenge as to claims 8

and 14 are unsuccessful for the reasons discussed above with respect to the challenge as to claim 1. We are persuaded by Petitioner's contentions regarding claims 8 and 14.

3. Claims 3, 6, and 7; 10 and 13; and 16, 19, and 20 depending from claims 1, 8, and 14, respectively.

Patent Owner relies on the same arguments, rebutting the challenge as to claim 1, to rebut the challenge as to claims 3, 6, and 7; 10 and 13; and 16, 19, and 20. Prelim. Resp. 21, 29, 30. Patent Owner's arguments rebutting the challenge as to these claims are unsuccessful for the reasons discussed above with respect to the challenge as to claim 1. We are persuaded sufficiently by Petitioner's contentions regarding claims 3, 6, 7, 10, 13, 16, 19, and 20.

4. Claims 4, 11, and 17 depending from claims 1, 10, and 14, respectively.

a. *Claim 4*

Claim 4 limits the method of claim 1 to further comprise "if the voltage later exceeds the first threshold after falling below the first threshold, resuming listening for the first telemetry type and resuming providing stimulation to device electrodes using the power source." Claims 11 and 17 include a similar limitation.

With respect to the limitation of claim 1 reciting, "if the voltage falls below the first threshold, . . . continuing listening for the second type of telemetry," we stated above that Petitioner has shown sufficiently that Torgerson '198 discloses that "if the voltage falls below the first threshold [i.e., falls below T1/T2 or ST, and into the 'Power Off' state], . . . continuing

listening for the second type of telemetry [i.e., recharge module 310 is On']," as claimed. We based this on a finding that, consistent with Petitioner's position, Table B shows "Telemetry 305" (i.e., "first type of telemetry") and "Recharge 310" (i.e., "second type of telemetry") as 'On' in the 'Normal Operation' state but shows "Telemetry 305" as 'Off' and "Recharge 310" as 'On' in the 'Power Off' state.

Here, with respect to the limitation of claim 4, as with said limitation of claim 1, Petitioner again points to Table B of Torgerson '198, and takes the same two alternative but similar views of the "first threshold." Pet. 55–56.

Patent Owner argues that

> [d]ependent claim 4 requires that "if the voltage later exceeds **the first threshold** after falling below **the first threshold**, resuming listening for the first telemetry type and resuming providing stimulation to device electrodes using the power source."
>
> Petitioner fails to point to the same "first threshold" where: (i) the device stops listening for the "first type of telemetry" and discontinues stimulation when voltage is below the first threshold (claim 1) and (ii) resumes listening for the "first type of telemetry" and resumes stimulation when voltage is above the first threshold (claim 4).

Prelim. Resp. 21. We disagree.

Specifically, Petitioner contends that the claim phrase "first threshold" covers falling below either the T1/T2 transition or the ST transition; in other words, falling below the "first threshold" occurs when the voltage falls below T1/T2 or ST, such that operations transition from "Normal Operation" to "Power Off." This can be seen in the marked-up versions of Table B set forth in the Petition for both claims 1 and 4. Pet. 51–52 (with respect to claim 1), 56–57 (with respect to claim 4). Given this, Patent Owner's

argument does not clearly explain how Petitioner fails to point to the same "first threshold" with respect to the conditional limitation in claim 1 and claim 4.

Patent Owner further argues that "Petitioner's asserted 'first threshold' is not when stimulation is turned on and off. Nor is T2 when the device both resumes listening for the 'first type of telemetry' and resumes stimulation (as required by claim 4)." Prelim Resp. 22. According to Patent Owner,

> [a]s shown in Table B, Therapy 350 (stimulation) is discontinued and resumed at T1. Ex. 1005 at Table B; *see* Petition at 26 (showing annotated Table B). Accordingly, stimulation (Therapy 350) would be discontinued during discharge at T1, before T2, and resumed during recharge at T1, after T2.

Prelim. Resp. 22.

> Claim 4 requires that, at the claimed "first threshold," the device **both** resumes listening for a "first type of telemetry" and resumes stimulation. As shown in Table B, both of these operations do not occur at T2, the asserted "first threshold," since Therapy 350 is turned on and off at T1 whereas Telemetry 305 is turned on and off at T2.

Prelim. Resp. 23–24.

This argument has the same difficulty as the prior argument. From Petitioner's perspective, if falling below T1/T2, or the obvious variant ST, represents falling below the "first threshold," a perspective we are persuaded is correct, then the device both resumes listening for "Telemetry 305" (i.e., a "first type of telemetry)," and resumes "Therapy 350" (i.e., stimulation), when the device *returns* to "Normal Operation" after *falling below* the "first threshold" (i.e., into the "Power Off" state, after falling below T1/T2 or ST), as claim 4 requires. Insofar as Petitioner's perspective is based on the claim

phrase "falling below" covering the path from "Normal Operation" to "Power Off," whether falling below T1/T2 or ST, we are persuaded that perspective is also correct. Accordingly, contrary to Patent Owner's argument, falling below and exceeding the "first threshold," as recited in claims 1 and 4, is shown in Torgerson '198. In particular, consistent with Table B, when the voltage reaches the "Normal Operation" state by exceeding T1/T2 or ST , after previously "falling below" that threshold and into the "Power Off" state, the device resumes listening for "Telemetry 305" (i.e., a "first type of telemetry)," and resumes "Therapy 350" (i.e., stimulation), when in that "Normal Operation" state.

Finally, Patent Owner argues that "Petitioner incorrectly assumes that Table B discloses the thresholds at which components are turned on during recharging . . . . Torgerson198 discloses different voltage thresholds for turning components off during discharge ([FIG. 7]) and back on during recharge ([FIG.] 8)." Prelim. Resp. 24.

Specifically, Patent Owner points out that "Figure 7 shows T1 at 3.6V and T2 at 1.85V. Therapy 350 is turned off after T1 (3.6V) and both Therapy 350 and Telemetry 305 are turned off after T2 (1.85v) . . . . [And] Figure 8 shows T3 at 2.0V and T4 at 3.6V. Before T3 (less than 2.0V), only recharge module 310 is active." Prelim. Resp. 24–25. "Petitioner completely ignores T3 and T4 and relies only on T1 and T2." Prelim. Resp. 26.

> Petitioner does not address the different transitions (T3, T4) during recharge, nor explain why it would have been obvious to have the same, single transition point for both discharge and recharge when Torgerson198 discloses using multiple, different transition points for discharge and recharge. Petitioner fails to

> address whether the transition point of modified Table B, which only addresses discharge, would match with either T3 or T4.

Prelim. Resp. 27.

The argument is unpersuasive because it is misplaced. Regardless of what is disclosed in FIGS. 7 and 8, Petitioner's focus is on Table B, and we are persuaded that Petitioner's characterization of falling below the transitions between "Normal Operation" to "Power Off" (i.e., T1/T2 or ST), in Table B, as falling below the "first threshold" is correct for the reasons indicated above. In particular, Petitioner has asserted, and we agree, that falling below the recited "first threshold" covers the transitions between "Normal Operation" to "Power Off" (i.e., voltage falling below T1/T2 or ST). Given this, the fact that Torgerson '198 may disclose other, more specific voltage transitions (i.e., for T1 and T2 via FIG. 7 and T3 and T4 via FIG. 8) does not materially affect Petitioner's position.

Accordingly, on this record, we are persuaded that Petitioner has shown sufficiently that Torgerson '198 discloses "if the voltage later exceeds the first threshold [i.e., into "Normal Operation"], after falling below the first threshold [i.e., into "Power Off" mode], resuming listening for the first telemetry type and resuming providing stimulation to device electrodes using the power source" as claimed.

We have reviewed the information provided by Petitioner, including the supporting Declaration of Dr. Mark Kroll (Ex. 1003), as well as Patent Owner's arguments, and are persuaded that, based on the current record, Petitioner has demonstrated a reasonable likelihood of prevailing on its obviousness challenge to claim 4 over Torgerson '198, Torgerson '756, and Torgerson '883.

b. Claims 11 and 17

Patent Owner relies on the same arguments, rebutting the challenge as to claim 4, to rebut the challenge as to claims 11 and 17. Prelim. Resp. 29 and 30. Patent Owner's arguments rebutting the challenge as to claims 11 and 17 are unsuccessful for the reasons discussed above with respect to the challenge as to claim 4. We are persuaded sufficiently by Petitioner's contentions regarding claims 11 and 17.

5. Claim 5, 12, and 18 depending from claims 1, 10, and 14, respectively.

a. Claim 5

Claim 5 further limits the method of claim 1 in *further comprising*:

> if the voltage falls below the first threshold, and later falls below a second threshold lower than the first threshold, discontinuing listening for the first telemetry type and discontinuing providing stimulation to device electrodes using the power source until the device is recharged.

Claims 12 and 18 include a similar limitation.

Petitioner's position is that if

> if T1 and T2 are considered the claimed "first threshold" and "second threshold," respectively, Torgerson198 discloses under the broadest reasonable interpretation of the claims that if the voltage of power source 315 falls below the claimed "second threshold," listening for the first telemetry type is discontinued (via disabling of telemetry unit 305) and stimulation therapy is discontinued (via disabling therapy module 350) until INS 14 is later recharged.

Pet. 60–61.

Patent Owner argues that

> Petitioner's argument for claim 5 requires T1 to be the "first threshold" and T2 to be the "second threshold." Petition at 60. However, T1 does not qualify as the "first threshold" of claim 1. Claim 1 requires that "if the voltage falls below the first threshold, discontinuing listening for the first type of telemetry." Telemetry 305 is still turned on after the voltage falls below T1 and is not turned off until the voltage reaches T2. Ex. 1005 at Table B. Thus, Torgerson198 does not disclose the "first threshold" of dependent claim 5 (and claim 1).

Prelim. Resp. 28. We agree with Petitioner.

A principal difficulty with the Patent Owner's argument is that claim 1 calls for the voltage to *fall below* a "first threshold;" it does not recite how far *below*, the threshold the voltage may fall. For example, assuming T1 represents the "first threshold," claim 1 does not require the voltage to pass below T1 and into the Low Power state once the voltage has fallen below T1. The voltage simply must fall *below* T1 to satisfy the claim. In that regard, claim 1 broadly covers the voltage falling so far below T1 (assuming T1 is the "first threshold") as to fall into the "Power Off" state. In so falling below, the voltage necessarily falls below T2 also.

Claim 5 limits the claim 1 method so that it "further compris[es]" performing certain events if the voltage falls below the "first threshold" (e.g., T1) and later falls below a "second threshold" (e.g., T2). Claim 5 does not call for any events to occur after the "first threshold" is reached. Only after the voltage "falls below a second threshold lower than the first threshold" are the two events performed; that is, "discontinuing listening for the first telemetry type and discontinuing providing stimulation to device electrodes using the power source until the device is recharged."

Another difficulty with Patent Owner's argument is that it presumes that those claim limitations of "continuing" and "discontinuing" various events, when the voltage falls below the first threshold, equates to the *exact* instant when the corresponding instruments are turned on and off. Patent Owner, however, provides no basis for giving the aforementioned claim limitation such a narrow scope. Claim 1 recites that "[i]f the voltage falls below the first threshold, *discontinuing* listening for the first type of telemetry from the first external component and *discontinuing* providing stimulation to device electrodes using the power source, while *continuing* listening for the second type of telemetry." (Claim 1, emphases added). Other than requiring the "continuing" and "discontinuing" to occur after "the voltage falls below the first threshold," no other temporal requirements are recited, i.e., it need not occur immediately or instantaneously. As Petitioner contends, according to Torgerson '198 (*see* Table B), if the voltage falls below T1/T2 (into the "Power Off" state), then "listening for the first type of telemetry from the first external component [telemetry unit 305] and . . . providing stimulation to device electrodes using the power source [therapy module 350] [are necessarily discontinued] while . . . listening for the second type of telemetry [recharge module 310] [is necessarily continued]" (claim 1).

On this record, and at this juncture in the proceeding, we are persuaded that Petitioner's contention in that regard is correct. And based on that posture for claim 1, we are persuaded that Petitioner's challenge of claim 5, in characterizing T1 as the "first threshold" and T2 as the "second threshold," and, thereby contending that Torgerson '198 discloses the "first threshold" of dependent claim 5 (and claim 1) is also correct.

We have reviewed the information provided by Petitioner, including the supporting Declaration of Dr. Mark Kroll (Ex. 1003), as well as Patent Owner's arguments, and are persuaded that, based on the current record, Petitioner has demonstrated a reasonable likelihood of prevailing on its obviousness challenge to claim 5 over Torgerson '198, Torgerson '756, and Torgerson '883.

b. Claims 12 and 18

Patent Owner relies on the same arguments, rebutting the challenge as to claim 5, to rebut the challenge as to claims 12 and 18. Prelim. Resp. 29, 31. Patent Owner's arguments rebutting the challenge as to claims 12 and 18 are unsuccessful for the reasons discussed above with respect to the challenge as to claim 5. We are persuaded sufficiently by Petitioner's contentions regarding 12 and 18.

8. Conclusion

For the above reasons, we determine that the Petition establishes a reasonable likelihood that claims 1, 3–8, 10–14, and 16–20 are unpatentable over Torgerson '198, Torgerson '756, and Torgerson '883.

F. Ground II

Petitioner challenges claims 2, 9, and 15 as obvious under 35 U.S.C. § 103(a) over Torgerson '198, Torgerson '756, Torgerson '883, and Abrahamson. Pet. 68–70. All three claims recite that "the first telemetry type comprises Frequency Shift Keying (FSK), and wherein the second telemetry type comprises On/Off Keying (OOK)."

Petitioner's contends that

> The three Torgerson patents, however, do not explicitly disclose the specific types of telemetry used by either telemetry unit 305 or recharge module 310. *Id.*, ¶ 179. Instead Torgerson198 discloses that such "components are generally known in the art" (Ex. 1005, 6:12–20, 6:35–36) and Torgerson756 discloses that a POSA would have appreciated that different types of communication techniques can be used (Ex. 1006, 9:46–53).
>
> Consistent with those disclosures, a POSA would have been aware of a variety of well-known telemetry techniques that could be employed in an IMD such as INS 14. Ex. 1003, ¶ 180. A POSA would have understood that those telemetry techniques include FSK and OOK modulation schemes as evidenced by Abrahamson. *Id.*; Ex. 1008, 1:14–25, 5:9–15. Thus it would have been obvious for a POSA to select any one of these well-known telemetry techniques such as FSK for the first type of telemetry used by telemetry module 305 and OOK for the second type of telemetry used by recharge module 310. Ex. 1003, ¶ 180.
>
> In particular, a POSA would have chosen the FSK modulation scheme for the communication between the telemetry module 305 and an external device for programming the INS 14 because FSK provides a higher bandwidth and thus a higher capacity to transmit useful information. *Id.*, ¶ 181. And a POSA would have chosen the OOK modulation scheme for the communication between the recharge module 310 and an external device used for recharging the INS 14 because that communication is typically simpler and can be fully achieved with the simpler OOK modulation scheme. *Id.*

Pet. 69-70

Patent Owner responds as follows:

> claim 2 requires that "the first telemetry type comprises Frequency Shift Keying (FSK), and wherein the second telemetry type comprises On/Off Keying (OOK)." Petitioner admits that the three Torgerson patents do not disclose this limitation. Petition at 69. Petitioner argues that Abrahamson

> discloses "FSK and OOK modulation schemes" and that it would have been obvious, therefore, to use FSK as the "first type of telemetry" and OOK as the "second type of telemetry." Petition at 69. While Abrahamson discloses FSK and OOK telemetry as two examples of telemetry, Abrahamson does not disclose using two types of telemetry in a single device. Petitioner do not assert that it does. Thus, Petitioner has not shown the prior art discloses a device using two types of telemetry wherein the first type of telemetry is FSK and the second type of telemetry is OOK.

Prelim. Rep. 31-32.

On this record, we are persuaded that Petitioner's position is correct.

As set forth above, we are persuaded that the Torgerson patents collectively suggest the employment of two telemetry units (e.g., telemetry unit 305 and via recharge module 310), and further suggest employing other generally known telemetry units. We are further persuaded that Abrahamson discloses that FSK and OOK are known telemetry units. Ex. 1008, 1:14–21; 5:9–15.

Patent Owner is arguing, essentially, that the prior art does not explicitly disclose FSK and OOK telemetry units *in the same device*. The argument is misplaced, as Petitioner ground of unpatentability is one of obviousness, and not anticipation. Specifically, Dr. Kroll testifies that "FSK provides a higher bandwidth and thus a higher capacity to transmit useful information" (Ex. 1003 ¶ 183) and the "OOK modulation scheme for communication . . . is typically simpler and can be fully achieved with the simpler OOK modulation scheme" (Ex. 1003 ¶ 183). We find these factual assertions, on this record and at this juncture in the proceeding, adequately supported. Given this, we are persuaded that it is reasonable to assert, as Petitioner has, that "POSA would have chosen the FSK modulation scheme for the communication between the telemetry module 305 and an external

device for programming the INS 14[, and further] . . . would have chosen the OOK modulation scheme for the communication between the recharge module 310 and an external device used for recharging the INS 14." Pet. 69.

We have reviewed the information provided by Petitioner, including the supporting Declaration of Dr. Mark Kroll (Ex. 1003), as well as Patent Owner's arguments, and are persuaded that, based on the current record, Petitioner has demonstrated a reasonable likelihood of prevailing on its obviousness challenge to claim 2, 9, and 15 over Torgerson '198, Torgerson '756, Torgerson '883, and Abrahamson.

III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated a reasonable likelihood that it would prevail with respect to all the claims challenged in the Petition.

IV. ORDER

It is

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of the '241 patent is hereby instituted on the following grounds:

A. Obviousness of claims 1, 3–8, 10–14, and 16–20 over Torgerson '198, Torgerson '756, and Torgerson '883; and,

B. Obviousness of claims 2, 9, and 15 over Torgerson '198, Torgerson '756, Torgerson '883, and Abrahamson.

FURTHER ORDERED that review based on any other grounds of unpatentability is not authorized; and

FURTHER ORDERED that 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 commencing on the entry date of this decision.

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