

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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K/S HIMPP,  
Petitioner,

v.

BRAGI GMBH,  
Patent Owner.

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IPR2023-01205  
Patent 10,397,688 B2

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Before LARRY J. HUME, STACEY G. WHITE, and GARTH D. BAER,  
*Administrative Patent Judges.*

WHITE, *Administrative Patent Judge.*

JUDGMENT  
Final Written Decision  
Determining All Challenged Claims Unpatentable  
Denying Patent Owner's Revised Motion to Amend  
*35 U.S.C. § 318(a)*

## I. INTRODUCTION

K/S HIMPP (“Petitioner”) requested an *inter partes* review of claims 1–14 of U.S. Patent No. 10,397,688 B2 (Ex. 1001, “the ’688 patent”). Paper 3 (“Pet.”). Bragi GmbH (“Patent Owner”) filed a Preliminary Response. Paper 7. Applying the standard in 35 U.S.C. § 314(a), we instituted an *inter partes* review of all challenged claims on all grounds asserted. Paper 8 (“Institution Decision” or “Dec.”). After we instituted trial, Petitioner filed a Reply to the Institution Decision.<sup>1</sup> Paper 22 (“Pet. Reply”).

Patent Owner filed a Corrected Motion to Amend claims 1–14 contingent upon a finding of unpatentability and requested Preliminary Guidance. Paper 14. Petitioner opposed the Motion to Amend. Paper 23. We provided Preliminary Guidance. Paper 24.

Patent Owner filed a Revised Motion to Amend claims 1–14 contingent upon a finding of unpatentability. Paper 26 (“RMTA”). Petitioner opposed the RMTA. Paper 30 (“Opp. RMTA”). Patent Owner filed a Reply to Petitioner’s Opposition. Paper 34 (“Reply RMTA”). Petitioner filed a Sur-reply. Paper 36 (“Sur-reply RMTA”).

An oral hearing was held on January 24, 2025, and a copy of the transcript was entered into the record. Paper 40 (“Tr.”).

In the Decision on Institution, “we place[d] Patent Owner on express notice that any argument not asserted in a timely-filed Response to the Petition, or in another manner permitted during trial, may be deemed waived, even if that argument was presented in the Preliminary Response.” Dec. 30. Further, in the Scheduling Order we stated that “[i]f Patent Owner elects not to file a [patent owner] response, Patent Owner must arrange a

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<sup>1</sup> Patent Owner did not file a Patent Owner Response.

conference call with the parties and the Board. Patent Owner is cautioned that any arguments not raised in the response may be deemed waived.”

Paper 9, 9. Patent Owner did not file a patent owner response nor did Patent Owner schedule a call to discuss its decision to not file a patent owner response. As such, we find all arguments directed to Petitioner’s challenge to the original claims to be waived. Patent Owner does not contest this waiver and in the oral hearing, Patent Owner’s counsel conceded that waiver did occur.

[JUDGE HUME]: . . . First of all, based on the demonstratives, it appears you’re -- and correct me if I’m wrong, you’re waiving arguments against the original claims? Is that correct?

[PATENT OWNER’S COUNSEL, MR. JARRETT]: Yes, Your Honor. We’re proceeding on the revised motion to amend.

[JUDGE HUME]: For both IPR[s], correct?

[MR. JARRETT]: Correct. Yes, Your Honor.

Tr. 35:9–16 (line numbering omitted). Thus, Patent Owner has waived all arguments against Petitioner’s original challenges to claims 1–14.

Having reviewed the arguments and evidence, we determine that Petitioner has shown by a preponderance of the evidence that originally challenged claims 1–14 of the ’688 patent are unpatentable. We also determine that Petitioner has shown by a preponderance of the evidence that proposed substitute claims 15–28 are not eligible for patenting as discussed below. Therefore, we deny Patent Owner’s Revised Motion to Amend.

#### *A. Related Matters*

Petitioner states that the ’688 patent is a continuation of U.S. Patent No. 10,117,014 (“the ’014 patent”), which is at issue in *K/S HIMPP v. BRAGI GmbH*, IPR2023-01204. Pet. 4. Petitioner also states that the ’014

patent is a continuation of U.S. Patent No. 9,843,853 (“the ’853 patent”), which is at issue in *K/S HIMPP v. BRAGI GmbH*, IPR2023-01150. *Id.*

*B. The ’688 Patent*

The ’688 patent titled, “Power Control for Battery Powered Personal Area Network Device System and Method,” describes a “system and method for managing wireless earpieces” that “are powered utilizing a high-power mode in response to detecting a magnetic field is not applied to one or more of the wireless earpieces” and “alter[ing] to a low power mode in response to detecting the magnetic field is applied to one or more of the wireless earpieces.” Ex. 1001, codes (54), (57); *see also id.* at 1:45–52. As described in the specification, the “growth of wearable devices” is “fostered by the decreasing sizes of . . . components,” and “[w]earable devices are necessarily dependent upon their batteries to complete their desired function.” *Id.* at 1:28–32. Challenges arise because the “overall utility of wearable devices is directly proportional to the battery life of the devices.” *Id.* at 1:32–34; *see also id.* at 1:34–41. The present invention endeavors to “provide a system, method, and wireless earpieces for managing and preserving battery life.” *Id.* at 2:44–46. The ’688 patent achieves this with the “wireless earpieces [that] may interact with a smart case” that “preserve[s] the battery life of the wireless earpieces by interacting with the wireless earpieces while in a low power mode or state” and “ensure[s] the wireless earpieces are charged to a desired level.” *Id.* at 2:46–51.

Figure 1 of the '688 patent, showing a pictorial representation of an exemplary smart case and wireless earpieces (*id.* at 2:28–30), is reproduced below.

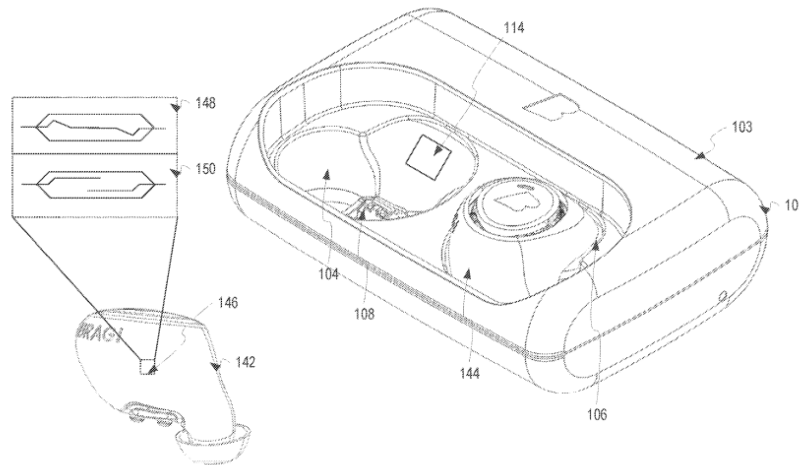


FIG. 1

Figure 1, reproduced above, depicts smart case 102 and wireless earpieces 142, 144. *Id.* at 3:5–7. “The smart case includes interfaces 108, 110 within the receptacles 104, 106” that are “hardware interfaces for electrically connecting the wireless earpieces 142, 144 to the smart case 102” and may include any number of contact points, busses, wires, or other physical connectors, or may include inductive chargers, for interfacing the wireless earpieces 142, 144 with the smart case 102. *Id.* at 4:13–22. “The interfaces 108, 110 may be utilized to charge the earpieces 142, 144.” *Id.* at 4:29–30. The interfaces 108, 110 “may each include a magnet activating the corresponding reed switch (i.e., reed switch 146 . . . ) to power off or initiate a low power mode (e.g., lower power state or mode) for one or both of the wireless earpieces 142, 144 when one or more of the wireless earpieces 142, 144 are placed within the receptacles 104, 106.” *Id.* at 4:36–42.

The '688 patent explains that the “the wireless earpiece may move to a low power mode to preserve battery life when the reed switch is activated

potentially indicating the wireless earpiece is within the smart case,” and the “wireless earpiece may also send a command or communication to the second wireless earpiece to change power mode or otherwise act in response to the reed switch being opened.” *Id.* at 9:5–13. “[B]y moving the device to a low power mode . . . the wireless earpiece is prepared to be charged.” *Id.* at 9:13–15. “The low power mode maintains the earpieces with minimal functionality to charge and synchronize data,” and “[a]s a result, the battery of the wireless earpieces may be maintained in an optimal state” and “the transition from the low power mode to a high-power mode may be implemented upon detecting the wireless earpieces have been removed from the smart case.” *Id.* at 10:28–36.

### *C. Illustrative Claim*

Petitioner challenges the patentability of claims 1–14. Claims 1 and 9 are independent. Claim 1 is reproduced below.

1. [1Preamble] A method for power control for a wireless earpiece, comprising:

- [1A] powering circuitry of the wireless earpiece utilizing a low power mode in response to detecting a magnetic field is applied to the wireless earpiece;
- [1B] powering circuitry of the wireless earpieces utilizing a high-power mode in response to detecting a magnetic field is not applied to one or more of the wireless earpieces;
- [1C] altering the power sent to the circuitry of the wireless earpiece to a high-power mode in response to detecting a magnetic field is not applied to one or more of the wireless earpieces;
- [1D] altering the power sent to the circuitry of the wireless earpieces to a low power mode in response to detecting

a magnetic field is applied to one or more of the wireless earpieces; and

[1E] charging an onboard battery of the wireless earpiece in response to detecting a magnetic field is applied to the wireless earpiece.

Ex. 1001, 10:59–11:11; *see also* Pet. 17–27 (numbering the claim limitations).

#### *D. Asserted Grounds of Unpatentability*

Petitioner, supported by a declaration of Sayfe Kiaei, Ph.D. (Ex. 1002), asserts the following grounds of unpatentability (Pet. 6).<sup>2</sup>

| <b>Claim(s) Challenged</b> | <b>35 U.S.C. §</b> | <b>Reference(s)/Basis</b>            |
|----------------------------|--------------------|--------------------------------------|
| 1, 2, 4                    | 102                | Hain <sup>3</sup>                    |
| 1–6, 8–12, 14              | 103                | Hain, Shaffer <sup>4</sup>           |
| 3, 5–7, 9–14               | 103                | Hain, Shaffer, Sørensen <sup>5</sup> |

## II. ANALYSIS

### *A. Level of Ordinary Skill in the Art*

To determine whether an invention would have been obvious, we consider the level of ordinary skill in the pertinent art at the critical time. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). Resolution of this question is important because it allows us to “maintain[] objectivity in the

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<sup>2</sup> We apply the AIA version of 35 U.S.C. §§ 102, 103 because the challenged claims have an effective filing date after March 16, 2013, the effective date of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011). *See* Ex. 1001, codes (22), (86), (60).

<sup>3</sup> DE Pat. App. No. 10 2007 039 455 A1, published Feb. 26, 2009 (Ex. 1004, “Hain”).

<sup>4</sup> U.S. Pat. Pub. No. 2015/0245126 A1, published Aug. 27, 2015 (Ex. 1003, “Shaffer”).

<sup>5</sup> U.S. Pat. No. 8,265,315 B2, issued Sep. 11, 2012 (Ex. 1005, “Sørensen”).

obviousness inquiry.” *Ryko Mfg. Co. v. Nu-Star, Inc.*, 950 F.2d 714, 718 (Fed. Cir. 1991). In assessing 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.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (quotation omitted). Generally, it is easier to establish obviousness under a higher level of ordinary skill in the art. *Innovation Toys, LLC v. MGA Entm’t, Inc.*, 637 F.3d 1314, 1323 (Fed. Cir. 2011) (“A less sophisticated level of skill generally favors a determination of nonobviousness . . . while a higher level of skill favors the reverse.”).

Petitioner asserts that a person of ordinary skill in the art “would have had a bachelor’s degree in Electrical Engineering, or equivalent experience, and one to two years of experience in the field of wireless electronic devices and battery systems, particularly wireless earpieces such as wireless headphones and hearing aids.” Pet. 17 (citing Ex. 1002 ¶ 25).

Patent Owner does not challenge Petitioner’s description of the level of ordinary skill in the art, and Patent Owner’s declarant, Dr. Darrin Young opines that the level of ordinary skill in the art is the same as proposed by Petitioner. RTMA 6 (citing Ex. 2005 ¶¶ 40–41).

We are persuaded that Petitioner’s description is consistent with the prior art and patent specification. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). For purposes of this Decision, we adopt Petitioner’s description.

*B. Claim Construction*

In an *inter partes* review proceeding, a patent claim 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). Our rule adopts the same claim construction standard used by Article III federal courts, which follow *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc), and its progeny. Under this standard, the words of a claim are generally given their “ordinary and customary meaning,” which is the meaning the term would have to a person of ordinary skill at the time of the invention, in the context of the entire patent including the specification. *See Phillips*, 415 F.3d at 1312–13.

Petitioner asserts that “no terms need to be construed to resolve the issues raised in this Petition.” Pet. 13. Patent Owner states that “there is not currently a construction-related dispute.” RMTA 7; *see also* Ex. 2005 ¶ 54 (“I do not believe any terms require construction in the present matter.”).

We determine that no claim terms require express construction for purposes of this Decision. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017).

*C. Overview of the Asserted Prior Art*

*1. Hain (Ex. 1004)*

Hain is a certified English translation of German Patent Application No. DE 10 2007 039 455 A1, titled “Hearing aid system with magnetic field sensors,” filed on August 21, 2007, and published on February 26, 2009. Ex. 1004, codes (10), (22), (43), (54); *see also* Ex. 1009 (copy of original reference in German).

Figure 1 of Hain is reproduced below.

FIG 1

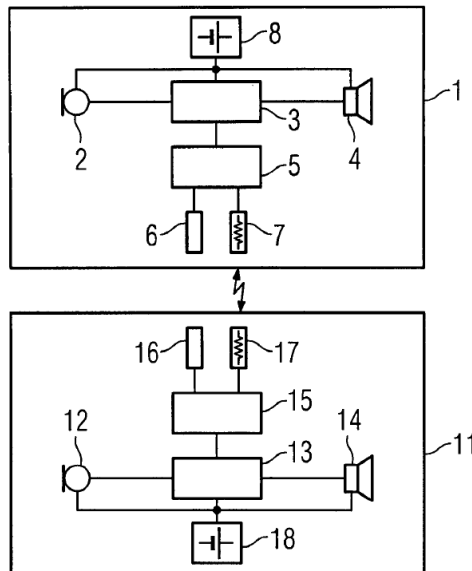


Figure 1 is a diagram of a hearing aid system. Ex. 1004 ¶ 16. Figure 1 shows a hearing aid system with first and second hearing aids (1 and 11) that each can be worn on a user's head. *Id.* ¶ 18. Hain explains that "hearing aids (1, 11) have sensor devices (6, 16) . . . which are used in order to detect whether the relevant hearing aid (1, 11) is in a magnetic field that exceeds a specific field strength." Ex. 1004, code (57). The sensor devices are reed contacts or other magnetic field sensors, such as Hall sensors. *Id.* ¶ 10. "If the reed contacts 6 or 16 are in the immediate vicinity of a magnetic field whose field strength exceeds a certain threshold value, the reed contacts 6 or 16 close." *Id.* ¶ 18. "[T]he status of reed contacts 6 and 16 can be queried by the signal transmission and control units 5 and 15, respectively." *Id.*

Hain's hearing aid system includes "an automatic detection of the hearing situation 'telephoning' and an automatic switching off of the hearing aids (1, 11) when they are removed from the head." *Id.* at code(57).

According to Hain, "[t]he setting of the parameters of the individual hearing programs as well as the settings for the individual compensation of the

hearing loss of a user takes place by means of the signal transmission and control units 5 or 15, to which the transmitting and receiving coils 7 or 17 are connected for wireless data transmission, in conjunction with an external programming unit (not shown).” *Id.* ¶ 18.

Figure 2 of Hain is reproduced below.

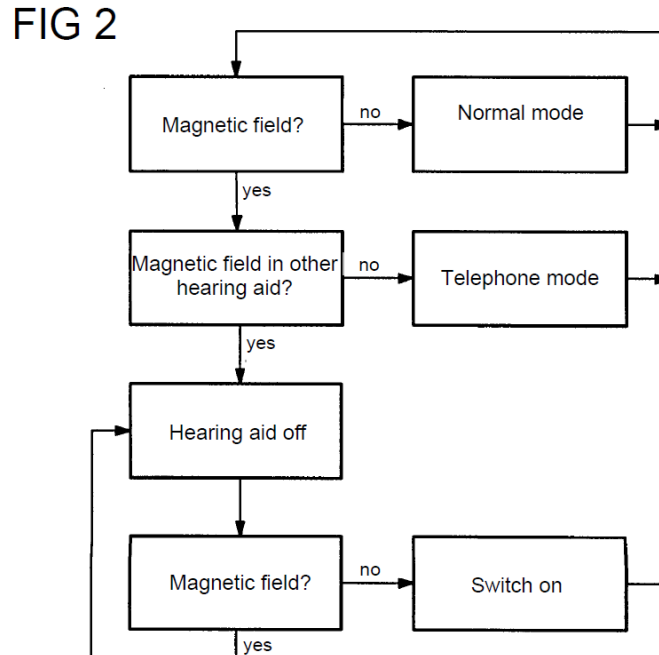


Figure 2 of Hain is a flow chart depicting a method “for automatically detecting the hearing situation ‘telephoning’ and for automatically switching off two hearing aids of a hearing aid system.” Ex. 1004 ¶ 21. Figure 2 shows that the “telephoning” operating mode can be set when one of the hearing aids detects “a telephone receiver emitting a magnetic field.” *Id.* ¶ 4. “If only one of the two hearing aids . . . detects a magnetic field, it can be deduced that the hearing situation is ‘telephoning.’” *Id.* at code (57). In such an example, “only the hearing aid that supplies the ear to which the telephone receiver is held is automatically switched to telephoning mode. The hearing aid that supplies the other ear, on the other hand, is not automatically switched to telephoning mode immediately.” *Id.* ¶ 10.

Figure 2 also shows that the hearing aids may be automatically switched off immediately after use when they are placed in the storage box, or automatically switched on when they are removed from the storage box. Ex. 1004 ¶¶ 11, 22. “For example, there is a permanent magnet in a storage box for the hearing aid in question, a corresponding sensor device can also determine here that the hearing aid is located in the storage box, so that the hearing aid is switched off automatically.” *Id.* ¶ 11. “[I]f both hearing aids detect a relatively strong magnetic field in their immediate vicinity, then this is an indication that the hearing aids are located in the storage box and can be switched off.” *Id.* ¶ 13. When the hearing aids are on, they remain in “normal operation” for as long as no magnetic field is detected. *Id.* ¶ 21.

The hearing aids can distinguish between telephoning and storage in the box by a wireless signal transmission between the two hearing aids. Ex. 1004 ¶ 13. “At least one of the hearing aids transmits to the other hearing aid the information as to whether an external magnetic field is detected. It therefore provides the information about the presence of an external magnetic field from both hearing aids.” *Id.*

To summarize, Hain describes a hearing aid system with a storage box in which the hearing aids are automatically turned on or off based on whether the hearing aids are in the storage box because the storage box contains at least one magnet which emits a magnetic field that opens or closes a reed sensor switch in each hearing aid.

## 2. *Shaffer (Ex. 1003)*

Shaffer is a U.S. patent application publication titled “Earbud Charging Case for Mobile Device,” filed on October 9, 2014, and published on August 27, 2015. Ex. 1003, codes (12), (22), (43), (54). Shaffer

describes “[a] case for a mobile electronic device [that] includes a portion configured to receive power via induction charging, an aperture configured to receive an earbud, and circuitry configured to simultaneously charge the earbud and the mobile electronic device.” *Id.* at code (57).

Figure 3A of Shaffer is reproduced below.

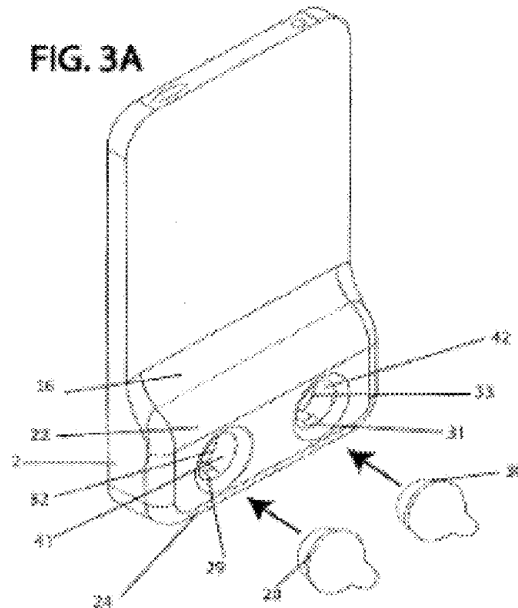


Figure 3A of Shaffer depicts a rear view of a mobile device case with an earbud dock and the mobile device removed from the case with earbuds entering the case. Ex. 1003 ¶¶ 14, 18. Figure 3A includes a mobile device case and earbuds that have magnetized earbud aperture rings (28, 30). *Id.* ¶ 42. “Examples of earbuds include in-ear headphones, hearing aids and the like.” *Id.* ¶ 32. The mobile device case has solid rear connection (22) with lower portion (24), middle portion (22), and upper portion (16). *Id.* ¶ 41. The solid rear connection provides housing for the earbuds in earbud receiving apertures (32, 33) that contain earbud electrical contacts (29, 31) and aperture magnetic contact strips (41, 42). *Id.* ¶¶ 40–42. Shaffer explains that the earbud electrical contacts provide electrical charge to the earbuds, but the aperture magnetic contact strips “may also serve as

electrical contacts, delivering charge directly to the earbud magnetic contact strips from the plug without the need for additional prongs or leaders” in some embodiments. *Id.* ¶¶ 40, 42.

Shaffer’s Figure 10 is reproduced below.

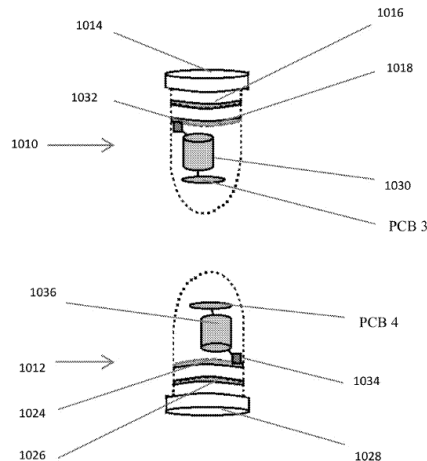


**Fig. 10**

Shaffer’s Figure 10 depicts “an embodiment of a set of earbuds.” Ex. 1003 ¶ 29. “FIG. 10 illustrates an embodiment in which the earbuds are equipped with features that enable them to automatically trigger on and off.” *Id.* ¶ 62. “[E]arbuds 1010 and 1012 include earbud rechargeable batteries 1030 and 1036 and earbud electrical contacts 1032 and 1034. The earbuds are outfitted with magnetic rings 1016 and 1026 that allow a connection with magnetized earbud aperture rings to ensure the earbuds remain securely retained within earbud apertures.” *Id.* “Wireless earbuds typically include internal components, such as a transmitter/receiver (e.g., Bluetooth®, or near field communication equipped) that communicates wirelessly with a mobile smart phone or other device” and “may be connected to printed circuit boards PCB 3 and PCB 4 within the earbuds and may contain encoded firm ware or other programming instructions to automatically

trigger on when the earbuds are removed from the earbud apertures, and turn off upon return to the apertures.” *Id.* ¶¶ 62–63. Shaffer explains:

Each earbud may include one or more contact sensors, such as pressure sensors or magnetic sensors that detect when the earbud is in (or out of) the aperture and which send a corresponding signal to the earbud PCBs. Firmware embedded within the earbud PCBs could cause a circuit that includes the rechargeable earbud batteries 930 and 934 to switch on or off, or return them to a low-energy consumption idle mode.

*Id.*

To summarize, Shaffer describes “a mobile device case that serves as an electrical charger and storage dock for rechargeable wireless audio earbuds.” *Id.* ¶ 2.

### 3. *Sørensen (Ex. 1005)*

Sørensen is a U.S. patent titled “Listening System Comprising a Charging Station with a Data Memory,” filed on October 12, 2009, and issued on September 11, 2012. Ex. 1005, codes (12), (22), (45), (54). Sørensen describes “[a] listening system, e.g., a hearing aid system, including a charging station and one or more listening devices, e.g., hearing instruments.” *Id.* at code (57). Sørensen’s hearing aid system includes:

a) a hearing instrument including a rechargeable battery for energizing the hearing instrument, and a volatile data memory, wherein basic data for the configuration of the hearing instrument are stored during normal operation, b) a charging station adapted for allowing a hearing instrument to be mounted and the battery to be recharged without removing the battery from the hearing instrument, and c) a connection allowing communication between the charging station and the hearing instrument, to allow the basic data for the configuration of the hearing instrument to be transferred from the data memory of the charging station to the data memory of the hearing

instrument, when the hearing instrument is mounted in the charging station.

*Id.*

Sørensen explains that the hearing instrument may include “an input transducer for picking up an input sound in the environment and converting it to an electric input signal and an output transducer for converting an electric output signal to an output sound adapted for being presented to a user wearing the hearing instrument.” Ex. 1005, 2:36–41. The hearing instrument may also include “a signal processor electrically connected to the input and output transducers and adapted to perform signal processing on the electric input signal using at least some of the basic data for the configuration of the hearing instrument read from the volatile memory of the hearing instrument” so that the hearing instrument can be adapted to the user’s hearing impairment. *Id.* at 2:42–51.

The hearing aid system may be adapted to monitor the battery voltage of the hearing instrument using a monitoring unit that is located in the hearing instrument or the charging station. *Id.* at 2:52–59. “In an embodiment, the hearing aid system is adapted to provide that data transfer between the charging station and the hearing instrument is initiated automatically, when the hearing instrument is mounted in the charging station (e.g., electrically connected to the charging station).” *Id.* at 3:48–52. The connection between the hearing instrument and the charging station may be wired or wireless, such that data transfer and charging can be accomplished using a wired connection via galvanic contact, or using a wireless connection via induction. *Id.* at 3:59–4:23.

Sørensen's Figure 1 is reproduced below.

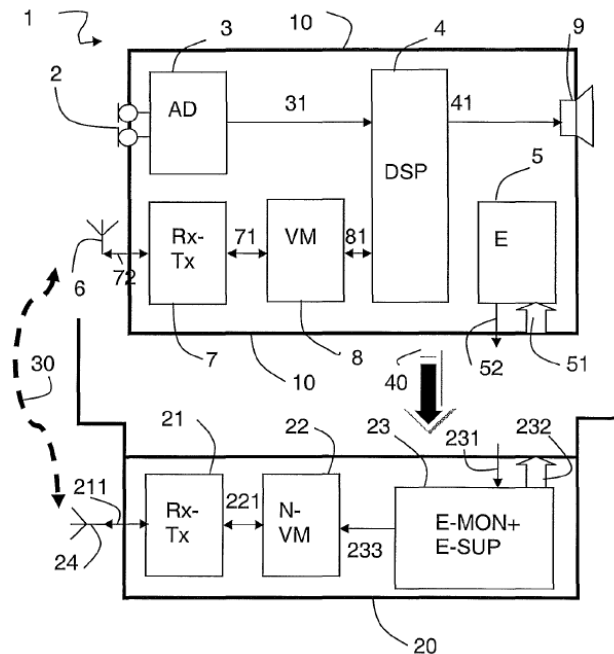


**Fig. 1**

Sørensen's Figure 1 depicts "a hearing aid system comprising a hearing instrument and a charging station for recharging a rechargeable battery of the hearing instrument." Ex. 1005, 6:1–3. The hearing aid system in Figure 1 includes a hearing instrument 10 and its functional blocks, and a charging station 20 for recharging a rechargeable battery of the hearing instrument and its functional blocks. *Id.* at 6:26–37. The hearing instrument includes rechargeable batteries 5, a microphone unit 2, an AD-converter 3, a signal processor 4, a speaker 9, a volatile data memory 8, transceivers 6 and 7, and connections 51 and 52. *Id.*; *see also id.* at 6:64–7:20. The charging station includes a data memory 22, transceivers 21 and 24, and a source of electric energy 23. *Id.* at 7:26–54. When the hearing instrument is mounted 40 to the charging station, the devices are wirelessly connected 30 and two-way wireless communication and charging can occur. *Id.* at 6:37–57. "The wireless signal 30 can e.g., be an inductive signal (based

on two electric coils that are coupled inductively with each other) or an electromagnetic RF-signal, e.g., based on a communications standard, e.g. Bluetooth or be an optical signal (e.g. comprising or constituted by infrared light).” *Id.* at 8:16–20.

To summarize, Sørensen describes “a system comprising a hearing instrument comprising a rechargeable energy source and a charging station for recharging the rechargeable energy source” and “a memory for storing the basic data of the hearing instrument (i.e. the data that are necessary for the hearing instrument to work properly, such as identification data, configuration data, program data, etc.).” *Id.* at 1:50–56.

*D. Anticipation by Hain*

Petitioner asserts that claims 1, 2, and 4 are unpatentable under 35 U.S.C. § 102 as anticipated by Hain, citing the Declaration of Dr. Kiaei for support. Pet. 17–29 (citing Ex. 1002). Patent Owner declined to file a Patent Owner Response and waived all arguments as to Petitioner’s challenges to the original claims. Tr. 35:9–16.

In the absence of arguments and evidence from the Patent Owner, we still review Petitioner’s assertions to ascertain whether Petitioner has met its burden to establish the unpatentability of the original claims by a preponderance of the evidence. *See Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015).

For the reasons explained below, we determine that Petitioner has demonstrated, by a preponderance of the evidence, that claims 1, 2, and 4 are anticipated by Hain.

*1. Independent Claim 1*

Petitioner’s argument regarding the teachings of Hain in regards to claim 1 is summarized as follows: Petitioner asserts that Hain teaches the preamble<sup>6</sup> of claim 1, which recites a method for power control of a wireless earpiece. Pet. 17–19 (citing Ex. 1004 ¶¶ 1, 11, 13, 18, 19, 21–22, Fig. 1; Ex. 1002 ¶¶ 40–41). Petitioner contends that Hain’s hearing aids 1 and 11 include circuitry that is powered down when the hearing aids are placed into their storage box. *Id.* at 19–20 (citing Ex. 1004 ¶¶ 11, 19, 20, 22, Figs. 1–2; Ex. 1002 ¶ 42). Specifically, Petitioner asserts that Hain’s hearing aid circuitry enters a residual or low power mode in response to detecting a magnetic field. *Id.* at 21–22 (citing Ex. 1002 ¶¶ 42–45). Petitioner further argues Hain’s hearing aid circuitry goes into a “normal” or high power mode in response to detecting that a magnetic field is not applied. *Id.* at 22–24 (citing Ex. 1004 ¶¶ 1, 8, 10, 18, 20, 21, Figs. 1–2; Ex. 1002 ¶¶ 46–49).

According to Petitioner, Hain’s Figure 2 illustrates that Hain’s hearing aids switch on (move from low power mode to high power mode) when they no longer detect a magnetic field. *Id.* at 25 (citing Ex. 1004 ¶¶ 10, 11, 13, 18, 19, 21, 22, Fig. 2; Ex. 1002 ¶ 50). Petitioner asserts Hain also discloses the opposite situation, moving from high power to low power mode, when the hearing aid detects a magnetic field after not previously detecting a magnetic field. *Id.* at 26 (citing Ex. 1004 ¶¶ 10, 11, 13, 18, 19, 21, 22, Fig. 2; Ex. 1002 ¶ 51). Finally, Petitioner argues Hain discloses charging an onboard battery, voltage sources 8 and 18 of hearing aids 1 and 11, in

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<sup>6</sup> We find Petitioner’s evidence and argument to be sufficient to show that the ’688 preamble was taught by the cited art. As such, we need not determine whether the preamble is limiting.

response to detecting the magnetic field is applied to the hearing aids. *Id.* at 27 (citing Ex. 1004 ¶ 20; Ex. 1002 ¶ 52).

Patent Owner does not respond. Nonetheless, the burden remains on Petitioner to demonstrate unpatentability. *See Dynamic Drinkware*, 800 F.3d at 1378.

Petitioner's un rebutted assertions and explanations are consistent with and supported by the evidence cited by Petitioner. Upon consideration of Petitioner's evidence and argument, we are persuaded that Petitioner has shown by a preponderance of the evidence that Hain anticipates claim 1.

## *2. Dependent Claims 2 and 4*

Petitioner asserts that claims 2 and 4 (which depend from claim 1) are unpatentable under 35 U.S.C. § 102 as anticipated by Hain, citing the Declaration of Dr. Kiaei for support. Pet. 17, 27–29 (citing Ex. 1002). Petitioner's analysis addresses the limitations in claims 2 and 4 and identifies evidence allegedly supporting its position. Pet. 27–29 (citing Ex. 1004 ¶¶ 8, 18–22, Fig. 1; Ex. 1002 ¶¶ 53–55).

Based on the evidence in the complete record, we are persuaded that Petitioner has shown by a preponderance of the evidence that Hain anticipates claims 2 and 4.

## *E. Obviousness over Hain and Shaffer*

Petitioner asserts that claims 1–6, 8–12, and 14 are unpatentable under 35 U.S.C. § 103 as obvious over Hain and Shaffer, citing the Declaration of Dr. Kiaei for support. Pet. 29–61 (citing Ex. 1002).

We have reviewed Petitioner's arguments and evidence and based on the evidence in the complete record, we are persuaded that Petitioner has

shown by a preponderance of the evidence that claims 1–6, 8–12, and 14 would have been obvious over the combination of Hain and Shaffer.

For example, Petitioner’s arguments regarding independent claim 1 may be summarized as follows: Petitioner asserts that Shaffer teaches the preamble<sup>7</sup> of claim 1, which recites a method for power control of a wireless earpiece. Pet. 29–31 (citing Ex. 1003 ¶¶ 32, 34, 62, 63, Figs. 3A, 10; Ex. 1002 ¶¶ 56–57). Petitioner contends that Shaffer’s wireless earbuds 1010 and 1012 are powered down automatically when they are placed into their storage case 11. *Id.* at 30. Specifically, Petitioner argues that Shaffer’s earbuds enter a low power mode in response to a magnetic sensor detecting that the earbuds are in their storage case. *Id.* at 31.

Petitioner further contends that Shaffer in view of Hain teaches limitation [1A] in view of: Hain’s teaching of a magnetic sensor (reed contacts 6 and 16) that determines that an earbud is in its storage case by detecting that a magnetic field is applied to the earpieces; and Shaffer’s teaching that the wireless earpieces (earbuds 1010 and 1012) are powered using a low-power mode (“low energy consumption idle mode”) in response to a magnetic sensor detecting that the earpieces are in their storage case. Pet. 31–35 (citing Ex. 1003 ¶¶ 40, 62, 63, Fig. 10; Ex. 1004 ¶¶ 18, 19, 21, 22, Fig. 1; Ex. 1002 ¶¶ 58–61). Petitioner further argues that Shaffer and Hain teach limitation [1B] in view of: Hain’s teaching of reed contacts 6 and 16 that determine that an earpiece is out of its storage case by detecting that a magnetic field is not applied to the earpiece; and Shaffer’s teaching

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<sup>7</sup> We find Petitioner’s evidence and argument to be sufficient to show that the ’688 preamble was taught by the cited art. As such, we need not determine whether the preamble is limiting.

that the circuitry of the wireless earpieces (earbuds 1010 and 1012) is powered using a high power mode (“on” state) in response to a magnetic sensor detecting that the earpieces are out of their storage case. Pet. 38–40 (citing Ex. 1003 ¶¶ 11, 62, 63; Ex. 1004 ¶¶ 18, 19, 21, 22, Fig. 1; Ex. 1002 ¶¶ 69–70).

Petitioner argues that “[a person of ordinary skill in the art] would have been motivated to utilize the specific sensors of Hain to implement Shaffer.” *Id.* 35, 40 (citing Ex. 1002 ¶¶ 63, 71). Petitioner identifies multiple reasons that would have prompted an ordinarily skilled artisan to combine Shaffer’s teachings with Hain’s teachings in the way Petitioner proposes. *See* Pet. 35–38 (citing Ex. 1002 ¶¶ 63–67).

Petitioner next argues Hain and Shaffer teach altering the power sent to the circuitry of the wireless earpieces. *Id.* at 40–41 (citing Ex. 1002 ¶¶ 72–74). Petitioner notes that Shaffer teaches firmware in the earbuds’ PCBs to automatically turn on when the earbuds are removed from the earbud apertures and to turn off upon return to the apertures. *Id.* at 40, 41 (citing Ex. 1003 ¶¶ 62, 63). Hain is relied upon to teach the sensors used to detect the magnetic fields that are or are not applied to the earbuds depending on whether they are in the case. *Id.* at 41, 42 (citing Ex. 1004 ¶¶ 18, 19, 21, 22, Fig. 1).

Finally, Petitioner submits that “Shaffer further discloses that powering the earpieces using the low-power mode includes charging an onboard battery of the wireless earpieces.” *Id.* at 43 (citing Ex. 1003 ¶¶ 62, 40, Fig. 10; Ex. 1002 ¶ 76) (emphasis omitted).

On this record, we find Petitioner’s unrebutted assertions and explanations (Pet. 29–43) are consistent with and supported by the evidence

cited by Petitioner, and Petitioner's rationale to combine Hain's and Shaffer's teachings is reasonable and sufficiently supported. We, therefore, find Petitioner's showing meets the burden to establish the unpatentability of claim 1 over Hain and Shaffer by a preponderance of the evidence.

We similarly have reviewed Petitioner's arguments and evidence for claim 2–6, 8–12, and 14 (Pet. 43–61) and are persuaded that Petitioner has demonstrated by a preponderance of the evidence the unpatentability of these claims over the combination of Hain and Shaffer.

*F. Obviousness over Hain, Shaffer, and Sørensen*

Petitioner asserts that claims 3, 5–7, and 9–14 are unpatentable under 35 U.S.C. § 103 as obvious over Hain, Shaffer, and Sørensen, citing the Declaration of Dr. Kiaei for support. Pet. 61–67 (citing Ex. 1002).

Here, Petitioner expands upon its showing from the ground based upon Hain and Shaffer with the addition of Sørensen. Petitioner states that each of these claims directly or indirectly recites a “smart case.” *Id.* at 61. Petitioner argues that “to the extent [Patent Owner] contends that Shaffer's storage case is not a ‘smart case’ as claimed, Sørensen discloses a smart case (e.g., charging station 20) that performs additional functions in connection with storing and charging wireless earpieces (e.g., hearing instrument 10).” *Id.* at 61–62 (citing Ex. 1005, 6:26-47, 7:26-54, Fig. 1; Ex. 1002 ¶¶ 99). According to Petitioner, one of ordinary skill in the art would have been motivated to modify Shaffer's storage case with the additional functionality of Sørensen to allow smaller, cheaper, and more energy efficient hearing aids and to allow the user, dispenser, or manufacturer to analyze data from or upload data to a hearing aid. *Id.* at 63–64 (citing Ex. 1002 ¶¶ 100–101).

We find Petitioner's showing to be persuasive and to meet the burden to establish the unpatentability of claim 9 over Hain, Shaffer and Sørensen by a preponderance of the evidence. We similarly have reviewed Petitioner's arguments and evidence for claims 3, 5–7, and 10–14 and also are persuaded that Petitioner has demonstrated by a preponderance of the evidence the unpatentability of these claims over the combination of Hain, Shaffer and Sørensen.

*G. Patent Owner's Revised Motion to Amend*

As discussed above, we determined that Petitioner has proved, by a preponderance of evidence, that claims 1–14 of the '688 patent are unpatentable. We, therefore, address Patent Owner's Revised Motion to Amend original claims 1–14 and replace them with proposed substitute claims 15–28. RMTA 1. We deny Patent Owner's Revised Motion to Amend for the reasons described below.

*1. Illustrative Proposed Substitute Claims*

Patent Owner contingently proposes substituting claims 15–28 in place of original claims 1–14. RMTA 1. Proposed substitute claims 15, 17, and 22 are illustrative of the subject matter of the proposed amendments and are reproduced below, showing the proposed amendments to the original claims with the added language underlined:

**Claim 15. [Proposed substitute for claim 1]** A method for power control for a wireless earpiece, comprising:  
powering circuitry of the wireless earpiece utilizing a low power mode in response to detecting a magnetic field is applied to the wireless earpiece;  
powering circuitry of the wireless earpiece utilizing a high-power mode in response to detecting a magnetic field is not applied to one or more of the wireless earpieces;

wherein a portion of the wireless earpiece fits within the ear canal opening and the wireless earpiece is configured to read user biometrics, and

altering the power sent to the circuitry of the wireless earpiece to a high-power mode in response to detecting a magnetic field is not applied to one or more of the wireless earpieces;

altering the power sent to the circuitry of the wireless earpieces to a low power mode in response to detecting a magnetic field is applied to one or more of the wireless earpieces;  
and

charging an onboard battery of the wireless earpiece in response to detecting a magnetic field is applied to the wireless earpiece.

RM TA Appx. A-1.

**Claim 17. [Proposed substitute for claim 3]** The method of claim 15, wherein the magnetic field is applied by a magnet of a smart case configured to receive the wireless earpiece, wherein the smart case comprises a rechargeable battery configured to charge the wireless earpiece.

RM TA Appx. A-2.

**Claim 22. [Proposed substitute for claim 8]** The method of claim 15, wherein the low power mode is a power saver mode and the user biometrics is utilized by the wireless earpiece to alter the power mode.

RM TA Appx. A-3.

## 2. *Legal Standard*

Petitioner bears the burden of persuasion to show that any proposed substitute claim is unpatentable by a preponderance of the evidence.

*Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 (PTAB

Feb. 15, 2019) (precedential); 37 C.F.R. § 42.121(d)(2). “Before considering the patentability of any substitute claims, however, the Board first must determine whether the motion to amend meets the statutory and regulatory requirements set forth in 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121.” *Lectrosonics*, Paper 15 at 4–8. Patent Owner bears the burden of persuasion to show by a preponderance of the evidence that the motion to amend complies with these requirements. 37 C.F.R. § 42.121(d)(1). Specifically, Patent Owner must make an initial showing to demonstrate the following: (1) that a “reasonable number of substitute claims” have been proposed for each challenged claim (35 U.S.C. § 316(d)(1)(B)); (2) that the proposed amendments respond to a ground of unpatentability involved in the trial (37 C.F.R. § 42.121(a)(2)(i)); and (3) that the amendments do not seek to enlarge the scope of the claims and do not introduce new matter (35 U.S.C. § 316(d)(3)). *Lectrosonics*, Paper 15 at 4–8.

3. *Compliance with Statutory and Regulatory Requirements*

Patent Owner bears the burden to ensure that its Motion to Amend complies with the legal requirements set forth in 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121. *Lectrosonics*, Paper 15 at 4–5, 7–8. For the reasons that follow, we determine that Patent Owner has satisfied that burden.

a) *Proposal of a reasonable number of substitute claims*

Patent Owner proposes a reasonable number of substitute claims. Patent Owner proposes a one-to-one substitution of proposed claims 15–28 for original claims 1–14. RMTA 2, Appx. A. Petitioner does not argue otherwise. *See generally* Opp. RMTA; Sur-reply RMTA. We determine that this requirement is met.

*b) Amendments responsive to a ground of unpatentability*

Petitioner asserts that “[a]ll the proposed substitute claims include at least one amendment that does not respond to any ground of unpatentability involved in this IPR and thus PO’s RMTA should be denied.” Opp.

RMTA 23. According to Petitioner, the additions of “a portion of the wireless earpiece fits within the ear canal opening” (substitute claims 15–28), “the smart case comprises a rechargeable battery configured to charge the wireless earpieces” (substitute claims 17, 19), and “the user biometrics is utilized by the wireless earpiece to alter the power mode” (substitute claim 22) are not relied upon by Patent Owner to overcome any ground of unpatentability. *Id.*

Patent Owner argues that Shaffer, Hain, and Sørensen do not disclose a wireless earpiece(s) configured to read user biometrics. RMTA 7–8. As noted in our precedential decision, Rule 41.121 “does not require . . . that every word added to or removed from a claim in a motion to amend be solely for the purpose of overcoming an instituted ground.” *Lectrosonics*, Paper 15 at 2. The Federal Circuit in accord with that view of our rules and has found that “so long as a proposed claim amendment does not enlarge the scope of the claims, does not add new matter, and responds to a ground of unpatentability in the proceeding, the patent owner may also make additional amendments to a claim without running afoul of the relevant statutes and regulation.” *Am. Nat’l Mfg. Inc. v. Sleep No. Corp.*, 52 F.4th 1371, 1380 (Fed. Cir. 2022). As such, we determine that this requirement is met.

*c) No enlargement of the scope of the claims*

The amendments proposed in the Revised Motion to Amend do not enlarge the scope of the claims, but include narrowing limitations to the

original claims of the '688 patent. *See* RMTA Appx. A. Petitioner does not argue otherwise. *See generally* Opp. RMTA; Sur-reply RMTA. We determine that this requirement is met.

*d) No introduction of new matter*

Patent Owner has identified written description support for proposed substitute claims 15–28. *See* RMTA 4–6, Claims App. The amendments do not add new matter. *See id.* Petitioner does not argue otherwise. *See generally* Opp. RMTA; Sur-reply RMTA. We determine that this requirement is met.

*4. Patentability of Proposed Substitute Claims*

The Board must assess the patentability of proposed substitute claims “without placing the burden of persuasion on the patent owner.” *Aqua Prods., Inc. v. Matal*, 872 F.3d 1290, 1328 (Fed. Cir. 2017) (en banc); *see also Lectrosonics*, Paper 15 at 3–4. The petitioner must prove that the proposed substitute claims are unpatentable by a preponderance of the evidence. *Bosch Auto. Serv. Sols., LLC v. Matal*, 878 F.3d 1027, 1040 (Fed. Cir. 2017); *Lectrosonics*, Paper 15 at 3–4.

Petitioner, supported by declarations from Dr. Kiaei (Exs. 1020, 1028), asserts the following grounds of unpatentability (Opp. MTA 3–19) in regards to the proposed substitute claims. Patent Owner, supported by declarations from Dr. Young (Exs. 2005, 2006), opposes. Reply RMTA.

| <b>Claim(s) Challenged</b> | <b>35 U.S.C. §</b> | <b>Reference(s)/Basis</b> |
|----------------------------|--------------------|---------------------------|
| 15–28                      | 112                | Indefiniteness            |
| 15–28                      | 112                | Enablement                |

| Claim(s) Challenged | 35 U.S.C. §      | Reference(s)/Basis             |
|---------------------|------------------|--------------------------------|
| 15, 16, 18          | 103 <sup>8</sup> | Hain, Rass <sup>9</sup>        |
| 15–21, 23–28        | 103              | Hain, Shaffer, Sørensen, Rass  |
| 22                  | 103              | Hain, Shaffer, Rass            |
| 15, 16, 18          | 103              | Hain, Aumer <sup>10</sup>      |
| 15–21, 23–28        | 103              | Hain, Shaffer, Sørensen, Aumer |
| 22                  | 103              | Hain, Shaffer, Rass, Aumer     |

*a) Indefiniteness*

Petitioner, supported by Dr. Kiaei (Ex. 1028), asserts indefiniteness as a ground of unpatentability in regards to the proposed substitute claims. Opp. RMTA 23–24. Patent Owner, supported by Dr. Young (Exs. 2005, 2006) opposes. Reply RMTA 12.

Petitioner argues that (i) it is unclear which “ear canal opening” referenced in proposed substitute independent claims 15 and 23 because the claimed “*the* ear canal opening” lacks antecedent basis, and (ii) it is unclear in proposed substitute claim 22 which “power mode” should be altered from among the “power saver mode” recited therein and the “low power” and “high-power” modes recited in base claim 15. *See* Opp. RMTA 23–24. We are unpersuaded by Petitioner’s contentions.

Regarding the claimed phrase “the ear canal opening” in proposed substitute claims 15 and 23, it is implicit that an ear canal has an opening, even in light of there being no prior recitation of “ear canal” in the claims.

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<sup>8</sup> Although Petitioner’s Opposition does not list every ground applied to the proposed substitute claims (instead using “and/or” language when referring to proposed combinations of references, *see* Opp. RMTA 5, 13), the Opposition states that it seeks “to combine Rass’s [sic] and/or Aumer’s teachings with the references in each of the Petition grounds” (*see id.* at 3).

<sup>9</sup> U.S. Pat. No. 7,522,739 B2, issued Apr. 21, 2009 (Ex. 1035, “Rass”).

<sup>10</sup> U.S. Pat. Pub. No. 2016/0094899 A1, published Mar. 31, 2016 (Ex. 1029, “Aumer”).

*Bose Corp. v. JBL, Inc.*, 274 F.3d 1354, 1359 (Fed. Cir. 2001). Furthermore, proposed substitute claims 15 and 23 inform, with reasonable certainty, that the referenced “ear canal opening” is in fact that of the “user” mentioned in these claims. *See* RMTA Appx. A-1 (claim 15 referencing “user biometrics”), A-3 (claim 23 referencing “user biometrics”).

That is, in view of the reference to a “user” whose biometrics are being read in these claims, one having ordinary skill in the art would understand that “the ear canal opening” recited therein belongs to that “user.” *See* Reply RMTA 12; *see Energizer Holdings, Inc. v. Int’l Trade Comm’n*, 435 F.3d 1366, 1370–71 (Fed. Cir. 2006) (“despite the absence of explicit antecedent basis, ‘If the scope of a claim would be reasonably ascertainable by those skilled in the art, then the claim is not indefinite.’”). Further, the Federal Circuit has found that implied antecedent basis may be sufficient. *Cross Med. Prods. v. Medtronic Sofamor Danek*, 424 F.3d 1293, 1319 (Fed. Cir. 2005). We, therefore, find no lack of clarity in this claim limitation.

Regarding the claimed phrase “alter the power mode” in proposed substitute claim 22, it appears that the claim informs, with reasonable certainty, those skilled in the art about its scope. In particular, claim 22 first recites that “the low power mode is a power saver mode,” immediately thereafter specifying that “the user biometrics is utilized by the wireless earpiece to alter the power mode.” *See* RMTA Appx. A-3. In view of the language in claim 22, we agree with Patent Owner that one having ordinary skill in the art would understand that “to alter the power mode” refers to the altering of the power mode referenced immediately prior—i.e., “the low power mode [that] is a power saver mode.” *See* Reply RMTA 12. We,

therefore, find no lack of clarity in the claim limitation directed to “alter[ing] the power mode.”

Thus, we determine that Petitioner has not established that the phrases “the ear canal opening” and “alter the power mode” recited in proposed substitute claims 15, 23, and 22 would render the claims unclear and indefinite. Therefore, Petitioner has not shown that proposed substitute claims 15, 22, and 23 fail to comply with the definiteness requirement.

*b) Enablement*

Petitioner, supported by a declaration from Dr. Kiaei (Ex. 1028), asserts lack of enablement in regards to the proposed substitute claims. Opp. RMTA 19–22. Patent Owner supported by declarations from Dr. Young (Exs. 2005, 2006) opposes. Reply RMTA 9–11.

*(1) Proposed substitute claims 15–21 and 23–28*

Petitioner argues the ’688 patent does not enable a person of ordinary skill in the art to make and use the invention claimed by the proposed substitute independent claims (and by all the proposed substitute dependent claims by virtue of their dependency) under 35 U.S.C. § 112(a). In particular, Petitioner argues “[t]he ’688 patent specification fails to enable a POSITA to make and use a ‘wireless earpiece [] configured to read user biometrics’” as recited in proposed substitute independent claims 15 and 23. Opp. RMTA 19; *see also* Sur-reply RMTA 9.

As pointed out by Petitioner, substitute claims 15 and 23 “simply require a wireless earpiece to be ‘configured to read user biometrics,’ with no restrictions on the type of user biometrics or how their reading is accomplished,” thereby covering “the *entire class* of user biometrics”; however, “[t]he ’688 patent specification fails to enable a POSITA to make

and use a wireless earpiece configured to read the entire class of user biometrics.” Opp. RMTA 19–20.

In *Amgen*, the Supreme Court guides, “the specification must enable the full scope of the invention as defined by its claims. The more one claims, the more one must enable.” *Amgen Inc. v. Sanofi*, 598 U.S. 594, 610 (2023). *Amgen* further holds, “[i]f a patent claims an entire class of processes, machines, manufactures, or compositions of matter, the patent’s specification must enable a person skilled in the art to make and use the entire class.” *Id.*

Patent Owner responds by arguing that, even given a broad patent disclosure, it is not required to exemplify every embodiment, because “it may suffice to give an example (or a few examples) if the specification also discloses some general quality . . . running through the class that gives it a ‘peculiar fitness for the particular purpose.’” Reply RMTA 9 (quoting *Amgen*, 598 U.S. at 611). According to Patent Owner’s expert, Dr. Young, the term “user biometrics” as used in the ’853 patent<sup>11</sup> means “biological, physiological, or chemical characteristics with respect to the individual.” See Ex. 1034,<sup>12</sup> 15:6–16:12.

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<sup>11</sup> The ’853 patent is the grandparent of the ’688 patent via a chain of continuations (*see* Ex. 1001, code (63)), and Patent Owner acknowledges that the ’688 patent’s specification is the same as the ’853 patent’s specification. See RMTA 4–5 (whereby Patent Owner identifies support for the proposed substitute claims in the specification of US Patent Appl. No. 15/245,031 (the ’031 application), which is the application from which the ’853 patent issued).

<sup>12</sup> Exhibit 1034 is a Transcript of a Second Deposition of Dr. Darrin Young dated 9/27/2024 originally filed in another proceeding (IPR2023-01150). In the current proceeding, Patent Owner stipulated that the 9/27/2024

Patent Owner cites to the '031 application as providing support for the added term “user biometrics.” *See* RMTA 5–6 (citing Ex. 1008, 4:19–22, 5:3–15, 6:6–20, 7:5–13, 7:27–8:8, Figs. 1, 2, 4). The cited portions of the '031 application provide: “In one embodiment, the wireless earpieces 142, 144 include a set of left and right ear pieces configured to fit into a user’s ears. The wireless earpieces 142, 144 may be configured to . . . read user biometrics and actions (e.g., heart rate, motion, sleeping, etc.).” Ex. 1008, 4:19–22. The '688 patent discloses “[i]n another embodiment, biometric readings, such as heart beat or temperature may be utilized by the wireless earpieces 142, 144 and smart case 102 to alter the power mode or status of the wireless earpieces 142, 144, as well as the smart case 102 (e.g., may be placed in a low power mode).” Ex. 1001, 5:21–26. “The data may include biometric information (e.g., pulse rate, oxygenation, distance travelled, calories burned, etc.) exercise information, commands received, and other data logged by sensors (e.g., heart rate monitor, pulse oximeter, accelerometers, gyroscopes, etc.) of the wireless earpiece or otherwise determined.” *Id.* at 9:67–10:5.

Dr. Kiaei, however, explains that “the term ‘user biometrics’ is much broader than what the specification of the '688 patent discloses.” Ex. 1028 ¶ 76. Patent Owner’s expert, Dr. Young, provides testimony that, in our view, concedes that the term user biometrics has a breadth that exceeds the disclosures of the '688 patent in that he explains that “user biometrics” also includes other technology such as retinal scans. Ex. 1034 at 16:24–17:3 (“for example, I [came a]cross technology where something is scanning an

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deposition of Dr. Young in IPR2023-01150 applies to the current proceeding. *See* Ex. 1037.

individual's retinal eye. . . . that will be considered a biometric"). According to Dr. Kiaei, the specification of the '688 patent does not disclose how to make a wireless earpiece configured to handle the breadth of user biometrics could be as diverse as DNA sequencing, retinal scans, vein patterns, or facial recognition. Ex. 1028 ¶ 78. Thus, Petitioner argues the '688 patent fails to enable wireless earpieces capable of reading the entire class of user biometrics. Sur-reply RMTA 10.

Patent Owner attempts to limit the scope of "user biometrics" recited in proposed substitute claims 15 and 23 to exclude particular types of biometrics based upon the recitation of a wireless earpiece configured to fit within the ear and for performing associated functions. Reply RMTA 10. In particular, Patent Owner argues:

The Substitute Claims require a wireless earpiece configured to fit within the ear canal and to read user biometrics. The reading of user biometrics is confined to the structure of the earpiece. Thus, a POSITA would understand that only a limited set of biometrics would be appropriate for use in an earpiece worn within the ear and for performing associated functions, which would include controlling various power modes, and would not logically include things like endoscopic pill, bone implants, etc. Ex. 1001 (2:1-2:2, 3:23-3:26); Ex. 1018 (15:15-17, 17:19-17:21); Ex. 2006 ¶ 61.

. . .

DNA sequencing, facial recognition, and retinal scans . . . would not be employed in an earpiece.

*Id.* at 10–11.

Any analysis of whether a particular claim finds support in an application's disclosure requires a determination of whether that disclosure, when filed, contained sufficient information regarding the subject matter of the claims so as to enable one skilled in the pertinent art to make and use the

claimed invention. The statute (35 U.S.C. § 112) has been interpreted to require that the claimed invention be enabled so that any person skilled in the art can make and use the invention without undue experimentation. *In re Wands*, 858 F.2d 731, 737 (Fed. Cir. 1988).

In our analysis below, we conclude that the '688 patent disclosure does not enable those skilled in the art to make and use the full scope of the invention claimed in proposed substitute claims 15 and 23 without undue experimentation because we are unable to identify a “general quality . . . running through the class [of biometric information].” *Amgen*, 598 U.S. at 611 (internal quotations omitted).

Factors to be considered in determining whether a disclosure would require undue experimentation . . . include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims.

*Wands*, 858 F.2d at 737.

Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations. *Id.* In reviewing for lack of enablement, the *Wands* court elected to consider “all of the factors.” *Id.* at 740. However, it is not necessary to review all the *Wands* factors to find a disclosure enabling. Rather, the *Wands* factors “are illustrative, not mandatory” and what is relevant to an enablement determination depends upon the facts of the particular case. *See Amgen, Inc. v. Chugai Pharm. Co.*, 927 F.2d 1200, 1213 (Fed. Cir. 1991); *see also Enzo Biochem, Inc. v. Calgene, Inc.*, 188 F.3d

1362, 1371 (Fed. Cir. 1999) and *Warner-Lambert Co. v. Teva Pharms. USA, Inc.*, 418 F.3d 1326, 1337 (Fed. Cir. 2005).

We now look to pertinent *Wands* factors in this case. As to *Wands* factor 8, “the breadth of the claims,” contrary to Patent Owner’s argument (Reply RMTA 10), the breadth of the functional recitation of “wireless earpiece [that] is configured to read user biometrics” appears to be unbounded as it would allow limitless types of biometric information, as there is no structural requirement recited and, as Patent Owner’s expert opined, the phrase “user biometrics” encompasses any “biological, physiological, or chemical characteristics” of a user. Ex. 1034, 15:2–14; *see also* Ex. 1028 ¶¶ 77–78.

As noted *supra*, Patent Owner submits that “a POSITA would understand [from the recitation in claim 15] that only a limited set of biometrics would be appropriate for use in an earpiece worn within the ear and for performing associated functions” which “would include controlling various power modes, and would not logically include things like endoscopic pill, bone implants” or “DNA sequencing, facial recognition, and retinal scans” because “these techniques would not be employed in an earpiece.” Reply RMTA 10–11. We are not persuaded by Patent Owner’s arguments because proposed substitute claims 15 and 23 provide no limit on the type of the read “user biometrics”; moreover, these claims only require that “a portion of the wireless earpiece fits within the ear canal opening” and that “the wireless earpiece is configured to read user biometrics.” *See* RMTA Appx. A-1. A plain reading of these claims shows that it is not required that biometric information be read *while* the wireless earpiece is

worn in the ear canal. *See* Sur-reply RMTA 10–11 (“the earpieces could read user biometrics while not positioned within the ear”).

For example, as Petitioner points out, the language in proposed substitute claims 15 and 23 does not preclude a wireless earpiece “configured to perform retinal scans or facial recognition when *not* worn within the ear, such as by having sensor(s) in a wireless earpiece to scan the face or eyes while a user holds and looks into the wireless earpiece.” Sur-reply RMTA 11 (citing Ex. 1028 ¶ 78). Moreover, we are persuaded by Petitioner’s argument that the language in proposed substitute claims 15 and 23 reciting that “a portion of the wireless earpiece fits within the ear canal opening” allows “for a portion of the earpiece to be outside of the ear canal, and thus the earpiece could be structurally configured to house a wide variety of technology for reading a broad range of user biometrics.” Sur-reply RMTA 11. As such, one of ordinary skill in the art would have to engage in extensive experimentation to understand the full breadth of biometrics that may be used in the earpieces of claims 15 and 23, and how those biometrics would be implemented in the earpiece. *See* Sur-reply RMTA 10–12.

With respect to *Wands* factors (5) and (7), “the state of the prior art” and “the predictability or unpredictability of the art” associated with “biometrics,” Petitioner submits that efforts are ongoing for which measurement techniques have been constantly evolving for, e.g., DNA sequencing, retinal scans, vein pattern recognition, and facial recognition; moreover, some types of user biometrics that involve biology, chemistry, or physiology, such as DNA sequencing, retinal scans, and vein patterns, may be challenging to measure. *See* Opp. RMTA 21–22 (citing Ex. 1028

¶¶ 79–80). Thus, one of ordinary skill would have to engage in experimentation to understand these evolving techniques and how they apply to the subject earpiece.

We agree with Petitioner’s characterization that “[r]eading of user biometrics involves the ability to measure a particular human biological, physiological, or chemical characteristic.” *Id.* at 22. Even if some types of biometrics such as heart beat or temperature may be well-known and have well understood measurement techniques, other types of biometrics (such as DNA sequencing, retinal scans, and vein pattern recognition) involve areas of biology, chemistry, or physiology that are more unpredictable. *Id.* (citing Ex. 1028 ¶ 80).

With respect to *Wands* factor 6, “the relative skill of those in the art,” this factor is, at best, neutral. We note that, “[i]t is the specification, not the knowledge of one skilled in the art, that must supply the novel aspects of an invention in order to constitute adequate enablement.’ Although the knowledge of one skilled in the art is indeed relevant, the novel aspect of an invention must be enabled in the patent.” *Auto. Techs. Int’l, Inc. v. BMW of North Am., Inc.*, 501 F.3d. 1274, 1283 (Fed. Cir. 2007) (citation omitted). The court explained, “when there is no disclosure of any specific starting material or of any of the conditions under which a process can be carried out, undue experimentation is required.” *Id.* at 1284.

However, we find this factor to be potentially neutral to the extent that a subset of biometric information obtained from particular sensors, e.g., a temperature sensor, might be more easily implemented than more esoteric types of biometric information, such as DNA. Dr. Young supports Patent Owner here by opining that “a POSITA would understand how to implement

the techniques disclosed in the specification within a wireless earpiece system.” Ex. 2006 ¶ 61.v.

As to *Wands* factors (2) and (3), “the amount of direction or guidance presented” by, and the “presence or absence of working examples” in the disclosure of the ’688 patent, we find that the disclosure is minimal, if not non-existent, for the full scope of claims 15 and 23 for certain types of biometric information. For example, we find no direction or guidance presented in the discussion in the disclosure as to how to measure biometrics like DNA sequencing, retinal scans, vein patterns, or facial recognition.

Thus, while we find that the disclosure in the ’688 patent relied upon by Patent Owner may be sufficient for written description purposes, we find no enabling disclosure of how a person with skill in the art would go about making and using Patent Owner’s proposed substitute claims 15 and 23 for the full scope of biometric information.

We find before us an extremely broad claim limitation in claims 15 and 23, directed to a relatively complex invention for which Patent Owner has not provided sufficient working examples. Based on our review of *Wands* factors (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, and (8) the breadth of the claims, we determine that the weighting of the *Wands* factors is heavily weighted towards undue experimentation. We conclude that the ’688 patent disclosure does not enable those skilled in the art to make and use the full scope of the invention claims in proposed substitute claims 15 and 23 (and proposed substitute dependent claims 16–21 and 24–28) without undue experimentation.

(2) *Proposed substitute claim 22*

We analyze proposed substitute claim 22 separately because we do not find that Petitioner’s non-enablement arguments directed to “the wireless earpiece [that] is configured to read user biometrics” (recited in claim 15) apply equally to the method of proposed substitute claim 22, in which “the low power mode is a power saver mode and the user biometrics is utilized by the wireless earpiece to alter the power mode.” *See* RMTA Appx. A-3.

For example, with respect to *claim 22*, we are unpersuaded by Petitioner’s arguments that: “the entire class of all user biometrics must be enabled [by the ’688 patent]” including “DNA sequencing, retinal scans, vein patterns, or facial features”; the claim would not be enabled because “making a wireless earpiece configured to read all user biometrics such as DNA sequencing, retinal scans, vein patterns, and facial features would require undue experimentation”; the “user biometrics” recited therein are “incredibly broad, covering any []biological, physiological or chemical characteristics of the user[]”; and the state of the art and predictability of “DNA sequencing, retinal scans, vein pattern recognition, and facial recognition” are particularly relevant to claim 22. *See* Opp. RMTA 19–22.

Biometrics such as DNA, retinal scans, vein patterns, and facial features appear to be inapposite to the user biometrics recited in claim 22 (which are “utilized by the wireless earpiece to alter the power mode”), and Petitioner does not explain why an ordinarily skilled artisan would naturally consider DNA analysis, retinal scans, vein patterns, and facial recognition when seeking to make and use a wireless earpiece that uses user biometrics “to alter the power mode,” as claimed.

Moreover, with respect to *Wands* factors (2), the amount of direction or guidance presented, and (3) the presence or absence of working examples,

we observe that the '688 patent provides at least one working example of user biometrics read by a wireless earpiece being configurable to alter the earpiece's power mode. *See* Ex. 1001, 5:21–36, 9:66–10:5. In particular, the '688 patent describes

*biometric readings, such as heart beat or temperature may be utilized by the wireless earpieces 142, 144 and smart case 102 to alter the power mode or status of the wireless earpieces 142, 144, as well as the smart case 102 (e.g., may be placed in a low power mode). For example, if the wireless earpieces 142, 144 are near the smart case 102 and no heart beat is detected, the smart case 102 may send a command for the wireless earpieces 142, 144 to shut themselves down or enter a low power mode with minimum functionality. In one embodiment, power to onboard sensory arrays may be terminated and only essential functions remain on. For example, in the low power mode allows charging of the wireless earpieces 142, 144 and/or smart case 102 and uploads/downloads to the wireless earpieces 142, 144 while in the low power mode.*

....

*the wireless earpiece may download or synchronize data with the smart case. The data may include biometric information (e.g., pulse rate, oxygenation, distance traveled, calories burned, etc.), exercise information, commands received, and other data logged by sensors (e.g., heart rate monitor, pulse oximeter, accelerometers, gyroscopes, etc.) of the wireless earpiece or otherwise determined.*

*Id.* (emphases added).

In conclusion, we find that Petitioner has not demonstrated, by a preponderance of the evidence, that the '688 patent's disclosure would not enable those skilled in the pertinent art to make and use the full scope of the invention claimed in proposed substitute claim 22.

c) *Overview of Asserted Prior Art*  
(1) *Rass (Ex. 1035)*

Rass is a U.S. patent titled “Hearing Aid with a Switching Device for Switching On and Off and Corresponding Method,” filed on May 10, 2005, and issued on April 21, 2009. Ex. 1035, codes (12), (22), (45), (54). Rass describes a “hearing aid (I) [that] is fitted with a temperature sensor (TS) to detect the body heat of the hearing aid wearer and therefore that the hearing aid is inserted in the auditory canal.” *Id.* at code (57). “The hearing aid is then switched on and off again based on the temperature signal.” *Id.*

Figure 1 of Rass is reproduced below.

FIG 1

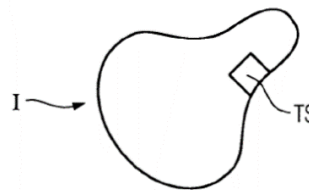


Figure 1, reproduced above, depicts a temperature sensor in an in-the-ear (ITE) hearing aid. *Id.* at 2:53–54. Rass explains that the ITE hearing aid illustrated in Figure 1 has a temperature sensor TS, and when the hearing aid is worn, “the hearing aid I or its shell heats up,” “temperature sensor TS registers this heat,” and “[o]nce a certain temperature threshold is exceeded, the device is switched on.” *Id.* at 2:63–3:4. However, “[i]f the temperature drops back to below a lower temperature threshold, the hearing aid I switches off again.” *Id.* Rass further provides that “[t]his temperature-controlled switching on and off is also possible in principle with a single temperature threshold.” *Id.*

Rass therefore provides a “method for switching a hearing aid on and off, by obtaining a switch signal from . . . a temperature signal relating to the body heat of a hearing aid wearer.” *Id.* at 2:5–9. Rass explains that an

advantage of its solution is that “there is no need for a mechanical switch, e.g. the battery compartment switch” with “[a]utomatic switching on and off . . . represent[ing] a significant increase in user-friendliness.” *Id.* at 2:14–20. According to Rass, its “switching on and off operations include switching to or from standby mode. . . . [which] extends the useful life or endurance of the hearing aid battery during normal operation.” *Id.* at 2:28–31.

(2) *Aumer (Ex. 1029)*

Aumer is a U.S. patent application publication titled “Methods and Apparatus for Improving Signal Quality in Wearable Biometric Monitoring Devices,” filed on August 18, 2015, and published on March 31, 2016. Ex. 1029, codes (12), (22), (43), (54). Aumer “relates generally to monitoring devices and methods, more particularly, to monitoring devices and methods for measuring physiological information” (Ex. 1029 ¶ 2), in which “a wearable biometric monitoring device is configured to assess the biometric signal quality of one or more sensors associated with the biometric monitoring device, determine how the user should adjust the device to improve the biometric fit, and instruct the user to wear the device a certain way.” *Id.* ¶ 6. “[T]he biometric monitoring device is integrated within an earbud, an audio headset, a wrist strap, a wrist watch, an ankle bracelet, or an armband” and “[i]n some embodiments, the biometric monitoring device comprises a band configured to at least partially encircle a portion of the body of a subject, and wherein the portion of the body comprises a limb, a nose, an earlobe, and/or a digit.” *Id.* ¶ 18.

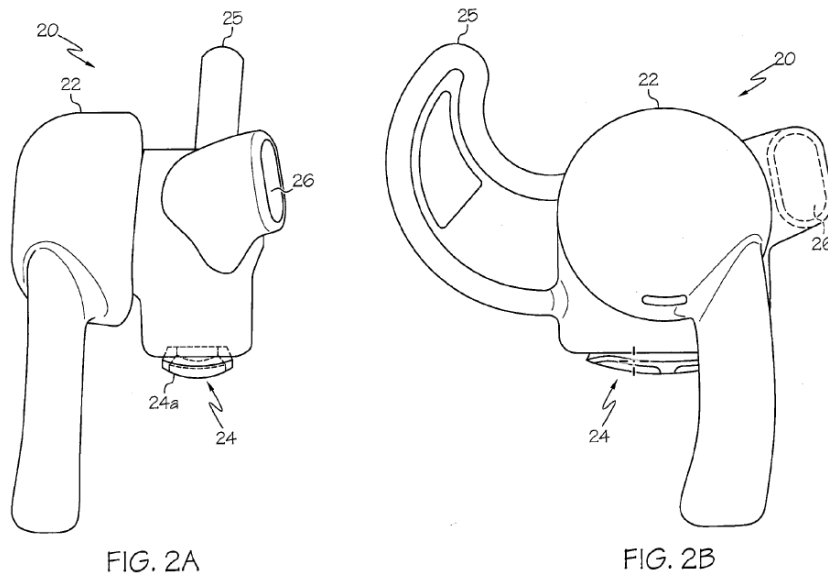
Aumer discloses:

The ear is an ideal location for wearable health and environmental monitors. The ear is a relatively immobile platform that does not obstruct a person’s movement or vision.

Monitoring devices located at an ear have, for example, access to the inner-ear canal and tympanic membrane (for measuring core body temperature), muscle tissue (for monitoring muscle tension), the pinna, earlobe, and elsewhere (for monitoring blood gas levels), the region behind the ear (for measuring skin temperature and galvanic skin response), and the internal carotid artery (for measuring cardiopulmonary functioning), etc. A particularly distinct pulsatile blood flow waveform can be discerned optically, via PPG, between the anti-tragus and concha region of the ear. The ear is also at or near the point of exposure to: environmental breathable toxicants of interest (volatile organic compounds, pollution, etc.); noise pollution experienced by the ear; and lighting conditions for the eye. Furthermore, as the ear canal is naturally designed for transmitting acoustical energy, the ear provides a good location for monitoring internal sounds, such as heartbeat, breathing rate, and mouth motion.

*Id.* ¶ 64.

Figures 2A and 2B of Aumer, reproduced below, “illustrate a biometric monitoring device that can be positioned within an ear of a subject. *Id.* ¶ 23.



Figures 2A and 2B, reproduced above, illustrate biometric monitoring device 20 that can be positioned within an ear of a subject. *Id.* ¶¶ 23, 65–66,

71. Aumer's monitoring earpiece 20 includes an earpiece body or housing 22, a sensor module 24, a stabilizer 25, and a sound port 26, and "[w]hen positioned within the ear of a subject, the sensor module 24 has a region 24a configured to contact a selected area of the ear" such as "matingly engag[ing] a portion of the ear between the anti tragus and acoustic meatus" while "the stabilizer is configured to engage the anti-helix." *Id.* ¶¶ 66, 69. "However, monitoring devices in accordance with [Aumer's] embodiments . . . can have sensor modules with one or more regions configured to engage various portions of the ear." *Id.* ¶ 66. Sensor module 24 is "configured to detect and/or measure physiological information from the subject." *Id.* ¶ 69. More particularly, Aumer provides that

A sensor module utilized in accordance with embodiments of the present invention may be an optical sensor module that includes at least one optical emitter and at least one optical detector. Exemplary optical emitters include, but are not limited to light-emitting diodes (LEDs), laser diodes (LDs), organic light-emitting diodes (OLEDs), compact incandescent bulbs, micro-plasma emitters, IR blackbody sources, or the like. In addition, a sensor module may include various types of sensors including and/or in addition to optical sensors. For example, a sensor module may include one or more inertial sensors (e.g., an accelerometer, piezoelectric sensor, vibration sensor, photoreflector sensor, etc.) for detecting changes in motion, one or more thermal sensors (e.g., a thermopile, thermistor, resistor, etc.) for measuring temperature of a part of the body, one or more electrical sensors for measuring changes in electrical conduction, one or more skin humidity sensors, and/or one or more acoustical sensors.

*Id.* ¶ 70. The sensor may also be "a PPG sensor" whose operation is "based upon shining light into the human body and measuring how the scattered light intensity changes with each pulse of blood flow," whereby "[t]he scattered light intensity will change in time with respect to changes in blood

flow or blood opacity associated with heart beats, breaths, blood oxygen level (SpO<sub>2</sub>), and the like.” *Id.* ¶¶ 3, 19.

Monitoring earpiece 20 further includes at least one processor that is coupled to the sensor(s) and that is configured to receive and analyze signals produced by the sensor(s), a communication component, and an adjustment mechanism. *Id.* ¶¶ 66, 71. The communication component allows the processor(s) to communicate with a wearer of the monitoring earpiece 20 via a remote device (such as a smart phone or computer). *Id.* ¶ 72. Adjustment mechanism 18 is a device that facilitates proper placement of the monitoring earpiece 20 relative to the body of the subject. *Id.* ¶ 73.

Aumer provides that its biometric monitoring device is “configured to assess the biometric signal quality of one or more sensors associated with the biometric monitoring device, determine how the user should adjust the device to improve the biometric fit, and instruct the user to wear the [ ] device a certain way” to “improve the biometric fit (and hence the biometric signal quality).” *Id.* ¶¶ 6–8. Aumer’s “method of monitoring signal quality of [the] wearable biometric monitoring device” includes “instructing the subject via the at least one processor [of the biometric monitoring device] to begin an exercise regimen,” “measuring signal quality produced by the at least one sensor [of the biometric monitoring device],” and “communicating information to the subject regarding the signal quality during the exercise regimen.” *Id.* ¶ 7.

### (3) *Obviousness of Proposed Substitute Claim 15*

Petitioner asserts that proposed substitute independent claim 15 would have been obvious over the Rass-based combinations (i.e., Hain and Rass, and Hain, Shaffer, and Rass), and over the Aumer-based combinations (i.e.,

Hain and Aumer, and Hain, Shaffer, and Aumer). *See* Opp. RMTA 3–18. Proposed substitute claim 15 includes amendments to original claim 1. *See* RMTA Appx. A-1. For the reasons given above (*see* Sections II.D.1 and II.E), based on the arguments and evidence of record, we determine that Petitioner proved, by a preponderance of evidence, that claim 1 is unpatentable as anticipated by Hain, and as rendered obvious by Hain and Shaffer. Below we address the parties’ disputes regarding proposed substitute claim 15 and the features recited in Patent Owner’s proposed amendments in claim 15.

Although the burden of persuasion and production regarding the patentability of the substitute claims is not borne by Patent Owner (*see Aqua Products, Inc. v. Matal*, 872 F.3d 1290, 1296 (Fed. Cir. 2017)), Patent Owner argues, with respect to the Petition’s original grounds based on Hain (anticipation) and Hain, Shaffer, and Sørensen (obviousness), that “Hain does not disclose a wireless earpiece(s) ‘configured to read user biometrics’” as “Hain does not state the claimed hearing aids are configured to read user biometrics. Nor does Hain mention biometrics at all,” and “Shaffer, Hain, Sorenson [sic] . . . do not disclose reading a user’s biometrics, nor [do they] even mention biometrics.” RMTA 7–8 (citing Ex. 2005 ¶¶ 66–69).

In response to Patent Owner’s Revised Motion to Amend, Petitioner argues that proposed substitute claim 15 is obvious over (i) the combination of Hain and Rass, (ii) the combination of Hain, Shaffer, and Rass, (iii) the combination of Hain and Aumer, and (iv) the combination of Hain, Shaffer, and Aumer. Opp. RMTA 2–19. In particular, Petitioner asserts that a person of ordinary skill in the art “would have been motivated to include in a wireless earpiece, as taught by Hain or Shaffer (*e.g.*, Hain’s hearing aids 1

and 11, Shaffer’s earbuds 1010 and 1012),” a “temperature sensor to detect user temperature to automatically switch on and off the hearing aid or earbud based on the detected temperature, as taught by Rass” or “one or more sensors, a processor, and a communication component to read user biometrics, as taught by Aumer.” *Id.* at 4–5, 13–14.

Patent Owner argues that Petitioner’s showing in the Opposition is insufficient. Reply RMTA 1–9. In particular, Patent Owner argues that the combinations of Rass with Hain and Shaffer, and Aumer with Hain and Shaffer, do not render proposed substitute claim 15 obvious because, *inter alia*, Rass and Aumer are not analogous art to the ’688 patent (Reply RMTA 2–7), Petitioner has not established proper motivation to combine each of Rass and Aumer with Hain and Shaffer (*id.* at 1, 4–5, 7–9), and Rass’ disclosed temperature reading is not a reading of user biometrics. *Id.* at 4, 8.

After considering the amended claim as a whole, in light of the parties’ arguments and evidence of record, we find Petitioner’s arguments and evidence to be persuasive and agree with Petitioner’s assertion that one of ordinary skill in the art would have understood the disclosures of Rass, Aumer, Hain, and Shaffer to teach or at least suggest all of the limitations of proposed substitute claim 15. We do not find Patent Owner’s arguments in opposition to be persuasive and as such they do not disturb Petitioner’s showing of unpatentability of claim 15, by a preponderance of the evidence, over the combination of Hain and Rass, the combination of Hain, Shaffer, and Rass, the combination of Hain and Aumer, and the combination of Hain, Shaffer, and Aumer.

(a) *Claim 15 element: “wireless earpiece is configured to read user biometrics”*

Rass-based Grounds

Petitioner argues that proposed substitute claim 15 would have been obvious over the combination of Hain and Rass, and the combination of Hain, Shaffer, and Rass. *See* Opp. RMTA 3–5.

Patent Owner’s proposed amendment in claim 15 recites “wherein a portion of the wireless earpiece fits within the ear canal opening and the wireless earpiece is configured to read user biometrics.” RMTA Appx. A-1. Petitioner argues that “Rass teaches ‘the wireless earpiece is configured to read user biometrics’” as claimed because “Rass discloses its hearing aid I fitted with a temperature sensor to ‘detect the body heat of the hearing aid wearer.’” Opp. RMTA 4, 7 (citing Ex. 1035, 2:5–8, 2:64–3:2, Abstr., Fig. 1). Petitioner emphasizes Rass’ disclosure of “switching on and off [its] ‘in-the-ear (ITE)’ hearing aid (I) by fitting it ‘with a **temperature sensor (TS)** to *detect the body heat of the hearing aid wearer*,’” and compares this with the ’688 patent’s disclosure of “biometric readings, such as heart beat or temperature [that] may be utilized by the wireless earpieces 142, 144 and smart case 102 to alter the power mode or status of the wireless earpieces 142, 144.” Opp. RMTA 3–4 (citing Ex. 1035, 2:5–8, 2:53–54, 2:63–3:2, Abstr., Fig. 1; Ex. 1001, 5:22–25; Ex. 1028 ¶¶ 9–10).

Patent Owner argues that “[Rass] temperature sensor is not detecting the body temperature of the wearer, which is understood by a POSITA to be a biometric signal. Rather, the temperature sensor is detecting an increase in heat, which could be the result of power dissipation of the hearing aid device

itself.” Reply RMTA 4 (citing Ex. 1035, 2:64–67; Ex. 2006 ¶¶ 63–66, 78);<sup>13</sup> *see also* Reply RMTA 8 (arguing that “Rass . . . mentions using the temperature of the hearing aid or shell to turn a hearing aid on or off, not the direct body temperature of the user” and “a POSITA would not consider the temperature of a hearing aid or hearing aid shell to be a biometric reading”).

Petitioner responds that “[Patent Owner’s] position is in direct contradiction with Rass’ explicit disclosure, which states that its hearing aid temperature sensor ‘detect[s] the *body heat of the hearing aid wearer*.’” Sur-reply RMTA 5 (citing Ex. 1035, Abstr.). Petitioner also submits that “the ’688 patent like[] [Rass] has no disclosure or teaching regarding how to limit the detection of heat to that of a user, rather than from other alleged heat sources,” while “[Patent Owner’s] expert agree[d] a POSITA ‘would know how to include a sensor in a wireless earpiece to measure the temperature of a user.’” *Id.* at 5–6 (citing Ex. 1034, 17:7–18:22).

Based on the complete record, we find Petitioner’s arguments and evidence persuasive. Petitioner’s argument that Rass teaches the claimed “wireless earpiece [that] is configured to read user biometrics” is supported by the cited evidence. Rass expressly discloses that its hearing aid is to be “inserted in the auditory canal” and “is fitted with a temperature sensor (TS) to detect the body heat of the hearing aid wearer” and obtain “a temperature signal relating to the body heat of [the] hearing aid wearer.” Ex. 1035, 1:62–66, 2:6–8, Abstr. The in-the-ear hearing aid shown in Rass’ Fig. 1 “has a temperature sensor TS” and

[w]hen wor[n], the hearing aid I or its shell heats up. The temperature sensor TS registers this heat. Once a certain

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<sup>13</sup> Dr. Young’s relied-upon declaration testimony (Ex. 2006 ¶¶ 63–66, 78) reiterates this argument.

temperature threshold is exceeded, the device is switched on. If the temperature drops back to below a lower temperature threshold, the hearing aid switches off again. This temperature-controlled switching on and off is also possible in principle with a single temperature threshold.

*Id.* at 2:63–3:4, Fig. 1. Thus, Rass’ temperature sensor in the wireless earpiece inserted in the auditory canal senses body heat of the hearing aid wearer, and produces a temperature signal related to that body heat. *See id.* That is, the *temperature read by Rass’ earpiece* when worn by a wearer is directly related to, and caused by, the body heat of the wearer—which is commensurate with the broad description of *user biometrics read by an earpiece* in the disclosure of the ’688 patent. *See id.*

The ’688 patent states that “biometric readings, such as . . . temperature [which] may be utilized by the wireless earpieces 142, 144 and smart case 102 to alter the power mode,” and “data [synchronized by the earpieces with the smart case] . . . include[ing] medical information, such as . . . temperature.” *See* Ex. 1001, 5:22–26, 10:9–11. The ’688 patent also references “user biometrics and actions (e.g., heart rate, motion, sleeping, etc.),” and provides that “biometric information” may be “logged by sensors (e.g., heart rate monitor, pulse oximeter, accelerometers, gyroscopes, etc.) of the wireless earpiece or otherwise determined.” *Id.* at 3:18–20, 9:67–10:5.

To the extent the temperature reading of a wireless earpiece inserted in the auditory canal may be influenced by “power dissipation” of the earpiece itself (*see* Reply RMTA 4) or by “the temperature of [the] hearing aid” itself (*see* Reply RMTA 8), we observe that the ’688 patent does not discuss a *precision* of the user biometrics read by the wireless earpiece, or a *precision* of the wireless earpiece’s sensor(s) reading the user biometrics. Proposed substitute claim 15 merely recites that “the wireless earpiece is

configured to read user biometrics,” without specifying how those biometrics are read, or the precision of the sensor(s) reading them. Thus, the claimed reading of user biometrics in claim 15 does not require a particular precision of the read user biometrics, nor does it require correcting the user biometrics for externalities such as power dissipation or temperature of the earpiece (*see* Reply RMTA 4, 8).

We, therefore, are persuaded by Petitioner that the broad limitation in claim 15 of a “wireless earpiece . . . configured to read user biometrics” reads on Rass’ wireless hearing aid configured (via an included temperature sensor) to read a temperature that is based on the detected body heat of the hearing aid wearer. *See* Opp. RMTA 3–4.

#### Aumer-based Grounds

Petitioner argues that proposed substitute claim 15 would have been obvious over the combination of Hain and Aumer, and the combination of Hain, Shaffer, and Aumer. *See* Opp. RMTA 13. Petitioner argues that “Aumer teaches ‘the wireless earpiece is configured to read user biometrics,’ as recited in substitute claim 15” because “Aumer discloses [] wireless earpiece 20 that includes one or more sensors (*e.g.*, sensor module 24) ‘configured to detect and/or measure physiological information from the subject’ such as temperature, blood gas levels, cardiopulmonary functioning” and “discloses techniques for configuring . . . earpiece 20 to include [the] one or more sensors to read user biometrics and improving the biometric signal quality from the sensors.” Opp. RMTA 13–15 (citing Ex. 1029 ¶¶ 2, 64, 66, 69–72, Title, Abstr., Figs. 1, 2A–2B, 5A–8B). Petitioner emphasizes the disclosure in paragraph 64 of Aumer that “[t]he ear is an ideal location for wearable health and environmental monitors”

such that “[m]onitoring devices located at an ear have . . . access to the inner-ear canal and tympanic membrane (for measuring core body temperature), muscle tissue (for monitoring muscle tension), the pinna, earlobe, and elsewhere (for monitoring blood gas levels)” —and compares this disclosure with the ’688 patent’s description of “biometric readings, such as heart beat or temperature” and “biometric information (e.g., pulse rate, oxygenation, distance travelled, calories burned, etc.).” *See* Ex. 1029 ¶ 64; Opp. RMTA 11, 14–15, 17 (citing Ex. 1029 ¶ 64; Ex. 1001, 5:22–23, 9:66–10:2).

Patent Owner submits arguments (discussed in the next sections, *infra*) against Petitioner’s combinations including Aumer, but does not appear to dispute Petitioner’s contention that Aumer describes a wireless earpiece configured to read user biometrics. *See* generally Reply RMTA.

Based on the arguments and evidence of record, including Aumer’s description of biometric monitoring earpiece 20, we are persuaded by Petitioner’s argument that Aumer teaches a wireless earpiece that is configured to read user biometrics, as recited in proposed substitute claim 15. *See* Opp. RMTA 13. More particularly, we determine that wireless earpiece 20 (which Aumer describes as exemplary “wearable biometric monitoring device 10,” *see* Ex. 1029 ¶¶ 65–66, 71) including sensor(s) 24 inserted into a user’s auditory canal to measure biometric characteristics such as core body temperature or blood gas levels (*id.* ¶¶ 64, 66, 71), is encompassed by the term “wireless earpiece . . . configured to read user biometrics,” as that dispositive limitation in proposed substitute claim 15 is described in the ’688 patent. Specifically, “biometric readings, such as heart beat or temperature may be utilized by the wireless earpieces

142, 144 and smart case 102 to alter the power mode or status of the wireless earpieces 142, 144, as well as the smart case 102 (e.g., may be placed in a low power mode).” Ex. 1001, 5:21–26. “The data may include biometric information (e.g., pulse rate, oxygenation . . . ) . . . logged by sensors. . . . [and] may also include medical information, such as blood measurements, . . . temperature.” *Id.* at 9:67–10:11.

(b) *Whether Rass and Aumer are Analogous Art*

We use “[t]wo separate tests [to] define the scope of analogous art: ‘(1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor’s endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.’” *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1379 (Fed. Cir. 2019) (quoting *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004)).

The “field of endeavor” test asks if the structure and function of the prior art is such that it would be considered by a person of ordinary skill in the art, because of the similarity to the structure and function of the claimed invention as disclosed in the application. *Bigio*, 381 F.3d at 1325–27. It is necessary to apply “common sense” in “deciding in which fields a person of ordinary skill would reasonably be expected to look for a solution to the problem facing the inventor.” *Id.* at 1326 (citations and quotation marks omitted).

As to the “reasonably pertinent” test:

A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor’s endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor’s attention in considering his problem. Thus, the purposes of both the invention and the

prior art are important in determining whether the reference is reasonably pertinent to the problem the invention attempts to solve. If a reference disclosure has the same purpose as the claimed invention, the reference relates to the same problem, and that fact supports use of that reference in an obviousness rejection. An inventor may well have been motivated to consider the reference when making his invention. If it is directed to a different purpose, the inventor would accordingly have had less motivation or occasion to consider it.

*In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992).

To be considered reasonably pertinent, prior art must “logically commend” itself to an inventor’s attention in considering the problem addressed by the challenged patent. *Innovention Toys, LLC*, 637 F.3d at 1321; *In re Icon Health and Fitness, Inc.*, 496 F.3d 1374, 1379–80 (Fed. Cir. 2007) (quoting *Clay*, 966 F.2d at 659). In other words, “familiar items may have obvious uses beyond their primary purposes.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 420 (2007). Importantly, however, the pertinence of prior art as a source of solution to the inventor’s problem *cannot* be considered using hindsight, but must instead be recognizable with the foresight of a person of ordinary skill. *In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992). “[A] prior art reference need not ‘be reasonably pertinent to each and every problem with which an inventor is involved; reasonable pertinence to a single such problem suffices.’” *Ex Parte Nguyen*, No. 2020-005994, 2022 WL 292612, at \*3 (PTAB Jan. 28, 2022) (quoting *Ex parte Gaechter*, 65 USPQ2d 1690, 1692 (BPAI 2002)).

Patent Owner contends that Rass is not analogous art to the ’688 patent because Rass and the ’688 patent are not from the same field of endeavor. Reply RMTA 2–4. In particular, Patent Owner states that “[t]he ’688 Patent’s field of invention relates to ‘wireless electronics and *battery*

*systems* [and] more specifically . . . wireless earpieces managing and extending battery life,’ to include techniques for charging the earpieces using a smart case,” whereas “Rass’ field of invention is ‘a hearing aid unit [and corresponding method] with a switching device for switching the hearing aid on and off.” *Id.* at 3 (citing Ex. 1001, 1:21–24; Ex. 1035, 1:14–17).

Patent Owner further alleges “Rass is also not reasonably pertinent to the particular problem with which the inventor of the ’688 Patent is involved” because “Rass is concerned with switching a hearing aid on and off . . . whereas the ’688 Patent is concerned with the larger problem of managing and extending battery life of wireless electronics through the variation and manipulation of power modes and methods of charging.” Reply RMTA 3–4 (citing Ex. 1001, 1:24–41; Ex. 1035, 1:15–17).

The ’688 patent explains that “[t]he present invention relates to wireless electronics and battery systems. More specifically, *but not exclusively*, the present invention relates to wireless earpieces managing and extending battery life.” Ex. 1001, 1:20–24 (emphasis added). The abstract of the patent similarly begins: “A system and method for managing wireless earpieces [in which c]ircuitry of the wireless earpieces are powered utilizing a high-power mode in response to detecting a magnetic field is not applied to one or more of the wireless earpieces.” *Id.* at code (57). The detailed description describes “a system, method, and wireless earpieces for managing and preserving battery life” where the “wireless earpieces may interact with a smart case to perform various actions. . . . [including] preserv[ing] the battery life of the wireless earpieces by interacting with the wireless earpieces while in a low power mode or state.” *Id.* at 2:44–50.

As to the first prong of the *Bigio* test, Petitioner argues that “Rass is analogous art to the ’688 patent. . . . it is from the same field of endeavor—wireless electronics, namely wireless earpieces.” Opp. RMTA 5–6 (citing Ex. 1001, 1:21–24; Ex. 1035, 1:14–17, 2:53–54, 2:63–64, Fig. 1); *see also* Sur-reply RMTA 3. Petitioner references *Netflix, Inc. v. DivX, LLC*, 80 F.4th 1352, 1359 (Fed. Cir. 2023) (Opp. RMTA 6, Sur-reply RMTA 3) noting that “field of endeavor may be broadly defined because it relies on ‘the complete disclosure of all embodiments in the patent’s specification.’” *See Netflix*, 80 F.4th at 1359 (quoting Jeffrey T. Burgess, *The Analogous Art Test*, 7 BUFF. INTELL. PROP. L.J. 63, 72 (2009)). Petitioner notes that “[Patent Owner] does not dispute that Rass (or any of Hain and Shaffer) discloses a wireless earpiece.” Sur-reply RMTA 3.

The *Netflix* court held, “[w]e have affirmed findings of analogous art where the references shared a general field of endeavor.” *Netflix*, 80 F.4th at 1359 (citing *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1001–02 (Fed. Cir. 2016) (“affirming Board’s finding of analogous art where the patent-in-dispute and prior art were both ‘in the field of interface design’”). Here, Petitioner argues that the field of endeavor of the ’688 patent is “wireless electronics, namely wireless earpieces.” Opp. RMTA 5; Sur-reply RMTA 3. Patent Owner argues that “Petitioner’s stated field of endeavor is oversimplified” because “[t]he ’688 Patent’s stated field of invention relates to ‘wireless electronics and *battery systems* [and] more specifically . . . wireless earpieces managing and extending battery life. . . . the ’688 Patent focuses on preserving battery life through varying power modes and actively charging the earpieces, using a smart case”—while “Rass’s [sic] field of invention is ‘a hearing aid unit [and corresponding method] with a switching

device for switching the hearing aid on and off. . . . Rass only focuses on turning the device on and off.” Reply RMTA 3 (citing Ex. 1001, 1:21–24, 10:33–36; Ex. 1035, 1:14–17).

Consistent with the holding in *Netflix* and the ’688 patent’s stated field of invention quoted above, and guided by *KSR*, we agree with Petitioner that the ’688 patent’s general field of endeavor is wireless electronics that include wireless earpieces. We are also of the view that Rass operates in this same general field of endeavor because, as pointed out by Petitioner, Rass discloses “***a hearing aid unit***” such as “an in-the ear (ITE) hearing aid” having a battery and “[a]utomatic [s]witching on and off.” Ex. 1035, 1:14–17, 2:5–8, 2:18–20, 2:27–31, 2:53–54, 2:64–3:2, Fig. 1; Opp. RMTA 4–6 (citing Ex. 1035, 1:14–17, 2:5–8, 2:14–31, 2:53–54, 2:64–3:2, Abstr., Fig. 1); Sur-reply RMTA 3.

We are persuaded by Petitioner that Rass and the claimed invention are both in the same general field of endeavor with respect to *Bigio* prong 1, i.e., wireless electronics that include wireless earpieces. Patent Owner asks that we take what we view as an unreasonably narrow view of the field of endeavor, rather than a more general one, as guided by *Netflix*. As such, Patent Owner’s argument does not persuade us.

We also are persuaded by Petitioner that Rass is reasonably pertinent to a particular problem with which the inventor of the ’688 patent is involved under prong 2 of the *Bigio* test. See Opp. RMTA 7–8. A prior art reference is reasonably pertinent only if “a person of ordinary skill would reasonably have consulted those references and applied their teachings in seeking a solution to the problem that the inventor was attempting to solve.” *GPAC*, 57 F.3d at 1578. “In order to determine whether a reference is

‘reasonably pertinent,’ . . . a reasonable factfinder should consider record evidence cited by the parties to demonstrate the knowledge and perspective of a person of ordinary skill in the art at the time of the invention.” *Airbus S.A.S.*, 941 F.3d at 1383.

Patent Owner argues, “Rass is concerned with switching a hearing aid on and off . . . whereas the ’688 Patent is concerned with the larger problem of managing and extending battery life of wireless electronics through the variation and manipulation of power modes and methods of charging.” Reply RMTA 3–4 (citing Ex. 1001, 1:24–41; Ex. 1035, 1:15–17).

Petitioner counters that Rass, too, is concerned with managing and extending battery life of a wireless earpiece as “Rass discloses techniques to ‘extend[] the useful life or endurance of the hearing aid battery.’ . . . [and] explains that this extension in battery life results from ‘the switching on and off operations [which] include switching to or from standby mode’—that is, variation of power modes.” Sur-reply RMTA 3–4 (citing Ex. 1035, 2:5–8, 2:27–31, 2:64–3:2, Abstr., Fig. 1); *see also* Opp. RMTA 4, 8 (citing Ex. 1035, 2:14–31). Petitioner reasons that a reasonably skilled artisan aware of Rass’ disclosure, “would have reasonably considered Rass when faced with the problem of implementing a wireless earpiece that can manage and extend battery life.” Opp. RMTA 8 (citing Ex. 1028 ¶¶ 19, 20, 33, 34; Ex. 1035, 2:27–31, 2:5–8, 2:64–3:2, Abstr., Fig. 1). We find this argument to be persuasive because Rass is, indeed, concerned with “switching on and off operations.” *See* Ex. 1035, 2:27–31, 2:64–3:4. And Rass discloses that its “switching on and off operations” allow “extend[ing] the useful life or endurance of the hearing aid battery during normal operation.” *See id.* at 2:27–31.

That is, if we were to adopt Patent Owner’s characterization of the problem solved by the ’688 patent, i.e., managing and extending battery life of wireless electronics through the variation and manipulation of power modes (*see* Reply RMTA 3–4), Rass addresses this problem by using “a temperature sensor (TS) [fitted in a hearing aid] to detect the body heat of the hearing aid wearer” when “the hearing aid is inserted in the auditory canal” thereby allowing “[t]he hearing aid . . . [to be] switched on and off again based on the temperature signal.” Ex. 1035, Abstr., Fig. 1; *see* Opp. RMTA 3–4, 6.

Petitioner further observes that Rass is reasonably pertinent to a problem faced by the inventors of the ’688 patent also “because [Rass] relates to how to configure a wireless earpiece to read user biometrics,” which is a feature described in the ’688 patent and added to all of Patent Owner’s proposed substitute claims. Opp. RMTA 6–7 (citing Ex. 1001, 5:22–23; Ex. 1035, 2:5–8, 2:64–3:2, Abstr., Fig. 1; *Netflix*, 80 F.4th at 1361–62). Petitioner further reasons that, faced with the problem of how to configure a wireless earpiece to read user biometrics, “[a] POSITA would have reasonably considered Rass, which discloses a temperature sensor fitted in the hearing aid for measuring user temperature.” *Id.* at 7–8 (citing Ex. 1035, 2:5–8, 2:64–3:2, Abstr., Fig. 1). We find this argument to be persuasive as well because Rass is, indeed, concerned with a hearing aid equipped with a “sensor (TS) to detect the body heat of the hearing aid wearer.” *See* Ex. 1035, 2:64–3:4, Abstr., Fig. 1.

Patent Owner also argues that “[c]omparing Hain with Rass yields the same result” because “Hain is directed to a hearing aid system having the ability to detect magnetic fields for alternating between various (i.e., more

than two) power modes” while “Rass seeks to implement a switch to turn on or off the hearing aid by detecting various ‘signals,’ one of which is related to the temperature of the hearing aid shell.” Reply RMTA 4. It appears that the “same result” referred to by Patent Owner pertains to an analogous art analysis because Patent Owner next submits that “Rass is not in the same field of endeavor as Hain.” *See id.* Patent Owner submits similar arguments regarding Shaffer, asserting that “a POSITA would not have been motivated to combine Shaffer with Rass because they are not directed to solving the same problems or the same technological fields”; rather, “Shaffer is directed ‘to a mobile device case that serves as an electrical charger and storage dock for rechargeable wireless audio earbuds.’ . . . [t]he focus on Shaffer is on the charging case, not turning the earpieces on or off, like Rass.” Reply RMTA 5 (citing Ex. 1003 ¶ 2).

Petitioner points out that “the field-of-endeavor test is relevant to determining whether a reference is ‘analogous to the claimed invention,’ not other references.” Sur-reply RMTA 4–5, 7 (citing *Bigio*, 381 F.3d at 1320, 1325; *Sanofi-Aventis Deutschland GmbH v. Mylan Pharms. Inc.*, 66 F.4th 1373, 1380 (Fed. Cir. 2023); *Corephotonics, Ltd. v. Apple Inc.*, 84 F.4th 990, 1007 (Fed. Cir. 2023)). Petitioner also observes that “[Patent Owner] does not dispute that Hain is analogous to the ’688 patent or [Patent Owner’s] proposed substitute claims” and “that Shaffer is analogous to the ’688 patent or [Patent Owner’s] proposed substitute claims.” *Id.* at 5, 7. Petitioner also notes, “[r]egardless, Prof. Kiaei explained that Hain, just like Rass . . . is analogous art . . . [and] that Shaffer, just like Rass . . . is analogous to the ’688 patent, including the proposed substitute claims.” *Id.* at 5, 7 (citing Ex. 1028 ¶¶ 15, 16, 19, 29, 30, 33).

We find Petitioner’s arguments to be persuasive, and further observe that, like the ’688 patent and Rass (concerned with wireless earpieces and managing and extending battery life, as discussed *supra*), Hain and Shaffer, too, are concerned with wireless earpieces and their battery life. *See* Ex. 1004 ¶¶ 5–6, 8, 11, 18–20, Abstr., Fig. 1; Ex. 1003 ¶¶ 3–4, 56–57. For example, Hain discloses earpieces having (*inter alia*) “transmitting and receiving coils 7 or 17” and “a voltage source (battery or accumulator) for supplying voltage to the electronic components,” and capability for “wireless signal transmission between the hearing aids” and “wireless data transmission, in conjunction with an external programming unit.” Ex. 1004 ¶¶ 1, 8, 18. And Hain is concerned with “increase[ing] the service life of the voltage source of a hearing aid,” “switch[ing] [hearing aids] off automatically immediately after use,” and “eliminat[ing] the need for manually operated on-and-off switches.” *Id.* ¶¶ 5–6, 11, 19–20. Shaffer is similarly concerned with wireless earbuds and attendant power issues such as that “[e]xisting charging devices for wireless earbuds require users to carry external battery packs, storage devices, or dedicated plug-in charging devices” and “[m]aintaining wireless earbuds can be inconvenient to a user because they require regular electrical charge.” *See* Ex. 1003 ¶¶ 3–4. Shaffer “address[es] some or all of the issues” with “earbuds 34 and 35 that contain internal rechargeable batteries” which are chargeable by a rechargeable case battery 109. *Id.* ¶¶ 4, 46, 56–57.

Accordingly, we are persuaded by Petitioner’s arguments that Rass is analogous art to the claimed invention.

Aumer

Patent Owner contends that Aumer is not analogous art to the '688 patent because Aumer and the '688 patent are not from the same field of endeavor. Reply RMTA 6–7. In particular, Patent Owner states that “[t]he '688 Patent’s stated field of invention relates to ‘wireless electronics and battery systems [and] more specifically . . . wireless earpieces managing and extending battery life,’” whereas “Aumer . . . defines its field of invention as ‘monitoring devices and methods for measuring physiological information.’” *Id.* at 6–7 (citing Ex. 1001, 1:21–24; Ex. 1029 ¶ 2; Ex. 2006 ¶ 75).

Patent Owner further alleges “Aumer is also not reasonably pertinent to the particular problem with which the inventor [of the '688 patent] is involved” because “[a]s [Aumer’s] title discloses, Aumer is concerned with improving signal quality . . . whereas the '688 Patent is concerned with managing and extending battery life of wireless electronics.” Reply RMTA 7 (citing Ex. 1001, 1:24–41; Ex. 1029, Title; Ex. 2006 ¶ 75).

As discussed in the immediately prior section, *supra*, we observed that the '688 patent explains that it “relates to wireless electronics and battery systems. More specifically, *but not exclusively*, the present invention relates to wireless earpieces managing and extending battery life.” Ex. 1001, 1:20–24 (emphasis added).

As to the first prong of the *Bigio* test, Petitioner argues that “Aumer is analogous art to the '688 patent. . . . It is from the same field of endeavor—wireless electronics, namely wireless earpieces.” Opp. RMTA 14 (citing Ex. 1001, 1:21–24; Ex. 1029 ¶¶ 64, 66, 74, Figs 2A–2B); *see also* Sur-reply RMTA 7–8 (submitting that “Aumer is . . . from the '688 patent’s general field of endeavor (wireless electronics; wireless earpieces)”). Patent Owner argues that “Petitioner’s stated field of endeavor is wrong” presumably

because Aumer is not concerned with “*battery systems*” and “wireless earpieces *managing and extending battery life*” like the ’688 patent. *See* Reply RMTA 6 (citing Ex. 1001, 1:21–24) (emphases added).

As explained above, we agree with Petitioner that the ’688 patent’s general field of endeavor is wireless electronics that include wireless earpieces. We are also of the view that Aumer operates in this same general field of endeavor because, as pointed out by Petitioner, Aumer discloses wearable wireless earpieces. Opp. RMTA 11–12, 14 (citing Ex. 1029 ¶¶ 64, 66, 70–72, 74, Figs 2A–2B); *see also* Tr. 25:13–26:9.

We are persuaded by Petitioner that Aumer and the claimed invention of the ’688 patent are in the same field of endeavor with respect to *Bigio* prong 1, i.e., wireless electronics that include wireless earpieces.

In addition, we are persuaded by Petitioner that Aumer is reasonably pertinent to a particular problem with which the inventor of the ’688 patent is involved under prong 2 of the *Bigio* test. *See* Opp. RMTA 14–15. Patent Owner argues, “Aumer is also not reasonably pertinent to the particular problem with which the inventor [of the ’688 patent] is involved” because “Aumer is concerned with improving signal quality . . . whereas the ’688 Patent is concerned with managing and extending battery life of wireless electronics.” Reply RMTA 7 (citing Ex. 1001, 1:24–41; Ex. 1029, Abstr.; Ex. 2006 ¶ 75).

Petitioner counters, “the only point of novelty that PO identifies is the requirement that the [claimed] wireless earpieces are configured to read user biometrics” and “Aumer is not only from the ’688 patent’s general field of endeavor (wireless electronics; wireless earpieces) but also from this alleged specific point of novelty.” Opp. RMTA 14 (citing Ex. 1001, 5:22–23,

9:66–10:2; Ex. 1029 ¶¶ 64, 66, 69–72); Sur-reply RMTA 8. Petitioner submits that “Aumer is reasonably pertinent to a problem faced by the inventors of the ’688 patent because it relates to how to configure a wireless earpiece to read user biometrics,” particularly as Aumer discloses a wireless earpiece 20 that includes sensors “configured to detect and/or measure physiological information from the subject” (such as temperature and blood gas levels) and also discloses techniques for configuring an earpiece to read user biometrics and improving the biometric signal quality from the earpiece’s sensors. Opp. RMTA 14–15 (citing Ex. 1029 ¶¶ 2, 64, 66, 69–72, Title, Abstr., Figs. 1, 2A–2B, 5A–8B); Sur-reply RMTA 8. Petitioner reasons that, in view of the disclosure in Aumer, “a POSITA would have reasonably considered Aumer when contemplating the problem of how to configure a wireless earpiece to read user biometrics.” Opp. RMTA 15 (citing Ex. 1028 ¶¶ 52, 53, 66, 67). We find Petitioner’s arguments persuasive in view of Aumer’s disclosed concerns (*see* Ex. 1029 ¶¶ 2, 4 (discussing signal quality problems of wearable monitoring devices, such as biometric earbuds)) and wireless earpieces to address these concerns (*see id.* ¶¶ 64, 66, 69–72).

Patent Owner also argues that “[c]omparing Hain with Aumer yields the same result” because “Hain is directed to a hearing aid system having the ability to detect magnetic fields for alternating between various (i.e., more than two) power modes.” Reply RMTA 7 (citing Ex. 1004). It appears that the “same result” referred to by Patent Owner also pertains to an analogous art analysis because Patent Owner next submits that “Hain is concerned with adjusting power modes based on detecting the presence or absence of a magnetic field” while “Aumer is concerned with detecting biometric

signals” such that “Aumer is not in the same field of endeavor as Hain.” *Id.* (citing Ex. 2006 ¶ 76). Patent Owner submits similar arguments regarding Shaffer, asserting that “a POSITA would not have been motivated to combine Aumer with Shaffer or Sorensen for the same reasons a POSITA would not have combined Hain with Aumer,” such as the reason that “Shaffer’s focus is the charging case, not the wireless earbuds.” *Id.* at 8 (citing Ex. 1003 ¶ 2; Ex. 2006 ¶¶ 80–85).

Petitioner points out that “the field-of-endeavor test is relevant to determining whether a reference is ‘analogous to the claimed invention,’ not other references.” Sur-reply RMTA 4–5, 7–8. Petitioner also observes that “[Patent Owner] does not dispute that Hain or Shaffer is analogous to the ’688 patent or PO’s proposed substitute claims,” and submits that “[Hain and Shaffer], just like Aumer . . . are analogous art [to the ’688 patent].” *Id.* at 8–9 (citing Ex. 1028 ¶¶ 49–52, 63–66). We find Petitioner’s arguments to be persuasive, especially as Hain and Shaffer (like the ’688 patent and Aumer) are all concerned with wireless earpieces. *See* Ex. 1004 ¶¶ 5–6, 8, 11, 18–20, Abstr., Fig. 1; Ex. 1003 ¶¶ 3–4, 56–57; Opp. RMTA 13–14; Sur-reply RMTA 8–9.

Accordingly, we are persuaded by Petitioner’s arguments that Aumer is analogous art to the claimed invention.

(c) *Petitioner’s Motivation to Combine*  
Rass-based Grounds

Petitioner asserts multiple reasons as to why a person with ordinary skill in the art would have been motivated to combine the teachings of Rass with Hain and/or Shaffer. Opp. RMTA 5–9.

Predictable Result

Petitioner asserts, with respect to combining the teachings of Hain, and Hain and Shaffer, with Rass, that “implementing hearing aids or earbuds, as taught by Hain or Shaffer, to include a temperature sensor to detect the temperature of the wearer, as taught by Rass, would have yielded expected, predictable results.” Opp. RMTA 8–9.

In *KSR*, the Supreme Court stated “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR*, 550 U.S. at 416. Petitioner contends that a person with skill in the art would have combined the elements taught by Hain and/or Shaffer, and Rass (i.e., hearing aids 1 and 11 in Hain, earbuds 1010 and 1012 in Shaffer, and hearing aid I fitted with temperature sensor TS as taught by Rass)

using known and routine electronic device design and manufacturing techniques to modify each of earpiece [sic] to include a temperature sensor to detect the temperature of the wearer and further configure each to switch on and off based on the detected temperature. Such modification would have been readily predictable and recognized by a POSITA and would have been well within the knowledge and skillset of a POSITA.

Opp. RMTA 8–9 (citing Ex. 1028 ¶¶ 22, 24, 36, 38).

Patent Owner argues, “[t]he fact that Rass is not analogous to the ’688 Patent defeats Petitioner’s alleged motivation to combine and with it Ground 1 [(original ground based on Hain alone)].” Reply RMTA 4. As discussed *supra*, however, we are not persuaded by Patent Owner’s arguments that Rass is not analogous art to the ’688 patent. And Patent Owner elsewhere recognizes (Reply RMTA 11) that “[a]s of the priority date, a POSITA would have known how to implement a sensor for reading various user

biometrics that are identified in the '688 Patent and '031 Application"<sup>14</sup> and include user temperature (*see* Ex. 1001, 5:21–23, 10:9–11). *See also* Opp. RMTA 9 (citing Ex. 1034, 18:18–22, 22:12–19) (observing that “PO’s expert testified that a POSITA would know how to include a sensor in a wireless earpiece to read user temperature”).

Patent Owner also argues that “implementing a magnetic-field hearing aid system as taught by Hain to include a temperature sensor would not have been a ‘predictable result’ because . . . Rass is not in the same field of endeavor as Hain.” Reply RMTA 4. As discussed *supra*, however, we are not persuaded by Patent Owner’s arguments that Rass and Hain have disjunctive fields of endeavor or technological areas of interest; rather (as discussed *supra*) like the '688 patent and Rass, Hain, too, is concerned with wireless earpieces and their battery life.

Patent Owner additionally argues that “[a] POSITA would not have been motivated to incorporate a temperature sensor in Hain because of the interference signal imposed on the temperature sensor and sensor electronics due to the magnetic field emitted by the telephone when it is being held next to the user’s ear during conversation,” and this “interference signal can produce a wrong temperature reading, thus, causing the hearing aid to shut down.” Reply RMTA 4–5 (citing Ex. 2006 ¶ 67). Petitioner responds that “[Patent Owner] provides no support or further explanation for how or why a magnetic field would interfere with a temperature sensor, other than citing to an expert declaration that merely parrots the Reply language verbatim”

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<sup>14</sup> Although Patent Owner noted this in the context of enablement of the proposed substitute claims, we determine that this statement also equally applies to the motivation issues before us.

and, “[f]urthermore, Hain’s telephone mode is irrelevant because at no point during this proceeding did Petitioner rely on Hain’s telephone mode for its obviousness positions or otherwise.” Sur-reply RMTA 6. Patent Owner disagrees with Petitioner’s assessment and notes that Rass itself mentions “interference” as it provides that prior “sensors are however relatively expensive, sensitive to interference or require additional objects for switching purposes” and Rass’ goal is “to improve or simplify the automatic switching on and off of hearing aids.” See Ex. 1035, 1:56–61. Upon consideration of the arguments and evidence of both parties, we do not find Patent Owner’s “interference” arguments persuasive.

Patent Owner argues that a magnetic field emitted during Hain’s hearing aid’s telephoning mode imposes an interference signal on a temperature sensor and (possibly its) attendant sensor electronics (e.g., on the temperature sensor in Rass), and this interference signal impacts the temperature sensor’s reading. See Reply RMTA 4–5. We, however, observe that Rass provides a general reference to “interference” by stating that “[t]he said sensors [(the ones mentioned at col. 1, lines 31–53)] are however relatively expensive, sensitive to interference or require additional objects for switching purposes.” See Ex. 1035, 1:31–59 (emphasis added).

The sensors referenced at Rass’ column 1, lines 31–53 are: “[a] remotely controlled hearing aid . . . which can be switched on and off using an external control device” (*id.* at 1:31–35), which do not appear relevant to Patent’s Owner’s arguments. Rass’ discussion of infrared-based hearing aids and magnetic-based hearing aids, Ex. 1035, 1:40–44, 1:49–53) having “sensors [that] are . . . sensitive to interference or require additional objects for switching purposes” (*id.* at 1:56–59) does not actually disclose that a

*magnetic field* (e.g., from the hearing aid) *would impose an interference signal on a temperature sensor* (as Patent Owner argues, Reply RMTA 4–5).

Rather, Rass’ disclosure appears to merely indicate that the “infrared sensor” and the “automatic hearing aid switch. . . . [that] operates on a magnetic basis” by sensing “an object containing a magnet” are “sensitive to interference” (*see* Ex. 1035, 1:40–44, 49–59)—without specifying whether *the interferences* that these sensors are sensitive to *include both* (i) interference caused by similar devices (e.g., infrared-based interference impacting an infrared sensor, or magnetic-based interference affecting a magnetic-based hearing aid switch) *and* (ii) interference caused by dissimilar devices (such as interference not caused by an infrared-device impacting the infrared sensor, or interference not caused by a magnetic device affecting the magnetic-based hearing aid switch).

Rass’ reference to “interference” does not specify that *a magnetic field* would *interfere with the operation of a temperature sensor to impact temperature readings* (as Patent Owner argues, Reply RMTA 4–5). As Rass does not specify that a magnetic field would interfere with the operation of a temperature sensor, and Patent Owner does not provide other evidence in support of this interference argument, we find persuasive Petitioner’s contention that “[Patent Owner] provides no support or further explanation for how or why a magnetic field would interfere with a temperature sensor.” *See* Sur-reply RMTA 6.

Thus, we agree with Petitioner and determine that combining Hain’s hearing aid and Shaffer’s earbud with Rass’ temperature sensor “to detect the temperature of the wearer and further configure each to switch on and off

based on the detected temperature” would yield predictable results. *See* Opp. RMTA 5, 8–9.

Reasonable Expectation of Success

Petitioner finally argues that an ordinarily skilled artisan would have had a reasonable expectation of success in applying Rass’ teachings of a hearing aid temperature sensor to the hearing aids or earbuds of Hain or Shaffer. Opp. RMTA 8.

Patent Owner opposes arguing that “there was no motivation to combine these references besides Petitioner’s hindsight.” Reply RMTA 5 (citing Ex. 2006 ¶ 68); *see also id.* at 1 (arguing that “Petitioner’s alleged motivation to combine these new references with the Petition references rests on conclusory statements, mischaracterization of the references’ disclosures, and hindsight bias”), 2 (arguing that “Petitioner’s motivation to combine is insufficient”). Patent Owner also contends, “a POSITA would not have been motivated to combine Rass with Shaffer for many of the same reasons a POSITA would not have combined Hain with Rass,” and “[t]he only basis for combining the references for Ground 2 [(i.e., Hain, Shaffer, and Rass ground)] is hindsight.” Reply RMTA 5 (citing Ex. 2006 ¶¶ 69–71).

As explained above, we determine that Petitioner has established, by a preponderance of the evidence, that combining Hain’s hearing aid and Shaffer’s earbud with Rass’ temperature sensor to detect the temperature of the wearer and configure each to switch on and off based on the detected temperature, would yield predictable results. We also observe that Petitioner has articulated reasoning for incorporating Rass’ temperature sensor into Hain’s hearing aid and Shaffer’s earbuds. *See* Opp. RMTA 4–5, 9 (citing

Ex. 1028 ¶¶ 11, 14, 23, 28, 37). In particular, Petitioner notes that Rass describes several advantages and benefits of its implementation (e.g., of switching on and off a hearing aid based on detected temperature by a sensor fitted therein)—including “a significant increase in user-friendliness” by providing “[a]utomatic switching on and off” with “no need for a mechanical switch,” allowing for a standby mode that “extends the useful life or endurance of the hearing aid battery.” Opp. RMTA 4, 9 (citing Ex. 1035, 2:14–31). Petitioner also argues that an ordinarily skilled artisan “would have been motivated to include in a wireless earpiece, as taught by Hain or Shaffer . . . a temperature sensor to detect user temperature and automatically switch on and off the hearing aid or earbud based on the detected temperature, as taught by Rass.” *Id.* at 5, 9. The ordinarily skilled artisan would have been so motivated by the above-referenced “benefits [disclosed in Rass] of switching on and off a hearing aid based on the temperature detected by a temperature sensor fitted therein.” *Id.* at 9 (citing Ex. 1035, 2:14–31; Ex. 1028 ¶¶ 23, 37); *see also* Sur-reply RMTA 6–7.

Patent Owner, on the other hand, did not provide sufficient evidence or persuasive reasoning to support the contention of impermissible hindsight or to illustrate that any knowledge regarding the inclusion of a biometrics-reading sensor in a wireless earpiece was gleaned only from the ’688 patent’s disclosure. *See In re Cree*, 818 F.3d 694, 702 n.3 (Fed. Cir. 2016); *KSR*, 550 U.S. at 418. We determine that Petitioner has established, by a preponderance of the evidence, that there is sufficient motivation to employ a temperature sensor as taught by Rass, in Hain’s hearing aid and Shaffer’s earbuds.

Aumer-based Grounds

Petitioner asserts multiple reasons as to why a person with ordinary skill in the art would have been motivated to combine the teachings of Aumer with Hain and/or Shaffer. Opp. RMTA 13–18.

Predictable Result

Petitioner asserts, with respect to combining the teachings of Hain, and Hain and Shaffer, with Aumer, that “implementing hearing aids or earbuds, as taught by Hain or Shaffer, to include one or more sensors, a processor, and a communication component to read user biometrics, as taught by Aumer, would have yielded expected, predictable results.” Opp. RMTA 15.

Petitioner contends that a person with ordinary skill in the art would have combined the elements taught by Hain and/or Shaffer, and Aumer (i.e., hearing aids 1 and 11 in Hain, earbuds 1010 and 1012 in Shaffer, and earpiece 20 with one or more sensors, a processor, and a communication component as taught by Aumer)

using known and routine electronic device design and manufacturing techniques to modify each earpiece to include one or more sensors, a processor, and a communication component to read user biometrics. Such modification would have been readily predictable and recognized by a POSITA and would have been well within the knowledge and skillset of a POSITA.

Opp. RMTA 15–16 (citing Ex. 1028 ¶¶ 55, 58, 69, 72).

Patent Owner argues, “implementing a magnetic field hearing aid system as taught by Hain to include a biometric monitoring would not have been a ‘predictable result’ because Aumer is not in the same field of endeavor as Hain” with “Hain . . . concerned with adjusting power modes based on detecting the presence or absence of a magnetic field” and “Aumer

is concerned with detecting biometric signals.” Reply RMTA 7 (citing Ex. 2006 ¶ 76). However, in contradiction to this argument, Patent Owner affirmatively states that (Reply RMTA 11) “[a]s of the priority date, a POSITA would have known how to implement a sensor for reading various user biometrics that are identified in the ’688 Patent and ’031 Application” and include user temperature and blood oxygenation (*see* Ex. 1001, 5:21–23, 10:1–11). *See also* Opp. RMTA 16 (citing Ex. 1034, 18:18–22, 22:12–19) (observing that “PO’s expert testified that a POSITA would know how to include a sensor in a wireless earpiece to read user biometrics such as temperature and heart beat”).

Patent Owner further submits that “a POSITA would not have been motivated to combine Aumer with Shaffer or Sorensen for the same reasons a POSITA would not have combined Hain with Aumer.” Reply RMTA 8. However, as discussed *supra*, we are not persuaded by Patent Owner’s arguments that Aumer is not analogous art to the ’688 patent, or that Aumer (on one hand) and Hain and Shaffer (on the other hand) have disjunctive technological fields. Rather, we agree with Petitioner that Hain and Shaffer (like the ’688 patent and Aumer) are concerned with wireless earpieces. *See* Ex. 1003 ¶¶ 3–4, 56–57; Ex. 1004 ¶¶ 5–6, 8, 11, 18–20, Abstr., Fig. 1; Opp. RMTA 13–14.

Thus, we agree with Petitioner and determine that combining Hain’s hearing aid and Shaffer’s earbud with Aumer’s sensors, processor, and communication component to read user biometrics would yield predictable results. *See* Opp. RMTA 13–16.

Use of Biometrics for Power Management was Known

As asserted by Petitioner (and as also discussed above in the context of the Rass grounds), the Rass reference provides, *inter alia*, an indication of that an ordinarily skilled artisan, before the priority date of the '688 patent, would know that “a sensor in a wireless earpiece could allow the wireless earpiece to automatically switch . . . on or off . . . depending on user biometrics.” Opp. RMTA 17–18 (citing Ex. 1035, 2:27–29, Abstr.); *see also* Ex. 1035, 2:63–3:4. Petitioner then reasons that the skilled artisan “would have been motivated to include, in each of Hain’s hearing aids 1 and 11 . . . or Shaffer’s earbuds 1010 and 1012, a sensor that reads user biometrics, as taught by Aumer” for “automatically switching the power mode of the hearing aid or earbud depending on user biometrics” which “would provide the added benefit of improving user-friendliness and extending the battery life of the hearing aid or earbud.” Opp. RMTA 18 (citing Ex. 1035, 2:14–31; Ex. 1028 ¶¶ 57, 71).

Patent Owner takes issue with Petitioner’s assertion because “Rass . . . mentions using *the temperature of the hearing aid or shell* to turn a hearing aid on or off, *not the direct body temperature of the user*,” and “a POSITA would not consider *the temperature of a hearing aid or hearing aid shell* to be a biometric reading.” Reply RMTA 8 (citing Ex. 1035, 2:64–2:65; Ex. 2006 ¶ 78) (emphases added). As discussed *supra*, however, we are not persuaded by Patent Owner’s arguments that Rass’ temperature sensor registers only “the temperature of the hearing aid or shell . . . [and] not the direct body temperature of the user” (as Patent Owner argues, *see* Reply RMTA 8). We agree with Petitioner that Rass explicitly discloses that its temperature sensor inserted in the auditory canal (via the wireless earpiece)

senses body heat of the hearing aid wearer, and produces a temperature signal related to that body heat. *See* Ex. 1035, 1:62–66, 2:6–8, 2:63–3:4 Abstr.; Sur-reply RMTA 5.

We, therefore, determine that Petitioner is correct in its assertion that Rass proves, by a preponderance of the evidence that it was well-known to exercise power management for a wireless earpiece by use of a sensor, i.e., a biometric sensor.

Reasonable Expectation of Success and Increased Consumer Interest

Petitioner argues that an ordinarily skilled artisan would have had a reasonable expectation of success in applying Aumer’s teachings to the hearing aids or earbuds of Hain or Shaffer. Opp. RMTA 15.

Petitioner asserts that, at the time of the filing of Aumer, consumers were demonstrating increased interest in personal health and sensor miniaturization. Opp. RMTA 16–17 (citing to Ex. 1032 ¶¶ 2–3, Ex. 1033 ¶ 3). Petitioner emphasizes that Aumer identifies the ear as being “an ideal location for wearable health and environmental monitors,” and allows for monitoring of various user biometrics including “core body temperature” and “blood gas levels.” *Id.* at 17 (citing Ex. 1029 ¶ 64). Petitioner argues that, in view of such consumer interests in health monitoring and miniaturization, “a POSITA aware of Hain or Shaffer and Aumer . . . would have been motivated to implement each of Hain’s hearing aids 1 and 11 or Shaffer’s earbuds 1010 and 1012 to include one or more sensors, a processor, and a communication component, as taught by Aumer” in order to “read and provide user biometrics to consumers, allowing them to monitor their personal health.” *Id.* (citing Ex. 1028 ¶¶ 56, 70).

Thus, Petitioner articulated reasoning for incorporating Aumer's biometrics-reading sensor(s) configurable in an earpiece, into Hain's hearing aid and Shaffer's earbuds. *See* Opp. RMTA 13–15, 17. In particular, Petitioner's reasons for incorporating biometrics-reading sensor(s) (and their attendant electronics, such as processor and communication component, as disclosed by Aumer) are that those earpiece sensor(s) allow an earpiece “to read user biometrics and improv[e] the biometric signal quality from the sensors” ultimately “provid[ing] user biometrics to consumers, allowing the[consumers] to monitor their personal health.” *See id.* at 11–12, 15, 17 (citing Ex. 1029 ¶¶ 2, 64, 66, 69, 70–72, Abstr., Figs. 2A–2B, 5A–8B; Ex. 1028 ¶¶ 56, 70). For these reasons, Petitioner submits that an ordinarily skilled artisan “would have been motivated to implement each of Hain's hearing aids 1 and 11 or Shaffer's earbuds 1010 and 1012 to include one or more sensors, a processor, and a communication component, as taught by Aumer.” Opp. RMTA 17.

Patent Owner disputes Petitioner's arguments because, allegedly, such “increased consumer interest in personal health and advances in miniaturizing sensors' . . . is irrelevant,” as an ordinarily skilled artisan “concerned with the problems described in Hain would not have been motivated to add biometric monitoring to the magnetic-field hearing aid system of Hain” because “[t]his would not have helped with improving the magnetic field to adjust power modes disclosed by Hain.” Reply RMTA 7 (citing Ex. 2006 ¶ 77).

Whether it would have been obvious for a person of ordinary skill in the art to combine two or more references is a flexible inquiry. A factfinder “need not seek out precise teachings directed to the specific subject matter of

the challenged claim” and “can take account of the inferences and creative steps that a person of ordinary skill in the art would employ.” *KSR*, 550 U.S. at 418. Moreover, evidentiary support from the text of the teaching reference is not necessary because the motivation can come, for instance, from general knowledge within the art, as evidenced by Exhibits 1032 and 1033. Furthermore, the Supreme Court has stated that, “if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *KSR*, 550 U.S. at 417.

Here, Patent Owner’s argument does not negate Petitioner’s asserted rationales for incorporating Aumer’s earpiece sensor(s) into Hain’s hearing aid. Patent Owner contends that an ordinarily skilled artisan would not have been motivated to add biometric monitoring to Hain’s magnetic-field hearing aid system because “[t]his *would not have helped with improving the magnetic field to adjust power modes disclosed by Hain.*” See Reply RMTA 7 (citing Ex. 2006 ¶ 77) (emphasis added). However, in an obviousness determination, the references and the reasoning for combining them do not have to address the same problem that a particular one of the references (e.g., Hain) addresses. See *Merck & Co. v. Biocraft Labs., Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (in a determination of obviousness, a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art).) Thus, Hain, and Aumer may be relied upon for all that each would have reasonably suggested to a skilled artisan. See *id.*; see also Sur-reply RMTA 9 (citing *KSR*, 550 U.S. at 420–421 (“familiar items may have obvious uses beyond their primary

purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle”)).

We are persuaded by Petitioner’s motivation arguments, because, as opined by Dr. Kiaei, “in view of the consumer interests, advances in sensors, and Aumer’s teachings, a POSITA aware of Hain [, Shaffer] and Aumer . . . would have been motivated to implement each of Hain’s hearing aids” and “each of Shaffer’s earbuds 1010 and 1012” to “include one or more sensors, a processor, and a communication component, as taught by Aumer, to read and provide user biometrics to consumers, allowing them to monitor their personal health.” Ex. 1028 ¶¶ 56, 70.

We determine that Petitioner has established, by a preponderance of the evidence, that there is sufficient motivation to include, in Hain’s hearing aid and Shaffer’s earbuds, one or more sensors, a processor, and a communication component to read user biometrics as taught by Aumer.

*(d) Conclusion for Obviousness of Claim 15*

For the reasons provided above, Petitioner has sufficiently shown that each of Petitioner’s asserted grounds (Hain in combination with Rass, Hain in combination with Shaffer and Rass, Hain in combination with Aumer, and Hain in combination with Shaffer and Aumer) renders proposed substitute independent claim 15 obvious. We have considered Patent Owner’s arguments and we do not agree for the reasons addressed above.

Accordingly, we are persuaded that Petitioner has shown, by a preponderance of the evidence that the subject matter of proposed substitute claim 15 is obvious over the combination of Hain and Rass, the combination of Hain, Shaffer, and Rass, the combination of Hain and Aumer, and the combination of Hain, Shaffer, and Aumer.

(4) *Obviousness of Proposed Substitute Claims 16–21 and 23–28*

We now turn to Petitioner’s arguments that (i) proposed substitute dependent claims 16 and 18 would have been obvious over the combination of Hain and Rass, and the combination of Hain and Aumer; (ii) proposed substitute independent claim 23 would have been obvious over the combination of Hain, Shaffer, and Rass, the combination of Hain, Shaffer, Sørensen, and Rass, the combination of Hain, Shaffer, and Aumer, and the combination of Hain, Shaffer, Sørensen, and Aumer; (iii) proposed substitute dependent claims 16–20, 24–26, and 28 would have been obvious over the combination of Hain, Shaffer, and Rass, and the combination of Hain, Shaffer, and Aumer; and (iv) proposed substitute dependent claims 17, 19–21, and 24–28 would have been obvious over the combination of Hain, Shaffer, Sørensen, and Rass, and the combination of Hain, Shaffer, Sørensen, and Aumer. *See* Opp. RMTA 3–5.

(i) *Proposed Substitute Claims 16 and 18, and Hain-Rass and Hain-Aumer Grounds*

Petitioner contends that the combination of Hain and Rass renders proposed substitute claims 16 and 18 obvious because “Rass teaches ‘the wireless earpiece is configured to read user biometrics,’ as recited in substitute claim 15 [(from which claims 16 and 18 depend)]” and “a POSITA would have been motivated to include in a hearing aid, as taught by Hain, a temperature sensor to detect user temperature to automatically switch on and off the hearing aid, as taught by Rass.” Opp. RMTA 4. Petitioner also contends that the combination of Hain and Aumer renders claims 16 and 18 obvious because “Aumer teaches ‘the wireless earpiece is configured to read user biometrics,’ as recited in substitute claim 15” and “a POSITA would have been motivated to include in a hearing aid, as taught by

Hain, one or more sensors, a processor, and a communication component to read user biometrics, as taught by Aumer.” *Id.* at 13.

With respect to proposed substitute claims 16 and 18, Patent Owner, in response, relies on the same arguments discussed above for claim 15. *See generally* Reply RMTA 2–8.

Proposed substitute claims 16 and 18 do not include amendments with respect to their corresponding original claims 2 and 4, and the only change in proposed substitute claims 16 and 18 (with respect to their corresponding original claims 2 and 4) is the dependency, whereby claims 16 and 18 depend from proposed substitute claim 15. *See* RMTA Appx. A-2. Above, we provide the reasons for our determination that Petitioner has proved, by a preponderance of evidence, that original claims 2 and 4 are unpatentable on grounds presented by Petitioner. Moreover, for the same reasons given for proposed substitute claim 15 and discussed *supra*, based on the arguments and evidence of record, we determine that Petitioner has proved, by a preponderance of evidence, that proposed substitute claims 16 and 18 would have been obvious over the combination of Hain and Rass, and over the combination of Hain and Aumer.

(ii) *Proposed Substitute Claim 23*

Proposed substitute independent claim 23 includes amendments to original claim 9 that are similar to the amendments added to proposed substitute claim 15 with respect to its original claim 1. *See* RMTA Appx. A-3, A-4. In particular, Patent Owner’s proposed substitute claim 23 amends original independent claim 9 to further recite that “a portion of the wireless earpiece fits within the ear canal opening and the wireless earpiece is configured to read user biometrics.” *See id.* at Appx. A-3.

Petitioner contends the combinations including Hain, Shaffer, and Rass, and Hain, Shaffer, Sørensen, and Rass render claim 23 obvious because “Rass teaches ‘the wireless earpiece is configured to read user biometrics’” as claimed, and “a POSITA would have been motivated to include in a hearing aid . . . a temperature sensor to detect user temperature to automatically switch on and off the earbud, as taught by Rass.” Opp. RMTA 5. Petitioner sets forth the same motivation arguments in connection with modifying Hain, Shaffer, and Sørensen with the teachings of Rass, as with the grounds asserted against proposed substitute claim 15 when combining Hain with Rass, and Hain with Shaffer and Rass. *See id.* (citing to Section II.A.4).

Petitioner also contends the combinations including Hain, Shaffer, and Aumer, and Hain, Shaffer, Sørensen, and Aumer render claim 23 obvious because “Aumer teaches ‘the wireless earpiece is configured to read user biometrics’” as claimed, and “a POSITA would have been motivated to include in an earbud, as taught by Shaffer, one or more sensors, a processor, and a communication component to read user biometrics, as taught by Aumer.” Opp. RMTA 13. Petitioner sets forth the same motivation arguments in connection with modifying Hain, Shaffer, and Sørensen with the teachings of Aumer, as with the grounds asserted against proposed substitute claim 15 when combining Hain with Aumer, and Hain with Shaffer and Aumer. *See id.* (citing to Section II.B.4).

With respect to proposed substitute claim 23 and the Rass-based grounds, Patent Owner relies on the same arguments discussed above for proposed substitute claim 15. *See Reply RMTA 5, 8.*

Above, we provide the reasons for our determination that Petitioner has proved, by a preponderance of evidence, that original claim 9 (whose limitations are incorporated into proposed substitute claim 23) is unpatentable on grounds presented by Petitioner. Moreover, as analyzed above in connection with the grounds asserted against proposed substitute claim 15, we reiterate that Rass and Aumer, and the '688 patent may be viewed as sharing the same general field of endeavor, i.e., wireless earpieces; that is, Rass and Aumer (like Hain and Shaffer) are concerned with wireless earpieces.

In addition, based upon Petitioner's arguments concerning motivation to combine Hain and Shaffer with each of Rass and Aumer (*see* Opp. RMTA 5–9, 13–18), we determine that the reasons submitted are persuasive for the reasons we outlined above in connection with proposed substitute claim 15.

Thus, based on the arguments and evidence of record, we determine that Petitioner has proved, by a preponderance of evidence, that proposed substitute claim 23 would have been obvious over the combination of Hain, Shaffer, and Rass, the combination of Hain, Shaffer, Sørensen, and Rass, the combination of Hain, Shaffer, and Aumer, and the combination of Hain, Shaffer, Sørensen, and Aumer.

*(iii) Proposed Substitute Claims 16–21 and 24–28, and Hain-Shaffer-Rass and Hain-Shaffer-Aumer Grounds*

Proposed substitute dependent claims 16, 18, 20, 21, and 24–28 do not include amendments with respect to their corresponding original claims 2, 4, 6, 7, and 10–14. The only changes in these proposed substitute claims with respect to their corresponding original claims are the dependencies, with claims 16, 18, 20, 21, and 28 depend from proposed substitute claim 15, and claims 24–27 depending from proposed substitute claim 23 (directly or

indirectly). *See* RMTA Appx. A-2, A-3, A-4. Proposed substitute dependent claims 17 and 19 include an amendment (with respect to their corresponding original claims 3 and 5) directed to “the smart case compris[ing] a rechargeable battery configured to charge the wireless earpiece.” *See* RMTA Appx. A-2.

Petitioner contends the combinations including Hain, Shaffer, and Rass, and Hain, Shaffer, Sørensen, and Rass, render claims 16–21 and 24–28 obvious because “Rass teaches ‘the wireless earpiece is configured to read user biometrics’” and “a POSITA would have been motivated to include in a hearing aid . . . a temperature sensor to detect user temperature to automatically switch on and off the earbud, as taught by Rass.” *Opp.* RMTA 5. Petitioner sets forth the same motivation arguments in connection with modifying Hain, Shaffer, and Sørensen with the teachings of Rass, as with the grounds asserted against proposed substitute claim 15 when combining Hain with Rass, and Hain with Shaffer and Rass. *See id.* (citing to Section II.A.4).

Petitioner also contends the combinations including Hain, Shaffer, and Aumer, and Hain, Shaffer, Sørensen, and Aumer, render claims 16–21 and 24–28 obvious because “Aumer teaches ‘the wireless earpiece is configured to read user biometrics’” and “a POSITA would have been motivated to include in an earbud, as taught by Shaffer, one or more sensors, a processor, and a communication component to read user biometrics, as taught by Aumer.” *Opp.* RMTA 13. Petitioner sets forth the same motivation arguments in connection with modifying Hain, Shaffer, and Sørensen with the teachings of Aumer, as with the grounds asserted against

proposed substitute claim 15 when combining Hain with Aumer, and Hain with Shaffer and Aumer. *See id.* (citing to Section II.B.4).

With respect to proposed substitute claims 16–21 and 24–28 and the Rass-based grounds, Patent Owner relies on the same arguments discussed above for proposed substitute claims 15 and 23. *See* Reply RMTA 5, 8.

As analyzed above in connection with the grounds asserted against proposed substitute claims 15 and 23, we reiterate that Rass and Aumer, and the '688 patent may be viewed as sharing the same general field of endeavor, i.e., wireless earpieces; that is, Rass and Aumer (like Hain and Shaffer) are concerned with wireless earpieces. In addition, based upon Petitioner's arguments concerning motivation to combine Hain and Shaffer with each of Rass and Aumer (*see* Opp. RMTA 5–9, 13–18), we determine that the reasons submitted are persuasive for the reasons we outlined above in connection with proposed substitute claims 15 and 23.

Thus, based on the arguments and evidence of record, we determine that Petitioner has proved, by a preponderance of evidence, that proposed substitute claims 16–21 and 24–28 would have been obvious over the combination of Hain, Shaffer, and Rass, the combination of Hain, Shaffer, and Aumer, the combination of Hain, Shaffer, Sørensen, and Rass, and the combination of Hain, Shaffer, Sørensen, and Aumer.

(5) *Obviousness of Proposed Substitute Claim 22*

We now turn to Petitioner's arguments that proposed substitute dependent claim 22 would have been obvious over the combination of Hain, Shaffer, and Rass, and over the combination of Hain, Shaffer, Rass, and Aumer. *See* Opp. RMTA 9–10, 18–19.

Proposed substitute dependent claim 22 includes an amendment (with respect to its corresponding original claim 8) directed to “the user biometrics [being] utilized by the wireless earpiece to alter the power mode.” *See* RMTA Appx. A-3.

Petitioner contends that each of the combination of Hain, Shaffer, and Rass, and the combination of Hain, Shaffer, Rass, and Aumer, renders claim 22 obvious because “Rass teaches ‘the user biometrics is utilized by the wireless earpiece to alter the power mode,’ as recited in substitute claim 22.” *Opp.* RMTA 9, 18. In particular, Petitioner submits that Rass discloses techniques for switching on and off an “in-the-ear (ITE)” hearing aid (I) by fitting it “with a **temperature sensor (TS)** to *detect the body heat of the hearing aid wearer*,” whereby “the switching on and off operations include switching to or from standby mode.” *Id.* at 3–4 (citing Ex. 1035, 2:5–8, 2:27–29, 2:53–54, 2:63–3:2, Abstr.; Ex. 1028 ¶¶ 9–10). More particularly, at column 2, line 63–column 3, line 4, Rass describes an exemplary in-the-ear hearing aid Fig. 1 that “has a temperature sensor TS” and

[w]hen worm [sic], the hearing aid I or its shell heats up. The *temperature sensor TS registers this heat*. Once a certain temperature threshold is exceeded, *the device is switched on*. If the *temperature drops back* to below a lower temperature threshold, *the hearing aid I switches off again*. This *temperature-controlled switching on and off* is also possible in principle with a single temperature threshold.

Ex. 1035, 2:63–3:4 (emphases added), Fig. 1. Petitioner submits that “[s]witching on and off the hearing aid [based on a temperature signal relating to the body heat of the wearer in Rass] alters the power mode of the hearing aid,” such that Rass teaches the added limitation in claim 22 requiring that “the user biometrics [read by the wireless earpiece] is utilized by the wireless earpiece to alter the power mode.” *Opp.* RMTA 10, 18.

Petitioner sets forth the same motivation arguments in connection with modifying Hain and Shaffer with the teachings of Rass, and with the teachings of Rass and Aumer, as with the grounds asserted against proposed substitute claim 15 when combining Hain and Shaffer with Rass and Aumer. *See id.* at 10, 18–19 (citing to Sections II.A.4 and II.B.4; Ex. 1028 ¶¶ 40, 74) (submitting that, “[a]s discussed above, a POSITA would have been motivated to combine Shaffer and Rass with a reasonable expectation of success,” “[a]s discussed in Section II.A.4, a POSITA would have been motivated to combine Shaffer and Rass with a reasonable expectation of success,” and “[a]s discussed in . . . Section II.B.4, a POSITA would have been motivated to combine Shaffer with Aumer with a reasonable expectation of success”).

Patent Owner responds that “Shaffer combined with Hain and Rass does not render Substitute Claim 22 obvious” for the reasons submitted in Sections II.A.1–2 of the Reply. *See* Reply RMTA 6. Sections II.A.1–2 of the Reply include Patent Owner’s arguments with respect to claim 15 and the combinability of Hain and Shaffer with Rass. *See id.* at 2–5. Patent Owner also contends that “Shaffer in combination with Hain, Aumer, and Rass does not render Substitute Claim 22 obvious” for the reasons submitted in Sections II.A.2–3 and II.B.2 of the Reply. *See id.* at 8–9 (arguing that “A POSITA would not have been motivated to combine Aumer and Rass with Shaffer for the same reasons a POSITA would not have combined Hain with Aumer and Rass. *See* Sections II.A.2-3 and II.B.2.”). Section II.A.2 of the Reply include Patent Owner’s arguments with respect to claim 15 and the combinability of Hain and Shaffer with Rass, Section II.A.3 of the Reply include Patent Owner’s arguments (shown *supra*) with respect to claim 22

and the Hain, Shaffer, and Rass ground, and Section II.B.2 of the Reply include Patent Owner's arguments with respect the combinability of Hain and Shaffer with Aumer in connection with the grounds asserted against proposed substitute claims 15–21 and 23–28. *See id.* at 5, 6, 8.

As discussed *supra* (in the context of the grounds applied to claim 15), we are not persuaded by Patent Owner's arguments that Petitioner's motivations to combine Hain and Shaffer with Rass and with Aumer are insufficient, or that Hain and Shaffer (on one hand) and Rass and Aumer (on the other hand) have disjunctive fields of endeavor or technological areas of interest. As analyzed above in connection with the grounds asserted against proposed substitute claims 15 and 23, we reiterate that Rass and Aumer, and the '688 patent may be viewed as sharing the same general field of endeavor, i.e., wireless earpieces; that is, Rass and Aumer (like Hain and Shaffer) are concerned with wireless earpieces. As analyzed above in connection with the grounds asserted against proposed substitute claims 15 and 23, we also determined that Petitioner has established, by a preponderance of the evidence, that there is sufficient motivation to employ a temperature sensor as taught by Rass, in Hain's hearing aid and Shaffer's earbuds, and that there is sufficient motivation to employ a sensor to read user biometrics as taught by Aumer, in Hain's hearing aid and Shaffer's earbuds.

Thus, based on the arguments and evidence presented, we determine that Petitioner has proved, by a preponderance of evidence, that proposed substitute claim 22 would have been obvious over Hain, Shaffer, and Rass, and obvious over Hain, Shaffer, Rass, and Aumer.

### III. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated by a preponderance of the evidence that claims 1–14 of the ’688 patent are unpatentable.<sup>15</sup> In addition, we determine that Petitioner has demonstrated by a preponderance of the evidence that proposed substitute claims 15–28 are unpatentable. Our determinations are summarized below.

| <b>Claims</b>          | <b>35 U.S.C. §</b> | <b>References/<br/>Basis</b> | <b>Claims Shown Unpatentable</b> | <b>Claims Not shown Unpatentable</b> |
|------------------------|--------------------|------------------------------|----------------------------------|--------------------------------------|
| 1, 2, 4                | 102                | Hain                         | 1, 2, 4                          |                                      |
| 1–6, 8–12, 14          | 103                | Hain, Shaffer                | 1–6, 8–12, 14                    |                                      |
| 3, 5–7, 9–14           | 103                | Hain, Shaffer, Sørensen      | 3, 5–7, 9–14                     |                                      |
| <b>Overall Outcome</b> |                    |                              | 1–14                             |                                      |

| <b>Motion to Amend Outcome</b>              | <b>Claims</b> |
|---------------------------------------------|---------------|
| Original Claims Cancelled by Amendment      |               |
| Substitute Claims Proposed in the Amendment | 15–28         |
| Substitute Claims: Motion to Amend Granted  |               |
| Substitute Claims: Motion to Amend Denied   | 15–28         |
| Substitute Claims: Not Reached              |               |

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<sup>15</sup> Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this Decision, we draw Patent Owner’s attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding*. See 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. See 37 C.F.R. § 42.8(a)(3), (b)(2).

#### IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 1–14 of the '688 patent are unpatentable;

FURTHER ORDERED that Petitioner has shown by a preponderance of the evidence that proposed substitute claims 15–28 are unpatentable, and Patent Owner's request to issue substitute claims 15–28 is *denied*; and

FURTHER ORDERED that, because this is a Final Written Decision, parties to the proceeding 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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