

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

K/S HIMPP
Petitioner

v.

BRAGI GmbH
Patent Owner

Case IPR2023-01204
U.S. Patent No. 10,117,014

THIRD DECLARATION OF SAYFE KIAEI, PH.D.

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I, Sayfe Kiaei, declare as follows:

I. INTRODUCTION

1. I submitted in this matter two prior declarations. I understand that my first declaration was filed as Exhibit 1002 on July 24, 2023 and my second declaration as Exhibit 1018 on September 10, 2024. My background and qualifications remain as stated in paragraphs 1–14 and Exhibit A of my first declaration (Exhibit 1002).

2. In addition to the materials listed in my first declaration (Exhibit 1002) and second declaration (Exhibit 1018), I have reviewed the following papers and exhibits from each of IPR2023-01204 (the present IPR proceeding challenging U.S. Patent No. 10,117,014 (“the ’014 patent”)) and IPR2023-01205 (related IPR proceeding challenging U.S. Patent No. 10,397,688 (“the ’688 patent”))¹: HIMPP’s Opposition to Patent Owner’s Motion to Amend (“MTA”), Patent Owner’s Revised Motion to Amend (“RMTA”), and the exhibits referenced in the RMTA. From IPR2023-01150 (related IPR proceeding challenging U.S. Patent No. 9,843,853

¹ The ’688 patent challenged in IPR2023-01205 is a continuation of and shares the same specification as the ’014 patent challenged in the present IPR proceeding.

(“the ’853 patent”))², I have reviewed HIMPP’s Opposition to Patent Owner’s MTA, Patent Owner’s RMTA, HIMPP’s Opposition to Patent Owner’s RMTA, Patent Owner’s Reply to HIMPP’s Opposition, HIMPP’s Sur-Reply, and the exhibits therein. I have reviewed all the exhibits referenced in this third Declaration of mine. Hereinafter, I refer to the papers and exhibits in the present IPR2023-01204 unless I state otherwise.

3. I confirm that my technical analyses in my first declaration (Exhibit 1002) and second declaration (Exhibit 1018) remain unchanged.

4. I confirm that my appraisal of a person of ordinary skill in the art (“POSITA”) stated in paragraph 25 of my first declaration (Exhibit 1002) remains unchanged.

5. My understanding of the relevant law as explained in paragraphs 17–24 of my first declaration (Exhibit 1002) and paragraphs 5–9 of my second declaration (Exhibit 1018) remains unchanged.

² The ’014 patent challenged in the present IPR proceeding is a continuation of and shares the same specification as the ’853 patent challenged in IPR2023-01150.

II. THE PRIOR ART RENDERS OBVIOUS THE SUBSTITUTE CLAIMS

6. In its RMTA, Patent Owner proposes the following amendments to the original claims of the '014 patent:

- (1) “a portion of the [left/right] wireless earpiece fits within the ear canal opening” in proposed substitute independent claims 14 and 23, corresponding to original claims 1 and 10, respectively;
- (2) “the [left/right] wireless earpiece is configured to read user biometrics” in proposed substitute independent claims 14 and 23;
- (3) “the smart case comprises[/comprising] a rechargeable battery configured to charge the [in-ear] wireless earpieces” in proposed substitute dependent claims 17, 19, and 20, corresponding to original claims 4, 6, and 7, respectively; and
- (4) “the user biometrics is utilized by the wireless earpiece to alter the power mode” in proposed substitute dependent claim 22, corresponding to original claim 9.

See RMTA, Appendix A.

7. Patent Owner does not dispute that proposed amendments (1), (3), and (4) are taught by the prior art. *See generally* RMTA. Patent Owner only argues that the prior art references as applied in HIMPP’s Petition and Opposition to Patent Owner’s Motion to Amend—Hain, Steinbrecher, Shaffer, Sorensen, and Marks—do

not disclose wireless earpiece(s) “configured to read user biometrics” (proposed amendment (2)). *See id.* at 8–10. But, as I will discuss next, the prior art references in invalidity grounds in HIMPP’s Petition combined with U.S. Patent No. 7,522,739 to Rass et al. (“Rass”) (Exhibit 1033) and/or U.S. Patent Application Publication No. 2016/0094899 to Aumer et al. (“Aumer”) (Exhibit 1027) render obvious all of Patent Owner’s proposed substitute claims 14–26. I agree with Patent Owner that “[t]echniques to read biometrics that would be implemented in an earpiece, such as heartbeat or temperature, *were known in the art and within the skill level of a POSITA to implement as of the priority date.*” Exhibit 1034 (IPR2023-01150, Patent Owner’s Reply) at 10 (emphasis added).

A. Combinations with Rass

1. Overview of Rass

8. Rass was filed on May 10, 2005, at least a decade before the priority date of the ’014 patent, and issued on April 21, 2009. Rass is prior art to the ’014 patent.

9. Rass discloses techniques for switching on and off a hearing aid (I) by fitting the hearing aid (I) “with a temperature sensor (TS) to detect the body heat of the hearing aid wearer” when “the hearing aid is inserted in the auditory canal.” Exhibit 1033 (Rass) at Abstract, Figure 1; *see also id.* at 2:5–8. Rass makes clear

that its hearing aid (I), which it illustrates in Figure 1 (reproduced below), is an “in-the-ear (ITE)” hearing aid. *Id.* at 2:53–54, 2:63–64.

FIG 1

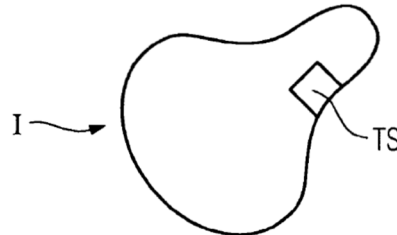


Exhibit 1033 (Rass), Figure 1

10. Rass explains that: “When wor[n], 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.” Exhibit 1033 (Rass) at 2:64–3:2; *cf.* Exhibit 1001 (’014 patent) at 5:18–21 (“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”).

11. According to Rass, its invention has the advantages of significantly increasing “user-friendliness” by providing automatic switching on and off without requiring a mechanical switch, and allowing for a standby mode that “extends the useful life or endurance of the hearing aid battery.” Exhibit 1033 (Rass) at 2:14–31.

Additionally, Rass states that its invention is “favorable for the hearing aid housing to be of a watertight design.” *Id.* at 2:42–43.

2. Hain in view of Rass renders substitute claims 14–16 and 18 obvious

12. For the reasons that I provided in my first declaration (Exhibit 1002), original claims 1–3 and 5 are anticipated by Hain in Ground 1. In its RMTA, Patent Owner has proposed claims 14–16 and 18 to substitute for claims 1–3 and 5, respectively. Patent Owner does not dispute that Hain teaches proposed amendment (1) (“a portion of the wireless earpiece fits within the ear canal opening”). Patent Owner only argues that “Hain does not disclose a wireless earpiece(s) ‘configured to read user biometrics’”—that is, proposed amendment (2). RMTA at 8.³

13. But Hain in combination with Rass renders obvious Patent Owner’s proposed amendment “the wireless earpiece is configured to read user biometrics,” as recited by proposed substitute claim 14. A POSITA would have found it obvious to include, in each of Hain’s hearing aids, a temperature sensor to detect the temperature of the wearer to automatically switch on and off the hearing aid, as taught by Rass, before the priority date of the ’014 patent. *See* Section II.A.1.

³ Proposed amendments (3) and (4) do not apply to proposed substitute claims 14–16 and 18.

(a) **Motivation to combine Hain and Rass**

14. A POSITA would have been motivated to combine Hain’s teachings, *e.g.*, Hain’s hearing aids 1 and 11, and Rass’s teachings to fit a temperature sensor in a hearing aid to detect the temperature of the wearer and automatically switch on and off the hearing aid based on the detected temperature.

15. **First**, Hain and Rass are analogous art. They are both from the same field of endeavor as the ’014 patent, including Patent Owner’s proposed substitute claims. Hain and Rass share the general field of endeavor of the ’014 patent—namely, wireless electronics, including wireless earpieces. Exhibit 1001 (’014 patent) at 1:17–20 (“The present invention relates to **wireless electronics** and battery systems. More specifically, **but not exclusively**, the present invention relates to **wireless earpieces** that manage and extend battery life.”) (emphasis added); *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner’s Reply) at 4 (“The ’853 Patent ‘relates to wireless electronics and battery systems. More specifically, but not exclusively, the present invention relates to wireless earpieces that manage and extend battery life.’”). Hain discloses hearing aids 1 and 11 that “can be worn in the ear (ITE)” and that communicate wirelessly. Exhibit 1004 (Hain) at ¶¶ 1, 14, 18, Figure 1. Similarly, Rass discloses a wireless in-the-ear (ITE) hearing aid I. Exhibit 1033 (Rass) at 2:53–54, 2:63–64, Figure 1.

16. If Patent Owner were to argue—as it did for parent ’853 patent in IPR2023-01150—that the field of endeavor of the ’014 patent is not simply wireless electronics or wireless earpieces, but wireless earpieces that specifically manage and extend battery life, both Hain and Rass fall within this field of endeavor. As I discussed in my first declaration (Exhibit 1002), like the ’014 patent, Hain discloses that its hearing aids automatically turn on and off based on detection of the magnetic field of a permanent magnet in their storage box. Exhibit 1004 (Hain) at ¶¶ 11, 21, 22, Figure 2. By automatically turning on and off, Hain’s hearing aids manage and extend their battery life. As I discussed above in Section II.A.1, Rass discloses a hearing aid that automatically switches on and off based on temperature detected by a temperature sensor fitted in the hearing aid. Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:64–3:2, Figure 1. Rass explicitly discloses that its invention allows for a standby mode that “extends the useful life or endurance of the hearing aid battery.” *Id.* at 2:14–31.

17. Further, wireless earpieces “configured to read user biometrics” is the only point of novelty identified by Patent Owner given that this is the only feature in the substitute claims that Patent Owner relies on to distinguish the prior art applied in HIMPP’s Petition. Even if not limited to this alleged point of novelty, the field of endeavor of Patent Owner’s proposed substitute claims includes wireless earpieces configured to read user biometrics. Rass remains from the field of

endeavor of wireless earpieces configured to read user biometrics. Rass discloses that its hearing aid I is fitted with a temperature sensor to “detect the body heat of the hearing aid wearer” when “the hearing aid is inserted in the auditory canal.” Exhibit 1033 (Rass) at Abstract, Figure 1; *see also id.* at 2:5–8, 2:64–3:2. Body heat or temperature of the wearer of the hearing aid is a type of user biometrics. *Cf.* Exhibit 1001 (’014 patent) at 5:18–19 (“biometric readings, such as heart beat or *temperature*”) (emphasis added).

18. I have been informed and understand that, under the doctrine of claim differentiation, none of the proposed substitute claims except claim 22 requires that the user biometrics read by the wireless earpiece be “utilized by the wireless earpiece to alter the power mode.” Indeed, other than claim 22, no claim recites any limitation directed to altering power of the wireless earpiece or managing battery life based on user biometrics. Yet, if Patent Owner were to argue that the field of endeavor of its proposed substitute claims is even narrower and directed to a wireless earpiece that reads user biometrics and utilizes the user biometrics to alter its power mode, Rass is from this field of endeavor. Once again, as I discussed above in Section II.A.1, Rass discloses automatically switching on and off its hearing aid I based on the wearer’s temperature detected by a temperature sensor fitted in the hearing aid when the hearing aid is worn by the user—more particularly, “inserted in the auditory

canal” of the wearer. Switching on and off the hearing aid alters the power mode of the hearing aid.

19. Moreover, Hain and Rass are reasonably pertinent to a problem faced by the inventors of the '014 patent. Like Patent Owner's assertion for parent '853 patent in IPR2023-01150 and because the '014 patent shares the same specification as the '853 patent, the '014 patent is concerned with wireless earpieces that manage and extend battery life of a wireless earpiece. Exhibit 1001 ('014 patent) at 1:17–20; *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner's Reply) at 4 (“[T]he '853 Patent is concerned with ‘managing and extending battery life.’”). Both Hain and Rass relate to and provide solutions to that same problem. As I explained previously and above, Hain discloses hearing aids that automatically turn on and off based on magnetic field detection, thereby managing and extending their battery life. Exhibit 1004 (Hain) at ¶¶ 11, 21, 22, Figure 2. Similarly, Rass discloses that automatically switching on and off a hearing aid based on detected temperature allows for a standby mode that “extends the useful life or endurance of the hearing aid battery.” Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:14–31, 2:64–3:2, Figure 1. Thus, a POSITA would have reasonably considered Hain and Rass when faced with the problem of implementing a wireless earpiece that can manage and extend battery life.

20. If Patent Owner were to instead argue that the inventors of the '014 patent were faced with the problem of how to configure a wireless earpiece to read user biometrics—because this is the only point of novelty that Patent Owner has identified—(whether the user biometrics is utilized to alter the power mode of the wireless earpiece or not), a POSITA would still have reasonably considered Rass, which discloses switching on and off (*i.e.*, altering the power mode) a hearing aid based on the temperature sensed by a temperature sensor fitted in the hearing aid. Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:64–3:2, Figure 1.

21. Because Hain and Rass are from the same field of endeavor and/or reasonably pertinent to a problem faced by the inventors of the '014 patent, Hain and Rass are analogous art and a POSITA would have therefore considered their teachings and would have readily been motivated to combine their teachings.

22. **Second**, implementing hearing aids, as taught by Hain, to each include a temperature sensor to detect the temperature of the wearer, as taught by Rass, would have yielded expected, predictable results. Each of Hain's hearing aids 1 and 11 houses multiple electronic components and “can be worn in the ear.” Exhibit 1004 (Hain) at ¶¶ 1, 14, 18, Figure 1. Rass discloses fitting a hearing aid with a temperature sensor to detect the temperature of a wearer when “the hearing aid is inserted in the auditory canal.” Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:53–54, 2:63–64, Figure 1. A POSITA would have combined the elements taught by Hain

and Rass—namely, hearing aids 1 and 11 as taught by Hain, 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 Hain’s hearing aids 1 and 11 to include a temperature sensor to detect the temperature of the wearer and further configure the hearing aids to switch on and off based on the detected temperature. This modification would have been readily predictable and recognized by a POSITA and would have been well within the knowledge and skillset of a POSITA.

23. **Third**, Rass explicitly discloses several benefits of switching on and off a hearing aid based on the temperature detected by a temperature sensor fitted in the hearing aid. As I discussed in Section II.A.1, Rass explains that its invention significantly increases “user-friendliness” by providing automatic switching on and off without requiring a mechanical switch, and allows for a standby mode that “extends the useful life or endurance of the hearing aid battery.” Exhibit 1033 (Rass) at 2:14–31. Additionally, Rass states that its invention is “favorable for the hearing aid housing to be of a watertight design.” *Id.* at 2:42–43.

24. **Fourth**, a POSITA would have had a reasonable expectation of success in applying Rass’s teachings to Hain’s hearing aids 1 and 11. As explained above, Rass’s implementation of a hearing aid fitted with a temperature sensor to detect the temperature of the wearer and automatically turn on and off the hearing aid based

on the detected temperature is directly applicable to Hain's hearing aids 1 and 11 and well within the knowledge and skillset of a POSITA.

25. For the above reasons, Hain in view of Rass renders obvious Patent Owner's proposed substitute claims 14–16 and 18.

3. Steinbrecher in view of Rass renders substitute claims 23 and 24 obvious

26. For the reasons that I provided in my first declaration (Exhibit 1002), original claims 10 and 11 are anticipated by Steinbrecher in Ground 2. In its RMTA, Patent Owner has proposed claims 23 and 24 to substitute for claims 10 and 11, respectively. Patent Owner does not dispute that Steinbrecher teaches proposed amendment (1) (“a portion of the wireless earpiece fits within the ear canal opening”). Patent Owner only argues that “Steinbrecher does not disclose a wireless earpiece(s) ‘configured to read user biometrics’”—that is, proposed amendment (2). RMTA at 8.⁴

27. But Steinbrecher in combination with Rass renders obvious Patent Owner's proposed amendment “the [left/right] wireless earpiece is configured to read user biometrics,” as recited by proposed substitute claim 23. A POSITA would

⁴ Proposed amendments (3) and (4) do not apply to proposed substitute claims 23 and 24.

have found it obvious to include, in Steinbrecher's hearing aid, a temperature sensor to detect the temperature of the wearer to automatically switch on and off the hearing aid, as taught by Rass, before the priority date of the '014 patent. *See* Section II.A.1.

(a) **Motivation to combine Steinbrecher and Rass**

28. A POSITA would have been motivated to combine Steinbrecher's teachings, *e.g.*, Steinbrecher's hearing aid H, and Rass's teachings to fit a temperature sensor in a hearing aid to detect the temperature of the wearer and automatically switch on and off the hearing aid based on the detected temperature.

29. **First**, Steinbrecher and Rass are analogous art. They are both from the same field of endeavor as the '014 patent, including Patent Owner's proposed substitute claims. Steinbrecher and Rass share the general field of endeavor of the '014 patent—namely, wireless electronics, including wireless earpieces. Exhibit 1001 ('014 patent) at 1:17–20 (“The present invention relates to **wireless electronics** and battery systems. More specifically, **but not exclusively**, the present invention relates to **wireless earpieces** that manage and extend battery life.”) (emphasis added); *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner's Reply) at 4. Steinbrecher discloses a wireless hearing aid H that can be “in-the-ear” and whose battery gets charged inductively when the hearing aid is placed in its charging shell/storage case. Exhibit 1006 (Steinbrecher) at ¶¶ 7, 24, 25, Figure 2. Rass discloses a wireless in-the-ear (ITE) hearing aid I. Exhibit 1033 (Rass) at 2:53–54, 2:63–64, Figure 1.

30. If Patent Owner were to argue—as it did for parent ’853 patent in IPR2023-01150—that the field of endeavor of the ’014 patent is not simply wireless electronics or wireless earpieces, but wireless earpieces that specifically manage and extend battery life, both Steinbrecher and Rass fall within this field of endeavor. As I discussed in my first declaration (Exhibit 1002), like the ’014 patent, Steinbrecher discloses that its hearing aid includes a reed switch that, upon actuation by a permanent magnet in the storage case, disconnects the battery from electronics within the hearing aid. Exhibit 1006 (Steinbrecher) at ¶¶ 18–20, 25, Figure 2. Steinbrecher explains that such a configuration “ensures that energy is not consumed unnecessarily.” *Id.* at ¶ 18; *see also id.* at ¶ 19 (“no current is consumed”). Ensuring that no energy or current is consumed when the hearing aid is placed in its storage case extends the battery life of the hearing aid. As I discussed above in Section II.A.1, Rass discloses a hearing aid that automatically switches on and off based on temperature detected by a temperature sensor fitted in the hearing aid. Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:64–3:2, Figure 1. Rass explicitly discloses that its invention allows for a standby mode that “extends the useful life or endurance of the hearing aid battery.” *Id.* at 2:14–31.

31. Further, wireless earpieces “configured to read user biometrics” is the only point of novelty identified by Patent Owner given that this is the only feature in the substitute claims that Patent Owner relies on to distinguish the prior art applied

in HIMPP’s Petition. Even if not limited to this alleged point of novelty, the field of endeavor of Patent Owner’s proposed substitute claims includes wireless earpieces configured to read user biometrics. Rass remains from the field of endeavor of wireless earpieces configured to read user biometrics. Rass discloses that its hearing aid I is fitted with a temperature sensor to “detect the body heat of the hearing aid wearer” when “the hearing aid is inserted in the auditory canal.” Exhibit 1033 (Rass) at Abstract, Figure 1; *see also id.* at 2:5–8, 2:64–3:2. Body heat or temperature of the wearer of the hearing aid is a type of user biometrics. *Cf.* Exhibit 1001 (’014 patent) at 5:18–19 (“biometric readings, such as heart beat or *temperature*”) (emphasis added).

32. I have been informed and understand that, under the doctrine of claim differentiation, none of the proposed substitute claims except claim 22 requires that the user biometrics read by the wireless earpiece be “utilized by the wireless earpiece to alter the power mode.” Indeed, other than claim 22, no claim recites any limitation directed to altering power of the wireless earpiece or managing battery life based on user biometrics. Yet, if Patent Owner were to argue that the field of endeavor of its proposed substitute claims is even narrower and directed to a wireless earpiece that reads user biometrics and utilizes the user biometrics to alter its power mode, Rass is from this field of endeavor. Once again, as I discussed above in Section II.A.1, Rass discloses automatically switching on and off its hearing aid I based on the

wearer's temperature detected by a temperature sensor fitted in the hearing aid when the hearing aid is worn by the user—more particularly, “inserted in the auditory canal” of the wearer. Switching on and off the hearing aid alters the power mode of the hearing aid.

33. Moreover, Steinbrecher and Rass are reasonably pertinent to a problem faced by the inventors of the '014 patent. Like Patent Owner's assertion for parent '853 patent in IPR2023-01150 and because the '014 patent shares the same specification as the '853 patent, the '014 patent is concerned with wireless earpieces that manage and extend battery life of a wireless earpiece. Exhibit 1001 ('014 patent) at 1:17–20; *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner's Reply) at 4 (“[T]he '853 Patent is concerned with ‘managing and extending battery life.’”). Both Steinbrecher and Rass relate to and provide solutions to that same problem. As I explained previously and above, Steinbrecher discloses a hearing aid that automatically turns on and off based on magnetic field detection, thereby managing and extending its battery life. Exhibit 1006 (Steinbrecher) at ¶¶ 18–20, 25, Figure 2. Similarly, Rass discloses that automatically switching on and off a hearing aid based on detected temperature allows for a standby mode that “extends the useful life or endurance of the hearing aid battery.” Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:14–31, 2:64–3:2, Figure 1. Thus, a POSITA would have reasonably considered

Steinbrecher and Rass when faced with the problem of implementing a wireless earpiece that can manage and extend battery life.

34. If Patent Owner were to instead argue that the inventors of the '014 patent were faced with the problem of how to configure a wireless earpiece to read user biometrics—because this is the only point of novelty that Patent Owner has identified—(whether or not the user biometrics is utilized to alter the power mode of the wireless earpiece), a POSITA would still have reasonably considered Rass, which discloses switching on and off (*i.e.*, altering the power mode) a hearing aid based on the temperature sensed by a temperature sensor fitted in the hearing aid. Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:64–3:2, Figure 1.

35. Because Steinbrecher and Rass are from the same field of endeavor and/or reasonably pertinent to a problem faced by the inventors of the '014 patent, Steinbrecher and Rass are analogous art and a POSITA would have therefore considered their teachings and would have readily been motivated to combine their teachings.

36. ***Second***, implementing a hearing aid, as taught by Steinbrecher, to include a temperature sensor to detect the temperature of the wearer, as taught by Rass, would have yielded expected, predictable results. Steinbrecher's hearing aid H can be “in-the-ear” and contains electronics. Exhibit 1006 (Steinbrecher) at ¶ 25, Figure 2. Rass discloses fitting a hearing aid with a temperature sensor to detect the

temperature of a wearer when “the hearing aid is inserted in the auditory canal.” Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:53–54, 2:63–64, Figure 1 A POSITA would have combined the elements taught by Steinbrecher and Rass—namely, hearing H as taught by Steinbrecher, 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 Steinbrecher’s hearing aid H to include a temperature sensor to detect the temperature of the wearer and further configure the hearing aid H to switch on and off based on the detected temperature. This modification would have been readily predictable and recognized by a POSITA and would have been well within the knowledge and skillset of a POSITA.

37. **Third**, Rass explicitly discloses several benefits of switching on and off a hearing aid based on the temperature detected by a temperature sensor fitted in the hearing aid. As I discussed in Section II.A.1, Rass explains that its invention significantly increases “user-friendliness” by providing automatic switching on and off without requiring a mechanical switch, and allows for a standby mode that “extends the useful life or endurance of the hearing aid battery.” Exhibit 1033 (Rass) at 2:14–31. Additionally, Rass states that its invention is “favorable for the hearing aid housing to be of a watertight design.” *Id.* at 2:42–43.

38. **Fourth**, a POSITA would have had a reasonable expectation of success in applying Rass’s teachings to Steinbrecher’s hearing aid H. As explained above,

Rass's implementation of a hearing aid fitted with a temperature sensor to detect the temperature of the wearer and automatically turn on and off the hearing aid based on the detected temperature is directly applicable to Steinbrecher's hearing aid H and well within the knowledge and skillset of a POSITA.

39. For the above reasons, Steinbrecher in view of Rass renders obvious Patent Owner's proposed substitute claims 23 and 24.

**4. Shaffer in view of Hain, Sorensen, Steinbrecher, and/or
Rass renders claims 14–21 and 23–26 obvious**

40. For the reasons that I provided in my first declaration (Exhibit 1002), original claims 1–8 are obvious over the teachings of Shaffer in view of Hain and/or Sorensen (Grounds 3 and 4) and original claims 10–13 are obvious over the teachings of Shaffer in view of Steinbrecher and/or Sorensen (Grounds 5 and 6). In its RMTA, Patent Owner has proposed claims 14–21 to respectively substitute for claims 1–8, and claims 23–26 to respectively substitute for claims 10–13. Patent Owner does not dispute that the combination of Shaffer, Hain, and/or Sorensen or the combination of Shaffer, Steinbrecher, and/or Sorensen teaches proposed amendment (1) (“a portion of the [left/right] wireless earpiece fits within the ear canal opening”) as recited by claims 14 and 23 and proposed amendment (3) (“the smart case comprises[/comprising] a rechargeable battery configured to charge the [in-ear] wireless earpieces”) as recited by claims 17, 19, and 20. Patent Owner only

argues that “none of these references discloses a wireless earpiece(s) ‘configured to read user biometrics’”—that is, proposed amendment (2). RMTA at 9–10.⁵

41. But Shaffer in combination with Rass renders obvious Patent Owner’s proposed amendment “the wireless earpiece is configured to read user biometrics,” as recited by proposed substitute claims 14, and proposed amendment “the [left/right] wireless earpiece is configured to read user biometrics,” as recited by proposed substitute claim 23. A POSITA would have found it obvious to include, in each of Shaffer’s earbuds, a temperature sensor to detect the temperature of the wearer to automatically switch on and off the earbud, as taught by Rass, before the priority date of the ’014 patent. *See* Section II.A.1.

⁵ Proposed amendment (4) does not apply to proposed substitute claims 14–21 and 23–26.

(a) **Motivation to combine Shaffer and Rass⁶**

42. A POSITA would have been motivated to combine Shaffer’s teachings, *e.g.*, Shaffer’s earbuds 1010 and 1012, and Rass’s teachings to fit a temperature sensor in a hearing aid to detect the temperature of the wearer and automatically switch on and off the hearing aid based on the detected temperature.

43. **First**, Shaffer and Rass are analogous art. They are both from the same field of endeavor as the ’014 patent, including Patent Owner’s proposed substitute claims. Shaffer and Rass share the general field of endeavor of the ’014 patent—namely, wireless electronics, including wireless earpieces. Exhibit 1001 (’014 patent) at 1:17–20 (“The present invention relates to **wireless electronics** and battery systems. More specifically, **but not exclusively**, the present invention relates to **wireless earpieces** that manage and extend battery life.”) (emphasis added); *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner’s Reply) at 4. Shaffer discloses rechargeable wireless earbuds 1010 and 1012 that “fit within the ear of a human.”

⁶ The reasons that I provided in my first declaration (Exhibit 1002) as to why a POSITA would have been motivated to combine Shaffer with Hain and/or Sorensen and Shaffer with Steinbrecher and/or Sorensen with a reasonable expectation of success apply equally here.

Exhibit 1003 (Shaffer) at ¶¶ 2, 3, 32, 46, 62, Figure 10. Similarly, Rass discloses a wireless in-the-ear (ITE) hearing aid I. Exhibit 1033 (Rass) at 2:53–54, 2:63–64, Figure 1.

44. If Patent Owner were to argue—as it did for parent ’853 patent in IPR2023-01150—that the field of endeavor of the ’014 patent is not simply wireless electronics or wireless earpieces, but wireless earpieces that specifically manage and extend battery life, both Shaffer and Rass fall within this field of endeavor. As I discussed in my first declaration (Exhibit 1002), like the ’014 patent, Shaffer discloses that its wireless earbuds 1010 and 1012 include circuitry that is powered using a “low-energy consumption idle mode” when magnetic sensors detect that the earbuds are placed in a storage case. Exhibit 1003 (Shaffer) at ¶¶ 40, 63. A low-energy consumption idle mode extends the battery life of the earbuds. As I discussed above in Section II.A.1, Rass discloses a hearing aid that automatically switches on and off based on temperature detected by a temperature sensor fitted in the hearing aid. Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:64–3:2, Figure 1. Rass explicitly discloses that its invention allows for a standby mode that “extends the useful life or endurance of the hearing aid battery.” *Id.* at 2:14–31.

45. Further, wireless earpieces “configured to read user biometrics” is the only point of novelty identified by Patent Owner given that this is the only feature in the substitute claims that Patent Owner relies on to distinguish the prior art applied

in HIMPP’s Petition. Even if not limited to this alleged point of novelty, the field of endeavor of Patent Owner’s proposed substitute claims includes wireless earpieces configured to read user biometrics. Rass remains from the field of endeavor of wireless earpieces configured to read user biometrics. Rass discloses that its hearing aid I is fitted with a temperature sensor to “detect the body heat of the hearing aid wearer” when “the hearing aid is inserted in the auditory canal.” Exhibit 1033 (Rass) at Abstract, Figure 1; *see also id.* at 2:5–8, 2:64–3:2. Body heat or temperature of the wearer of the hearing aid is a type of user biometrics. *Cf.* Exhibit 1001 (’014 patent) at 5:18–19 (“biometric readings, such as heart beat or *temperature*”) (emphasis added).

46. I have been informed and understand that, under the doctrine of claim differentiation, none of the proposed substitute claims except claim 22 requires that the user biometrics read by the wireless earpiece be “utilized by the wireless earpiece to alter the power mode.” Indeed, other than claim 22, no claim recites any limitation directed to altering power of the wireless earpiece or managing battery life based on user biometrics. Yet, if Patent Owner were to argue that the field of endeavor of its proposed substitute claims is even narrower and directed to a wireless earpiece that reads user biometrics and utilizes the user biometrics to alter its power mode, Rass is from this field of endeavor. Once again, as I discussed above in Section II.A.1, Rass discloses automatically switching on and off its hearing aid I based on the

wearer's temperature detected by a temperature sensor fitted in the hearing aid when the hearing aid is worn by the user—more particularly, “inserted in the auditory canal” of the wearer. Switching on and off the hearing aid alters the power mode of the hearing aid.

47. Moreover, Shaffer and Rass are reasonably pertinent to a problem faced by the inventors of the '014 patent. Like Patent Owner's assertion for parent '853 patent in IPR2023-01150 and because the '014 patent shares the same specification as the '853 patent, the '014 patent is concerned with wireless earpieces that manage and extend battery life of a wireless earpiece. Exhibit 1001 ('014 patent) at 1:17–20; *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner's Reply) at 4 (“[T]he '853 Patent is concerned with ‘managing and extending battery life.’”). Both Shaffer and Rass relate to and provide solutions to that same problem. As I explained previously and above, Shaffer discloses that its wireless earbuds 1010 and 1012 include circuitry that is powered using a “low-energy consumption idle mode” when they are placed in a storage case. Exhibit 1003 (Shaffer) at ¶¶ 40, 63. Similarly, Rass discloses that automatically switching on and off a hearing aid based on detected temperature allows for a standby mode that “extends the useful life or endurance of the hearing aid battery.” Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:14–31, 2:64–3:2, Figure 1. Thus, a POSITA would have reasonably considered Shaffer and Rass

when faced with the problem of implementing a wireless earpiece that can manage and extend battery life.

48. If Patent Owner were to instead argue that the inventors of the '014 patent were faced with the problem of how to configure a wireless earpiece to read user biometrics—because this is the only point of novelty that Patent Owner has identified—(whether the user biometrics is utilized to alter the power mode of the wireless earpiece or not), a POSITA would still have reasonably considered Rass, which discloses switching on and off (*i.e.*, altering the power mode) a hearing aid based on the temperature sensed by a temperature sensor fitted in the hearing aid. Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:64–3:2, Figure 1.

49. Because Shaffer and Rass are from the same field of endeavor and/or reasonably pertinent to a problem faced by the inventors of the '014 patent, Shaffer and Rass are analogous art and a POSITA would have therefore considered their teachings and would have readily been motivated to combine their teachings.

50. **Second**, implementing earbuds, as taught by Shaffer, to each include a temperature sensor to detect the temperature of the wearer, as taught by Rass, would have yielded expected, predictable results. Each of Shaffer's earbuds 1010 and 1012 houses multiple electronic components. Exhibit 1003 (Shaffer) at ¶¶ 61–62, Figure 10; *see also id.* at ¶ 32 (“The term “earbud” refers to a device designed to fit within the ear of a human, and which emits audio signals that the earbud receives from a

mobile electronic device. Examples of earbuds include in-ear headphones, hearing aids and the like.”). Rass discloses fitting a hearing aid with a temperature sensor to detect the temperature of a wearer when “the hearing aid is inserted in the auditory canal.” Exhibit 1033 (Rass) at Abstract, 2:5–8, 2:53–54, 2:63–64, Figure 1 A POSITA would have combined the elements taught by Shaffer and Rass—namely, earbuds 1010 and 1012 as taught by 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 Shaffer’s earbuds 1010 and 1012 to include a temperature sensor to detect the temperature of the wearer and further configure the earbuds 1010 and 1012 to switch on and off based on the detected temperature. This modification would have been readily predictable and recognized by a POSITA and would have been well within the knowledge and skillset of a POSITA.

51. **Third**, Rass explicitly discloses several benefits of switching on and off a hearing aid based on the temperature detected by a temperature sensor fitted in the hearing aid. As I discussed in Section II.A.1, Rass explains that its invention significantly increases “user-friendliness” by providing automatic switching on and off without requiring a mechanical switch, and allows for a standby mode that “extends the useful life or endurance of the hearing aid battery.” Exhibit 1033 (Rass)

at 2:14–31. Additionally, Rass states that its invention is “favorable for the hearing aid housing to be of a watertight design.” *Id.* at 2:42–43.

52. **Fourth**, a POSITA would have had a reasonable expectation of success in applying Rass’s teachings to Shaffer’s earbuds 1010 and 1012. As explained above, Rass’s implementation of a hearing aid fitted with a temperature sensor to detect the temperature of the wearer and automatically turn on and off the hearing aid based on the detected temperature is directly applicable to Shaffer’s earbuds 1010 and 1012 and well within the knowledge and skillset of a POSITA.

53. For the above reasons, Shaffer in view of Hain, Sorensen, and/or Rass renders obvious Patent Owner’s proposed substitute claims 14–21, and Shaffer in view of Steinbrecher, Sorensen, and/or Rass renders obvious Patent Owner’s proposed substitute claims 23–26.

5. Shaffer in view of Hain and Rass renders claim 22 obvious

54. For the reasons that I provided in my first declaration (Exhibit 1002), original claim 9 is obvious over the teachings of Shaffer in view of Hain (Ground 3). In its RMTA, Patent Owner has proposed claim 22 to substitute for claim 9. Claim 22 includes the new limitation “the user biometrics is utilized by the wireless earpiece to alter the power mode”—that is, proposed amendment (4). RMTA at APPX A-3. Patent Owner does not dispute that proposed amendment (4) is taught by the prior art. In fact, in IPR2023-01150, Patent Owner acknowledged that Rass

“discloses the ability to power up or down a hearing aid based on temperature of the hearing aid or shell, registered by a temperature sensor.” Exhibit 1034 (IPR2023-01150, Patent Owner’s Reply) at 5; *see also* Section II.A.1. Switching on and off the hearing aid alters the power mode of the hearing aid. As I discussed above in Section II.A.4(a), a POSITA would have been motivated to combine Shaffer and Rass with a reasonable expectation of success. For this reason and the reasons that I provided above in Section II.A.4, Shaffer in view of Hain and Rass renders obvious Patent Owner’s substitute claim 22.

B. Combinations with Aumer

1. Overview of Aumer

55. Aumer was filed on August 18, 2015 and claims priority to U.S. Provisional Application No. 62/056,510 (“Aumer Provisional 1”) (Exhibit 1028) and U.S. Provisional Application No. 62/110,655 (“Aumer Provisional 2”) (Exhibit 1029). Aumer Provisional 1 was filed on September 17, 2014 and Aumer Provisional 2 on February 2, 2015. I have been informed and understand that Aumer is prior art to the ’014 patent as of its filing date and/or the filing date of either Aumer Provisional 1 or Aumer Provisional 2.

56. Aumer discloses and illustrates in Figures 2A–2B a monitoring earpiece 20. Exhibit 1027 (Aumer) at ¶ 66. Looking at Aumer’s Figures 2A–2B, a POSITA would appreciate that the earpiece 20 includes a portion (*e.g.*, sound port

26) that fits within the ear canal opening, as required directly or indirectly by all of Patent Owner’s proposed substitute claims 14–26.

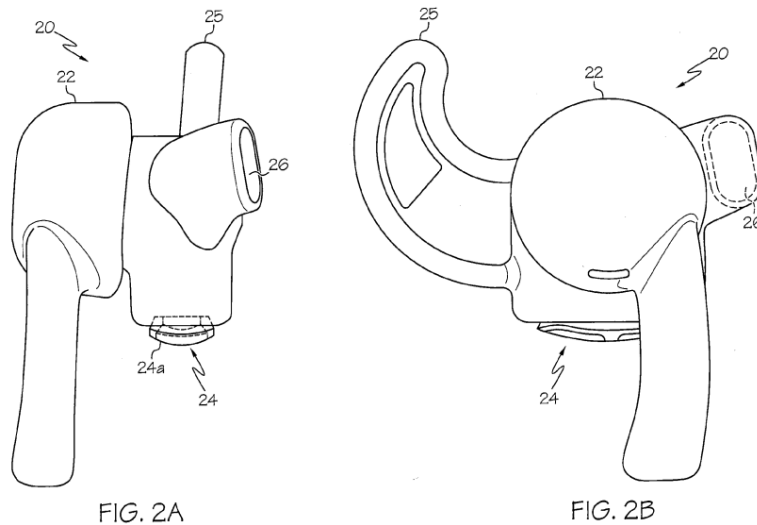


Exhibit 1027 (Aumer), Figures 2A–2B

57. Aumer discloses that the earpiece 20 includes a sensor module 24, which “has a region 24a configured to contact a selected area of the ear.” *Id.* at ¶ 66. The sensor module 24 is “configured to detect and/or measure physiological information from the subject.” *Id.* at ¶ 69. Aumer explains that “[t]he ear is an ideal location for wearable health and environmental monitors.” *Id.* at ¶ 64. In particular, “[m]onitoring 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.” *Id.* Some of Aumer’s physiological information (*e.g.*, temperature, blood gas levels, cardiopulmonary functioning, etc.) are similar to the biometric readings/information that the ’014 patent discloses. *See* Exhibit 1001 (’014 patent) at 5:18–19 (“biometric readings, such as ***heart beat*** or ***temperature***”), 9:64–66 (“biometric information (*e.g.*, ***pulse rate***, ***oxygenation***, distance travelled, calories burned, etc.)”) (emphasis added).

58. According to Aumer, the earpiece 20 may function as the “wearable biometric monitoring device 10” of Figure 1. Exhibit 1027 (Aumer) at ¶¶ 66, 71.

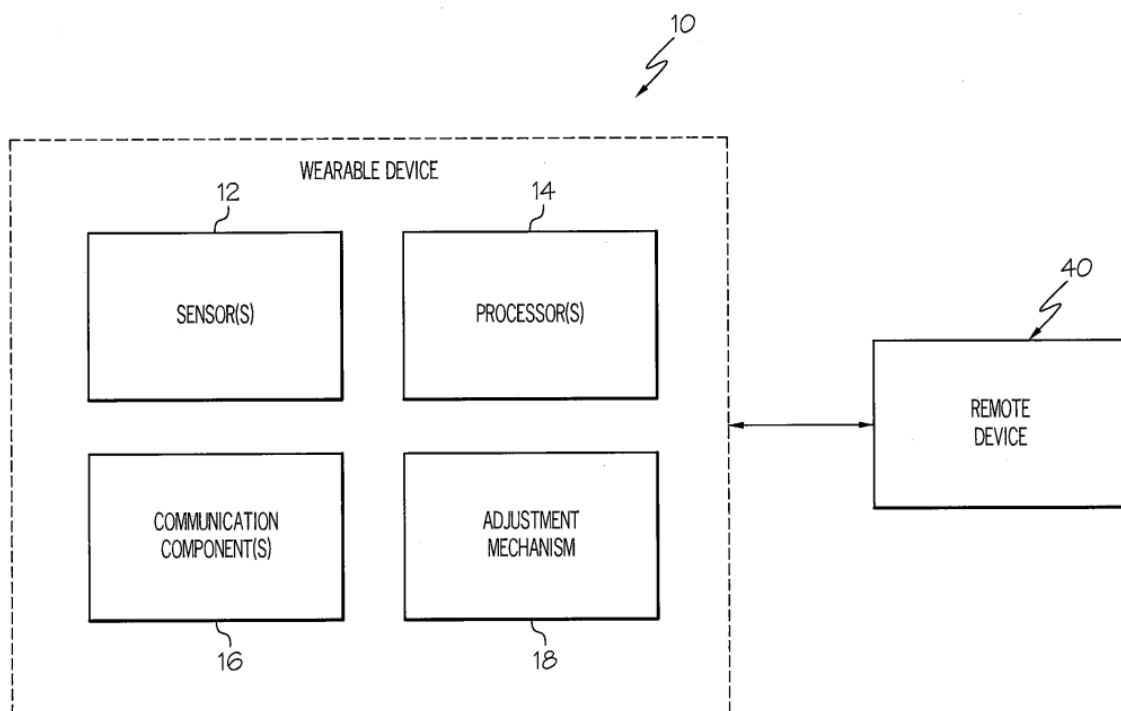


FIG. 1

Exhibit 1027 (Aumer), Figure 1

59. Aumer discloses that the wearable biometric monitoring device 10 includes one or more sensors 12 (*e.g.*, sensor module 24) and “at least one processor 14 that is coupled to the sensor(s) 12 and that is configured to receive and analyze signals produced by the sensor(s).” *Id.* at ¶ 71. According to Aumer, sensors 12 may include various types of sensors including optical sensors, thermal sensors, electrical sensors, among others. *Id.* at ¶ 70. Device 10 also includes a communication component 16 that “allows the processor(s) 14 to communicate with a wearer of the biometric monitoring device 10 via a remote device 40, such as a smart phone, computer, etc.” *Id.* at ¶ 72. Furthermore, “[t]he remote device 40 may be in wired or wireless communication with the wearable device 10.” *Id.* at ¶ 74.

2. Hain in view of Aumer renders substitute claims 14–16 and 18 obvious

60. For the reasons that I provided in my first declaration (Exhibit 1002), original claims 1–3 and 5 are anticipated by Hain in Ground 1. In its RMTA, Patent Owner has proposed claims 14–16 and 18 to substitute for claims 1–3 and 5, respectively. Patent Owner does not dispute that Hain teaches proposed amendment (1) (“a portion of the wireless earpiece fits within the ear canal opening”). Patent

Owner only argues that “Hain does not disclose a wireless earpiece(s) ‘configured to read user biometrics’”—that is, proposed amendment (2). RMTA at 8.⁷

61. But Hain in combination with Aumer renders obvious Patent Owner’s proposed amendment “the wireless earpiece is configured to read user biometrics,” as recited by proposed substitute claim 14. A POSITA would have found it obvious to include, in each of Hain’s hearing aids, one or more sensors, a processor, and a communication component to read (*e.g.*, detect and/or measure) user biometrics (*e.g.*, body temperature, blood gas levels, and/or cardiopulmonary functioning), as taught by Aumer, before the priority date of the ’014 patent. *See* Section II.B.1.

(a) **Motivation to combine Hain and Aumer**

62. A POSITA would have been motivated to combine Hain’s teachings, *e.g.*, Hain’s hearing aids 1 and 11, and Aumer’s teachings to have wireless earpieces that each includes one or more sensors, a processor, and a communication component to read user biometrics.

63. ***First***, Hain and Aumer are analogous art. They are both from the same field of endeavor as the ’014 patent, including Patent Owner’s proposed substitute

⁷ Proposed amendments (3) and (4) do not apply to proposed substitute claims 14–16 and 18.

claims. Hain and Aumer share the general field of endeavor—namely, wireless electronics, including wireless earpieces. Exhibit 1001 ('014 patent) at 1:17–20 (“The present invention relates to *wireless electronics* and battery systems. More specifically, *but not exclusively*, the present invention relates to *wireless earpieces* that manage and extend battery life.”) (emphasis added); *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner’s Reply) at 4 (“The ’853 Patent ‘relates to wireless electronics and battery systems. More specifically, but not exclusively, the present invention relates to wireless earpieces that manage and extend battery life.’”). Hain discloses hearing aids 1 and 11 that “can be worn in the ear (ITE)” and that communicate wirelessly. Exhibit 1004 (Hain) at ¶¶ 1, 14, 18, Figure 1. Similarly, Aumer discloses an earpiece 20 that can be “positioned within the ear of a subject” and in wireless communication with a remote device 40 such as a smartphone or a computer. Exhibit 1027 (Aumer) at ¶ 66, 74, Figures 2A–2B.

64. If Patent Owner were to argue—as it did for parent ’853 patent in IPR2023-01150—that the field of endeavor of the ’014 patent is not simply wireless electronics or wireless earpieces, but wireless earpieces that specifically manage and extend battery life, Hain falls within this field of endeavor. As I discussed in my first declaration (Exhibit 1002), like the ’014 patent, Hain discloses that its hearing aids automatically turn on and off based on detection of the magnetic field of a permanent magnet in their storage box. Exhibit 1004 (Hain) at ¶¶ 11, 21, 22, Figure

2. By automatically turning on and off, Hain’s hearing aids manage and extend their battery life.

65. Further, wireless earpieces “configured to read user biometrics” is the only point of novelty identified by Patent Owner given that this is the only feature in the substitute claims that Patent Owner relies on to distinguish the prior art applied in HIMPP’s Petition. Even if not limited to this alleged point of novelty, the field of endeavor of Patent Owner’s proposed substitute claims includes wireless earpieces configured to read user biometrics. Aumer remains from the field of endeavor of wireless earpieces configured to read user biometrics. Aumer discloses a 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. Exhibit 1027 (Aumer) at ¶¶ 64, 66, 69–72, Figures 1, 2A–2B; *cf.* Exhibit 1001 (’014 patent) at 5:18–19 (“biometric readings, such as *heart beat* or *temperature*”), 9:64–66 (“biometric information (*e.g.*, *pulse rate*, *oxygenation*, distance travelled, calories burned, etc.)”) (emphasis added).

66. Moreover, Hain and Aumer are reasonably pertinent to a problem faced by the inventors of the ’014 patent. Like Patent Owner’s assertion for parent ’853 patent in IPR2023-01150 and because the ’014 patent shares the same specification as the ’853 patent, the ’014 patent is concerned with wireless earpieces that manage

and extend battery life of a wireless earpiece. Exhibit 1001 ('014 patent) at 1:17–20; *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner's Reply) at 4 (“[T]he '853 Patent is concerned with ‘managing and extending battery life.’”). Hain relates to and provides the same solution to that same problem. As I explained previously and above, Hain discloses hearing aids that automatically turn on and off based on magnetic field detection, thereby managing and extending their battery life. Exhibit 1004 (Hain) at ¶¶ 11, 21, 22, Figure 2. Thus, a POSITA would have reasonably considered Hain when faced with the problem of implementing a wireless earpiece that can manage and extend battery life.

67. If Patent Owner were to instead argue that the inventors of the '014 patent were faced with the problem of how to configure a wireless earpiece to read user biometrics—because this is the only point of novelty that Patent Owner has identified—(whether the user biometrics is utilized to alter the power mode of the wireless earpiece or not), a POSITA would have reasonably considered Aumer, which discloses techniques for configuring a wearable biometric monitoring device such as earpiece 20 to include one or more sensors to read user biometrics and improving the biometric signal quality from the sensors. Exhibit 1027 (Aumer) at Title, Abstract, ¶¶ 2, 64, Figures 2A–2B, 5A–8B.

68. Because Hain and Aumer are from the same field of endeavor and/or reasonably pertinent to a problem faced by the inventors of the '014 patent, Hain and

Aumer are analogous art and a POSITA would have therefore considered their teachings and would have readily been motivated to combine their teachings.

69. **Second**, implementing hearing aids, as taught by Hain, to each 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. Each of Hain’s hearing aids 1 and 11 houses multiple electronic components and “can be worn in the ear.” Exhibit 1004 (Hain) at ¶¶ 14, 18, Figure 1. Aumer discloses earpiece 20 that includes one or more sensors (*e.g.*, sensor module 24), a processor, and a communication component to read user biometrics. Exhibit 1027 (Aumer) at ¶¶ 64, 66, 69–72, Figures 1, 2A–2B. A POSITA would have combined the elements taught by Hain and Aumer—namely, hearing aids 1 and 11 as taught by Hain, 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 of Hain’s hearing aids 1 and 11 to include one or more sensors, a processor, and a communication component to read user biometrics. This modification would have been readily predictable and recognized by a POSITA and would have been well within the knowledge and skillset of a POSITA.

70. **Third**, around the time of Aumer’s filings, there were increased consumer interests in personal health and advances in miniaturizing sensors. *See*,

e.g., U.S. Patent Application Publication No. 2014/0275852 to Hong et al. (“Hong”; Exhibit 1030) at ¶ 2 (“Recent consumer interest in personal health has led to a variety of personal health monitoring devices being offered on the market.”), ¶ 3 (“Recent advances in sensor, electronics, and power source miniaturization have allowed the size of personal health monitoring devices, also referred to herein as ‘biometric tracking’ or ‘biometric monitoring’ devices, to be offered in extremely small sizes that were previously impractical.”); U.S. Patent Application Publication No. 2013/0072765 to Kahn et al. (“Kahn”; Exhibit 1031) at ¶ 3 (“As medicine advances, and sensors are miniaturized, sensors targeted to consumers are increasingly available.”). Importantly, Aumer explicitly disclosed that “[t]he ear is an ideal location for wearable health and environmental monitors” and allows for measurement and monitoring of a plurality of user biometrics such as “core body temperature,” “blood gas levels,” “cardiopulmonary functioning,” etc. Exhibit 1027 (Aumer) at ¶ 64. Accordingly, in view of the consumer interests, advances in sensors, and Aumer’s teachings, a POSITA aware of Hain and Aumer before the priority date of the ’014 patent would have been motivated to implement each of Hain’s hearing aids 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.

71. ***Fourth***, as I explained with respect to Rass in Section II.A, it was known prior to the priority date of the '014 patent that a sensor in a wireless earpiece could allow the wireless earpiece to automatically switch on or off depending on user biometrics. Accordingly, a POSITA would have been further motivated to include, in each of Hain's hearing aids 1 and 11, a sensor that reads user biometrics, as taught by Aumer, for automatic switching on and off of the hearing aids depending on user biometrics. Such a feature would provide the added benefit of saving battery life of Hain's hearing aids 1 and 11. Configuring Hain's hearing aids 1 and 11 to automatically switch on and off depending on user biometrics would have been well within the knowledge and skillset of a POSITA and readily implemented using known and routine electronic device design and manufacturing techniques.

72. ***Fifth***, a POSITA would have had a reasonable expectation of success in applying Aumer's teachings to Hain's hearing aids 1 and 11. As explained above, Aumer's implementation of an earpiece that includes one or more sensors, a processor, and a communication component to read user biometrics is directly applicable to Hain's hearing aids 1 and 11 and well within the knowledge and skillset of a POSITA.

73. For the above reasons, Hain in view of Aumer renders obvious Patent Owner's proposed substitute claims 14–16 and 18.

3. Steinbrecher in view of Aumer renders substitute claims 23 and 24 obvious

74. For the reasons that I provided in my first declaration (Exhibit 1002), original claims 10 and 11 are anticipated by Steinbrecher in Ground 2. In its RMTA, Patent Owner has proposed claims 23 and 24 to substitute for claims 10 and 11, respectively. Patent Owner does not dispute that Steinbrecher teaches proposed amendment (1) (“a portion of the wireless earpiece fits within the ear canal opening”). Patent Owner only argues that “Steinbrecher does not disclose a wireless earpiece(s) ‘configured to read user biometrics’”—that is, proposed amendment (2). RMTA at 8.⁸

75. But Steinbrecher in combination with Aumer renders obvious Patent Owner’s proposed amendment “the [left/right] wireless earpiece is configured to read user biometrics,” as recited by proposed substitute claim 23. A POSITA would have found it obvious to include, in Steinbrecher’s hearing aid, one or more sensors, a processor, and a communication component to read (*e.g.*, detect and/or measure) user biometrics, as taught by Aumer, before the priority date of the ’014 patent. *See* Section II.B.1.

⁸ Proposed amendments (3) and (4) do not apply to proposed substitute claims 23 and 24.

(a) **Motivation to combine Steinbrecher and Aumer**

76. A POSITA would have been motivated to combine Steinbrecher's teachings, *e.g.*, Steinbrecher's hearing aid H, and Aumer's teachings to have a wireless earpiece that includes one or more sensors, a processor, and a communication component to read user biometrics.

77. **First**, Steinbrecher and Aumer are analogous art. They are both from the same field of endeavor as the '014 patent, including Patent Owner's proposed substitute claims. Steinbrecher and Aumer share the general field of endeavor—namely, wireless electronics, including wireless earpieces. Exhibit 1001 ('014 patent) at 1:17–20 (“The present invention relates to **wireless electronics** and battery systems. More specifically, **but not exclusively**, the present invention relates to **wireless earpieces** that manage and extend battery life.”) (emphasis added); *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner's Reply) at 4 (“The '853 Patent ‘relates to wireless electronics and battery systems. More specifically, but not exclusively, the present invention relates to wireless earpieces that manage and extend battery life.’”). Steinbrecher discloses a wireless hearing aid H that can be “in-the-ear” and whose battery gets charged inductively when the hearing aid is placed in its charging shell/storage case. Exhibit 1006 (Steinbrecher) at ¶¶ 7, 24, 25, Figure 2. Aumer discloses an earpiece 20 that can be “positioned within the ear of

a subject” and in wireless communication with a remote device 40 such as a smartphone or a computer. Exhibit 1027 (Aumer) at ¶¶ 66, 74, Figures 2A–2B.

78. If Patent Owner were to argue—as it did for parent ’853 patent in IPR2023-01150—that the field of endeavor of the ’014 patent is not simply wireless electronics or wireless earpieces, but wireless earpieces that specifically manage and extend battery life, Steinbrecher falls within this field of endeavor. As I discussed in my first declaration (Exhibit 1002), like the ’014 patent, Steinbrecher discloses that its hearing aid includes a reed switch that, upon actuation by a permanent magnet in the storage case, disconnects the battery from electronics within the hearing aid. Exhibit 1006 (Steinbrecher) at ¶¶ 18–20, 25, Figure 2. Steinbrecher explains that such a configuration “ensures that energy is not consumed unnecessarily.” *Id.* at ¶ 18; *see also id.* at ¶ 19 (“no current is consumed”). Ensuring that no energy or current is consumed when the hearing aid is placed in its storage case extends the battery life of the hearing aid.

79. Further, wireless earpieces “configured to read user biometrics” is the only point of novelty identified by Patent Owner given that this is the only feature in the substitute claims that Patent Owner relies on to distinguish the prior art applied in HIMPP’s Petition. Even if not limited to this alleged point of novelty, the field of endeavor of Patent Owner’s proposed substitute claims includes wireless earpieces configured to read user biometrics. Aumer remains from the field of

endeavor of wireless earpieces configured to read user biometrics. Aumer discloses a 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. Exhibit 1027 (Aumer) at ¶¶ 64, 66, 69–72, Figures 1, 2A–2B; *cf.* Exhibit 1001 (’014 patent) at 5:18–19 (“biometric readings, such as *heart beat* or *temperature*”), 9:64–66 (“biometric information (*e.g.*, *pulse rate*, *oxygenation*, distance travelled, calories burned, etc.)”) (emphasis added).

80. Moreover, Steinbrecher and Aumer are reasonably pertinent to a problem faced by the inventors of the ’014 patent. Like Patent Owner’s assertion for parent ’853 patent in IPR2023-01150 and because the ’014 patent shares the same specification as the ’853 patent, the ’014 patent is concerned with wireless earpieces that manage and extend battery life of a wireless earpiece. Exhibit 1001 (’014 patent) at 1:17–20; *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner’s Reply) at 4 (“[T]he ’853 Patent is concerned with ‘managing and extending battery life.’”). Steinbrecher relates to and provides the same solution to that same problem. As I explained previously and above, Steinbrecher discloses a hearing aid that automatically turns on and off based on magnetic field detection, thereby managing and extending its battery life. Exhibit 1006 (Steinbrecher) at ¶¶ 18–20, 25, Figure 2. Thus, a POSITA would have reasonably considered Steinbrecher when faced

with the problem of implementing a wireless earpiece that can manage and extend battery life.

81. If Patent Owner were to instead argue that the inventors of the '014 patent were faced with the problem of how to configure a wireless earpiece to read user biometrics—because this is the only point of novelty that Patent Owner has identified—(whether the user biometrics is utilized to alter the power mode of the wireless earpiece or not), a POSITA would have reasonably considered Aumer, which discloses techniques for configuring a wearable biometric monitoring device such as earpiece 20 to include one or more sensors to read user biometrics and improving the biometric signal quality from the sensors. Exhibit 1027 (Aumer) at Title, Abstract, ¶¶ 2, 64, Figures 2A–2B, 5A–8B.

82. Because Steinbrecher and Aumer are from the same field of endeavor and/or reasonably pertinent to a problem faced by the inventors of the '014 patent, Steinbrecher and Aumer are analogous art and a POSITA would have therefore considered their teachings and would have readily been motivated to combine their teachings.

83. **Second**, implementing a hearing aid, as taught by Steinbrecher, 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. Steinbrecher discloses hearing aid H that houses multiple electronic

components. Exhibit 1006 (Steinbrecher) at ¶ 25, Figure 2. Steinbrecher discloses that hearing aid H can be “an in-the-ear device.” *Id.* at ¶ 24. Aumer discloses earpiece 20 that includes one or more sensors (*e.g.*, sensor module 24), a processor, and a communication component to read user biometrics. Exhibit 1027 (Aumer) at ¶¶ 64, 66, 69–72, Figures 1, 2A–2B. A POSITA would have combined the elements taught by Steinbrecher and Aumer—namely, hearing aid H as taught by Steinbrecher, 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 Steinbrecher’s hearing aid H to include one or more sensors, a processor, and a communication component to read user biometrics. This modification would have been readily predictable and recognized by a POSITA and would have been well within the knowledge and skillset of a POSITA.

84. ***Third***, around the time of Aumer’s filings, there were increased consumer interests in personal health and advances in miniaturizing sensors. *See, e.g.*, Exhibit 1030 (Hong) at ¶ 2 (“Recent consumer interest in personal health has led to a variety of personal health monitoring devices being offered on the market.”), ¶ 3 (“Recent advances in sensor, electronics, and power source miniaturization have allowed the size of personal health monitoring devices, also referred to herein as ‘biometric tracking’ or ‘biometric monitoring’ devices, to be offered in extremely

small sizes that were previously impractical.”); Exhibit 1031 (Kahn) at ¶ 3 (“As medicine advances, and sensors are miniaturized, sensors targeted to consumers are increasingly available.”). Importantly, Aumer explicitly disclosed that “[t]he ear is an ideal location for wearable health and environmental monitors” and allows for measurement and monitoring of a plurality of user biometrics such as “core body temperature,” “blood gas levels,” “cardiopulmonary functioning,” etc. Exhibit 1027 (Aumer) at ¶ 64. Accordingly, in view of the consumer interests, advances in sensors, and Aumer’s teachings, a POSITA aware of Steinbrecher and Aumer before the priority date of the ’014 patent would have been motivated to implement Steinbrecher’s hearing aid H 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.

85. ***Fourth***, as I explained with respect to Rass in Section II.A, it was known prior to the priority date of the ’014 patent that a sensor in a wireless earpiece could allow the wireless earpiece to automatically switch on or off depending on user biometrics. Accordingly, a POSITA would have been further motivated to include, in Steinbrecher’s hearing aid H, a sensor that reads user biometrics, as taught by Aumer, for automatic switching on and off of the hearing aid depending on user biometrics. Such a feature would provide the added benefit of saving battery life of Steinbrecher’s hearing aid H. Configuring Steinbrecher’s hearing aid H to

automatically switch on and off depending on user biometrics would have been well within the knowledge and skillset of a POSITA and readily implemented using known and routine electronic device design and manufacturing techniques.

86. *Fifth*, a POSITA would have had a reasonable expectation of success in applying Aumer's teachings to Steinbrecher's hearing aid H. As explained above, Aumer's implementation of an earpiece that includes one or more sensors, a processor, and a communication component to read user biometrics is directly applicable to Steinbrecher's hearing aid H and well within the knowledge and skillset of a POSITA.

87. For the above reasons, Steinbrecher in view of Aumer renders obvious Patent Owner's proposed substitute claims 23 and 24.

4. Shaffer in view of Hain, Sorensen, Steinbrecher, and/or Aumer renders claims 14–21 and 23–26 obvious

88. For the reasons that I provided in my first declaration (Exhibit 1002), original claims 1–8 are obvious over the teachings of Shaffer in view of Hain and/or Sorensen (Grounds 3 and 4) and original claims 10–13 are obvious over the teachings of Shaffer in view of Steinbrecher and/or Sorensen (Grounds 5 and 6). In its RMTA, Patent Owner has proposed claims 14–21 to respectively substitute for claims 1–8, and claims 23–26 to respectively substitute for claims 10–13. Patent Owner does not dispute that the combination of Shaffer, Hain, and/or Sorensen or

the combination of Shaffer, Steinbrecher, and/or Sorensen teaches proposed amendments (1) (“a portion of the [left/right] wireless earpiece fits within the ear canal opening”) as recited by claims 14 and 23 and proposed amendment (3) (“the smart case comprises[/comprising] a rechargeable battery configured to charge the [in-ear] wireless earpieces”) as recited by claims 17, 19, and 20. Patent Owner only argues that “none of these references discloses a wireless earpiece(s) ‘configured to read user biometrics’”—that is, proposed amendment (2). RMTA at 9–10.⁹

89. But Shaffer in combination with Aumer renders obvious Patent Owner’s proposed amendment “the wireless earpiece is configured to read user biometrics,” as recited by proposed substitute claim 14, and proposed amendment “the [left/right] wireless earpiece is configured to read user biometrics,” as recited by proposed substitute claim 23. A POSITA would have found it obvious to include, in each of Shaffer’s earbuds, one or more sensors, a processor, and a communication component to read (*e.g.*, detect and/or measure) user biometrics, as taught by Aumer, before the priority date of the ’014 patent. *See* Section II.B.1.

⁹ Proposed amendment (4) does not apply to proposed substitute claims 14–21 and 23–26.

(a) **Motivation to combine Shaffer and Aumer**¹⁰

90. A POSITA would have been motivated to combine Shaffer’s teachings, e.g., Shaffer’s earbuds 1010 and 1012, and Aumer’s teachings to have wireless earpieces that each includes one or more sensors, a processor, and a communication component to read user biometrics.

91. **First**, Shaffer and Aumer are analogous art. They are both from the same field of endeavor as the ’014 patent, including Patent Owner’s proposed substitute claims. Hain and Aumer share the general field of endeavor—namely, wireless electronics, including wireless earpieces. Exhibit 1001 (’014 patent) at 1:17–20 (“The present invention relates to *wireless electronics* and battery systems. More specifically, *but not exclusively*, the present invention relates to *wireless earpieces* that manage and extend battery life.”) (emphasis added); cf. Exhibit 1034 (IPR2023-01150, Patent Owner’s Reply) at 4 (“The ’853 Patent ‘relates to wireless electronics and battery systems. More specifically, but not exclusively, the present

¹⁰ The reasons that I provided in my first declaration (Exhibit 1002) as to why a POSITA would have been motivated to combine Shaffer with Hain and/or Sorensen and Shaffer with Steinbrecher and/or Sorensen with a reasonable expectation of success apply equally here.

invention relates to wireless earpieces that manage and extend battery life.”). Shaffer discloses rechargeable wireless earbuds 1010 and 1012 that “fit within the ear of a human.” Exhibit 1003 (Shaffer) at ¶¶ 2, 3, 32, 46, 62, Figure 10. Aumer discloses an earpiece 20 that can be “positioned within the ear of a subject” and in wireless communication with a remote device 40 such as a smartphone or a computer. Exhibit 1027 (Aumer) at ¶ 66, 74, Figures 2A–2B.

92. If Patent Owner were to argue—as it did for parent ’853 patent in IPR2023-01150—that the field of endeavor of the ’014 patent is not simply wireless electronics or wireless earpieces, but wireless earpieces that specifically manage and extend battery life, Shaffer falls within this field of endeavor. As I discussed in my first declaration (Exhibit 1002), like the ’014 patent, Shaffer discloses that its wireless earbuds 1010 and 1012 include circuitry that is powered using a “low-energy consumption idle mode” when magnetic sensors detect that the earbuds are placed in a storage case. Exhibit 1003 (Shaffer) at ¶¶ 40, 63. A low-energy consumption idle mode extends the battery life of the earbuds.

93. Further, wireless earpieces “configured to read user biometrics” is the only point of novelty identified by Patent Owner given that this is the only feature in the substitute claims that Patent Owner relies on to distinguish the prior art applied in HIMPP’s Petition. Even if not limited to this alleged point of novelty, the field of endeavor of Patent Owner’s proposed substitute claims includes wireless

earpieces configured to read user biometrics. Aumer remains from the field of endeavor of wireless earpieces configured to read user biometrics. Aumer discloses a 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. Exhibit 1027 (Aumer) at ¶¶ 64, 66, 69–72, Figures 1, 2A–2B; *cf.* Exhibit 1001 (’014 patent) at 5:18–19 (“biometric readings, such as *heart beat* or *temperature*”), 9:64–66 (“biometric information (*e.g.*, *pulse rate*, *oxygenation*, distance travelled, calories burned, etc.)”) (emphasis added).

94. Moreover, Shaffer and Aumer are reasonably pertinent to a problem faced by the inventors of the ’014 patent. Like Patent Owner’s assertion for parent ’853 patent in IPR2023-01150 and because the ’014 patent shares the same specification as the ’853 patent, the ’014 patent is concerned with wireless earpieces that manage and extend battery life of a wireless earpiece. Exhibit 1001 (’014 patent) at 1:17–20; *cf.* Exhibit 1034 (IPR2023-01150, Patent Owner’s Reply) at 4 (“[T]he ’853 Patent is concerned with ‘managing and extending battery life.’”). Shaffer relates to and provides a solution to that same problem. As I explained previously and above, Shaffer discloses that its wireless earbuds 1010 and 1012 include circuitry that is powered using a “low-energy consumption idle mode” when they are placed in a storage case. Exhibit 1003 (Shaffer) at ¶¶ 40, 63. Thus, a

POSITA would have reasonably considered Shaffer when faced with the problem of implementing a wireless earpiece that can manage and extend battery life.

95. If Patent Owner were to instead argue that the inventors of the '014 patent were faced with the problem of how to configure a wireless earpiece to read user biometrics—because this is the only point of novelty that Patent Owner has identified—(whether the user biometrics is utilized to alter the power mode of the wireless earpiece or not), a POSITA would have reasonably considered Aumer, which discloses techniques for configuring a wearable biometric monitoring device such as earpiece 20 to include one or more sensors to read user biometrics and improving the biometric signal quality from the sensors. Exhibit 1027 (Aumer) at Title, Abstract, ¶¶ 2, 64, Figures 2A–2B, 5A–8B.

96. Because Shaffer and Aumer are from the same field of endeavor and/or reasonably pertinent to a problem faced by the inventors of the '014 patent, Shaffer and Aumer are analogous art and a POSITA would have therefore considered their teachings and would have readily been motivated to combine their teachings.

97. **Second**, implementing earbuds, as taught by Shaffer, to each 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. Each of Shaffer's earbuds 1010 and 1012 houses multiple electronic components. Exhibit 1003 (Shaffer) at ¶¶ 61–62, Figure 10; *see also id.* at ¶ 32 (“The term

“earbud” refers to a device designed to fit within the ear of a human, and which emits audio signals that the earbud receives from a mobile electronic device. Examples of earbuds include in-ear headphones, hearing aids and the like.”). Aumer discloses earpiece 20 that includes one or more sensors (*e.g.*, sensor module 24), a processor, and a communication component to read user biometrics. Exhibit 1027 (Aumer) at ¶¶ 64, 66, 69–72, Figures 1, 2A–2B. A POSITA would have combined the elements taught by Hain and Aumer—namely, earbuds 1010 and 1012 as taught by 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 of Shaffer’s earbuds 1010 and 1012 to include one or more sensors, a processor, and a communication component to read user biometrics. This modification would have been readily predictable and recognized by a POSITA and would have been well within the knowledge and skillset of a POSITA.

98. **Third**, around the time of Aumer’s filings, there were increased consumer interests in personal health and advances in miniaturizing sensors. *See, e.g.*, Exhibit 1030 (Hong) at ¶ 2 (“Recent consumer interest in personal health has led to a variety of personal health monitoring devices being offered on the market.”), ¶ 3 (“Recent advances in sensor, electronics, and power source miniaturization have allowed the size of personal health monitoring devices, also referred to herein as

‘biometric tracking’ or ‘biometric monitoring’ devices, to be offered in extremely small sizes that were previously impractical.”); Exhibit 1031 (Kahn) at ¶ 3 (“As medicine advances, and sensors are miniaturized, sensors targeted to consumers are increasingly available.”). Importantly, Aumer explicitly disclosed that “[t]he ear is an ideal location for wearable health and environmental monitors” and allows for measurement and monitoring of a plurality of user biometrics such as “core body temperature,” “blood gas levels,” “cardiopulmonary functioning,” etc. Exhibit 1027 (Aumer) at ¶ 64. Accordingly, in view of the consumer interests, advances in sensors, and Aumer’s teachings, a POSITA aware of Shaffer and Aumer before the priority date of the ’014 patent would have been motivated to implement 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.

99. ***Fourth***, as I explained with respect to Rass in Section II.A, it was known prior to the priority date of the ’014 patent that a sensor in a wireless earpiece could allow the wireless earpiece to automatically switch on or off depending on user biometrics. Accordingly, a POSITA would have been further motivated to include, in each of Shaffer’s earbuds 1010 and 1012, a sensor that reads user biometrics, as taught by Aumer, for automatic switching on and off of the earbuds depending on user biometrics. Such a feature would provide the added benefit of

saving battery life of Shaffer's earbuds 1010 and 1012. Configuring Shaffer's earbuds 1010 and 1012 to automatically switch on and off depending on user biometrics would have been well within the knowledge and skillset of a POSITA and readily implemented using known and routine electronic device design and manufacturing techniques.

100. *Fifth*, a POSITA would have had a reasonable expectation of success in applying Aumer's teachings to Shaffer's earbuds 1010 and 1012. As explained above, Aumer's implementation of an earpiece that includes one or more sensors, a processor, and a communication component to read user biometrics is directly applicable to Shaffer's earbuds 1010 and 1012 and well within the knowledge and skillset of a POSITA.

101. For the above reasons, Shaffer in view of Hain, Sorensen, and/or Aumer renders obvious Patent Owner's proposed substitute claims 14–21, and Shaffer in view of Steinbrecher, Sorensen, and/or Aumer renders obvious Patent Owner's proposed substitute claims 23–26.

C. Combination with Aumer and Rass

1. Shaffer in view of Hain, Aumer, and Rass renders claim 22 obvious

102. For the reasons that I provided in my prior Declaration, original claim 9 would have been obvious over the teachings of Shaffer in view of Hain (Ground

3). In its RMTA, Patent Owner has proposed claim 22 to substitute for claim 9. Claim 22 includes the new limitation “the user biometrics is utilized by the wireless earpiece to alter the power mode”—that is, proposed amendment (4). RMTA at APPX A-3. Patent Owner does not dispute that proposed amendment (4) is taught by the prior art. In fact, in IPR2023-01150, Patent Owner acknowledged that Rass “discloses the ability to power up or down a hearing aid based on temperature of the hearing aid or shell, registered by a temperature sensor.” Exhibit 1034 (IPR2023-01150, Patent Owner’s Reply) at 5; *see also* Section II.A.1. Switching on and off the hearing aid alters the power mode of the hearing aid. As I also discussed above in Section II.A.4(a), a POSITA would have been motivated to combine Shaffer with Rass with a reasonable expectation of success and, in Section II.B.4(a), a POSITA would have been motivated to combine Shaffer with Aumer with a reasonable expectation of success. For these reasons and reasons that I provided in Section II.B.4, Shaffer in view of Hain, Aumer, and Rass renders obvious Patent Owner’s substitute claim 22.

III. THE SUBSTITUTE CLAIMS ARE NOT ENABLED

103. Substitute claims 14–26 directly or indirectly require that “the [left/right] wireless earpiece is configured to read user biometrics.” Substitute claims 14–26 do not include any other limitation on how to configure the wireless

earpiece(s) to read user biometrics. *See* RMTA at Appendix A. Therefore, a POSITA would turn to the specification of the '014 patent to understand how.

104. The specification of the '014 patent discloses heart beat, temperature, pulse rate, oxygenation, distance travelled, and calories burned as examples of user biometrics. Exhibit 1001 ('014 patent) at 5:18–19 (“biometric readings, such as heart beat or temperature”), 9:64–66 (“biometric information (e.g., pulse rate, oxygenation, distance travelled, calories burned, etc.)”). The specification of the '014 patent further discloses sensors like “heart rate monitor, pulse oximeter, accelerometers, gyroscopes” to read the examples of user biometrics that it discloses. Exhibit 1001 ('014 patent) at 9:67–10:1. However, the term “user biometrics” is much broader than what the specification of the '014 patent discloses.

105. I have reviewed the September 27, 2024 deposition transcript of Patent Owner’s expert, Dr. Darrin Young, in IPR2023-01150 and note that Dr. Young testified that a POSITA would understand that the term “user biometrics in the context of the '853 patent means biological, physiological or chemical characteristics of the user.” Exhibit 1032 (IPR2023-01150, Second Young Deposition Transcript) at 15:2–14, 15:18–22. Dr. Young’s testimony about the specification and context of the '853 patent applies equally to the '014 patent because the '014 patent is a continuation of and shares the same specification as the '853 patent. I agree with Dr. Young’s broad definition of “user biometrics.” I also

agree with Dr. Young’s testimony that a POSITA would have known how to include a sensor in a wireless earpiece to read the temperature or heart beat of a user wearing the wireless earpiece. *See id.* at 18:18–22 (“Q And a person of ordinary skill in the art would know how to include a sensor in a wireless earpiece to measure the temperature of a user, correct? A That’s correct.”), 22:12–19 (“And what I said was, you know, a person of ordinary skill in the art would know how to -- how to do that, and they will know how to build a sensor or use an existing sensor to monitor in an individual’s heartbeat and put that -- and put that into the wireless earpiece as a part of the overall device.”).

106. But Dr. Young’s broad definition of “user biometrics” also includes, for example, DNA sequencing, retinal scans, vein patterns, and facial features. *See id.* at 16:24–17:3 (“for example, I [came across] technology where something is scanning an individual’s retinal eye . . . that will be considered a biometrics”). It is important to note that Patent Owner’s proposed substitute claims do not require that the wireless earpiece read user biometrics while it is worn within the ear. Thus, it is plausible for a wireless earpiece to incorporate an optical sensor (*e.g.*, an infrared sensor or a camera) that can scan the user’s face or eyes while the user looks into the sensor or the user’s vein patterns when placed on the user’s hand or finger. If such a wireless earpiece is paired with another electronic device (*e.g.*, a computer, a smart television, a smartphone), identifying a user through facial, retinal, or vein pattern

recognition could not only unlock the device itself but also features, applications, and other settings within the device that are tailored for this specific user. In fact, the '014 patent itself contemplates embodiments of wireless earpieces that “may be ingested or implanted into a user,” allowing for measurements of all sorts of biological, physiological, or chemical characteristics of the user. Exhibit 1001 ('014 patent) at 3:15–20. The specification of the '853 and '014 patents does not disclose how to make a wireless earpiece configured to read DNA sequencing, retinal scans, vein patterns, or facial features.

107. Research and development on DNA sequencing, retinal scans, vein pattern recognition, and facial recognition have been ongoing. Techniques for measuring such user biometrics have not stopped changing and evolving.

108. For a wireless earpiece to read user biometrics, it needs to measure a particular human biological, physiological, or chemical characteristic. *See* Exhibit 1032 (Second Young Deposition Transcript), 15:2–14. Some types of user biometrics, such as temperature and heart beat, are straightforward to measure. But measuring other types of biometrics such as DNA sequencing, retinal scans, vein patterns, and facial features can be challenging because they involve biology, chemistry, or physiology, which are areas that can be highly unpredictable. It may also be challenging to include the necessary sensors or other equipment required to detect or measure these features within the form factor of a wireless earpiece.

109. As I discussed above, the specification of the '853 and '014 patents mentions sensors such as heart rate monitor, pulse oximeter, accelerometers, and gyroscopes. However, it does not explain how to measure other user biometrics like DNA sequencing, retinal scans, vein patterns, or facial features. Those features are not detectable using the types of sensors disclosed in the specification, and the specification otherwise provides no other guidance regarding how other user biometrics may be measured or detected.

110. For the foregoing reasons, I have come to the conclusion that the specification of the '853 and '014 patents fails to enable a POSITA to make and use a wireless earpiece configured to read the entire class of user biometrics without undue experimentation.

IV. AVAILABILITY FOR CROSS EXAMINATION

111. In signing this declaration, I recognize that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I also recognize that I may be subject to cross examination in the case and that cross examination will take place within the United States. If cross examination is required of me, I will appear for cross examination within the United States during the time allotted for cross examination.

V. RIGHT TO SUPPLEMENT

112. I reserve the right to supplement my opinions in the future to respond to any arguments that the Patent Owner raises and to take into account new information as it becomes available to me.

VI. JURAT

113. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: December 6, 2024

A handwritten signature in cursive script, reading "Sayfe Kiaei".

Dr. Sayfe Kiaei