

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

K/S HIMPP
Petitioner

v.

BRAGI GmbH
Patent Owner

Case IPR2023-01150
U.S. Patent No. 9,843,853

THIRD DECLARATION OF SAYFE KIAEI, PH.D.

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	THE PRIOR ART RENDERS OBVIOUS THE SUBSTITUTE CLAIMS	2
A.	Aumer	2
B.	Ground 1: Brown in view of Aumer renders substitute claims 31 and 35 obvious.....	6
C.	Ground 2: Hain in view of Aumer renders substitute claims 22– 24 and 26 obvious.....	10
D.	Ground 3: Steinbrecher in view of Aumer renders substitute claims 31 and 42 obvious	14
E.	Grounds 4–7: Shaffer in view of Hain, Sorensen, and/or Aumer renders claims 22–30 obvious and Shaffer in view of Steinbrecher, Sorensen, and/or Aumer renders claims 31–42 obvious	18
III.	THE SUBSTITUTE CLAIMS ARE NOT ENABLED	23
IV.	AVAILABILITY FOR CROSS EXAMINATION.....	26
V.	RIGHT TO SUPPLEMENT.....	27
VI.	JURAT	27

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 13, 2023 and my second declaration as Exhibit 1017 on July 19, 2024. My background and qualifications remain as stated in paragraphs 1–14 and Exhibit A of first declaration (Exhibit 1002).

2. In addition to the materials listed in my first declaration (Exhibit 1002) and second declaration (Exhibit 1017), I have reviewed Patent Owner’s Revised Motion to Amend (“RMTA”), the exhibits referenced in the RMTA, and the exhibits referenced in this third Declaration of mine.

3. I confirm that my technical analyses in my first declaration (Exhibit 1002) and second declaration (Exhibit 1017) 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 1017) remains unchanged.

II. THE PRIOR ART RENDERS OBVIOUS THE SUBSTITUTE CLAIMS

6. Patent Owner’s proposed amendments to the original claims of the ’853 patent require that (1) “a portion of the wireless earpieces[/earpiece] fits within the ear canal opening,” (2) “the wireless earpieces[/earpiece] are[/is] configured to read user biometrics,” and (3) “the smart case comprises[/comprising] a rechargeable battery configured to charge the wireless earpieces.” *See* RMTA, Appendix A. Proposed amendments (1) and (2) apply directly or indirectly to all proposed substitute claims. Proposed amendment (3) applies only to proposed substitute dependent claims 27–29.

7. Patent Owner does not dispute that proposed amendments (1) and (3) are taught by the prior art as applied in Grounds 1–7 of HIMPP’s Petition. *See generally* RMTA. Patent Owner only argues that the prior art references in the Grounds—Brown, Hain, Steinbrecher, and Sorensen—do not disclose wireless earpiece(s) “configured to read user biometrics” (proposed amendment (2)). *See id.* at 7–10. But, as I will discuss next, the prior art references in the Grounds combined with U.S. Patent Application Publication No. 2016/0094899 to Aumer et al. (“Aumer”) render obvious Patent Owner’s proposed substitute claims 22–42.

A. Aumer

8. Aumer was filed on August 18, 2015 and claims priority to U.S. Provisional Application No. 62/056,510 (“Aumer Provisional 1”) and U.S.

Provisional Application No. 62/110,655 (“Aumer Provisional 2”). 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 ’853 patent as of its filing date and/or the filing date of either Aumer Provisional 1 or Aumer Provisional 2.

9. Aumer discloses and illustrates in Figures 2A–2B a monitoring earpiece 20. Exhibit 1022 (Aumer), ¶ 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 by all of Patent Owner’s proposed substitute claims 22–42.

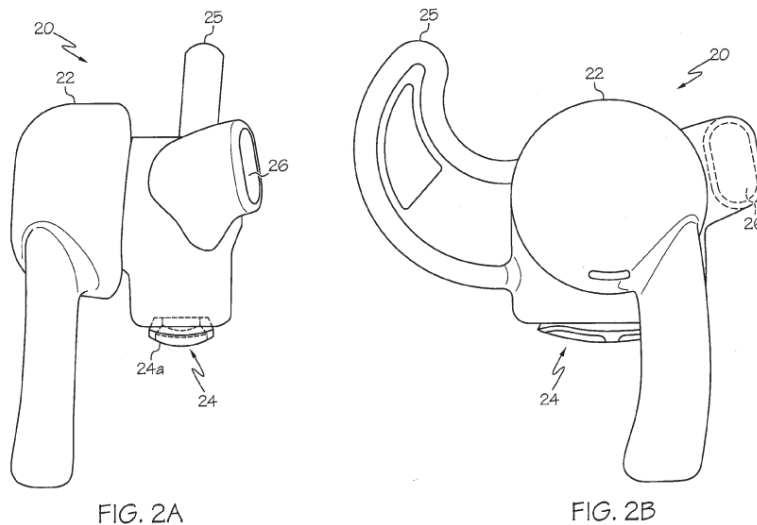


Exhibit 1022 (Aumer), Figures 2A–2B

10. 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.*, ¶ 66.

The sensor module 24 is “configured to detect and/or measure physiological information from the subject.” *Id.*, ¶ 69. Aumer explains that “[t]he ear is an ideal location for wearable health and environmental monitors.” *Id.*, ¶ 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 ’853 patent discloses. *See* Exhibit 1001 (’853 patent), 5:16–17 (“biometric readings, such as **heart beat** or **temperature**”), 9:62–64 (“biometric information (*e.g.*, **pulse rate**, **oxygenation**, distance travelled, calories burned, etc.)”) (emphasis added).

11. According to Aumer, the earpiece 20 may function as the “wearable biometric monitoring device 10” of Figure 1. Exhibit 1022 (Aumer), ¶¶ 66, 71.

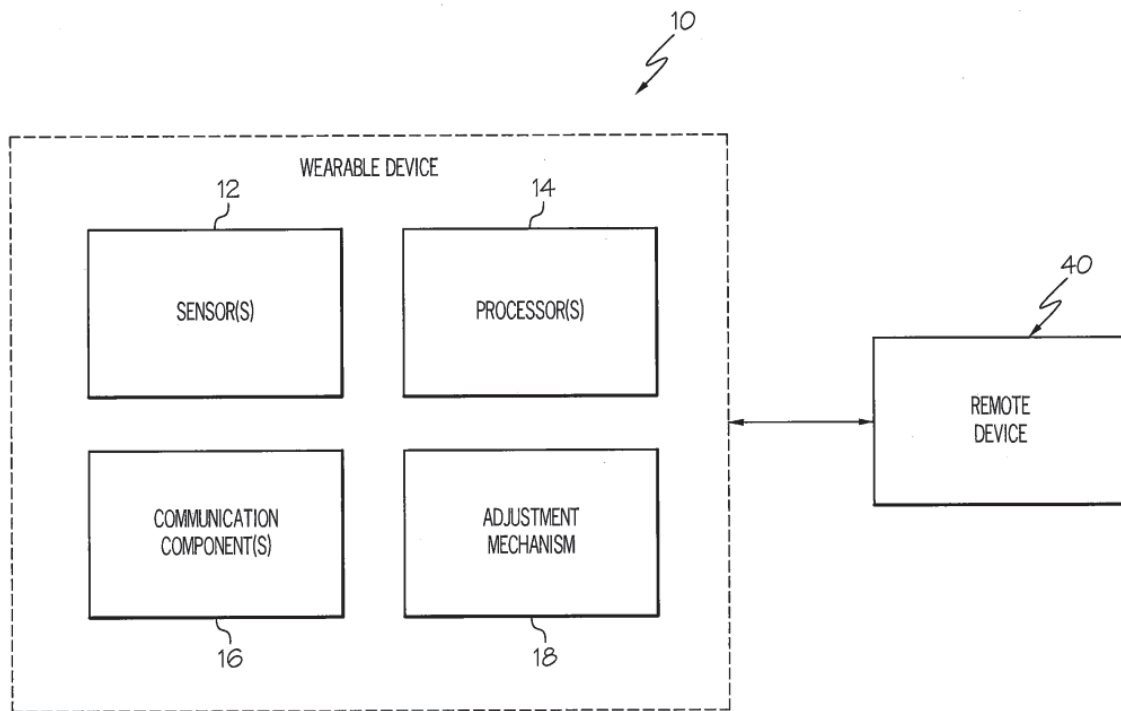


FIG. 1

Exhibit 1022 (Aumer), Figure 1

12. 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.*, ¶ 71. According to Aumer, sensors 12 may include various types of sensors including optical sensors, thermal sensors, electrical sensors, among others. *Id.*, ¶ 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.*, ¶ 72. Furthermore, “[t]he remote device 40 may be in wired or wireless communication with the wearable device 10.” *Id.*, ¶ 74.

B. Ground 1: Brown in view of Aumer renders substitute claims 31 and 35 obvious

13. For the reasons that I provided in my first declaration (Exhibit 1002), original claims 10 and 14 are anticipated by Brown. In its RMTA, Patent Owner has proposed claims 31 and 35 to substitute for claims 10 and 14, respectively. As I noted at the beginning of this Section II, Patent Owner does not dispute that Brown teaches proposed amendments (1) and (3), but argues that “Brown does not disclose a wireless earpiece(s) ‘configured to read user biometrics’”—that is, proposed amendment (2). RMTA at 7–8.

14. But Brown 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 31. A POSITA would have found it obvious to include in a hearing aid, as taught by Brown, 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 ’853 patent’s priority date. *See* Section II.A.

(a) Motivation to combine Brown and Aumer

15. A POSITA would have been motivated to combine Brown's teachings, *e.g.*, Brown's hearing aid 10, 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.

16. First, Brown and Aumer are from the same field of endeavor. Both references are directed to a similar wearable electronic device. Brown discloses a hearing aid 10. Exhibit 1007 (Brown), 1:88–89, Figure 1. Similarly, as I discussed above, Aumer discloses an earpiece 20. Exhibit 1022 (Aumer), ¶ 66, Figures 2A–2B. A POSITA would have therefore considered the teachings of Brown and Aumer and would have readily been motivated to combine their teachings.

17. Second, implementing a hearing aid, as taught by Brown, 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. Brown discloses hearing aid 10 with an earmould 13 and a cavity 16 that houses multiple electronic components. Exhibit 1007 (Brown), 1:94–2:21, 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 1022 (Aumer), ¶¶ 64, 66, 69–72, Figures 1, 2A–2B. A POSITA would have combined the elements taught by Brown and Aumer—namely, hearing aid 10 as

taught by Brown, 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 Brown’s hearing aid 10 to include one or more sensors (*e.g.*, in or around earmould 13) and a processor and a communication component (*e.g.*, in cavity 16) 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.

18. 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 1025), ¶ 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 1026), ¶ 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 1022 (Aumer), ¶ 64. Accordingly, in view of the consumer interests, advances in sensors, and Aumer’s teachings, a POSITA would have been motivated to implement Brown’s hearing aid 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.

19. Fourth, it was well known prior to the ’853 patent’s priority date that a sensor in a wireless earpiece could allow the wireless earpiece to automatically switch on or off depending on user biometrics. For example, as early as 2005, like Aumer, U.S. Patent No. 7,522,739 to Rass et al. disclosed “an in-the-ear hearing aid I” that includes “a temperature sensor TS.” Exhibit 1028 (Rass), 2:63–64, Figure 1. Rass further disclosed 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.” *Id.*, 2:64–3:2; *cf.* Exhibit 1001 (’853 patent), 5:16–19 (“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”). A POSITA

would have been motivated to include, in Brown's hearing aid 10, a sensor that reads user biometrics, as taught by Aumer, for automatic switching on and off of the hearing aid. Such a feature would provide the added benefit of saving battery life of Brown's hearing aid 10.

20. Fifth, a POSITA would have had a reasonable expectation of success in applying Aumer's teachings to Brown's hearing aid 10. 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 Brown's hearing aid 10 and well within the knowledge and skillset of a POSITA.

21. For the above reasons, Brown in view of Aumer renders obvious Patent Owner's proposed substitute claims 31 and 35.

C. Ground 2: Hain in view of Aumer renders substitute claims 22–24 and 26 obvious

22. For the reasons that I provided in my first declaration (Exhibit 1002), original claims 1–3 and 5 are anticipated by Hain. In its RMTA, Patent Owner has proposed substitute claims 22–24 and 26 corresponding to claims 1–3 and 5, respectively. As I noted at the beginning of this Section II, Patent Owner does not dispute that Hain teaches proposed amendments (1) and (3), but argues that “Hain

does not disclose a wireless earpiece(s) ‘configured to read user biometrics’”—that is, proposed amendment (2). RMTA at 8.

23. But Hain in combination with Aumer renders obvious Patent Owner’s proposed amendment “the wireless earpieces are configured to read user biometrics,” as recited by proposed substitute claim 22. 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 ’853 patent’s priority date. *See* Section II.A.

(a) Motivation to combine Hain and Aumer

24. 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.

25. First, Hain and Aumer are from the same field of endeavor. Both references are directed to a similar wearable electronic device. Hain discloses hearing aids 1 and 11. Exhibit 1004 (Hain), ¶ 18, Figure 1. Similarly, Aumer discloses an earpiece 20. Exhibit 1022 (Aumer), ¶ 66, Figures 2A–2B. A POSITA

would have therefore considered the teachings of Hain and Aumer and would have readily been motivated to combine their teachings.

26. 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), ¶¶ 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 1022 (Aumer), ¶¶ 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.

27. 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 1025 (Hong), ¶¶ 2–3; Exhibit 1026 (Kahn), ¶ 3. 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 1022 (Aumer), ¶ 64. Accordingly, in view of the consumer interests, advances in sensors, and Aumer’s teachings, a POSITA 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.

28. Fourth, it was well known prior to the ’853 patent’s priority date that a sensor in a wireless earpiece could allow the wireless earpiece to automatically switch on or off depending on user biometrics. For example, as early as 2005, like Aumer, Rass disclosed “an in-the-ear hearing aid I” that includes “a temperature sensor TS.” Exhibit 1028 (Rass), 2:63–64, Figure 1. Rass further disclosed 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.” *Id.*, 2:64–3:2; *cf.* Exhibit 1001 (’853 patent), 5:16–19 (“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”). A POSITA would have been 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. Such a feature would provide the added benefit of saving battery life of Hain’s hearing aids 1 and 11.

29. 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.

30. For the above reasons, Hain in view of Aumer renders obvious Patent Owner’s proposed substitute claims 22–24 and 26.

D. Ground 3: Steinbrecher in view of Aumer renders substitute claims 31 and 42 obvious

31. For the reasons that I provided in my first declaration (Exhibit 1002), original claims 10 and 21 are anticipated by Steinbrecher. In its RMTA, Patent Owner has proposed claims 31 and 42 to substitute for claims 10 and 21, respectively. As I noted at the beginning of this Section II, Patent Owner does not

dispute that Steinbrecher teaches proposed amendments (1) and (3), but argues that “Steinbrecher does not disclose a wireless earpiece(s) ‘configured to read user biometrics’”—that is, proposed amendment (2). RMTA at 8–9.

32. But Steinbrecher 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 claims 31 and 42. A POSITA would have found it obvious to include in a hearing aid, as taught by Steinbrecher, 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 ’853 patent’s priority date. *See* Section II.A.

(a) Motivation to combine Steinbrecher and Aumer

33. 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.

34. First, Steinbrecher and Aumer are from the same field of endeavor. Both references are directed to a similar wearable electronic device. Steinbrecher discloses a hearing aid H. Exhibit 1006 (Steinbrecher), ¶ 25, Figure 2. Similarly, Aumer discloses an earpiece 20. Exhibit 1022 (Aumer), ¶ 66, Figures 2A–2B. A

POSITA would have therefore considered the teachings of Steinbrecher and Aumer and would have readily been motivated to combine their teachings.

35. 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), ¶ 25, Figure 2. Steinbrecher discloses that hearing aid H can be “a behind-the-ear device” or “an in-the-ear device.” *Id.*, ¶ 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 1022 (Aumer), ¶¶ 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.

36. 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 1025 (Hong), ¶¶ 2–3; Exhibit 1026 (Kahn), ¶ 3. 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 1022 (Aumer), ¶ 64. Accordingly, in view of the consumer interests, advances in sensors, and Aumer’s teachings, a POSITA would have been motivated to implement Steinbrecher’s hearing aid 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.

37. Fourth, it was well known prior to the ’853 patent’s priority date that a sensor in a wireless earpiece could allow the wireless earpiece to automatically switch on or off depending on user biometrics. For example, as early as 2005, like Aumer, Rass disclosed “an in-the-ear hearing aid I” that includes “a temperature sensor TS.” Exhibit 1028 (Rass), 2:63–64, Figure 1. Rass further disclosed 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.” *Id.*, 2:64–3:2; *cf.* Exhibit 1001 (’853 patent), 5:16–19 (“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”). A POSITA would have been 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. Such a feature would provide the added benefit of saving battery life of Steinbrecher’s hearing aid H.

38. 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.

39. For the above reasons, Steinbrecher in view of Aumer renders obvious Patent Owner’s proposed substitute claims 31 and 42.

E. Grounds 4–7: Shaffer in view of Hain, Sorensen, and/or Aumer renders claims 22–30 obvious and Shaffer in view of Steinbrecher, Sorensen, and/or Aumer renders claims 31–42 obvious

40. For the reasons that I provided in my prior Declaration, original claims 1–9 would have been obvious over the teachings of Shaffer in view of Hain and/or

Sorensen (Grounds 4 and 5) and original claims 10–21 would have been obvious over the teachings of Shaffer in view of Steinbrecher and/or Sorensen (Grounds 6 and 7). In its RMTA, Patent Owner has proposed claims 22–30 to respectively substitute for claims 1–9, and claims 31–42 to respectively substitute for claims 10–21. 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) and (3), but 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.

41. But Shaffer in combination with Hain, Sorensen, and/or Aumer renders obvious Patent Owner’s proposed amendment “the wireless earpieces are configured to read user biometrics,” as recited by proposed substitute claim 22. And Shaffer in combination with Steinbrecher, Sorensen, and/or Aumer renders obvious Patent Owner’s proposed amendment “the wireless earpiece is configured to read user biometrics,” as recited by proposed substitute claims 31 and 42. 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 ’853 patent’s priority date. *See* Section II.A.

(a) **Motivation to combine Shaffer and Aumer¹**

42. 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.

43. First, Shaffer and Aumer are from the same field of endeavor. Both references are directed to a similar wearable electronic device. Shaffer discloses earbuds 1010 and 1012. Exhibit 1003 (Shaffer), ¶ 62, Figure 10. Similarly, Aumer discloses an earpiece 20. Exhibit 1022 (Aumer), ¶ 66, Figures 2A–2B. A POSITA would have therefore considered the teachings of Shaffer and Aumer and would have readily been motivated to combine their teachings.

44. 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.

¹ 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.

Each of Shaffer's earbuds 1010 and 1012 houses multiple electronic components. Exhibit 1003 (Shaffer), ¶¶ 61–62, Figure 10; *see also id.*, ¶ 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 1022 (Aumer), ¶¶ 64, 66, 69–72, Figures 1, 2A–2B. A POSITA would have combined the elements taught by Shaffer 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.

45. 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 1025 (Hong), ¶¶ 2–3; Exhibit 1026 (Kahn), ¶ 3. 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 1022 (Aumer), ¶ 64. Accordingly, in view of the consumer interests, advances in sensors, and Aumer’s teachings, a POSITA would have been motivated to implement each of Shaffer’s earbuds 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.

46. Fourth, it was well known prior to the ’853 patent’s priority date that a sensor in a wireless earpiece could allow the wireless earpiece to automatically switch on or off depending on user biometrics. For example, as early as 2005, like Aumer, U.S. Patent No. 7,522,739 to Rass et al. disclosed “an in-the-ear hearing aid I” that includes “a temperature sensor TS.” Exhibit 1028 (Rass), 2:63–64, Figure 1. Rass further disclosed 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.” *Id.*, 2:64–3:2; *cf.* Exhibit 1001 (’853 patent), 5:16–19 (“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”). A POSITA

would have been motivated to include, in Shaffer's earbuds 1010 and 1012, a sensor that reads user biometrics, as taught by Aumer, for automatic switching on and off of the hearing aid. Such a feature would provide the added benefit of saving battery life of Shaffer's earbuds 1010 and 1012.

47. 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.

48. For the above reasons, Shaffer in view of Shaffer, Sorensen, and/or Aumer renders obvious Patent Owner's proposed substitute claims 22–30, and Shaffer in view of Steinbrecher, Sorensen, and/or Aumer renders obvious Patent Owner's proposed substitute claims 31–42.

III. THE SUBSTITUTE CLAIMS ARE NOT ENABLED

49. Substitute claims 22–42 require that “the wireless earpieces[/earpiece] are[/is] configured to read user biometrics.” Substitute claims 22–42 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 '853 patent to understand how.

50. The specification of the '853 patent discloses heart beat, temperature, pulse rate, oxygenation, distance travelled, and calories burned as examples of user biometrics. Exhibit 1001 ('853 patent) at 5:16–17 (“biometric readings, such as heart beat or temperature”), 9:62–64 (“biometric information (e.g., pulse rate, oxygenation, distance travelled, calories burned, etc.)”). The specification of the '853 patent further discloses sensors like “heart rate monitor, pulse oximeter, accelerometers, gyroscopes” to read the examples of user biometrics that it discloses. Ex-1001-USP853, 9:65–67. However, the term “user biometrics” is much broader than what the specification of the '853 patent discloses.

51. I have reviewed the September 27, 2024 deposition transcript of Patent Owner’s expert, Dr. Darrin Young, and note that Dr. Young testified that a POSITA would understand the term “user biometrics” to mean “biological, physiological or chemical characteristics with respect to the individual . . . who uses or wears the wireless earpieces.” Exhibit 1027 (Second Young Deposition Transcript) at 15:2–14. 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."). 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"). The specification of the '853 patent does not disclose how to make a wireless earpiece configured to read DNA sequencing, retinal scans, vein patterns, or facial features.

52. 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.

53. For a wireless earpiece to read user biometrics, it needs to measure a particular human biological, physiological, or chemical characteristic. *See Exhibit 1027 (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.

54. As I discussed above, the specification of the '853 patent 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.

55. For the foregoing reasons, I have come to the conclusion that the specification of the '853 patent 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

56. 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

57. 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

58. 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: October 2, 2024

A handwritten signature in cursive script, appearing to read "Sayfe Kiaei".

Dr. Sayfe Kiaei