

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

**DECLARATION OF DR. DARRIN YOUNG, PH.D.
IN SUPPORT OF PATENT OWNER'S RESPONSE**

HIMPP 1024
IPR2023-01204
HIMPP v. Bragi

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I, Dr. Darrin Young, declare as follows:

I. INTRODUCTION

1. I have been retained as an independent expert consultant on behalf of Bragi GmbH (“Patent Owner” or “Bragi”) in this *Inter Partes* Review proceeding (“IPR”) before the Patent Trial and Appeal Board (“Board” or PTAB”) of the United States Patent and Trademark Office (“PTO”) regarding U.S. Patent No. 9,843,853 (“the ’853 patent” or “the Challenged Patent”) (Ex. 1001).¹ I am being compensated for the time I spend on this matter, in addition to expenses. My compensation in this case is in no way contingent on the nature of my findings, the presentation of my findings in testimony, or the outcome of this or any other proceeding. I have no other interest in this proceeding.

2. In particular, I have been asked to consider, and provide my opinions regarding, whether the proposed substitute claims 22-42 are patentable. I have also been asked to consider, and provide my opinions regarding whether the alleged prior art references cited in this proceeding disclose the features recited in certain claims of the ’853 patent (proposed claims 22-42, corresponding to original claims 1-21, respectively), which I understand K/S HIMPP (“Petitioner”)

¹ In this Declaration, I reference documents by exhibit numbers that, as I understand, are attached to exhibits in this *Inter Partes* Review of the ’853 patent.

has challenged in this IPR. In my view, the alleged prior art references do neither. This declaration is based on the information currently available to me. To the extent that additional information becomes available, I reserve the right to continue my investigation and study, which may include review of documents and information that may be produced, as well as testimony from depositions that have not yet taken place. My opinions are set forth below.

II. BACKGROUND AND QUALIFICATIONS

3. I have summarized in this section my educational background, career history, publications, and other relevant qualifications. My full *curriculum vitae* is attached as Appendix A to this declaration.

4. I am a Utah Science Technology and Research Initiative (USTAR) Associate Professor and the chair of the solid-state/micro-electro-mechanical systems/circuit area of the Electrical and Computer Engineering Department of the University of Utah.

5. I earned a bachelor of science degree in Electrical Engineering and Computer Sciences from the University of California at Berkeley in 1991, a master of science in Electrical Engineering and Computer Sciences from the University of California at Berkeley in 1993, and a Ph.D. in Electrical Engineering and Computer Sciences from the University of California at Berkeley in 1999.

6. I have extensive experience in academia. I have been teaching and conducting research for over 24 years. My teaching and research have included a focus on electronic circuits design, electrical interface design for micro-electro-mechanical systems (“MEMS”), and integrated microsystem technology development for industrial sensing, wireless sensing, wearable sensing, navigation, biomedical implant, power and energy scavenging, and RF communication applications.

7. My work also includes research, design, and development of wireless electronic systems, including wireless power transmission systems and wireless data telemetry systems. My work focuses on wireless sensing, which involves designing systems that wirelessly provide power and data telemetry to remote devices, such as sensors or biomedical implants. As part of this work, I have frequently researched, designed, and developed systems that wirelessly provide power via inductive coupling of two inductive coils or resonators as well as data telemetry through inductive coupling or by employing active data transmitters.

8. I teach both undergraduate and graduate level electrical engineering courses, ranging from an Introduction to Circuits and Instruments to detailed lectures on Applied Electronics for various sensing and communication applications, including industrial applications and biomedical applications. I

have taught numerous graduate-level courses and invited lectures that bear on wireless power transfer system design and wireless data telemetry system design, including Radio-Frequency Integrated Circuits Design, MEMS for Sensing and Communication, Electrical Interface for MEMS, and Analog Integrated Circuit Design.

9. Since 2009, I have been the Director of the Wireless Microsystem Laboratory at the University of Utah, where I conduct and oversee research on the design and development of wireless power transfer and wireless data telemetry systems for biomedical applications and environmental sensing applications.

10. In my research lab I have designed, built, and tested a number of sensor-based microsystems. Those microsystems include wearable sensors to detect physiological signals such as blood pressure waveforms, heart rate, pulse rate, and pulse wave velocity, implantable sensors for detecting blood pressure waveforms, ECG, and glucose level, micro-implantable coils array for wireless power transfer to the brain, middle ear implantable microphone for fully implantable cochlear prosthesis, flexible tactile sensors array for personal navigation applications under GPS-denied environment, and MEMS-based wireless strain sensing module that can detect surface conditions of metallic rotating machinery elements.

11. As part of my research, I have authored more than 130 peer-reviewed publications. A complete list of peer-reviewed conference papers, journal articles, and invited book chapters that I have authored is listed in my curriculum vitae, which also includes a more detailed summary of my background, experience, and qualifications to render an expert opinion in this matter.

12. I have testified in a number of patent cases. I have served as a technical expert in district court cases and for a number of *inter partes* reviews. I have served as a technical expert in patent cases involving wearable biosensors and wireless power transfer and data telemetry technologies.

III. MATERIALS REVIEWED AND TIME OF ALLEGED INVENTION

13. The opinions contained in this declaration are based on the documents that I reviewed, my professional judgment, as well as my education, experience, and knowledge regarding technologies related to the '853 patent.

14. In forming my opinions expressed in this declaration, I reviewed:

- the '853 patent (Ex. 1001);
- the file history of the '853 patent (Ex. 1008);
- the declaration of Dr. Sayfe Kiaei (Ex. 1002);
- U.S. Patent Application Publication No. 2015/0245126 (“Shaffer” – Ex. 1003);

- Certified English translation of DE Patent Application No. 102007039455 (“Hain” – Ex. 1004);
- U.S. Patent No. 8,265,315 (“Sorensen” – Ex. 1005);
- Certified English translation of EP Patent Application No. 1727395 (“Steinbrecher” – Ex. 1006);
- GB Patent Application No. 1254017 (“Brown” – Ex. 1007); and
- The Parties’ papers and exhibits in this case (IPR2023-01150).

15. I have been asked to consider the time of the alleged invention to be around August 29, 2015, which I understand is the filing date of the application (U.S. Provisional Application No. 62/211,767 to which the ’853 patent claims priority (Ex. 1001, Cover). My opinions reflect how a person of ordinary skill in the art (as I define in Section V below) would have understood the claims and the specification of the ’853 patent, the prior art to the patent, and the state of the art, at the time of the alleged invention.

16. As I discuss in detail below, it is my opinion that the proposed substitute claims of the ’853 patent are patentable, and that the limitations of the proposed substitute claims are not disclosed by the prior art references cited by Petitioner in this *Inter Partes* Review.

IV. LEGAL STANDARDS

1. Overview

17. I am not an attorney or a legal expert. The legal standards I applied in reaching the conclusions expressed throughout this declaration were provided to me by counsel. In preparing this declaration, I have endeavored to faithfully apply these legal standards. I do not intend to offer opinions on the law. Below, I describe the law I applied in considering whether the claims of the Challenged Patent are patentable.

18. I have been informed that an issued patent is presumed valid and that the challenger of the patent's validity bears the burden of proving invalidity of the patent.

2. Patent Claims

19. Patent claims describe the invention made by the inventors and describe what the patent owner owns and what the owner may prevent others from doing.

20. Claims may describe products, such as machines or chemical compounds, or processes for making or using a product. Claims are usually divided into parts or steps called limitations.

21. There are two types of claims: independent claims and dependent claims. An independent claim sets forth all the requirements that must be met in order to be covered by that claim. Thus, it is not necessary to look at any other claim to determine what an independent claim covers. A dependent claim does

not itself recite all of the requirements of the claim, but refers to another claim for some of its requirements. In this way, the claim depends on another claim. The law considers a dependent claim to incorporate all of the requirements of the claims to which it refers.

22. The dependent claim then adds its own additional requirements. To determine what a dependent claim covers, it is necessary to look at both the dependent claim and any other claims to which it refers.

23. In that case, the dependent claims incorporate the limitations of the independent claim upon which they depend and, if a reference fails to disclose any of the limitations of an independent claim, the claims which depend on that claim cannot be made invalid by that reference. As a result, any of the references at issue in this proceeding that fail to disclose all of the limitations of an independent claim necessarily also fail to disclose all of the limitations of claims which depend on that claim.

3. Burden of Proof for Invalidity

24. I understand that the party challenging the validity of an issued U.S. patent in an IPR bears the burden of proving invalidity through facts supported by a preponderance of the evidence. I understand that a “preponderance of the evidence” means evidence sufficient to prove that a fact is more likely true than it is not.

4. Claim Construction

25. I understand that the first step in determining validity is to properly construe the claims. I further understand that, in this proceeding, the Board must determine the scope of the claims by using the same claim construction standard that United States District Courts use. Under this standard, words of a claim are given their “ordinary” and “customary” meaning as understood by a person of skill in the art at the time of the invention. I understand that such a person looks to the claims, specification, and file history in understanding the meaning of the claim terms. I have applied this understanding in this declaration.

5. Person of Ordinary Skill in the Art

26. I understand that a person having ordinary skill in the art may be defined by factors such as: (a) the levels of education and experience of the inventor and other persons actively involved in the field; (b) the types of problems encountered in the field; (c) prior art solutions to those problems; (d) rapidity with which innovations are made; and (e) the sophistication of the technology.

6. Prior Art

27. I understand that a patent cannot be invalidated based on one person’s testimony alone without corroborating evidence, particularly documentary evidence. Moreover, I understand that corroboration is required of any witness whose testimony alone is asserted to invalidate a patent, regardless of his or her level of interest in relation to that patent. Accordingly, even if the

testifying individual has no interest in the litigation, I understand that that corroboration is still required.

28. In this declaration, I may use the phrase “prior art” when describing specific references. However, my use of this phrase should not be interpreted as agreement that the item(s) described qualify as prior art under the patent laws. I merely use this phrase to address the items labeled as “prior art” by Petitioner and its expert.

7. Anticipation

29. I understand that a patent claim can be found invalid as anticipated if each and every element of the claim, as properly construed, is found either explicitly or inherently in a single prior art reference. If the single prior art reference does not disclose any one claim limitation, then that claim is not anticipated. I further understand that the single prior art reference cannot merely disclose each element; rather, it must disclose all of the elements as arranged in the claim. I have been informed that for a prior art reference to “inherently” disclose something, the reference must necessarily function in accordance with, or include the claimed limitations, to anticipate. The missing descriptive matter cannot merely probably or possibly include the claimed limitations. I further understand that, with respect to an anticipation analysis, it is improper to combine separate, distinct embodiments of a single prior art reference.

30. I understand that for a claim to be anticipated, each claim limitation must be disclosed in a single prior art reference, and the claimed arrangement or combination of those limitations must also be disclosed in that same prior art reference. I understand that for a reference to be anticipatory, the reference must contain an enabling disclosure. I understand that merely naming or describing the subject matter is insufficient if it cannot be produced without undue experimentation.

8. Obviousness

31. I understand that a patent claim can be found invalid as obvious if the differences between the claim and the prior art references would have been obvious to a person of ordinary skill in the art at the time of the invention, taking into account (1) the scope and content of the prior art, (2) the differences between the prior art and the claims, (3) the level of ordinary skill in the art, and (4) any objective indicia of non-obviousness. I further understand that a claim can be found to be obvious in light of either a single prior art reference or multiple prior art references. I understand that references qualify as prior art for an obviousness determination only when they are analogous to the claimed invention. Two separate tests define the scope of analogous prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed; and (2) if the reference is not within the field of the inventor's endeavor, whether the reference

still is reasonably pertinent to the particular problem with which the inventor is involved.

32. To be obvious in light of a single prior art reference or multiple prior art references, there must be a reason either to modify either the single prior art reference or to combine the two or more prior art references to achieve the claimed invention. I understand that this reason may come from a teaching, suggestion, or motivation to combine or may come from the reference or references themselves, the knowledge or “common sense” of one skilled in the art, or from the nature of the problem to be solved, and may be explicit or implicit from the prior art as a whole.

33. The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.

34. I further understand that there is no suggestion to combine, however, if a reference teaches away from its combination with another source. A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant, or if it suggests that the line of development flowing from the reference’s disclosure is unlikely to be productive of the result sought by the applicant. If when combined, the references would produce a seemingly

inoperative device, then they teach away from their combination. I understand that it is improper to combine references where the references teach away from their combination.

35. I understand that the degree of teaching away will depend on the particular facts; in general, a reference will teach away if it suggests that the line of development flowing from the reference's disclosure is unlikely to be productive of the result sought by the applicant. I understand that a reference teaches away, for example, if (1) the combination would produce a seemingly inoperative device, or (2) the references leave the impression that the product would not have the property sought by the applicant.

36. I understand that if the teachings of a prior art reference would lead one skilled in the art to make a modification that would render another prior art device inoperable, then such a modification would generally not be obvious. I understand that if a proposed modification would render the prior art device unsatisfactory for its intended purpose, then the proposed modification would generally not be obvious.

37. I understand that it is improper to use hindsight in making the obviousness determination.

38. I understand that some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness must be made. For

example, I understand that there may be no rational underpinning to support the legal conclusion of obviousness where systems are already complete and the party challenging validity seeks to mix and match components, which each exist in the separate systems, from these complete systems.

V. PERSON OF ORDINARY SKILL IN THE ART (POSA)

39. Based on my review of the '853 patent, the types of problems encountered in the art at and prior to the time of the alleged invention, prior solutions to those problems, the pace with which innovations were made during the relevant time period, the sophistication of the technology, and the educational level of active professionals in the field, I believe that a person of ordinary skill in the art (POSA), at the time of the alleged invention, would have had at least a bachelor's degree in Electrical Engineering, or equivalent experience, and one to two years of experience in the field of wireless electronic devices and battery systems, particularly wireless earpieces such as wireless headphones and hearing aids.

40. All of my opinions in this declaration are from the perspective of a person of ordinary skill in the art, as I have defined it above and during the relevant time frame (e.g., 2015, including August 29, 2015). During this time frame, I possessed at least the qualifications of a POSA, as defined above.

VI. THE '853 PATENT

41. The '853 Patent discloses a system in which one or more wireless earpieces interact with a smart case in order to preserve battery life, by entering a low power mode when the one or more earpieces are detected in the case, or a high power mode when the one or more earpieces are not detected in the case, presumably removed by the user to play audio.

42. Figure 1 of the '853 Patent, reproduced below, demonstrates some of the novel aspects in a particular embodiment. As shown below, the invention claimed in the '853 Patent allows one or more wireless in-ear earpieces to interact with a smart case comprising a rechargeable battery capable of being utilized to charge a wireless earpiece to perform various actions. For example, the '853 Patent provides multiple functionalities for interaction including utilizing the smart case to preserve the battery life of the wireless earpieces while in a low power mode or state and ensuring charging of the earpieces to a desired level, overcoming the interference from headphone wires.

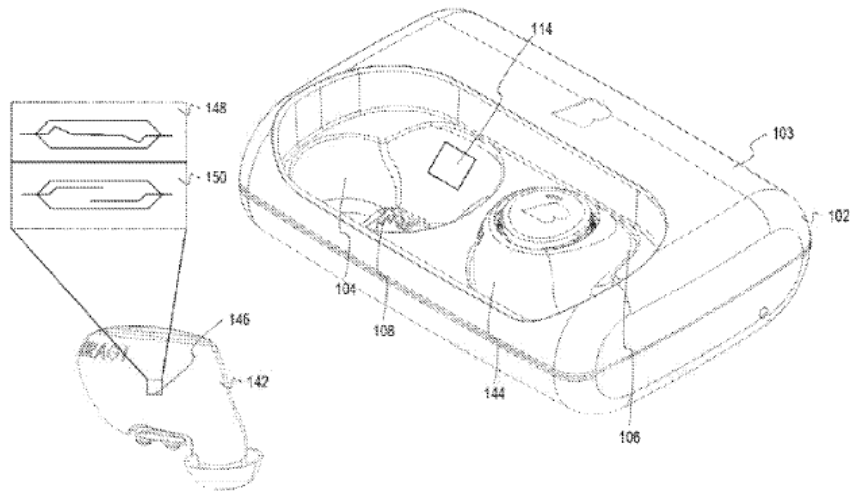


FIG. 1

Ex-1001, Fig. 1.

43. The '853 Patent discloses a reed switch which is an electrical switch operated by an applied magnetic field, provided by a magnet of the smart case which turns the wireless earpieces on and off. Ex-1001, 2:52-62; Figure 1. The wireless earpiece may operate in a variety of power modes. For example, the wireless earpiece may operate in a power saver or a low power mode, in which the wireless earpiece utilizes minimal power to maintain functionality and alert status of the wireless earpiece. *Id.* at 10:15-36. The wireless earpiece may also operate in a high-power mode, which is implemented upon detecting that the wireless earpieces have been removed from the smart case. *Id.*

44. The '853 Patent system comprises one or more wireless in-ear earpieces and a smart case. The in-ear wireless earpieces may be referred to as a

pair or singularly. Ex-1001, 3:1-3. The in-ear wireless earpieces are configured to fit into a user's ear. *Id.* at 3:5-11.

45. The smart case is configured to receive the in-ear wireless earpieces such that they fit securely inside of the smart case. *Id.* at 3:55-60. The smart case comprises a rechargeable battery, which receives charge inductively and is utilized to charge the wireless earpieces. *Id.* at 3:31-34 and 6:16-20. The wireless earpieces may be charged via direct contact or wirelessly.

46. The reed switch operates in a closed mode when no magnetic field is present or in an open mode when a magnetic field is present. *Id.* The magnetic field is supplied by one or more magnets of the smart case, such that the reed switch is in the closed mode when the wireless earpieces are outside of the smart case and in an open mode when the wireless earbuds are in the smart case. *Id.* When the reed switch is in the open mode indicating that the wireless earpieces are in the smart case, the wireless earpieces may be charged by the smart case. *Id.* at 5:39-47. When the wireless earpieces are removed from the case for use, the reed switch is in a closed mode, which results in the wireless earpieces functioning under their own power. *Id.* The reed switch may initiate a self-power (or high power) mode when deactivated (closed) by the magnet of the smart case. *Id.* at 8:1-21. As a result, the wireless earpieces may be fully activated and ready for use.

47. In operation, the wireless earpieces interface with a smart case. The process begins with one or more wireless in-ear earpiece determining whether a magnetic field is present. This determination may be based on the interaction of a magnet or magnetic field with a reed switch of the wireless earpiece. If the magnetic field is not present, the wireless earpiece remains powered on and the reed switch remains closed. When in this state, the onboard battery of the wireless earpiece powers and operates the wireless earpiece to ensure full functionality. Ex-1001, 8:32-53. If a magnetic field is present, the reed switch is opened and the wireless earpiece enters low power mode to preserve battery life.

VII. CLAIM CONSTRUCTION

48. I understand that claim terms are typically given their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art at the time of the alleged invention. In considering the meaning of the claims, I also understand that one must consider the claim language, specification, prosecution history, and the knowledge of a person of ordinary skill in the art at the relevant time. I do not believe any terms require construction in the present matter.

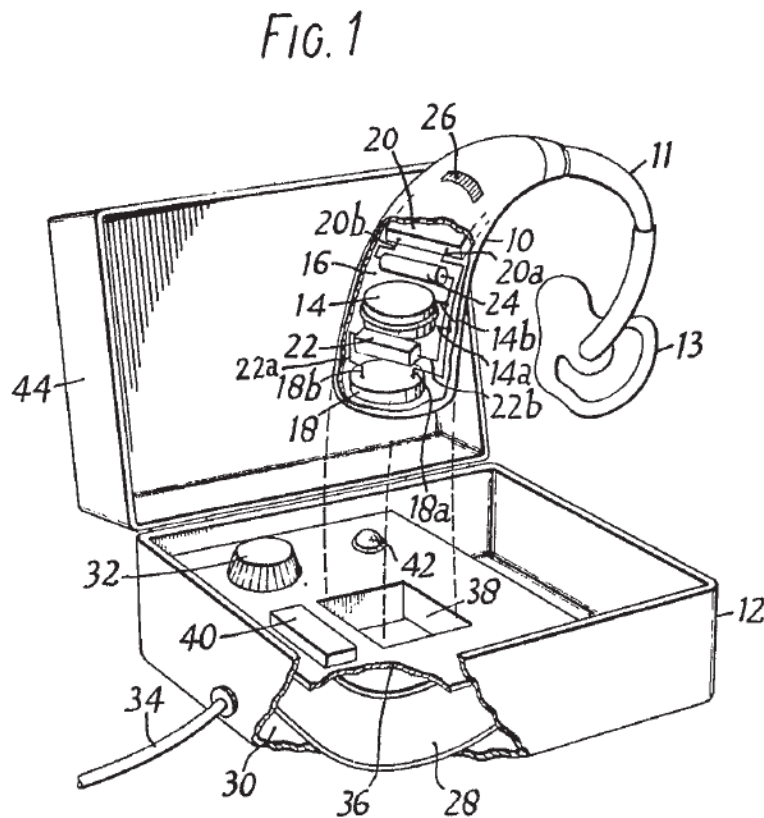
VIII. OVERVIEW OF ALLEGED PRIOR ART REFERENCES

49. In its Petition (Paper No. 1), Petitioner presents seven grounds challenging claims 1-21 using various combinations of Brown, Hain,

Steinbrecher, Shaffer, and Sorensen These references are described briefly below.

1. Brown

50. Brown is directed to an over the ear hearing aid charging case. Ex-1007 at Figure 1 (reproduced below). A magnetic reed relay switch automatically disconnects the amplifying circuits from the cell when the aid is removed from the head and placed in its receptacle. *Id.* at 1:36-44. The hearing aid has a sound tube and earmould. *Id.* at 2:94-96; Figure 1. The earmould of Brown is configured to fit securely around the outside of a user's ear, as pictured below.



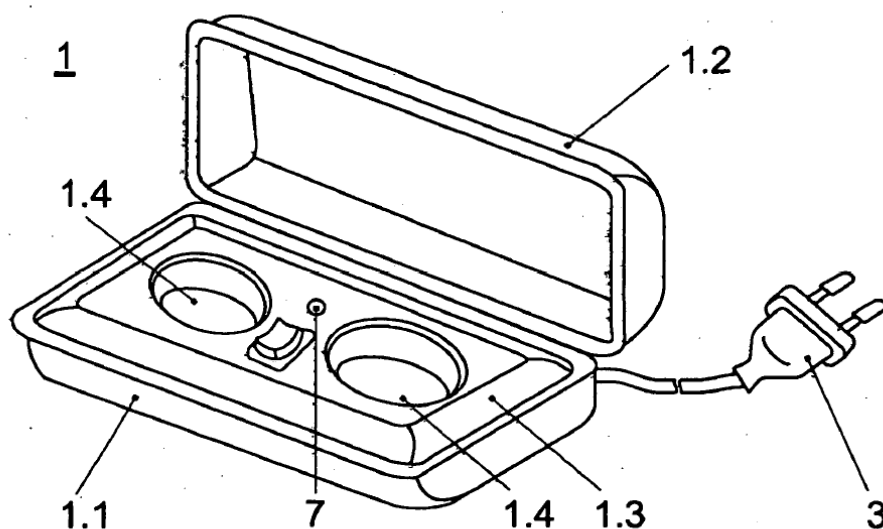
Ex-1007, Fig. 1.

2. Hain

51. Hain generally discloses a dual hearing aid system with magnetic field sensors. Ex-1004. In some scenarios, the magnetic field is only detected by one hearing aid, which indicates that the hearing aid is “telephoning,” and the hearing aids (which has detected the magnetic field) remains active. *Id.* at [0013]. In other scenarios, when the magnetic field is detected by both hearing aids, the hearing aids enter an off state. *Id.* at Abstract. Hain discloses three modes of operation: “normal operation,” the “telephoning” operation, and an off state. *Id.* at [0021]-[0022].

3. Steinbrecher

52. Steinbrecher is directed to a device for contactless loading of an accumulator battery in a hearing aid when the hearing aid is located in a charging shell. Ex-1006 at [0001]. The charging shell is connected by a main plug, or plug-in power supply, in order to provide power. *Id.* at [0024]. This is shown in Figure 1, reproduced below.



Ex-1006, Fig. 1.

4. Shaffer

53. Shaffer discloses a mobile device case which operates as an electrical charger and storage dock for wireless earbuds. Ex-1003 at [0002]. Each earbud may include sensors, including a pressure sensor or a magnetic sensor that identifies when the earbud is within or outside the case. *Id.* at [0011]. The case has electrical components which allow the earbud batteries to be charged in the case when the case is plugged into a power source via a charging cable. *Id.* at [0047].

5. Sorensen

54. Sorensen is directed to a hearing aid system including a charging station in which a hearing instrument is mounted to charge the hearing instrument without removal of the battery. Ex-1005, Abstract. The system provides communication

between the charging station and the hearing instrument when the hearing instrument is placed in the charging station, such that data can be exchanged between the devices. *Id.* at 6:25-62.

IX. PATENT OWNER'S SUBSTITUTE CLAIMS ARE PATENTABLE

55. I understand that Patent Owner has proposed potentially substituting claims as listed below. The proposed amendments rewrite each of claims 1-21 as proposed substitute claims 22-42. The proposed substitute claims do not broaden the claim scope or introduce new subject matter. The proposed claim amendments rewrite further limit the method and/or system of each of these claims by adding additional functionalities. These amendments further distinguish the claims over the prior art, narrowing the claim scope. The claims are patentable over art from original prosecution. Further, as I discuss below, a POSA would have understood that the inventor possessed the substitute claims as of the priority date, and would have been sufficiently enabled in how to make and use the invention recited in the Substitute Claims. As discussed below, I find that Patent Owner's proposed substitute claims are patentable.

1. Proposed Substitute Claims

56. According to Patent Owner's proposal, I understand that the original claims in the '853 Patent may be canceled and replaced with the proposed substitute claims. I have been asked to evaluate these proposed substitute claims.

I understand that these are not currently claims in the '853 Patent. I am informed by Counsel that text that is underlined is proposed to be added to the original claims, and text that is struck through is proposed to be removed from the original claims.

Claim 22. [Proposed substitute for claim 1] A method for managing in-ear wireless earpieces, comprising:

powering circuitry of the in-ear wireless earpieces utilizing a high power mode in response to detecting a magnetic field is not applied to one or more of the in-ear wireless earpieces;

wherein the powering circuitry is housed within the in-ear wireless earpieces, and

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

Claim 23. [Proposed substitute for claim 2] The method of claim 22, further comprising:

operating the in-ear wireless earpieces utilizing an onboard battery in response to detecting the magnetic field is not applied to one or more of the in-ear wireless earpieces.

Claim 24. [Proposed substitute for claim 3] The method of claim 22, further

comprising:

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

Claim 25. [Proposed substitute for claim 4] The method of claim 22, wherein the magnetic field is applied by a magnet of a smart case configured to receive the in-ear wireless earpieces.

Claim 26. [Proposed substitute for claim 5] The method of claim 22, wherein the magnetic field is detected by a reed switch of the in-ear wireless earpieces.

Claim 27. [Proposed substitute for claim 6] The method of claim 22, further comprising:

coupling the in-ear wireless earpieces to interfaces of a smart case, wherein the smart case comprises a rechargeable battery configured to charge the in-ear wireless earpieces and applies a magnetic field to one or more of the in-ear wireless earpieces.

Claim 28. [Proposed substitute for claim 7] The method of claim 22, wherein the magnetic field is detected by a reed switch integrated in magnetic contacts that interface with a smart case, the smart case comprising a rechargeable battery configured to charge the in-ear wireless earpieces, for securing the in-ear wireless earpieces.

Claim 29. [Proposed substitute for claim 8] The method of claim 22, further comprising:

synchronizing data between the in-ear wireless earpieces and a smart case, the smart case comprising a rechargeable battery configured to charge the in-ear wireless earpieces, in response to detecting the magnetic field.

Claim 30. [Proposed substitute for claim 9] The method of claim 22, wherein the low power mode is a power saver mode.

Claim 31. [Proposed substitute for claim 10] An in-ear wireless earpiece, comprising:

circuitry operating the in-ear wireless earpiece, wherein the powering circuitry is housed within the in-ear wireless earpiece;

a battery powering the circuitry of the in-ear wireless earpiece; and

a reed switch connecting the battery to the circuitry, wherein:

the reed switch connects the circuitry to the battery when a magnetic field is not detected;

the reed switch disconnects the circuitry from the battery when a magnetic field is detected; and

wherein the magnetic field is applied by a smart case comprising a rechargeable battery configured to receive charge inductively and to charge the in-ear wireless earpiece.

Claim 32. [Proposed substitute for claim 11] The in-ear wireless earpiece of claim 31,

wherein the smart case is configured to receive the in-ear wireless earpiece, and powers the in-ear wireless earpiece when received in the smart case.

Claim 33. [Proposed substitute for claim 12] The in-ear wireless earpiece of claim 31, further comprising:

magnetic contacts in connection with the circuitry and the battery that interface with a smart case to charge the battery.

Claim 34. [Proposed substitute for claim 13] The in-ear wireless earpiece of claim 33, wherein the in-ear wireless earpiece synchronizes data with the smart case.

Claim 35. [Proposed substitute for claim 14] The in-ear wireless earpiece of claim 31, wherein the in-ear wireless earpiece alters a power level of the in-ear wireless earpiece in response to the reed switch detecting the magnetic field.

Claim 36. [Proposed substitute for claim 15] The in-ear wireless earpiece of claim 31, wherein the in-ear wireless earpiece updates software of the in-ear wireless earpiece in response to detecting the magnetic field.

Claim 37. [Proposed substitute for claim 16] The in-ear wireless earpiece of claim 31, wherein the circuitry includes logic that alters a power state of the in-

ear wireless earpiece in response to detecting the magnetic field and a startup process in response to not detecting the magnetic field after having detected the magnetic field.

Claim 38. [Proposed substitute for claim 17] A system comprising the in-ear wireless earpiece of claim 31, wherein the in-ear wireless earpiece is a left in-ear earpiece and a smart case for charging the left in-ear earpiece, the smart case comprising:

- a smart case housing;

- a first receptacle for receiving the left in-ear earpiece disposed within the smart case housing;

- a second receptacle for receiving a right in-ear earpiece disposed within the smart case housing;

- a first interface associated with the first receptacle for electrically connecting the smart case to the left in-ear earpiece;

- a second interface associated with the second receptacle for electrically connecting the smart case to the right in-ear earpiece;

- an intelligent control disposed within the smart case housing and operatively connected to the first interface and the second interface; and

- the rechargeable battery configured to charge the left in-ear wireless earpiece and the right in-ear wireless earpiece.

Claim 39. [Proposed substitute for claim 18] The system of claim 38 wherein the smart case further comprises a display.

Claim 40. [Proposed substitute for claim 19] The system of claim 39 wherein the display is moveably connected to the smart case to transition from a first position to a second position.

Claim 41. [Proposed substitute for claim 20] The system of claim 40 wherein the smart case further comprises at least one manual input for receiving user input to provide additional functionality.

Claim 42. [Proposed substitute for claim 21] A system comprising:

- a first in-ear wireless earpiece, comprising:
 - circuitry operating the first in-ear wireless earpiece;
 - a battery powering the circuitry of the first in-ear wireless earpiece; and
 - a switch connecting the battery to the circuitry, wherein the switch connects the circuitry to the battery when a magnetic field is not detected, and wherein the switch disconnects the circuitry from the battery when a magnetic field is detected;
- a smart case for charging the first in-ear wireless earpiece and a second in-ear wireless earpiece, the smart case comprising:
 - a smart case housing;
 - a first receptacle for receiving the first in-ear wireless earpiece disposed within the smart case housing;

a second receptacle for receiving the second in-ear wireless earpiece disposed within the smart case housing;

a first interface associated with the first receptacle for electrically connecting the smart case to the first in-ear earpiece;

a second interface associated with the second receptacle for electrically connecting the smart case to the second in-ear earpiece;

an intelligent control disposed within the smart case housing and operatively connected to the first interface and the second interface; and

a rechargeable battery configured to receive charge inductively and to charge the first in-ear wireless earpiece and the second in-ear wireless earpiece.

2. The Original Application for the '853 Patent Includes Support for the Proposed Substitute Claims

57. I have been asked to provide my opinions regarding whether the proposed substitute claims are supported by the original application for the '853 Patent. In performing this analysis, I have applied the plain and ordinary meaning of the terms. I include exemplary citations to the original application for both the existing limitations of the claims and the limitations added by each proposed substitute claim. The '853 patent issued from U.S. Patent Application No. 16/245,031 ("the '031 Application"), which is found at pages 1-36 of Exhibit 1008.

58. As noted above, the Substitute Claims rewrite claims 1-21 with

additional limitations. The following features, found in the Substitute Claims, were supported by the '031 Application. A POSA would have found that the inventor was in the possession of the features (and each claim as a whole) at the time of filing the '031 Application.

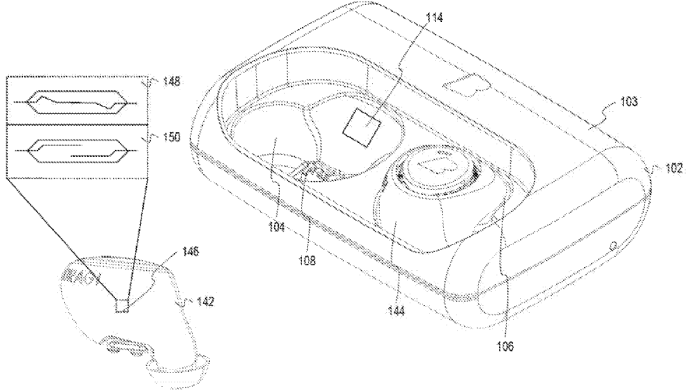
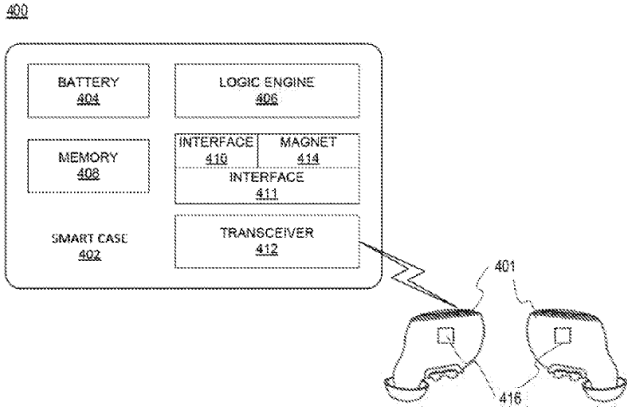
Claim Limitation	Proposed Substitute Claims	Support from Original U.S. Application for the '853 Patent
in-ear wireless earpieces	22-29, 31-38, 42	In one embodiment, the wireless earpieces 142, 144 include a set of left and right ear pieces configured to fit into a user's ears. [4:19-20]  FIG. 1 Figure 1

		FIG. 2
		Figure 2 FIG. 4
wherein the powering circuitry is housed within the in-ear wireless earpieces,	22, 31	Figure 4 The wireless earpiece also includes a battery for powering the circuitry of the wireless earpiece. The wireless earpiece further includes a reed switch connecting the battery to the circuitry. The reed switch connects the circuitry to the battery when a magnetic field is not detected. The reed switch disconnects the circuitry from the battery when a magnetic field is detected.

		[2:8-12] The wireless earpiece 401 may include components similar to those shown for the smart case 402 that are miniaturized and compacted to fit within the three dimensional footprint of the wireless earpiece 401. Although not shown, the wireless earpiece 401 may include circuitry for operating the device including a logic engine (e.g., microprocessor), memory, and transceiver all of which are powered by an onboard battery. [12:3-7]  FIG. 4 Figure 4
wherein the smart case comprises a rechargeable battery configured [to receive charge inductively and] to charge the	27-29, 31, 38, 42	The smart case 102 encloses a battery, and various other circuitry (not shown). The battery of the smart case 102 may be utilized to charge the wireless earpieces 142, 144 through direct contact or wirelessly. As a result, the smart case 102 may act as a custom charger for ensuring the proper power management and functionality of the wireless earpieces 142, 144. For example, the battery of the smart case 102 may be utilized to charge the wireless earpieces 142, 144 any number of times before the smart case 102 and

in-ear wireless earpieces	corresponding battery may require charging. In one embodiment, the smart case 102 may include one or more solar panels, or surfaces configured to charge the smart case 102 utilizing ambient or direct sunlight. The smart case 102 ensures that the duty cycle of the wireless earpieces 142, 144 are maximized by properly maintaining power levels. For example, the smart case 102 may keep the wireless earpieces 142, 144 fully charged during a time period of inactivity, such as before being purchased (e.g., on a shelf or as part of inventory) or once purchased. [5:3-15] The smart case includes interfaces 108, 110 within the receptacles 104, 106. The interfaces 108, 110 are hardware interfaces for electrically connecting the wireless earpieces 142, 144 to the smart case 102. The interfaces 108, 110 may include any number of contact points, busses, wires, or other physical connectors for interfacing the wireless earpieces 142, 144, with the smart case 102. The interfaces 108, 110 may alternatively include inductive chargers for charging the wireless earpieces 142, 144. In one embodiment, the interfaces 108, 110 are magnetic for automatically coupling with contact points or interfaces of the wireless earpieces 142, 1144. In another embodiment, the interfaces 108, 110 may represent male (or alternatively female) connectors for interfacing with the wireless earpieces 142, 144, such as micro-USB, or other developing miniature external connectors. The interfaces 108, 110 may be utilized to charge the wireless earpieces 142, 144. Wireless charging is also contemplated utilizing an inductive charger integrated in the smart case 102 or other charging devices compatible with the wireless earpieces 142, 144.
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		The interfaces 108, 110 may also be utilized to synchronize data between the wireless earpieces 142, 144. [6:6-20] The smart case 102 may also include a port 112. The port 112 may be utilized to interface with the smart case 102. For example, the port 112 may be utilized with a connector to charge the battery of the smart case 102. The port 112 may also be utilized to download or upload data stored by the smart case 102 that may have previously been stored in the wireless earpieces 142, 144. The port 112 may be a miniaturized port, such as USB Type C, micro-USB, or other miniaturized port suitable for connecting to another electronic device, such as a wall charger, desktop computer, laptop, or wireless device (e.g., smart phone, tablet, etc.) In another embodiment, the smart case 102 may include a dedicated port for charging, such as for receiving a male direct-current (DC) connector. [7:5-13] In one embodiment, the smart case 402 may include a battery 404, a logic engine 406, a memory 408, interfaces 410, 411, a transceiver 412, and a magnet 414. The battery 404 is a power storage device configured to charge the power storage system of the wireless earpieces 401 once or multiple times. In other embodiments, the battery 404 as well as the batteries of the wireless earpieces 401 may represent a fuel cell, thermal electric generator, piezo electric charger, solar charger, ultra-capacitor, or other existing or developing power storage technologies.
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		[9:14-20] The battery 404 may itself be charged through an interface 410. The interface 410 is a hardware interface for connecting the smart case to a power supply or other electronic device. The interfaces 410 may be utilized for charging as well as communicating with externally connected devices. For example, the interface 410 may represent a mini-USB, micro-USB or other similar miniature standard connector. [9:26-10:2]
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3. The Original Application for the '853 Patent Enables the Proposed Substitute Claims

59. I have also been asked to evaluate whether the proposed Substitute Claims are enabled by the original application. I have been informed that, to be enabling, a specification or application must teach those skilled in the art how to make and use the full scope of the claimed invention without undue experimentation, as of the patent's effective filing date. I understand that the factors to consider when determining whether a disclosure would require undue experimentation include (1) the quantity of experimentation necessary; (2) the amount of direction or guidance presented; (3) the presence or absence of working examples; (4) the nature of the invention; (5) the state of the prior art; (6) the relative skill of those in the art; (7) the predictability or unpredictability of the art; and (8) the breadth of the claims.

60. Given the table of exemplary citations in the previous section, it is

my opinion that a POSA would have had a sufficient amount of information to make and use the full scope of the proposed substitute claims without undue experimentation. To the extent Petitioner and/or Petitioner's expert argue differently, I reserve the right to respond.

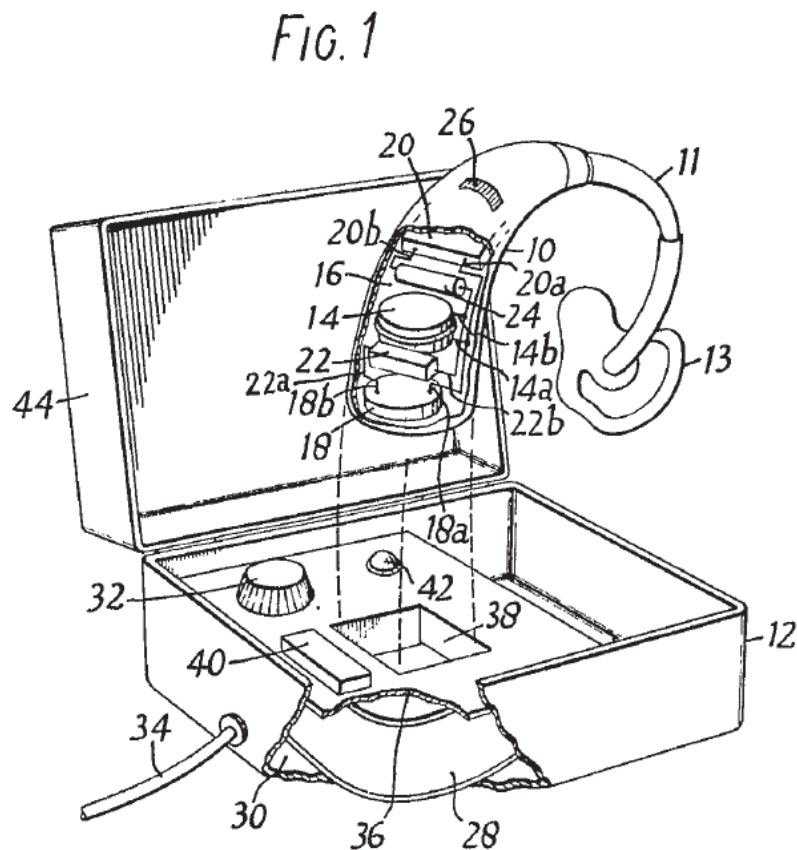
4. The Proposed Substitute Claims are Patentable Over the Cited Prior Art

a) Ground 1 – Brown

61. The Petition relies on Brown as anticipating claims 10 and 14. Petition, 18. Original claims 10 and 14 correspond to proposed substitute claims 31 and 35, respectively. However, Brown fails to disclose the proposed substitute claims at least because Brown does not disclose an “in-ear wireless earpiece.” As explained above, the application for the '853 Patent teaches that “the wireless earpieces 142, 144 include a set of left and right ear pieces configured to fit into a user's ears.” Ex-1008 at [4:19-20]. This disclosure is captured by the amendment clarifying that the “wireless earpieces” of the original claims are “in-ear wireless earpieces.” Brown similarly fails to disclose that the “powering circuitry operating the in-ear wireless earpiece” is “housed within the in-ear wireless earpiece” as required by the proposed substitute claims.

62. Brown discloses a hearing aid that is worn *on* the ear, not a hearing aid configured to fit inside of a user's ears. Further, in Brown, the powering circuitry

is housed in a portion of the hearing aid outside of the user's ear. Figure 1 of Brown, reproduced below, illustrates that all of the circuitry and associated parts of the hearing aid *except* for the earmould (13) and part of the sound tube (11) are housed in the portion of Brown's hearing aid that sits *outside* the ear. In other words, the "powering circuitry operating the" hearing aid sites outside of the ear, not within an in-ear portion of the hearing aid.



Ex-1007, Fig. 1.

63. Not only does Brown fail to teach "in-ear wireless earpieces" wherein the "powering circuitry operating the in-ear wireless earpiece" is "housed within

the in-ear wireless earpiece,” but Brown fails to disclose “a smart case comprising a rechargeable battery configured to receive charge inductively and to charge the in-ear wireless earpiece.” Brown discloses no battery in the hearing aid case at all, and therefore cannot disclose a “rechargeable battery configured to receive charge inductively and to charge the in-ear wireless earpiece.”

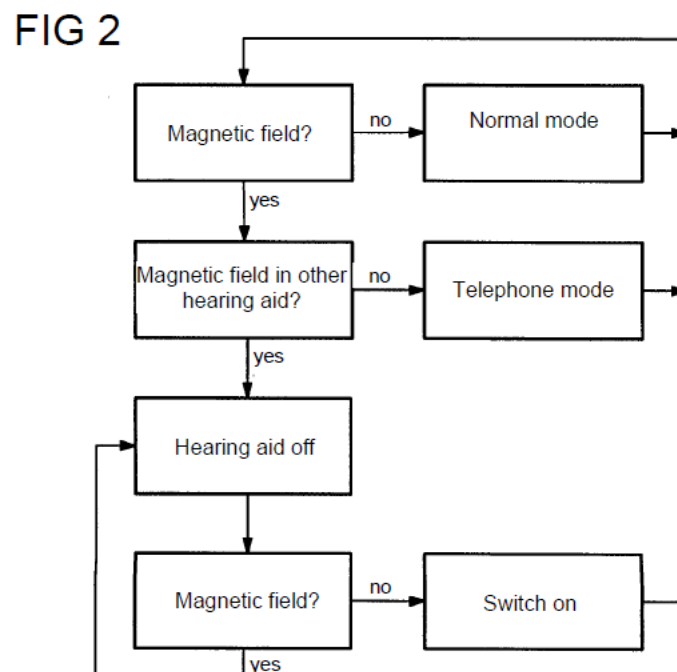
64. Therefore, Brown fails to disclose proposed substitute claim 31 as amended. Proposed substitute claim 35 depends from proposed substitute claim 31, and therefore Brown also fails to disclose proposed substitute claim 35 for at least the same reasons as for proposed substitute claim 31. As a result, Brown does not anticipate proposed substitute claims 31 and 35, corresponding to original claims 10 and 14, due to at least the additional functionalities added in the proposed amendments.

b) Ground 2 – Hain

65. In Ground 2, the Petition asserts that Hain anticipates claims 1-3 and 5. Petition, 22. Claims 1-3 and 5 correspond to proposed substitute claims 22-24 and 26, respectively. In my opinion, Hain does not disclose proposed substitute claims 22-24.

66. In particular, proposed substitute claim 22 (which proposed substitute claims 23, 24 and 26 depend from) requires that the “powering circuitry of the in-ear wireless earpieces utilizing a high power mode in response to detecting a

magnetic field is not applied to one or more of the in-ear wireless earpieces.” Petitioner maps this limitation (present in the original claims) to Figure 2 of Hain, which introduces Hain’s “telephone mode.” Petitioner maps Hain’s “telephone mode” to the claimed “high power mode.” In Hain’s telephone mode, if a magnetic field is applied to one hearing aid but not the other, that hearing aid (detecting the magnetic field) will operate in a high power mode. The idea behind this concept is that a singularly detected magnetic field would indicate the presence of a telephone being held next to a hearing aid, and the wearer of the hearing aid would need increased power to that hearing aid to pick up the sound coming from the phone. Ex-1006, Figure 2, [0004], [0010].



Ex-1004, Figure 2.

67. Hain's teaching is the opposite of what is claimed by the '853 Patent. In the present claims, the "powering circuitry of the wireless earpieces utilize[es] a high power mode in response to detecting a magnetic field is not applied to one of the wireless earpieces." In the '853 Patent, when a singular wireless earpiece detects a magnetic field, a POSA would understand that it is the other wireless earpiece (*not* detecting the magnetic field) that enters into a high power mode, presumably because the user has removed the hearing aid from the case and it now needs to be ready for use. In other words, in the '853 Patent, the wireless earpiece will utilize a high power mode in response to detecting *the absence* of a magnetic field. This is demonstrated by Figure 5 of the '853 Patent, reproduced below.

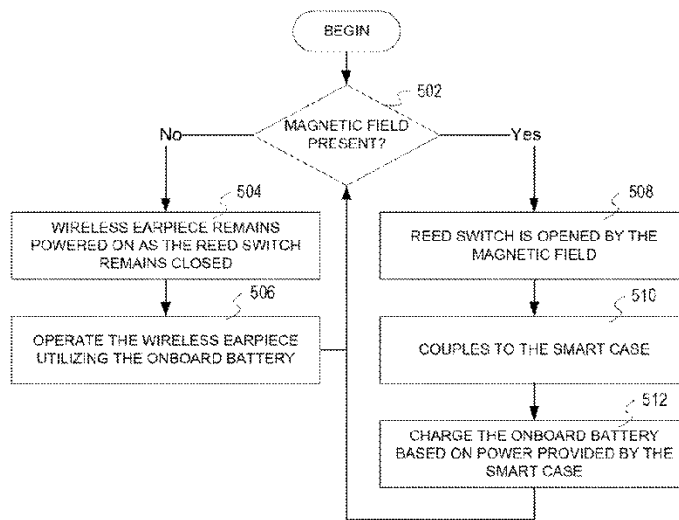


FIG. 5

Ex-1001, Figure 5.

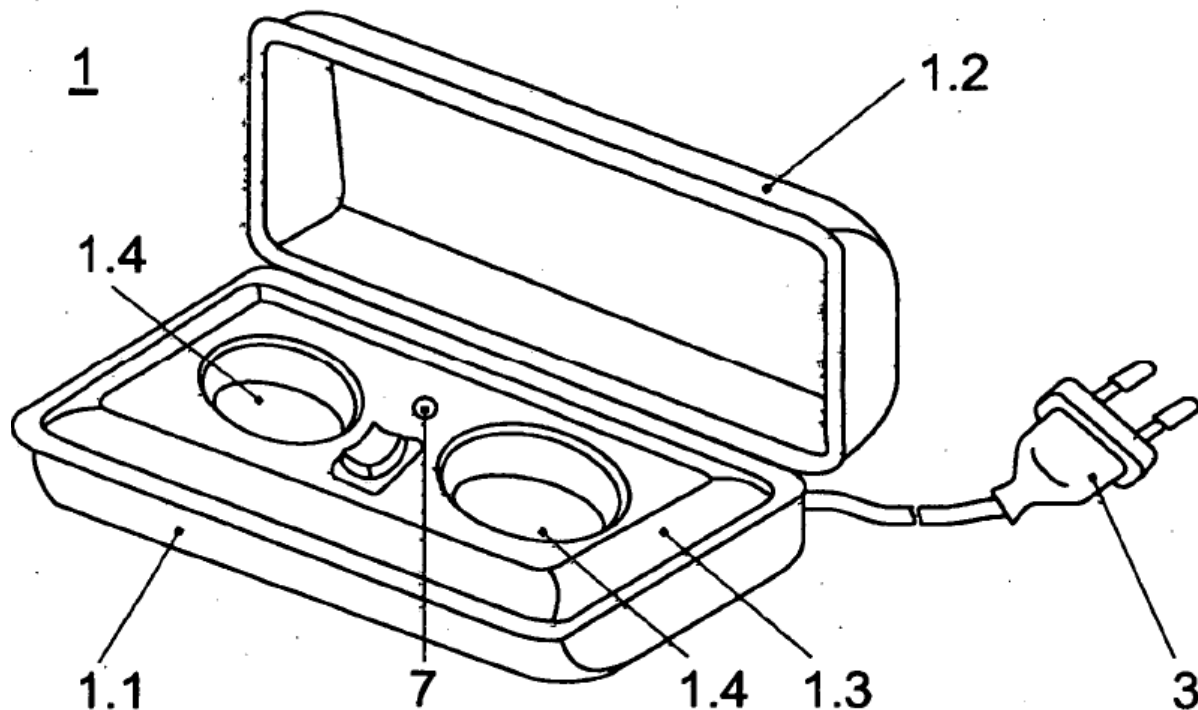
68. Therefore, Hain fails to anticipate the claims of the '853 Patent as presented in Petitioner's Ground 2.

c) Ground 3 – Steinbrecher

69. The Petition states that Steinbrecher anticipates claims 10 and 21. Petition, 30. Original claims 10 and 21 correspond to proposed substitute claims 31 and 42, respectively. However, Steinbrecher does not disclose a “smart case

comprising a rechargeable battery configured to receive charge inductively and to charge the in-ear wireless earpiece” as required by the amendments to proposed substitute claims 31 and 42.

70. Steinbrecher discloses a charging shell comprising a coil, not a rechargeable battery. This coil is charged when the charging shell is plugged into an outlet, there’s no battery inside of the charging shell that is being recharged. This is illustrated by Figure 1, reproduced below. Steinbrecher’s charging shell comprises “a primary coil arranged in the first circuit arrangement” that is “connected by the mains plug 3 to the electrical network” or “with a plug-in power supply.” Ex-1006, [0009], [0024].



Ex. 1006, Fig. 1.

71. Steinbrecher does not disclose a rechargeable battery configured to receive charge inductively, Steinbrecher discloses no rechargeable battery at all. Therefore, Steinbrecher does not anticipate proposed substitute claims 31 and 42.

d) Grounds 4-5

72. Grounds 4-5 rely on a combination of references, each combination including Hain. As I explained above above, Hain does not disclose “powering circuitry of the wireless earpieces utilizing a high power mode in response to detecting a magnetic field is not applied to one of the wireless earpieces,” as claimed by the proposed substitute claim 22 (corresponding to original claim 1). Petitioner similarly relies on Hain as disclosing this limitation for this limitation in Grounds 4 and 5. Claims 2-9 (proposed substitute claims 23-30) each depend from claim 1 (proposed substitute claim 22), and similarly each fail to disclose this base limitation.

73. As a result, Grounds 4 and 5 fail for the same reasons as I explained above with respect to Ground 2.

e) Grounds 6-7

74. Grounds 6-7 rely on a combination of references, including some combination of Shaffer, Steinbrecher and Sorensen. *See* Petition, 42-92. Grounds 6-7 challenge claims 10-21 (corresponding to proposed substitute claims 31-42). None of these three references teach a “smart case comprising a rechargeable

battery configured to receive charge inductively and to charge the in-ear wireless earpiece” as required by proposed substitute claims 31 and 42 (the independent claims challenged by Grounds 6-7). The dependent claims challenged fail for the same reasons as the independent claims from which they depend.

75. As I explained above, Steinbrecher discloses a charging shell with a coil, not a rechargeable battery. Because Steinbrecher fails to disclose a rechargeable battery, Steinbrecher cannot teach a rechargeable battery configured to receive charge inductively.

76. Sorensen refers to batteries, but nowhere teaches a rechargeable battery as required by the proposed substitute claims. Because Sorensen fails to teach a rechargeable battery, Sorensen cannot teach a rechargeable battery configured to receive charge inductively.

77. Finally, Shaffer teaches that its case charges earbuds via a power input jack to charge earbud batteries. *Id.* at [0054]. Shaffer teaches that the case may contain an internal rechargeable battery, but not a rechargeable battery configured to receive charge inductively. *Id.* at [0056].

78. None of the three references relied on in Grounds 6 and 7 disclose a “smart case comprising a rechargeable battery configured to receive charge inductively and to charge the in-ear wireless earpiece.” Therefore, Grounds 6 and 7 fail. Ex. 2001 at ¶ 75.

X. CONCLUSION

3. This declaration represents the opinions that I have formed up to date based on the material currently available to me. I reserve the right to revise, supplement, and/or amend my opinions stated in this declaration based on new information that becomes available to me and on my continuing analysis of the materials available to me.

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

Dated: April 12, 2024



Dr. Darrin Young