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Please find below and/or attached an Office communication concerning this application or proceeding.

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***EX PARTE* REEXAMINATION COMMUNICATION TRANSMITTAL FORM**

REEXAMINATION CONTROL NO. 90/015,146 .

PATENT UNDER REEXAMINATION 10979836 .

ART UNIT 3992 .

Enclosed is a copy of the latest communication from the United States Patent and Trademark Office in the above identified *ex parte* reexamination proceeding (37 CFR 1.550(f)).

Where this copy is supplied after the reply by requester, 37 CFR 1.535, or the time for filing a reply has passed, no submission on behalf of the *ex parte* reexamination requester will be acknowledged or considered (37 CFR 1.550(g)).

EX PARTE REEXAMINATION FINAL ACTION

Notice of Pre-AIA or AIA Status

The present application is being examined under the pre-AIA first to invent provisions.

I. Summary

Claims 1-18 of US Patent 10,979,836 B2 to Usher *et al.* (hereinafter "the '836 Patent") as well as new claims 19-42 are currently under *ex parte* reexamination for the reasons set forth in the order granting *ex parte* reexamination ("Order") mailed December 19, 2022, responsive to the Request for reexamination filed October 28, 2022 ("Request") by the Third Party Requester ("Requester") as well as the amendment of June 21, 2023 ("Amendment") adding new claims 19-42.

The '836 Patent to Usher *et al.* issued April 13, 2021 based on U.S. Pat. App. Ser. No. 16/838,277, filed April 20, 2020, with an earliest possible effective filing date of September 19, 2008 based on provisional application 61/098,250. The '836 Patent is still enforceable.

Claims 1-42 are pending as issued and stand unamended in this proceeding. Claims 1-42 stand rejected below.

This action is Final.

II. Related Proceedings and Matters

The '836 Patent under this determination is currently under litigation. See, *inter alia*, *Staton Techiya, LLC v. Samsung Electronics Co., Ltd.*, No. 2:21-cv-00413-JRG-RSP (E.D. Tex. Nov. 5, 2021).

The '836 Patent is not currently subject to a Reissue proceeding, nor is it a parent of a pending continuation or subject to a pending post-grant proceeding before the Patent Trial and Appeal Board. The '836 Patent was subject to Inter Partes Review No. IPR2022-00410 before the Patent Trial and Appeal Board, which was denied. Please see the Order at 17-18 with respect to the reasons for said denial.

III. Amendment

The amendment proposes new claims 19-42 that do not comply with 37 CFR 1.530(d)-(j), which sets forth the manner of making amendments in reexamination proceedings.

Specifically, new claims 19-42 are not underlined in their entirety. Please see MPEP 2250 IV. *D.* for examples of correct presentation of new claims in an *ex parte* reexamination. However, as per MPEP § 2150 IV. *D.*, it is noted that the Examiner may accept an amendment even if the claim number is not underlined or the status identifier(s) used is not a status identifier recommended by 37 CFR 1.530(d)(2) or 1.121(c). Here the Examiner is accepting and entering the Amendment in spite of the lack of underlining of the claim number on the basis of special dispatch.

IV. Claim Interpretation

During reexamination ordered under 35 U.S.C. 304 or 35 U.S.C. 257, claims are given the broadest reasonable interpretation consistent with the specification and limitations in the specification are not read into the claims. *In re Yamamoto*, 740 F.2d 1569, 222 USPQ 934 (Fed. Cir. 1984).

The statutory presumption of validity, 35 U.S.C. 282, has no application in reexamination. *In re Etter*, 756 F.2d 852, 225 USPQ 1 (Fed. Cir. 1985).

It is noted that independent claims 1, 9, and 14 all recite limitations requiring the sending of a first or second message if a comparison meets a threshold. The broadest reasonable interpretation of a system (or apparatus or product) claim having structure that performs a function, which only needs to occur if a condition precedent is met, requires structure for performing the function should the condition occur. The system claim interpretation differs from a method claim interpretation because the claimed structure must be present in the system regardless of whether the condition is met and the function is actually performed. See *Ex parte Schulhauser*, Appeal 2013-007847 (PTAB April 28, 2016) for an analysis of contingent claim limitations in the context of both method claims and system claims. In *Schulhauser*, when analyzing the claimed system as a whole, the PTAB determined that "[t]he broadest reasonable interpretation of a system claim having structure that performs a function, which only needs to occur if a condition precedent is met, still requires structure for performing the function should the condition occur." *Schulhauser* at 14. Therefore "[t]he Examiner did not need to present evidence of the obviousness of the [] method steps of claim 1 that are not

required to be performed under a broadest reasonable interpretation of the claim (e.g., instances in which the electrocardiac signal data is not within the threshold electrocardiac criteria such that the condition precedent for the determining step and the remaining steps of claim 1 has not been met);" however to render the claimed system obvious, the prior art must teach the structure that performs the function of the contingent step along with the other recited claim limitations. *Schulhauser* at 9, 14.

Claim Limitations Interpreted Under 35 U.S.C. 112, Sixth Paragraph

The following is a quotation of pre-AIA 35 U.S.C. 112, sixth paragraph:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof.

The claims in this application are given their broadest reasonable interpretation using the plain meaning of the claim language in light of the specification as it would be understood by one of ordinary skill in the art. The broadest reasonable interpretation of a claim element (also commonly referred to as a claim limitation) is limited by the description in the specification when pre-AIA 35 U.S.C. 112, sixth paragraph, is invoked.

As explained in MPEP § 2181 I., claim limitations that meet the following three-prong test will be interpreted under § 112 ¶ 6:

- (A) the claim limitation uses the term “means” or “step” or a term used as a substitute for “means” that is a generic placeholder (also called a nonce term or a non-structural term having no specific structural meaning) for performing the claimed function;

- (B) the term “means” or “step” or the generic placeholder is modified by functional language, typically, but not always linked by the transition word “for” (e.g., “means for”) or another linking word or phrase, such as “configured to” or “so that”; and
- (C) the term “means” or “step” or the generic placeholder is not modified by sufficient structure, material, or acts for performing the claimed function.

Use of the word “means” (or “step”) in a claim with functional language creates a rebuttable presumption that the claim limitation is to be treated in accordance with § 112 ¶ 6. The presumption that the claim limitation is interpreted under § 112 ¶ 6, is rebutted when the claim limitation recites sufficient structure, material, or acts to entirely perform the recited function.

Absence of the word “means” (or “step”) in a claim creates a rebuttable presumption that the claim limitation is not to be treated in accordance with § 112 ¶ 6. The presumption that the claim limitation is not interpreted under § 112 ¶ 6, is rebutted when the claim limitation recites function without reciting sufficient structure, material or acts to entirely perform the recited function.

Claim limitations in this application that use the word “means” (or “step”) are being interpreted under § 112 ¶ 6, except as otherwise indicated in an Office action. Conversely, claim limitations in this application that do not use the word “means” (or “step”) are not being interpreted under § 112 ¶ 6, except as otherwise indicated in an Office action as per below.

This application includes one or more claim limitations that do not use the word “means,” but are nonetheless being interpreted under § 112 ¶ 6, because the claim

limitation(s) uses a generic placeholder that is coupled with functional language without reciting sufficient structure to perform the recited function and the generic placeholder is not preceded by a structural modifier. Such claim limitation(s) is/are:

1. In claim 1, *“the processor is configured to execute the instructions to perform operations, the operations comprising:
receiving a microphone signal from the microphone;
comparing the microphone signal to the test fit signal to determine eartip seal;
sending a first message if the eartip seal is below a threshold level....;
sending a second message if the eartip seal is below a threshold level....;”*
2. In claim 9, *“the processor is configured to execute the instructions to perform operations, the operations comprising:
sending a test fit signal to the speaker....;
receiving the first microphone signal;
comparing the microphone signal to the test fits signal to determine eartip seal;
sending a first message to a user if the eartip seal is above a threshold level....;
sending a second message to a user if the eartip seal is below a threshold level....where the second message is visually displayed on the device communicatively coupled to the earphone.”*
3. In claim 14, *“the processor is configured to execute the instructions to perform operations, the operations comprising:*

sending a test fit signal to the speaker....;
retrieving the microphone signal from memory....;
comparing the retrieved microphone signal to the test fit signal to
determine eartip seal;
sending a first message if the eartip seal is above a threshold level....;
sending a second message if the eartip seal is below a threshold level....”.

4. In claim 31, “the logic circuit performs operations, the operations
comprising:

receiving a microphone signal...
generating a first signal...
comparing multiple components of the first signal to the multiple
components of the test fit signal...
sending a first message if the acoustic seal value is above a first
threshold...
sending a second message if the acoustic seal value is below a second
threshold value...”

5. In claim 33, “the logic circuit performs operations, the operations
comprising:

receiving a microphone signal...
generating a first signal...
comparing multiple components of the first signal to the multiple
components of the test fit signal...
sending a first message if the acoustic seal value is below a first

threshold...

sending a second message if the acoustic seal value is above a second threshold value..."

6. In claim 37, *"the circuit performs operations, the operations comprising:*

receiving a microphone signal...

generating a first signal...

generating a second signal...

comparing the first signal to the second signal...

sending a first message if the acoustic seal value is below a first threshold...

sending a second message if the acoustic seal value is above a second threshold value..."

7. In claim 38, *"the device logic circuit...sends a test signal to the earphone*

speaker...receives a microphone signal from the ear canal

microphone...compares multiple components of the test signal to multiple components of the microphone signal...sends a visual message to a display..."

8. In claim 42, *"the logic circuit...sends a test signal to the earphone*

speaker...receives a microphone signal from the ear canal

microphone...compares multiple components of the test signal to multiple components of the microphone signal...sends a visual message to a display..."

In all three of these cases, the processor or circuit is performing a function of a computing means.

Under the three-pronged approach above, it is thus determined by the Examiner that 1) the claims use a term used as a substitute for “means” for performing the claimed function; 2) the term is modified by the functional language; and 3) the term is not modified by sufficient structure for performing the claimed function.

Specifically as to prong 3) above, in this particular case the limitations recite “function without reciting sufficient structure for performing that function.” *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015) (en banc) (quoting *Watts v. XL Systems, Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000); see also *Personalized Media Communications, LLC v. International Trade Commission*, 161 F. 3d 696, 704 (Fed. Cir. 1998). Here the function is one that may be performed by a general-purpose processor and § 112 ¶ 6 applies as further described below.

For a computer-implemented § 112 ¶ 6 claim limitation, the specification must disclose an algorithm for performing the claimed specific computer function, or else the claim is indefinite. See *Net MoneyIN, Inc. v. Verisign. Inc.*, 545 F.3d 1359, 1367 (Fed. Cir. 2008). See also *In re Aoyama*, 656 F.3d 1293, 1297, 99 USPQ2d 1936, 1939 (Fed. Cir. 2011) (“[W]hen the disclosed structure is a computer programmed to carry out an algorithm, ‘the disclosed structure is not the general purpose computer, but rather that special purpose computer programmed to perform the disclosed algorithm.’”) (quoting *WMS Gaming, Inc. v. Int’l Game Tech.*, 184 F.3d 1339, 1349, 51 USPQ2d 1385, 1391 (Fed. Cir. 1999)).

To claim a means for performing a specific computer-implemented function and then to disclose only a general purpose computer as the structure designed to perform that function amounts to pure functional claiming. *In Aristocrat Techs. Australia PTY Ltd. v. Int'l Game Tech.*, 521 F.3d 1328, 1336-37, 86 USPQ2d 1235, 1242 (Fed. Cir. 2008). In this instance, the structure corresponding to a § 112 ¶ 6 claim limitation for a computer-implemented function must include the algorithm needed to transform the general purpose computer or microprocessor disclosed in the specification. *Aristocrat*, 521 F.3d at 1333, 86 USPQ2d at 1239; *Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1340, 86 USPQ2d 1609, 1623 (Fed. Cir. 2008); *WMS Gaming, Inc. v. Int'l Game Tech.*, 184 F.3d 1339, 1349, 51 USPQ2d 1385, 1391 (Fed. Cir. 1999). The corresponding structure is not simply a general purpose computer by itself but the special purpose computer as programmed to perform the disclosed algorithm. *Aristocrat*, 521 F.3d at 1333, 86 USPQ2d at 1239. Thus, the specification must sufficiently disclose an algorithm to transform a general purpose microprocessor to the special purpose computer. See *Aristocrat*, 521 F.3d at 1338, 86 USPQ2d at 1241. ("Aristocrat was not required to produce a listing of source code or a highly detailed description of the algorithm to be used to achieve the claimed functions in order to satisfy § 112 ¶ 6. It was required, however, to at least disclose the algorithm that transforms the general purpose microprocessor to a 'special purpose computer programmed to perform the disclosed algorithm.'" (quoting *WMS Gaming*, 184 F.3d at 1349, 51 USPQ2d at 1391.)) An algorithm is defined, for example, as "a finite sequence of steps for solving a logical or mathematical problem or performing a task." Microsoft Computer Dictionary, Microsoft Press, 5th edition, 2002. Applicant may express the

algorithm in any understandable terms including as a mathematical formula, in prose, in a flow chart, or "in any other manner that provides sufficient structure." *Finisar*, 523 F.3d at 1340, 86 USPQ2d at 1623; see also *Intel Corp. v. VIA Techs., Inc.*, 319 F.3d 1357, 1366, 65 USPQ2d 1934, 1941 (Fed. Cir. 2003); *In re Dossel*, 115 F.3d 942, 946-47, 42 USPQ2d 1881, 1885 (Fed. Cir.1997); *Typhoon Touch Inc. v. Dell Inc.*, 659 F.3d 1376, 1385, 100 USPQ2d 1690, 1697 (Fed. Cir. 2011); *In re Aoyama*, 656 F.3d at 1306, 99 USPQ2d at 1945.

Thus the Examiner looks to the disclosure to construe the claim limitations to cover the corresponding structure described therein and equivalents thereof.

As to **element 1** above, looking to the specification, the description of the processor of claim 1 is described in FIG 2 element 206 and 5:53-65 and 6:35-38, describing a microprocessor, ASIC or DSP providing functionality by way of program code and operatively coupled to memory. This processor means has a particular known general function, and, based upon their known functions, do not represent sufficient structure to perform the claimed function. Rather, special programming is required. The claim term "processor" is thus interpreted to cover this corresponding structure described in the specification as performing the claimed function as well as the disclosed algorithm for performing the function. Here, the algorithm is shown in FIG 3 and the description at 8:3-58 and 16/27-35, specifically requiring that the comparison function comprise a step of cross-correlating the test vs. microphone signals. Thus the cross-correlation analysis is part of the corresponding structure claimed by way of the required algorithm and is required to be shown by the prior art to read on the claim.

As to **element 2** above, looking to the specification, the description of the processor of claim 9 is described in FIG 2 element 206 and 5:53-65 and 6:35-38, describing a microprocessor, ASIC or DSP providing functionality by way of program code and operatively coupled to memory. This processor means has a particular known general function, and, based upon their known functions, do not represent sufficient structure to perform the claimed function. Rather, special programming is required. The claim term "processor" is thus interpreted to cover this corresponding structure described in the specification as performing the claimed function as well as the disclosed algorithm for performing the function. Here, the algorithm is shown in FIG 3 and the description at 8:3-58 and 16:27-35, specifically requiring that the comparison function comprise a step of cross-correlating the test vs. microphone signals. Thus the cross-correlation analysis is part of the corresponding structure claimed by way of the required algorithm and is required to be shown by the prior art to read on the claim. *However*, it is noted here by the Examiner that the claimed function of "*where the second message is visually displayed on the device communicatively coupled to the earphone*" is not described in the patent background as any portion of the required algorithm of the claim, rather the cited portion merely states that a visual response can be provided to let the user know the status of the seal. The visual response is not described as being associated with the display and is not described as being displayed on a user device coupled to the earphone.

As to **element 3** above, looking to the specification, the description of the processor of claim 14 is described in FIG 2 element 206 and 5:53-65 and 6:35-38, describing a microprocessor, ASIC or DSP providing functionality by way of program

code and operatively coupled to memory. This processor means has a particular known general function, and, based upon their known functions, do not represent sufficient structure to perform the claimed function. Rather, special programming is required. The claim term “processor” is thus interpreted to cover this corresponding structure described in the specification as performing the claimed function as well as the disclosed algorithm for performing the function. Here, the algorithm is shown in FIG 4 and the description at 9:13-50 and 16/27-35, specifically requiring that the comparison function comprise a step of cross-correlating the test vs. microphone signals. Thus the cross-correlation analysis is part of the corresponding structure claimed by way of the required algorithm and is required to be shown by the prior art to read on the claim. However, the disclosure does not disclose the sending of a first or second message as part of the algorithm associated with FIG 4.

As to **elements 4-8** above, looking to the specification, the description of the circuit of claims 31-42 is described in FIG 2 element 206 and 5:53-65 and 6:35-38, describing a microprocessor, ASIC or DSP providing functionality by way of program code and operatively coupled to memory. This processor means has a particular known general function, and, based upon their known functions, do not represent sufficient structure to perform the claimed function. Rather, special programming is required. The claim term “processor” is thus interpreted to cover this corresponding structure described in the specification as performing the claimed function as well as the disclosed algorithm for performing the function. Here, the algorithm is shown in FIG 3 and the description at 8:3-58 and 16/27-35, specifically requiring that the comparison function comprise a step of cross-correlating the test vs. microphone signals. Thus the

cross-correlation analysis is part of the corresponding structure claimed by way of the required algorithm and is required to be shown by the prior art to read on the claim. However, there is no description in the disclosure of an algorithm as to the claimed function of sending a first or second message based on a threshold and thus no corresponding structure as to those functions.

Because this/these claim limitation(s) is/are being interpreted under § 112 ¶ 6, it/they is/are being interpreted to cover the corresponding structure described in the specification as performing the claimed function, and equivalents thereof.

If applicant does not intend to have this/these limitation(s) interpreted under § 112 ¶ 6, applicant may: (1) amend the claim limitation(s) to avoid it/them being interpreted under § 112 ¶ 6 (e.g., by reciting sufficient structure to perform the claimed function); or (2) present a sufficient showing that the claim limitation(s) recite(s) sufficient structure to perform the claimed function so as to avoid it/them being interpreted under § 112 ¶ 6.

V. Rejections

In the event the determination of the status of the application as subject to AIA 35 U.S.C. 102 and 103 (or as subject to pre-AIA 35 U.S.C. 102 and 103) is incorrect, any correction of the statutory basis for the rejection will not be considered a new ground of rejection if the prior art relied upon, and the rationale supporting the rejection, would be the same under either status.

Claim Rejections - 35 USC § 305

Claims 31-42 are rejected under 35 U.S.C. 305 as enlarging the scope of the claim(s) of the patent being reexamined¹. In 35 U.S.C. 305, it is stated that "[n]o proposed amended or new claim enlarging the scope of a claim of the patent will be permitted in a reexamination proceeding...." A claim presented in a reexamination "enlarges the scope" of the patent claims where the claim is broader than each and every claim of the patent. A claim is broader in scope than the original claims if it contains within its scope any conceivable product or process which would not have infringed the original patent. A claim is broadened if it is broader in any one respect, even though it may be narrower in other respects. The test for when an amended or "new claim enlarges the scope of an original claim under 35 U.S.C. 305 is the same as that under the 2-year limitation for reissue applications adding enlarging claims under 35 U.S.C. 251, last paragraph." *In re Freeman*, 30 F.3d 1459, 1464, 31 USPQ2d 1444,

¹ Where an amendment enlarges the scope of the claims of the patent, the amendment will be entered; however the appropriate claims will be rejected under 35 U.S.C. 305. MPEP § 2270.

1447 (Fed. Cir. 1994). See MPEP § 2258 for a discussion of enlargement of claim scope.

It is noted that new independent claims 31, 33, 37, 38, and 42 all differ from the issued claims in a number of ways, notably as to issued claim 1, which is the broadest issued claim.

First, claims 31, 33, 37, 38, and 42 no longer require a “processor”, but rather instead more broadly claim a “circuit” or “logic circuit”, of which a “processor” is a subset. Thus for this reason alone claims 31, 33, 37, 38, and 42 are broader than the issued claims, all of which are limited to a processor.

Further, claims 31 and 33 claim a function of only comparing a portion of each signal to determine seal, which is broader than the original issued claims. Additionally, claims 31 and 33 compare a generated signal, generated from the microphone and/or test signals, rather than the signals themselves as originally claimed.

Further, 31, 33, and 37 disclose the use of two different thresholds for the first and second message determination, rather than the same threshold, and claim 33 determines the first and second message as to the result of the comparison being below a threshold and above a threshold, whereas in the original claims it was opposite this.

Further, claims 38 and 42 remove entirely the requirement of the issued claims as to a threshold-based comparison, or a first or second message being sent; instead claims 38 and 42 require a single message indicating seal quality, the ear seal quality being determined more generically by way of a comparison of signals.

Lastly, 38 requires the circuitry be within a mobile device, rather than the earphone as required by the issued claims.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of pre-AIA 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same, and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of 35 U.S.C. 112 (pre-AIA), second paragraph:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 31-42 are rejected under 35 U.S.C. 112 (pre-AIA), first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor or a joint inventor, or for applications subject to pre-AIA 35 U.S.C. 112, the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claims 31, 33, 37 disclose a first and second message based on first and second threshold. Looking to the disclosure, it is noted that issued claims 1-18 (notably independent claims 1, 9, and 14) are originally filed, thus the disclosure of a first or second message being sent are considered part of the original disclosure. However, this original disclosure is not specific as to any "GOOD" message being sent based on any threshold different than the one used for the "BAD" message. Likewise, while the Patent disclose speaks of determining a good fit based on a value being between two thresholds, this is not the same as sending a message as to a good seal when a value is above one threshold and sending another message as to a bad seal when a value is below a different one. This is especially notable as to claim 33, which requires that a

message as to a good seal is based on a value being *below* a threshold, and a message as to a bad seal is based on the value being *above* a different one.

Claims 38 and 42 require a message as to an earphone seal being a visual message sent to a display. Claim 42 further specifies that the display is on a connected mobile device. Looking to the disclosure, the Patent discloses a message provided to the user in the case of a problem. This is not described as a visual message, nor one sent to a display. It is noted that issued claim 9 is originally filed, thus the disclosure of a first or second message being sent, as well as a first or second message being visually displayed on a device coupled to the earphone, are considered part of the original disclosure. However, this original disclosure is not specific as to any function of specifically sending any message to a display, rather it merely states that the message is visually displayed, and no teaching as to the processor sending any such message to a display is in the Patent.

Claims 38 and 42 further disclose a mobile device and claim 38 requires the circuitry as to the determination of seal be in the mobile device. Patent Owner provisions support for this added matter according to FIG 2 of the Patent, which shows a user mobile communication device operatively connected to the circuitry in the earphone, but there is no disclosure as to claim 38 that the user mobile communication device include circuitry that performs the functions claimed, notably as to the sending of the test signal, receiving a microphone signal, comparing the signals to determine seal, and sending a message indicating seal.

Lastly, claims 38 and 42 require that the circuitry perform the functions of sending of the test signal, receiving a microphone signal, comparing the signals to determine seal, and sending a message indicating seal responsive to user control interface signal. User control interface 214 is disclosed in FIG 2 and generally described in but the Patent does not disclose the functions above being responsive to a signal from the user control interface 214.

Claims 31-37 are rejected under 35 U.S.C. 112 (pre-AIA), second paragraph, as failing to set forth the subject matter which the inventor or a joint inventor, or for applications subject to pre-AIA 35 U.S.C. 112, the applicant regards as the invention.

As noted above as to claims 31, 33, 37, 38, and 42, claim elements 4-8 invoke pre-AIA 112 ¶ 6. However, the written description fails to disclose the corresponding structure, material, or acts for performing the entire claimed function and to clearly link the structure, material, or acts to the function. For the reasons noted above under Claim Interpretation. Therefore, the claim is indefinite and is rejected under pre-AIA 112 ¶ 2.

Applicant may:

- (a) Amend the claim so that the claim limitation will no longer be interpreted as a limitation under 112 ¶ 6;
- (b) Amend the written description of the specification such that it expressly recites what structure, material, or acts perform the entire claimed function, without introducing any new matter (35 U.S.C. 132(a)); or

- (c) Amend the written description of the specification such that it clearly links the structure, material, or acts disclosed therein to the function recited in the claim, without introducing any new matter (35 U.S.C. 132(a)).

If applicant is of the opinion that the written description of the specification already implicitly or inherently discloses the corresponding structure, material, or acts and clearly links them to the function so that one of ordinary skill in the art would recognize what structure, material, or acts perform the claimed function, applicant should clarify the record by either:

- (a) Amending the written description of the specification such that it expressly recites the corresponding structure, material, or acts for performing the claimed function and clearly links or associates the structure, material, or acts to the claimed function, without introducing any new matter (35 U.S.C. 132(a)); or
- (b) Stating on the record what the corresponding structure, material, or acts, which are implicitly or inherently set forth in the written description of the specification, perform the claimed function. For more information, see 37 CFR 1.75(d) and MPEP §§ 608.01(o) and 2181.

When a claim containing a computer-implemented 112 ¶ 6 claim limitation is found to be indefinite under 112 ¶ 2 for failure to disclose sufficient corresponding structure (e.g., the computer and the algorithm) in the specification that performs the entire claimed function, it will also lack written description under 112 ¶ 1. See MPEP § 2181 II. B. and 2163.03 VI. Thus **claims 31-37** are further rejected under 112 ¶ 1. *Id.*

Intervening Art

As noted above, claims 31-42 are rejected under § 112 ¶ 1 for lack of written description as to the added matter. The instant '836 Patent was filed April 20, 2020 as a continuation of U.S. Pat. 10,701,499, filed May 16, 2019, and ultimately claims a priority date of September 19, 2008 from provisional application 61/098,250. The later-filed application must be an application for a patent for an invention which is also disclosed in the prior application (the parent or earlier-filed nonprovisional application or provisional application for which benefit is claimed). The disclosure of the invention in the parent application and in the later-filed application must be sufficient to comply with the requirements of the first paragraph of pre-AIA 35 U.S.C. 112, except for the best mode requirement. See *Transco Products, Inc. v. Performance Contracting, Inc.*, 38 F.3d 551, 32 USPQ2d 1077 (Fed. Cir. 1994). As the added matter does not exist in the parent applications, the effective filing date of claims 31-42 is, at best, the filing date of the underlying application, namely April 20, 2020, for the purposes of applying prior art under pre-AIA 35 U.S.C. 102. See MPEP §§ 211.05 and 2217 ("the effective date of some of the claims in a patent which resulted from a continuing application under 35 U.S.C. 120 could be the filing date of the continuing application since those claims were not supported in the parent application. Therefore, intervening patents or printed publications are available as prior art. See *In re Ruscetta*, 255 F.2d 687, 118 USPQ 101 (CCPA 1958), *In re van Langenhoven*, 458 F.2d 132, 173 USPQ 426 (CCPA 1972).").

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103 which forms the basis for all obviousness rejections set forth in this Office action:

A patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries for establishing a background for determining obviousness under 35 U.S.C. 103 are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 5-8, 14-16, 18, 20-22, and 28-30 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. PGPUB 2004/0196992 A1 to Ryan ("Ryan") in view of U.S. Pat. 6,567,524 B1 to Svean *et al.* ("Svean") and U.S. Pat. PGPUB 2005/0096899 A1 to Padhi *et al.* ("Padhi").

As to claim 1, Ryan discloses:

An earphone configured to perform an eartip fit test

Ryan discloses an earphone. Ryan at ¶¶ [0002] and [0059]. This earphone is configured to perform an eartip fitment test. *Id.* at ¶[0053].

comprising:

a microphone;

a speaker, where the speaker is configured to emit an audio test signal in response to receiving a test fit signal;

Ryan discloses a microphone as well as a speaker for emitting an audio signal in response to receiving a signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026]. The signal connected to the loudspeaker is used to further determine the seal i.e. the fit of the earphone as described below, and thus the signal connected to the loudspeaker reads a test fit signal.

an eartip, configured to seal the earphone between the first side and a second side of the earphone;

Ryan discloses that the end 10 of the earphone device forms a seal in the cavity 12 i.e. the ear canal, which reads an eartip for sealing between a first and second end (side) of the earphone. Ryan at ¶¶[0020], [0024], and [0053].

a memory that stores instructions;

and a processor, operatively connected to the microphone, where the processor is operatively connected to the speaker, where the processor is operatively connected to the memory, where the processor is configured to execute the instructions to perform operations,

Ryan discloses a microprocessor connected to the microphone and speaker. Ryan at ¶¶[0030]-[0031]. As Ryan discloses a programmable microprocessor, one of ordinary skill in the art would have understood that a memory storing such programming instructions would have been inherent in Ryan as such would have been inherent in the operation of such a microprocessor.

the operations comprising:

receiving a microphone signal [...];

Ryan discloses that the processor receives a microphone signal. Ryan at FIG 4 and ¶¶[0030]-[0031].

comparing the microphone signal to [...] test fit signal to determine eartip seal;

Ryan discloses that the processor compares the microphone signal to a test fit signal to determine seal. Ryan at ¶¶[0030]-[0032] and [0053]-[0056].

Ryan fails to disclose that the processor receives the microphone signal from the microphone as well as the test fit signal for the comparison, rather Ryan discloses that the processor receives a filtered and level-detected signal from elements 22 and 32 (FIG 3) which are connected to the test fit signal and microphone, respectively. Ryan further fails to disclose that the comparison is a cross-correlation as required by the construction of the claim limitation under § 112 ¶6 noted above. Ryan further fails to disclose sending a first or second message if the seal is above or below a threshold indicating a good or bad seal, respectively, however Ryan does disclose the system determining a faulty seal and providing a notification to the user that the earphone requires fitting adjustment. Ryan at ¶[0057].

Svean discloses an analogous art, namely an earphone test fitment system and method. Svean at FIG 1 and 7 as well as 5:4-59. Svean discloses the earphone comprises a foam eartip and processor that processes a microphone signal and test fit signal. *Id.* at FIG 2 and at 6:65-7:10, 12:1-14, and 12:58-64. Svean discloses that the processor may, based on the processing, provide a “go/no go” indication to a user that corresponds to the fit of the seal of the earphone. *Id.* at FIG 7 and at 12:12-14, noting a

message signal transmitted to the user if the leakage is low (*i.e.* the seal is sufficient) or another if the leakage is high (*i.e.* the seal is insufficient).

Padhi discloses an analogous art, namely an apparatus and computer program product for comparing audio signal, wherein an input signal from a microphone and a reference signal to be compared may be cross correlated with each other to generate an indication of the extent of a match between the two. Padhi at FIG 1 and at ¶¶[0001]-[0003] and [0017]-[0018].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ryan in such a manner, namely as to including the filtering/level detection elements 22 and 32 in the processing means and sending a first or second message if the seal is good or bad as per Svean, and comparing in the processing means using cross correlation as per Padhi.

First off, Ryan discloses the utility of providing feedback to a user of the earphone as to the seal and fit of the device. Ryan at ¶¶[0054]-[0055]. One of ordinary skill in the art would have turned to Svean as to provisioning such information and would have been motivated to modify Ryan by such teachings based on Svean's disclosure that leakage should be detected and remedied before exposure to noise in order to avoid damaging the user's hearing. Svean at 3:60-4:7. Further, including the filtering and level detection means in the processor would have been seen by one of ordinary skill in the art as a routine engineering decision to make elements integral, a common and known supporting rationale for obviousness, thus simplifying the system. MPEP § 2144.04 V. B., citing *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

Second, Ryan discloses comparing audio signals to determine a seal, and thus one of ordinary skill in the art would have looked to Padhi for examples of comparing signals, and would have been motivated by Padhi's disclosure that cross correlating a microphone signal and reference signal is an improvement over merely comparing the levels of the signal (such as in Ryan), improving accuracy. Padhi at ¶[0003]-[0005]. Further, one of ordinary skill in the art, understanding that cross correlation of signals was a notoriously well-known method of comparing audio signals at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Further as to claim 2,

The earphone according to claim 1, where the audio test signal has a frequency component that is below 1000 Hz.

Ryan discloses that the signals being compared may be filtered such that the comparison is between components between 200-500Hz, which means that the audio test signal would necessarily have a frequency component in this range *i.e.* less than 1000Hz.

Further as to claim 3,

The earphone according to claim 2, where the frequency component is below 400 Hz.

Ryan discloses that the signals being compared may be filtered such that the comparison is between components between 200-500Hz, which means that the audio

test signal would necessarily have a frequency component in this range *i.e.* less than 400Hz.

Further as to claim 5,

The earphone according to claim 3, where the eartip is a foam eartip.

Svean discloses that the eartip is a foam eartip as noted above in the rejection of claim 1. Svean at 6:65-7:3.

Further as to claim 6,

The earphone according to claim 3, where the microphone signal is buffered in the memory.

While the combination of Ryan in view of Svean and Padhi fails to disclose buffering one or more of the signals to be processed, Ryan discloses storing ratio data of the two signals prior to further processing, and Padhi discloses that the two signals are arranged such that frames line up in the time domain. Ryan at ¶[0051], Padhi at FIG 2 and ¶[0039]. One of ordinary skill in the art at the time would have found it obvious to modify the combined teachings of Ryan in view of Svean and Padhi in such a manner, namely as to storing one or both of the compared signals, in order to provide the analysis at a later time in the manner of the other teachings of Ryan, as it would help adjust the device after initial fitting as specifically stated by Ryan. *Id.* at ¶[0050].

Likewise, one of ordinary skill in the art would have understood buffering a signal in a processor to have been an obvious modification as it was in consistent use at the time of the invention in digital systems for processing and comparing two signals such that the signals are compared or processed at the same time, as shown by Padhi.

Further as to claim 7,

The earphone according to claim 3, where the eartip does not encapsulate a sealed eartip volume when inserted.

Ryan and Svean disclose that the eartip does not encapsulate a sealed eartip volume when inserted in the same manner as in the instant disclosure FIG 2. Ryan at FIG 2, Svean at FIG 1.

Further as to claim 8,

The earphone according to claim 6, where the received microphone signal is recording when the audio test signal is being emitted by the speaker.

Ryan discloses that the system may simultaneously and continuously monitor the input test signal and the microphone signal to compare the two. Ryan at ¶¶[0025] and [0029]-[0030], which reads recording.

Further as to claim 20,

The earphone according to claim 1, wherein the test signal is acoustically masked.

Svean discloses that the test signal may be acoustically masked. Svean at 13/12-18.

Further as to claim 21,

The earphone according to claim 3, wherein the frequency component is below 50 Hz.

Svean discloses that the test signal may be below 50 Hz. Svean at 13/12-18.

Further as to claim 22,

The earphone according to claim 1, wherein the operations further comprise sending a test fit signal to the speaker when the test can be performed unobtrusively to the user.

Svean discloses that the test signal may be sent in an unobtrusive manner.

Svean at 13/12-18.

As to claim 14, Ryan discloses:

An earphone configured to perform an eartip fit test comprising:

Ryan discloses an earphone. Ryan at ¶¶ [0002] and [0059]. This earphone is configured to perform an eartip fitment test. *Id.* at ¶[0053].

a microphone, configured to output a microphone signal based on a measurement of sound captured from a first side of the earphone;

a speaker;

Ryan discloses a microphone as well as a speaker for emitting an audio signal in response to receiving a signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026]. The microphone is configured to output a signal based on a measurement of sound from a first side of the device. *Id.*

an eartip, configured to seal the earphone between the first side and a second side of the earphone, where the eartip does not encapsulate a sealed eartip volume when inserted;

Ryan discloses that the end 10 of the earphone device forms a seal in the cavity 12 *i.e.* the ear canal, which reads an eartip for sealing between a first and second end (side) of the earphone. Ryan at ¶¶[0020], [0024], and [0053]. Ryan discloses that the

eartip does not encapsulate a sealed eartip volume when inserted in the same manner as in the instant disclosure FIG 2. Ryan at FIG 2.

a memory that stores instructions [...];

and a processor, operatively connected to the first microphone;

where the processor is operatively connected to the speaker, where the processor is operatively connected to the memory, where the processor is configured to execute the instructions to perform operations,

Ryan discloses a microprocessor connected to the microphone and speaker. Ryan at ¶¶[0030]-[0031]. As Ryan discloses a programmable microprocessor, one of ordinary skill in the art would have understood that a memory storing such programming instructions would have been inherent in Ryan as such would have been inherent in the operation of such a microprocessor.

the operations comprising:

sending a test fit signal to the speaker, where the speaker emits an audio test signal in response to the test fit signal;

Ryan discloses sending a test fit signal to the speaker. The signal connected to the loudspeaker is used to further determine the seal *i.e.* the fit of the earphone as described below, and thus the signal connected to the loudspeaker reads a test fit signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026].

[...];

comparing the retrieved microphone signal to the test fit signal to determine eartip seal;

Ryan discloses that the processor receives a microphone signal. Ryan at FIG 4 and ¶¶[0030]-[0031]. Ryan discloses that the processor compares the microphone signal to a test fit signal to determine seal. Ryan at ¶¶[0030]-[0032] and [0053]-[0056].

Ryan fails to disclose that the processor buffers the microphone signal and the processor retrieves the microphone signal from the memory as well as provides the test fit signal for the comparison, rather Ryan discloses that the processor receives a filtered and level-detected signal from elements 22 and 32 (FIG 3) which are connected to the test fit signal and microphone, respectively. Ryan further fails to disclose that the comparison is a cross-correlation analysis as required by the construction of the claim limitation under § 112 ¶6 noted above. Ryan further fails to disclose sending a first or second message if the seal is above or below a threshold indicating a good or bad seal, respectively, however Ryan does disclose the system determining a faulty seal and providing a notification to the user that the earphone requires fitting adjustment. Ryan at ¶[0057]. Ryan further fails to disclose that the time span of the microphone signal corresponds to the timespan of the emission of the audio signal.

Svean discloses an analogous art, namely an earphone test fitment system and method. Svean at FIG 1 and 7 as well as 5:4-59. Svean discloses the earphone comprises a foam eartip and processor that creates a test signal and provides such to a speaker, and processes the test signal and a microphone signal from a microphone M2 to determine fitment. *Id.* at FIG 2 and FIG 8 and at 6:65-7:10, 12:1-14, and 12:58-64. Svean discloses that the processor may, based on the processing, provide a “go/no go” indication to a user that corresponds to the fit of the seal of the earphone. *Id.* at FIG 7 and at 12:12-14, noting a message signal transmitted to the user if the leakage is low (*i.e.* the seal is sufficient) or another if the leakage is high (*i.e.* the seal is insufficient). Svean further discloses a second microphone M1 along with a first microphone M2, the second being arranged on another side of the device (FIG 1) and thus outputting a

signal based on sound measured closer to the other side of the earphone than the first microphone. *Id.* at 5:66-6:21.

Padhi discloses an analogous art, namely an apparatus and computer program product for comparing audio signals, wherein an input signal from a microphone and a reference signal to be compared may be cross correlated with each other to generate an indication of the extent of a match between the two. Padhi at FIG 1 and at ¶¶[0001]-[0003] and [0017]-[0018]. Padhi mentions that the first and second signals may each be one or more frames, thus they may each be the same number of frames *i.e.* the same time span. *Id.* at ¶¶[0036]-[0037].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ryan in such a manner, namely as to including the filtering/level detection elements 22 and 32 in the processing means as well as the test fit signal, and sending a first or second message if the seal is good or bad as per Svean, and comparing in the processing means using cross correlation and time window alignment as per Padhi.

First off, Ryan discloses the utility of providing feedback to a user of the earphone as to the seal and fit of the device. Ryan at ¶¶[0054]-[0055]. One of ordinary skill in the art would have turned to Svean as to provisioning such information and would have been motivated to modify Ryan by such teachings based on Svean's disclosure that leakage should be detected and remedied before exposure to noise to avoid damaging the user's hearing. Svean at 3:60-4:7. Further, including the filtering and level detection means and signal means in the processor would have been seen by one of ordinary skill in the art as a routine engineering decision to make elements

integral, a common and known supporting rationale for obviousness, thus simplifying the system. MPEP § 2144.04 V. B., citing *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

Second, Ryan discloses comparing audio signals to determine a seal, and thus one of ordinary skill in the art would have looked to Padhi for examples of comparing signals, and would have been motivated by Padhi's disclosure that cross correlating a microphone signal and reference signal is an improvement over merely comparing the levels of the signal (such as in Ryan), improving accuracy. Padhi at ¶[0003]-[0005]. Further, one of ordinary skill in the art, understanding that cross correlation of signals was a notoriously well-known method of comparing audio signals at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

As to the memory storing the signal and the processor retrieving it, while the combination of Ryan in view of Svean and Padhi fails to disclose buffering one or more of the signals to be processed, Ryan discloses storing ratio data of the two signals prior to further processing, and Padhi discloses that the two signals are arranged such that frames line up in the time domain. Ryan at ¶[0051], Padhi at FIG 2 and ¶[0039]. One of ordinary skill in the art at the time would have found it obvious to modify the combined teachings of Ryan in view of Svean and Padhi in such a manner, namely as to storing one or both of the compared signals, in order to provide the analysis at a later time in the manner of the other teachings of Ryan, as it would help adjust the device after initial

fitting as specifically stated by Ryan. *Id.* at ¶[0050]. Likewise, one of ordinary skill in the art would have understood buffering a signal in a processor to have been an obvious modification as it was in consistent use at the time of the invention in digital systems for processing and comparing two signals such that the signals are compared or processed at the same time, as shown by Padhi.

Further as to claim 15,

The earphone according to claim 14, where the audio test signal has a frequency component that is below 1000 Hz.

Ryan discloses that the signals being compared may be filtered such that the comparison is between components between 200-500Hz, which means that the audio test signal would necessarily have a frequency component in this range *i.e.* less than 1000Hz.

Further as to claim 16,

The earphone according to claim 15, where the frequency component is below 400 Hz.

Ryan discloses that the signals being compared may be filtered such that the comparison is between components between 200-500Hz, which means that the audio test signal would necessarily have a frequency component in this range *i.e.* less than 400Hz.

Further as to claim 18,

The earphone according to claim 16, where the eartip is a foam eartip.

Svean discloses that the eartip is a foam eartip as noted above in the rejection of claim 14. Svean at 6:65-7:3.

Further as to claim 28,

The earphone according to claim 14, wherein the test signal is acoustically masked.

Svean discloses that the test signal may be acoustically masked. Svean at 13/12-18.

Further as to claim 29,

The earphone according to claim 16, wherein the frequency component is below 50 Hz.

Svean discloses that the test signal may be below 50 Hz. Svean at 13/12-18.

Further as to claim 30,

The earphone according to claim 14, wherein the operations further comprise sending a test fit signal to the speaker when the test can be performed unobtrusively to the user and can provide an accurate test.

Svean discloses that the test signal may be sent in an unobtrusive manner.
Svean at 13/12-18.

Claims 9-13 and 24-26 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. PG PUB 2004/0196992 A1 to Ryan ("Ryan") in view of U.S. Pat. 6,567,524 B1 to Svean *et al.* ("Svean") and U.S. Pat. PG PUB 2005/0096899 A1 to Padhi *et al.* ("Padhi"), and U.S. PG PUB 2006/0188105 A1 to Baskerville *et al.* ("Baskerville").

As to claim 9, Ryan discloses:

An earphone configured to perform an eartip fit test comprising:

Ryan discloses an earphone. Ryan at ¶¶ [0002] and [0059]. This earphone is configured to perform an eartip fitment test. *Id.* at ¶[0053].

a first microphone, configured to output a first microphone signal based on a measurement of sound measured from a first side of the earphone;

[...]

a speaker;

Ryan discloses a microphone as well as a speaker for emitting an audio signal in response to receiving a signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026]. The microphone is configured to output a signal based on a measurement of sound from a first side of the device. *Id.*

an eartip, configured to seal the earphone between the first side and a second side of the earphone;

Ryan discloses that the end 10 of the earphone device forms a seal in the cavity 12 *i.e.* the ear canal, which reads an eartip for sealing between a first and second end (side) of the earphone. Ryan at ¶¶[0020], [0024], and [0053].

a memory that stores instructions;

and a processor, operatively connected to the first microphone, where the processor is operatively connected to the speaker, where the processor is operatively connected to the memory, where the processor is configured to execute the instructions to perform operations,

Ryan discloses a microprocessor connected to the microphone and speaker.

Ryan at ¶¶[0030]-[0031]. As Ryan discloses a programmable microprocessor, one of ordinary skill in the art would have understood that a memory storing such programming instructions would have been inherent in Ryan as such would have been inherent in the operation of such a microprocessor.

the operations comprising:

[...], where the speaker emits an audio test signal in response to the test fit signal;

Ryan discloses sending a test fit signal to the speaker. The signal connected to the loudspeaker is used to further determine the seal *i.e.* the fit of the earphone as described below, and thus the signal connected to the loudspeaker reads a test fit signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026].

receiving [...] microphone signal;

Ryan discloses that the processor receives a microphone signal. Ryan at FIG 4 and ¶¶[0030]-[0031].

comparing the microphone signal to the test fit signal to determine eartip seal;

Ryan discloses that the processor compares the microphone signal to a test fit signal to determine seal. Ryan at ¶¶[0030]-[0032] and [0053]-[0056].

Ryan fails to disclose a second microphone, although the claim does not disclose any specific purpose for the second microphone nor disclose it as being connected or

coupled to any other portion of the apparatus. Ryan fails to disclose that the processor receives the microphone signal from the microphone as well as providing the test fit signal for the comparison, rather Ryan discloses that the processor receives a filtered and level-detected signal from elements 22 and 32 (FIG 3) which are connected to the test fit signal and microphone, respectively. Ryan further fails to disclose that the comparison is a cross-correlation as required by the construction of the claim limitation under § 112 ¶6 noted above. Ryan further fails to disclose sending a first or second message to be displayed on a connected device if the seal is above or below a threshold indicating a good or bad seal, respectively, however Ryan does disclose the system determining a faulty seal and providing a notification to the user that the earphone requires fitting adjustment. Ryan at ¶[0057].

Svean discloses an analogous art, namely an earphone test fitment system and method. Svean at FIG 1 and 7 as well as 5:4-59. Svean discloses the earphone comprises a foam eartip and processor that creates a test signal and provides such to a speaker, and processes the test signal and a microphone signal from a microphone M2 to determine fitment. *Id.* at FIG 2 and FIG 8 and at 6:65-7:10, 12:1-14, and 12:58-64. Svean discloses that the processor may, based on the processing, provide a “go/no go” indication to a user that corresponds to the fit of the seal of the earphone. *Id.* at FIG 7 and at 12:12-14, noting a message signal transmitted to the user if the leakage is low (*i.e.* the seal is sufficient) or another if the leakage is high (*i.e.* the seal is insufficient). Svean further discloses a second microphone M1 along with a first microphone M2, the second being arranged on another side of the device (FIG 1) and thus outputting a

signal based on sound measured closer to the other side of the earphone than the first microphone. *Id.* at 5:66-6:21.

Padhi discloses an analogous art, namely an apparatus and computer program product for comparing audio signal, wherein an input signal from a microphone and a reference signal to be compared may be cross correlated with each other to generate an indication of the extent of a match between the two. Padhi at FIG 1 and at ¶¶[0001]-[0003] and [0017]-[0018].

Baskerville discloses an analogous art, namely a testing system and method for an in-ear device, including playing a predetermined sound through a speaker connected to a processor, reading a microphone input of the played sound at the processor, and determining the amount of attenuation performed by the in-ear device which corresponds with fitment of the earpiece. Baskerville at ¶¶[0035]-[0039] and [0045]-[0052]. Specifically, a message is provided to a user device connected to the earpiece such that a display may show a display corresponding to the proper operation of the device. *Id.* at ¶[0012].

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ryan in such a manner, namely as to providing a second microphone, as well as providing the test fit signal and further including the filtering/level detection elements 22 and 32 in the processing means, as well as sending a first or second message if the seal is good or bad, as per Svean, and comparing in the processing means using cross correlation as per Padhi, and finally providing a visual display on a coupled device as per Baskerville.

First off, Ryan discloses the utility of providing feedback to a user of the earphone as to the seal and fit of the device. Ryan at ¶¶[0054]-[0055]. One of ordinary skill in the art would have turned to Svean as to provisioning such information and would have been motivated to modify Ryan by such teachings based on Svean's disclosure that leakage should be detected and remedied before exposure to noise to avoid damaging the user's hearing. Svean at 3:60-4:7. Further, including the filtering and level detection means and signal means in the processor would have been seen by one of ordinary skill in the art as a routine engineering decision to make elements integral, a common and known supporting rationale for obviousness, thus simplifying the system. MPEP § 2144.04 V. B., citing *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

Second, Ryan discloses comparing audio signals to determine a seal, and thus one of ordinary skill in the art would have looked to Padhi for examples of comparing signals, and would have been motivated by Padhi's disclosure that cross correlating a microphone signal and reference signal is an improvement over merely comparing the levels of the signal (such as in Ryan), improving accuracy. Padhi at ¶[0003]-[0005]. Further, one of ordinary skill in the art, understanding that cross correlation of signals was a notoriously well-known method of comparing audio signals at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Third, one of ordinary skill in the art at the time of the invention would have found it obvious to modify the Ryan as to provisioning a display of the first and/or second messages on a device connected to the earpiece as taught by Baskerville, as Ryan discloses the utility of providing feedback on fitment of the device and Svean discloses connecting the earpiece to an external device for the purposes of determining access to industrial areas to minimize hearing loss in *e.g.* industrial workers. One of ordinary skill in the art would have looked to teachings like Baskerville to determine the way to provided such information to the user, and further states the use of visual indicators. Adding the teachings of Baskerville would have provided a clear visual display of the efficacy of the seal, protecting people by allowing them safe access to loud environments and thus “verifying the protection achieved on an individual basis in-field” as stated by Baskerville at ¶[0009].

Further as to claim 10,

The earphone according to claim 9, where the audio test signal has a frequency component that is below 1000 Hz.

Ryan discloses that the signals being compared may be filtered such that the comparison is between components between 200-500Hz, which means that the audio test signal would necessarily have a frequency component in this range *i.e.* less than 1000Hz.

Further as to claim 11,

The earphone according to claim 10, where the frequency component is below 400 Hz.

Ryan discloses that the signals being compared may be filtered such that the comparison is between components between 200-500Hz, which means that the audio

test signal would necessarily have a frequency component in this range *i.e.* less than 400Hz.

Further as to claim 12,

The earphone according to claim 11, where the eartip is a foam eartip.

Svean discloses that the eartip is a foam eartip as noted above in the rejection of claim 9. Svean at 6:65-7:3.

Further as to claim 13,

The earphone according to claim 11, where the eartip does not encapsulate a sealed eartip volume when inserted.

Ryan and Svean disclose that the eartip does not encapsulate a sealed eartip volume when inserted in the same manner as in the instant disclosure FIG 2. Ryan at FIG 2, Svean at FIG 1.

Further as to claim 24,

The earphone according to claim 9, wherein the test signal is acoustically masked.

Svean discloses that the test signal may be acoustically masked. Svean at 13/12-18.

Further as to claim 25,

The earphone according to claim 11, wherein the frequency component is below 50 Hz.

Svean discloses that the test signal may be below 50 Hz. Svean at 13/12-18.

Further as to claim 26,

The earphone according to claim 9, wherein the operations further comprise sending a test fit signal to the speaker when the test can be performed unobtrusively to the user and can provide an accurate test.

Svean discloses that the test signal may be sent in an unobtrusive manner.

Svean at 13/12-18.

Claim 4 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. PGPUB 2004/0196992 A1 to Ryan ("Ryan") in view of U.S. Pat. 6,567,524 B1 to Svean *et al.* ("Svean") and U.S. Pat. PGPUB 2005/0096899 A1 to Padhi *et al.* ("Padhi") as applied to claim 3 above, and further in view of U.S. PGPUB 2006/0188105 A1 to Baskerville *et al.* ("Baskerville").

As to claim 4,

The earphone according to claim 3, where the first message, if sent, is visually displayed on a device communicatively coupled to the earphone, and where the second message, if sent, is visually displayed on the device communicatively coupled to the earphone.

While disclosing the invention of claim 1 above, the combined teachings of Ryan in view of Svean and Padhi fail to disclose that the first and second messages are visually displayed on a device communicatively coupled to the earphone. Svean does, however, disclose that one such message of claim 1 above may be transmitted to an external monitoring unit. Svean at 12:11-17.

Baskerville discloses an analogous art, namely a testing system and method for an in-ear device, including playing a predetermined sound through a speaker connected

to a processor, reading a microphone input of the played sound at the processor, and determining the amount of attenuation performed by the in-ear device which corresponds with fitment of the earpiece. Baskerville at ¶¶[0035]-[0039] and [0045]-[0052]. Specifically, a message is provided to a user device connected to the earpiece such that a display may show a display corresponding to the proper operation of the device. *Id.* at ¶[0012].

Therefore, one of ordinary skill in the art at the time of the invention would have found it obvious to modify the combined teachings of Ryan in view of Svean and Padhi in such a manner, namely as to provisioning a display of the first and/or second messages on a device connected to the earpiece. Svean discloses connecting the earpiece to an external device for the purposes of determining access to industrial areas to minimize hearing loss in *e.g.* industrial workers. One of ordinary skill in the art would have looked to teachings like Baskerville to determine the way the industrial health monitoring unit would have provided such information to the user, and further states the use of visual indicators. Adding the teachings of Baskerville would have provided a clear visual display of the efficacy of the seal, protecting industrial workers by allowing them safe access to loud environments as stated by Svean, and thus “verifying the protection achieved on an individual basis in-field” as stated by Baskerville at ¶[0009].

Claim 17 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. PG PUB 2004/0196992 A1 to Ryan (“Ryan”) in view of U.S. Pat. 6,567,524 B1 to Svean *et al.* (“Svean”) and U.S. Pat. PG PUB 2005/0096899 A1 to Padhi *et al.* (“Padhi”) as applied to claim 16 above, and further in view of U.S. PG PUB 2006/0188105 A1 to Baskerville *et al.* (“Baskerville”).

As to claim 17,

The earphone according to claim 16, where the first message, if sent, is visually displayed on a device communicatively coupled to the earphone, and where the second message, if sent, is visually displayed on the device communicatively coupled to the earphone.

While disclosing the invention of claim 1 above, the combined teachings of Ryan in view of Svean and Padhi fail to disclose that the first and second messages are visually displayed on a device communicatively coupled to the earphone. Svean does, however, disclose that one such message of claim 1 above may be transmitted to an external monitoring unit. Svean at 12:11-17.

Baskerville discloses an analogous art, namely a testing system and method for an in-ear device, including playing a predetermined sound through a speaker connected to a processor, reading a microphone input of the played sound at the processor, and determining the amount of attenuation performed by the in-ear device which corresponds with fitment of the earpiece. Baskerville at ¶¶[0035]-[0039] and [0045]-[0052]. Specifically, a message is provided to a user device connected to the earpiece such that a display may show a display corresponding to the proper operation of the device. *Id.* at ¶[0012].

Therefore, one of ordinary skill in the art at the time of the invention would have found it obvious to modify the combined teachings of Ryan in view of Svean and Padhi in such a manner, namely as to provisioning a display of the first and/or second messages on a device connected to the earpiece. Svean discloses connecting the earpiece to an external device for the purposes of determining access to industrial areas to minimize hearing loss in *e.g.* industrial workers. One of ordinary skill in the art would have looked to teachings like Baskerville to determine the way the industrial health monitoring unit would have provided such information to the user, and further states the use of visual indicators. Adding the teachings of Baskerville would have provided a clear visual display of the efficacy of the seal, protecting industrial workers by allowing them safe access to loud environments as stated by Svean, and thus “verifying the protection achieved on an individual basis in-field” as stated by Baskerville at ¶[0009].

Claim 19 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. PG PUB 2004/0196992 A1 to Ryan (“Ryan”) in view of U.S. Pat. 6,567,524 B1 to Svean *et al.* (“Svean”) and U.S. Pat. PG PUB 2005/0096899 A1 to Padhi *et al.* (“Padhi”) as applied to claim 1 above, and further in view of U.S. Pat. 6,879,692 B2 to Nielsen *et al.* (“Nielsen”), newly cited².

As to claim 19,

The earphone according to claim 1, wherein the test signal is a single frequency signal.

Ryan in view of Svean and Padhi discloses claim 1 above, from which claim 19 depends, but fails to disclose the test signal being a single frequency. Ryan discloses various methods including a multifrequency signal as well as the use of a frequency sweep (meaning a single frequency at a singular point in time), and Svean discloses the benefit of two tones, but not one.

Nielsen discloses an analogous art, namely an earphone device. Nielsen at FIG 1 and at 4/19-35. The earphone comprises a processor, speaker, and microphone for picking up interior sound for use in adapting the device for a person’s hearing. *Id.* Nielsen discloses the benefit of analyzing the device’ response using a self-test initiated by the user based on a test signal and microphone signal, including the use of signal level, correlation, or cross-correlation of signals. *Id.* at 4/46-5/42 and Abstract. Nielsen further specifies the production of a single tone signal. *Id.*

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Ryan in view of Svean and Padhi to further include the use of a single tone for the test signal as disclosed by

² Bramslow is cited in an IDS provided by Patent Owner on June 22, 2023.

Nielsen. As mentioned above, the combined invention envisions numerous methods of provisioning a test signal including noise, frequency sweep, and two tones. One of ordinary skill in the art would have been motivated by Nielsen's discussion that the use of such a self-test is desirable "so that a defect in the hearing aid can be signaled to the operator", who may be fitting the device properly. Nielsen at 1/20-25. Further, one of ordinary skill in the art, understanding that the choice of test signal would have been a routine engineering decision at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Claim 23 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. PGPUB 2004/0196992 A1 to Ryan ("Ryan") in view of U.S. Pat. 6,567,524 B1 to Svean *et al.* ("Svean") and U.S. Pat. PGPUB 2005/0096899 A1 to Padhi *et al.* ("Padhi"), and U.S. PGPUB 2006/0188105 A1 to Baskerville *et al.* ("Baskerville") as applied to claim 9 above, and further in view of U.S. Pat. 6,879,692 B2 to Nielsen *et al.* ("Nielsen").

As to claim 23,

The earphone according to claim 9, wherein the test signal is a single frequency signal.

Ryan in view of Svean, Padhi, and Baskerville discloses claim 9 above, from which claim 23 depends, but fails to disclose the test signal being a single frequency. Ryan discloses various methods including a multifrequency signal as well as the use of

a frequency sweep (meaning a single frequency at a singular point in time), and Svean discloses the benefit of two tones, but not one.

Nielsen discloses an analogous art, namely an earphone device. Nielsen at FIG 1 and at 4/19-35. The earphone comprises a processor, speaker, and microphone for picking up interior sound for use in adapting the device for a person's hearing. *Id.*

Nielsen discloses the benefit of analyzing the device' response using a self-test initiated by the user based on a test signal and microphone signal, including the use of signal level, correlation, or cross-correlation of signals. *Id.* at 4/46-5/42 and Abstract. Nielsen further specifies the production of a single tone signal. *Id.*

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Ryan in view of Svean, Padhi, and Baskerville to further include the use of a single tone for the test signal as disclosed by Nielsen. As mentioned above, the combined invention envisions numerous methods of provisioning a test signal including noise, frequency sweep, and two tones. One of ordinary skill in the art would have been motivated by Nielsen's discussion that the use of such a self-test is desirable "so that a defect in the hearing aid can be signaled to the operator", who may be fitting the device properly. Nielsen at 1/20-25. Further, one of ordinary skill in the art, understanding that the choice of test signal would have been a routine engineering decision at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Claim 27 is rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. PGPUB 2004/0196992 A1 to Ryan ("Ryan") in view of U.S. Pat. 6,567,524 B1 to Svean *et al.* ("Svean") and U.S. Pat. PGPUB 2005/0096899 A1 to Padhi *et al.* ("Padhi") as applied to claim 14 above, and further in view of U.S. Pat. 6,879,692 B2 to Nielsen *et al.* ("Nielsen").

As to claim 27,

The earphone according to claim 14, wherein the test signal is a single frequency signal.

Ryan in view of Svean and Padhi discloses claim 14 above, from which claim 27 depends, but fails to disclose the test signal being a single frequency. Ryan discloses various methods including a multifrequency signal as well as the use of a frequency sweep (meaning a single frequency at a singular point in time), and Svean discloses the benefit of two tones, but not one.

Nielsen discloses an analogous art, namely an earphone device. Nielsen at FIG 1 and at 4/19-35. The earphone comprises a processor, speaker, and microphone for picking up interior sound for use in adapting the device for a person's hearing. *Id.* Nielsen discloses the benefit of analyzing the device' response using a self-test initiated by the user based on a test signal and microphone signal, including the use of signal level, correlation, or cross-correlation of signals. *Id.* at 4/46-5/42 and Abstract. Nielsen further specifies the production of a single tone signal. *Id.*

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the combined invention of Ryan in view of Svean and Padhi to further include the use of a single tone for the test signal as disclosed by Nielsen. As mentioned above, the combined invention envisions numerous methods of

provisioning a test signal including noise, frequency sweep, and two tones. One of ordinary skill in the art would have been motivated by Nielsen's discussion that the use of such a self-test is desirable "so that a defect in the hearing aid can be signaled to the operator", who may be fitting the device properly. Nielsen at 1/20-25. Further, one of ordinary skill in the art, understanding that the choice of test signal would have been a routine engineering decision at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Claims 31-34 and 37 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. PG PUB 2004/0196992 A1 to Ryan ("Ryan") in view of U.S. Pat. 6,567,524 B1 to Svean *et al.* ("Svean"), U.S. Pat. PG PUB 2005/0096899 A1 to Padhi *et al.* ("Padhi"), and U.S. Pat. PG PUB 2011/0116643 A1 to Tiscareno *et al.* ("Tiscareno"), newly cited. This is an *intervening art* rejection. See above as to the lack of written description support for these claims under § 112 ¶ 1.

As to claim 31, Ryan discloses:

An earphone configured to perform an eartip fit test

Ryan discloses an earphone. Ryan at ¶¶ [0002] and [0059]. This earphone is configured to perform an eartip fitment test. *Id.* at ¶[0053].

comprising:

a microphone;

a speaker, where the speaker is configured to emit an audio test signal in response to receiving a test fit signal:

Ryan discloses a microphone as well as a speaker for emitting an audio signal in response to receiving a signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026]. The signal connected to the loudspeaker is used to further determine the seal i.e. the fit of the earphone as described below, and thus the signal connected to the loudspeaker reads a test fit signal.

an eartip, wherein the eartip generates an acoustic seal between the first side and a second side of the earphone when the earphone is worn;

Ryan discloses that the end 10 of the earphone device forms a seal in the cavity 12 i.e. the ear canal, which reads an eartip for sealing between a first and second end (side) of the earphone. Ryan at ¶¶[0020], [0024], and [0053].

a memory that stores instructions; and

a logic circuit, operatively connected to the microphone, where the logic circuit is operatively connected to the speaker, where the logic circuit is operatively connected to the memory, where the logic circuit is formed by a processor executing the instructions, wherein the logic circuit performs operations,

Ryan discloses a microprocessor connected to the microphone and speaker, which is a logic circuit. Ryan at ¶¶[0030]-[0031]. As Ryan discloses a programmable microprocessor, one of ordinary skill in the art would have understood that a memory storing such programming instructions would have been inherent in Ryan as such would have been inherent in the operation of such a microprocessor.

the operations comprising:

receiving a microphone signal [...];

Ryan discloses that the processor receives a microphone signal. Ryan at FIG 4 and ¶¶[0030]-[0031].

comparing multiple components of the first signal to the multiple components of the test fit signal to generate an acoustic seal value, wherein multiple components are values that occur at different times or values associated with different frequencies;

Ryan discloses that the processor compares the microphone signal to a test fit signal to determine seal and provision such as a graph which reads a seal value. Ryan at ¶¶[0030]-[0032] and [0053]-[0056]. Ryan discloses comparing components of the signals together, namely intensity levels over a frequency band. *Id.* and at FIG 11.

Ryan fails to disclose that the processor receives the microphone signal from the microphone as well as the test fit signal for the comparison, rather Ryan discloses that the processor receives a filtered and level-detected signal from elements 22 and 32 (FIG 3) which are connected to the test fit signal and microphone, respectively. Ryan discloses generating a first signal, wherein the first signal is at least one of the microphone signal or a filtered microphone signal (via elements 22 and 32), however such is not disclosed as occurring in the processor.

Ryan further fails to disclose that the comparison is a cross-correlation as required by the construction of the claim limitation under § 112 ¶6 noted above. Ryan further fails to disclose sending a first or second message if the seal is above or below a first or second threshold indicating a good or bad seal, respectively, however Ryan does disclose the system determining a faulty seal and providing a notification to the user that the earphone requires fitting adjustment. Ryan at ¶[0057]. Ryan discloses that this is based on a threshold, that is, “an example actual response within a threshold level of

the baseline response over the band...indicates a well-sealed hearing instrument”, and a response outside of the threshold does not. *Id.* at ¶¶55.

Svean discloses an analogous art, namely an earphone test fitment system and method. Svean at FIG 1 and 7 as well as 5:4-59. Svean discloses the earphone comprises a foam eartip and processor that processes a microphone signal and test fit signal. *Id.* at FIG 2 and at 6:65-7:10, 12:1-14, and 12:58-64. Svean discloses that the processor may, based on the processing, provide a “go/no go” indication to a user that corresponds to the fit of the seal of the earphone. *Id.* at FIG 7 and at 12:12-14, noting a message signal transmitted to the user if the leakage is low (*i.e.* the seal is sufficient) or another if the leakage is high (*i.e.* the seal is insufficient).

Padhi discloses an analogous art, namely an apparatus and computer program product for comparing audio signal, wherein an input signal from a microphone and a reference signal to be compared may be cross correlated with each other to generate an indication of the extent of a match between the two. Padhi at FIG 1 and at ¶¶[0001]-[0003] and [0017]-[0018].

Tiscareno discloses an analogous art, namely an apparatus for evaluating in situ earphones for the ear, including evaluating seal quality. Tiscareno at ¶¶24-28. If measured seal quality is determined to be below a threshold, a message is sent to the user. Further, a second threshold, different from the first, is provided for an additional, different message to the user that the seal is incorrect. *Id.* at ¶47.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ryan in such a manner, namely as to including the filtering/level detection elements 22 and 32 in the processing means and sending a first

or second message if the seal is good or bad as per Svean, comparing in the processing means using cross correlation as per Padhi, and providing an additional message as per Tiscareno.

First off, Ryan discloses the utility of providing feedback to a user of the earphone as to the seal and fit of the device. Ryan at ¶¶[0054]-[0055]. One of ordinary skill in the art would have turned to Svean as to provisioning such information and would have been motivated to modify Ryan by such teachings based on Svean's disclosure that leakage should be detected and remedied before exposure to noise in order to avoid damaging the user's hearing. Svean at 3:60-4:7. Further, including the filtering and level detection means in the processor would have been seen by one of ordinary skill in the art as a routine engineering decision to make elements integral, a common and known supporting rationale for obviousness, thus simplifying the system. MPEP § 2144.04 V. B., citing *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

Second, Ryan discloses comparing audio signals to determine a seal, and thus one of ordinary skill in the art would have looked to Padhi for examples of comparing signals, and would have been motivated by Padhi's disclosure that cross correlating a microphone signal and reference signal is an improvement over merely comparing the levels of the signal (such as in Ryan), improving accuracy. Padhi at ¶[0003]-[0005]. Further, one of ordinary skill in the art, understanding that cross correlation of signals was a notoriously well-known method of comparing audio signals at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results.

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MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Lastly, one of ordinary skill in the art would have found it obvious to provide detailed messages as to the seal quality such as suggested by Tiscareno as Tiscareno states it would have provided an improved device. Tiscareno at ¶¶2-3 and 10. Further, one of ordinary skill in the art would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Further as to claim 32:

The earphone according to claim 31 wherein the test fit signal is filtered prior to comparing the first signal to the test fit signal.

Ryan discloses that the test fit signal is filtered prior to the comparison. Ryan at FIG 3 elements 24 and 34 and at ¶27.

As to claim 33, Ryan discloses:

An earphone

Ryan discloses an earphone. Ryan at ¶¶ [0002] and [0059]. This earphone is configured to perform an eartip fitment test. *Id.* at ¶[0053].

comprising:

a microphone;

a speaker, where the speaker is configured to emit an audio test signal in response to receiving a test fit signal:

Ryan discloses a microphone as well as a speaker for emitting an audio signal in response to receiving a signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and

[0025-0026]. The signal connected to the loudspeaker is used to further determine the seal i.e. the fit of the earphone as described below, and thus the signal connected to the loudspeaker reads a test fit signal.

an eartip, wherein the eartip generates an acoustic seal between the first side and a second side of the earphone when the earphone is worn;

Ryan discloses that the end 10 of the earphone device forms a seal in the cavity 12 i.e. the ear canal, which reads an eartip for sealing between a first and second end (side) of the earphone. Ryan at ¶¶[0020], [0024], and [0053].

**a memory that stores instructions; and
a logic circuit, operatively connected to the microphone, where the logic circuit is operatively connected to the speaker, where the logic circuit is operatively connected to the memory, where the logic circuit is formed by a processor executing the instructions, wherein the logic circuit performs operations,**

Ryan discloses a microprocessor connected to the microphone and speaker, which is a logic circuit. Ryan at ¶¶[0030]-[0031]. As Ryan discloses a programmable microprocessor, one of ordinary skill in the art would have understood that a memory storing such programming instructions would have been inherent in Ryan as such would have been inherent in the operation of such a microprocessor.

**the operations comprising:
receiving a microphone signal [...];**

Ryan discloses that the processor receives a microphone signal. Ryan at FIG 4 and ¶¶[0030]-[0031].

comparing multiple components of the first signal to the multiple components of the test fit signal to generate an acoustic seal value, wherein multiple components are values that occur at different times or values associated with different frequencies;

Ryan discloses that the processor compares the microphone signal to a test fit signal to determine seal and provision such as a graph which reads a seal value. Ryan at ¶¶[0030]-[0032] and [0053]-[0056]. Ryan discloses comparing components of the signals together, namely intensity levels over a frequency band. *Id.* and at FIG 11.

Ryan fails to disclose that the processor receives the microphone signal from the microphone as well as the test fit signal for the comparison, rather Ryan discloses that the processor receives a filtered and level-detected signal from elements 22 and 32 (FIG 3) which are connected to the test fit signal and microphone, respectively. Ryan discloses generating a first signal, wherein the first signal is at least one of the microphone signal or a filtered microphone signal (via elements 22 and 32), however such is not disclosed as occurring in the processor.

Ryan further fails to disclose that the comparison is a cross-correlation as required by the construction of the claim limitation under § 112 ¶6 noted above. Ryan further fails to disclose sending a first or second message if the seal is below or above a first or second threshold indicating a good or bad seal, respectively, however Ryan does disclose the system determining a faulty seal and providing a notification to the user that the earphone requires fitting adjustment. Ryan at ¶[0057]. Ryan discloses that this is based on a threshold, that is, “an example actual response within a threshold level of the baseline response over the band...indicates a well-sealed hearing instrument”, and a response outside of the threshold does not. *Id.* at ¶[55].

Svean discloses an analogous art, namely an earphone test fitment system and method. Svean at FIG 1 and 7 as well as 5:4-59. Svean discloses the earphone comprises a foam eartip and processor that processes a microphone signal and test fit

signal. *Id.* at FIG 2 and at 6:65-7:10, 12:1-14, and 12:58-64. Svean discloses that the processor may, based on the processing, provide a “go/no go” indication to a user that corresponds to the fit of the seal of the earphone. *Id.* at FIG 7 and at 12:12-14, noting a message signal transmitted to the user if the leakage is low (*i.e.* the seal is sufficient) or another if the leakage is high (*i.e.* the seal is insufficient).

Padhi discloses an analogous art, namely an apparatus and computer program product for comparing audio signal, wherein an input signal from a microphone and a reference signal to be compared may be cross correlated with each other to generate an indication of the extent of a match between the two. Padhi at FIG 1 and at ¶¶[0001]-[0003] and [0017]-[0018].

Tiscareno discloses an analogous art, namely an apparatus for evaluating in situ earphones for the ear, including evaluating seal quality. Tiscareno at ¶¶24-28. If measured seal quality is determined to be below a threshold, a message is sent to the user. Further, a second threshold, different from the first, is provided for an additional, different message to the user that the seal is incorrect. *Id.* at ¶47.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ryan in such a manner, namely as to including the filtering/level detection elements 22 and 32 in the processing means and sending a first or second message if the seal is good or bad as per Svean, comparing in the processing means using cross correlation as per Padhi, and providing an additional message as per Tiscareno.

First off, Ryan discloses the utility of providing feedback to a user of the earphone as to the seal and fit of the device. Ryan at ¶¶[0054]-[0055]. One of ordinary

skill in the art would have turned to Svean as to provisioning such information and would have been motivated to modify Ryan by such teachings based on Svean's disclosure that leakage should be detected and remedied before exposure to noise in order to avoid damaging the user's hearing. Svean at 3:60-4:7. Further, including the filtering and level detection means in the processor would have been seen by one of ordinary skill in the art as a routine engineering decision to make elements integral, a common and known supporting rationale for obviousness, thus simplifying the system. MPEP § 2144.04 V. B., citing *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

Second, Ryan discloses comparing audio signals to determine a seal, and thus one of ordinary skill in the art would have looked to Padhi for examples of comparing signals, and would have been motivated by Padhi's disclosure that cross correlating a microphone signal and reference signal is an improvement over merely comparing the levels of the signal (such as in Ryan), improving accuracy. Padhi at ¶[0003]-[0005]. Further, one of ordinary skill in the art, understanding that cross correlation of signals was a notoriously well-known method of comparing audio signals at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Lastly, one of ordinary skill in the art would have found it obvious to provide detailed messages as to the seal quality such as suggested by Tiscareno as Tiscareno states it would have provided an improved device. Tiscareno at ¶¶2-3 and 10. Further,

one of ordinary skill in the art would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Lastly, while the combined invention above discloses a good seal being determined above a first threshold and a bad seal being determined below a second threshold, one of ordinary skill in the art at the time of the invention would have understood the measurement of the “seal value” being either a positive or negative measurement to have been arbitrary and a routine engineering decision. That is to say, there would have been no difference between determining a positive acoustic seal as a measurement of how good the seal is and determining instead a negative value as a measurement of how bad the seal may be, and comparing the thresholds in the opposite manner as is claimed here; note that there is no specific teaching in the ‘836 Patent as to these limitations as noted above.

Further as to claim 34:

The earphone according to claim 33 wherein the test fit signal is filtered prior to comparing the first signal to the test fit signal.

Ryan discloses that the test fit signal is filtered prior to the comparison. Ryan at FIG 3 elements 24 and 34 and at ¶27.

As to claim 37, Ryan discloses:

An earphone comprising:

Ryan discloses an earphone. Ryan at ¶¶ [0002] and [0059]. This earphone is configured to perform an eartip fitment test. *Id.* at ¶[0053].

comprising:

a microphone;

a speaker, where the speaker is configured to emit an audio test signal in response to receiving a test fit signal:

Ryan discloses a microphone as well as a speaker for emitting an audio signal in response to receiving a signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026]. The signal connected to the loudspeaker is used to further determine the seal i.e. the fit of the earphone as described below, and thus the signal connected to the loudspeaker reads a test fit signal.

an eartip, wherein the eartip generates an acoustic seal between the first side and a second side of the earphone when the earphone is worn;

Ryan discloses that the end 10 of the earphone device forms a seal in the cavity 12 i.e. the ear canal, which reads an eartip for sealing between a first and second end (side) of the earphone. Ryan at ¶¶[0020], [0024], and [0053].

a memory that stores instructions; and

a circuit, operatively connected to the microphone, where the circuit is operatively connected to the speaker, where the logic circuit is operatively connected to the memory, where the circuit is formed by a processor executing the instructions, wherein the logic circuit performs operations,

Ryan discloses a microprocessor connected to the microphone and speaker, which is a circuit. Ryan at ¶¶[0030]-[0031]. As Ryan discloses a programmable microprocessor, one of ordinary skill in the art would have understood that a memory

storing such programming instructions would have been inherent in Ryan as such would have been inherent in the operation of such a microprocessor.

the operations comprising:

receiving a microphone signal [...];

Ryan discloses that the processor receives a microphone signal. Ryan at FIG 4 and ¶¶[0030]-[0031].

comparing the first signal to the second signal to generate a set of acoustic seal values;

Ryan discloses that the processor compares the microphone signal to a test fit signal to determine seal and provision such as a graph which reads a seal value. Ryan at ¶¶[0030]-[0032] and [0053]-[0056]. Ryan discloses comparing components of the signals together, namely intensity levels over a frequency band. *Id.* and at FIG 11.

Ryan fails to disclose that the processor receives the microphone signal from the microphone as well as the test fit signal for the comparison, rather Ryan discloses that the processor receives a filtered and level-detected signal from elements 22 and 32 (FIG 3) which are connected to the test fit signal and microphone, respectively. Ryan discloses generating a first filtered microphone signal and a second filtered test fit signal, (via elements 22 and 32), however such is not disclosed as occurring in the processor.

Ryan further fails to disclose that the comparison is a cross-correlation as required by the construction of the claim limitation under § 112 ¶6 noted above. Ryan further fails to disclose sending a first or second message if the seal is above or below a first or second threshold indicating a good or bad seal, respectively, however Ryan does disclose the system determining a faulty seal and providing a notification to the user that

the earphone requires fitting adjustment. Ryan at ¶[0057]. Ryan discloses that this is based on a threshold, that is, “an example actual response within a threshold level of the baseline response over the band...indicates a well-sealed hearing instrument”, and a response outside of the threshold does not. *Id.* at ¶[55].

Svean discloses an analogous art, namely an earphone test fitment system and method. Svean at FIG 1 and 7 as well as 5:4-59. Svean discloses the earphone comprises a foam eartip and processor that processes a microphone signal and test fit signal. *Id.* at FIG 2 and at 6:65-7:10, 12:1-14, and 12:58-64. Svean discloses that the processor may, based on the processing, provide a “go/no go” indication to a user that corresponds to the fit of the seal of the earphone. *Id.* at FIG 7 and at 12:12-14, noting a message signal transmitted to the user if the leakage is low (*i.e.* the seal is sufficient) or another if the leakage is high (*i.e.* the seal is insufficient).

Padhi discloses an analogous art, namely an apparatus and computer program product for comparing audio signal, wherein an input signal from a microphone and a reference signal to be compared may be cross correlated with each other to generate an indication of the extent of a match between the two. Padhi at FIG 1 and at ¶¶[0001]-[0003] and [0017]-[0018].

Tiscareno discloses an analogous art, namely an apparatus for evaluating in situ earphones for the ear, including evaluating seal quality. Tiscareno at ¶¶24-28. If measured seal quality is determined to be below a threshold, a message is sent to the user. Further, a second threshold, different from the first, is provided for an additional, different message to the user that the seal is incorrect. *Id.* at ¶47.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ryan in such a manner, namely as to including the filtering/level detection elements 22 and 32 in the processing means and sending a first or second message if the seal is good or bad as per Svean, comparing in the processing means using cross correlation as per Padhi, and providing an additional message as per Tiscareno.

First off, Ryan discloses the utility of providing feedback to a user of the earphone as to the seal and fit of the device. Ryan at ¶¶[0054]-[0055]. One of ordinary skill in the art would have turned to Svean as to provisioning such information and would have been motivated to modify Ryan by such teachings based on Svean's disclosure that leakage should be detected and remedied before exposure to noise in order to avoid damaging the user's hearing. Svean at 3:60-4:7. Further, including the filtering and level detection means in the processor would have been seen by one of ordinary skill in the art as a routine engineering decision to make elements integral, a common and known supporting rationale for obviousness, thus simplifying the system. MPEP § 2144.04 V. B., citing *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

Second, Ryan discloses comparing audio signals to determine a seal, and thus one of ordinary skill in the art would have looked to Padhi for examples of comparing signals, and would have been motivated by Padhi's disclosure that cross correlating a microphone signal and reference signal is an improvement over merely comparing the levels of the signal (such as in Ryan), improving accuracy. Padhi at ¶¶[0003]-[0005]. Further, one of ordinary skill in the art, understanding that cross correlation of signals

was a notoriously well-known method of comparing audio signals at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Lastly, one of ordinary skill in the art would have found it obvious to provide detailed messages as to the seal quality such as suggested by Tiscareno as Tiscareno states it would have provided an improved device. Tiscareno at ¶¶2-3 and 10. Further, one of ordinary skill in the art would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Claims 38-42 are rejected under pre-AIA 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. PGPUB 2004/0196992 A1 to Ryan ("Ryan") in view of U.S. Pat. 6,567,524 B1 to Svean *et al.* ("Svean"), U.S. Pat. PGPUB 2005/0096899 A1 to Padhi *et al.* ("Padhi"), and U.S. PGPUB 2006/0188105 A1 to Baskerville *et al.* ("Baskerville").

As to claim 38, Ryan discloses:

A system comprising: [...] a device logic circuit;

Ryan discloses a microprocessor which is a device logic circuit. Ryan at ¶¶[0030]-[0031].

an earphone [...], wherein the earphone includes:

an ear canal microphone; and

an earphone speaker;

Ryan discloses an earphone. Ryan at ¶¶ [0002] and [0059]. This earphone is configured to perform an eartip fitment test. *Id.* at ¶[0053]. Ryan discloses a microphone as well as a speaker for emitting an audio signal in response to receiving a signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026]. The microphone is configured to output a signal based on a measurement of sound from a first side of the device. *Id.*

[...] sends a test signal to the earphone speaker,

Ryan discloses sending a test fit signal to the speaker. The signal connected to the loudspeaker is used to further determine the seal *i.e.* the fit of the earphone as described below, and thus the signal connected to the loudspeaker reads a test fit signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026].

wherein the device logic circuit receives a microphone signal from the ear canal microphone of the earphone,

Ryan discloses that the processor receives a microphone signal. Ryan at FIG 4 and ¶¶[0030]-[0031].

wherein the device logic circuit compares multiple components of the test signal to multiple components of the microphone signal to determine an ear seal quality between a first side of the earphone and a second side of the earphone, wherein the multiple components are values that occur at different times or values associated with different frequencies,

Ryan discloses that the processor compares the microphone signal to a test fit signal to determine seal. Ryan at ¶¶[0030]-[0032] and [0053]-[0056]. Ryan discloses this occurs over a frequency band, that is, multiple frequency components of the signals are compared to determine the seal. *Id.* The seal is between the inside and outside of the earphone.

Ryan fails to disclose a second microphone, although the claim does not disclose any specific purpose for the second microphone nor disclose it as being connected or coupled to any other portion of the apparatus.

Ryan fails to disclose that the logic circuit is in a wirelessly-connected mobile device, or that the logic circuit receives the microphone signal from the microphone as well as providing the test fit signal for the comparison in response to a user control interface signal, rather Ryan discloses that the processor receives a filtered and level-detected signal from elements 22 and 32 (FIG 3) which are connected to the test fit signal and microphone, respectively. Ryan further fails to disclose that the comparison is a cross-correlation analysis as required by the construction of the claim limitation

under § 112 ¶6 noted above. Ryan further fails to disclose sending a message to be displayed indicating seal quality, however Ryan does disclose the system determining a faulty seal and providing a notification to the user that the earphone requires fitting adjustment. Ryan at ¶[0057].

Svean discloses an analogous art, namely an earphone test fitment system and method. Svean at FIG 1 and 7 as well as 5:4-59. Svean discloses the earphone comprises a foam eartip and processor that creates a test signal and provides such to a speaker, and processes the test signal and a microphone signal from a microphone M2 to determine fitment. *Id.* at FIG 2 and FIG 8 and at 6:65-7:10, 12:1-14, and 12:58-64. Svean discloses that the processor may, based on the processing, provide a “go/no go” indication to a user that corresponds to the fit of the seal of the earphone. *Id.* at FIG 7 and at 12:12-14, noting a message signal transmitted to the user if the leakage is low (*i.e.* the seal is sufficient) or another if the leakage is high (*i.e.* the seal is insufficient). Svean further discloses a second microphone M1 along with a first microphone M2, the second being arranged on another side of the device (FIG 1) and thus outputting a signal based on sound measured closer to the other side of the earphone than the first microphone. *Id.* at 5:66-6:21.

Padhi discloses an analogous art, namely an apparatus and computer program product for comparing audio signal, wherein an input signal from a microphone and a reference signal to be compared may be cross correlated with each other to generate an indication of the extent of a match between the two. Padhi at FIG 1 and at ¶¶[0001]-[0003] and [0017]-[0018].

Baskerville discloses an analogous art, namely a testing system and method for an in-ear device, including playing a predetermined sound through a speaker connected to a processor, reading a microphone input of the played sound at the processor, and determining the amount of attenuation performed by the in-ear device which corresponds with fitment of the earpiece. Baskerville at ¶¶[0035]-[0039] and [0045]-[0052]. Specifically, a message is provided to a user device connected to the earpiece such that a display may show a display corresponding to the proper operation of the device. *Id.* at ¶[0012]. The connected device is a mobile computer which includes the device logic for producing the test signal and receiving the microphone signal, comparing the two, and providing the response to the comparison on the display. *Id.* at ¶45. This would inherently be in response to a user control interface signal, as the computer program for the test would necessarily be controlled by an input means such as a keyboard or mouse. *Id.* at FIGS 13 and 15.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ryan in such a manner, namely as to providing a second microphone, as well as providing the test fit signal and further including the filtering/level detection elements 22 and 32 in the processing means, as well as sending a first or second message if the seal is good or bad, as per Svean, and comparing in the processing means using cross correlation as per Padhi, and finally providing a visual display as well as a coupled device including the testing means as per Baskerville.

First off, Ryan discloses the utility of providing feedback to a user of the earphone as to the seal and fit of the device. Ryan at ¶¶[0054]-[0055]. One of ordinary skill in the art would have turned to Svean as to provisioning such information and

would have been motivated to modify Ryan by such teachings based on Svean's disclosure that leakage should be detected and remedied before exposure to noise to avoid damaging the user's hearing. Svean at 3:60-4:7. Further, including the filtering and level detection means and signal means in the processor would have been seen by one of ordinary skill in the art as a routine engineering decision to make elements integral, a common and known supporting rationale for obviousness, thus simplifying the system. MPEP § 2144.04 V. B., citing *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

Second, Ryan discloses comparing audio signals to determine a seal, and thus one of ordinary skill in the art would have looked to Padhi for examples of comparing signals, and would have been motivated by Padhi's disclosure that cross correlating a microphone signal and reference signal is an improvement over merely comparing the levels of the signal (such as in Ryan), improving accuracy. Padhi at ¶[0003]-[0005]. Further, one of ordinary skill in the art, understanding that cross correlation of signals was a notoriously well-known method of comparing audio signals at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Third, one of ordinary skill in the art at the time of the invention would have found it obvious to modify the Ryan as to provisioning a display of the first and/or second messages on a device connected to the earpiece as taught by Baskerville, as Ryan discloses the utility of providing feedback on fitment of the device and Svean discloses

connecting the earpiece to an external device for the purposes of determining access to industrial areas to minimize hearing loss in e.g. industrial workers. One of ordinary skill in the art would have looked to teachings like Baskerville to determine the way to provided such information to the user, and further states the use of visual indicators. Adding the teachings of Baskerville would have provided a clear visual display of the efficacy of the seal, protecting people by allowing them safe access to loud environments and thus “verifying the protection achieved on an individual basis in-field” as stated by Baskerville at ¶[0009].

Further as to claim 39,

The system according to claim 38, wherein the ear seal quality is poor or good.

Ryan and Svean disclose that the seal is either good or bad (that is, poor or good). Ryan at ¶55, Svean at 13/1-4.

Further as to claim 40,

The system according to claim 38, wherein the values are amplitudes and the multiple components are amplitudes that vary in time.

Ryan discloses that the signals are compared using frequency sweeps, that is, that the components are amplitudes that vary in frequency and over a period of time. Ryan at Ryan at ¶¶[0030]-[0032] and [0053]-[0056].

Further as to claim 41,

The system according to claim 38, wherein the values are amplitudes and the multiple components are amplitudes that vary in frequency.

Ryan discloses that the signals are compared over frequencies, that is, that the components are amplitudes that vary in frequency. Ryan at Ryan at ¶¶[0030]-[0032] and [0053]-[0056].

As to claim 42, Ryan discloses:

A system comprising: [...]

an earphone [...], wherein the earphone includes:

an ear canal microphone; and

an earphone speaker; and

a logic circuit;

Ryan discloses a system comprising an earphone. Ryan at ¶¶ [0002] and [0059]. This earphone is configured to perform an eartip fitment test. *Id.* at ¶[0053]. Ryan discloses a microphone as well as a speaker for emitting an audio signal in response to receiving a signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026]. The microphone is configured to output a signal based on a measurement of sound from a first side of the device. *Id.* Ryan discloses a microprocessor which is a device logic circuit. Ryan at ¶¶[0030]-[0031].

[...] sends a test signal to the earphone speaker,

Ryan discloses sending a test fit signal to the speaker. The signal connected to the loudspeaker is used to further determine the seal *i.e.* the fit of the earphone as

described below, and thus the signal connected to the loudspeaker reads a test fit signal. Ryan at FIG 3 elements 30 and 20 and ¶¶[0020] and [0025-0026].

wherein the logic circuit receives a microphone signal from the ear canal microphone of the earphone,

Ryan discloses that the processor receives a microphone signal. Ryan at FIG 4 and ¶¶[0030]-[0031].

wherein the logic circuit compares multiple components of the test signal to multiple components of the microphone signal to determine an ear seal quality between a first side of the earphone and a second side of the earphone, wherein the multiple components are values that occur at different times or values associated with different frequencies,

Ryan discloses that the processor compares the microphone signal to a test fit signal to determine seal. Ryan at ¶¶[0030]-[0032] and [0053]-[0056]. Ryan discloses this occurs over a frequency band, that is, multiple frequency components of the signals are compared to determine the seal. *Id.* The seal is between the inside and outside of the earphone.

Ryan fails to disclose a second microphone, although the claim does not disclose any specific purpose for the second microphone nor disclose it as being connected or coupled to any other portion of the apparatus.

Ryan fails to disclose a wirelessly-connected mobile device, although the claim does not disclose any specific purpose for or function associated with the mobile device.

Ryan fails to disclose that the logic circuit receives the microphone signal from the microphone as well as providing the test fit signal for the comparison in response to a user control interface signal, rather Ryan discloses that the processor receives a

filtered and level-detected signal from elements 22 and 32 (FIG 3) which are connected to the test fit signal and microphone, respectively. Ryan further fails to disclose that the comparison is a cross-correlation analysis as required by the construction of the claim limitation under § 112 ¶6 noted above. Ryan further fails to disclose sending a message to be displayed indicating seal quality, however Ryan does disclose the system determining a faulty seal and providing a notification to the user that the earphone requires fitting adjustment. Ryan at ¶[0057].

Svean discloses an analogous art, namely an earphone test fitment system and method. Svean at FIG 1 and 7 as well as 5:4-59. Svean discloses the earphone comprises a foam eartip and processor that creates a test signal and provides such to a speaker, and processes the test signal and a microphone signal from a microphone M2 to determine fitment. *Id.* at FIG 2 and FIG 8 and at 6:65-7:10, 12:1-14, and 12:58-64. Svean discloses that the processor may, based on the processing, provide a “go/no go” indication to a user that corresponds to the fit of the seal of the earphone. *Id.* at FIG 7 and at 12:12-14, noting a message signal transmitted to the user if the leakage is low (*i.e.* the seal is sufficient) or another if the leakage is high (*i.e.* the seal is insufficient). Svean further discloses a second microphone M1 along with a first microphone M2, the second being arranged on another side of the device (FIG 1) and thus outputting a signal based on sound measured closer to the other side of the earphone than the first microphone. *Id.* at 5:66-6:21.

Padhi discloses an analogous art, namely an apparatus and computer program product for comparing audio signal, wherein an input signal from a microphone and a reference signal to be compared may be cross correlated with each other to generate

an indication of the extent of a match between the two. Padhi at FIG 1 and at ¶¶[0001]-[0003] and [0017]-[0018].

Baskerville discloses an analogous art, namely a testing system and method for an in-ear device, including playing a predetermined sound through a speaker connected to a processor, reading a microphone input of the played sound at the processor, and determining the amount of attenuation performed by the in-ear device which corresponds with fitment of the earpiece. Baskerville at ¶¶[0035]-[0039] and [0045]-[0052]. Specifically, a message is provided to a user device connected to the earpiece such that a display may show a display corresponding to the proper operation of the device. *Id.* at ¶[0012]. The connected device is a mobile computer which includes the device logic for producing the test signal and receiving the microphone signal, comparing the two, and providing the response to the comparison on the display. *Id.* at ¶45. This would inherently be in response to a user control interface signal, as the computer program for the test would necessarily be controlled by an input means such as a keyboard or mouse. *Id.* at FIGS 13 and 15.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ryan in such a manner, namely as to providing a second microphone, as well as providing the test fit signal and further including the filtering/level detection elements 22 and 32 in the processing means, as well as sending a first or second message if the seal is good or bad, as per Svean, and comparing in the processing means using cross correlation as per Padhi, and finally providing a visual display as well as a coupled device as per Baskerville.

First off, Ryan discloses the utility of providing feedback to a user of the earphone as to the seal and fit of the device. Ryan at ¶¶[0054]-[0055]. One of ordinary skill in the art would have turned to Svean as to provisioning such information and would have been motivated to modify Ryan by such teachings based on Svean's disclosure that leakage should be detected and remedied before exposure to noise to avoid damaging the user's hearing. Svean at 3:60-4:7. Further, including the filtering and level detection means and signal means in the processor would have been seen by one of ordinary skill in the art as a routine engineering decision to make elements integral, a common and known supporting rationale for obviousness, thus simplifying the system. MPEP § 2144.04 V. B., citing *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965).

Second, Ryan discloses comparing audio signals to determine a seal, and thus one of ordinary skill in the art would have looked to Padhi for examples of comparing signals, and would have been motivated by Padhi's disclosure that cross correlating a microphone signal and reference signal is an improvement over merely comparing the levels of the signal (such as in Ryan), improving accuracy. Padhi at ¶[0003]-[0005]. Further, one of ordinary skill in the art, understanding that cross correlation of signals was a notoriously well-known method of comparing audio signals at the time of the invention, would further have understood such to have been merely an example of combining prior art elements according to known methods to yield predictable results. MPEP § 2143 I. A., citing *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 415-421, 82 USPQ2d 1385, 1395-97 (2007).

Third, one of ordinary skill in the art at the time of the invention would have found it obvious to modify the Ryan as to provisioning a display of the first and/or second messages on a device connected to the earpiece as taught by Baskerville, as Ryan discloses the utility of providing feedback on fitment of the device and Svean discloses connecting the earpiece to an external device for the purposes of determining access to industrial areas to minimize hearing loss in *e.g.* industrial workers. One of ordinary skill in the art would have looked to teachings like Baskerville to determine the way to provided such information to the user, and further states the use of visual indicators. Adding the teachings of Baskerville would have provided a clear visual display of the efficacy of the seal, protecting people by allowing them safe access to loud environments and thus “verifying the protection achieved on an individual basis in-field” as stated by Baskerville at ¶[0009].

VI. Response to Arguments

Patent Owner provides arguments in pp. 21-47 of his Amendment (“Remarks”). Patent Owner further provides a Declaration of Christopher J. Struck (“Struck Declaration”) with his Remarks, which is addressed inasmuch as it is relied upon by Patent Owner in his arguments.

1. Claim Interpretation Under § 112 ¶ 6

First, with regards to the finding in the previous Office action (and upheld in the instant action) that § 112 ¶ 6 applies to the “processor” limitations in the issued independent claims (Remarks at pp. 22-26, citing the Struck Declaration at ¶¶45-46),

the Examiner finds Patent Owner's arguments not persuasive for the reasons set forth below.

As noted above, the limitations at issue recite "function without reciting sufficient structure for performing that function." *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1349 (Fed. Cir. 2015) (en banc) (quoting *Watts v. XL Systems, Inc.*, 232 F.3d 877, 880 (Fed. Cir. 2000); see also *Personalized Media Communications, LLC v. International Trade Commission*, 161 F. 3d 696, 704 (Fed. Cir. 1998). More specifically, the *en banc* Court in *Williamson* stated the presumption that § 112 ¶ 6 does not apply to a claim limitation that does not use the term "means" is overcome when the claim term "fails to 'recite sufficiently definite structure' **or else** recites 'function without reciting sufficient structure for performing that function.'" *Williamson*, 792 F.3d at 1349.

While the Examiner agrees that the term "processor" or "circuit" implies some structure, it isn't merely a matter of whether the claim term implies structure; the presumption that § 112 ¶ 6 does not apply may be overcome when the term implies structure that is not sufficient *for performing the claimed function*. "Sufficient structure exists when the claim language specifies the exact structure that performs the function in question without need to resort to other portions of the specification or extrinsic evidence for an adequate understanding of the structure." *TriMed, Inc. v. Stryker Corp.*, 514 F.3d 1256, 1259-60 (Fed. Cir. 2008) and MPEP § 2181 I. ¶ 2 quoting the same. Here the function claimed is one beyond merely that performed by a general-purpose processor without special programming, and thus § 112 ¶ 6 applies. In summary, the question is not whether a claim term recites *any* structure but whether it

recites *sufficient* structure—a claim term is subject to § 112 ¶ 6 if it recites function without reciting sufficient structure *for performing that function*.

Patent Owner's arguments are primarily towards the first prong of *Williamson*, whereas the analysis in the previous and instant Office action are under the second, *alternate* prong. Thus Patent Owner's arguments towards *VDPP LLC v. Vizion, Inc.*, Appeal No. 2021-2040, 2022 WL 885771, at *3 (Fed. Cir. 2022) are misplaced, as such decision was not regarding the second prong of *Williamson*. As to *Apex Inc. v. Raritan Comput., Inc.*, 325 F.3d 1364, 1373 (Fed. Cir. 2003), such was prior to and superseded by *Williamson* cited above and relied upon, and more importantly did not involve the second prong analysis of *Williamson* relied upon here. Patent Owner's reliance on *Dyfan, LLC v. Target Corp.*, 28 F.4th 1360, 1365 (Fed. Cir. 2022) is similarly misplaced as in *Dyfan*, the Court decided that the term at issue connoted structure because the function could be performed by "existing, off-the-shelf" software. *Dyfan*, F.4th at 1367-1369. This analysis was similar to *In re Katz Interactive Call Processing Patent Litigation*, 639 F.3d 1303, 1316, 97 USPQ2d 1737, 1747 (Fed. Cir. 2011), where a processing means was determined to be a sufficiently structural term in a claim precisely because the functions performed thereby were routine enough that an off-the-shelf general-purpose processor would perform the functions without any special programming. "It is only in the rare circumstances where any general-purpose computer without any special programming can perform the function that an algorithm need not be disclosed". *EON Corp. IP Holdings LLC v. AT&T Mobility LLC*, 785 F.3d 616, 622, 114 USPQ2d 1711, 1714 (Fed. Cir. 2015), citing *Katz*.

Here the claims at issue are not towards a new arrangement of the structural elements claimed, that is the ear tip, speaker, microphone, and circuitry – what is clearly intended as the novel invention is the function of the processor, that is the special programming that takes the processor out of the ambit of “general-purpose computer” and into the realm of a special-purpose device. That is to say, the special programming is what aims to differentiate the claimed invention from an existing standard earphone with an existing processor. The Examiner assumes it is not Patent Owner’s intention to assert that the functions claimed are so well-known that any off-the-shelf software may perform them as in *Dyfan* or so fundamentally basic that any off-the-shelf processor may perform them as in *Katz*, however if it is Patent Owner’s intention to assert such or that special programming *i.e.* an algorithm is not required to perform the claimed functions, the Examiner requests that Patent Owner state so explicitly on the record.

The Examiner notes that, as to new claims 31-42, Patent Owner has changed the term “processor” to claim terms such as “logic”, “circuit”, or “logic circuit”. These terms, while more general than “processor”, are nonetheless interpreted under § 112 ¶ 6 for the same reason set forth above as to the issued claims. First off, the term “circuit” or “logic” is not read by the Examiner as excluding a processor or general-purpose computer. This is because the Patent disclosure describes a processor as exemplifying the claimed circuitry, and thus the claimed “circuit” or “logic” encompasses a general-purpose computer. Second, the claimed “logic” is being claimed in the same functional manner as the issued claims, and thus the second prong of *Williamson* is still controlling in that the term does not connote on its face sufficient structure *to perform the claimed function*.

Second, regarding Patent Owner's arguments towards the structure of the Patent disclosure should § 112 ¶ 6 apply, as to other "comparison" techniques, Patent Owner asserts that, outside of the cross-correlation technique described in the disclosure, general correlation, coherence and level differencing are further described in an algorithmic manner and, should the Office continue interpreting the claims at issue under § 112 ¶ 6, such would necessarily be part of the algorithm imported into the claims. Remarks at 26. The Examiner disagrees, noting here that while the '836 Patent describes a correlation or coherence analysis in 16/27-31, these techniques are not disclosed in any algorithmic manner, rather the other two are merely stated aside as alternative ways to create "a measure of the similarity of the signals in the first and second volumes". Further as to "level differencing", level differencing is not disclosed in the Patent in any algorithmic manner necessary to import such a technique as a part of the structure claimed here as the disclosure merely mentions level differencing as an aside, saying instead that cross correlation is a better method. Thus "correlation", "coherence", and "level differencing" are not disclosed in any algorithmic manner that renders them a part of the scope of the claim term at issue under § 112 ¶ 6.

2. Prior Art Rejections Under § 103

Third, as to the rejection of claims under § 103 (Remarks at 27-47), the Examiner finds Patent Owner's arguments not persuasive for the following reasons:

A. *"Comparing the microphone signal to the test fit signal" limitation in claim 1*

As to the limitation "comparing the microphone signal to the test fit signal" in claim 1 (Remarks at 28-38, citing ¶¶49-58, 64 and 65 of the Struck Declaration), as noted in the Office action Ryan discloses a microphone and test fit signal, and discloses a processor which compares a filtered RMS version of these signals, but does not disclose that the processor inputs the signals itself, rather the signals are first input into elements 22 and 32. However, as the rejection makes clear, combining these elements into a single processor would have been an obvious modification. Non-Final rejection at 17, citing MPEP §2144.04 which sets forth making such elements integral as a routine engineering decision and long-standing rationale for obviousness. This produces a modified form of Ryan as shown below:

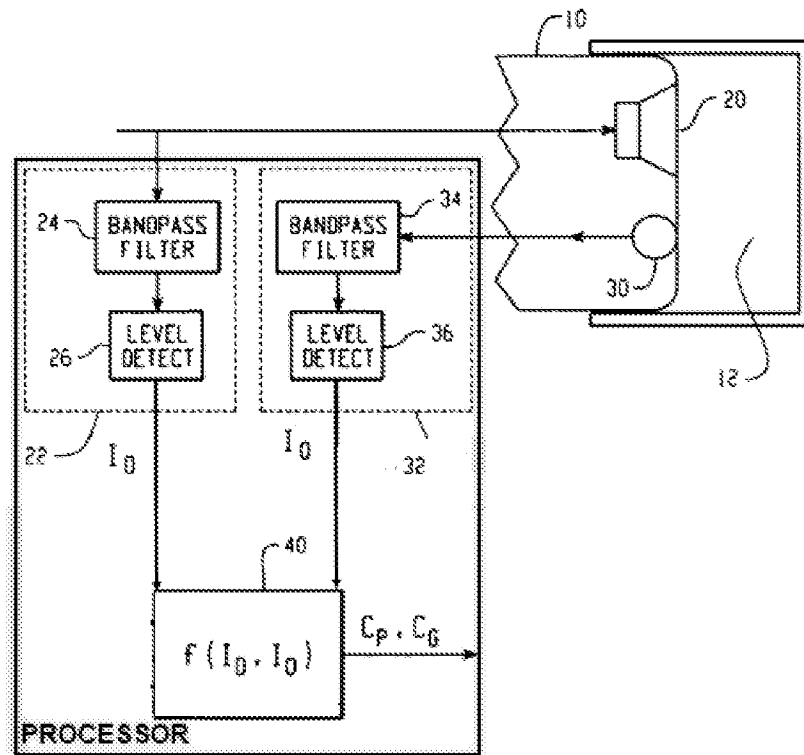


FIG 3 and 4 of Ryan as combined in the rejection and annotated by the Examiner

As this is set forth, the modified processor of Ryan takes in the test fit and microphone signals and compares the two inasmuch as it conditions the signals via filtering (which the instant '836 Patent includes in its own methodology) first before comparing RMS intensity levels of the two by way of producing a ratio of them.

If it is Patent Owner's assertion that merely comparing components of the two signals does not meet the definition of "comparing" them, the Examiner must point out here that Patent Owner provisions new claims which specify that merely comparing components of the first and second signal is in fact comparing the two signals;. *cf.* new claim 31 which recites comparing components of the two signals and claim 32 dependent thereon, which states that the test fit signal is filtered "prior to comparing the first signal to the test fit signal". The Examiner also notes that the instant '836 Patent

envisions comparing components of the signals as “comparing” them. ‘836 Patent at 14/6-26, and considers calculating the RMS and mean of each signal in the comparison. *Id.* at FIG 5. That is to say, if the instant Patent considers inputting the two signals into a processor wherein the two are filtered and an RMS value of each is determined and further processed as a “comparison” of the two to determine a seal, then the modified form of Ryan, wherein the same two signals are input into a processor wherein the two are filtered and an RMS value of each is determined and further processed and compared to determine a seal is also a “comparing” of the two. One of ordinary skill in the art, reading Ryan’s disclosure of determining a ratio of the intensity levels of the filtered and processed signals, would have clearly considered the overall process to be an example of “comparing” the two signals within the modified processing means including elements 22 and 32.

Patent Owner’s arguments towards Svean and this limitation (Remarks at 30-35) are not found persuasive, as while Patent Owner points to the analysis of Svean in IPR2022-00410 as to “comparing”, comparison of the two signals is disclosed by Ryan (as well as Padhi); the teachings of Svean which are the basis of modifying the Ryan reference are, as set forth in the previous rejection as well as the rejection above, the teachings as to using a single processor as well as sending a “GO” or “NO GO” message in response to determining a seal. Non-Final Rejection at 16-17 (“[i]t would have been obvious to one of ordinary skill in the art at the time of the invention to modify Ryan...namely as to including the filtering/level detection elements 22 and 32 in the processing means and sending a first or second message if the seal is good or bad as per Svean...”).

As to Padhi, Patent Owner argues further that Padhi fails to disclose comparing the two signals. Remarks at 36-38, citing Struck Declaration at ¶¶64-65. First, Patent Owner's arguments that cross correlation would not be operable on the intensity values of Ryan as they are not frequency dependent is incorrect, as Ryan makes clear that the comparison of the two signals vary according to frequency. Ryan at FIGS and 11. As one of ordinary skill in the art would have understood, correlation of signals is a method by which two inputs may be compared to determine how similar they are. Ryan discloses comparing the two signals, both of which are of the same format, in order to determine how close the measurements are to each other over a given frequency range, and to calculate if one differs from the other more than a set amount in order to determine a quality of the seal. One of ordinary skill in the art would have found cross-correlating the signals to have been a notoriously well-known method for comparing two signals to determine their similarity. Patent Owner argues that cross-correlating two signals that differ in frequency but have similar intensity would not provide a useful answer, however Ryan clearly discloses comparing the two signals to each other at corresponding frequencies in the frequency range. Ryan at FIG 11 and ¶54. While it is true that cross-correlation is more computationally intensive than comparing levels at one or a few frequencies, it is a long-known and utilized calculation, and Patent Owner has not shown that such a calculation would have been beyond the abilities of the processor of the combined invention of Ryan in view of Svean and Padhi, such as the DSP disclosed by Svean.

B. "Sending a test fit signal to the speaker" limitation in claim 9

As to the limitation "processor...sending a test fit signal to the speaker" in claim 9 (Remarks at 38-46, citing ¶¶72-85 of the Struck Declaration), as noted in the Office action Ryan discloses sending the test signal to the speaker, but does not disclose how the test signal is specifically produced. See *e.g.* FIG 3 of Ryan. However, Svean discloses the production of a test fit tone in a processor within an earphone. Svean at 12/51-13/5 which discloses "two pure tones of different frequencies f_1 and f_2 are generated by algorithms in the processing unit E3", the unit E3 being a DSP which also performs the "GO/NO GO" analysis. As the rejection makes clear, combining the elements of Ryan, including the production of the speaker signal, into a single processor would have been an obvious modification. Non-Final rejection at 29-30, citing MPEP §2144.04 which sets forth making such elements integral as a routine engineering decision and long-standing rationale for obviousness. For example, Ryan discloses that the result of the processing of the signals may be used to control the signal to the speaker, and thus the processor is envisioned as having control over the speaker signal. Ryan at ¶20.

With respect to Patent Owner's argument that Ryan's purpose is to capture and amplify ambient sounds, note here that Ryan intends for the processor to control the amplification and therefore production of said ambient sounds as noted above, and that Svean discloses that the microphone M1 which obtains ambient sounds which may be amplified and produced at the in-ear speaker are connected first to the processing unit E3 for pre-processing. Svean at 5/24-41 and FIG 2.

The Examiner notes here that the claim merely recites a “test fit signal”. The ambient sound signal of the combined invention, provisioned by an ambient sound microphone, and via the processor (as taught by Svean) provided to the speaker reads on the test fit signal of claims 1 and 9 as it is not claimed in any manner as a specialized signal. Even then, in the combined invention, Svean clearly discloses the processor producing tones to be delivered to the speaker for the purpose of measuring the seal via the internal microphone.

VII. Conclusion

The Patent Owner is reminded of the continuing responsibility under 37 CFR 1.565(a), to apprise the Office of any litigation activity, or other prior or concurrent proceeding, involving the instant ‘836 Patent throughout the course of this reexamination proceeding.

Patent owner’s amendment filed June 21, 2023 necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

A shortened statutory period for response to this action is set to expire two months from the mailing date of this action.

Extensions of time under 37 CFR 1.136(a) do not apply in reexamination proceedings. The provisions of 37 CFR 1.136 apply only to “an applicant” and not to parties in a reexamination proceeding. Further, in 35 U.S.C. 305 and in 37 CFR 1.550(a), it is required that reexamination proceedings “will be conducted with special dispatch within the Office.”

Extensions of time in reexamination proceedings are provided for in 37

CFR 1.550(c). A request for extension of time must specify the requested period of extension and it must be accompanied by the petition fee set forth in 37 CFR 1.17(g). Any request for an extension in a third party requested ex parte reexamination must be filed on or before the day on which action by the patent owner is due, and the mere filing of a request will not effect any extension of time. A request for an extension of time in a third party requested ex parte reexamination will be granted only for sufficient cause, and for a reasonable time specified. Any request for extension in a patent owner requested ex parte reexamination (including reexamination ordered under 35 U.S.C. 257) for up to two months from the time period set in the Office action must be filed no later than two months from the expiration of the time period set in the Office action. A request for an extension in a patent owner requested ex parte reexamination for more than two months from the time period set in the Office action must be filed on or before the day on which action by the patent owner is due, and the mere filing of a request for an extension for more than two months will not effect the extension. The time for taking action in a patent owner requested ex parte reexamination will not be extended for more than two months from the time period set in the Office action in the absence of sufficient cause or for more than a reasonable time.

The filing of a timely first response to this final rejection will be construed as including a request to extend the shortened statutory period for an additional two months. In no event, however, will the statutory period for response expire later than SIX MONTHS from the mailing date of the final action. See MPEP § 2265.

All correspondence relating to this *ex parte* reexamination proceeding should be directed:

By Mail to: Mail Stop *Ex Parte* Reexam
Central Reexamination Unit
Commissioner for Patents
United States Patent & Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

By FAX to: (571) 273-9900
Central Reexamination Unit

By hand: Customer Service Window
Randolph Building
401 Dulany Street
Alexandria, VA 22314

Effective July 9, 2007, the U.S. Patent and Trademark Office began accepting requests for reexamination, and "follow-on" papers (*i.e.*, subsequent correspondence in reexamination proceedings) submitted via the Office's Web-based electronic filing system (EFS-Web). The Office has updated the Legal Framework for EFS-Web to set forth that requests for reexamination, and proper reexamination "follow-on" papers (see MPEP § 2267) are permitted to be submitted using EFS-Web. The current version of the Legal Framework for EFS-Web is at: **www.uspto.gov/patents-application-process/filing-online/legal-framework-efs-web**.

After the filing of the request for *ex parte* reexamination, any letters sent to the U.S. Patent and Trademark Office relating to the resulting *ex parte* reexamination proceeding should identify the proceeding by the number of the patent undergoing reexamination, the reexamination request control number assigned, the art unit, and the name of the examiner.

Any inquiry concerning this communication should be directed to the Central
Reexamination Unit at telephone number (571) 272-7705.

Signed:

/CHARLES R CRAVER/
Reexamination Specialist, Art Unit 3992

Conferees:

/ERON J SORRELL/
Primary Examiner, Art Unit 3992

/ANDREW J FISCHER/
Supervisory Patent Examiner, Art Unit 3992

Office Action in Ex Parte Reexamination	Control No. 90/015,146	Patent Under Reexamination 10979836	
	Examiner CHARLES R CRAVER	Art Unit 3992	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

- a. ☒ Responsive to the communication(s) filed on 21 June 2023.
☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

- b. ☒ This action is made FINAL.

- c. ☐ A statement under 37 CFR 1.530 has not been received from the patent owner.

A shortened statutory period for response to this action is set to expire 2 month(s) from the mailing date of this letter. Failure to respond within the period for response will result in termination of the proceeding and issuance of an *ex parte* reexamination certificate in accordance with this action. 37 CFR 1.550(d). **EXTENSIONS OF TIME ARE GOVERNED BY 37 CFR 1.550(c)**. If the period for response specified above is less than thirty (30) days, a response within the statutory minimum of thirty (30) days will be considered timely.

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- | | |
|---|---|
| 1. ☐ Notice of References Cited by Examiner, PTO-892. | 3. ☐ Interview Summary, PTO-474. |
| 2. ☒ Information Disclosure Statement, PTO/SB/08. | 4. ☐ _____. |

Part II SUMMARY OF ACTION

- 1a. ☒ Claims 1-42 are subject to reexamination.
- 1b. ☐ Claims _____ are not subject to reexamination.
2. ☐ Claims _____ have been canceled in the present reexamination proceeding.
3. ☐ Claims _____ are patentable and/or confirmed.
4. ☒ Claims 1-42 are rejected.
5. ☐ Claims _____ are objected to.
6. ☐ The drawings, filed on _____ are acceptable.
7. ☐ The proposed drawing correction, filed on _____ has been (7a) ☐ approved (7b) ☐ disapproved.
8. ☐ Acknowledgment is made of the priority claim under 35 U.S.C. 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the certified copies have
 - 1 ☐ been received.
 - 2 ☐ not been received.
 - 3 ☐ been filed in Application No. _____.
 - 4 ☐ been filed in reexamination Control No. _____.
 - 5 ☐ been received by the International Bureau in PCT application No. _____.

* See the attached detailed Office action for a list of the certified copies not received.

9. ☐ Since the proceeding appears to be in condition for issuance of an *ex parte* reexamination certificate except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte* Quayle, 1935 C.D. 11, 453 O.G. 213.
10. ☐ Other: _____

cc: Requester (if third party requester)