UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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K/S HIMPP

Petitioner,

v.

III Holdings 4, LLC

Patent Owner.

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Case IPR2017-00782
Patent No. 8,654,999

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PATENT OWNER'S NOTICE OF APPEAL

Notice is hereby given, pursuant to 35 U.S.C. §§ 141(c), 142, and 319, and 37 C.F.R. §§ 90.2(a) and 90.3(a), that Patent Owner III Holdings 4, LLC hereby appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision entered on July 23, 2018 (Paper 29) in IPR2017-00782 (Exhibit A), and from all underlying orders, decisions, rulings and opinions that are adverse to Patent Owner, including, without limitation, those within the Decision on Institution of Inter Partes Review, entered on July 27, 2017 (Paper 8).

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Patent Owner further indicates that the issues on appeal include, but are not limited to, the Board's claim constructions, the Board's determination that claims 10, 13, 14, and 20 are unpatentable as obvious over Fichtl and Mangold, the Board's determination that claims 11 and 15 are unpatentable as obvious over Fichtl, Mangold, and Sacha, any finding or determination supporting or relating to those issues, as well as all other issues decided adversely to Patent Owner in any orders, decisions, rulings, and opinions.

This Notice of Appeal is timely pursuant to 37 C.F.R. § 90.3, having been duly filed within 63 days after the Final Written Decision.

Simultaneous with this submission, a copy of the Notice of Appeal is being filed with the Patent Trial and Appeal Board. In addition, a copy of this Notice of Appeal, along with the required docketing fees, is being filed with the Clerk's

Office for the United States Court of Appeals for the Federal Circuit. In addition,

pursuant to Fed. Cir. R. 15(a)(1), one paper copy of the notice is also being sent to

the Clerk of the Federal Circuit.

If there is any fee due in connection with the filing of this Notice of Appeal,

please charge the fee to Deposit Account No. 50-1662.

Respectfully submitted,

Date: September 21, 2018
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CERTIFICATE OF SERVICE

The undersigned hereby certifies that in addition to being filed electronically with the U.S. Patent and Trademark Office, pursuant to 37 C.F.R. §§ 42.6(e)(4) and 90.2, the foregoing PATENT OWNER'S NOTICE OF APPEAL and all accompanying documents, were filed by Express Mail on September 21, 2018, with the Director of the United States Patent and Trademark Office, at the following address:

> Director of the U.S. Patent and Trademark Office
> c/o Office of the General Counsel
> P.O. Box 1450
> Alexandria, VA 22313-1450

The undersigned certifies that a copy of the foregoing Patent Owner's Notice of Appeal and accompanying documents, along with the required docket fee, was filed on September 21, 2018, with the United States Court of Appeals for the Federal Circuit through the Court's CM/ECF filing system and the filing fee is being paid electronically using pay.gov, and that a copy of the foregoing Patent Owner's Notice of Appeal and accompanying documents were filed with the Patent Trial and Appeal Board electronically on September 21, 2018, pursuant to 37 C.F.R. 42.6(b), and that the foregoing Notice of Appeal and accompanying documents were served upon the Petitioner pursuant to 37 C.F.R. 42.6(e)(1) via

electronic mail on September 21, 2018, by serving the following attorneys of record as follows:

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EXHIBIT A

UNITED STATES PATENT AND TRADEMARK OFFICE
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BEFORE THE PATENT TRIAL AND APPEAL BOARD
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K/S HIMPP,
Petitioner,

v.

III HOLDINGS 4, LLC
Patent Owner.

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Case IPR2017-00782
Patent 8,654,999 B2

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Before SALLY C. MEDLEY, DAVID C. MCKONE, and
KIMBERLY MCGRAW, *Administrative Patent Judges*.

MCKONE, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. INTRODUCTION

A. Background

K/S HIMPP ("Petitioner") filed a Petition (Paper 3, "Pet.") to institute an *inter partes* review of claims 10–15 and 20 of U.S. Patent No. 8,654,999 B2 (Ex. 1101, "the '999 patent"). Petitioner indicates that GN Hearing A/S (formerly GN Resound A/S), GN Store Nord A/S, IntriCon Corporation, Sivantos GmbH, Sivantos Inc., Sonova Holding AG, Sonova AG (formerly Phonak AG), Starkey Laboratories, Inc. (aka Starkey Hearing Technologies), Widex A/S, and William Demant Holding A/S are also real parties in interest. Pet. 1. III Holdings 4, LLC ("Patent Owner"), filed a Preliminary Response (Paper 7, "Prelim. Resp.").

Pursuant to 35 U.S.C. § 314, in our Institution Decision (Paper 8, "Dec."), we instituted this proceeding as to claims 10, 11, 13–15, and 20, but not claim 12.

Patent Owner filed a Patent Owner's Response (Paper 12, "PO Resp."), and Petitioner filed a Reply to the Patent Owner's Response (Paper 15, "Reply").

Patent Owner also filed a Motion to Exclude Evidence (Paper 17, "Mot. to Exclude"), Petitioner filed an Opposition to the Motion to Exclude (Paper 21, "Opp. to Mot. to Exclude"), and Patent Owner filed a Reply to the Opposition to the Motion to Exclude (Paper 22, "Reply Mot. to Exclude").

Petitioner relies on the Declaration of Les Atlas, Ph.D. (Ex. 1108, "Atlas Decl.").[1] Patent Owner relies on the Declaration of Clyde Brown (Ex. 2103, "Brown Decl.").

An oral argument was held on May 1, 2018 (Paper 28, "Tr.").

On April 24, 2018, the Supreme Court held that a decision to institute under 35 U.S.C. § 314 may not institute on less than all claims challenged in the petition. *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1369–60 (2018). Following the Supreme Court's decision, the parties filed a Joint Motion to Limit the Petition to remove claim 12 from the proceeding, Paper 26, which we granted, Paper 27.

We have jurisdiction under 35 U.S.C. § 6. This Decision is a final written decision under 35 U.S.C. § 318(a) as to the patentability of claims 10, 11, 13–15, and 20. Based on the record before us, Petitioner has proved, by a preponderance of the evidence, that claims 10, 11, 13–15, and 20 are unpatentable.

B. Related Matters

Petitioner challenges claims 1–9 and 16–19 of the '999 patent in *K/S HIMPP v. III Holdings 4, LLC*, Case IPR2017-00781 (PTAB). Pet. 2.

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[1] Patent Owner argues that we should give Dr. Atlas's Declaration no weight because it merely repeats the arguments in the Petition. PO Resp. 32–35. In the cases of both Dr. Atlas's testimony and that of Mr. Brown (whose Declaration suffers from essentially the same defect Patent Owner ascribes to Dr. Atlas's testimony) we evaluate the extent to which expert testimony discloses the underlying facts or data on which it is based as a factor in determining the weight to give that testimony. *See* 37 C.F.R. § 42.65(a). We are not persuaded to discount either expert's testimony entirely.

C. Asserted Prior Art References

Petitioner relies on the following prior art:

Ex. 1103 ("Fichtl")	US 8,787,603 B2	July 22, 2014 (filed June 19, 2012)
Ex. 1104 ("Sacha")	US 2003/0215105 A1	Nov. 20, 2003
Ex. 1107 ("Mangold")	US 4,972,487	Nov. 20, 1990

D. The Asserted Grounds

We instituted on the following grounds of unpatentability (Dec. 33):

References	Basis	Claims Challenged
Fichtl and Mangold	§ 103(a)	10, 13, 14, and 20
Fichtl, Mangold, and Sacha	§ 103(a)	11 and 15

E. The '999 Patent

The '999 patent describes a hearing aid system. By way of background, the '999 patent explains that an individual's hearing loss can vary across audio frequencies and that an audiologist typically measures the individual's hearing capacities in various environments and tunes or calibrates a hearing aid for the individual to compensate for that individual's particular hearing loss. Ex. 1101, 1:46–55. The patent further notes that the abrupt transition to a hearing aid can be traumatic or distressful for the individual. *Id.* at 1:58–67. To address this, the '999 patent describes a hearing aid system in which, "rather than abruptly implementing the hearing correction for the user immediately, the hearing aid progressively applies incremental adjustments to progressively or gradually adjust the user's

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experience from an uncompensated hearing level to a fully compensated

hearing level." *Id.* at 2:30–34.

Figure 2, reproduced below, illustrates an embodiment of the hearing
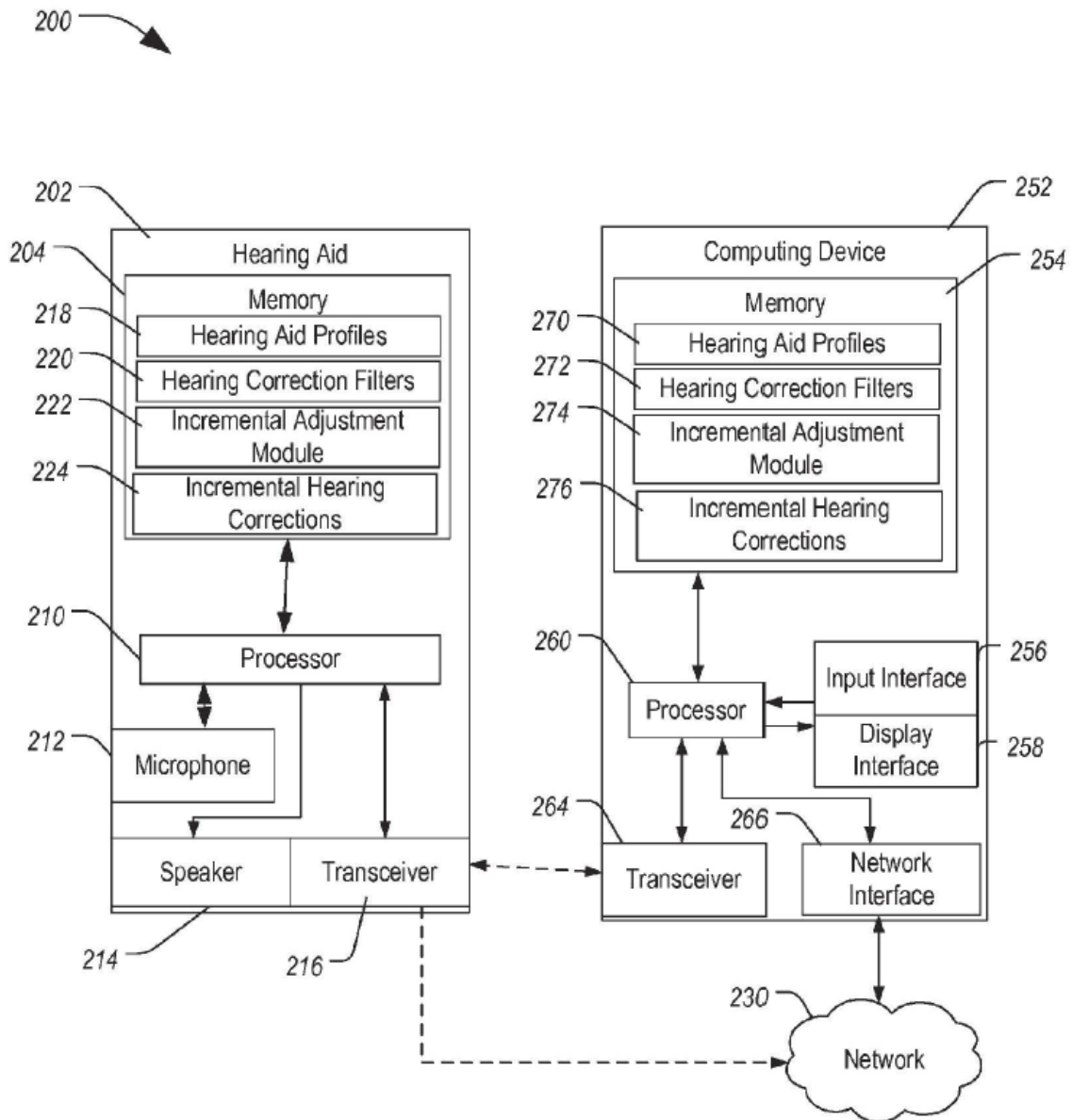
aid system of the '999 patent:

FIG. 2

Figure 2 is a block diagram of a hearing aid system. *Id.* at 2:10–12. Hearing

aid 202 and computing device 252 (e.g., a personal digital assistant (PDA) or

smart phone) communicate using transceivers 216 and 264, through a wired

or wireless channel (e.g., a Bluetooth channel or network 230). *Id.* at 5:49–

61, 6:3–16. Hearing aid 202 includes memory 204 and processor 210 to

store and process hearing aid profiles 218 and hearing correction filters 220.

Id. at 5:61–6:2. Computing device 252 includes memory 254 and processor

260 for storing and processing hearing aid profiles 270 and hearing

correction filters 272. *Id.* at 6:29–35.

Processor 210 of hearing aid 202 shapes acoustic signals according to

a "hearing aid profile," which the patent explains is "a collection of acoustic

configuration settings," and provides the shaped acoustic signals to a speaker

or bone conduction element to correct a user's hearing loss. *Id.* at 2:40–46.

In one embodiment, processor 210 applies a "collection of hearing

correction filters" that "include a series of hearing correction adjustments

designed to be applied in a sequence over a period of time to provide

incremental corrections for the user's hearing loss." *Id.* at 3:2–7. For

example, "a first hearing correction filter attenuates the hearing aid profile

by a pre-determined amount" and "[e]ach . . . subsequent hearing correction

filter in the sequence increases the correction provided by (decreases the

attenuation applied to) the hearing aid profile to some degree, until the

sequence is complete and the hearing aid profile is fully applied to provide

the desired hearing correction for the user." *Id.* at 3:7–15. The processor

can provide an alert to the user when the user's hearing is at the desired level

and the adjustment process is complete. *Id.* at 10:55–59. For example, "the

alert may be an audible alert reproduced through a speaker of hearing aid" or

"may be sent to the computing device for display on the display interface." *Id.* at 10:59–62.

In one embodiment, processor 210 of hearing aid 202 selectively applies a hearing correction filter 220 to selected hearing aid profile 218 to provide hearing correction for a period of time before advancing to a next incremental hearing correction filter 220 in a sequence. *Id.* at 6:42–52. In another embodiment, hearing aid 202 receives a trigger from computing device 252 through the communication channel and selects a filter from hearing correction filters 222 for application to a selected hearing aid profile 218. *Id.* at 7:9–16. In some instances, hearing aid 202 can signal computing device 252 to retrieve an incremental hearing correction filter 276 from memory 254. *Id.* at 9:62–65.

Claim 10, the only independent claim at issue, is illustrative of the invention and reproduced below:

10.   A computing device comprising:

a transceiver configurable to communicate with a hearing aid through a communication channel;

a processor coupled to the transceiver; and

a memory coupled to the processor and configured to store instructions that, when executed by the processor, cause the processor to:

generate a sequence of incremental hearing correction filters based at least in part on a magnitude of a difference between a hearing aid profile and a hearing loss level associated with a user of the hearing aid, the sequence of incremental hearing correction filters including at least a first hearing correction filter and a second hearing correction filter;

> provide a first signal related to the first hearing correction filter of the sequence of incremental hearing correction filters to the hearing aid through the communication channel; and

> provide a second signal related to a second hearing correction filter of the sequence of incremental hearing correction filters to the hearing aid in response to receiving a selection of the second hearing correction filter from a user of the hearing aid.

II. ANALYSIS

A. *Claim Construction*

We interpret claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *Cuozzo Speed Techs., LLC v. Lee*, 136 S. Ct. 2131, 2144–45 (2016). In applying a broadest reasonable construction, claim terms generally are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007).

1. *"hearing correction filter"*

In the Decision on Institution, we preliminarily construed "hearing correction filter" to mean "a filter that is applied by a processor within a hearing aid to a hearing aid profile to reduce the level of correction provided to the user by application of the hearing aid profile." Dec. 9. The parties' primary dispute was whether an individual hearing correction filter itself must include a collection of filters, as Patent Owner advocates. *Id.* at 7–9.

We rejected Patent Owner's argument based on the preliminary record. *Id.* at 9. In its Response, Patent Owner asks us to revisit our construction and rule that a hearing correction filter requires a collection of filters. PO Resp. 14.

> The '999 patent describes "hearing correction filter" as follows:

> As used herein, the term "hearing correction filter" refers to a collection of filters for hearing aid 202, which are applied by processor 210 within hearing aid 202 to a hearing aid profile to reduce the level of correction provided to the user by application of the hearing aid profile. The collection of hearing correction filters may include a series of hearing correction adjustments designed to be applied in a sequence over a period of time to provide incremental corrections for the user's hearing loss to ease the user's transition from uncompensated to corrected hearing.

Ex. 1101, 2:65–3:7. Patent Owner argues that the first sentence in this passage provides a clear definition that "hearing correction filter," singular means a collection of filters, plural. PO Resp. 14.

"To act as its own lexicographer, a patentee must 'clearly set forth a definition of the disputed claim term' other than its plain and ordinary meaning. It is not enough for a patentee to simply disclose a single embodiment or use a word in the same manner in all embodiments, the patentee must 'clearly express an intent' to redefine the term." *Thorner v. Sony Computer Entm't Am. LLC*, 669 F.3d 1362, 1365 (Fed. Cir. 2012) (quoting *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002) and *Helmsderfer v. Bobrick Washroom Equip., Inc.*, 527 F.3d 1379, 1381 (Fed. Cir. 2008)). As a starting point, the Federal Circuit has "repeatedly emphasized that an indefinite article 'a' or 'an' in patent parlance carries the meaning of 'one or more' in open-ended claims

containing the transitional phrase 'comprising.'" *Convolve, Inc. v. Compaq Computer Corp.*, 812 F.3d 1313, 1321 (Fed. Cir. 2016) (quoting *KCJ Corp. v. Kinetic Concepts, Inc.*, 223 F.3d 1351, 1356 (Fed. Cir. 2000)). According to the Federal Circuit, "[t]he exceptions to this rule are 'extremely limited: a patentee must 'evince [ ] a clear intent' to limit 'a' or 'an' to 'one.''" *Id.* (quoting *Baldwin Graphic Sys., Inc. v. Siebert, Inc.*, 512 F.3d 1338, 1342 (Fed. Cir. 2008)). By the same reasoning, we look for a clear intent to limit "a" or "an" to more than one. Thus, we start with the premise that the language "a first hearing correction filter" and "a second hearing correction filter," as recited in claim 10, identify one or more filters, and determine whether the specification evinces a clear intent to redefine these phrases to mean more than one filter.

The claim language supports our preliminary construction by reciting a hearing correction filter as a member of a collection of filters rather than itself including a collection of filters. For example, claim 10 recites "a sequence of incremental hearing correction filters" and "the sequence of incremental hearing correction filters including at least a first hearing correction filter and a second hearing correction filter." In this recitation, a collection of incremental hearing correction filters is recited as a set of individual filters ("first," "second") that are applied in a sequence.

The specification also supports our preliminary construction. In the Decision on Institution, we recognized that the '999 patent's statement that "the term 'hearing correction filter' refers to a collection of filters" suggests that a single hearing correction filter actually is a collection of filters. Dec. 8 (quoting Ex. 1101, 2:65–66). Nevertheless, consistent with the claim language discussed above, we explained that the patent's use of the term in

context indicates that a hearing correction filter can be a single filter that is a member of a collection. *Id.* Specifically, the patent explains that "[t]he collection of hearing correction filters may include a series of hearing correction adjustments designed to be applied in a sequence over a period of time." *Id.* at 3:2–5. This informs how the '999 patent intends "collection of filters" to be understood. Here, the collection of hearing correction filters is a "series" of adjustments applied "in a sequence over a period of time," not all at once. The patent then expands on this explanation of a collection of filters:

> In such an instance, a first hearing correction filter attenuates the hearing aid profile by a pre-determined amount, limiting the adjustment provided by hearing aid 202. Each of subsequent hearing correction filter in the sequence increases the correction provided by (decreases the attenuation applied to) the hearing aid profile to some degree, until the sequence is complete and the hearing aid profile is fully applied to provide the desired hearing correction for the user.

Ex. 1101, 3:7–15. Here, the patent describes individual hearing correction filters that are part of a collection and are individually applied in sequence.

Patent Owner contends that these passages "merely describe[] how a larger collection contains smaller collections." PO Resp. 16. Mr. Brown repeats this argument in his testimony without further elaboration, and states that they do not impact the definition of hearing correction filter. Ex. 2103 ¶ 32. Patent Owner also cites to Dr. Atlas's cross-examination testimony that it would not be unusual to refer to a filter that includes multiple filters. PO Resp. 16 (citing Ex. 2105, 134:10–14 ("Q. In the world of audio devices in general, there would be nothing unusual about saying a filter comprises multiple other filters, is there? A. No, there wouldn't be.")). We disagree

with Patent Owner's reading of these passages and do not give substantial weight to Mr. Brown's testimony. As explained above, the specification describes a collection of individual filters that are applied in a sequence, not a collection of collections of filters applied in a sequence. As to Dr. Atlas's cross-examination testimony, even if it is acceptable to say that a filter contains multiple filters, the specification does not suggest that it must be understood this way. Ex. 1101, 3:2–15.

Patent Owner next argues (PO Resp. 16–17) that additional description in the specification supports its construction, namely:

> Further, it should be understood that the filter or correction used to achieve the correction lines and ultimately the hearing aid profile is composed of a plurality of coefficients, parameters, or other settings that are applied by a processor of the hearing aid to alter various characteristics of the sounds to modulate them to compensate for the user's hearing impairment.

Ex. 1101, 5:42–48. As we noted in the Decision on Institution, this description on its face describes a single filter that is composed of multiple coefficients or parameters. Dec. 9. It does not state that a filter is comprised of multiple filters, each such filter corresponding to one of the coefficients or parameters. Patent Owner appears to disagree, arguing that "[t]o the extent that passage provides any context to how 'hearing correction filter' is used in the specification, it supports the express definition in the specification," and otherwise provides no additional context. PO Resp. 16–17. In support, Patent Owner cites to Mr. Brown, who testifies that "[t]his passage merely explains how a correction line is achieved." Ex. 2103 ¶ 33.

Patent Owner attempted to clarify its position at the oral argument, contending that "a single filter would only be able to achieve a correction of a single frequency band" while "a collection of hearing correction filters

would be able to achieve the correction for multiple frequencies."
Tr. 29:16–19.[2] Patent Owner, however, does not cite to persuasive evidence
to support this argument. We find that this passage (Ex. 1001, 5:42–48) is
consistent with either multiple filters, each adjusting a single characteristic,
or a single filter with multiple coefficients for adjusting multiple
characteristics.

In a similar argument, Patent Owner contends that a hearing
correction filter "impacts different frequencies of the signal in different
ways." PO Resp. 25. According to Mr. Brown, "applying a hearing
correction filter to a hearing aid profile for adjusting a signal provides a
varying effect on different frequencies of the signal." Ex. 2103 ¶ 49. The
specification explains, "in the illustrated example [of Figure 1], the hearing
sensitivity lines 110, 112, 114, 116, and 118 appear to indicate that the
incremental hearing corrections adjust selected frequencies to the desired
hearing level while providing less of an enhancement to other frequencies."
Ex. 1101, 4:35–39. According to Mr. Brown, a skilled artisan "would
recognize that this means a collection of frequency adjustments not a single
setting." Ex. 2103 ¶ 49. However, the specification describes this as an
"illustrated example," not a limitation on the invention. Ex. 1101, 4:35.

Indeed, as Petitioner points out (Reply 7–8), directly below this
passage, the specification makes clear that "it should be understood that
other incremental hearing corrections could be used. For example, in one

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[2] Petitioner contended at the oral argument that adjustments to multiple
coefficients or parameters could be implemented with a filter comprising
multiple filters, but that the specification also describes implementing it with
a single filter with multiple coefficients or parameters. Tr. 12:21–14:12.

particular instance, the incremental hearing correction could dampen or otherwise apply filters to the selected hearing aid profile to incrementally adjust the hearing correction across the entire range of frequencies substantially evenly." Ex. 1101, 4:39–44. The specification continues: "In another instance, the incremental hearing correction could adjust selected frequencies by different amounts, providing a non-uniform hearing correction." *Id.* at 4:44–47. Here, the specification clearly distinguishes between uniform and non-uniform hearing corrections.

At the oral argument, Patent Owner argued "the '999 patent discloses that the hearing correction filters can dampen an entire range of frequencies substantially evenly. Not entirely evenly. And dampening substantially evenly is done with a collection of filters." Tr. 39:5–8. Patent Owner points to no evidence that the language "substantially evenly" was intended to draw a distinction between one filter adjusting all frequencies perfectly evenly and a collection of filters adjusting all frequencies substantially evenly.

On the complete record, based on the language of the claims, the definition in the specification when viewed in its proper context, and the remaining consistent description in the specification, we maintain our construction of "hearing correction filter," namely, "a filter that is applied by a processor within a hearing aid to a hearing aid profile to reduce the level of correction provided to the user by application of the hearing aid profile."

In the Petition, Petitioner argued that a hearing correction filter should not be construed to cover a filter that is applied to modulate an audio signal that already has been modulated by the hearing aid profile, arguing that such a construction would be contradicted by the embodiments and definition provided by the specification. Pet. 14–15. Claim 10, the independent claim

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at issue in this proceeding, does not recite applying the first and second hearing correction filters. Nevertheless, we declined to place such a restriction on "hearing correction filter," as the claims themselves, where applicable, recite the signals to which the hearing correction filter is applied. Dec. 9–10; *see also* claim 1 ("the selected hearing aid profile configured to modulate the electrical signals to a level to compensate for a hearing impairment of a user" and "apply a first one of a sequence of incremental hearing correction filters to the modulated electrical signals to produce a modulated output signal"), claim 6 ("apply a first hearing correction filter to the selected hearing aid profile"). Patent Owner appears to dispute this aspect of our construction, at least with respect to claims 1 and 6, neither of which is at issue in this proceeding. PO Resp. 17–18. Nevertheless, neither party argues that any factual dispute turns on this aspect of our construction. Thus, we need not address it further. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g*, Inc., 200 F.3d 795, 803 (Fed. Cir. 1999) ("[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy.").

2. *"incremental hearing correction filter"*

In light of our construction of "hearing correction filter," above, and additional description in the specification of "incremental hearing correction" (Ex. 1101, 3:24–36), we construed "incremental hearing correction filter" to mean a hearing correction filter (as construed above) that represents an intermediate hearing adjustment to provide a modulated output signal having a level that is within a range between an uncompensated output level and the desired output level. Dec. 10–12. The parties do not

raise additional disputes for this term beyond those raised for "hearing correction filter." Accordingly, we maintain our construction of "incremental hearing correction filter" on the complete record.

B. Asserted Grounds of Unpatentability

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are "such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." We resolve the question of obviousness on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) objective evidence of nonobviousness, i.e., secondary considerations.[3] *See Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966).

1. Level of Skill in the Art

Petitioner contends that a person of ordinary skill in the art "would have been someone with a bachelor's degree in electrical or computer engineering, or the equivalent, and at least two years of experience in audio signal processing for audiological products" and that "[g]raduate education could substitute for work experience, and additional work experience/training could substitute for formal education." Pet. 11 (citing

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[3] The complete record does not include allegations or evidence of objective indicia of nonobviousness.

Ex. 1108 ¶¶ 22–28). Petitioner relies on the Atlas Declaration, which states that a skilled artisan "would have had a B.S. degree in electrical or computer engineering, or the equivalent, and at least two years of experience in hearing aid systems." Ex. 1108 ¶ 28. Patent Owner does not propose an alternative. We adopt Petitioner's proposed level of skill and find that it is consistent with the level of ordinary skill reflected by the prior art of record. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (the prior art itself can reflect the appropriate level of skill in the art).

2. Alleged Obviousness over Fichtl and Mangold

Petitioner contends that claims 10, 13, 14, and 20 would have been obvious over Fichtl and Mangold. Pet. 18–38. For the reasons given below, we agree.

a. Scope and Content of the Prior Art
(1) Overview of Fichtl

Fichtl describes a hearing device that implements an acclimatization algorithm. Ex. 1103, Abstract. Acclimatization is the process by which, over the course of several weeks to half a year, the intensity of a hearing device gradually is increased from an initially low intensity to a target intensity. *Id.* at 1:19–26.

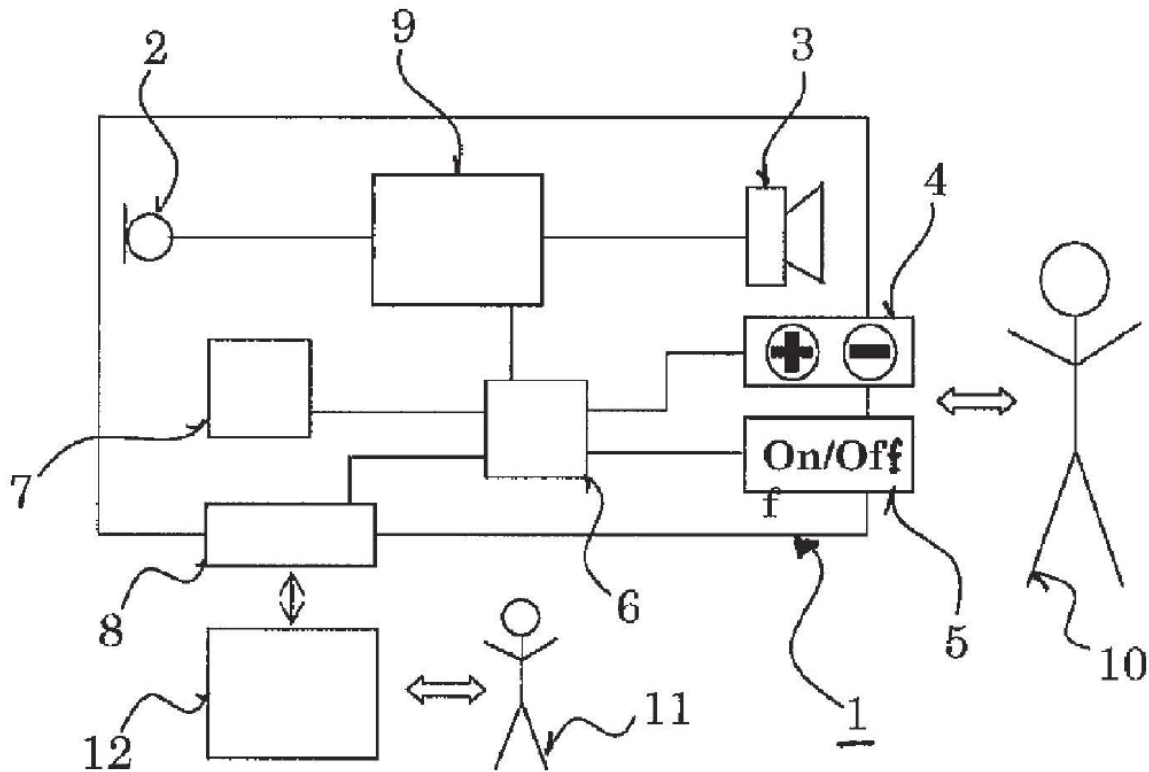Fichtl's hearing device is depicted in Figure 1, reproduced below:

Fig. 1

Figure 1 is a schematic diagram of hearing device 1. *Id.* at 3:1–2. Sounds are picked up by microphone 2, processed by signal processor 9, and presented to hearing device user 10 by receiver 3. *Id.* at 3:23–25. User 10 controls the magnitude of amplification using volume control 4. *Id.* at 3:25–26. Controller 6 sets hearing device parameters when hearing device 1 is switched on or when volume control 4 is actuated. *Id.* at 3:28–30. Non-volatile memory 7 stores parameters when hearing device 1 is off. *Id.* at 3:30–32. Controller 6 executes an acclimatization algorithm. *Id.* at 3:32–34.

Fichtl's acclimatization algorithm is described with respect to Figure 2, reproduced below:

Fig. 2

Figure 2 is a graph that depicts how an audio processing parameter ("APP") is changed over time in a hearing aid. *Id.* at 3:3–5. Examples of APP include volume, treble, and noise cancelling. *Id.* at 3:42–47.

In the algorithm of Figure 2, at time A, an audiologist (11 in Figure 1) programs into memory 7 initial power-on value iPOV and target power-on value tPOV for the APP, for example tPOV being 10 dB higher than iPOV. *Id.* at 3:42–48. At time B, user 10 switches the hearing aid on and the APP is set to iPOV. *Id.* at 3:49–53. An intermediate value of APP, X, is increased slowly during time C. *Id.* at 3:54–57. During time D, the user selects the APP to be two steps higher than the original audio processing

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parameter, APP_{ref}, and X is increased faster. *Id.* at 3:58–61. During time E, the user selects the APP to be one step lower than APP_{ref}, and X is increased more slowly. *Id.* at 3:62–65.

The user switches the hearing aid off at time F and intermediate value X is stored in memory 7 as the first replacement power-on value $rPOV_1$. *Id.* at 3:66–4:4. The user switches the hearing aid back on at time G and the APP is set to $rPOV_1$ and intermediate value X is increased. *Id.* at 4:5–7. At time H, intermediate value X reaches tPOV and is not changed anymore, at which time the acclimatization phase ends. *Id.* at 4:8–11. When the user switches the hearing aid off, as at time I, the value stored in memory 7, second replacement value $rPOV_2$, is tPOV. *Id.* at 4:12–15. According to Fichtl, "[i]t is to be noted that the increase of the intermediate value X as well as the power-on-value POV is shown exaggerated for illustrative purposes. Usually, the acclimatization phase will take few weeks up to several months and not only one and a half days as in the example." *Id.* at 4:16–20.

b. *Overview of Mangold*

Mangold describes an auditory prosthesis (hearing aid) with datalogging capability. Ex. 1107, Abstract. Figures 2 and 3, reproduced below, illustrate an example:
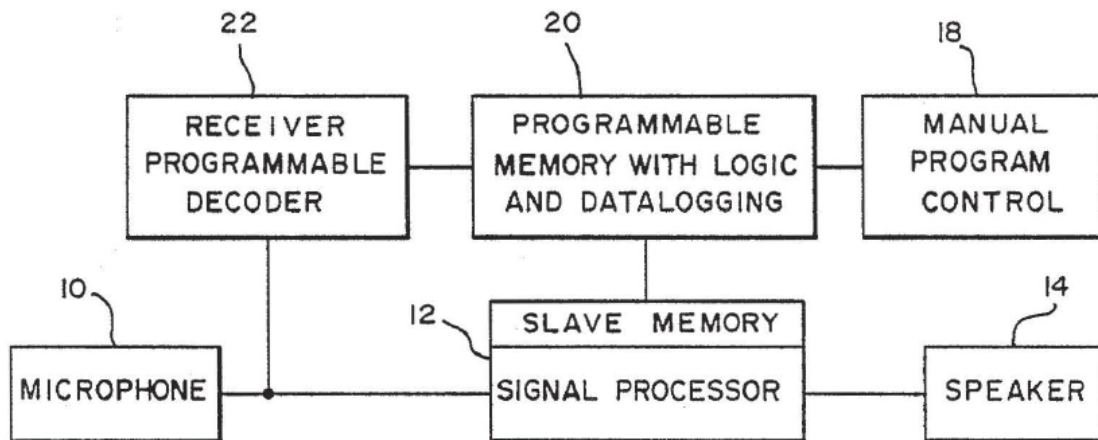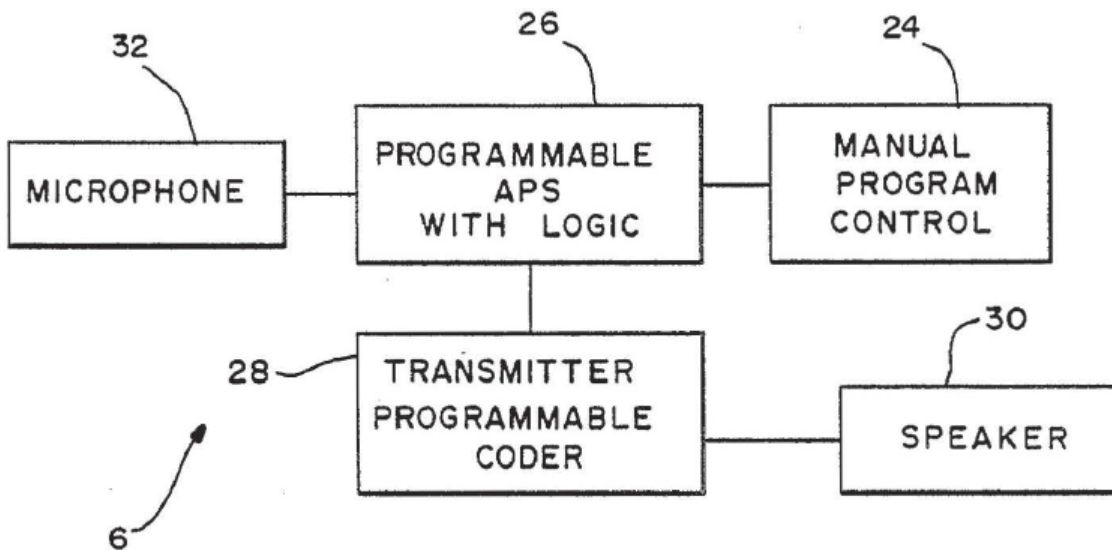
FIG.—2

FIG.—3

Figure 2 is a functional block diagram of remote-controlled programmable hearing aid 4 and Figure 3 is a functional block diagram of remote control unit 6 for use with hearing aid 4. *Id.* at 2:42–48.

Hearing aid 4 includes microphone 10, signal processor 12 with slave memory, speaker 14, and programmable memory with logic 20, which

includes logic for datalogging capability. *Id.* at 3:22–29. Remote control 6 is worn on a user's wrist or placed in a pocket. *Id.* at 3:38–40. Remote control 6 includes programmable block 26 with an automatic program selector ("APS") to automatically select a program in response to the ambient noise level as detected by microphone 32. *Id.* at 3:49–52. "Programs," as used in Mangold, are "one or more of: specific settings of a limited number of parameters; selection of a processing configuration of strategy; modification of a prosthesis control program; or setting of coefficients in a prosthesis program." *Id.* at 2:28–33. The selected program is transmitted to the hearing aid where the program is entered. *Id.* at 3:57–59.

In its datalogging capability, memory 20 of hearing aid 4 records environmentally selected events, such as selection of programs based on a current sound environment. *Id.* at 1:40–49. After a period of time, the dispenser of the hearing aid can connect to the hearing aid, read out the data stored in memory 20, and determine a new set of operating parameters for the hearing aid based on the degree to which the user has used the original programs. *Id.* at 2:3–11.

In an alternative embodiment (depicted in Figures 4 and 5), the functions of datalogging unit 20 of the hearing aid of Figure 2 are placed in programmable APS with logic unit 26 in remote control unit 9 of Figure 5. *Id.* at 4:11–21.

    c. Differences Between the Claimed Subject Matter and the Prior Art, and Reasons to Modify or Combine

    (1) Claim 10

Claim 10 recites a "computing device" that communicates with "a hearing aid." As noted above, Fichtl describes a hearing device, states that additional devices such as a remote control can be considered a part of the hearing device, Ex. 1103, 1:14–18, and depicts device 12 interfacing with hearing device 1, *id.* at Fig. 1. Petitioner identifies Fichtl's remote control as a "computing device," as recited in claim 10, but acknowledges that Fichtl does not describe details of its remote control. Pet. 18.

Petitioner argues that the details of a remote control for a hearing aid can be found in Mangold. *Id.* at 18–19. According to Petitioner, "it would have been obvious to implement Fichtl's hearing device such that Fichtl's user controls, controller to determine audio processing parameters (APPs), and memory to store the APPs are implemented in Fichtl's remote control, as Mangold discloses implementing similar or analogous components, used for a similar purpose, in a remote control." *Id.* at 19. As noted above, Mangold describes its remote control as including programmable block 26 with an automatic program selector to automatically select a program in response to the detected ambient noise level and memory to store programs. Ex. 1107, 3:49–52, 4:11–21.

Petitioner argues that a skilled artisan "would have been motivated to incorporate Fichtl's user controls, controller, and memory in Fichtl's remote control, as taught by Mangold" to provide the benefit of acclimatization, as taught in Fichtl, but keeping the processor and memory components in the remote control to make the hearing aid "smaller, lighter in weight, and less

visible," as taught in Mangold. Pet. 20–21 (quoting Ex. 1107, 1:67–2:2).
We agree that Mangold itself expressly states a reason to incorporate control
functionality in a remote control that communicates with a hearing aid.
Petitioner further notes that U.S. Patent No. 6,741,712 B2 (Ex. 1106,
"Bisgaard") describes using the hearing aid of Mangold with a "habituation
system" that provides acclimatization. *Id.* (citing Ex. 1106, 1:5–15, 2:48–
56). This is further evidence that a skilled artisan would have combined
Mangold's remote control teachings with Fichtl's hearing aid system.
Dr. Atlas testifies that, in the combination, Fitchtl's remote control, in light
of the teachings of Mangold, would allow a hearing aid user to control APP
values using the remote control. Ex. 1108 ¶ 180. On the complete record,
we find that a skilled artisan would have had reasons to combine the
teachings of Fichtl and Mangold.

Regarding "a transceiver configurable to communicate with a hearing
aid through a communication channel," Petitioner cites to Figure 1 and the
claims of Fichtl to show audiologist 11 inputting parameters to hearing
device 1 via fitting interface 8. Pet. 22–23. Dr. Atlas testifies that "[a]
transceiver is a well-known mechanism for communicating between
electronic devices such as hearing aids and remotes, and allows the remote
control not only to send commands and data, but also to receive
confirmations and other data from the hearing aid." Ex. 1108 ¶ 186.
Petitioner also argues that Mangold describes its remote control as including
a transmitter for sending information to its hearing aid, confirming that
Fichtl's remote control would include such a transmitter. Pet. 24–25.
Mangold describes sending a coded digital control signal from transmitter
and coder 28, via speaker 30 of remote control unit 6, to microphone 10 and

programmable decoder 22 of hearing aid 4. Ex. 1107, 3:23–49. We find that Fichtl implicitly teaches and Mangold expressly teaches a transceiver configurable to communicate with a hearing aid through a communication channel.

Regarding "a processor coupled to the transceiver" and "a memory coupled to the processor and configured to store instructions," as recited in claim 10, Petitioner points to Fichtl's controller 6 and memory 7, and argues that Fichtl would be modified, per Mangold's teachings, to include these components in Fichtl's remote control 12. *Id.* at 25–26. Fichtl describes "[a] controller 6 is adapted to set such parameters, for example, when the hearing device 1 is switched on or when the volume control 4 is actuated," and "a non-volatile memory 7 to store parameters while the hearing device 1 is switched off." Ex. 1103, 3:28–32. We find that Fichtl describes a processor and a memory coupled to the processor and configured to store instructions. We also find, in light of Mangold's teachings, that a skilled artisan would have had reasons, with rational underpinning, to locate the processor and memory in the remote control (and, thus, coupled to the transceiver), for example to limit the size and weight of the hearing aid, as discussed above.

Patent Owner does not dispute that Fichtl and Mangold teach the "transceiver," "processor," and "memory" limitations of claim 10.

Nevertheless, the parties dispute whether Fichtl and Mangold teach the instructions recited in claim 10. Specifically, the parties dispute whether the references teach

> instructions that, when executed by the processor, cause the
> processor to: generate a sequence of incremental hearing

correction filters based at least in part on a magnitude of a
difference between a hearing aid profile and a hearing loss level
associated with a user of the hearing aid, the sequence of
incremental hearing correction filters including at least a first
hearing correction filter and a second hearing correction filter

as recited in claim 10.

Petitioner cites Fichtl for this aspect of claim 10. As explained above,
Fichtl describes an algorithm for changing over time an APP corresponding
to a user's hearing loss. Ex. 1103, 3:35–4:15. Petitioner contends that
Fichtl's algorithm would be applied to multiple APPs in a collection that
would correspond to a "hearing aid profile," as recited in claim 10. Pet. 28–
29. As Petitioner notes (*id.*), Fichtl describes processing a signal "based on
audio processing parameters," that the controller is "adapted to set such
parameters, for example, when the hearing device 1 is switched on or when
the volume control 4 is actuated," and that non-volatile memory 7 stores
"parameters while the hearing device 1 is switched off." Ex. 1103, 3:23–32.
Based on Fichtl's repeated references to plural parameters, we find that
Fichtl describes a system that processes multiple APPs as part of a collection
of acoustic configuration settings, i.e., a hearing aid profile.

Petitioner contends that, because "Fichtl's acclimatization algorithm
corresponds to adjustments applied by controller 6 to the collection of APPs
of processor 9 to reduce the level of correction provided to the hearing
device user by application of the hearing aid profile," the algorithm
comprises a sequence of hearing correction filters. Pet. 29. Petitioner
further contends that, because the Fichtl algorithm outputs intermediate APP
values with reduced amplitudes relative to tPOV, the algorithm provides a
modulated output signal having a level that is within a range between an

uncompensated output level and the desired output level, and, thus, includes "incremental hearing correction filters." Pet. 29–30.

Patent Owner contends that Fichtl and Mangold do not teach generating a "sequence" of incremental hearing correction filters. PO Resp. 28–32. Patent Owner contends that the progression of a sequence must be predictable from the first step to the next in a sequence and that Fichtl is different in that it describes a user-provided adjustment to the volume of a hearing aid, where that adjustment "at any one point in time is solely based on a user-provided command indicating the user's hearing preferences at that particular moment in time." *Id.* at 29. According to Patent Owner, "there is no teaching or suggestion in Fichtl that allows a person of ordinary skill in the art to determine or predict the order of subsequent adjustments." *Id.* at 30. As a result, Patent Owner argues, "the adjusted APPs are not determined in advance, are not predictable, and are not designated to be applied sequentially," but rather "[t]he implementation of the first APP is the earliest that the second APP can be calculated." *Id.*

At the hearing, Patent Owner clarified that it is arguing that the entire sequence of hearing correction filters must be determined before the first hearing correction filter is applied. Tr. 50:1–4 ("JUDGE McKONE: So it's your position that the entire sequence of hearing correction filters has to be determined before you apply the first one? MS. SAVEE: Yes, it has to be determined in advance."). Nevertheless, Patent Owner does not contend that this turns on an issue of the construction of the term "sequence" (which

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Patent Owner says it is not disputing[4]). *Id.* at 50:9–17. Rather, according to Patent Owner, its position stems from "[t]he fact that the claims do recite a first hearing correction filter and a second hearing correction filter in the claims of this system, this device." *Id.* at 50:18–23. Patent Owner argues that the '999 patent describes an example of a collection of hearing correction filters that are known in advance and does not have any examples in which the hearing correction filters are not known in advance. *Id.* at 51:1–10; PO Resp. 31 (citing Ex. 1101, 2:65–3:40). The specification describes, for example:

> In one embodiment, the incremental hearing corrections can be formed by applying one or more hearing correction filters to a selected hearing aid profile to produce the intermediate hearing aid profiles. In another embodiment, the incremental hearing corrections can be programmed by a hearing health professional. In still another embodiment, the incremental hearing corrections can be calculated dynamically as a function of a difference in decibels between the uncompensated level and the desired output level.

Ex. 1101, 3:33–41. This description does not indicate any requirement that all hearing correction filters be determined in advance of applying the first filter. To the contrary, the description of calculating the hearing corrections "dynamically" suggests that, in one example, hearing correction filters are not determined in advance, but rather as they are needed.

Patent Owner also supports its argument with the testimony of Mr. Brown. PO Resp. 31 (citing Ex. 2103 ¶¶ 59–60). Here, Mr. Brown

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[4] Petitioner cites a dictionary definition of "sequence" as "the following of one thing after another in chronological, causal, or logical order." Reply 10 (citing WEBSTER'S NEW COLLEGE DICTIONARY 2007, Ex. 1117, 1308).

testifies that the '999 patent describes a processor providing a series of generated hearing correction filters designated to be sequentially applied to a hearing aid profile, but does not testify as to when those filters must be generated, and specifically does not testify that all such filters must be generated or determined in advance of applying the first filter. Ex. 2103 ¶ 59. Thus, Mr. Brown's testimony does not support the requirement Patent Owner proposes, as we understand that requirement from Patent Owner's clarification at the oral argument. Moreover, as Petitioner points out (Reply 12), Mr. Brown conceded on cross-examination that Fichtl's power-on values iPOV, $rPOV_1$, and $rPOV_2$ form a sequence. Ex. 1116, 61:1–17.

Patent Owner's argument is unpersuasive, as it relies implicitly on limitations that are not present in claim 10, either expressly or by virtue of disclosure in the specification. As Petitioner argues, "each power-on value (POV) [of Fichtl] follows one after another in time, where each POV corresponds to a hearing correction filter." Reply 12. Moreover, we agree with Petitioner (*id.* at 13) that Fichtl's power-on values are determined in advance of when they are applied, as they are stored when the user powers off the device and applied when the device is turned back on. Ex. 1103, 3:42–53. Upon consideration of the complete record, we find that Fichtl describes instructions to "generate a sequence of incremental hearing correction filters," as recited in claim 10.

As to "generate a sequence of incremental hearing correction filters *based at least in part on a magnitude of a difference between a hearing aid profile and a hearing loss level* associated with a user of the hearing aid," as recited in claim 10 (emphasis added), Petitioner contends that, because, in Fichtl's system, initial iPOV is selected to provide a smaller level of

compensation than tPOV (the target value corresponding to the hearing aid profile), all incremental adjustments are generated to provide values between iPOV and tPOV. Pet. 30–31. Thus, Petitioner argues, the sequence of incremental hearing correction filters of Fichtl is generated based at least in part on the magnitude of the difference between tPOV and iPOV. *Id.*

> In one example, Fichtl provides:

> The threshold value T be the target power-on value tPOV itself or it can be calculated from it by a formula:

> > T=tPOV–dist,

> > in particular with

> > dist=p*(tPOV–iPOV)

> iPOV is an initial power-on value. For example, dist is equal to 1 dB, and p is equal to 0.1, for example.

Ex. 1003, 4:57–67. Dr. Atlas testifies that "the iPOV and all incremental adjustments in-between the iPOV and the tPOV are generated to provide values between the hearing loss level associated with the user (determined during the initial fitting) and the hearing aid profile (tPOV)." Ex. 1108 ¶ 194. Patent Owner does not contest this aspect of claim 10. Based on the disclosure of Fichtl and Dr. Atlas's uncontroverted testimony, we find that Fichtl's incremental hearing correction filters are based on a magnitude of a difference between a hearing aid profile and a hearing loss level associated with the user of the hearing aid.

Patent Owner, however, does dispute whether Fichtl and Mangold teach "the sequence of incremental hearing correction filters including at least a first hearing correction filter and a second hearing correction filter," as recited in claim 10.

Patent Owner characterizes Fichtl as describing "a series of disjointed volume adjustment events during each of which a volume of a hearing device is adjusted based on a user-provided adjustment command," and argues that "[a]djusting a volume is not the same as generating [a hearing correction filter] for a hearing aid profile because changing a volume does not change frequency characteristics of the underlying audio signal, and changing volumes does not involve a 'collection of filters.'" PO Resp. 23–24. This argument has two aspects, both based on Patent Owner's proposed construction of "hearing correction filter."

First, Patent Owner argues that Fichtl's algorithm operates on a single APP, for example volume, and that "under the correct claim construction, as set forth above, Fichtl's application of its algorithm to an APP does not teach or suggest the limitations of the claim, as the disclosure of Fichtl does not include '***a collection of filters*** applied by a processor to a hearing aid profile to reduce the level of correction provided to a user by application of the hearing aid profile.'" *Id.* at 24–25. As explained in Section II.A.1 above, an individual "hearing correction filter" is "a filter that is applied by a processor within a hearing aid to a hearing aid profile to reduce the level of correction provided to the user by application of the hearing aid profile," and need not be a collection of such filters.

Second, Patent Owner contends that a hearing correction filter must "impact[] different frequencies of the signal in different ways," for example adjusting one set of selected frequencies to a desired hearing level while providing less enhancement to other frequencies. *Id.* at 25. In contrast, Patent Owner argues, "adjusting a volume at any given disjointed volume adjusting event disclosed by Fichtl does not provide varying effects on

different portions of the underlying audio signal of the hearing device."
Id. at 24–26. As explained in Section II.A.1 above (at 13–14), however, a
hearing correction filter need not provide such varying effects.[5]

On the complete record, we find that Fichtl teaches storing
intermediate power-on values of an APP upon a user turning off the hearing
aid and that these power-on values (e.g., iPOV, rPOV) are applied to an APP
when the hearing aid is turned on to reduce the level of correction provided
to the user. Ex. 1103, 3:42–4:15. We find that each of these power-on
values represents an intermediate hearing adjustment applied by the
processor to reduce the level of correction provided to the user by
application of the hearing aid profile and, thus, is an "incremental hearing
correction filter." Because these filters are applied sequentially, we find that
Fichtl teaches "the sequence of incremental hearing correction filters
including at least a first hearing correction filter and a second hearing
correction filter," as recited in claim 10.

We also find that, even under Patent Owner's proposed construction
of "hearing correction filter," Fichtl teaches a collection of filters applied by
a processor to a hearing aid profile. As explained above, we find that Fichtl
describes a system that processes multiple APPs as part of a collection,

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[5] Patent Owner argues that "[t]he Petitioner never explains any alleged
relationship between volume change and a filter, and provides no evidence
that the teaching of changing a volume renders obvious a filter or a
collection of filters." PO Resp. 27. This argument is unclear. Nevertheless,
Petitioner contends that a filter is simply an "adjustment" applied to a
hearing aid profile. Pet. 13 (quoting Ex. 1101, 2:65–3:7). At the oral
argument, Patent Owner disagreed that "filter" and "adjustment" are
synonymous, but admitted that it did not provide a construction for "filter"
or raise it as a dispute. Tr. 30:24–35:10.

rather than the single volume audio parameter value discussed in the example of Figure 2. Ex. 1103, 3:27–32.

Patent Owner takes issue with the specific APP examples, beyond volume, identified in Fichtl. Fichtl states that "[t]he audio processing parameter APP is typically volume but may also be something else, as, for example, treble or noise cancelling." Ex. 1103, 3:44–47. Patent Owner argues that "[o]ne of ordinary skill in the art understands that adjusting treble takes place without using a collection of filters, but instead, as described in Fichtl, will be adjusted via an APP value." PO Resp. 27. In support, Mr. Brown testifies, without elaboration or citation to evidence, that a skilled artisan "would not understand a treble adjustment, as referred to in Fichtl, to be a collection of filters." Ex. 2103 ¶ 53. However, applied together with adjusting volume, adjusting treble would adjust multiple frequency ranges differently. Mr. Brown admits that this would be a hearing correction filter:

> Q. . . . We've got the overall gain adjustment. We've got a set of higher frequencies that gets adjusted. And this takes place during the acclimatization process. Would you agree that those two adjustments constitutes a hearing correction filter?
>
> THE WITNESS: I would agree that the modifications of the high-frequency bands could constitute a hearing correction filter.

Ex. 1116, 54:24–55:8 (objections omitted). Thus, Patent Owner's argument is not persuasive.

Patent Owner also argues that "[n]oise cancellation is a pre-processing technique that is applied to a signal before the signal is provided to a hearing aid profile, and is also adjusted via an APP value." PO Resp. 27. In

support, Mr. Brown testifies, again without citation to evidence, that a

skilled artisan

> would understand that noise cancellation adjustments typically
> take place before the signal is provided to a hearing aid profile,
> as this pre-processing is needed to remove the extraneous
> frequencies. After this pre-processing, typically the signal is
> then sent to the hearing aid profile for any profile adjustment to
> the signal.

Ex. 2103 ¶ 54. Patent Owner, however, does not explain why this should

affect our analysis. In any case, Fichtl does not describe treating noise

cancellation differently from volume and treble, the other example APPs it

describes. Ex. 1103, 3:44–47. Thus, Patent Owner's argument is

unpersuasive.

> Claim 10 further recites

> provide a first signal related to the first hearing correction filter
>> of the sequence of incremental hearing correction filters
>> to the hearing aid through the communication channel;
>> and

> provide a second signal related to a second hearing correction
>> filter of the sequence of incremental hearing correction
>> filters to the hearing aid in response to receiving a
>> selection of the second hearing correction filter from a
>> user of the hearing aid.

As explained above, we find that Fitchl's controller, in a combination with

Mangold, would be implemented in the remote control. Dr. Atlas testifies:

> Because the APP power-on values provided by Fichtl's remote
> control to the hearing aid through a communication channel are
> related to corresponding incremental hearing correction filters,
> Fichtl in view of Mangold discloses providing a first signal
> related to the first hearing correction filter of the sequence of
> incremental hearing correction filters to the hearing aid through
> the communication channel.

Ex. 1108 ¶ 195. Dr. Atlas provides similar testimony for providing a second signal related to a second hearing correction filter. *Id.* ¶ 197. We agree with and credit Dr. Atlas's uncontroverted testimony. We find the successive POV values would be provided via related signals (i.e., first and second signals) transmitted on the communication channels. As Dr. Atlas testifies (*id.*), because successive POV values are sent when the user turns the hearing aid on, the second signal would be provided in response to receiving a selection of the filter by the user of the hearing aid. Accordingly, we find that Fichtl and Mangold teach these limitations of claim 10.

In sum, we find that Fichtl and Mangold teach each limitation of claim 10 and a person of ordinary skill in the art would have had reasons to combine Fichtl and Mangold in the manner recited in claim 10.

(2) Claims 13, 14, and 20

Claim 13 depends from claim 10 and adds "wherein the first signal and the second signal comprise triggers to initiate an adjustment to a currently selected incremental hearing correction filter executing on the hearing aid." As explained for claim 10, above, in the combination of Fichtl and Mangold, successive replacement POV values are sent, via the communication channel, in response to a user turning a hearing aid on. Dr. Atlas testifies that "these signals, including the first and second signals related to the first and second hearing correction filters, respectively, comprise triggers to initiate an adjustment to a currently selected incremental hearing correction filter executing on the hearing aid." Ex. 1108 ¶ 199; Pet. 34. We agree with Dr. Atlas's uncontroverted testimony and find that the first and second signals sent by the remote control of the

Fichtl/Mangold combination to the hearing aid would have included triggers to initiate adjustments to the currently selected incremental hearing correction filters executing on the hearing aid.

Claim 14 depends from claim 10 and adds "wherein the first signal and the second signal include the first hearing correction filter and the second hearing correction filter." As explained for claim 10, above, in the combination of Fichtl and Mangold, successive replacement POV values are sent, via the communication channel, in response to a user turning a hearing aid on. Also as explained above, the POV values are hearing correction filters. Therefore, we find that Fichtl and Mangold teach that the first signal and the second signal include the first hearing correction filter and the second hearing correction filter. *See* Pet. 34–35; Ex. 1108 ¶ 200.

Claim 20 depends from claim 10. Although claim 10 recites a "computing device," claim 20 recites "[t]he computer-readable device of claim 10." We understand Petitioner to contend this to be an obvious typographical error. Pet. 35. A patent claim may be interpreted as if it had been corrected "only if (1) the correction is not subject to reasonable debate based on consideration of the claim language and the specification and (2) the prosecution history does not suggest a different interpretation of the claims." *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1357 (Fed. Cir. 2003). As explained in our Decision on Institution (Dec. 25), claim 20, as originally drafted (numbered claim 25 at the time), depended from claim 10 (numbered claim 14 at the time). Ex. 1102, 138, 141. Claim 20 also recites "provide the hearing aid profile to *the hearing aid*." We recognize that claim 20 recites "[t]he computer-readable device," rather than "the computing device," and that independent claim 6 recites "[a] non-

transitory computer-readable device." Nevertheless, the antecedent basis for "the hearing aid" of claim 20 is "a transceiver configurable to communicate with *a hearing aid* through a communication channel," recited in claim 10. Patent Owner does not dispute the preliminary conclusion in the Decision on Institution (Dec. 25) that claim 20 contains an obvious typographical error. Based on the complete record, we conclude that claim 20 contains an obvious typographical error and should read "the computing device of claim 10" rather than the "computer-readable device of claim 10."

Claim 20 further recites instructions that "cause the processor to receive: a selection of a hearing aid profile; and provide the hearing aid profile to the hearing aid." As explained above, Fichtl describes an APP as part of a collection of APP values, which we find is a hearing aid profile. Petitioner contends that Mangold teaches selection of a hearing aid profile from a plurality of profiles and that a skilled artisan would have incorporated that teaching into Fichtl's system. Pet. 36–38.

Petitioner argues that in Mangold, an audiologist programs multiple hearing aid profiles into a hearing aid memory and a user selects a profile from the multiple profiles. *Id.* at 36–37 (citing Ex. 1107, 1:17–22, 3:13–15, 3:40–41, 3:49–56, 3:60–66, 4:11–26). For example, Mangold explains that "[a] manual program control switch 18 is provided for the user of the device to select from among the several programming options stored in memory 16." Ex. 1107, 3:13–15. Mangold describes its programs as including "one or more of: specific settings of a limited number of parameters; selection of a processing configuration strategy; modification of a prosthesis control program; or setting of coefficients in a prosthesis program." Ex. 1107, 2:28–33. Based on this description, we find that Mangold's stored programs are

"hearing aid profiles" and correspond to Fichtl's collection of APPs. Mangold describes transmitting the selected program to the hearing aid. *Id.* at 3:46–49. On this evidence, we find that Mangold teaches receiving a selection of a hearing aid profile and providing the profile to a hearing aid.

As explained above, we find that Mangold expressly states a reason to incorporate control functionality in a remote control that communicates with a hearing aid. Ex. 1107, 1:67–2:2. Dr. Atlas testifies that "[p]roviding a plurality of hearing aid profiles would allow . . . a profile to be selected based on the hearing aid user's current sound environment to better compensate for hearing loss in that environment." Ex. 1108 ¶ 204. We credit Dr. Atlas's uncontroverted testimony. On the complete record, we find that a skilled artisan would have had reasons to combine Fichtl and Mangold to arrive at the subject matter of claim 20.

We note that Patent Owner does not present separate argument for claims 13, 14, and 20.

d. Conclusion of Obviousness

As explained above, Fichtl and Mangold teach each limitation of claims 10, 13, 14, and 20. Petitioner has introduced persuasive evidence that a skilled artisan would have had reasons to combine the teachings of Fichtl and Mangold. Patent Owner does not argue or introduce evidence of objective indicia of nonobviousness. In sum, upon consideration of all the evidence, we conclude that Petitioner has proved by a preponderance of the evidence that claims 10, 13, 14, and 20 would have been obvious over Fichtl and Mangold.

3. *Alleged Obviousness over Fichtl, Mangold, and Sacha*

Petitioner contends that claims 11 and 15 would have been obvious over Fichtl, Mangold, and Sacha. Pet. 38–44. For the reasons given below, we agree.

a. *Scope and Content of the Prior Art—Overview of Sacha*

Sacha describes a hearing aid that compensates for a patient's hearing deficit gradually over time. Ex. 1104, Abstract. The hearing aid is programmed with a group of parameter sets representing optimal and sub-optimal parameter sets, based on testing of the patient's hearing. *Id.* ¶ 12. The hearing aid selects parameter sets by sequencing through the parameter sets over time, for example in order of increasing amplification gain. *Id.* The hearing aid includes a timer that records the time during which the hearing aid is powered on and stores that value in a flash memory when the device is powered off. *Id.* ¶ 15. The progression from one parameter set to the next can occur after a specified time interval has elapsed. *Id.*

b. *Differences Between Claims 11 and 15 and the Prior Art, and Reasons to Modify or Combine*

Claims 11 and 15 depend from claim 10 and recite instructions that add timing aspects to the selection of hearing correction filters. Regarding "initiate a timer to determine the period of time," as recited in claim 11, Petitioner contends that Sacha describes an acclimatization program with a time-based trigger for sequencing through sub-optimal signal processing parameters. Pet. 38. Sacha describes "a timer 230 . . . that operates when the device is powered on" and "records the time during which the device is

powered up and stores that value in the flash memory when the device is powered down." Ex. 1104 ¶ 15. Sacha explains that its device can maintain a running total of its operating time and that "[t]he progression from each parameter set to another may occur after the same operating time interval, or different operating time intervals may be defined for each parameter set." *Id.* Based on this evidence, we find that Sacha teaches a device that "initiate[s] a timer to determine the period of time," as recited in claim 11.

Claim 11 further recites "iteratively select and provide selection signals related to subsequent ones of the incremental hearing correction filters from the sequence to the hearing aid when the period of time exceeds the threshold time increment." For this limitation, Petitioner points to the same signals it identifies for claim 13 as being the "selection signals" of claim 11. Pet. 41. According to Petitioner, "Fichtl in view of Sacha discloses sending such trigger signals after the current hearing correction filter has been applied for a predetermined amount of time." *Id.* As Petitioner points out (Pet. 38–39), Sacha describes that a "device may successively select a new parameter set after a specified operating time interval has elapsed" and that "[t]he progression from each parameter set to another may occur after the same operating time interval, or different operating time intervals may be defined for each parameter set." Ex. 1104 ¶ 15. On this evidence, we find that Sacha teaches instructions causing the processor to "iteratively select and provide selection signals related to subsequent ones of the incremental hearing correction filters from the sequence to the hearing aid when the period of time exceeds the threshold time increment," as recited in claim 11.

Claim 11 further recites instructions causing the processor to "reset and restart the timer when each of the subsequent ones of the incremental hearing correction filters is provided to the hearing aid." Petitioner, citing Dr. Atlas's testimony, contends Sacha's description of progressing through parameter sets using the same operating time interval teaches resetting and restarting the timer so that the next hearing correction filter could be provided. Pet. 42 (citing Ex. 1108 ¶ 210). We agree with Petitioner and find that Sacha teaches this limitation of claim 11.

Petitioner, relying on Dr. Atlas's testimony, contends that a skilled artisan would have recognized that power-on events (Fichtl) and operating time (Sacha) are common, alternative mechanisms for triggering incremental corrections during an acclimatization process. Pet. 39 (citing Ex. 1108 ¶ 207). According to Dr. Atlas, Sacha's teaching would have prevented Fichtl's acclimatization process from occurring too quickly or slowly in instances where a user powers the hearing aid on and off too frequently or infrequently. Ex. 1108 ¶ 207. Dr. Atlas also testifies that triggering based on time intervals would have allowed control over which corrections are applied for longer or shorter time intervals depending on how close the algorithm is to full compensation. *Id.*; Pet. 40. We credit Dr. Atlas's uncontroverted testimony, which has rational underpinning. Accordingly, we find that a skilled artisan would have had reasons to apply Sacha's teachings to Fichtl and Mangold.

Claim 15 depends from claim 10 and adds instructions to

cause the processor to progressively advance through the sequence of the incremental hearing correction filters by providing each of the incremental hearing correction filter to the hearing aid, one at a time, over a sequence of time

> increments to provide a progressive hearing aid adjustment
> from an uncompensated hearing level to a corrected hearing
> level to aid in the user in acclimating to the hearing aid.

Fichtl describes progressively advancing through a sequence of incremental hearing correction filters (iPOV, $rPOV_1$, POV_2) by providing the filters to the hearing aid one at a time to provide a progressive hearing aid adjustment from an uncompensated hearing level to a corrected hearing level (tPOV). Ex. 1103, 3:42–4:15. Sacha describes providing hearing adjustments over a sequence of time increments. Ex. 1104 ¶ 15 ("The progression from each parameter set to another may occur after the same operating time interval, or different operating time intervals may be defined for each parameter set."); Pet. 43–44. We explain above that a skilled artisan would have had reasons to combine Fichtl, Mangold, and Sacha. Accordingly, we find that Fichtl, Mangold, and Sacha teach the additional limitations of claim 15.

c. Conclusion of Obviousness

As explained above, Fichtl, Mangold, and Sacha teach each limitation of claims 11 and 15. Petitioner has introduced persuasive evidence that a skilled artisan would have had reasons to combine the teachings of Fichtl, Mangold, and Sacha. Patent Owner does not argue or introduce evidence of objective indicia of nonobviousness. In sum, upon consideration of all the evidence, we conclude that Petitioner has proved by a preponderance of the evidence that claims 11 and 15 would have been obvious over Fichtl, Mangold, and Sacha.

III. Patent Owner's Motion to Exclude Evidence

Patent Owner moves to exclude Exhibits 1109 (a translation into English of German Patent Specification DE 195 42 961 C1)[6], 1111, and 1112. Mot. to Exclude. Our decision does not rely on Exhibits 1109, 1111, or 1112. Accordingly, we dismiss the Motion to Exclude as moot.

IV. CONCLUSION

Petitioner has proved by a preponderance of the evidence that claims 10, 11, 13–15, and 20 are unpatentable.

Patent Owner's Motion to Exclude is dismissed as moot.

V. ORDER

For the reasons given, it is:

ORDERED, based on a preponderance of the evidence, that claims 10, 11, 13–15, and 20 are unpatentable;

FURTHER ORDERED that Patent Owner's Motion to Exclude Evidence is *dismissed*; and

FURTHER ORDERED, because this is a final written decision, the parties to this proceeding seeking judicial review of our Decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

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[6] Exhibit 1109 is relied upon in the related IPR2017-00781 (numbered as Exhibit 1009 in that proceeding). A similar motion to exclude is raised in that proceeding as to Exhibit 1009 and is addressed on the merits as to this exhibit.

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