

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

1964 EARS, LLC,
Petitioner,

v.

JERRY HARVEY AUDIO HOLDING, LLC,
Patent Owner.

Case IPR2017-01084
Patent 8,567,555 B2

PATENT OWNER'S NOTICE OF APPEAL

Notice is hereby given, pursuant to 37 C.F.R. § 90.2(a)(1), that Patent Owner Jerry Harvey Audio Holding, LLC, hereby timely appeals under 35 U.S.C. §§ 141, 142, and 319 to the United States Court of Appeals for the Federal Circuit from the Final Written Decision entered on April 2, 2019 (Paper 60) and from all underlying orders, decisions, rulings, and opinions. A copy of the Final Written Decision is attached hereto as Exhibit A.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), the issues on appeal include, but are not limited to: the Board's determination that claims 1–20 of U.S. Patent No. 8,567,555 were shown to be unpatentable; the Board's denial of Patent Owner's Motion to Amend; and, any finding or determination supporting or relating to these issues, as well as all other issues decided adversely to Patent Owner in any order, decision, ruling, or opinion.

Pursuant to 35 U.S.C. § 142 and 37 C.F.R. § 90.2(a), this Notice is being filed with the Director of the United States Patent and Trademark Office, and a copy of this Notice is being concurrently filed with the Patent Trial and Appeal Board. In addition, a copy of this Notice and the required docketing fee are being filed with the Clerk's Office for the United States Court of Appeals for the Federal Circuit via CM/ECF.

Respectfully submitted,

Date: June 4, 2019

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CERTIFICATE OF SERVICE AND FILING

I hereby certify that on the date indicated below, in addition to being filed and served electronically through the Board’s E2E System, a true and correct copy of the foregoing “**PATENT OWNER’S NOTICE OF APPEAL,**” was served on the Director of the United States Patent and Trademark Office, via Express Mail overnight delivery at the following address:

Office of the General Counsel
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450

I also hereby certify that on the date indicated below, a true and correct copy of the foregoing “**PATENT OWNER’S NOTICE OF APPEAL,**” and the filing fee, were or will be filed with the Clerk’s Office of the United States Court of Appeals for the Federal Circuit through the Court’s CM/ECF system.

I also hereby certify that on the date indicated below, a true and correct copy of the foregoing “**PATENT OWNER’S NOTICE OF APPEAL,**” was served, by electronic mail, upon Petitioner’s counsel of record as follows:

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Date: June 4, 2019

By: /Daniel B. Ravicher/
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Counsel for Patent Owner

EXHIBIT A

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

1964 EARS, LLC,
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JERRY HARVEY AUDIO HOLDING, LLC,
Patent Owner.

Case IPR2017-01084
Patent 8,567,555 B2

Before BRIAN J. McNAMARA, JOHN F. HORVATH, and
AARON W. MOORE, *Administrative Patent Judges*.

HORVATH, *Administrative Patent Judge*.

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

ORDER ON MOTION TO AMEND
35 U.S.C. § 316(d) and 37 C.F.R. § 42.121

I. INTRODUCTION

A. Background

On March 15, 2017, 1964 Ears, LLC (“Petitioner”),¹ an Oregon limited liability company, filed a Petition (Paper 1, “Pet.”) to institute *inter partes* review of claims 1–20 of U.S. Patent No. 8,567,555 B2 (Ex. 1001, “the ’555 patent”) supported by a Declaration of Bob Young (Ex. 1003). Jerry Harvey Audio Holdings, LLC (“Patent Owner”) filed a Preliminary Response (Paper 7, “Prelim. Resp.”). On October 4, 2017, upon consideration of the Petition and Preliminary Response, we instituted review to determine the patentability of all of the challenged claims, but only on a subset of the grounds raised in the Petition. Paper 8, 4–5, 33–34 (“Dec. Inst.”).

Subsequent to institution, Patent Owner filed a Response to the Petition (Paper 20, “PO Resp.”), and a Contingent Motion to Amend, seeking to replace claims 1–20 with substitute claims 21–40 (Paper 21, “PO MTA”). Petitioner filed a Reply to Patent Owner’s Response (Paper 22, “Pet. Reply”) supported by a second Declaration of Bob Young (Ex. 1028), and an Opposition to the Motion to Amend (Paper 23, “Pet. Opp. MTA”) supported by a third Declaration of Bob Young (Ex. 1033). Patent Owner filed a Reply in support of its Motion to Amend (Paper 31, “PO Reply MTA”), and Petitioner filed a Sur-Reply (Paper 32, “Pet. Sur-Reply MTA”).

¹ Petitioner further identifies 1964 Ears LLC, Reshell LLC, Magrepha Sound LLC, and Masters Touch 2, LLC, all Washington limited liability companies, and 64 Audio Inc., VIB Marketing Corp., Shell & Casting Corp., Sklar, Inc., and Digital Ear Corp., all Washington corporations, as real parties-in-interest.

Patent Owner deposed Mr. Young regarding his opinions in support of Petitioner's Opposition to the Motion to Amend, and submitted the deposition transcript as evidence. Paper 28; Ex. 2001. Patent Owner also deposed Mr. Young regarding his opinions in support of Petitioner's Reply to Patent Owner's Response to the Petition, and submitted the deposition transcript as evidence. Paper 29; Ex. 2002. Patent Owner filed a Motion for Observations on the cross-examination of Mr. Young (Paper 34, "PO Obs."), and Petitioner filed a Response to the Motion (Paper 40, "Pet. Resp. Obs."). Petitioner filed a Motion to Exclude portions of Mr. Young's deposition transcript as beyond the scope of cross-examination. Paper 36. Patent Owner filed an Opposition to the Motion to Exclude (Paper 39), and Petitioner filed a Reply (Paper 41).

On April 24, 2018, the Supreme Court issued its decision in *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018). On April 26, 2018, the Board published "Guidance on the Impact of SAS on AIA Trial Proceedings."² According to the guidance, when "a panel has instituted trial only on some of the challenges raised in the petition . . . the panel may issue an order supplementing the institution decision to institute on all challenges raised in the petition." On May 17, 2018, we conducted a conference call with the parties to discuss the implications of the *SAS* decision on the non-instituted grounds in this proceeding, and, subsequent to the call, modified our Institution Decision to institute review of all challenged claims on all challenged grounds. Paper 42, 2–3. On June 13, 2018, Petitioner filed a

² See <https://www.uspto.gov/patents-application-process/patent-trial-and-appeal-board/trials/guidance-impact-sas-aia-trial>.

Request for Partial Adverse Judgment, seeking adverse judgment on the claims and grounds for which we did not originally institute *inter partes* review in this proceeding. Paper 48, 3–4. Patent Owner did not oppose the request. Paper 51, 3. Consequently, on June 27, 2018, we granted Petitioner’s Request for Partial Adverse Judgment, and found that Petitioner had not shown by a preponderance of evidence that the challenged claims were unpatentable on those grounds for which we originally declined to institute *inter partes* review. *Id.* at 5–6.

An oral hearing to determine the patentability of the challenged claims on the originally instituted grounds and the patentability of the proposed substitute claims was held on December 17, 2018, and the hearing transcript is included in the record. *See* Paper 59 (“Tr.”). We have jurisdiction under 35 U.S.C. § 6(b). This is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

For the reasons set forth below, we find Petitioner has shown by a preponderance of evidence that claims 1–20 of the ’555 patent are unpatentable, and has shown by a preponderance of evidence that proposed substitute claims 21–40 of the ’555 patent are unpatentable.

B. Related Matters

Petitioner and Patent Owner identify the following as matters that could affect, or be affected by, a decision in this proceeding: *Jerry Harvey Audio Holding, LLC et al. v. 1964 Ears, LLC et al.*, Case No. 6:16-cv-00409-CEM-KRS (M.D. Fla); *1964 Ears, LLC v. Jerry Harvey Audio Holding LLC*, Case No. IPR2017-01091 (challenging the patentability of U.S. Patent No. 8,925,674, which is a continuation-in-part of the ’555 patent); and *1964 Ears, LLC v. Jerry Harvey Audio Holding LLC*, Case No.

IPR2017-01091 (challenging the patentability of U.S. Patent No. 9,197,960, which is a continuation of the '674 patent). Pet. 2–3; Paper 5, 1.

C. Evidence Relied Upon³

Reference		Publication Date	Exhibit
von Dombrowski (“Dombrowski”)	US 2006/0159298 A1	July 20, 2006	Ex. 1004
Saggio	US 2011/0058702 A1	Mar. 10, 2011	Ex. 1005
LoPresti	US 2007/0223735 A1	Sept. 27, 2007	Ex. 1006
Knowles Electronics, Inc., Effects of Acoustical Termination Upon Receiver Response, Technical Bulletin TB6 (“Knowles TB6”)		Aug. 16, 2010	Ex. 1007
Blanchard	US 2009/0147981 A1	June 11, 2009	Ex. 1008

D. Instituted Grounds of Unpatentability

We instituted review on the following grounds of unpatentability:

Ground	Reference(s)	Basis	Claims Challenged
1	Dombrowski	§ 102(b)	1–5, 8, and 17–19
2	Dombrowski	§ 103(a)	10
3	Dombrowski and Knowles TB6	§ 103(a)	6, 7, 11–15, and 20

³ As noted in § I.A, *supra*, Petitioner also relies upon the Declaration of Bob Young (Ex. 1003), the Declaration of Bob Young in Support of Petitioner’s Reply (Ex. 1028), and the Declaration of Bob Young in Support of Petitioner’s Opposition to Motion to Amend (Ex. 1033).

Ground	Reference(s)	Basis	Claims Challenged
4	Dombrowski and Blanchard	§ 103(a)	9
5	Dombrowski, Knowles TB6, and Blanchard	§ 103(a)	16
6	Saggio and Dombrowski	§ 103(a)	1–5, 8, 10, and 17– 19
7	Saggio and Dombrowski	§ 103(a)	6, 7, 11–15, and 20
8	Saggio, Dombrowski, and Blanchard	§ 103(a)	9
9	Saggio, Dombrowski, Knowles TB6, and Blanchard	§ 103(a)	16
10	LoPresti and Dombrowski	§ 103(a)	1–3, 8–10, and 17
11	LoPresti, Dombrowski, and Knowles TB6	§ 103(a)	4–7, 11–16, and 18–20

II. ANALYSIS

A. The '555 Patent

The '555 patent is directed toward canalphones. Ex. 1001, 1:5–6.
Figure 1 of the '555 patent is reproduced below:

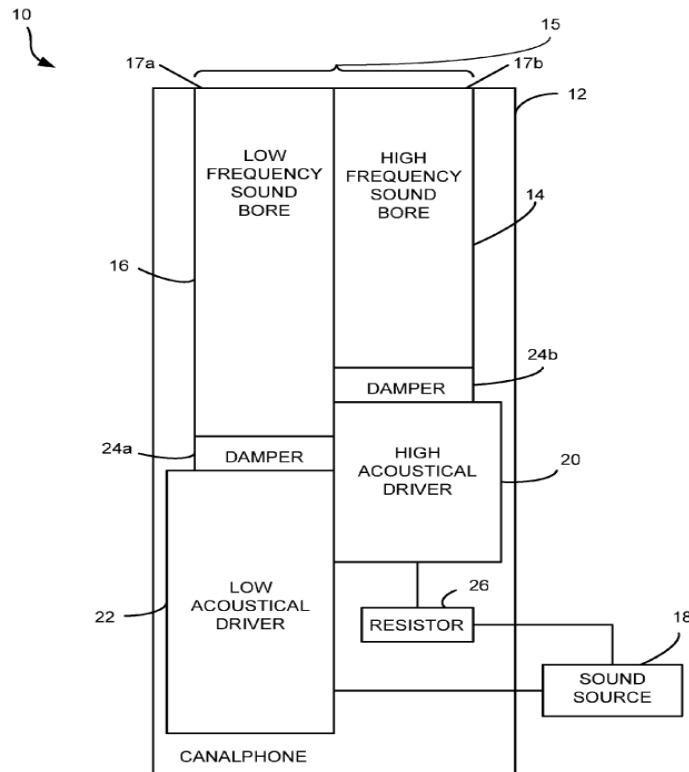


FIG. 1

Figure 1 is a block diagram showing the components of a canalphone according to the invention described in the '555 patent. *Id.* at 2:39–40. Canalphones, also referred to as in-ear monitors (IEMs), are “personal listening devices that are substantially smaller than a person’s outer ear,” and that are “placed directly in one end of the ear canal.” *Id.* at 1:14–22. Canalphones are “worn in the ear of the user and not over and/or around the ear of the user.” *Id.* at 1:22–24.

Canalphone 10, shown in Figure 1, consists of housing 12 having sound outlets 17a and 17b. *Id.* at 2:59–64. Sound source 18 provides an

electrical signal corresponding to a sound recording (e.g., music) to high frequency acoustic driver (HFD) 20, which delivers the sound to sound outlet 17b via high frequency sound bore (HFSB) 14. *Id.* at 3:16–19. Sound source 18 similarly provides an electrical signal corresponding to a sound recording to low frequency acoustic driver (LFD) 22, which delivers the sound to sound outlet 17a via low frequency sound bore (LFSB) 16. *Id.* at 3:19–22. HFD 20 can include two HFDs, and LFD 22 can include two LFDs. *Id.* at 3:23–25. HFSB 14 can carry acoustic damper 24b, positioned without a rubber boot, and LFSB 16 can carry acoustic damper 24a, positioned without a rubber boot. *Id.* at 3:26–30. HFSB 14 and LFSB 16 are positioned adjacent one another to form a single unit prior to being introduced into canalphone housing 12. *Id.* at 2:65–3:3. HFSB 14 and LFSB 16 are sized to deliver sound from sound source 18 to sound outlets 17b and 17a, respectively, with a correct time and phase relationship. *Id.* at 3:3–7. HFSB 14 and LFSB 16 can be sized by selecting their respective diameters and lengths, and each can have its length extended to reduce its diameter while preserving the correct time and phase relationship. *Id.* at 3:8–12, 3:31–36. Reducing the diameters of HFSB 14 and LFSB 16 allows canalphone 10 to be fitted to persons with smaller ear canals. *Id.* at 3:36–42. In one embodiment, the length of HFSB 14 is more than 3 millimeters. *Id.* at 42–44.

Claims 1, 11, and 17 of the '555 patent are independent claims. Other challenged claims depend directly or indirectly from claims 1, 11, and 17. Claim 1 is reproduced below.

1. A system comprising:
a high acoustical driver carried within a canalphone;

a low acoustical driver carried within the canalphone;

a one-piece high frequency sound bore carried within the canalphone; and

a one-piece low frequency sound bore adjoining the high frequency sound bore to form a single unit prior to the sound bores being introduced to the canalphone, the one-piece low frequency sound bore and the one-piece high frequency sound bore each sized to fit between the low acoustical driver and the high acoustical driver respectively,

the high acoustical driver to deliver sound through the one-piece high frequency sound bore to the canalphone's outlet and

the low acoustical driver to deliver sound through the one-piece low frequency sound bore to the canalphone's outlet.

Ex. 1001, 5:11–29.

Independent claim 11 differs in scope from claim 1 by requiring two additional elements. *Compare* Ex. 1001, 5:11–29, *with* Ex. 1001, 5:52–6:19. First, claim 11 requires the low and high frequency sound bores to have extended lengths to reduce their respective diameters. *Id.* Second, claim 11 requires the single (low/high frequency) sound bore unit to be positioned at an angle between 30 and 65 degrees with respect to the low and high acoustical drivers. *Id.* Claim 11's requirement that the low and high frequency sound bores have extended lengths is also a requirement of claim 6, which depends from claim 1. *See* Ex. 1001, 5:39–41. Claim 11's requirement that the single (low/high frequency) sound bore unit be positioned at an angle between 30 and 65 degrees with respect to the low

and high acoustical drivers is also a requirement of claim 10, which depends from claim 1.⁴ *See* Ex. 1001, 5:48–51.

Independent claim 17 differs in scope from claim 1 in that it recites a method for making the system of claim 1 by positioning low and high acoustical drivers and a single unit including low and high frequency sound bores in a canalphone. *Compare* Ex. 1001, 5:11–29, *with* Ex. 1001, 6:32–43. That is, claim 17 requires a method of making the system described in claim 1.

B. Claim Construction

In *inter partes* reviews filed before November 13, 2018, the Board interprets claims of an unexpired patent using the broadest reasonable interpretation 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, 2144–46 (2016); *Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board*, 83 Fed. Reg. 51,340 (Oct. 11, 2018). Consistent with the rule of

⁴ Claim 10 literally recites “the single unit is positioned at an angle between 30 degrees and degrees with respect to the high acoustical driver and the low acoustical driver.” Ex. 1001, 5:48–51. This is a typographical error that occurred during prosecution. *Compare* Ex. 1002, 14, *with id.* at 35. We correct it here, as we did in our Institution Decision, to recite an angle between 30 degrees and 65 degrees, the range recited in claim 10 as originally filed, and the only range disclosed in the Specification. *See id.* at 14; *see also* Ex. 1001, 1:56–59, 2:11–14, 3:50–53, 4:6–9; *see also* *Novo Indus., L.P. v. Micro Molds Corp.*, 350 F.3d 1348, 1357 (Fed. Cir. 2003) (finding a district court can correct an error if the correction is not subject to reasonable debate, and the prosecution history does not suggest a different interpretation). Neither party disputes the correction. *See* PO Resp. 1–12; Pet. Reply 1–13.

broadest reasonable interpretation, claim terms are generally given their plain and ordinary 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). Only those terms in controversy need to be construed and only to the extent necessary to resolve the controversy. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999). Neither party requests express construction of any claim term, and neither party argues that the claims should be construed to have a meaning other than their plain and ordinary meaning. *See* Pet. 9; PO Resp. 1–12.

In our Institution Decision, we construed the term “*the one-piece low frequency sound bore and the one-piece high frequency sound bore each sized to fit between the low acoustical driver and the high acoustical driver, respectively*” to mean that “each sound bore is sized to fit between its respective driver and the outlet.” *See* Dec. Inst. 10–11. Our construction was based on statements the patentee made during prosecution to distinguish the claims over prior art. *Id.* We also construed the term “a resistor on the high acoustical driver to tune the high acoustical driver,” recited in dependent claims 9 and 16, to encompass “a resistor coupled to the high acoustical driver.” *Id.* at 11–12. Neither party contests either of these constructions, which we maintain for purposes of this Final Written Decision. *See* PO Resp. 1–12; Pet. Reply 1–13.

C. Partial Adverse Judgment

As discussed in § I.A, *supra*, we initially instituted *inter partes* review to determine the patentability of all of the claims challenged in the Petition on only a subset of the grounds raised in the Petition. Dec. Inst. 4–5, 33–34.

We subsequently modified our Institution Decision to review all of the challenged claims on all of the challenged grounds. Paper 42, 2–3.

Petitioner subsequently requested partial adverse judgment on those claims and grounds for which we did not initially institute *inter partes* review. Paper 48, 3–4. In particular, Petitioner requested adverse judgment on the following claims and grounds:

Ground	Reference(s)	Basis	Claims Challenged
1	Dombrowski	§ 102(b)	1–5, 8, and 17–19
2	Dombrowski	§ 103(a)	10
3	Dombrowski and Knowles TB6	§ 103(a)	6, 7, 11–15, and 20
4	Dombrowski and Blanchard	§ 103(a)	9
5	Dombrowski, Knowles TB6, and Blanchard	§ 103(a)	16
6	Saggio and Dombrowski	§ 103(a)	1–5, 8, 10, and 17–19
7	Saggio and Dombrowski	§ 103(a)	6, 7, 11–15, and 20
8	Saggio, Dombrowski, and Blanchard	§ 103(a)	9
9	Saggio, Dombrowski, Knowles TB6, and Blanchard	§ 103(a)	16

Id. Patent Owner did not oppose Petitioner’s request, which we granted. Paper 51, 3, 5–6. As a result, we find Petitioner has failed to show by a preponderance of evidence that:

1. Claims 1–5, 8, and 17–19 of the '555 patent are unpatentable as anticipated by Dombrowski;
2. Claim 10 of the '555 patent is unpatentable as obvious over Dombrowski;
3. Claims 6, 7, 11–15, and 20 of the '555 patent are unpatentable as obvious over Dombrowski and Knowles TB6;
4. Claim 9 of the '555 patent is unpatentable as obvious over Dombrowski and Blanchard;
5. Claim 16 of the '555 patent is unpatentable as obvious over Dombrowski, Knowles TB6, and Blanchard;
6. Claims 1–5, 8, 10, and 17–19 of the '555 patent are unpatentable as obvious over Saggio and Dombrowski;
7. Claims 6, 7, 11–15, and 20 of the '555 patent are unpatentable as obvious over Saggio, Dombrowski, and Knowles TB6;
8. Claim 9 of the '555 patent is unpatentable as obvious over Saggio, Dombrowski, and Blanchard; and
9. Claim 16 of the '555 patent is unpatentable as obvious over Saggio, Dombrowski, Knowles TB6, and Blanchard.

In view of our granting Petitioner's request for partial adverse judgment, the only grounds in the Petition left remaining for consideration are Petitioner's challenges that:

1. Claims 1–3, 8–10, and 17 of the '555 patent are unpatentable as obvious over LoPresti and Dombrowski; and
2. Claims 4–7, 11–16, and 18–20 of the '555 patent are unpatentable as obvious over LoPresti, Dombrowski, and Knowles TB6.

D. Overview of Prior Art

1. LoPresti

LoPresti discloses an electronic transducer system 10 that can be used in various electronic devices, including hearing aids, inset earphones, and headphones. Ex. 1006 ¶ 17. Figure 1 of LoPresti is reproduced below.

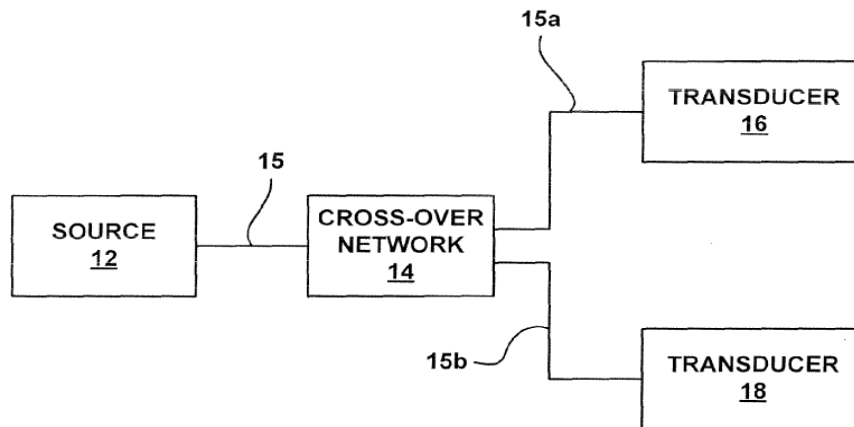


Figure 1 is a block diagram of electronic transducer system 10. *Id.* ¶ 3. Electrical audio signal 15 from source 12 is provided to cross-over network 14, which divides the signal into different frequency components 15a and 15b that are provided to transducers 16 and 18, respectively. *Id.* ¶ 17. Cross-over network 14 may be a passive or active filter, an analog or digital filter, or a combination thereof. *Id.* Transducers 16/18 are receivers for converting the electrical audio signals 15a/15b into acoustic signals, and may be low frequency, mid-frequency, or high frequency drivers, or any combination thereof. *Id.* ¶ 18.

The physical structures of transducers 16/18 are shown in Figure 4 of LoPresti, which is reproduced below.

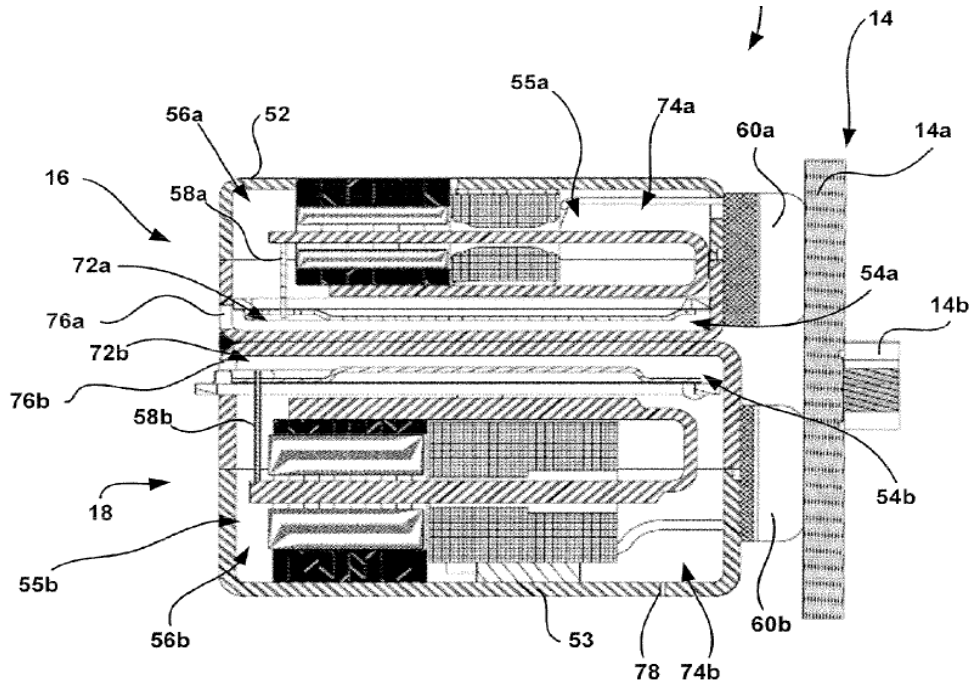


FIGURE 4

Figure 4 is a cross-sectional view of a dual transducer device 80 for an electroacoustic transducer system. Ex. 1006 ¶ 6. Dual transducer 80 includes first transducer 16 (top) and second transducer 18 (bottom). *Id.* ¶ 22. One or more sound tubes (not shown) may be attached to sound port 76a of transducer 16 and sound port 76b of transducer 18 to allow the acoustic energy produced by transducers 16/18 to be transmitted to a user. *Id.* ¶ 24.

2. Dombrowski

Dombrowski discloses a hearing instrument, such as a hearing aid, that can be a behind-the-ear (BTE), in-the-ear (ITE), in-the-canal (ITC), or completely-in-the-canal (CIC) hearing instrument. Ex. 1004 ¶¶ 1–2, 49, 59. Dombrowski's hearing instrument contains at least two receivers having

different frequency responses, such as a high frequency receiver and a low frequency receiver. *Id.* ¶¶ 50, 54. In one embodiment, the two receivers can be placed in a housing that sits outside a user's ear canal, for example, in the concha of the user's ear. *Id.* ¶¶ 58–59. In this embodiment, the sound from the two receivers can be delivered to the ear canal via two sound conduction channels. *Id.* ¶ 58. The two sound conduction channels can be mechanically coupled to each other, for example, as two bores in a single sound conduction tube. *Id.*

Figure 6 of Dombrowski is reproduced below.

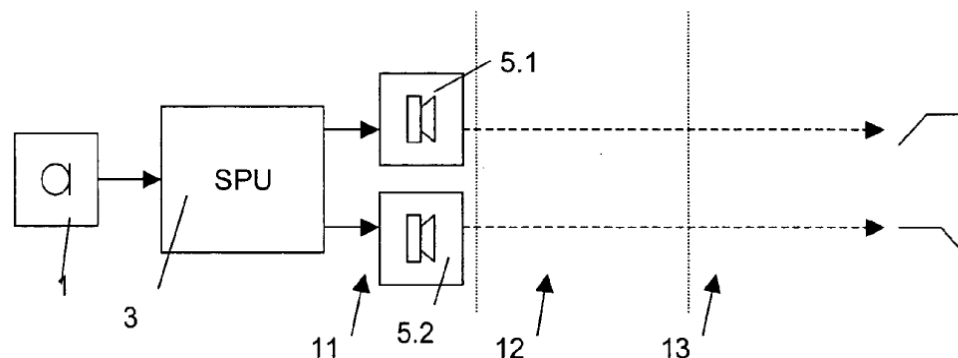


Fig. 6

Figure 6 is a schematic illustration of a hearing aid with two receivers, where both receivers are placed outside the user's ear canal. *Id.* ¶ 123. Microphone 1 converts an acoustic signal to an electrical signal, and transmits the electrical signal to signal processing unit (SPU) 3. *Id.* ¶¶ 167, 178. SPU 3 filters the electrical signal, and transmits the low/high frequency signal components to respective low/high frequency receivers 5.1/5.2. *Id.* SPU 3 may be an analog, digital, or hybrid circuit, and may be implemented with discrete or integrated circuit components. *Id.* ¶ 116. Low and high frequency receivers 5.1/5.2 can be placed outside the user's ear canal, for example, in the user's concha. *Id.* ¶¶ 58–59, 180. Two sound transmission

channels 17 (not shown), which need not be physically separated, lead from receivers 5.1/5.2 to the user's ear canal. *Id.* ¶¶ 180–181. For example, channels 17 may be two bores 37/38 formed in a single sound conduction tube 36. *Id.* ¶¶ 58, 182, Fig. 7 (panel C). Each bore 37/38 may contain a conventional, passive, acoustic filter. *Id.* ¶ 182. Alternatively, channels 17 may be two sound conduction tubes 51/52 mechanically coupled to one another. *Id.* ¶¶ 58, 186, Fig. 8. Dombrowski further discloses that the hearing instrument may include more than two receivers, and that the outputs of more than one receiver may be coupled to a single sound conducting bore. *Id.* ¶ 190.

3. Knowles TB6

Knowles TB6 discloses how changing the length and diameter of a sound tube affects the frequency response of the sound tube. Ex. 1007, 1–2. Figure 3 of Knowles TB6 is reproduced below.

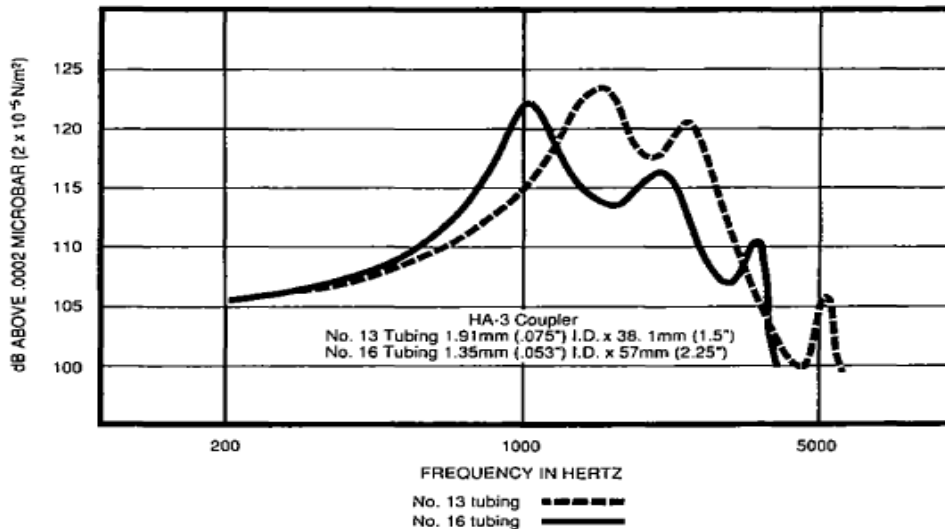


FIGURE 3. Effects of Tubing Length and Diameter Combined.

Figure 3 discloses the combined effects of varying the length and inner diameter of a sound tube on the sound tube's frequency response. *Id.* at 2.

In particular, Figure 3 shows the change in response when a 38.1 mm sound tube having a 1.91 mm inner diameter (No. 13 tubing) is replaced with a longer 57 mm sound tube having a smaller 1.35 mm inner diameter (No. 16 tubing). *Id.*

Knowles TB6 also discloses how adding an acoustic damper to the end of a sound tube affects the frequency response of the sound tube depending on its placement. Ex. 1007, 3. Figure 4 of Knowles TB6 is reproduced below.

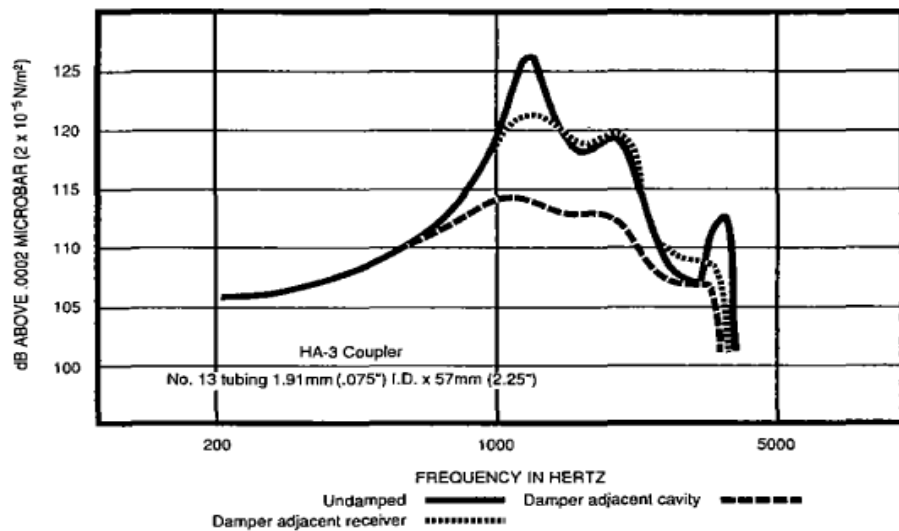


FIGURE 4. Effects of Damping.

Figure 4 discloses how the frequency response of a sound tube is affected by placing an acoustic damper adjacent to either the inlet/receiver end of the sound tube or the outlet/cavity end of the sound tube. *Id.*

E. Level of Ordinary Skill in the Art

Petitioner argues a person having ordinary skill in the art would have had approximately 2–4 years background in electronics, at least 3 years of experience working with or studying sound transmitting devices, and a working knowledge of the physics and mechanics of sound transmitting devices. Pet. 9 (citing Ex. 1003 ¶ 16). Patent Owner does not contest

Petitioner's characterization of a person having ordinary skill in the art. PO Resp. 1–12.

In our Institution Decision, we determined that although Petitioner's characterization of a person having ordinary skill in the art was reasonable, no express finding on the level of ordinary skill in the art was necessary because any such level is reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *In re GPAC Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995); *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978). Neither party disputes that finding. *See* PO Resp. 1–12; Pet. Reply 1–13.

F. Petitioner's Challenges to Claims 1–20

Petitioner argues claims 1–20 of the '555 patent are unpatentable as obvious over the combination of LoPresti and Dombrowski or over the combination of LoPresti, Dombrowski, and Knowles TB6. Pet. 37–47. For the reasons explained below, we are persuaded that Petitioner has demonstrated by a preponderance of evidence that claims 1–20 of the '555 patent are unpatentable.

1. *Obviousness of Claims 1–3, 8–10, and 17 over the Combination of LoPresti and Dombrowski*

a. Claims 1 and 17

Claim 1 recites a system comprising a high acoustical driver, a low acoustical driver, a one-piece high frequency sound bore, and a one-piece low frequency sound bore carried within a canalphone. Ex. 1001, 5:12–17. Petitioner demonstrates by a preponderance of evidence that LoPresti teaches these limitations. *See* Pet. 37–38 (citing Ex. 1003 ¶¶ 160–162; Ex. 1005, Fig. 1; Ex. 1006 ¶¶ 17–18, 24, Figs. 1, 4, 6–9).

LoPresti discloses electroacoustic transducer system 10, which

includes transducers 16/18 that may be low or high frequency receivers, or combinations thereof, and which can be used in listening devices such as “insert earphone[s].” Ex. 1006 ¶¶ 17–18, Figs. 1, 6–9. LoPresti further discloses connecting sound tubes to the sound ports 76a/76b of transducers 16/18. *Id.* ¶ 24, Fig. 4. According to the un rebutted testimony of Mr. Young, a person of ordinary skill in the art would have known the following: (a) LoPresti’s “insert earphone” was a canalphone that could have been placed directly in one end of a user’s ear canal; (b) LoPresti’s low/high frequency receivers were low/high acoustical drivers; and (c) LoPresti’s sound tubes were one-piece sound tubes because one-piece sound tubes were conventionally used in canalphones. Ex. 1003 ¶¶ 160–162 (citing Ex. 1005, Fig. 1; Ex. 1012, Fig. 1). Patent Owner does not dispute that LoPresti discloses a canalphone having a high acoustical driver, a low acoustical driver, a one-piece high frequency sound bore, and a one-piece low frequency sound bore. *See* PO Resp. 1–12.

Claim 1 further requires the high acoustical driver to deliver sound through the one-piece high frequency sound bore to the canalphone’s outlet, and the low acoustical driver to deliver sound through the one-piece low frequency sound bore to the canalphone’s outlet. Ex. 1001, 5:24–29. Petitioner demonstrates by a preponderance of evidence that LoPresti teaches these limitations. *See* Pet. 39 (citing Ex. 1003 ¶¶ 168–169; Ex. 1006 ¶¶ 18, 24, Fig. 4).

As discussed above, LoPresti discloses connecting sound tubes to the sound ports 76a/76b of an insert earphone’s transducers 16/18. Ex. 1006 ¶ 24, Fig. 4. The sound tubes “allow acoustic energy to be transmitted to the user via the sound ports 76a, 76b.” *Id.* ¶ 24. According to the un rebutted

testimony of Mr. Young, LoPresti's sound tubes carry sound from sound ports 76a/76b of transducers 16/18 to the outlet of LoPresti's insert earphone. Ex. 1003 ¶¶ 168–169. Patent Owner does not dispute that LoPresti's transducer's 16/18 are low/high acoustical drivers that deliver sound to the outlet of LoPresti's insert earphone via one-piece low/high frequency sound bores. *See* PO Resp. 1–12.

Claim 1 further requires the one-piece low frequency sound bore and the one-piece high frequency sound bore to be sized to fit between the low acoustical driver and the high acoustical driver. Ex. 1001, 5:19–22. As discussed in § II.B, *supra*, we construe this limitation to mean that the low/high frequency sound bores are respectively sized to fit between the low/high frequency drivers and the canalphone outlet. Neither party contests that construction. *See* PO Resp. 1–12; Pet. Reply 1–13. Petitioner demonstrates by a preponderance of evidence that LoPresti teaches these limitations. Pet. 38–39 (citing Ex. 1003 ¶ 167; Ex. 1005, Fig. 1; Ex. 1006 ¶ 24).

According to the unrebutted testimony of Mr. Young, a person of ordinary skill in the art would have understood that LoPresti's sound tubes 76a/76b were respectively sized to fit between transducers 16/18 and the insert earphone's outlet as shown in the prior art. Ex. 1003 ¶ 167 (citing Ex. 1005, Fig. 1). For example, Figure 1 of Saggio discloses two sound tubes respectively sized to fit between low/high acoustical drivers and a canalphone's outlet. *Id.* Patent Owner does not dispute that LoPresti teaches low/high frequency sound tubes respectively sized to fit between low/high frequency acoustical drivers and the insert earphone's outlet. *See* PO Resp. 1–12.

Claim 1 further requires the one-piece low frequency sound bore to adjoin the one-piece high frequency sound bore to form a single unit prior to being introduced into the canalphone. Ex. 1001, 5:17–19. Petitioner argues the combination of Dombrowski and LoPresti teaches this limitation. Pet. 38. Specifically, relying on the testimony of Mr. Young, Petitioner argues Dombrowski teaches a hearing instrument having “mechanically coupled” sound tubes, and a person of ordinary skill in the art would have found it obvious to mechanically couple LoPresti’s sound tubes, as taught by Dombrowski, prior to inserting them into LoPresti’s insert earphone because doing so would have made assembly easier. *Id.* (citing Ex. 1003 ¶ 166; Ex. 1004 ¶ 186, Fig. 8). Petitioner further argues that combining LoPresti’s sound tubes into a single unit would have been an obvious engineering choice. *Id.* (citing Ex. 1003 ¶ 32; quoting *In re Larson*, 340 F.2d 965, 968 (CCPA 1965)).

Patent Owner argues Petitioner has failed to demonstrate by a preponderance of evidence that the combination of LoPresti and Dombrowski teaches adjoining one-piece low and high frequency sound bores to form a single unit prior to introducing them into a canalphone for several reasons. *See* PO Resp. 5–11.

First, Patent Owner argues “all Dombrowski teaches is two sound bores ‘mechanically coupled to each other.’ It does not teach that the mechanical coupling adjoins the two sound bores to form a single unit as claimed.” *Id.* at 6. Petitioner counters that although the ’555 patent does not define the term adjoining, it illustrates the meaning of the term through Figure 1, which shows the low and high frequency sound bores lying next to one another and sharing an edge or boundary. Pet. Reply 4 (citing Ex. 1001,

Fig. 1). Petitioner argues Figure 1's illustration is consistent with the plain and ordinary meaning of "adjoining," which means "touching or bounding at a point or line." *Id.* (citing Ex. 1029, 3). Moreover, Petitioner argues, Dombrowski teaches "coupled" sound tubes, to "[c]ouple" means "to join for combined effect," and to "join" means "to put or bring together so as to form a unit." *Id.* at 5 (citing Ex. 1029, 4–5). Thus, relying on the testimony of Mr. Young, Petitioner argues that a person of ordinary skill in the art would have understood that Dombrowski's coupled sound tubes "are brought together to form a single unit." *Id.* (citing Ex. 1028 ¶ 10).

We agree with Petitioner. Dombrowski teaches a canalphone having mechanically coupled sound tubes. Ex. 1004 ¶¶ 53, 54, 58–59. To "couple" means "to join for combined effect" or "to fasten together." Ex. 1029, 4. To "join" means "to put or bring together so as to form a unit." *Id.* at 5. To "adjoin" means "to add or attach by joining." *Id.* at 3. Thus, given the plain and ordinary meaning of these terms, Dombrowski's mechanically coupled sound tubes are adjoined to form a single unit. *See In re Gleave*, 560 F.3d 1311, 1334 (Fed. Cir. 2009) (obviousness is not an *ipsissimis verbis* test). Indeed, Dombrowski expressly discloses that mechanically coupled sound tubes "may for example be formed as two bores in a *single* sound conduction tube." Ex. 1004 ¶ 58 (emphasis added).

Second, Patent Owner argues Dombrowski does not teach or suggest mechanically coupling sound tubes prior to introducing them into a *canalphone*. PO Resp. 6 (emphasis added). Patent Owner argues "[t]he vast majority of Dombrowski's disclosure is directed to hearing aids with a behind-the-ear component," and that "[t]he portions of Dombrowski cited by Petitioner do not teach that the sound conduction elements are mechanically

coupled prior to being introduced to an *entirely in-the-ear canalphone*.” *Id.* (citing Ex. 1004, Figs. 5, 6, 12, and 24) (emphasis added).

Petitioner counters that Dombrowski’s invention relates to “a hearing instrument with two receivers and two mechanically coupled sound tubes, all of which can be in the same housing.” Pet. Reply 6 (citing Ex. 1004 ¶¶ 50, 54, 58–59, 180, 186, 192–95, Figs. 6, 8). Petitioner further argues that Dombrowski’s “hearing instrument” includes canalphones because it includes “devices which may improve the hearing of individuals with normal hearing” and may “even be used in context . . . with audio listening.” *Id.* (citing Ex. 1004 ¶ 115). Moreover, Petitioner argues, canalphones or “IEMs with two receivers and two sound tubes in the same housing that fit[] in the ear canal and concha,” were known in the prior art at the time of the invention. *Id.* (citing Ex. 1005 ¶¶ 36–37, Fig. 1; Ex. 1012, 3:42–67, Fig. 1). Petitioner further argues that although Dombrowski does not “explicitly state the sound tubes are coupled prior to introducing them to the housing,” a person of ordinary skill in the art would have inferred doing so because such a person “is ‘not an automaton.’” *Id.* at 7 (citing Ex. 1028 ¶ 13; quoting *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 421 (2007)).

We agree with Petitioner. Dombrowski teaches a “hearing instrument” that includes two receivers and two mechanically coupled sound tubes, i.e., two sound tubes adjoined to form a single unit for the reasons discussed above. *See* Ex. 1004 ¶¶ 53, 54, 58. The receivers can be located outside the ear canal, including in the concha. *Id.* ¶ 59. The “hearing instrument” can be “on the one hand hearing aid devices,” and “[o]n the other hand . . . devices which may improve the hearing of individuals with normal hearing . . . which may even be used in context with . . . audio

listening, for instance as provided by headphones.” *Id.* ¶ 115. Thus, Dombrowski’s “hearing instrument” can be either a hearing aid or a canalphone having receivers placed in the concha as shown in the prior art. *See, e.g.*, Ex. 1005 ¶¶ 36–37, Fig. 1 (showing acoustic drivers 107 and 109 in concha portion 105 of IEM 100); Ex. 1012, 3:42–67, Fig. 1 (same).

We credit Mr. Young’s testimony that a person skilled in the art would have understood Dombrowski’s sound tubes could have been “mechanically coupled *before* they were put into the housing” because there were only “two ways to install ‘adjoined’ sound tubes: either ‘adjoin’ them *before* putting them into the housing, or ‘adjoin’ them *after* putting them into the housing.” Ex. 1028 ¶ 13. We further credit Mr. Young’s testimony that “if two things are joined together to form a ‘single unit’ it will be easier to install them than if they were installed separately.” Ex. 1003 ¶ 163. Thus, Dombrowski teaches or suggests mechanically coupling sound tubes to form a single unit prior to placing the sound tubes into a canalphone housing.

Patent Owner argues Mr. Young’s testimony regarding adjoining sound tubes *prior* to inserting them into a canalphone housing is not credible. PO Mot. Obs. 1. In particular, Patent Owner argues that Mr. Young testified on cross-examination that he did not have any opinions on “whether it would have been better to adjoin two sound tubes together as a single unit,” or “whether it would have been easier to combine two [sound] tubes into a single unit before or after they are installed in [an] IEM.” *Id.* (citing Ex. 2002, 33:21–34:2, 34:21–25). Petitioner counters that Mr. Young did, in fact, state his opinion on cross-examination regarding coupling sound tubes to form a single unit before placing them into a

canalphone housing, and stated a reason for his opinion. Pet. Opp. Mot. Obs. 1 (citing Ex. 2002, 32:18–33:5, 34:11–19).

We agree with Petitioner. As discussed above, Mr. Young initially testified that “[i]t would have been obvious to a POSA [person of ordinary skill in the art] to mechanically couple LoPresti’s sound tubes, as taught by von Dombrowski, since doing so would make IEM assembly easier, which a POSA would recognize.” Ex. 1003 ¶ 166. Although Mr. Young appears to have hedged this opinion somewhat on cross-examination, he nonetheless maintained it. *Compare* Ex. 2002 33:20–34:2 (Mr. Young agreeing he didn’t “have an opinion about whether or not it would have been better to adjoin two sound tubes together as a single unit when manufacturing an IEM”), *with id.* at 32:18–33:5 (Mr. Young stating an IEM manufacturer would have joined two sound tubes to form a single unit for “ease of manufacture” because “the assembler is handling only one unit, one tube assembly instead of two. . . .”); *compare also id.* at 34:21–25 (Mr. Young agreeing “[i]t could go either way” and that he didn’t have an opinion on “whether or not it would have been easier . . . to combine the two tubes in a single unit before or after they are installed in the canal phone”), *with id.* at 34:11–19 (Mr. Young stating “my best guess would be before” in response to the question “if we wanted to combine two sound tubes into a single unit, would it have been easier to do that before the two sound tubes were put into the canal phone or after they were put into the canal phone?”). Considering Mr. Young’s testimony as a whole, including his declaration and cross-examination testimony, we find Mr. Young’s opinion to be that a person of ordinary skill in the art would have found it obvious to couple two sound tubes to form a single unit prior to inserting them into a canalphone housing

because doing so would have made manufacturing easier. We find this testimony to be credible, and adopt the reasoning and opinions expressed in Mr. Young's declarations as our own. *See* Ex. 1003 ¶ 166; Ex. 1028 ¶ 13.

Third, Patent Owner argues Mr. Young's testimony regarding mechanically coupling LoPresti's sound tubes prior to placing them in a housing is conclusory, and improperly relies on "common sense" to supply a missing claim limitation. PO Resp. 7–8. As a result, Patent Owner argues that Petitioner's analysis presents "the type of evidence that is insufficient to support an allegation that a POSA would have been motivated to do what was not done in the prior art." *Id.* at 9 (citing *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361–63 (Fed. Cir. 2016)). Petitioner counters that it does not rely on "common sense" to supply a missing limitation. Pet. Reply 8. Rather, Petitioner argues, "Dombrowski teaches the 'single unit' limitations," and had no need to "explicitly state the sound tubes are coupled prior to introducing them to the housing" because a person of ordinary skill in the art, as a person of ordinary creativity and "not an automaton," would have inferred this teaching from Dombrowski. *Id.* at 7–8 (quoting *KSR*, 550 U.S. at 421).

We agree with Petitioner. Petitioner's analysis of coupling LoPresti's sound tubes prior to introducing them into the insert earphone relies on Mr. Young's testimony regarding the knowledge that was available to a person of ordinary skill in the art at the time of the invention rather than on "common sense." *See* Pet. 38 (citing Ex. 1003 ¶ 166); Pet. Reply 7 (citing Ex. 1028 ¶ 13). As discussed above, the combination of LoPresti and Dombrowski expressly teaches all the limitations of claim 1 except coupling the sound tubes *prior* to inserting them into a housing. Patent Owner

essentially admits this. *See* Tr. 22:4–10 (“So this is a pretty narrow patent we’re talking about. . . . So that’s the element that’s missing from the prior art, the single unit. The limitation on that element that’s missing is the prior to installation.”). We are persuaded by Mr. Young’s testimony that a skilled artisan of ordinary creativity would have been motivated to couple LoPresti’s sound tubes to form a single unit (as taught by Dombrowski) prior to inserting them into LoPresti’s insert earphone to “make IEM assembly easier” because “if two things are joined together to form a ‘single unit’ it will be easier to install them than if they were installed separately.” Ex. 1003 ¶¶ 163, 166; *see also* Ex. 2002, 32:18–33:5 (an IEM manufacturer would join two sound tubes to form a single unit for “ease of manufacture” because “the assembler is handling only one unit, one tube assembly instead of two”).

Moreover, to the extent Petitioner’s analysis is based on “common sense,” the obviousness of limitations that are missing from the prior art can be demonstrated using “common sense” if explained with sufficient reasoning. *See Perfect Web Tech., Inc. v. InfoUSA, Inc.*, 587 F.3d 1324, 1328 (Fed. Cir. 2009) (“Common sense has long been recognized to inform the analysis of obviousness if explained with sufficient reasoning.”); *id.* at 1329 (“while an analysis of obviousness always depends on evidence . . . it also may include recourse to logic, judgment, and common sense available to the person of ordinary skill that do not necessarily require explication in any reference or expert opinion”). This is especially true in cases, such as the present case, where the knowledge and common sense of a person of ordinary skill in the art is used “to supply a limitation that [is] admittedly *missing* from the prior art [and] the limitation in question [is] unusually

simple and the technology particularly straightforward.” *Arendi*, 832 F.3d at 1362.

Lastly, Patent Owner argues Petitioner has failed to demonstrate the obviousness of combining the teachings of LoPresti and Dombrowski because Petitioner has provided no evidence that by doing so, a person of ordinary skill in the art would have had a reasonable expectation of success. PO Resp. 10. Patent Owner argues that requiring Petitioner to provide evidence of a reasonable expectation of success is not a “rigid preventative rule,” as we found in our Institution Decision, but rather a requirement for Petitioner to carry “its burden to prove unpatentability.” PO Resp. 10.

As stated in our Institution Decision, we disagree that a petition *must* fail if a petitioner does not expressly argue that a combination of references would have had a reasonable expectation of success. *See* Dec. Inst. 22–23. The Supreme Court has rejected such overly rigid, formalistic approaches to determining obviousness. *See KSR*, 550 U.S. at 421 (finding “[r]igid preventative rules that deny factfinders recourse to common sense . . . are neither necessary under our case law nor consistent with it”). So has the Federal Circuit. *See Merck & Cie v. Gnosis S.P.A.*, 808 F.3d 829, 836 (Fed. Cir. 2015) (citing *KSR*, 550 U.S. at 419) (“*KSR* does not require an explicit statement of a reasonable expectation of success in every case,” in part because *KSR* “caution[s] against confining the obviousness analysis using formalistic rules.”).

Moreover, we are persuaded that a person of ordinary skill would have had a reasonable expectation of success in combining the teachings of LoPresti and Dombrowski as proposed by Petitioner because the sound tubes used in the systems of both references serve the same basic function—

conducting sound from a listening device's acoustical driver to an outlet in a user's ear canal. *See* Ex. 1004 ¶¶ 53, 58, 180, Fig. 6; Ex. 1006 ¶ 24, Fig. 4. Nothing in Dombrowski suggests that its mechanically coupled sound tubes 51/52 are inferior in any way to its non-mechanically coupled sound tubes 17, or are unable to conduct sound from the hearing instrument's acoustical drivers 5.1/5.2 to the outlet in a user's ear canal. *See* Ex. 1004 ¶¶ 53, 58, 180, 186, Fig. 6. Therefore, modifying LoPresti's sound tubes by mechanically coupling them in the manner taught by Dombrowski would not prohibit LoPresti's mechanically coupled sound tubes from conducting sound to the outlet of LoPresti's insert earphone. That is, a person of ordinary skill in the art would have recognized Petitioner's proposed combination of LoPresti and Dombrowski would have had a reasonable expectation of success.

We have considered Petitioner's and Patent Owner's evidence and arguments as described above. We are persuaded, on this record, that Petitioner has established by a preponderance of evidence that the combination of LoPresti and Dombrowski teaches adjoining low and high frequency sound bores to form a single unit by mechanically coupling them prior to introducing the single unit into LoPresti's insert earphone. We further find that Petitioner has articulated a rational reason to combine the teachings of LoPresti and Dombrowski, and that the combination would have had a reasonable expectation of success.

As discussed in § II.A, *supra*, claim 17 differs from claim 1 in that it recites a method for making the system recited in claim 1. Petitioner relies on the same analysis for demonstrating the obviousness of claim 17 over the combination of LoPresti and Dombrowski that Petitioner provided for

demonstrating the obviousness of claim 1. *See* Pet. 40–41. Patent Owner does not separately argue for the patentability of claim 17. *See* PO Resp. 1–12.

Accordingly, for the reasons discussed above, having considered both Petitioner’s and Patent Owner’s evidence and arguments, we find on this record that Petitioner has demonstrated by a preponderance of evidence that claims 1 and 17 are unpatentable over LoPresti and Dombrowski.

b. Claims 2 and 3

Claim 2 requires the low acoustical driver in the system of claim 1 to comprise two low acoustical drivers. Ex. 1001, 5:30–31. Claim 3 requires the high acoustical driver in the system of claim 1 to comprise two high acoustical drivers. *Id.* at 5:32–33. Petitioner demonstrates by a preponderance of evidence that LoPresti teaches these limitations. *See* Pet. 41–42 (citing Ex. 1003 ¶ 182; Ex. 1006 ¶¶ 36, 38, Figs. 10–11) (quoting Ex. 1006 ¶ 19).⁵

LoPresti’s transducer system 30 can include “three or more transducers . . . without varying from the scope of the invention.” Ex. 1006 ¶ 19. The transducers can be any combination of low or high frequency transducers, such as two low frequency and one high frequency driver as required by claim 2, or two high frequency and one low frequency driver as required by claim 3. *Id.* ¶¶ 36, 38, Figs. 10–11. Patent Owner does not dispute that LoPresti’s insert earphone can include two low frequency and one high frequency driver, or two high frequency and one low frequency

⁵ Petitioner mistakenly cites to paragraph 20 of LoPresti. The material quoted in the Petition is located at the bottom of paragraph 19. *Compare* Pet. 41, *with* Ex. 1006 ¶ 19. We correct the citation here.

driver as required by claims 2 and 3. *See* PO Resp. 1–12.

Accordingly, for the reasons discussed above, Petitioner has demonstrated by a preponderance of evidence that claims 2 and 3 of the '555 patent are unpatentable over LoPresti and Dombrowski.

c. Claim 8

Claim 8 depends from claim 1, and requires the “single unit” that is formed from the low and high frequency sound bores to “aid[] in the assembly of the canalphone.” Ex. 1001, 5:44–45. Petitioner demonstrates by a preponderance of evidence that the combination of LoPresti and Dombrowski teaches this limitation. *See* Pet. 45 (citing Ex. 1003 ¶¶ 198–199; Ex. 1004 ¶¶ 58, 186, Fig. 8).

As discussed above, Dombrowski teaches mechanically coupling sound tubes 51/52 to form a “single unit.” *See* Ex. 1004 ¶¶ 58, 186, Fig. 8. Mr. Young credibly testifies that a person of ordinary skill in the art would have recognized that “installing a single unit” consisting of mechanically coupled sound tubes into a canalphone would have been “easier than installing the components separately.” Ex. 1003 ¶ 198; *see also id.* ¶¶ 163, 166. Although Patent Owner disputes that Dombrowski’s mechanically coupled sound tubes form a single unit, and criticizes Mr. Young’s testimony regarding installing mechanically coupled sound tubes into a canalphone as speculative and conclusory, we do not find these arguments persuasive for the reasons discussed in § II.F.1.a, *supra*. *See* PO Resp. 5–9.

Accordingly, having considered both Petitioner’s and Patent Owner’s evidence and arguments, and for the reasons discussed above, Petitioner has demonstrated by a preponderance of evidence that claim 8 of the '555 patent is unpatentable over LoPresti and Dombrowski.

d. Claim 9

Claim 9 depends from claim 1, and requires “a resistor on the high acoustical driver to tune the high acoustical driver.” Ex. 1001, 5:46–47. As discussed in § II.B, *supra*, we construe this term to require a resistor coupled to the high acoustical driver as described in the Specification and Drawings. *See id.* at 1:59–61, 3:53–55, Fig. 1. Petitioner demonstrates by a preponderance of evidence that LoPresti teaches this limitation. Pet. 45 (citing Ex. 1006 ¶ 30, Fig. 7).

LoPresti discloses its insert earphone includes crossover network 214 having resistor R coupled in series to transducer 216, which is a tweeter or high acoustical driver. Ex. 1006, Fig. 7. Patent Owner does not dispute that LoPresti’s insert earphone includes a resistor on a high acoustical driver to tune the high acoustical driver. *See* PO Resp. 1–12.

Accordingly, for the reasons discussed above, Petitioner has demonstrated by a preponderance of evidence that claim 9 of the ’555 patent is unpatentable over LoPresti and Dombrowski.

e. Claim 10

Claim 10 depends from claim 1, and requires the single unit consisting of the low and high frequency sound bores to be positioned at an angle of between 30 and 65 degrees with respect to the high and low acoustical drivers. Ex. 1001, 5:48–51.⁶ Petitioner demonstrates by a preponderance of evidence that the combination of LoPresti and Dombrowski teaches or suggests this limitation. *See* Pet. 46 (citing Ex. 1003 ¶ 206).

The ’555 patent does not describe any unique advantages from

⁶ *See* § II.B, note 3, *supra*.

positioning the single unit low/high frequency sound bores at an angle of between 30 and 65 degrees with respect to the low/high acoustical drivers, and does not indicate that doing so produces unexpected results. Moreover, according to the un rebutted testimony of Mr. Young, there is no advantage to placing the single unit low/high frequency sound bores within the recited angular range of the low/high frequency acoustical drivers. *See* Ex. 1003 ¶ 206. Mr. Young further testifies that a person of ordinary skill in the art would have found it obvious to place LoPresti's low/high frequency sound bores, mechanically coupled to form a single unit as taught by Dombrowski, within the recited angular range to accommodate LoPresti's components within the insert earphone's housing given the size and configuration of the housing. *Id.* We credit Mr. Young's testimony, and note that Patent Owner does not dispute that a person skilled in the art would have found it obvious to position a single unit low/high frequency sound bore within the recited angular range. *See* PO. Resp. 1–12; *see also In re Aller*, 220 F.2d 454, 456 (CCPA 1955) (“[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.”); *In re Woodruff*, 919 F.2d 1575, 1578 (Fed. Cir. 1990) (finding when the difference between a claimed invention and the prior art is some range or other variable, patentability can only be found when the claimed range is *critical*, such as a range that achieves unexpected results relative to the prior art).

Accordingly, having considered both Petitioner's and Patent Owner's evidence and arguments, for the reasons discussed above, Petitioner has demonstrated by a preponderance of evidence that claim 10 is unpatentable over the combined teachings of LoPresti and Dombrowski.

2. *Obviousness of Claims 4–7, 11–16, and 18–20 over the Combination of LoPresti, Dombrowski, and Knowles TB6*

a. *Claims 4, 5, 18, and 19*

Claim 4 depends from claim 1, and requires at least one of the low or high frequency sound bores in the system of claim 1 to carry an acoustic damper. Ex. 1001, 5:34–36. Claim 5 depends from claim 4, and requires the acoustic damper to be positioned without a rubber boot. *Id.* at 5:37–38. Claims 18 and 19 are method claims corresponding to claims 4 and 5, respectively, that recite a method for making the systems of claims 4 and 5 by inserting an acoustical damper within at least one of the low or high frequency sound bores (claim 18), and doing so without a rubber boot (claim 19). *Id.* at 6:44–49. Petitioner demonstrates by a preponderance of evidence that the combination of LoPresti, Dombrowski, and Knowles TB6 teaches or suggests all the limitations of claims 4, 5, 18, and 19. *See* Pet. 43 (citing Ex. 1003 ¶¶ 187–189).

According to the unrebutted testimony of Mr. Young, placing dampers on sound tubes with or without a rubber boot was well-known to those of ordinary skill in the art at the time of the invention, as shown by Knowles TB6. Ex. 1003 ¶¶ 187–189 (citing Ex. 1007, 3; Ex. 1010, Figs. 3–4). Thus, a person of ordinary skill in the art would have found it obvious to place a damper on one of LoPresti’s sound tubes to “tune” the driver connected to that sound tube. For example, Figure 4 of Knowles TB6 discloses the effect placing a damper on a sound tube has on the frequency response of a driver connected to that sound tube. *See* Ex. 1007, Fig. 4. Mr. Young further testifies that Knowles TB6 does not disclose putting a boot on the damper because placing dampers on sound tubes without a boot was also

well-known to those of ordinary skill in the art. Ex. 1003 ¶ 188. Lastly, Mr. Young testifies that a person of ordinary skill in the art would not have needed to know about Knowles TBS to place a damper on one of LoPresti's sound tubes to tune the driver connected to that sound tube because such knowledge was commonplace to those of ordinary skill in the art. *Id.* ¶ 189. Patent Owner does not dispute that it would have been obvious to those of ordinary skill in the art to place dampers on sound tubes with or without boots. *See* PO Resp. 1–12.

Accordingly, for the reasons discussed above, Petitioner has demonstrated by a preponderance of evidence that claims 4, 5, 17, and 18 are unpatentable over the combination of LoPresti, Dombrowski, and Knowles TB6.

b. Claims 6, 7, and 20

Claim 6 depends from claim 1, and requires the low and high frequency sound bores to have extended lengths to reduce each sound bore's diameter. Ex. 1001, 5:39–41. Claim 7 depends from claim 6, and requires the length of the high frequency sound bore to be greater than 3 millimeters. *Id.* at 5:42–43. Claim 20 is a method claim corresponding to claim 6, and recites a method for making the system of claim 6 by reducing the diameters of the low and high frequency sound bores by extending their lengths. *Id.* at 6:50–53. Petitioner demonstrates by a preponderance of evidence that the combination of LoPresti, Dombrowski, and Knowles TB6 teaches or suggests all the limitations of claims 6, 7, and 20. *See* Pet. 44–45 (citing Ex. 1003 ¶ 192; Ex. 1007, Figs. 2–3).

According to the unrebutted testimony of Mr. Young, claims 6, 7, and 20 refer to the well-known practice of sound tube tuning, and Knowles TB6

teaches extending the lengths and reducing the diameters of sound tubes to tune the frequency response of acoustical drivers coupled to the sound tubes. Ex. 1003 ¶ 192 (citing Ex. 1007, Fig. 3). For example, Knowles TB6 teaches “tuning” the frequency response of a sound tube by extending its length and reducing its inner diameter. In particular, Knowles TB6 teaches “tuning” a sound tube to be more sensitive to lower frequencies by using No. 16 tubing instead of No. 13 tubing, where No. 16 tubing has an extended length (57 mm vs. 38.1 mm) and reduced inner diameter (1.35 mm vs. 1.91 mm). Ex. 1007, 2, Fig. 3. Notably, the lengths of both the No. 16 (57 mm) and No. 13 (38.1 mm) sound tubes are greater than the 3 mm length required by claim 7. Thus, according to the unrebutted testimony of Mr. Young, a person of ordinary skill in the art would have been motivated to extend the length and reduce the diameter of LoPresti’s sound tubes, as taught by Knowles TB6, “in order to affect the frequency response and ‘tune’ the drivers.” Ex. 1003 ¶ 192. Mr. Young further testifies that a person of ordinary skill in the art would not have needed to know of the teachings of Knowles TB6 to extend the lengths and reduce the diameters of LoPresti’s sound tubes to tune the drivers because such knowledge was commonplace at the time of the invention. *Id.* Patent Owner does not dispute Petitioner’s contentions. *See* PO Resp. 1–12.

Accordingly, having considered both Petitioner’s and Patent Owner’s evidence and arguments, Petitioner has demonstrated by a preponderance of evidence that claims 6, 7, and 20 are unpatentable over LoPresti, Dombrowski, and Knowles TB6.

c. Claim 11

Claim 11 is an independent system claim. As discussed in § II.A, *supra*, claim 11 requires all the limitations of claims 1, 6, and 10. *Compare* Ex. 1001, 5:52–6:19, *with id.* at 5:12–29, 5:39–41, 5:48–51. In particular, in addition to the limitations of claim 1, claim 11 requires the low/high frequency sound bores to have extended lengths and reduced diameters (as does claim 6), and to be positioned as a single unit at an angle between 30 and 65 degrees with respect to the low/high acoustical drivers (as does claim 10). *Id.* Petitioner relies on the same analysis for demonstrating the obviousness of claim 11 over the combination of LoPresti, Dombrowski, and Knowles TB6 that Petitioner provided for demonstrating the obviousness of claims 1, 6, and 10. *See* Pet. 39–40.

Accordingly, for the reasons discussed in §§ II.F.1.a, II.F.1.e, and II.F.2.b, *supra*, having considered both Petitioner’s and Patent Owner’s evidence and arguments, Petitioner has demonstrated by a preponderance of evidence that claim 11 is unpatentable over LoPresti, Dombrowski, and Knowles TB6.

d. Claims 12–16

Claim 12 depends from claim 11, and requires at least one of the low or high frequency sound bores to carry an acoustic damper positioned without a rubber boot. Ex. 1001, 6:20–23. Thus, claim 12 requires all the limitations of claims 1, 4–6, and 10. *Compare* Ex. 1001, 5:52–6:23, *with id.* at 5:12–29, 5:34–41, 5:48–51. Petitioner relies on the same analysis for demonstrating the obviousness of claim 12 over the combination of LoPresti, Dombrowski, and Knowles TB6 that Petitioner provided for demonstrating the obviousness of claims 1, 4–6, and 10. *See* Pet. 42–43.

Accordingly, for the reasons discussed in §§ II.F.1.a, II.F.1.e, II.F.2.a, and II.F.2.b, *supra*, having considered both Petitioner's and Patent Owner's evidence and arguments, Petitioner has demonstrated by a preponderance of evidence that claim 12 is unpatentable over LoPresti, Dombrowski, and Knowles TB6.

Claim 13 depends from claim 11, and requires the low acoustic driver to comprise two low acoustic drivers. Ex. 1001, 6:24–25. Thus, claim 13 requires all the limitations of claims 1, 2, 6, and 10. *Compare* Ex. 1001, 5:52–6:19, 6:24–25, *with id.* at 5:12–31, 5:39–41, 5:48–51. Petitioner relies on the same analysis for demonstrating the obviousness of claim 13 over the combination of LoPresti, Dombrowski, and Knowles TB6 that Petitioner provided for demonstrating the obviousness of claims 1, 2, 6, and 10. *See* Pet. 41–42.

Accordingly, for the reasons discussed in §§ II.F.1.a, II.F.1.b, II.F.1.e, and II.F.2.b, *supra*, having considered both Petitioner's and Patent Owner's evidence and arguments, Petitioner has demonstrated by a preponderance of evidence that claim 13 is unpatentable over LoPresti, Dombrowski, and Knowles TB6.

Claim 14 depends from claim 13, and requires the high acoustic driver to comprise two high acoustic drivers. Ex. 1001, 6:26–27. Thus, claim 14 requires all the limitations of claims 1–3, 6, and 10. *Compare* Ex. 1001, 5:52–6:19, 6:26–27, *with id.* at 5:12–33, 5:39–41, 5:48–51. Petitioner relies on the same analysis for demonstrating the obviousness of claim 14 over the combination of LoPresti, Dombrowski, and Knowles TB6 that Petitioner provided for demonstrating the obviousness of claims 1–3, 6, and 10. *See* Pet. 41–42.

Accordingly, for the reasons discussed in §§ II.F.1.a, II.F.1.b, II.F.1.e, and II.F.2.b, *supra*, having considered both Petitioner's and Patent Owner's evidence and arguments, Petitioner has demonstrated by a preponderance of evidence that claim 14 is unpatentable over LoPresti, Dombrowski, and Knowles TB6.

Claim 15 depends from claim 11, and requires the high frequency sound bores length to be greater than 3 millimeters. Ex. 1001, 6:28–29. Thus, claim 15 requires all the limitations of claims 1, 6, 7, and 10. *Compare* Ex. 1001, 5:52–6:19, 6:28–29, *with id.* at 5:12–29, 5:39–43, 5:48–51. Petitioner relies on the same analysis for demonstrating the obviousness of claim 15 over the combination of LoPresti, Dombrowski, and Knowles TB6 that Petitioner provided for demonstrating the obviousness of claims 1, 6, 7, and 10. *See* Pet. 44–45.

Accordingly, for the reasons discussed in §§ II.F.1.a, II.F.1.e, and II.F.2.b, *supra*, having considered both Petitioner's and Patent Owner's evidence and arguments, Petitioner has demonstrated by a preponderance of evidence that claim 15 is unpatentable over LoPresti, Dombrowski, and Knowles TB6.

Claim 16 depends from claim 11, and requires a resistor on the high acoustical driver to tune the high acoustical driver. Ex. 1001, 6:30–31. Thus, claim 16 requires all the limitations of claims 1, 6, 9, and 10. *Compare* Ex. 1001, 5:52–6:19, 6:30–31, *with id.* at 5:12–29, 5:39–41, 5:46–51. Petitioner relies on the same analysis for demonstrating the obviousness of claim 16 over the combination of LoPresti, Dombrowski, and Knowles TB6 that Petitioner provided for demonstrating the obviousness of claims 1, 6, 9, and 10. *See* Pet. 45–46.

Accordingly, for the reasons discussed in §§ II.F.1.a, II.F.1.d, II.F.1.e, and II.F.2.b, *supra*, having considered both Petitioner's and Patent Owner's evidence and arguments, Petitioner has demonstrated by a preponderance of evidence that claim 16 is unpatentable over LoPresti, Dombrowski, and Knowles TB6.

G. Patent Owner's Motion to Amend

As noted above, Patent Owner has filed a contingent motion to amend the '555 patent. For each claim challenged in an *inter partes* review, Patent Owner "may file 1 motion to amend the patent . . . [by] propos[ing] a reasonable number of substitute claims." 35 U.S.C. § 316(d)(1). A reasonable number of substitute claims, by rebuttable presumption, is "one substitute claim . . . to replace each challenged claim." 37 C.F.R. § 42.121(a)(3).

A motion to amend "may not enlarge the scope of the claims of the patent or introduce new matter." 35 U.S.C. § 316(d)(3). New matter is any matter that lacks support in the original application. *See TurboCare Div. of Demag Delaval Turbomach. v. Gen. Elec. Co.*, 264 F.3d 1111, 1118 (Fed. Cir. 2001) ("When [an] applicant adds a claim . . . the new claim[] . . . must find support in the original specification."). A proposed claim that introduces new matter is properly rejected under 35 U.S.C. § 112 for lack of written description. *See, e.g., In re Rasmussen*, 650 F.2d 1212, 1214 (CCPA 1981) ("The proper basis for rejection of a claim amended to recite elements thought to be without support in the original disclosure, therefore, is § 112, first paragraph . . ."). Thus, a proposed claim satisfies § 316(d)(3) when it does not enlarge the scope of the claims, and when the written description in the original application "reasonably conveys to those skilled in the art that

the inventor had possession of the claimed subject matter as of the filing date.” *Ariad Pharms., Inc. v. Eli Lilly & Co.*, 598 F.3d 1336, 1351 (Fed. Cir. 2010) (en banc). For this reason, our Rules require a motion to amend to set forth “[t]he support in the original disclosure of the patent for each claim that is added or amended.” 37 C.F.R. § 42.121(b)(1).

Patent Owner seeks to amend the ’555 patent by substituting proposed claims 21–40 for issued claims 1–20 “in the event the Board determines that any of the [issued] claims are unpatentable.” PO MTA 1. Independent proposed claims 21, 31, and 37 respectively amend independent issued claims 1, 11, and 17 by requiring the low/high frequency sound bores adjoined to form a single unit not be adjoined by mechanical coupling. *Id.* For example, independent proposed claim 21 recites:⁷

- ± 21. A system comprising:
 - a high acoustical driver carried within a canalphone;
 - a low acoustical driver carried within the canalphone;
 - a one-piece high frequency sound bore carried within the canalphone; and
 - a one-piece low frequency sound bore adjoining the high frequency sound bore to form a single unit prior to the sound bores being introduced to the canalphone, the one-piece low frequency sound bore and the one-piece high frequency sound bore

⁷ In the proposed claims, material deleted from the issued claims is shown by strike-through and material added to the issued claims is shown by underlining. See 37 C.F.R. §§ 1.121(c)(2), 42.121(b).

each sized to fit between the low acoustical driver and the high acoustical driver respectively,

the high acoustical driver to deliver sound through the one-piece high frequency sound bore to the canalphone's outlet and

the low acoustical driver to deliver sound through the one-piece low frequency sound bore to the canalphone's outlet-; and

wherein the sound bores are not adjoined by mechanical coupling.

Id. at 2–3. Dependent proposed claims 22–30, 32–36, and 38–40 contain the same “not adjoined by mechanical coupling” limitation by virtue of their respective dependencies from independent proposed claims 21, 31, and 37, but do not otherwise add any new limitations to their respective issued claims 2–10, 12–16, and 18–20. *Id.*

Patent Owner argues proposed claims 21–40 are reasonable in number because “Patent Owner presents only one substitute claim for each challenged claim, which is presumably reasonable.” *Id.* at 1. Patent Owner argues proposed claims 21–40 respond to a ground of unpatentability involved in the trial because “[t]he instituted grounds rely on exclusively Dombrowski to teach . . . two sound bores are adjoined to form a single unit” and “the substitute claims each add the limitation, ‘wherein the sound bores are not adjoined by mechanical coupling.’” *Id.* at 6. Petitioner does not dispute these contentions, with which we agree. *See* Pet. Opp. MTA 1–15.

Patent Owner argues proposed claims 21–40 do not enlarge the scope of the claims because “[t]he substitute claims . . . include all of the

limitations of the [issued] claims and add an additional limitation.” PO MTA 1–2. Patent Owner further argues the proposed claims do not add new matter because the added limitation “wherein the sound bores are not adjoined by mechanical coupling” is supported by U.S. Patent Application No. 13/315,610 (“the ’610 application”) from which the ’555 patent issued. *Id.* at 2–5 (citing Ex. 1002 ¶¶ 4, 9, 19, 27, Figs 1–5, claims 1, 11, and 17).

Petitioner argues the ’610 application does not provide written description support for the limitation “wherein the sound bores are not adjoined by mechanical coupling,” and therefore argues that the proposed claims “impermissibly enlarge the scope of the claims and introduce new matter.” Pet. Opp. MTA 9–10. Petitioner argues the limitation “not adjoined by mechanical coupling” is a negative limitation, and requires written description support that either provides a reason to exclude the limitation, or discloses the limitation as one among a number of excludable alternatives. *See id.* at 7–8 (citing *Santarus, Inc. v. Par Pharma, Inc.*, 694 F.3d 1344, 1351 (Fed. Cir. 2012); *Inphi Corp. v. Netlist, Inc.*, 805 F.3d 1350, 1356 (Fed. Cir. 2015)). Petitioner argues the ’610 application “does not describe a reason to exclude ‘mechanical coupling’ as a way to adjoin sound bores,” nor does it “positively recite alternative ways to adjoin the sound bores, of which mechanical coupling is one way.” *Id.* at 9. Therefore, Petitioner argues, the ’610 application does not “reasonably convey to a POSA that the inventor was in possession of a system and method wherein the sound bores are adjoined *but not* by mechanical coupling.” *Id.* Patent Owner contends the limitation “not adjoined by mechanically coupling” is not “a negative limitation, but rather an express clarification of the

‘adjoining . . . to form a single unit’ limitation that is already present” in the disclosure of the ’610 application. PO Reply MTA 2.

We agree with Petitioner that the proposed claims are not supported by the disclosure of the ’610 application, and therefore improperly seek to add new matter to the ’555 patent. First, the added limitation “wherein the sound bores *are not* adjoined by mechanical coupling” is a negative limitation because it excludes sound bores that *are* adjoined by mechanical coupling. *See, e.g., In re Bankowski*, 318 F.2d 778, 783 (CCPA 1963) (describing a negative limitation as one that excludes, for example, a “limitation such as ‘metal, except for nickel’”). Second, the ’610 application does not reasonably convey to a person of ordinary skill in the art that the inventor was in possession of an invention in which sound bores *could be* but purposefully *were not* adjoined by mechanical coupling. For example, the ’610 application does not disclose a reason to exclude adjoining sound bores by mechanical coupling. *See Santarus*, 694 F.3d at 1351 (“Negative claim limitations are adequately supported when the specification describes a reason to exclude the relevant limitation.”). Nor does the ’610 application disclose adjoining by mechanical coupling to be one of a number of excludable alternatives for adjoining sound bores. *See Inphi*, 805 F.3d at 1357 (“[A]lternative features are sufficient to satisfy the written description standard of § 112, paragraph 1 for negative claim limitations.”). Indeed, as Patent Owner admits, the ’610 application does not discuss adjoining sound bores by mechanical coupling. *See* PO Reply MTA 2 (“nothing in the . . . original disclosures teaches two sound bores being mechanically adjoined together”). Nor does it disclose a reason why you would not adjoin sound bores by mechanical coupling.

Accordingly, for the reasons discussed above, we find the proposed claims lack written description support under 35 U.S.C. § 112 ¶ 1, and the Motion to Amend improperly seeks to add new matter to the '555 patent in contravention of 35 U.S.C. § 316(d)(3). We therefore deny the Motion to Amend for at least this reason.

Petitioner raises additional arguments for denying Patent Owner's Motion to Amend. *See* Pet. Opp. MTA 3–7. For example, Petitioner argues the Motion should be denied because Patent Owner has failed to comply with 37 C.F.R. § 42.121(b)(1). *Id.* at 3–4. Petitioner argues the only written description support for the proposed claims provided by Patent Owner are string cites to the '610 application, and “[s]tring cites in a chart, without any further explanation, do not satisfy the requirement for Patent Owner to show, in the MTA, written description support.” *Id.* Petitioner further argues that the proposed claims are obvious over LoPresti, Dombrowski, and Carlson⁸ because Carlson teaches mechanical coupling to be an exemplary way of coupling sound tubes, not the only way. *Id.* at 13 (citing Ex. 1034, 4:3–6). Petitioner argues a person of ordinary skill in the art would have known of other ways of coupling sound tubes, such as by fusing them together as taught by Nemirovski.⁹ *Id.* at 13–14 (citing Ex. 1036 ¶¶ 47, 53).

As discussed above, we deny Patent Owner's Motion to Amend for improperly seeking to add new matter to the '555 patent. This finding is dispositive. Accordingly, we need not consider Petitioner's additional

⁸ U.S. Patent No. 5,068,901 issued Nov. 26, 1991 (Ex. 1034).

⁹ U.S. Patent Application Pub. No. 2007/0121974 A1, published May 31, 2007 (Ex. 1036).

arguments for denying the Motion to Amend. *See Beloit Corp. v. Valmet Oy*, 742 F.2d 1421, 1423 (Fed. Cir. 1984) (finding an administrative agency is at liberty to reach a decision based on a single dispositive issue because doing so “can not only save the parties, the [agency], and [the reviewing] court unnecessary cost and effort,” but can “greatly ease the burden on [an agency] faced with a . . . proceeding involving numerous complex issues and required by statute to reach its conclusion within rigid time limits”).

H. Petitioner’s Motion to Exclude

Petitioner supported its Opposition to Patent Owner’s Motion to Amend with the third Declaration of Bob Young. *See, e.g.*, Pet. Opp. MTA 11 (citing Ex. 1033 ¶ 11). Patent Owner deposed Mr. Young, and submitted the deposition transcript as evidence. *See* Ex. 2001. Moreover, Patent Owner relied on Mr. Young’s cross-examination testimony in support of its argument for the patentability of the proposed substitute claims. *See* PO Reply MTA 4–5 (citing Ex. 2001, 57:4–9, 62:2–14). Petitioner seeks to exclude this evidence as beyond the proper scope of Mr. Young’s cross-examination under Fed. R. Evid. 611 and 37 C.F.R. § 42.53(d)(5)(ii). *See* Paper 36, 2–3. Patent Owner counters that the cited cross-examination testimony is proper because it “is reasonably related to Mr. Young’s direct testimony regarding his opinion that the proposed amended claims are obvious.” Paper 39, 2.

As discussed in § II.G, *supra*, Patent Owner’s proposed substitute claims are not patentable because they lack written description support under 35 U.S.C. § 112 ¶ 1. We, therefore, do not consider whether the claims are also unpatentable over the cited prior art, and have not considered either Mr. Young’s direct or cross-examination testimony on the patentability of the

proposed substitute claims over the cited prior art. Accordingly, we dismiss Petitioner's Motion to Exclude as moot.

I. Constitutionality of Inter Partes Review

Patent Owner disputes the constitutionality of these proceedings as improperly "extinguishing private property rights through a non-Article III forum without a jury." PO Resp. 11. The Supreme Court has found that patent rights are public rights, and therefore that *inter partes* reviews before the Patent Trial and Appeal Board are constitutionally permissible. *See Oil States Energy Servs., v. Greene's Energy Grp.*, 138 S. Ct 1365, 1373 (2018).

III. CONCLUSION

We have reviewed the Petition, Patent Owner's Response, and Petitioner's Reply. We have considered all of the arguments made by Petitioner and Patent Owner, as well as all of the evidence cited both for and against the patentability of the challenged claims, and have weighed and assessed the entirety of this evidence as a whole.

For the reasons discussed in § II.F.1, *supra*, we are persuaded that Petitioner has demonstrated by a preponderance of evidence that claims 1–3, 8–10, and 17 of the '555 patent are unpatentable over LoPresti and Dombrowski. For the reasons discussed in § II.F.2, *supra*, we are similarly persuaded that Petitioner has demonstrated by a preponderance of evidence that claims 4–7, 11–16, and 18–20 of the '555 patent are unpatentable over LoPresti, Dombrowski, and Knowles TB6.

Because we find claims 1–20 of the '555 patent to be unpatentable, we have also reviewed and considered Patent Owner's Motion to Amend to substitute proposed claims 21–40 for unpatentable claims 1–20, as well as

Petitioner's Opposition to the Motion to Amend, Patent Owner's Reply to the Opposition, and Petitioner's Sur-Reply.

For the reasons discussed in § II.G, *supra*, we find proposed claims 21–40 are unpatentable for lack of written description, and deny Patent Owner's Motion to Amend.

IV. ORDER

It is ORDERED that claims 1–3, 8–10, and 17 of the '555 patent are unpatentable under 35 U.S.C. § 103(a) over LoPresti and Dombrowski;

FURTHER ORDERED that claims 4–7, 11–16, and 18–20 of the '555 patent are unpatentable under 35 U.S.C. § 103(a) over LoPresti, Dombrowski, and Knowles TB6;

FURTHER ORDERED that Patent Owner's Motion to Amend is *denied*;

FURTHER ORDERED that Petitioner has not shown by a preponderance of evidence that claims 1–5, 8, and 17–19 of the '555 patent are unpatentable under 35 U.S.C. § 102 over Dombrowski;

FURTHER ORDERED that Petitioner has not shown by a preponderance of evidence that claim 10 of the '555 patent is unpatentable under 35 U.S.C. § 103(a) over Dombrowski;

FURTHER ORDERED that Petitioner has not shown by a preponderance of evidence that claims 6, 7, 11–15, and 20 of the '555 patent are unpatentable under 35 U.S.C. § 103(a) over Dombrowski and Knowles TB6;

FURTHER ORDERED that Petitioner has not shown by a preponderance of evidence that claim 9 of the '555 patent is unpatentable under 35 U.S.C. § 103(a) over Dombrowski and Blanchard;

FURTHER ORDERED that Petitioner has not shown by a preponderance of evidence that claim 16 of the '555 patent is unpatentable under 35 U.S.C. § 103(a) over Dombrowski, Knowles TB6, and Blanchard;

FURTHER ORDERED that Petitioner has not shown by a preponderance of evidence that claims 1–5, 8, 10, and 17–19 of the '555 patent are unpatentable under 35 U.S.C. § 103(a) over Saggio and Dombrowski;

FURTHER ORDERED that Petitioner has not shown by a preponderance of evidence that claims 6, 7, 11–15, and 20 of the '555 patent are unpatentable under 35 U.S.C. § 103(a) over Saggio, Dombrowski, and Knowles TB6;

FURTHER ORDERED that Petitioner has not shown by a preponderance of evidence that claim 9 of the '555 patent is unpatentable under 35 U.S.C. § 103(a) over Saggio, Dombrowski, and Blanchard;

FURTHER ORDERED that Petitioner has not shown by a preponderance of evidence that claim 16 of the '555 patent is unpatentable under 35 U.S.C. § 103(a) over Saggio, Dombrowski, Knowles TB6, and Blanchard; and

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

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Patent 8,567,555 B2

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