

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC.,
Petitioner,

v.

EIGHT KHZ, LLC,
Patent Owner.

IPR2023-01003
Patent 9,226,090 B1

Before JUSTIN T. ARBES, LYNNE H. BROWNE, and
SCOTT RAEVSKY, *Administrative Patent Judges*.

ARBES, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

A. *Background and Summary*

Petitioner Meta Platforms, Inc. filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–3, 6, 8–10, 12, and 14–19 of U.S. Patent No. 9,226,090 B1 (Ex. 1001, “the ’090 patent”) pursuant to 35 U.S.C. § 311(a). Patent Owner Eight kHz, LLC filed a Preliminary Response (Paper 6, “Prelim. Resp.”) pursuant to 35 U.S.C. § 313. Pursuant

to our authorization (Ex. 1045), Petitioner filed a Reply (Paper 7, “Reply”) and Patent Owner filed a Sur-Reply (Paper 8, “Sur-Reply”).

Pursuant to 35 U.S.C. § 314(a), the Director may not authorize an *inter partes* review unless the information in the petition and preliminary response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” *See* 37 C.F.R. § 42.4(a) (“The Board institutes the trial on behalf of the Director.”). For the reasons that follow, we institute an *inter partes* review as to claims 1–3, 6, 8–10, 12, and 14–19 of the ’090 patent on all grounds of unpatentability asserted in the Petition.

B. Related Matters

The parties indicate that the ’090 patent is the subject of *Eight kHz, LLC v. Meta Platforms, Inc.*, No. 6:22-cv-00575 (W.D. Tex.) (“the district court case”). *See* Pet. 2–3; Paper 4, 2. Petitioner filed petitions challenging patents related to the ’090 patent in Cases IPR2023-01004 and IPR2023-01005, and petitions challenging unrelated patents asserted in the district court case in Cases IPR2023-01019, IPR2023-01020, IPR2023-01021, IPR2023-01022, IPR2023-01023, and IPR2023-01024.

C. The ’090 Patent

The ’090 patent states that electronic devices, such as telephones, “typically provide monophonic or stereophonic sound,” which has “good speech intelligibility” but “is not comparable in quality to sound that the listeners would hear if they were communicating face-to-face with each other.” Ex. 1001, col. 1, ll. 6–14. The ’090 patent discloses an improved “computer system in which two electronic devices communicate with each

other during a telephone call between two people” and “[t]he computer system positions a voice of one person at a sound localization point that is proximate to the other person.” *Id.* at col. 2, ll. 42–46.

In order to determine a location of sound, humans process and compare monaural cues from each ear. This comparison reveals difference cues or binaural cues that enable sound localization. These cues include interaural time differences (ITDs), interaural level differences (ILDs), and head-related transfer functions (HRTFs). Cues thus result from changes to the sound wave from an interaction with the human anatomy. Humans process these changes as impulse responses or head-related impulse responses (HRIRs). Once the HRIRs for an individual are known, the associated or transformed HRTFs can be calculated. The HRIRs and transformed HRTFs enable sound to be convolved such that a location of the sound or sound localization point can be changed. A listener hears the convolved sound as if it had originated from the sound localization point.

Id. at col. 2, ll. 53–67.

The '090 patent describes, with reference to Figure 1, a method of “provid[ing] sound that is localized at a sound localization point.” *Id.* at col. 3, ll. 1–2. Step 100 is to “capture sound that will be provided to a listener,” where the “sound can be provided in real-time to a listener, processed and delayed, or stored in memory.” *Id.* at col. 3, ll. 3–9. Step 110 is to “designate a sound localization point at a location in empty space that is away from and proximate to a location of the listener such that the sound localization point simulates an origin of the sound that the listener hears.” *Id.* at col. 3, ll. 33–36. The sound localization point (SLP) can be a three-dimensional or two-dimensional position. *Id.* at col. 3, ll. 46–54. Step 120 is to “adjust the sound so the sound originates from the sound localization point at the location in empty space that is away from and proximate to the location of the listener.” *Id.* at col. 4, ll. 16–19. For

example, the sound can be “processed to alter, add, or generate head-related transfer functions (HRTFs), interaural time differences, and/or interaural level differences to correspond to a fixed or variable distance from the listener, a coordinate location or a GPS location of the sound localization point.” *Id.* at col. 4, ll. 24–29. Lastly, step 130 is to “provide the sound to the listener such that the listener localizes the origin of the sound at the sound localization point in empty space.” *Id.* at col. 4, ll. 30–32. The SLP can be “an empty space” or an occupied space where a physical or virtual object or character exists. *Id.* at col. 4, ll. 33–60.

Similarly, the ’090 patent describes, with reference to Figure 9, a method of “adust[ing] HRTFs of an individual during an electronic call.” *Id.* at col. 21, ll. 7–8. Step 900 is to “execute an electronic call between a first individual and a second individual such that an origin of a voice of the second individual appears to the first individual to originate from a sound localization point that simulates a location in empty space of the second individual.” *Id.* at col. 21, ll. 9–13. Step 910 is to “monitor, during the electronic call, movements of a head location and/or head orientation of the first individual in response to the first individual localizing sounds,” for example, using an electronic device that determines “when the [first individual’s] head turns left or right, turns up or down, or rotates back and forth.” *Id.* at col. 21, ll. 24–32. Lastly, step 920 is to “adjust, during the electronic call, stored [HRTFs] of the first individual to more accurately simulate real HRTFs of the first individual in response to the movements of the head location and/or head orientation of the first individual.” *Id.* at col. 21, ll. 43–47. The HRTFs can be adjusted in real time. *Id.* at col. 21, ll. 51–53.

Figure 17 of the '090 patent is reproduced below.

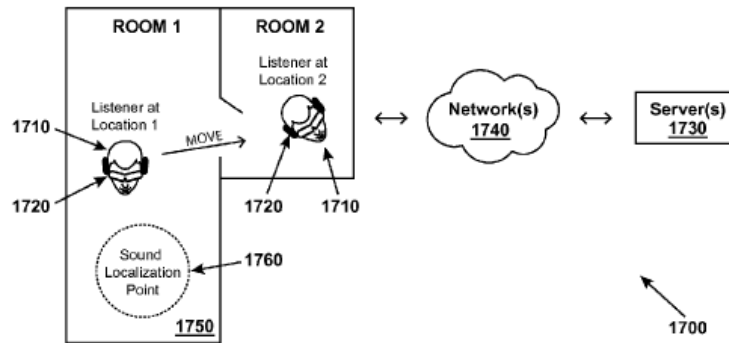


Figure 17

Figure 17 depicts listener 1710 wearing wearable electronic device (WED) 1720 that plays sound, displays corresponding images, and tracks the location and head orientation of the listener. *Id.* at col. 30, ll. 3–6, 14–18, 37–43. Sound from WED 1720 initially localizes at SLP 1760 in empty space of room 1. *Id.* at col. 30, ll. 6–10. When the listener moves, SLP 1760 “remains fixed at the location in room 1” and the sound “automatically adjusts to compensate for changes to the head orientation and the location of the listener as the listener moves about rooms 1 and 2.” *Id.* at col. 30, ll. 10–35. “For example, amplitude and localization cues (e.g., ITD and ILD) change in real-time as the listener 1710 moves from room 1 to room 2.” *Id.* at col. 30, ll. 35–37.

Figure 18 of the '090 patent is reproduced below.

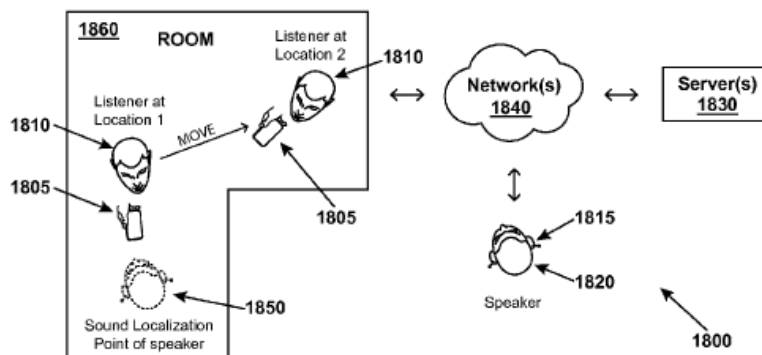


Figure 18

Figure 18 depicts a similar arrangement involving listener 1810 conducting an electronic call with handheld portable electronic device (HPED) 1805 that captures and emits binaural sound and tracks the location and head orientation of the listener. *Id.* at col. 30, l. 60–col. 31, l. 4. SLP 1850 “has a size, a shape, and an orientation of a head that emulates a size, a shape, and an orientation of a head of the speaker 1820” such that “[w]hen the speaker 1820 moves his head (such as changing location, yaw, pitch, or roll), then a head of the sound localization point 1850 simultaneously changes to emulate or copy this movement” and “[a] direction or source of the sound from the sound localization point emulates sound from the mouth of the speaker 1820.” *Id.* at col. 31, ll. 5–12. Likewise,

[w]hen the listener 1810 moves his head with respect to the sound localization point 1850 (such as changing location, yaw, pitch, or roll), then adjustments are simultaneously made to the sound of the voice of the speaker to compensate for these movements. These adjustments change the sound so the sound that the listener hears emulates the sound that the listener would hear if the speaker were physically present at the sound localization point 1850. For instance, the listener 1810 continues to hear the voice of the speaker 1820 at the sound localization point as the listener moves from location 1 in the room 1860 to location 2 in the room 1860.

Id. at col. 31, ll. 21–31.

Finally, the '090 patent discloses an embodiment in which a user speaks with others on a conference call and the system localizes the voice of each user at different SLPs around a table (e.g., at empty spaces or chairs at the table). *Id.* at col. 34, l. 58–col. 35, l. 44, Fig. 23. “Adjustments are made to the sound for each of the[] users since they are located at different locations around the table with respect to the sound localization points” (e.g., adjustments “based on movements to head orientation and location for

each user”). *Id.* at col. 35, ll. 49–63. The ’090 patent also discloses an example in which a user is speaking to four others that “are not people but computer programs with interactive audio input/output interfaces.” *Id.* at col. 35, l. 64–col. 36, l. 1. The user “can hear each of his programs running in a different spot on his large desk” and “can move the SLPs of a window/process using, for example, a voice command, a mouse, a head or other body gesture, or other method.” *Id.* at col. 36, ll. 12–17.

D. Illustrative Claim

Challenged claims 1, 8, and 15 of the ’090 patent are independent. Claims 2, 3, and 6 depend from claim 1, claims 9, 10, 12, and 14 depend from claim 8, and claims 16–19 depend from claim 15. Claim 1 recites (with letter designations used in the Petition to refer to the various limitations):

1. [pre] A method, comprising:

[a] capturing, with an electronic earphone located at a head of a talking person, binaural sound that will be provided to a listening person during a telephone call;

[b] designating, with a computer system, a sound localization point in empty space that is away from and proximate to the listening person such that the sound localization point simulates an origin of the binaural sound at the empty space that the listening person hears during the telephone call;

[c] adjusting, with the computer system, the binaural sound captured at the earphone of the talking person so the binaural sound originates during the telephone call from the sound localization point in empty space that is away from and proximate to the listening person; and

[d] providing, with an electronic earphone located at a head of the listening person, the binaural sound to the listening person during the telephone call such that the origin of the

binaural sound for the listening person occurs at the sound localization point in empty space that is away from and proximate to the listening person.

E. Evidence

Petitioner relies on the following prior art:

U.S. Patent No. 8,406,439 B1, issued Mar. 26, 2013 (Ex. 1005, “Bedingfield”);

U.S. Patent No. 8,818,000 B2, filed Oct. 29, 2010, issued Aug. 26, 2014 (Ex. 1007, “Andrea”);

U.S. Patent No. 9,131,305 B2, filed Jan. 17, 2013, issued Sept. 8, 2015 (Ex. 1006, “Li”);

U.S. Patent Application Publication No. 2003/0059070 A1, published Mar. 27, 2003 (Ex. 1008, “Ballas”); and

U.S. Patent Application Publication No. 2008/0273708 A1, published Nov. 6, 2008 (Ex. 1017, “Sandgren”).

F. Prior Art and Asserted Grounds

Petitioner asserts that claims 1–3, 6, 8–10, 12, and 14–19 of the ’090 patent are unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	References/Basis
1–3, 6, 15–17	103	Bedingfield, Andrea
18	103	Bedingfield, Andrea, Ballas
19	103	Bedingfield, Andrea, Sandgren
8–10, 12, 14	103	Bedingfield, Ballas
1, 3, 6, 15–17	103	Li, Andrea
2, 18	103	Li, Andrea, Ballas
19	103	Li, Andrea, Sandgren
8–10, 12, 14	103	Li, Ballas

II. ANALYSIS

A. Discretionary Denial Under 35 U.S.C. § 314(a)

Institution of *inter partes* review is discretionary. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an [*inter partes* review (IPR)] proceeding.”); 35 U.S.C. § 314(a) (“The Director *may not* authorize an *inter partes* review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” (emphasis added)). Patent Owner argues that we should exercise our discretion to deny the Petition in view of the district court case. *See* Prelim. Resp. 30–39; Sur-Reply 1–5. Petitioner disagrees. *See* Pet. 86–87; Reply 1–4.

The Board has held that the advanced state of a parallel district court action is a factor that may weigh in favor of denying a petition under § 314(a). *See NHK Spring Co. v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 at 20 (PTAB Sept. 12, 2018) (precedential); Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019), 58 & n.2, *available at* <https://www.uspto.gov/TrialPracticeGuideConsolidated>. We consider the following factors to assess “whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding”:

1. whether the court granted a stay or evidence exists that one may be granted if a proceeding is instituted;
2. proximity of the court’s trial date to the Board’s projected statutory deadline for a final written decision;

3. investment in the parallel proceeding by the court and the parties;
4. overlap between issues raised in the petition and in the parallel proceeding;
5. whether the petitioner and the defendant in the parallel proceeding are the same party; and
6. other circumstances that impact the Board's exercise of discretion, including the merits.

Apple Inc. v. Fintiv, Inc., IPR2020-00019, Paper 11 at 5–6 (PTAB Mar. 20, 2020) (precedential). We also consider “several clarifications” made by the Director of the United States Patent and Trademark Office (“USPTO”). See USPTO Memorandum, Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation, 2 (June 21, 2022) (“Director’s Memo”), available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

The Director’s Memo provides that “[c]onsistent with [*Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential as to § II.A) (*‘Sotera’*)], the PTAB will not discretionarily deny institution in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB.” Director’s Memo 3. With our authorization, Petitioner filed a stipulation which stipulates that

[i]f the PTAB institutes the pending IPR in IPR2023-01003 challenging the patentability of claims 1–3, 6, 8–10, 12, [and] 14–19 of the ’090 patent, then [Petitioner, Meta Platforms Technologies, LLC, and Twisted Pixel Games, LLC] will not pursue as to the challenged claims any ground raised or that

could have been reasonably raised in the IPR in the above-captioned district court litigation (No. 6:22-cv-00575-ADA).

Reply 1 (quoting Ex. 1046, 4); *see also* Ex. 2009, 2 (Petitioner’s final invalidity contentions, dated October 18, 2023, indicating that Patent Owner is asserting only claims 8, 14, and 15 of the ’090 patent in the district court case); Ex. 2002 (Order Granting Joint Motion to Amend Scheduling Order in the district court case indicating that the deadlines to serve final infringement contentions and to amend pleadings, including to “add[] . . . patent claims,” have expired).

Patent Owner concedes that Petitioner filed a “*Sotera*-like stipulation” but argues that it is insufficient because it “leaves the door open to a duplication of efforts and the possibility of conflicting decisions.”

Sur-Reply 1–2 (citing Ex. 1046, 4 (“This stipulation is not intended . . . to limit [Petitioner’s] ability to assert . . . invalidity under 35 U.S.C. §§ 102 and 103 not available in IPR and under 35 U.S.C. §§ 101 and 112[], regardless of whether IPRs are instituted.”)). Namely, Patent Owner argues that Petitioner’s stipulation carves out the “right to assert overlapping system art in the district court,” such that institution here would not address the risk of “inconsistent outcomes between the PTAB and the district court.” *Id.* at 2–5.

We disagree with Patent Owner, as Petitioner’s stipulation comports with the “could have reasonably been raised” language of the Director’s Memo. *Compare* Reply 1 (stipulation not to pursue in the district court case “any ground raised or that could have been reasonably raised in” this proceeding), *with* Director’s Memo 3 (“stipulation not to pursue in a parallel proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB”). Patent Owner’s argument essentially attacks

the reasoning of *Sotera* itself and the Director’s Memo, which we are bound to follow. Accordingly, Patent Owner’s argument is unavailing.

Patent Owner also urges us not to accept a “late” stipulation. Sur-Reply 5. We disagree that Petitioner’s stipulation is late. It is within our discretion to permit Petitioner to file a stipulation prior to institution. *See NXP USA, Inc. v. Impinj, Inc.*, IPR2021-01556, Paper 13 at 4 (PTAB Sept. 7, 2022) (precedential).

For the above reasons, we decline to exercise our discretion to deny institution under § 314(a).

B. Legal Standards

A claim is unpatentable for obviousness if “the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.” 35 U.S.C. § 103; *see KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including “the scope and content of the prior art”; “differences between the prior art and the claims at issue”; and “the level of ordinary skill in the pertinent art.” *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). Additionally, secondary considerations, such as “commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy.” *Id.* When conducting an obviousness analysis, we consider a prior art reference “not only for what it expressly teaches, but also for what

it fairly suggests.” *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1049 (Fed. Cir. 2019).

A patent claim “is not proved obvious merely by demonstrating that each of its elements was, independently, known in the prior art.” *KSR*, 550 U.S. at 418. An obviousness determination requires finding “both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.’” *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016); *see KSR*, 550 U.S. at 418 (for an obviousness analysis, “it can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does”).

“Although the *KSR* test is flexible, the Board ‘must still be careful not to allow hindsight reconstruction of references . . . without any explanation as to *how* or *why* the references would be combined to produce the claimed invention.’” *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1066 (Fed. Cir. 2016). Further, an assertion of obviousness “cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)); *accord In re NuVasive, Inc.*, 842 F.3d 1376, 1383 (Fed. Cir. 2016) (stating that “conclusory statements” amount to an “insufficient articulation[] of motivation to combine”; “instead, the finding must be supported by a ‘reasoned explanation’”); *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory

statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.”).

C. Level of Ordinary Skill in the Art

Petitioner argues that at the time of the ’090 patent (June 2014), a person of ordinary skill in the art would have had “at least a bachelor’s degree in computer science or engineering with a focus on audio signal processing and sound localization, with at least two years of relevant experience,” where “[a]dditional experience could substitute for less education, and additional education could likewise substitute for less experience.” Pet. 15 (citing Ex. 1003 ¶¶ 32–34). Patent Owner applies Petitioner’s definition of the level of ordinary skill in the art for purposes of its Preliminary Response. Prelim. Resp. 12. Based on the record presented, including our review of the ’090 patent and the types of problems and solutions described in the ’090 patent and cited prior art, we agree with Petitioner’s proposed definition of the level of ordinary skill in the art and apply it for purposes of this Decision, except that we remove the term “at least” to eliminate vagueness as to the amount of education and practical experience.

D. Claim Interpretation

We interpret each challenged claim

using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.

37 C.F.R. § 42.100(b). Petitioner does not propose express interpretations of any claim terms and states that “[t]he prior art relied on in this Petition discloses the subject matter of the challenged claims under any reasonable construction, including their plain meaning.” Pet. 15. Petitioner also notes that Patent Owner argued in the district court case that the “processor” limitation in claim 15 is not a means-plus-function limitation under 35 U.S.C. § 112(f). *Id.* at 16 (citing Ex. 1027, 24–38). Petitioner states that it adopts Patent Owner’s district court construction “[s]olely for this IPR.” *Id.* Patent Owner likewise does not propose express interpretations of any claim terms, but disputes Petitioner’s statement regarding “any reasonable construction,” arguing that it “harkens back to the broadest reasonable interpretation standard” previously used by the Board. Prelim. Resp. 12–13. We do not understand Petitioner to have applied that standard, however, given that Petitioner never used the term “broadest.” *See* Pet. 15. We apply the claim interpretation standard set forth in 37 C.F.R. § 42.100(b) and conclude that no express interpretation of any claim term is necessary to determine whether to institute an *inter partes* review in this proceeding. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“Because we need only construe terms ‘that are in controversy, and *only to the extent necessary* to resolve the controversy,’ we need not construe [a particular claim limitation] where the construction is not ‘material to the . . . dispute.’” (citation omitted) (emphasis added)).

E. Obviousness Ground Based on Bedingfield and Andrea (Claims 1–3, 6, and 15–17)

Petitioner contends that claims 1–3, 6, and 15–17 are unpatentable over Bedingfield and Andrea under 35 U.S.C. § 103, citing the testimony of

Chris Kyriakakis, Ph.D., as support. Pet. 16–39 (citing Ex. 1003). Patent Owner responds. Prelim. Resp. 15–22. We are persuaded that Petitioner has established a reasonable likelihood of prevailing on its asserted ground based on Bedingfield and Andrea as to independent claims 1 and 15.

1. Bedingfield

Bedingfield discloses “[a]n improved telephone or network-based communication system” that “simulate[s] an in-person conference setting.” Ex. 1005, col. 3, ll. 25–27. The disclosed system “provide[s] multi-channel sound to a listener by modifying a single channel signal provided by another participant’s system,” and “assign[s] each participant a virtual position within a virtual sound field” where “[e]ach participant is heard by the listener in multi-channel audio based on the participant’s virtual location in the sound field.” *Id.* at col. 3, ll. 27–34.

Figure 1 of Bedingfield is reproduced below.

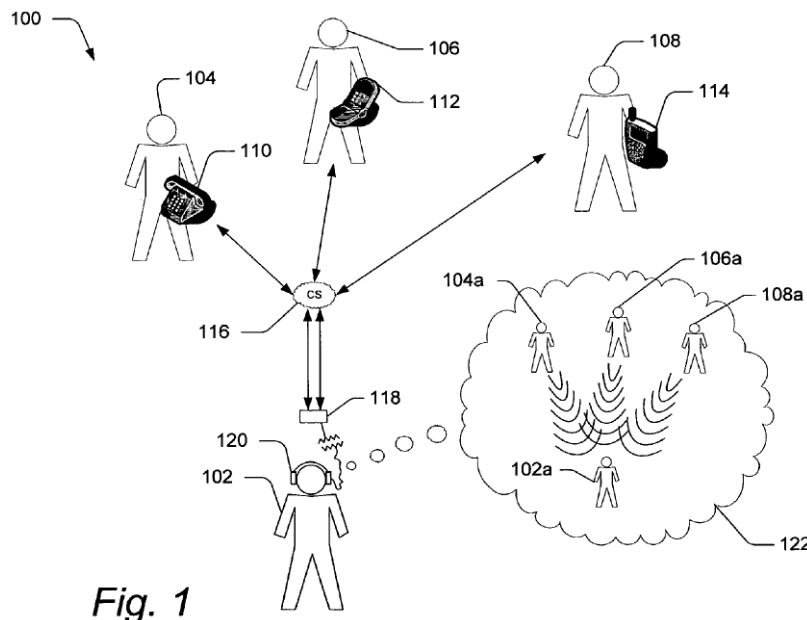


Figure 1 depicts “overall environment 100 for providing a synthetic audio placement to a listener 102” conducting a conference call with participants

104, 106, and 108 having, respectively, communication devices 110, 112, and 114 (e.g., telephones, mobile phones). *Id.* at col. 4, ll. 18–30.

Multi-channel processing device 118 receives signals from the communication devices of speaking participants and creates sound field 122 when listener 102 hears audio through speaker system 120 (e.g., stereo headphones). *Id.* at col. 4, ll. 40–45, col. 13, ll. 34–36. As shown in Figure 1, sound field 122

represents the perception resulting from the audio output of the multi-channel processing device 118 through the multi-channel speaker system 120 as heard by the listener 102. For example, if a listener 102_a and participants 104_a, 106_a, 108_a were in the same location and speaking to each other directly (without the communication system 116), then the listener 102_a would hear sounds from the participants 104_a, 106_a, 108_a through both of the listener's 102_a ears, and thus have a specific balance, volume, and timbre for each speaker.

Id. at col. 4, ll. 52–61. In that way, created sound field 122 “is substantially similar (or approximately similar) to an actual sound field where the listener 102 is present between all of participants 104, 106, 108.” *Id.* at col. 4, l. 66–col. 5, l. 3, col. 5, ll. 27–32, col. 9, ll. 20–23, col. 16, ll. 36–48, Figs. 19a–c. The sound effects produced for the sound field can be accomplished “using various audio techniques such as volume, balance, parametric equalization, delay, echo and the like.” *Id.* at col. 5, ll. 35–41.

Bedingfield further describes “selections a listener may make” using multi-channel processing device 118. *Id.* at col. 5, ll. 51–53. For example, the listener can “change a participant's location” by “select[ing] a participant and then select[ing] a new location for the participant within the sound field.” *Id.* at col. 6, ll. 29–32, 43–45, col. 17, ll. 6–14, 20–25, Fig. 3 (block 328). Bedingfield also discloses detecting movement of the listener (e.g.,

turning his head) and changing the sound field accordingly for the listener's new orientation. *Id.* at col. 13, l. 34–col. 14, l. 43, Figs. 13–15.

2. *Andrea*

Andrea discloses “a stereo headset or stereo earbuds with an integrated array of microphones” with improved noise cancellation. Ex. 1007, col. 2, ll. 37–40. Two microphones are “mounted on the left and right earphones” of a headset or set of earbuds. *Id.* at col. 11, ll. 25–27, Fig. 10. Andrea discloses that

[t]he stereo microphone spacing allows for determining different time of arrival and direction of the acoustic signals to the microphones. From the centered position of the mouth, the voice signal 210 will look like a plain wave and arrive in-phase at same time with equal amplitude at both the microphones, while noise from the sides will arrive at each microphone in different phase/time and be cancelled by the adaptive processing of the algorithm.

Id. at col. 11, ll. 6–13. “[T]he dual-channel earbud embodiment allows for the application of audio enhancement techniques, such as active noise reduction (ANR) . . . for reducing unwanted sound.” *Id.* at col. 15, ll. 18–22.

3. *Claim 1*

Petitioner argues that Bedingfield and Andrea collectively teach all of the limitations of claim 1. Pet. 16–27. With respect to limitation 1[a], “capturing, with an electronic earphone located at a head of a talking person, binaural sound that will be provided to a listening person during a telephone call,” Petitioner contends that Bedingfield teaches participants 104, 106, and 108 (each a “talking person”) with respective communication devices 110, 112, and 114 (e.g., mobile phones, wearable speakers) that capture sound

with a microphone, and it would have been obvious to use well-known earbuds or headphones. *Id.* at 19–21. Sound from the participants is captured and provided to listener 102 (a “listening person”) via multi-channel processing device 118 and multi-channel speaker system 120 during a telephone call with the participants. *Id.* Petitioner acknowledges that “Bedingfield does not expressly teach capturing a binaural sound,” but argues that doing so would have been obvious based on Andrea, which teaches “earbuds . . . worn by a user at left and right ears that ‘create a binaural recording.’” *Id.* at 22 (quoting Ex. 1007, col. 14, ll. 55–58) (emphasis omitted). According to Petitioner, a person of ordinary skill in the art would have been motivated to modify Bedingfield’s system based on Andrea because, among other reasons, capturing binaural sound would have “made it easier for the listener to distinguish between signal and noise,” “improved call quality,” “allow[ed] for a more life-like conversation,” and “enhanced the participants’ experience on the electronic call.” *Id.* at 16–18 (citing Ex. 1003 ¶¶ 96–106). Petitioner further provides reasons why an ordinarily skilled artisan would have had a reasonable expectation of success in making the combination. *Id.* at 18–19 (citing Ex. 1003 ¶¶ 107–112).

Patent Owner makes three arguments in response. First, Patent Owner contends that Petitioner relies merely on Andrea’s single use of the phrase “binaural recording” and does not explain sufficiently what “binaural” means in the reference. Prelim. Resp. 18–19 (quoting Ex. 1007, col. 14, ll. 55–58). Andrea, however, describes how sound is captured using two microphones mounted on the user’s left and right earphones or earbuds, such that the sound captured by each microphone has a “different time of arrival and direction” and ambient noise is removed. *See* Ex. 1007, col. 10, l. 35–col. 15, l. 15, Figs. 10, 13, 19. Andrea then explains that

[w]hile a user is wearing the earbuds, the audio receiving means on each earbud may pick up the same sound emanating from a single sound source (i.e., the respective audio receiving means may create a binaural recording). Because of the spatial discrepancy between each of the audio receiving means, a distinct audio signal may be produced in each of the channels corresponding to the same sound.

Id. at col. 14, ll. 55–61. Thus, Andrea provides more than a single mention of “binaural recording,” as it explains how such a recording is accomplished.¹

Second, Patent Owner contends that Andrea discloses that “it is not to be combined with previously known products or methods” and thereby “teaches away from using prior art products or methods with its disclosed system.” Prelim. Resp. 19 & n.1. Specifically, Andrea states that “it is an object of the invention to not encompass within the invention any previously known product, process of making the product, or method of using the product such that Applicants reserve the right and hereby disclose a disclaimer of any previously known product, process, or method.” Ex. 1007, col. 4, ll. 33–38. Petitioner relies on Bedingfield for its underlying teaching

¹ We note that Patent Owner argued in the district court case that the term “binaural” has a “well-understood meaning[] to a [person of ordinary skill in the art]” and “is a basic term that a [person of ordinary skill in the art] would clearly understand,” citing a dictionary definition of “binaural” as “of or related to sound reproduction involving the use of two separated microphones and two transmission channels to have a stereophonic effect.” Ex. 1027, 12–13. Patent Owner further asserted that the phrase “a binaural voice” in claim 15 should be construed to mean “a binaural sound.” *Id.* at 12. To the extent the parties disagree as to the interpretation of “binaural sound” in claim 1, “binaural voice” in claim 15, or any other claim terms, the parties are encouraged to provide in their papers during trial proposed interpretations for the term(s) and cite support in the Specification and/or prosecution history of the ’090 patent for their respective interpretations.

of communication devices that capture sound and relies on Andrea as teaching capture of a specific type of sound, “binaural sound,” using its two-microphone arrangement. *See* Pet. 16–22. We disagree on this record that Andrea’s statement regarding what its “invention” was intended to encompass would have counseled against making a modification to *Bedingfield* to capture binaural sound. *See* Ex. 1007, col. 4, ll. 33–38. Indeed, Andrea also states that “audio transmitting/receiving devices” of the type described in the reference “may be used in a multitude of different applications,” such as “PC to PC communications,” “PC to telephone communications,” and “directional listening,” indicating that its teachings have applicability outside the particular described invention. *See id.* at col. 1, ll. 44–56. We also must consider Andrea for “everything that it teaches, not simply the described invention or a preferred embodiment.” *In re Applied Materials, Inc.*, 692 F.3d 1289, 1298 (Fed. Cir. 2012); *see also In re Mouttet*, 686 F.3d 1322, 1331 (Fed. Cir. 2012) (“A reference may be read for all that it teaches, including uses beyond its primary purpose.”).

Third, Patent Owner argues that Petitioner “fails to provide an explanation how the ‘binaural recording’ in Andrea would be successfully combined and successfully work with the multi-channel technology volume-level modulation approach of *Bedingfield*,” noting that claim 1 requires capture of “binaural sound” (in limitation 1[a]) and a SLP that “simulates an origin of the [captured] binaural sound” (in limitation 1[b]). Prelim. Resp. 19–21. According to Patent Owner, “[t]he binaural sound of [the ’090 patent] is not the simple stereo sound *Bedingfield* deals with; it is more. Binaural sound is augmented stereo, formed by ‘recording stereo sound and processing it to imprint head-related transfer functions (HRTFs).’” *Id.* at 20 (quoting Ex. 1001, col. 3, ll. 28–32).

We disagree based on the current record. As explained above, Andrea explains how it creates a “binaural recording” of sound using its two-microphone arrangement. *See* Ex. 1007, col. 10, l. 35–col. 15, l. 15. Petitioner cites the supporting testimony of Dr. Kyriakakis, who explains why a person of ordinary skill in the art would have found it straightforward and simple to “modify[] the system of Bedingfield to include a wearable device that implements Andrea’s second microphone for noise cancellation.” Ex. 1003 ¶¶ 105, 107–112; *see* Pet. 16–19. Thus, in the combined system, rather than using Bedingfield’s existing communication devices that capture multi-channel audio, a speaking participant would use a wearable device with two microphones so that binaural sound captured using those microphones (as in Andrea) would be provided to the listener. *See* Pet. 16–19, 22. Petitioner’s arguments regarding the combination of Bedingfield and Andrea are supported adequately at this stage.²

With respect to limitation 1 [b], “designating, with a computer system, a sound localization point in empty space that is away from and proximate to the listening person such that the sound localization point simulates an origin of the binaural sound at the empty space that the listening person hears during the telephone call,” Petitioner argues that multi-channel processing device 118 in Bedingfield simulates a sound field and allows the listener to select a participant’s location within the sound field (the “sound localization point” simulating the origin from which the listener hears the participant speaking). *Id.* at 22–23. Petitioner contends that it would have been

² As to Patent Owner’s arguments regarding “stereo” sound, “augmented stereo” sound, and “binaural” sound, we encourage the parties to address the interpretation of “binaural sound” in their papers during trial. *See* Prelim. Resp. 20–21; Ex. 1001, col. 3, ll. 5–32.

obvious to position the SLP “in empty space, i.e., at a location where no physical object exists,” because Bedingfield discloses positioning the participants around a circular conference table. *Id.* at 24–25 (emphasis omitted).

Next, limitation 1[c] recites “adjusting, with the computer system, the binaural sound captured at the earphone of the talking person so the binaural sound originates during the telephone call from the sound localization point in empty space that is away from and proximate to the listening person” and limitation 1[d] recites “providing, with an electronic earphone located at a head of the listening person, the binaural sound to the listening person during the telephone call such that the origin of the binaural sound for the listening person occurs at the sound localization point in empty space that is away from and proximate to the listening person.” Petitioner argues that multi-channel processing device 118 processes the audio signals received from the participants to create the sound field and the listener hears the speaking participants at their respective locations within the sound field using a “wearable headset or headphones.” *Id.* at 26–27.

Other than its arguments pertaining to “binaural sound,” which we address above, Patent Owner does not dispute Petitioner’s arguments regarding limitations 1[b]–1[d]. Prelim. Resp. 15–21. Petitioner’s contentions regarding the combination of Bedingfield and Andrea are supported by the testimony of Dr. Kyriakakis and are persuasive based on the current record. *See* Pet. 16–27; Ex. 1003 ¶¶ 96–140. Petitioner has shown a reasonable likelihood of prevailing on its assertion that claim 1 is unpatentable over Bedingfield and Andrea. Accordingly, we institute review “on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” *See* 37 C.F.R. § 42.108(a).

4. *Claim 15*

Independent claim 15 is somewhat similar to claim 1, but recites a computer system rather than a method. Petitioner argues that Bedingfield teaches a “first wearable electronic device” (i.e., multi-channel speaker system 120) for a “first person” (i.e., listener 102), “second wearable electronic device” (i.e., communication device 114) for a “second person” (i.e., participant 108) that captures sound during an electronic phone call, “memory” that stores instructions, and a “processor” that executes the instructions to adjust the voice of the second person to position a SLP representing the origin of the voice. Pet. 32–36. Petitioner further asserts that “Bedingfield-Andrea renders obvious” capturing “binaural sound” or “binaural voice” from the second person. *Id.* at 33. In its analysis, Petitioner refers to many of its earlier arguments regarding similar limitations 1[a] (capturing binaural sound), 1[c] (adjusting the binaural sound), and 1[d] (providing the binaural sound), which we address above. *See id.* at 32–36; *supra* Section II.E.3.

Patent Owner argues that Petitioner’s asserted ground is not identified with particularity under 35 U.S.C. § 312(a)(3) because Petitioner “rel[ies] extensively on internal cross-referencing” and “nested citations” as a “short cut to fit a myriad of arguments for unpatentability in the Petition.” Prelim. Resp. 3–6. Patent Owner notes that Petitioner does not directly cite Andrea in its analysis of claim 15 and fails to address the aspect of limitation 15[d1] of adjusting the binaural voice “to position a sound localization point of the binaural voice to a location.” *Id.* at 4–5.

We have reviewed Petitioner’s contentions regarding claim 15 and find them sufficiently specific based on the current record. Although Petitioner does not cite particular portions of Andrea in addressing claim 15,

Petitioner expressly references “Section VIII.C.2” of the Petition, which pertains to limitation 1[a] and explains Petitioner’s position as to how the combination of Bedingfield and Andrea teaches capturing “binaural sound.” *See* Pet. 33 (citing *id.* at 19–22); *CRFD Research, Inc. v. Matal*, 876 F.3d 1330, 1345–46 (Fed. Cir. 2017) (agreeing with the petitioner that it “incorporated [an] argument into other grounds of unpatentability . . . by direct citation to [the] argument in the petition”).

Further, limitation 15[d1] recites “adjust[ing] the binaural voice of the second person during the electronic phone call in order to position a sound localization point of the binaural voice to a location that is away from and proximate to the first person.” Petitioner argues that “Bedingfield processes . . . audio signals . . . of the speaking participant . . . during the conference call . . . in order to position a perceived location 104a, 106a, 108a (SLP) of the audio signals . . . to a location that is away from and proximate to the listener” and expressly references “Section VIII.C.4” of the Petition pertaining to limitation 1[c]. Pet. 35–36 (emphasis omitted). Similar to limitation 15[d1]’s recitation of adjusting binaural voice “to position a sound localization point of the binaural voice to a location,” limitation 1[c] recites “adjusting . . . the binaural sound . . . so the binaural sound originates during the telephone call from the sound localization point” (that has already been designated, per limitation 1[b]). Given the similarity, we are able to determine the substance of Petitioner’s assertions for limitation 15[d1] based on the reference to the earlier portion of the Petition. *See id.* (citing *id.* at 26); *Netflix, Inc. v. DivX, LLC*, 84 F.4th 1371, 1377 (Fed. Cir. 2023) (“A petitioner may not rely on a vague, generic, and/or meandering petition and later fault the Board for failing to understand what the petition really

meant. Ultimately, it is the petitioner’s burden to present a clear argument.”).

Patent Owner also repeats its arguments regarding “binaural sound” for purposes of claim 15’s recitation of “binaural voice.” Prelim. Resp. 21–22. We disagree with those arguments based on the current record for the reasons explained above. *See supra* Section II.E.3.

Petitioner’s contentions regarding the combination of Bedingfield and Andrea are supported by the testimony of Dr. Kyriakakis and are persuasive based on the current record. *See* Pet. 32–36; Ex. 1003 ¶¶ 155–165. On this record, we are persuaded that Petitioner has shown a reasonable likelihood of prevailing on its assertion that claim 15 is unpatentable over Bedingfield and Andrea.

5. *Claims 2, 3, 6, 16, and 17*

Patent Owner does not argue challenged dependent claims 2, 3, 6, 16, and 17 separately. Prelim. Resp. 22. On this record, we are persuaded that Petitioner has shown a reasonable likelihood of prevailing on its assertion that independent claims 1 and 15 are unpatentable over Bedingfield and Andrea, and need not determine at this time whether Petitioner also has shown a reasonable likelihood of prevailing as to any of the challenged dependent claims. *See* 37 C.F.R. § 42.108(a).

F. Obviousness Ground Based on Bedingfield and Ballas (Claims 8–10, 12, and 14)

Petitioner contends that claims 8–10, 12, and 14 are unpatentable over Bedingfield and Ballas under 35 U.S.C. § 103, and Patent Owner responds. *See* Pet. 48–56; Prelim. Resp. 22–24. We are persuaded that Petitioner has

established a reasonable likelihood of prevailing on its asserted ground based on Bedingfield and Ballas as to independent claim 8.

1. Ballas

Ballas discloses a system for “producing virtual sound sources that are externally perceived and positioned at any orientation in azimuth and elevation from a listener.” Ex. 1008, code (57). The system comprises

a pair of speakers . . . mounted in a location near the temple of a listener’s head, such for example, on an eyeglass frame or inside a helmet, rather than in headphones. A head tracking system also mounted on the frame where speakers are mounted determines the location and orientation of the listener’s head and provides the measurements to a computer system for audio signal processing in conjunction with a head related transfer function (HRTF) filter to produce spatialized audio. The HRTF filter maintains [the] virtual location of the audio signals, thus allowing the listener to change locations and head orientation without degradation of the audio signal.

Id. ¶ 17. Ballas discloses that the amplified, spatialized audio signals “are binaural in nature (i.e., left channel signals are supplied to the left ear and right channel signals are supplied to the right ear[)].” *Id.* ¶ 25. “The speakers may also be mounted on a virtual reality head mounted visual display system.” *Id.*

2. Claim 8

Petitioner relies on Bedingfield as teaching the majority of the limitations of claim 8 and relies on “Bedingfield alone or in view of Ballas” as teaching (1) executing an electronic call where the origin of a second individual’s voice appears to “originate from a fixed location . . . while the first individual moves and changes a location and a head orientation with

respect to the sound localization point” (limitation 8[c]), and (2) “maintain[ing] the origin of the voice of the second individual at the sound localization point . . . in response to the first individual moving the head orientation with respect to the sound localization point” (limitation 8[d]). Pet. 48–52. Petitioner references its earlier analysis of Ballas with respect to dependent claim 18, which recites similar limitations. *Id.* at 51–52 (citing *id.* at 39–43). Petitioner argues that it would have been obvious to modify Bedingfield’s system to “track the user’s head orientation and adjust the sound so that the sound appears fixed even as the user’s head moves, as taught in Ballas.” *Id.* at 48–49 (citing *id.* at 39–40).

Patent Owner responds that the asserted ground fails because Petitioner argues Bedingfield and Ballas in the alternative and Petitioner’s alleged motivation for combining the references’ teachings and reasonable expectation of success are based on the references sharing the same goal and having similar functionality. Prelim. Resp. 22–24. According to Patent Owner, “[i]f Bedingfield satisfactorily teaches limitations 8[c]–[d], Petitioner has not resolved why the teachings of Bedingfield as to the limitations should be disregarded by a [person of ordinary skill in the art] in favor of Ballas’s teachings.” *Id.* at 23. For similar reasons, Patent Owner contends that the asserted ground is not identified with particularity under 35 U.S.C. § 312(a)(3) due to Petitioner’s alternative arguments and references to other parts of the Petition. *Id.* at 6–7.

Based on the current record, we find Petitioner’s arguments regarding the combination of Bedingfield and Ballas to be sufficient and, therefore, need not determine at this time whether Petitioner has made a sufficient showing for limitations 8[c] and 8[d] based on Bedingfield alone. Petitioner expressly identifies the modification to Bedingfield’s system that a person of

ordinary skill in the art would have been motivated to make. *See* Pet. 39, 41, 43, 48–49. Namely, an ordinarily skilled artisan “would have been motivated to apply Ballas’s wearable frame with head tracking and HRTF processing to [Bedingfield’s] headphones, as this provides a more realistic virtual experience, allowing the user to move while fixing the perceived origin of the sound sources.” *Id.* at 41, 43. Importantly, although Petitioner discusses shared goals and similar functionality of Bedingfield and Ballas, *see id.* at 39–41, Petitioner does not assert a motivation to combine or reasonable expectation of success based solely on such disclosures. Rather, Petitioner contends that making the described modification would have resulted in a more realistic experience for the listener that simulates an actual in-person conference. *Id.* at 40, 43.

Petitioner’s contentions regarding the combination of Bedingfield and Ballas are supported by the testimony of Dr. Kyriakakis and are persuasive based on the current record. *See id.* at 39–43, 48–52; Ex. 1003 ¶¶ 175–191, 206–218. On this record, we are persuaded that Petitioner has shown a reasonable likelihood of prevailing on its assertion that claim 8 is unpatentable over Bedingfield and Ballas.

3. *Claims 9, 10, 12, and 14*

Patent Owner does not argue challenged dependent claims 9, 10, 12, and 14 separately. Prelim. Resp. 24. On this record, we are persuaded that Petitioner has shown a reasonable likelihood of prevailing on its assertion that independent claim 8 is unpatentable over Bedingfield and Ballas, and need not determine at this time whether Petitioner also has shown a reasonable likelihood of prevailing as to any of the challenged dependent claims. *See* 37 C.F.R. § 42.108(a).

G. Additional Obviousness Grounds Based on Bedingfield, Andrea, and Other References (Claims 18 and 19)

Petitioner contends, under 35 U.S.C. § 103, that claim 18 is unpatentable over Bedingfield, Andrea, and Ballas, and claim 19 is unpatentable over Bedingfield, Andrea, and Sandgren. Pet. 39–48. Patent Owner only makes arguments as to parent claim 15 in its Preliminary Response. Prelim. Resp. 22. On this record, we are persuaded that Petitioner has shown a reasonable likelihood of prevailing on its assertion that independent claim 15 is unpatentable over Bedingfield and Andrea, and need not determine at this time whether Petitioner also has shown a reasonable likelihood of prevailing as to dependent claims 18 and 19 based on Bedingfield, Andrea, and other references. *See* 37 C.F.R. § 42.108(a).

H. Obviousness Grounds Based on Li and Other References (Claims 1–3, 6, 8–10, 12, and 14–19)

Petitioner contends, under 35 U.S.C. § 103, that claims 1, 3, 6, and 15–17 are unpatentable over Li and Andrea; claims 2 and 18 are unpatentable over Li, Andrea, and Ballas; claim 19 is unpatentable over Li, Andrea, and Sandgren; and claims 8–10, 12, and 14 are unpatentable over Li and Ballas. Pet. 56–86. Patent Owner responds. Prelim. Resp. 8–10, 24–30. As explained above, we are persuaded, based on the current record, that Petitioner has shown a reasonable likelihood of prevailing on certain grounds based on combinations with Bedingfield for the challenged independent claims. Accordingly, we institute review “on all of the challenged claims and on all grounds of unpatentability asserted for each claim.” *See* 37 C.F.R. § 42.108(a). To provide guidance to the parties regarding the Li-based grounds, however, we note the following.

Limitation 1[b] recites “designating, with a computer system, a sound localization point in empty space that is away from and proximate to the listening person such that the sound localization point simulates an origin of the binaural sound at the empty space that the listening person hears during the telephone call.” Petitioner argues that a person of ordinary skill in the art would have understood Li and Andrea to teach the limitation, relying on Andrea for the “binaural sound” aspect. Pet. 60–63. Petitioner asserts that “[b]ecause the sound sources [in Li] are placed ‘at different spots to mimic a real conference room environment,’ such as seats around a conference table located ‘a distance from’ the listener, . . . the *SLP at a first location* is away from and proximate to the user.” *Id.* at 62–63.

Petitioner then states in a footnote that “[t]he mapping for the phrase *SLP in empty space that is away from and proximate to the listening person*, also applies to [limitations] 1[c], 1[d], 3, 6[b], 8[b], 8[c], 12[b], 14, 15[d1], [and] 17, which recite the same or similar phrase, and the mapping is not repeated in those sections.” *Id.* at 63 n.16. For example, when addressing limitation 1[c], Petitioner only discusses whether Li teaches a “computer system,” “adjusting . . . the binaural sound,” and “listening person.” *Id.* at 63–65. As Patent Owner points out, this does not account for the portion of limitation 1[c] reciting “captured at the earphone of the talking person so the binaural sound originates during the telephone call from the sound localization point in empty space that is away from and proximate to.” Prelim. Resp. 25–26. Although part of that language (“empty space that is away from and proximate to the listening person”) is identical to limitation 1[b], the remainder is not. Also, the language as it appears in limitation 1[c] pertains to the claim step of “adjusting” the captured binaural sound, which is different from the step of “designating” the SLP addressed earlier for

limitation 1[b]. At this stage, we question whether Petitioner's approach of using its analysis of limitation 1[b] as a shorthand for ten other allegedly "similar" limitations that use different language and pertain to different steps, without any further explanation, is sufficient to meet its burden. *See* Pet. 63 n.16.

III. CONCLUSION

Based on the arguments presented in the Petition, we conclude that Petitioner has demonstrated a reasonable likelihood of prevailing with respect to at least one claim of the '090 patent challenged in the Petition. Accordingly, we institute a trial on all claims and all grounds asserted in the Petition. The Board has not made a final determination under 35 U.S.C. § 318(a) with respect to the patentability of the challenged claims.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of claims 1–3, 6, 8–10, 12, and 14–19 of the '090 patent is instituted with respect to all grounds set forth in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4(b), *inter partes* review of the '090 patent shall commence on the entry date of this Decision, and notice is hereby given of the institution of a trial.

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Patent 9,226,090 B1

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