

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

META PLATFORMS, INC.,
Petitioner,

v.

EIGHT KHZ, LLC,
Patent Owner.

Case IPR2023-01005
Patent 9,674,628

PATENT OWNER'S PRELIMINARY RESPONSE
35 U.S.C. §313, and 37 C.F.R. §42.107(a)

TABLE OF CONTENTS

	Page
I. INTRODUCTION	1
A. The '628 Patent	1
1. The '628 Patent discloses and claims a novel and nonobvious improvement to methods executed by one or more electronic devices in an electronic system which provides binaural sound of a voice of a person to localize at an image during a telephone call.	1
2. The challenged claims.....	2
II. THE ASSERTED GROUNDS	4
A. Person of Ordinary Skill in the Art	5
B. Claim Construction	5
III. PETITIONER HAS FAILED TO ESTABLISH A REASONABLE LIKELIHOOD THAT ANY CLAIM IS UNPATENTABLE	7
A. Institution Standards	7
C. The Petition Should Not be Instituted on Ground 1 Because Prior Art Fails to Disclose or Teach the Invention as Claimed.....	17
1. Billingham	17
2. Schröder	21
3. A POSITA Would Not Have Been Motivated to Combine Billingham and Schröder	24
4. Billingham, alone or in combination with Schröder, fails to disclose, teach, or suggest several limitations of independent claim 9, nor does it render obvious claim 9.....	26
5. All remaining claims that depend on claim 9 fail for the same reasons	31
6. Billingham, alone or in combination with Schröder, fails to disclose, teach, or suggest several limitations of independent claim 16, nor does it render obvious claim 16.....	31
7. All remaining claims that depend on claim 16 fail for the same reasons.	32
D. The Petition Should Not be Instituted on Ground 2 Because Prior Art Fails to Disclose or Teach the Invention as Claimed.....	32
1. Zhou	32
2. Haddick	33
3. Billingham in view of Schröder in further view of Zhou and Haddick fails to disclose, teach, or suggest several limitations of independent claim 9, nor does it render obvious claim 9.....	34
4. All remaining claims that rely on Billingham in view of Schröder in further view of Zhou and Haddick fail for the same reasons.....	35

5. Billinghamhurst in view of Schröder in further view of Zhou and Haddick, fails to disclose, teach, or suggest several limitations of independent claim 16, nor does it render obvious claim 16.....	35
6. All Remaining Claims That Depend on Claim 16 Fail for the Same Reasons	35
E. The Petition Should Not be Instituted on Ground 3 Because Prior Art Fails to Disclose or Teach the Invention as Claimed.....	36
1. Ballas.....	36
2. Billinghamhurst in view of Ballas fails to disclose, teach, or suggest several limitations of independent claim 9, nor does it render obvious claim 9.	38
3. All Remaining Claims That Rely on Billinghamhurst in View of Ballas Fail for the Same Reasons	39
4. Billinghamhurst in view Ballas, fails to disclose, teach, or suggest several limitations of independent claim 16, nor does it render obvious claim 16.	39
5. All Remaining Claims That Depend on Claim 16 Fail for the Same Reasons	40
F. The Petition Should Not be Instituted on Ground 4 Because Prior Art Fails to Disclose or Teach the Invention as Claimed.....	40
1. Billinghamhurst in view of Ballas in further view of Zhou and Haddick fails to disclose, teach, or suggest several limitations of independent claim 9, nor does it render obvious claim 9.....	40
2. All remaining claims that rely on Billinghamhurst in view of ballas in further view of Zhou and Haddick fail for the same reasons	42
3. Billinghamhurst in view Ballas in further view of Zhou and Haddick, fails to disclose, teach, or suggest several limitations of independent claim 16, nor does it render obvious claim 16.....	42
4. All Remaining Claims That Rely on Billinghamhurst in view of Ballas in further view of Zhou and Haddick Fail for the Same Reasons.....	43
IV. THE BOARD SHOULD EXERCISE DISCRETION UNDER 35 U.S.C. §314 TO DENY INSTITUTION	43
A. The Board should exercise its discretion to deny institution of this Petition.....	43
1. Factor 1 weighs against institution, because no court has granted a stay and no evidence exists that a stay may be granted.	46
2. Factor 2 weighs against institution, because trial in the district court is scheduled to begin months before the final written decision deadline.	46
3. Factor 3 weighs against institution, because the court and parties have and will continue to invest significant time and resources in the parallel proceeding.	48
4. Factors 4-6 weigh against institution, because there is significant overlap between this IPR and district court proceedings, the parties involved are the same, and the asserted grounds fail.	50
V. CONCLUSION.....	52

TABLE OF AUTHORITIES

	Page(s)
Federal Cases	
<i>Apple Inc. v. Fintiv, Inc.</i> , IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020).....	<i>passim</i>
<i>Arendi S.A.R.L. v. Apple, Inc.</i> , 832 F.3d 1355 (Fed. Cir. 2016)	7
<i>Aylus Networks, Inc. v. Apple Inc.</i> , 856 F.3d 1353 (Fed. Cir. 2017)	5
<i>In re Baxter Int’l, Inc.</i> , 678 F.3d 1357 (Fed. Cir. 2012)	6
<i>Cisco Sys., Inc. v. C-Cation Tech, LLC</i> , IPR2014-00454, Paper No. 12 (PTAB Aug. 29, 2014).....	6
<i>Cisco Systems, Inc. v. Monarch Networking Solutions, LLC</i> , IPR2020-01227, Paper 11 (PTAB Mar. 4, 2021).....	47
<i>Cisco Systems, Inc. v. Oyster Optics</i> , LLC, IPR2021-00319, Paper 9 (PTAB Jun. 8, 2021)	46
<i>Depuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.</i> , 567 F.3d 1314 (Fed. Cir. 2009)	25
<i>eClinicalWorks, LLC v. Decapolis LLC</i> , IPR2022-00229, Paper 10 (April 13, 2022)	45
<i>Gen. Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha</i> , IPR2016-01357, Paper 19 (PTAB Sept. 6, 2017).....	44
<i>GlobalFoundries Inc. v. UNM Rainforest Innovations</i> , IPR2020-00984, Paper 11 (PTAB Dec. 9, 2020)	46
<i>KSR Int’l Co. v. Teleflex Inc.</i> , 550 U.S. 398 (2007).....	7

<i>In re Magnum Oil Tools Int’l, Ltd.</i> , 829 F.3d 1364 (Fed. Cir. 2016)	6, 7, 40
<i>NanoCelect Biomedical, Inc. v. Cytonome/ST, LLC</i> , IPR2020-00551, Paper 19 (PTAB Aug. 27, 2020).....	46
<i>NHK Spring Co., Ltd., v. Intri-Plex Techs., Inc.</i> , IPR2018-00752, Paper 8 (PTAB Sep. 12, 2018).....	42, 43, 44, 46
<i>In re Nuvasive, Inc.</i> , 842 F.3d 1376 (Fed. Cir. 2016)	7
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005) (en banc)	5
<i>Samsung Electronics Co., Ltd. v. Bell Northern Research, LLC</i> , IPR2020-00611 (“2020-611 case”)	9
<i>U.S. Venture, Inc. v. Sunoco Partners Marketing & Terminals, L.P.</i> , IPR2020-00728 Paper 10 (PTAB October 1, 2020).....	46
<i>Universal Elecs., Inc. v. Universal Remote Control, Inc.</i> , 943 F. Supp. 2d 1028 (C.D. Cal. 2013).....	49
<i>Xerox Corp. v. Bytemark, Inc.</i> , IPR2022-00624, Paper 9.....	7

EXHIBIT LIST

Ex.	Description
2001	Declaration of Durand Begault, Ph.D. (“Begault”)
2002	CV of Durand Begault, Ph.D.
2003	U.S. Patent No. 5,438,623
2004	Moller, Henrik, et al., “Head-Related Transfer Functions of Human Subjects”, Spatial Sound Techniques: Part 1, PP. 417-437, 1995 (“Moller”)
2005	U.S. Patent No. 3,236,949
2006	Defendants’ Preliminary Invalidity Contentions
2007	U.S. District Court Order in <i>Eight kHz, LLC v. Meta Platforms, Inc.</i> , No. 6:22-cv-00575-ADA-DTG (W.D. Tex. Aug. 30, 2023), Granting Joint Motion to Amend Scheduling Order
2008	U.S. District Court Order in <i>Eight kHz, LLC v. Meta Platforms, Inc.</i> , No. 6:22-cv-00575-ADA-DTG (W.D. Tex. Sep. 11, 2023), Resetting Markman Hearing Via Zoom
2009	Memorandum from Katherine K. Vidal on Interim Procedure for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation (June 21, 2022)
2010	Lex Machina, Patent Cases (All Judges) Time to Trial, U.S. District Court for the Western District of Texas, September 9, 2023
2011	Lex Machina, Patent Cases (Judge Alan D. Albright) Time to Trial, U.S. District Court for the Western District of Texas, September 9, 2023
2012	U.S. District Court Minute Entry in <i>Eight kHz, LLC v. Meta Platforms, Inc.</i> , No. 6:22-cv-00575-ADA-DTG (W.D. Tex. Oct. 3, 2023), Denying Motion to Transfer Venue

Patent Owner Eight KHZ, LLC (“8KHZ”) submits this Preliminary Response (“POPR”) to the Petition for *inter partes* review (“IPR”) of claims 9-14 and 16-20 of U.S. Patent No. 9,674,628 (Ex. 1001, “’628 Patent”). Paper 2 (“Pet.”).

I. INTRODUCTION

A. The ’628 Patent

The ’628 Patent is titled “Providing Binaural Sound to Localize at an Image During a Telephone Call,” and was issued by the United States Patent and Trademark Office on June 6, 2017. Ex. 1001.

- 1. The ’628 Patent discloses and claims a novel and nonobvious improvement to methods executed by one or more electronic devices in an electronic system which provides binaural sound of a voice of a person to localize at an image during a telephone call.**

The ’628 Patent is generally directed to using one or more electronic devices in an electronic system which provides binaural sound of a voice of a person to localize at an image during a telephone call. Ex. 1001, Abstract. The system uses head related transfer functions (HRTFs) to localize the voice of the calling party at a sound location point (SLP) and displays an image that represents the calling party that is seen by called party as being at that SLP. *See id.*, Claims 9, 16. The system further tracks head movements of the called party with respect to the image perceived as being at the SLP, and changes the HRTFs in response the tracked head movements so that the voice of the calling party continues to localize to the SLP. *Id.*

2. The challenged claims

Of the challenged claims, claim 9 and 16 are the only independent claims, and are reproduced below:

9. A method executed by one or more electronic devices in an electronic system that improves an experience of a calling party and a called party talking to each other during a telephone call, the method comprising:

processing, during the telephone call and with a processor, a voice of the calling party with **head related transfer functions (HRTFs)** so the voice of the calling party localizes to the called party as binaural sound **at a sound localization point (SLP) that is one meter to two meters away from the called party;**

displaying, during the telephone call and to the called party with a wearable electronic device worn on a head of the called party, an image that represents the calling party **that is seen by the called party as being at the SLP that is one meter to two meters away from the called party;**

tracking, during the telephone call and with the wearable electronic device, **head movements of the called party with respect to the image that represents the calling party and that is seen by the called party as being at the SLP;** and

changing, during the telephone call and **in response to the head movements of the called party,** the HRTFs processing the voice of the calling party **so the voice of the calling party continues**

to localize to the SLP that is seen by the called party as being the image that represents the calling party that is one meter to two meters away from the called party **while the head of the called party moves with respect to the image that represents the calling party.**

16. A non-transitory computer readable storage medium storing instructions that one or more electronic devices in an electronic system execute as a method during a telephone call between a calling party and a called party, the method comprising:

displaying, during the telephone call and to the called party with a wearable electronic device worn on a head of the called party, an image of the calling party **that appears to the called party as being at least one meter away from a head of the called party;**

processing, during the telephone call, a voice of the calling party with **head related transfer functions (HRTFs)** so the voice of the calling party localizes to the called party as binaural sound at the image of the calling party that appears at least one meter away from the head of the called party;

tracking, during the telephone call, **head movements of the called party;** and

changing, during the telephone call and in response to the head movements of the called party, **the HRTFs processing the voice of the calling party so the voice of the calling party continues to localize to the image of the calling party** that appears at least

one meter away from the head of the called party **as the head of the called party moves and changes head orientations.**

II. THE ASSERTED GROUNDS

Petitioner asserts the challenged claims are unpatentable based on the following grounds:

Challenged Claims	35 U.S.C. §	Reference(s)/Basis
9-14, 16-20	103	Billinghurst (Ex. 1010) in view of Schröder (Ex. 1012)
9-14, 16-20	103	Billinghurst and Schröder in view of Zhou (Ex. 1018) and Haddick (Ex. 1011)
9-14, 16-20	103	Billinghurst in view of Ballas (Ex. 1008)
9-14, 16-20	103	Billinghurst and Ballas in view of Zhou and Haddick

Pet. 5-6.

A. Person of Ordinary Skill in the Art

For purposes of the POPR, 8KHZ applies Petitioner’s characterization of a person of ordinary skill in the art (“POSITA”).

B. Claim Construction

The claim terms should be given their “ordinary and customary meaning” as understood by a POSITA in view of the patent claims, specification and prosecution history. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-14 (Fed. Cir. 2005) (en banc); and 37 C.F.R. § 42.100(b). There is a “heavy presumption” that the ‘628 Patent’s disputed claim terms “are to be given their ordinary and customary meaning.” See *Aylus Networks, Inc. v. Apple Inc.*, 856 F.3d 1353, 1358 (Fed. Cir. 2017) (citation omitted). The ordinary meaning may be readily apparent to a POSITA, and claim construction can involve merely accepting the meaning of commonly understood words. *Phillips*, 415 F.3d at 1314.

The Petitioner’s “any reasonable construction, including their plain meaning” harkens back to the broadest reasonable interpretation standard used by the Board before November 13, 2018 and conflicts with the expressed directive that the Board use the same claim construction standard as in a civil action. 37 C.F.R. § 42.100(b). Thus, Petitioner’s assertion that the claims should be construed to include “any reasonable construction” should be rejected. Pet. 19-20. Here, no express

constructions of the claims are necessary. To the extent that any term needs construction, the plain and ordinary mean of the term should be adopted.

III. PETITIONER HAS FAILED TO ESTABLISH A REASONABLE LIKELIHOOD THAT ANY CLAIM IS UNPATENTABLE

A. Institution Standards

Review cannot be instituted unless the Petition demonstrates a reasonable likelihood that at least one of the challenged claims is unpatentable. 35 U.S.C. §314(a); 37 C.F.R. §42.108(c). The Board “will not take on the role of advocate for a party, trying to make out a case the party has not adequately stated.” Standing Order ¶121.5.2 (B.P.A.I. Mar. 8, 2011). Rather, it is Petitioner’s duty to provide sufficient grounds for the institution of a review “focus[ing] on concise, well organized, easy-to-follow arguments supported by readily identifiable evidence of record.” *Cisco Sys., Inc. v. C-Cation Tech, LLC*, IPR2014-00454, Paper No. 12 at 11 (PTAB Aug. 29, 2014).

The ultimate determination of obviousness under 35 U.S.C. §103 is a question of law based on underlying factual findings. *In re Baxter Int’l, Inc.*, 678 F.3d 1357, 1362 (Fed. Cir. 2012) (citing *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17-18 (1966)). “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.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380-81 (Fed. Cir. 2016). The “factual inquiry” into the reasons for “[combining] references must be

thorough and searching, and the need for specificity pervades.” *In re Nuvasive, Inc.*, 842 F.3d 1376, 1381-82 (Fed. Cir. 2016) (internal quotations and citations omitted). The specific reasoning must include some rational underpinning to combine the prior art elements as claimed to support the conclusion of obviousness. *See KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007). It is Petitioner’s burden to demonstrate a motivation to combine, and a reasonable expectation of success. *See In re Magnum Oil Tools Int’l Ltd.*, 829 F.3d at 1381. Mere conclusory statements are insufficient. *Id.*, at 1380.

Further to this point, expert declarations with conclusory statements are entitled to little weight or no weight. *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9 at 15 (precedential) (citing 37 C.F.R. §42.65(a)). The *Xerox* opinion explains (citing *KSR*, 550 U.S. at 421 (2007)) on page 16: “This is particularly problematic in cases where, like here, expert testimony is offered not simply to provide a motivation to combine prior-art teachings, but rather to supply a limitation missing from the prior art.” *See also Arendi S.A.R.L. v. Apple, Inc.*, 832 F.3d 1355, 1361–62 (Fed. Cir. 2016) (holding that reliance on common sense in an obviousness analysis is “typically invoked to provide a known motivation to combine, not to supply a missing claim limitation”). Petitioner asserts four obviousness grounds of unpatentability. Pet. 5-6. The Board need only consider the validity of independent claims 9 and 16, addressed on all grounds. As shown below, the Petition fails to

establish a reasonable likelihood that Petitioner will prevail. A trial therefore should not be instituted.

B. The Petition Should Not Be Instituted on Any Ground Because Petitioner Has Not Demonstrated that Either Billingham or Zhou is a Printed Publication

The Petition fails to establish that the non-patent literature Billingham (Ex. 1010) and Zhou (Ex. 1018) are printed publications within the meaning of 35 U.S.C. §102. Petitioner cannot establish a reasonable likelihood that any challenged claim is unpatentable because the Grounds rely on these references.

Petitioner bears the burden of establishing a reference qualifies as a printed publication. “[A]t the institution stage, the petition must identify, with particularity, evidence sufficient to establish a reasonable likelihood that the reference was publicly accessible before the critical date of the challenged patent and therefore that there is a reasonable likelihood that it qualifies as a printed publication.” *Hulu, LLC v. Sound View Innovations LLC*, No. IPR2018-01039, 2019 WL 7000067, at *5 (PTAB Dec. 20, 2019).

Petitioner bears the burden to show, within the Petition, a reasonable likelihood that a relied-upon reference was publicly accessible. All four grounds rely on one or both of non-patent publications Billingham (Ex. 1010) and Zhou (Ex. 1018). For institution on any ground, therefore, Petitioner has the burden to

demonstrate that Billingham and/or Zhou qualify as printed publications under 35 U.S.C. §102(a)(1) (post-AIA).

The Petition literally does not contain the phrase “printed publication,” nor does it directly take on the issue at all. Instead, in a pair of footnotes, Petitioner merely alleges that Billingham and Zhou are “prior art under at least 35 U.S.C. § 102(a)(1)” (Pet. 5) and then merely word block-cites to the entirety of a 43-page declaration from serial declarant Ingrid Hsieh-Yee that purports to show that Billingham and Zhou qualify as printed publications. Particularly given that the Petition weighs in at 13,950 words, the Board should reject this broad-spectrum incorporation by reference as an improper attempt to circumvent the word limit.

Even if the Board were to consider Ms. Hsieh-Yee’s incorporated opinions on their merits, they still do not adequately demonstrate that Billingham qualifies as a printed publication. The Board has previously declined to credit Ms. Hsieh-Yee’s largely cookie-cutter declarations regarding printed publication status because, despite performing a wide variety of internet research and consulting electronic records of various libraries, she does not opine that she had any personal knowledge of the underlying facts that would supposedly render the reference in question a printed publication. *See, e.g., Samsung Electronics Co., Ltd. v. Bell Northern Research, LLC*, IPR2020-00611 (“2020-611 case”), paper 11 (“2020-611 ID”, denying institution, among other reasons, because of such shortcomings in Ms.

Hsieh-Yee's declaration (Ex. 1019 (in the 2020-611 case)), nearly identical in approach to the one she submitted in this case).

a. Ms. Hsieh-Yee's Qualifications

Ms. Hsieh-Yee describes extensive qualifications, but none that would permit her to opine on the public availability of Billingham or Zhou. She states: "In 2022 I was conferred the title of Professor Emerita after 32 years as a professor in the Department of Library and Information Science of the Catholic University of America. I have experience working in an academic library, a medical library, and a legislative library." Ex. 1019, ¶4. While this background may well qualify Ms. Hsieh-Yee to opine on library indexing, cataloging, and shelving practices in general, she does not purport to have any personal knowledge of the actual appearance of Billingham or Zhou on the shelves of any library. Nor does she rely on the testimony of anyone who might have such personal knowledge.

This failure of proof is four corners with the 2020-611 case, where the Board noted: "Petitioner does not rely on the declaration of someone who has first-hand knowledge of the practices of the Library of Congress during the relevant time period, who could (for example) attest to when the book became publicly available. Rather, Petitioner relies on the testimony of Dr. Hsieh-Yee, who has experience working 'in an academic library, a medical library, and a legislative library' and has 'been a professor for more than 25 years.'" 2020-611 ID, 14. The Board held: "This

testimony, from someone who does not have personal knowledge of current or past practices of the Library of Congress, is too speculative to sufficiently counter the 2005 copyright date in the book itself and the 2005 publication dates in the MARC record and the call number.” *Id.*

b. Authenticity

Ms. Hsieh-Yee puts her credibility in question right out of the box with her opinions on the authenticity of Billingham and Zhou. She states: “I began my research on this work on Google Scholar and found a record that led me to an IEEE metadata record for this article at <https://ieeexplore.ieee.org/document/729532> in the IEEE Xplore Digital Library. ***I followed the PDF link to purchase this article from the publisher. The IEEE copy is presented as Ex. 1010 in this Declaration.***” Ex. 1019, ¶72 (emphasis added). But Ex. 1010 on its face shows that it is not a purchased copy downloaded from IEEE at all: the cover page states that it was “[d]ownloaded from Academia.edu” a web site to which anyone who creates a free account may upload documents for others to download. Thus, neither Petitioner nor its expert has provided any way to determine if Ex. 1010 is a genuine copy of the original IEEE paper. This sharp contrast between the clearly stated origin of Ex. 1010 and Ms. Hsieh-Yee’s claims of its origin should itself call into question the reliability of her opinions as a whole.

c. IEEE Metadata Records

Ms. Hsieh-Yee similarly purports to provide as Appendix 1010A an IEEE metadata record of Billingham, but there is nothing in her declaration labeled Appendix 1010A and it is not clear which of the 200+ pages accompanying her declaration might constitute such a metadata record. In any event, she simply walks through and describes the content of the fields in the purported metadata record but ultimately does not opine on how such a metadata record or any of its content would demonstrate the public availability of Billingham.

Ms. Hsieh-Yee similarly purports to provide as Appendix 1018A an IEEE metadata record of Zhou, but there is nothing in her declaration labeled Appendix 1018A and it is not clear which of the 200+ pages accompanying her declaration might constitute such a metadata record. In any event, here too she simply walks through and describes the content of the fields in the purported metadata record but ultimately does not opine on how such a metadata record or any of its content would demonstrate the public availability of Zhou.

d. Library of Congress Records

Ms. Hsieh-Yee purports to have obtained copies of Billingham (Appendix 1010E) and Zhou (Appendix 1018B), as well as the MARC record for Billingham (Appendix 1010F) and Zhou (Appendix 1018C), from the Library of Congress. Again, none of the documents accompanying her declaration bear any of these four

appendix numbers, so it is not clear which of the many copies of the references these might be, or if she provided them at all.

That aside, this flood of raw data does not compensate for the fact that Ms. Hsieh-Yee does not allege to have personal knowledge of current or past practices of the Library of Congress, and does not rely on testimony from anyone who does have such knowledge. Nor does she provide any other basis for showing when Billinghamhurst or Zhou were first available to members of the interested public from the Library of Congress. Instead, she simply provides in ¶61 her bare opinion “that the issue containing Zhou would have been publicly accessible by December 14, 2004, at the Library of Congress,” based on no more than her opinions of what libraries “usually” do and what their “customary practice” might be. In the 2020-611 case, the Board found this to be insufficient: “Petitioner does not rely on the declaration of someone who has first-hand knowledge of the practices of the Library of Congress during the relevant time period, who could (for example) attest to when the book became publicly available. Rather, Petitioner relies on the testimony of Dr. Hsieh-Yee . . .”). 2020-611 ID, 14. For the same reasons, the Board should so decline to credit Ms. Hsieh-Yee’s speculative testimony here.

e. Other Library Records

Ms. Hsieh-Yee walks through similar exercises for Billinghamhurst at the Linda Hall Library, purporting to include a copy of Billinghamhurst obtained from the library

as Appendix 1010B and a copy of the corresponding MARC record as Appendix 1010C. Likewise, she purports to include a copy of Zhou obtained from the University of Michigan library as Appendix 1018D, and a copy of the corresponding MARC record as Appendix 1018E. Again, there are no such labeled appendices to her declaration, and it is not clear which of the several copies of the references these might be, or if she provided them at all.

And in any event, as with the Library of Congress copies and records discussed above, here too Ms. Hsieh-Yee claims no personal knowledge of the practices of the Linda Hall or University of Michigan libraries at the relevant time periods, and does not rely on testimony from anyone who does have such knowledge. Nor does she provide any other basis for showing when Billinghamst or Zhou were first available to members of the interested public from those libraries. Again, the Board should decline to credit Ms. Hsieh-Yee's speculative testimony.

f. Usage Records

In two short paragraphs (45 and 71), Ms. Hsieh-Yee describes running Google Scholar searches for citations to Billinghamst and Zhou and listing certain citations as well as screenshots of those searches as Appendix 1010G (Billinghamst) and Appendix 1018F (Zhou). Though once again there no attachments to her declaration so labeled, there are a handful of pages that do appear to correspond to her cursory description (Ex. 1019, 135-139 and 223-225).

Ms. Hsieh-Yee makes no effort to demonstrate the publication date of any of the supposed citing references, instead simply regurgitating results from Google Scholar with no attempt to validate them or explain why such blind reliance is warranted. Again, the Board found this insufficient in the 2020-611 case: “First, Appendix 1010-C, which is Dr Hsieh-Yee’s compilation of cites from Google Scholar, is not persuasive evidence because Dr. Hsieh-Yee does not explain how specifically the search for ‘Haykin’ was conducted such that it is clear that each reference is citing to the version of Haykin with the 2005 copyright date that was obtained from the Library of Congress upon which Petitioner relies in its challenges. . . . Also, neither Petitioner nor Dr. Hsieh-Yee provides evidence corroborating the publication dates of the references on the list that allegedly cite to Haykin.” 2020-611 ID, 15.

In sum, despite its extensive size and superficial appeal, Ms. Hsieh-Yee’s declaration is based entirely on present-day searches of databases and retrieval of library copies of the references in question, and offers nothing beyond conclusory conjecture that those database entries and library copies actually existed and were accessible by interested members of the public at the relevant time periods. The Board should not reinforce such an unmoored approach. Because Petitioner does not argue printed publication status of Billingham or Zhou at all but instead relies on wholesale incorporation by reference, and because the improperly incorporated

opinions of Petitioner's declarant do not adequately show the printed publication status of either Billinghamurst or Zhou in any event, the Board should decline to institute on all grounds.

C. The Petition Should Not be Instituted on Ground 1 Because Prior Art Fails to Disclose or Teach the Invention as Claimed

Petitioner asserts the Ground 1 claims are obvious based on Billinghamurst in view of Schröder. Pet. 5-6. The asserted prior art references fail to disclose or teach numerous limitations, either expressly or inherently, and a POSITA would not have been motivated to start with or combine the asserted references to arrive at the claimed subject matter, nor would they have had a reasonable expectation of success in arriving at the claimed subject matter. The Petition fails to establish a reasonable likelihood that Billinghamurst in view of Schröder would have rendered the challenged claims obvious. The Board should therefore deny institution based on Ground 1.

1. Billinghamurst

Billinghurst is titled "A Wearable Spatial Conferencing Space" and discusses a prototype wearable computer. Begault ¶10. Billinghamurst outlines three possible types of wearable communication spaces:

Head-stabilized - information is fixed to the users viewpoint and doesn't change as the user changes viewpoint orientation or position.

Body-stabilized - information is fixed relative to the users body position and varies as the user changes viewpoint orientation, but not as they change position. This requires the users viewpoint orientation to be tracked.

World-stabilized - information is fixed to real world locations and varies as the user changes viewpoint orientation and position. This requires the users viewpoint position and orientation to be tracked.

Ex. 1010, 4. Billingham goes on to describe the team's research system, which he describes as "the simplest form of body-stabilized display; one which uses one degree of orientation to give the user the impression they are surrounded by a virtual cylinder of visual and auditory information." *Id.*; see also Fig. 1.0b:



**Figure 1.0b One Degree of Freedom
Body-Stabilized Display**

This two-dimensional space with one degree of freedom is reinforced by Figure 4 of Billinghamurst, which shows a “radar display” of other participants in the virtual space that are inside and outside the user’s current viewing angle, and which are all shown at the same elevation (presumably corresponding to the eye level of the user). Begault ¶11. This sort of two-dimensional display of sound sources on the azimuth was well-known at the time, and reflects the focus of a POSITA familiar with 3D audio applications for teleconferencing on arranging voices at eye level to simulate a virtual conference table. *Id.* Petitioner’s expert Dr. Kyriakakis confirms this notion: “In general, videoconferences were widely known in the relevant time frame to mimic a conference room setting, where participants are seated around a physical conference table and could meet and collaborate face-to-face.” *Id.* (citing Ex. 1003 (“Kyriakakis”) ¶138).

Billinghamurst briefly discusses the potential for more complex environments, but notes that “[t]he technical requirements for such a conferencing space place it several years in the future” and further notes that even his extremely simplistic system slowed down significantly under increased user load. Ex. 1010, 7-8.

Billinghamurst’s system generated sound using what he described as “spatialized audio” using Microsoft’s Direct Sound technology (Ex. 1010, 6) that allowed for some level of perceived directionality to sounds in the virtual cylinder, but does not refer to HRTF processing of sounds in 3D space. Begault ¶¶10, 17-18. Nor does

Billinghurst's passing mention of the use of Microsoft DirectSound imply the use of HRTFs: Indeed, Petitioner's supposed evidence to the contrary does not mention HRTFs at all, much less that their use was mandatory. Ex. 1043. *Id.*, ¶19. In fact, the technical details that Billinghurst does provide point away from the use of HRTFs: Billinghurst's 8-bit audio used a 22KHz sample rate, which was incapable of any meaningful spatial audio rendering because it could not reproduce the full dynamic range needed for HRTF filtering. Begault ¶¶20-21. Billinghurst's limited audio hardware thus would have been unusable for successfully conveying 3D audio cues for spatial hearing. *Id.*, ¶21.

Petitioner strongly implies that it was not possible for Billinghurst's system to work without the use of head-related transfer functions (HRTFs) through its repeated quote of the unsupported opinion: “[e]xact spatial 3D sound in virtual and augmented environments requires perceptual externalization of the sound source, which can only be brought about using **head related transfer functions (HRTFs)**.” Pet. 20 (emphasis in original). But this opinion is not from either Billinghurst or Schröder, but a third reference, Zhou, not included in Ground 1. Furthermore, since Petitioner does not argue that Billinghurst discloses **exact** spatial 3D sound, Zhou's opinion by definition cannot cure Billinghurst's lack of disclosure of HRTFs. This quote from Zhou is even more off-point because, as discussed above in the overview of Billinghurst, Billinghurst did not provide a true three-dimensional audio space but

instead placed all sound sources at the same elevation as the user. *See also* Begault ¶¶17-19. Also consistent with this picture is the fact that Billinghurst’s audio was incapable of reproducing the dynamic range needed for full 3D audio cues. *Id.*, ¶¶20-21.

In sum, Petitioner has not met its burden to show that a POSITA would have understood Billinghurst to disclose HRTFs: its argument is based solely on its expert’s conclusory opinion, which does not grapple with the objectively incapable sound system Billinghurst discloses and is based solely on a document that does not say what its expert claims.

2. Schröder

Schröder describes a headphone-based audio system that used techniques to mitigate inside-the-head localization of sound. Schröder’s proposed solution tracked the user’s head and trunk to “detect the rotational movements of the head and are used to keep the position of a virtual sound source outside the head.” Begault ¶22. Schröder used a method of HRTF filtering to keep headphone-produced sound at the same position, on average, that a user would experience if listening to stereo loudspeakers outside of their head. *Id.* But Schröder criticized systems that tracked the user’s orientation and indiscriminately adjusted the perceived direction of the sounds based on the user’s orientation, finding that it proved disorienting for users in motion such as joggers:

This inherently positive property may be perceived as a drawback when the listener is not sitting still and is listening to a performance. When the listener is moving himself, such as when jogging, the aural event remains virtually still in space whenever there is a change of direction. If the listener now changes direction, then the virtual direction from which the listener hears the aural event also changes. So as now to hear the aural 35 event from the preferred direction again, that is say normally from the front, it is known practice to set the normal direction or preferred direction manually.

Ex. 1012, 5:4-10.

Schröder's system thus tracked user movement and automated the process of maintaining the preferred direction of the sound for listeners in motion: small, frequent movements would be passed to the HRTF filters to maintain the perceived location of the sound, while larger, less frequent movements would result in a resetting of the preferred direction so that the user would again perceive the "virtual speakers" as being in front of them. Begault ¶31. This runs counter to the claimed behavior of the '628 Patent, which is to consistently change the HRTFs in response to any head movements so the perceived voice of the calling party continues to track the image of the calling party as the head of the called party moves. *Id.*, ¶¶30-31; see also '628 Patent claims 9 and 16. Furthermore, Schröder does not discuss the

use of his system in conjunction with video, how his improvement on automatically resetting the user's preferred direction would work with a system including images corresponding to the sound sources, or any other complications that incorporating video might add to the system design.

Schröder used HRTF filters both to simulate the loudspeakers' positions and to implement the well-known technique of "cross-talk filtering," but in an unusual way: instead of filtering the cross-talk signal from the sound source, Schröder proposes a "mirror image" of the same concept of by adding cross-talk back into the signal from the opposite channel. Begault ¶¶22-23. As a result, Schröder's system simulates for a headphone user the experience of stereo loudspeakers, where both ears hear both loudspeakers. *Id.*, ¶¶23-24.

Schröder's implementation of cross-talk filtering is not necessary or sensible for the simulation of virtual sounds at sound localization points (SLPs) in the '628 Patent, particularly in a headphone-based system. *Id.*, ¶25. In fact, a POSITA would understand that Schröder's cross-talk filtering would actually degrade rather than enhance the user's experience of a simulated sound position using 3D audio, and would not use it. *Id.*

3. A POSITA Would Not Have Been Motivated to Combine Billinghamhurst and Schröder

As previously discussed, Petitioner has not demonstrated that Billinghamhurst qualifies as a printed publication, and thus it is not a valid prior art reference. See *supra* III(B)(a-f). Further, even if Billinghamhurst were a valid prior art reference, a POSITA would not have been motivated to combine Billinghamhurst with Schröder to arrive at the claimed invention of the '628 Patent because Schröder's solution was incompatible with and would not have improved Billinghamhurst's system on multiple fronts.

As discussed above in the overview of Schröder, Schröder teaches a method to maintain a virtual image at a fixed, constant position using HRTFs, by simulating the virtual image produced by stereo loudspeakers independent of head position: in other words, creating a stable SLP independent of movement of the listener. Begault ¶28. This differs from the use of HRTFs in a spatial auditory display, where the position of simulated sound sources can potentially move to any location in three-dimensional space relative to a listener, even when the head of the listener is fixed. *Id.*

Furthermore, a POSITA would not have been motivated to combine Billinghamhurst and Schröder because Schröder does not consider the use of sound source elevation, and thus does not improve on Billinghamhurst's own lack of elevation

cues as discussed above. Begault ¶29. The techniques used to position a pair of simulated virtual loudspeakers on a constant plane (e.g., amplitude panning) are different than those required to support dynamically-changing virtual images in a three-dimensional world. *Id.* A POSITA thus would not have been motivated to combine the technologies to improve Billinghamhurst’s system at all, much less to arrive at the ‘628 Patent’s claimed invention. *Id.*

But perhaps most importantly, Schröder’s averaging of the SLP and periodic resetting of the preferred direction of sound teach away from the claimed invention. Begault ¶¶30-31. Schröder’s system did not consistently adjust the perceived direction of a sound based on head movement—instead it “averaged” the perceived direction of the sound and periodically reset it to a new preferred direction based on the user’s movements. *Id.* This is contrary to the location of dynamically changing sounds in a virtual world, where such arbitrary changes in preferred direction cannot be made without destroying the immersive experience. *Id.* A POSITA therefore would have understood the goal of Schröder’s system as distinct from the simulation of dynamically-changing virtual sound sources in three-dimensional space and not relevant or related to Billinghamhurst’s system, and thus would not have been motivated to combine Billinghamhurst with Schröder. *Id.* And to the extent Petitioner argues that a POSITA simply would have cherry-picked the use of HRTFs from Schröder without regard to the context in which Schröder taught the use of HRTFs, that misses

the point: a POSITA wanting to improve a system that used continuous tracking of a user's movements would not even have considered Schröder at all, because it taught a completely different type of system with different behavior and different goals than the '628 Patent's claimed invention. *Id.*; see also *Depuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed. Cir. 2009) ("A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant." (internal citation omitted)).

4. Billinghurst, alone or in combination with Schröder, fails to disclose, teach, or suggest several limitations of independent claim 9, nor does it render obvious claim 9.

a. Limitation 9[a]: Billinghurst, alone or in combination with Schröder, fails to disclose or teach "processing, during the telephone call and with a processor, a voice of the calling party with head related transfer functions (HRTFs) so the voice of the calling party localizes to the called party as binaural sound at a sound localization point (SLP) that is one meter to two meters away from the called party"

As discussed in the above overview of Billinghurst, Petitioner admits that Billinghurst does not directly disclose HRTFs, and Petitioner presents no competent evidence that HRTFs were necessarily present in Billinghurst. Nor does Petitioner allege that using HRTFs in Billinghurst's system to localize sound at a sound

location point (SLP) would have been obvious based on a POSITA's knowledge, but only alleges obviousness in view of Schröder. Pet. 51, 56. And, as discussed *supra* III(C)(3), a POSITA would not have been motivated to combine Billinghurst and Schröder because Schröder's system does not consistently adjust its HRTFs to track head movements so that the audio continues to maintain a consistent perceived location, and a POSITA therefore would not have looked to Schröder to improve Billinghurst's system and arrive at the claims of the '628 Patent.

Petitioner does not allege that Schröder teaches "at a sound localization point (SLP) that is one meter to two meters away from the called party" at all. Pet. 36. Nor does Petitioner actually allege that Billinghurst teaches it. Instead, Petitioner simply appeals to a picture of Billinghurst's virtual conferencing space ***with no description of the distance whatsoever*** and yet asks the Board to find that "Billinghurst teaches an SLP that is one meter to two meters away from the called party." *Id.*

In its attempt to support this argument, Petitioner cites to two references, neither included in the ground: 1) Ex. 1029, which concerns a different prototype videoconferencing system that Petitioner does not allege is related at all to Billinghurst's, and 2) Ex. 1030, a textbook discussing human interaction research from the 1950s that Petitioner likewise does not claim is related to videoconferencing in general, much less Billinghurst's system in particular, and

indeed given its timing cannot speak to perceived distances during a virtual videoconference. Pet. 36-37. Nor does Ex. 1028, the additional reference explored by Petitioner’s expert in a block of paragraphs improperly incorporated by reference, help matters: the sentence fragments Petitioner’s expert strings together all pertain to **audio** conferencing. Ex. 1003, ¶142; *see also* Ex 1028, 3 (“A speakerphone system aiming at mimicking physical presence should be able support the fluctuations in the interpersonal distance. In Section 4.4 we give overview of some of the technologies to control the distance in audio telephony.”).

- b. Limitation 9[b]: Billinghurst fails to disclose or teach “displaying, during the telephone call and to the called party with a wearable electronic device worn on a head of the called party, an image that represents the calling party that is seen by the called party as being at the SLP that is one meter to two meters away from the called party”**

Petitioner relies only on Billinghurst for this limitation. Pet. 38. As discussed above for Limitation 9[a], Billinghurst does not disclose “at the SLP that is one meter to two meters away from the called party” and thus cannot disclose displaying “an image that represents the calling party that is seen by the called party as being at” that SLP.

- c. Limitation 9[c]: Billinghurst fails to disclose or teach “tracking, during the telephone call and with the wearable electronic device, head movements of the called party with respect to the image that represents**

the calling party and that is seen by the called party as being at the SLP”

Petitioner relies only on Billinghamurst for this limitation. Pet. 40-43. Billinghamurst does not disclose “tracking, during the telephone call and with the wearable electronic device, head movements of the called party.”

As discussed in the overview of Billinghamurst, Billinghamurst’s system only localized sounds in two dimensions, without any adjustments for elevation. Consistent with this, Billinghamurst does not disclose tracking in three dimensions, either. Begault ¶16.

Claim 9 of the ’628 Patent states that the sound localization point (SLP) is located at an image location of the calling party, and that the head movements of the called party are tracked with respect to that SLP and corresponding image. Begault ¶12. The ’628 Patent teaches tracking of head movements in three-dimensional space across a full 6 degrees of freedom (“6DOF”) including location, yaw, pitch, and roll, which teaches a POSITA that compensation of both azimuth and elevation is required. *Id.*, ¶¶12-15. Billinghamurst does not teach a method of interaction within 3-dimensional space that includes an elevation component, or a change in the 6DOF coordinates of the SLPs for interaction. *Id.*, ¶16. Nor would there be any purpose in Billinghamurst doing so: again, Billinghamurst’s sounds are fixed in elevation and at eye-level positions on the azimuth around the listener, and the participants cannot

freely move in 3-dimensional space such that elevation cues would be required. *Id.*, ¶¶16-18. A POSITA would therefore understand that Billinghamurst does not disclose the tracking of head movements as disclosed and claimed. *Id.*, ¶¶15-16.

Additionally, for the reasons stated above with respect to limitations 9[a] and 9[b], Billinghamurst cannot disclose tracking head movements “with respect to the image that represents the calling party and that is seen by the called party as being at the SLP” because it discloses neither such an SLP nor an image corresponding to it.

- d. Limitation 9[d]: Billinghamurst fails to disclose or teach “changing, during the telephone call and in response to the head movements of the called party, the HRTFs processing the voice of the calling party so the voice of the calling party continues to localize to the SLP that is seen by the called party as being the image that represents the calling party that is one meter to two meters away from the called party while the head of the called party moves with respect to the image that represents the calling party”**

As discussed in detail *supra* III(C)(3), Schröder teaches away from this limitation. Schröder’s system does not consistently adjust its HRTFs to track head movements so that the audio continues to maintain a consistent perceived location—it arbitrarily overrides such tracking at certain times based on Schröder’s notion of what users of his system would prefer. Begault ¶¶30-31. A POSITA therefore

would not have been motivated to combine Billinghurst with Schröder to arrive at the claims of the '628 Patent. *Id.*, ¶31.

Because the Petition fails to show Billinghurst, alone or in combination with Schröder, discloses, teaches, or suggests all of the limitations of independent claim 9, institution based on Ground 1 should be denied.

5. All remaining claims that depend on claim 9 fail for the same reasons

Because challenged claims 10-14 of Ground 1 depend on independent claim 9 and rely on the same references, alone or in combination, for at least the teachings of the several limitations of claim 9 above, these claims are not rendered obvious by those references, alone or in combination.

6. Billinghurst, alone or in combination with Schröder, fails to disclose, teach, or suggest several limitations of independent claim 16, nor does it render obvious claim 16.

Petitioner raises the same arguments for the similarly-worded limitations in claim 16 as it did for claim 9, not providing any new or unique analysis for the claim 16 limitations but simply referring back to its analysis for the similar term in claim 9. Without waiving the potential to identify relevant differences between claims 9 and 16, for purposes of this preliminary response 8KHZ follows Petitioner's lead and incorporates by reference the shortcomings identified in Petitioner's analysis of claim 9 under this ground.

7. All remaining claims that depend on claim 16 fail for the same reasons.

Because challenged claims 17-20 of Ground 1 depend on independent claim 16 and rely on the same references, alone or in combination, for at least the teachings of the several limitations of claim 16 above, these claims are not rendered obvious by those references, alone or in combination.

D. The Petition Should Not be Instituted on Ground 2 Because Prior Art Fails to Disclose or Teach the Invention as Claimed

Petitioner asserts the Ground 2 claims are obvious based on Billingham in view of Schröder in further view of Zhou and Haddick. Pet. 5-6. In other words, Petitioner further layers Zhou and Haddick onto its Ground 1 combination of Billingham in view of Schröder. 8KHZ thus incorporates its arguments on the shortcomings of Ground 1, and further notes below reasons why the addition of Zhou and Haddick do not cure those shortcomings. The Petition fails to establish a reasonable likelihood that Billingham in view of Schröder in further view of Zhou and Haddick would have rendered the challenged claims obvious. The Board should therefore deny institution based on Ground 2.

1. Zhou

Zhou describes a series of experiments where viewers were presented with a pair of objects on a screen with normal visual depth cues obfuscated, to test the viewers' ability to judge relative distance based only on the characteristics of sounds

corresponding to the two objects. Ex. 1018, 11-12. Specifically, Zhou noted that humans poorly estimate the distance of objects based on relative volume of sounds corresponding to them, and that error in judgment increases as the distances from the viewer decrease. *Id.*, 3 (“Normally the space of AR environments is relatively small, and the attenuation of sound with distance in this small area can be too vague to be perceived.”). Thus, Zhou’s experiments tested whether exaggerating the volume of a sound beyond what normally would correspond to the distance of a viewed object would help the listener judge which object was further away. *Id.*, 5. Zhou found that such exaggerated volumes improved, but did not completely solve, the viewers’ lack of ability to perceive relative distances. *Id.*, 13.

2. Haddick

Haddick is a 473-page PCT application describing potential applications for head-mounted displays used for augmented reality (AR), where the user sees a virtual image on the display overlaid on the user’s natural surroundings. Ex. 1011, ¶30. Petitioner appears to rely on this massive reference solely for passing reference on a single page to the notion of using “3D sound” (which Haddick does not further describe), which Petitioner alleges Haddick discloses in the context of videoconferencing (which Haddick discusses in a completely different portions of the specification). Pet. 17; Ex. 1011, ¶653.

3. Billinghurst in view of Schröder in further view of Zhou and Haddick fails to disclose, teach, or suggest several limitations of independent claim 9, nor does it render obvious claim 9.

As previously discussed, Petitioner has not demonstrated that Zhou qualifies as a printed publication, and thus it is not a valid prior art reference. *See supra* III(B)(a-f). Further, even if Zhou were a valid prior art reference, Petitioner relies on Zhou only with respect to the limitation “a sound localization point (SLP) that is one meter to two meters away from the called party.” Pet. 64, 68-69. Petitioner further relies on Haddick only with respect to performing the method during a telephone call involving a calling party and a called party. Pet. 64, 69-71.

Petitioner does not rely on either Zhou or Haddick for limitations involving processing sound with HRTFs to localize the sound on an SLP, or for “tracking, during the telephone call and with the wearable electronic device, head movements of the called party with respect to the image that represents the calling party and that is seen by the called party as being at the SLP.” Pet. 64, 68-71. Instead, Petitioner continues to rely on the same flawed Billinghurst-Schröder combination for these limitations as it did in Ground 1. Pet. 68. As explained with respect to Ground 1, therefore, Petitioner makes an insufficient showing of these limitations in claim 9. *See supra* III(C)(4)(a-d).

4. All remaining claims that rely on Billingham in view of Schröder in further view of Zhou and Haddick fail for the same reasons.

Because challenged claims 10-14 of Ground 2 depend on independent claim 9 and rely on the same references, alone or in combination, for at least the teachings of the several limitations of claim 9 above, these claims are not rendered obvious by those references, alone or in combination.

5. Billingham in view of Schröder in further view of Zhou and Haddick, fails to disclose, teach, or suggest several limitations of independent claim 16, nor does it render obvious claim 16.

Petitioner raises the same arguments for the similarly-worded limitations in claim 16 as it did for claim 9, without providing any new or unique analysis for the claim 16 limitations. Instead, Petitioner simply discusses the limitations for claim 9 and 16 together, incorporating its arguments of Ground 1. Without waiving the potential to identify relevant differences between claims 9 and 16, for purposes of this preliminary response 8KHZ follows Petitioner's lead and incorporates by reference the shortcomings identified in Petitioner's analysis of claim 9 under this ground.

6. All Remaining Claims That Depend on Claim 16 Fail for the Same Reasons

Because challenged claims 17-20 of Ground 2 depend on independent claim 16 and rely on the same references, alone or in combination, for at least the teachings

of the several limitations of claim 16 above, these claims are not rendered obvious by those references, alone or in combination.

E. The Petition Should Not be Instituted on Ground 3 Because Prior Art Fails to Disclose or Teach the Invention as Claimed

Petitioner asserts the Ground 3 claims are obvious based on Billingham in view of Ballas. Pet. 5-6. Here, Petitioner exchanges Schröder in Ground 1 for Ballas, for the alleged disclosure of the very same limitation. As discussed below, a POSITA would not look to Ballas for the limitation Petitioner relies on, and thus the Petition fails to establish a reasonable likelihood that Billingham in view of Ballas would have rendered the challenged claims obvious. The Board should therefore deny institution based on Ground 3.

1. Ballas

Ballas discloses a spatialized audio system comprising a conventional eyeglass frame or helmet to which a pair of miniature speakers are attached near the wearer's ears. Ex. 1008, Abstract.; Begault ¶33. Except for the use of speakers mounted as described, Ballas offers nothing novel regarding what was known regarding 3D audio processing at the time. *Id.* Ballas describes in a very general way the well-understood concept of head tracking and HRTF filters that are updated in response to listener orientation. *Id.* Even the concept of using speakers instead of headphones was known at the time as “nearphones”: loudspeakers near the ears,

mounted in a headrest, motorcycle helmet, etc. *Id.* Once a transducer is no longer in direct proximity to the ear canal, it is essentially a loudspeaker, as Ballas describes in reference to loudspeakers on either side of a personal computer, a “typical multimedia configuration comes as close to binaural sound as can be expected from free field speakers”. *Id.*

A POSITA would not glean any technical details from Ballas regarding the implementation of HRTF filtering or rendering of 3D audio: Ballas simply states in paragraph 24 his “computer system 102 is an “off the shelf commercially available system.” *Id.*, 34. Additionally, a POSITA would be discouraged from using Ballas’s system to improve Billinghurst’s, due to significant and unaddressed technical ramifications of Ballas’s “nearphone” implementation, most notably the cross-talk between the two external loudspeakers. *Id.*, 35. Without a traditional headphone design, the sound from each transducer cannot reach the ear canal by a direct, isolated path. *Id.* This contradicts the normal teachings for implementing 3D audio, where the signal is processed for each ear in isolation by a binaural HRTF pair. *Id.*, ¶36 And because Ballas’ transducers are not oriented directionally opposite to the ear canal, but instead are at a 90 degree orientation to the ear, small transducers as shown in Ballas Fig. 3 will emit a significant level of sound in all directions (omnidirectionally). *Id.* This inadvertent cross-talk in Ballas’s system would act as a significant distortion to any provided HRTF cues, and therefore significantly affect

the ability to create spatial imagery. *Id.* Nor does Ballas address how to eliminate this cross-talk problem, or even acknowledge it. *Id.*

Given that Billinghurst never mentions HRTFs in an application to teleconferencing, and the technical description of Ballas that relies on unnamed “off the shelf” products and ignores the obvious problem of interchannel cross talk for loudspeaker reproduction of 3D sound, a POSITA therefore would not have been motivated to combine Billinghurst with Ballas in any way. *Id.*, ¶37. Ballas’s system has simply too many basic technical deficiencies and unspecified details for a POSITA to have considered it a viable candidate for improving Billinghurst’s spatialized audio to arrive at the claims of the ‘628 Patent. *Id.*

2. Billinghurst in view of Ballas fails to disclose, teach, or suggest several limitations of independent claim 9, nor does it render obvious claim 9.

Petitioner relies on Ballas only with respect to the limitations claiming the use of HRTFs to localize sound at a sound location point (SLP). Pet. 74-76. As discussed above, a POSITA would not be motivated to combine Ballas with Billinghurst and thus a POSITA therefore would not have looked to Ballas to improve Billinghurst’s system and arrive at the claims of the ‘628 Patent.

Petitioner does not rely on Ballas for limitations involving “a sound localization point (SLP) that is one meter to two meters away from the called party.” *Id.* Nor does Petitioner rely on Ballas for “tracking, during the telephone call and

with the wearable electronic device, head movements of the called party with respect to the image that represents the calling party and that is seen by the called party as being at the SLP.” *Id.* Instead, Petitioner continues to rely on its same flawed analysis of Billinghurst as it did in Ground 1. Pet. 74. As explained with respect to Ground 1, therefore, Petitioner makes an insufficient showing of the above limitations in claim 9. *Supra* III(C)(4)(a-d).

3. All Remaining Claims That Rely on Billinghurst in View of Ballas Fail for the Same Reasons

Because challenged claims 10-14 of Ground 3 depend on independent claim 9 and rely on the same references, alone or in combination, for at least the teachings of the several limitations of claim 9 above, these claims are not rendered obvious by those references, alone or in combination.

4. Billinghurst in view Ballas, fails to disclose, teach, or suggest several limitations of independent claim 16, nor does it render obvious claim 16.

Petitioner raises the same arguments for the similarly-worded limitations in claim 16 as it did for claim 9, not providing any new or unique analysis for the claim 16 limitations but simply discussing the limitations for claim 9 and 16 together and incorporating its arguments of Ground 1. Without waiving the potential to identify relevant differences between claims 9 and 16, for purposes of this preliminary

response 8KHZ follows Petitioner's lead and incorporates by reference the shortcomings identified in Petitioner's analysis of claim 9 under this ground.

5. All Remaining Claims That Depend on Claim 16 Fail for the Same Reasons

Because challenged claims 17-20 of Ground 3 depend on independent claim 16 and rely on the same references, alone or in combination, for at least the teachings of the several limitations of claim 16 above, these claims are not rendered obvious by those references, alone or in combination.

F. The Petition Should Not be Instituted on Ground 4 Because Prior Art Fails to Disclose or Teach the Invention as Claimed

Petitioner asserts the Ground 4 claims are obvious based on Billingham in view of Ballas in further view of Zhou and Haddick. Pet. 5-6. In other words, Petitioner further layers Zhou and Haddick onto its Ground 3 combination of Billingham in view of Ballas. 8KHZ thus incorporates its arguments onto the shortcomings of Ground 3, and further notes below reasons why the addition of Zhou and Haddick do not cure those shortcomings. The Petition fails to establish a reasonable likelihood that Billingham in view of Ballas in further view of Zhou and Haddick would have rendered the challenged claims obvious. The Board should therefore deny institution based on Ground 4.

1. Billingham in view of Ballas in further view of Zhou and Haddick fails to disclose, teach, or suggest several limitations of independent claim 9, nor does it render obvious claim 9.

Petitioner makes no effort at all in Ground 4 to provide a rationale for why a POSITA would have been motivated to combine Zhou and/or Haddick with Billingham in view of Ballas and would have had a reasonable expectation of success in so doing. Nor can Petitioner implicitly rely on its rationales for motivation to combine and reasonable expectation of success regarding the addition of Zhou and Haddick in Ground 2, since those were explicitly in reference to the base combination of Billingham in view of Schröder, not Billingham in view of Ballas.

It is Petitioner's burden to provide a rationale for both motivation to combine and reasonable expectation of success. *See In re Magnum Oil Tools Int'l Ltd.*, 829 F.3d at 1381. Since Petitioner did not even attempt to meet its burden for the specific combination of references in this ground, the Board therefore should decline to institute on Ground 4 for this reason alone.

Substantively, in this ground Petitioner relies exclusively on its arguments for Billingham in view of Ballas in Ground 3 and its arguments for Zhou and Haddick in Ground 2, not providing any new or unique analysis for Ground 4. Therefore, for purposes of this preliminary response 8KHZ follows Petitioner's lead and incorporates by reference the shortcomings identified in Petitioner's analysis of Billingham in view of Ballas in Ground 3 and Zhou and Haddick in Ground 2. *See supra* III(D)(1-3); *see also supra* III(E)(1-2).

In sum, even if a POSITA would have been sufficiently motivated to combine all four references in the way Petitioner argues, Ground 4 at a minimum does not disclose “tracking, during the telephone call and with the wearable electronic device, head movements of the called party with respect to the image that represents the calling party and that is seen by the called party as being at the SLP,” because Petitioner relies solely on a flawed reading of Billingham for that limitation. *See supra* III(C)(4)(c).

2. All remaining claims that rely on Billingham in view of ballas in further view of Zhou and Haddick fail for the same reasons

Because challenged claims 10-14 of Ground 4 depend on independent claim 9 and rely on the same references, alone or in combination, for at least the teachings of the several limitations of claim 9 above, these claims are not rendered obvious by those reference, alone or in combination.

3. Billingham in view Ballas in further view of Zhou and Haddick, fails to disclose, teach, or suggest several limitations of independent claim 16, nor does it render obvious claim 16.

Petitioner raises the same arguments for the similarly-worded limitations in claim 16 as it did for claim 9, not providing any new or unique analysis for the claim 16 limitations but simply discussing the limitations for claim 9 and 16 together and incorporating its arguments of Grounds 2 and 3. Without waiving the potential to identify relevant differences between claims 9 and 16, for purposes of this

preliminary response 8KHZ follows Petitioner's lead and incorporates by reference the shortcomings identified in Petitioner's analysis of claim 9 under this ground.

4. All Remaining Claims That Rely on Billinghurst in view of Ballas in further view of Zhou and Haddick Fail for the Same Reasons

Because challenged claims 17-20 of Ground 4 depend on independent claim 16 and rely on the same references, alone or in combination, for at least the teachings of the several limitations of claim 16 above, these claims are not rendered obvious by those references, alone or in combination.

IV. THE BOARD SHOULD EXERCISE DISCRETION UNDER 35 U.S.C. §314 TO DENY INSTITUTION

Institution of *inter partes* review is always discretionary. 35 U.S.C. §314(a). The Board should exercise its discretion under §314(a) to deny institution here.

A. The Board should exercise its discretion to deny institution of this Petition.

The Board should deny institution under §314(a) in view of its precedential decisions in *NHK Spring*¹ and *Fintiv*² because the district court and parties have

¹ *NHK Spring Co., Ltd., v. Intri-Plex Techs., Inc.*, IPR2018-00752, Paper 8 (PTAB Sep. 12, 2018) (precedential).

² *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 (PTAB Mar. 20, 2020) ("*Fintiv*") (precedential).

already expended substantial time and resources, a stay is unlikely, and a final written decision (“FWD”) in this proceeding is expected no earlier than January 2025, at least five months after the jury trial begins in August 2024. The ’628 Patent is involved in the related matter, (Pet. 2-3), that involves the same issues, arguments, and evidence that Petitioner has presented in the Petition. Petitioner gives little attention to the discretionary issues in the Petition and provides no *Sotera* stipulation resulting in an overlap of invalidity issues. Pet. 77. Duplicating the district court’s efforts would not be an efficient use of the Board’s resources and would not serve to fulfill the primary purpose of AIA proceedings: to provide a practical and efficient alternative to district court litigation.

In *NHK Spring* the Board denied institution primarily because the related district court case was nearing its final stages and would resolve all the issues before the Board. *NHK Spring*, Paper 8 at 20; *see also id.*, 11-18 (applying discretion under 35 U.S.C. §325(d)). Other cases—relying on *NHK Spring*—have also denied institution. For example, in *E-One, Inc. v. Oshkosh Corp.*, the Board applied *NHK Spring*’s analysis under 35 U.S.C. §314(a) to deny institution. IPR2019-00161, Paper 16 (PTAB May 15, 2019). In *E-One*, the Board reasoned:

[i]n the § 314(a) portion of its analysis, [*NHK Spring*] noted that a district court proceeding involving the same patent was scheduled to go to trial before a final decision would have been

due in the Board proceeding, and the Board proceeding would involve the same claim construction standard, the same prior art references, and the same arguments as in the district court.

Id., 6. In both *NHK Spring* and *E-One*, factors warranting a denial of institution included: the district court investing considerable time and resources to handle the same issues presented in the IPR, and trials that were scheduled to be completed prior to a Board’s FWD. The facts here warrant denial just as decided in *NHK Spring* and *E-One*. Further, the Petition will not serve as an “effective and efficient alternative” to litigation, frustrating a primary objective of the AIA. *Gen. Plastic Indus. Co., Ltd. v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 at 16–17 (PTAB Sept. 6, 2017) (precedential).

In *Fintiv*, the Board emphasized six factors to consider under *NHK Spring* which are discussed below. See *Fintiv*, Paper 11 at 5-16. The Board stated that “[t]hese factors relate to 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.” *Id.*, 6. Here, each of these factors favors denial of institution of this Petition. Because the overall balance of factors favors denial of institution, the Board should apply its discretion under 35 U.S.C. §314(a) to deny institution of the requested proceeding.

1. Factor 1 weighs against institution, because no court has granted a stay and no evidence exists that a stay may be granted.

The parallel district court proceeding has not been stayed. That proceeding includes a total of nine patents-in-suit, and Petitioner has filed Petitions against all patents-in-suit. The motion for inter-district transfer noted in the Petition (Pet. 77) was recently denied. Ex. 2012.

The district court has not indicated whether it would grant a stay if *inter partes* review is instituted, and the Board should decline to speculate whether the district court would grant a stay in this proceeding. *See, eClinicalWorks, LLC v. Decapolis LLC*, IPR2022-00229, Paper 10 at 8 (April 13, 2022) (“We will not attempt to predict, based on the facts in allegedly similar prior situations, how the Texas District Court would rule should a stay be requested in the WDTX Cases.”).

There is no evidence a stay may be granted if trial is instituted. This factor is at least neutral or weighs in favor of discretionary denial of institution.

2. Factor 2 weighs against institution, because trial in the district court is scheduled to begin months before the final written decision deadline.

Trial is set to begin in the parallel district court proceeding in August 2024. Ex. 2007 at 3. This date has remained unchanged. This trial date is currently at least five (5) months before an expected January 2025 FWD would issue in this IPR. Proceedings with similar substantial gaps between trial and FWD have found Factor

2 weighs in favor of denying institution. *See GlobalFoundries Inc. v. UNM Rainforest Innovations*, IPR2020-00984, Paper 11 at 11-16 (PTAB Dec. 9, 2020) (finding that a scheduled trial date four months before the statutory deadline for a final written decision was a factor weighing in favor of discretionary denial); *NanoCelect Biomedical, Inc. v. Cytonome/ST, LLC*, IPR2020-00551, Paper 19 at 16 (PTAB Aug. 27, 2020) (same); *U.S. Venture, Inc. v. Sunoco Partners Marketing & Terminals, L.P.*, IPR2020-00728 Paper 10 at 9 (PTAB October 1, 2020) (three or four months before issuance of final written decision). Here, just as in *NHK Spring*, “[i]nstitution of an inter partes review under these circumstances would not be consistent with ‘an objective of the AIA ... to provide an effective and efficient alternative to district court litigation.’” *NHK Spring*, Paper 8 at 20. As the Board recognized in *Fintiv*, “[i]f the court’s trial date is earlier than the projected statutory deadline, the Board generally has weighed this fact in favor of exercising authority to deny institution under *NHK*.” *Fintiv*, IPR2020-00019, Paper 11 at 9.

Importantly, there is no evidence that the parties’ trial will be extended, let alone delay of trial would extend past the statutory deadline for the FWD. *See Cisco Systems, Inc. v. Oyster Optics, LLC*, IPR2021-00319, Paper 9 at 10-12 (PTAB Jun. 8, 2021) (weighing *Fintiv* factor 2 in favor of exercising discretion to deny Petition).

In sum, there is no reason to believe the August 2024 trial will be postponed. *See Fintiv*, Paper 11 at 13 (“We generally take courts’ trial schedules at face value

absent some strong evidence to the contrary.”); *see also*, *Cisco Systems, Inc. v. Monarch Networking Solutions, LLC*, IPR2020-01227, Paper 11 at 9-11 (PTAB Mar. 4, 2021) (declining to speculate whether the district court will grant the pending motion to transfer and weighing *Fintiv* factor 2 in favor of denial of institution).³ Without a stay pending IPR, litigation continues, and there will be a continued expenditure of court resources. This factor weighs in favor of discretionary denial of institution.

3. Factor 3 weighs against institution, because the court and parties have and will continue to invest significant time and resources in the parallel proceeding.

³ This timing continues to hold under the guidance in the Director’s June 21, 2022, memo titled “Interim Procedures for Discretionary Denials in AIA Post-Grant Proceedings with Parallel District Court Litigation” (“*Fintiv* Memo;” Ex. 2009). The *Fintiv* Memo directs the Board to “consider the median time from filing to disposition” in the district court (Ex. 2009 at 3), which for patent cases in the Western District of Texas is 25.4 months (Ex. 2010), and for patent cases before Judge Albright is 24.7 months (Ex. 2011). Counting from the June 3, 2022, filing of the parallel district court case results in an average time to trial before the end of August 2024, precisely in line with the scheduled August 2024 trial and roughly five months before any expected FWD here.

The district court action was filed June 3, 2022, and served June 13, 2022. A scheduling order has been in place since November 14, 2022. The Petition was filed on June 9, 2023. Pet. 77. Since then, the district court and parties have invested significant time and resources. In *Fintiv*, the Board stated, “if, at the time of the institution decision, the district court has issued substantive orders related to the patent at issue in the petition, this fact favors denial. Likewise, district court claim construction orders may indicate that the court and parties have invested sufficient time in the parallel proceeding to favor denial” of institution. *Fintiv*, Paper 11 at 9-10. Further, “[t]his investment factor is related to the trial date factor, in that more work completed by the parties and court in the parallel proceeding tends to support the arguments that the parallel proceeding is more advanced, a stay may be less likely, and instituting would lead to duplicative costs.” *Id.*, 10.

The investment by the parties and the court will be significant by the time either an institution decision or a FWD is issued. Petitioner waited nearly a full year—literally at the last minute—to file this Petition. **Prior** to filing this POPR, the parties have (1) completed Claim Construction briefing after depositions, (2) received the Court’s ruling on Petitioner’s motion to transfer after related discovery and depositions, (3) conducted the Markman hearing, and (4) received claim constructions (the Court’s procedure is to provide preliminary construction shortly

in advance of the Markman hearing and then provide final constructions at the hearing). Ex. 2008 (setting Markman hearing for October 3, 2023).

By the time an institution decision is rendered in January 2024, the parties will have (1) exchanged Final Infringement and Invalidity Contentions, and (2) engaged in a substantial portion of fact discovery, which opened October 5, 2023 and closes within four months thereafter. Ex. 2008; Ex. 2007 at 2. Further, the fact that the parallel district court proceeding opens fact discovery just weeks after claim construction does not change this analysis. *Universal Elecs., Inc. v. Universal Remote Control, Inc.*, 943 F. Supp. 2d 1028, 1031-32 (C.D. Cal. 2013) (“That the schedule in this case set discovery to occur after claim construction does not mean that the case remains in its procedural infancy until discovery is well underway.”). The district court action has and will proceed with significant costs to 8KHZ by the time an institution decision is rendered. This factor weighs in favor of discretionary denial of institution.

4. Factors 4-6 weigh against institution, because there is significant overlap between this IPR and district court proceedings, the parties involved are the same, and the asserted grounds fail.

The dispute in this proceeding and the district court case involves the same parties and overlapping issues. (Factors 4 and 5). Petitioner and 8KHZ are parties in the parallel district court litigation. Petitioner has presented substantially the same

art and grounds of unpatentability in this Petition that it is asserting in the district court case – that the claims of the '628 Patent are allegedly obvious over at least the prior art Billingham, Schröder, Ballas, Zhou, and Haddick. Ex. 2006 at 89-111. Thus, the claims and prior art addressed by PTAB will not materially differ from what is being addressed in the parallel district court litigation. Further, as discussed above, there are blatant contradictions between the present Petition and Defendants' Invalidity Contentions in district court. Conducting proceedings in both the PTAB and district court with differing claim constructions and substantially similar prior art creates the potential of two different outcomes, leading to inconsistent results.

Petitioner has also not stipulated or withdrawn any invalidity positions raised at the district court that are also brought before the Board. Importantly, Petitioner has failed to make a stipulation in the Petition in full accordance with *Sotera* and has not filed such a stipulation in the district court.

Because the district court will address substantially the same issues, arguments, and evidence months before the Board's FWD would be due, instituting review here would not efficiently use the Board's resources, nor would it be an effective and efficient alternative to district court litigation.

The Board noted in *Fintiv* with respect to Factor 6 that:

[I]f the merits of a ground raised in the petition seem particularly strong on the preliminary record, this fact has favored

institution.... [I]f the merits of the grounds raised in the petition are a closer call, then *that fact has favored denying institution* when other factors favoring denial are present.

Fintiv, IPR2020-00019, Paper 11 at 14-15. As shown above, the Petition fails on the merits for numerous reasons. These weaknesses, and the Factors addressed above, weigh in favor of discretionary denial of institution.

V. CONCLUSION

For the foregoing reasons, institution of this IPR should be denied.

Date: October 11, 2023

Respectfully submitted,

/Kevin S. Tuttle/

Kevin S. Tuttle (Reg. No. 52,307)
Kyle L. Elliott (Reg. No. 39,485)
Homayoon Rafatijo (Reg. No. 80,870)
SPENCER FANE LLP
1000 Walnut Street, Suite 1400
Kansas City, MO 64106
ktuttle@spencerfane.com
kelliott@spencerfane.com
hrafatijo@spencerfane.com
Tel: (816) 474-8100
Fax: (816) 474-3216

Erick S. Robinson (Reg. No. 51,354)
Patrick M. Dunn (Reg. No. 70,474)
Spencer Fane LLP
3040 Post Oak Boulevard, Suite 1300
Houston, TX 77056
erobinson@spencerfane.com
pdunn@spencerfane.com
Tel: (713) 212-2638
Fax: (713) 963-0859

Attorney for Eight KHZ, LLC

CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), the undersigned hereby certifies that the foregoing Patent Owner's Preliminary Response contains 11,462 words using the word count feature of Microsoft Word.

Dated: _____

/Kevin S. Tuttle/
Kevin S. Tuttle (Reg. No. 52,307)
Attorney for Eight KHZ, LLC

CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. §42.6(e), the undersigned hereby certifies that the above-captioned Eight KHZ LLC's Patent Owner Preliminary Response, and its cited exhibits, were served via electronic mail, as authorized by Petitioner's Mandatory Notices, on June 9, 2023 at the following email correspondence addresses of record:

Lisa K. Nguyen (Reg. No. 58,018)
Eric E. Lancaster (*pro hac vice* to be filed)
Allen & Overy LLP
550 High Street
Palo Alto, CA 94301
lisa.nguyen@allenoverly.com
eric.lancaster@allenoverly.com

David M. Tennant (Reg. No. 48,362)
Alan Billharz (Reg. No. 79,532)
Allen & Overy LLP
1101 New York Ave NW
Washington, DC 20005
david.tennant@allenoverly.com
alan.billharz@allenoverly.com

Grace I. Wang (Reg. No. 69,892)
David A. Hubbard (Reg. No. 73,621)
Allen & Overy LLP
1221 Avenue of the Americas
New York, NY 10020
grace.wang@allenoverly.com
david.hubbard@allenoverly.com

Date: October 11, 2023

Respectfully Submitted,
SPENCER FANE LLP

By: /Kevin S. Tuttle/
Kevin S. Tuttle (Reg. No. 52,307)
Spencer Fane LLP
1000 Walnut Street, Suite 1400
Kansas City, Missouri 64106-2140
Customer No. 21129
Tel: (816) 474-8100
Fax: (816) 474-3216
Attorneys for Eight KHZ LLC