Trials@uspto.gov
571-272-7822

Paper 9
Date: May 19, 2023

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SONOS, INC.,
Petitioner,

v.

GOOGLE LLC,
Patent Owner.

IPR2023-00119
Patent 10,593,330 B2

Before KEVIN F. TURNER, BARRY L. GROSSMAN, and TERRENCE W. MCMILLIN, *Administrative Patent Judges*.

GROSSMAN, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background and Summary

Sonos, Inc. ("Petitioner") filed a Petition (Paper 1, "Pet.") requesting an *inter partes* review of claims 1–7, 9–15, 17, and 18 (the "challenged claims") of U.S. Patent No. 10,593,330 B2 (Ex. 1001, "the '330 patent"). Google LLC ("Patent Owner") filed a Preliminary Response (Paper 6, "Prelim. Resp.").

We have jurisdiction under 35 U.S.C. § 314. Under § 314, an *inter partes* review may not be instituted "unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition." 35 U.S.C. § 314(a). The Board determines whether to institute a trial on behalf of the Director. 37 C.F.R. § 42.4(a).

Petitioner has the burden of proof. *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) ("In an IPR, the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.").

After considering the Petition, the Preliminary Response, and the evidence of record, based on the analysis in this Decision: (1) we decline to exercise our discretion to deny the Petition because the same or substantially the same prior art or arguments previously were presented to the Office, as asserted by Patent Owner; and (2) we determine that Petitioner has demonstrated that there is a reasonable likelihood that at least one of the challenged claims is unpatentable. Accordingly, we institute an *inter partes* review of all challenged claims and on all grounds asserted in the Petition.

B. Real Parties-in-Interest

Petitioner identifies itself as the sole real party-in-interest. Pet. 1.

Patent Owner identifies itself as the sole real party-in-interest. Paper 4, 2.

C. Related Matters

The parties indicate that the '330 patent is the subject of the following ITC and district court proceedings: *Certain Audio Players and Components Thereof*, Inv. No. 337-TA-1329 and *Google LLC v. Sonos, Inc.*, Case No. 3:22-CV-04552 (N.D. Cal.). Pet. 1–2; Paper 4, 2.

Petitioner states that U.S. Patent 10,134,398 (the '398 patent") "is related to the '330 Patent, and Sonos is filing an IPR challenging claims of the '398 Patent."[1] Pet. 2, n.1. Petitioner also states that "Google has also asserted U.S. Patents 9,812,128 and 11,024,311 against Sonos in *Certain Audio Players and Components Thereof*, Inv. No. 337-TA-1330 and *Google LLC v. Sonos, Inc.*, Case No. 3:22-CV-04553 (N.D. Cal.)" and that "[t]hese patents are related to the '330 patent and have been challenged by Sonos in IPR2022-01594 and IPR2022-01592, respectively." *Id.* at 2; *see also* Ex. 3004.

D. The '330 patent

The '330 patent is titled "Hotword Detection on Multiple Devices." Ex. 1001, code (54). The disclosed technology relates generally to voice-controllable devices. A "hotword" is a word or phrase, which, by agreement among the users in the environment, "is reserved as a predetermined word

[1] U.S. Patent 10,134,398 is the subject of IPR2023-00118. The '330 patent is a continuation of application No. 15/346,914, which is now the '398 patent. Ex. 1001 code (63).

that is spoken to invoke the attention of the system." Ex. 1001, 1:57–61. An example of a hotword used to invoke the system's attention is the phrase "OK computer." *Id.* at 1:61–63. In this example, each time the phrase "OK computer" is spoken within proximity of a system microphone, the system first determines whether the reserved, predetermined hotword was spoken and, "if so, awaits an ensuing command or query." *Id.* at 1:63–67. As further explained in the '330 patent,

> utterances directed at the system take the general form [HOTWORD] [QUERY], where 'HOTWORD' in this example is 'OK computer' and 'QUERY' can be any question, command, declaration, or other request that can be speech recognized, parsed and acted on by the system, either alone or in conjunction with the server via the network.

Id. at 2:1–6.

The '330 patent explains that in a speech-enabled environment, "a network of connected microphone devices distributed throughout the various rooms or areas of the environment" can be implemented for a user "to orally query the system from essentially anywhere in the environment without the need to have a computer or other device in front of him/her or even nearby." *Id.* at 1:27–34. According to the '330 patent, "the system, which potentially picks up all utterances made in the surrounding environment including those not directed to the system, must have some way of discerning when any given utterance is directed at the system" and "[o]ne way to accomplish this is to use a hotword." *Id.* at 1:52–58. Accordingly, the '330 patent discloses an embodiment in which

> a user device receives an utterance that is spoken by a user. The user device determines whether the utterance includes a hotword and computes a hotword confidence score that indicates a likelihood that the utterance includes the hotword. The user

> device transmits this score to other user devices in the near vicinity. The other user devices likely received the same utterance. The other user devices compute a hotword confidence score and transmit their scores to the user device. The user device compares the hotword confidence scores. If the user device has the highest hotword confidence score, then the user device remains active and prepares to process additional audio. If the user device does not have the highest hotword confidence score, then the user device does not process the additional audio.

Ex. 1001,2:8–22. An advantage of this system is that "[m]ultiple devices can detect a hotword and only one device will respond to the hotword." *Id.* at 3:21–23. The system "addresses the problem of selecting the correct device for reacting to a hotword, and suppressing reaction to the hotword on other devices." *Id.* at 3:55–57.

Figure 1 of the '330 patent is reproduced below.

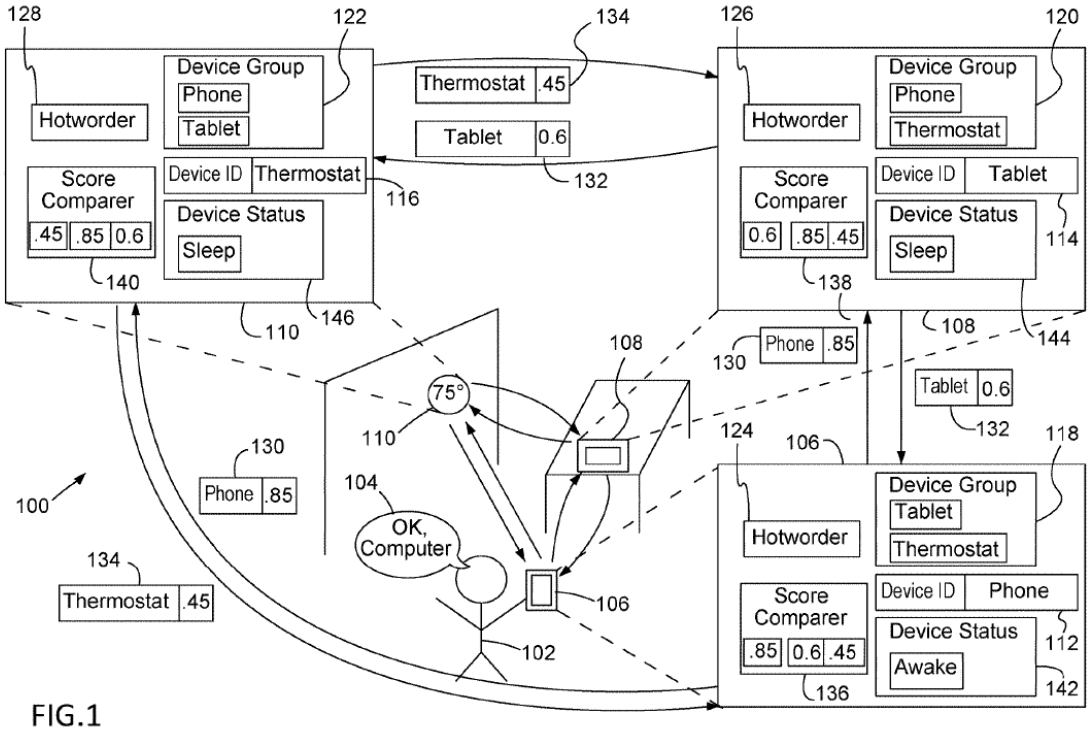

FIG.1

Figure 1 "is a diagram of an example system for hotword detection." Ex. 1001, 3:33–34. System 100 allows user 102 to speak utterance 104 that

is detected by microphones of computing devices 106, 108, and 110. Ex. 1001, 3:59–61. Computing devices 106, 108, and 110 process utterance 104 to determine a likelihood that utterance 104 includes a hotword and "each transmit[s] data to each other that indicates the likelihood that the utterance 104 includes a hotword." *Id.* at 3:61–66.

Computing devices 106, 108, and 110 then compare the data and "the computing device that computed the highest likelihood that the utterance 104 included a hotword initiates speech recognition on the utterance 104" while "computing devices that did not compute the highest likelihood that the utterance 104 includes a hotword do not initiate speech recognition on the speech following the utterance 104." *Id.* at 3:66–4:6. Each of computing devices 106, 108, and 110 stores and shares with each other corresponding device identifiers 112, 114, and 116 in corresponding device groups 118, 120, and 122. *Id.* at 4:47–5:6.

Computing devices 106, 108, and 110 include corresponding hotworders 124, 126, and 128. *See, e.g.*, *id.* at 26–29. The "hotworder" "compares the processed audio data to known hotword data and computes a confidence score that indicates the likelihood that the utterance 104 corresponds to a hotword." *Id.* at 3:17–20.

Computing devices 106, 108, and 110 also include corresponding score comparers 136, 138, and 140 "to compare the hotword confidence scores that the computing device has received." *Id.* at 6:20–29. To make the comparison, confidence score data packets 130, 132, and 134 are transmitted from one computing device to another. *Id.* at 5:33–6:19.

E. Illustrative Claim

Petitioner challenges claims 1–7, 9–15, 17, and 18. Claims 1, 9, and 17 are independent claims. Independent claim 1 is directed to a "computer-implemented method." Ex. 1001, 16:25. Independent claim 9 is directed to a "system." *Id.* at 17:10. Independent claim 17 is directed to a "non-transitory computer-readable medium storing software comprising instructions executable by one or more computers." *Id.* at 18:24–26. As we discuss below in our consideration of independent claims 9 and 16, but for the preambles, claims 9 and 16 are substantive repetitions of independent claim 1.

Independent claim 1 is illustrative and is reproduced below with bracketed labels employed by Petitioner to facilitate analysis and discussion. *See* Pet. 47.

> [1.0] A computer-implemented method comprising:
>
> [1.1] receiving, by a computing device that is in a low power mode, audio data that includes an utterance of a particular, predefined hotword;
>
> [1.2] while the computing device remains in the low power mode, and in response to receiving the audio data that includes the utterance of the particular, predefined hotword, transmitting, by the computing device, a message;
>
> [1.3] while the computing device remains in the low power mode, receiving, by the computing device and from an additional computing device that is in a low power mode, an additional message; and
>
> [1.4] based on the message and the additional message, determining, by the computing device, to exit the low power mode.

Ex. 1001, 16:25–40.

F. Prior Art and Asserted Grounds

Petitioner asserts that one or more of the challenged claims would have been obvious on the following two grounds:

Claim(s) Challenged	35 U.S.C. §[2]	Reference(s)/Basis
1–3, 5, 7, 9–11, 13, 15, 17, 18	102(a)	Rosenberger[3]
4, 6, 12, 14	103	Rosenberger, Basye[4]

Petitioner also relies on the Declaration testimony of Dr. Michael T. Johnson. *See* Ex. 1002.[5]

II. ANALYSIS

A. Legal Standards

"To anticipate a claim, a prior art reference must disclose each and every element of the claim, either explicitly or inherently." *Adasa Inc. v. Avery Dennison Corp.*, 55 F.4th 900, 910 (Fed. Cir. 2022) (citing *Eli Lilly &*

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[2] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125 Stat. 284, 296–07 (2011), took effect on September 16, 2011. The changes to 35 U.S.C. §§ 102 and 103 in the AIA do not apply to any patent application filed before March 16, 2013. Because the application for the patent at issue in this proceeding claims priority to applications filed after March 16, 2013, we refer to the AIA version of the statute.

[3] U.S. Patent No. 8,340,975 B1, Dec. 25, 2012, Ex. 1003 ("Rosenberger").

[4] U.S. Patent Application Publ. No. 2014/01636978 A1, June 12, 2014, Ex. 1013 ("Basye").

[5] Dr. Johnson earned undergraduate degrees in Computer Science Engineering and in Electrical Engineering, a Master's degree in Electrical Engineering, and a Ph.D. degree "with a doctoral dissertation focused on speech processing and automatic speech recognition." Ex. 1002 ¶ 6. He currently is "the Department Chair and a Full Professor in the Department of Electrical and Computer Engineering at the University of Kentucky." *Id.* ¶ 5. His extensive experience in academia and research is summarized in his testimony. *See id.* ¶¶ 5–11; *see also id.*, App. A (Dr. Johnson's CV).

Co. v. Zenith Goldline Pharms., Inc., 471 F.3d 1369, 1375 (Fed. Cir. 2006). "While those elements must be arranged or combined in the same way as in the claim, the reference need not disclose the elements in the very same terms used by the patent." *Id.* (citing *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009) ("[T]he reference need not satisfy an *ipsissimis verbis* test." (citing *In re Bond*, 910 F.2d 831, 832–33 (Fed. Cir. 1990))). "The question of what a reference teaches and whether it describes every element of a claim is a question for the finder of fact." *Id.* (citing *Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1221 (Fed. Cir. 2003)).

As further explained in *Net MoneyIN,*

> unless a reference discloses within the four corners of the document not only all of the limitations claimed but also all of the limitations arranged or combined in the same way as recited in the claim, it cannot be said to prove prior invention of the thing claimed and, thus, cannot anticipate under 35 U.S.C. § 102.

Net MoneyIN, Inc. v. VeriSign, Inc., 545 F.3d 1359, 1371 (Fed. Cir. 2008). *Id.*; *see also Verdegaal Bros. v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987) ("A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference."). "The identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989).

Section 103 forbids issuance of a patent when "the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains." *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: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) when available, evidence such as commercial success, long felt but unsolved needs, and failure of others.[6] *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); *see KSR*, 550 U.S. at 407 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls."). The Court in *Graham* explained that these factual inquiries promote "uniformity and definiteness," for "[w]hat is obvious is not a question upon which there is likely to be uniformity of thought in every given factual context." 383 U.S. at 18.

The Supreme Court made clear that we apply "an expansive and flexible approach" to the question of obviousness. *KSR*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. To support this conclusion, however, it is not enough to show merely that the prior art includes separate references covering each separate limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires that a person of ordinary skill at the time of the invention "would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention." *Id.*

[6] Patent Owner does not direct us to any objective evidence of non-obviousness in its Preliminary Response.

In determining whether there would have been a motivation to combine prior art references to arrive at the claimed invention, it is insufficient to simply conclude the combination would have been obvious without identifying any reason *why* a person of skill in the art would have made the combination. *Metalcraft of Mayville, Inc. v. Toro Co.*, 848 F.3d 1358, 1366 (Fed. Cir. 2017).

Moreover, in determining the differences between the prior art and the claims, the question under 35 U.S.C. § 103 is not whether the differences themselves would have been obvious, but whether the claimed invention as a whole would have been obvious. *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 164 (Fed. Cir. 1985) ("It is elementary that the claimed invention must be considered as a whole in deciding the question of obviousness."); *see also Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1537 (Fed. Cir. 1983) ("[T]he question under 35 U.S.C. § 103 is not whether the differences *themselves* would have been obvious. Consideration of differences, like each of the findings set forth in *Graham*, is but an aid in reaching the ultimate determination of whether the claimed invention *as a whole* would have been obvious.").

As a factfinder, we also must be aware "of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning." *KSR*, 550 U.S. at 421.

Applying these general principles, we consider the evidence and arguments of the parties.

B. Level of Ordinary Skill in the Art

The level of skill in the art is "a prism or lens" through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d

1350, 1355 (Fed. Cir. 2001). "This reference point prevents . . . factfinders from using their own insight or, worse yet, hindsight, to gauge obviousness." *Id.*

"The *Graham* analysis includes a factual determination of the level of ordinary skill in the art. Without that information, a . . . court cannot properly assess obviousness because the critical question is whether a claimed invention would have been obvious at the time it was made to one with ordinary skill in the art." *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986); *see also Ruiz v. A.B. Chance*, 234 F.3d 654, 666 (Fed. Cir. 2000) ("The determination of the level of skill in the art is an integral part of the *Graham* analysis.").

Factors pertinent to a determination of the level of ordinary skill in the art include: (1) educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of workers active in the field. *Env't Designs, Ltd. v. Union Oil Co.*, 713 F.2d 693, 696–697 (Fed. Cir. 1983) (citing *Orthopedic Equip. Co. v. All Orthopedic Appliances, Inc.*, 707 F.2d 1376, 1381–82 (Fed. Cir. 1983)). Not all such factors may be present in every case, and one or more of these or other factors may predominate in a particular case. *Id.* Moreover, these factors are not exhaustive but are merely a guide to determining the level of ordinary skill in the art. *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1254, 1256 (Fed. Cir. 2007). In determining a level of ordinary skill, we also may look to the prior art, which may reflect an appropriate skill level. *Okajima*, 261 F.3d at 1355.

Petitioner asserts that a person of ordinary skill in the art would have had "the equivalent of a four-year degree from an accredited institution (typically denoted as a B.S. degree) in electrical or computer engineering, or a related field, and approximately 2-4 years of experience in the field of voice and/or audio processing, or an equivalent level of skill, knowledge, and experience." Pet. 22 (citing Ex. 1002 ¶¶ 59–62).

Dr. Johnson's Declaration testimony states he considered some of the factors listed above. Ex. 1002 ¶ 60. Dr. Johnson "also considered [his] own experiences working and teaching in the fields of voice and audio processing." *Id.* Dr. Johnson testifies that, in his opinion, the level of ordinary skill is as stated by Petitioner. *Id.* at 61.

Patent Owner does not assert a level of ordinary skill, nor does Patent Owner dispute Petitioner's definition of the level of ordinary skill. *See*, Prelim. Resp., *generally*.

For purposes of this Decision, based on the prior art, the sophistication of the disclosed technology in the '398 patent, and Dr. Johnson's undisputed testimony, we adopt Petitioner's definition of the level of ordinary skill.[7]

C. Claim Construction

We construe each 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)." 37 C.F.R. § 42.100(b) (2021). Under this standard, claim terms

[7] Any determination, no matter how designated in this decision (except our decision to institute), is preliminary and non-binding. We have not heard from Patent Owner on any issue except discretionary denial under § 325(d), and we wish to have the record developed before rendering any binding determination, finding, or conclusion.

are generally given their ordinary and customary meaning as would have been understood by a person of ordinary skill in the art at the time of the invention and in the context of the entire patent disclosure. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc) ("We have frequently stated that the words of a claim 'are generally given their ordinary and customary meaning.'" (citations omitted)).

Petitioner states, "the Challenged Claims do not require construction." Pet. 22. Patent Owner also does not propose any claim construction. *See generally* Prelim. Resp.

We do not perceive the need to construe any claim limitation. Claims must be construed "only to the extent necessary to resolve the controversy." *AstraZeneca AB v. Mylan Pharms. Inc.*, 19 F.4th 1325, 1345 (Fed. Cir. 2021) (quoting *Vivid Techs., Inc. v. American Science & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999); *see also 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 the claim preambles here where the construction is not 'material to the [obviousness] dispute.'" (citations omitted)).

D. Discretionary Denial Under 35 U.S.C. § 325(d)

The sole argument raised in Patent Owner's Preliminary Response is that the Board should exercise discretion, and deny institution under 35 U.S.C. § 325(d) because the same or substantially the same prior art or arguments previously were presented to the Office during prosecution. *See* Prelim. Resp. 8–18.

1. Legal Standards

We have discretion to deny review when "the same or substantially the same prior art or arguments previously were presented to the Office." 35 U.S.C. § 325(d). Section 325(d) provides that the Director may elect not to institute a proceeding if the challenge to the patent is based on matters previously presented to the Office.[8] *Advanced Bionics, LLC v. Med-El Elektromedizinische Geräte GmbH*, IPR2019-01469, Paper 6 at 7 (PTAB Feb. 13, 2020) (precedential) ("*Advanced Bionics*").

In evaluating the exercise of discretion to deny institution under § 325(d), the Board applies a two-part framework: (1) first, we determine whether the same or substantially the same art previously was presented to the Office, or whether the same or substantially the same arguments previously were presented to the Office; and (2) if either condition of the first part of the framework is satisfied, we examine whether the petitioner has demonstrated that the Office erred in a manner material to the patentability of challenged claims. *Advanced Bionics,* Paper 6 at 8.

In applying the two-part framework, we consider several nonexclusive factors, including:

(a) the similarities and material differences between the asserted art and the prior art involved during examination;

(b) the cumulative nature of the asserted art and the prior art evaluated during examination;

(c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;

[8] By regulation, the Director has delegated the decision whether to institute trial to the Board. 37 C.F.R. § 42.4(a) (2020).

(d) the extent of the overlap between the arguments made during examination and the manner in which petitioner relies on the prior art or patent owner distinguishes the prior art;

(e) whether petitioner has pointed out sufficiently how the examiner erred in its evaluation of the asserted prior art; and

(f) the extent to which additional evidence and facts presented in the petition warrant reconsideration of the prior art or arguments.

Becton, Dickinson & Co. v. B. Braun Melsungen AG, IPR2017-01586, Paper 8 at 17–18 (PTAB Dec. 15, 2017) (precedential as to Section III.C.5, first paragraph) ("*Becton, Dickinson*"). Factors (a), (b), and (d) of the *Becton, Dickinson* factors relate to whether the art or arguments presented in the petition are the same or substantially the same as those previously presented to the Office. *Advanced Bionics*, Paper 6 at 10. "If, after review of Factors (a), (b), and (d), it is determined that the same or substantially the same art or arguments previously were presented to the Office, then Factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office." *Advanced Bionics*, Paper 6 at 10.

2. Analysis

a) Advanced Bionics Step 1: Factors (a), (b), and (d)

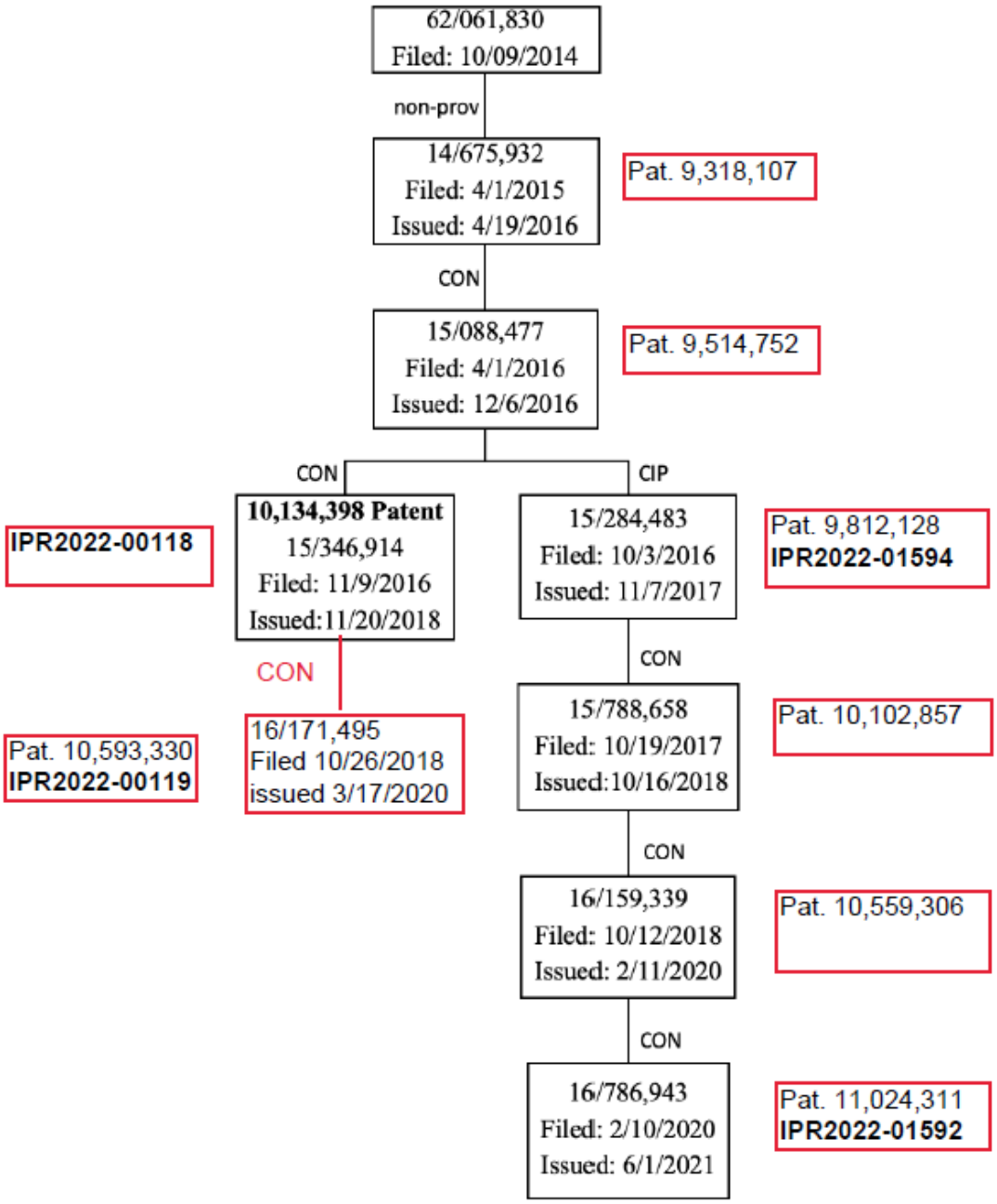
We first consider whether Petitioner has asserted substantially the same art or arguments presented to the Office during initial examination, a prior *inter partes* review petition, or *ex parte* reexamination. *Advanced Bionics*, Paper 6 at 8 (Factors (a), (b), and (d)).

Patent Owner's argument focuses exclusively on the Rosenberger reference. Prelim. Resp. 8–18; *see also, id.* at 17 ("The Addition of Basye Does Not Change the § 325(d) Analysis**.** Basye is only used as a secondary

reference for dependent claims. Basye cannot cure the deficiencies with respect to Rosenberger and the independent claims under the section 325(d) analysis.").

Patent Owner asserts that "the Examiner considered Rosenberger during prosecution of the '330 Patent and during prosecution of multiple family members." *Id.* at 1; *see also id.* at Appendix A (providing a "family tree" of the multiple family members with a citation to prior consideration of Rosenberger during prosecution of these family members).

For convenient reference, we reproduce below a "family tree" provided in the Petition (Pet. 8), annotated in red to add identification of issued patents and pending *inter partes* review proceedings.



Petitioner's "family tree" of related patents and patent applications (Pet. 8) annotated in red to show issued patent numbers and pending *inter partes* review proceedings.

In the '330 patent, Rosenberger is identified as one of the "References Cited" (*See* Ex. 1001, pg. 2, col. 1, code (56) (listing "Rosenberger" as one of the references cited).

Patent Owner asserts the Examiner "considered Rosenberger during examination of the '330 Patent and found the claims allowable over it. Prelim. Resp. 6; *see also, id.* at 7 (referring to "the five citations to Rosenberger during prosecution of the '330 Patent").

Exhibit 2001, relied on by Patent Owner, is an excerpt from the prosecution history of patent application No. 16/171,495, which matured into the '330 patent.

First, Patent Owner states "Rosenberger was cited during examination of the '330 Patent on January 18, 2019 in an Information Disclosure Statement ('IDS') submitted by the applicant." *Id.* at 6 (citing Ex. 2001, 89). The cited page 89 is part of a six-page IDS submitted to the PTO by the applicant. Ex. 2001, 87–92. The six-page IDS lists 131 documents. Rosenberger is document No. 75, listed near the bottom of page 3 of the six-page listing. There is no substantive discussion in this applicant-submitted IDS of any of these 131 cited references.

On May 29, 2019, the Examiner signed each of the six pages of the submitted IDS, thereby indicating that these documents were "considered." *Id.* at 80–85. There is no substantive discussion in this Examiner-signed IDS of any of these 131 cited references.

Patent Owner then cites to pages 5, 10, 25, 55, and 76 of Exhibit 2001 and pages 78–86 of Exhibit 2008 as further support that Rosenberger was considered in the proceedings leading to the '330 patent. Prelim. Resp. 6.

Cited page 5 of Exhibit 2001 is part of a nine-page *Supplemental* Notice of Allowability. Ex. 2001, 3–11. This *Supplemental* Notice of Allowability includes several "Attachments," including a "Notice of References Cited (PT0-892);" an "Examiner's Amendment/Comment;" and an "Examiner's Statement of Reasons for Allowance." *Id.* at 3 (note checked boxes at bottom of page 3). The Examiner's Reasons for Allowance, on cited page 5, do not mention Rosenberger. *See id.* at 5.

Cited page 10 of Exhibit 2001 is part of a four-page Notice of References Cited, referred to in the *Supplemental* Notice of Allowability cited above. Ex. 2001, 8–11. This *Supplemental* Notice replaces the *Original* Notice of Allowability discussed in the next paragraph. Rosenberger is one of forty-one references listed on this Notice (item "B" on page 2 of the four-page Notice of References Cited). There is no substantive discussion in this cited Notice of Rosenberger.

Cited page 25 of Exhibit 2001 is part of an *Original* Notice of Allowability. *Id.* at 19–26. Page 25, like page 10 discussed above, is part of a four-page Notice of References Cited, referred to in the *Original* Notice of Allowability. Ex. 2001, 23–26. Rosenberger is one of forty-one references listed on this Notice (item "B" on page 2 of the four-page Notice of References Cited). There is no substantive discussion in this cited Notice of Rosenberger.

Cited page 55 of Exhibit 2001 is another four-page Notice of References Cited. *See* Ex. 2001, 54–57. Rosenberger is one of forty references listed (item "M" on page 2 of the four-page Notice). There is no substantive discussion in this cited Notice of Rosenberger.

Patent Owner asserts throughout its Preliminary Response that "during prosecution of the eleven applications in the '330 Patent family, Rosenberger was cited or considered fifty-six times, including forty-eight times during prosecution of the applications examined by Examiner Colucci." Prelim. Resp. 7; *see also, e.g.*, *id.* at 10 (asserting Rosenberger "was also used in rejections in related applications and cited fifty-six times, mostly by the same examiner, throughout prosecution of the family"), 12 ("Rosenberger was cited fifty-six times").

There is no dispute that Rosenberger was cited throughout the prosecution of this family of applications and patents. These repeated citations, however, emphasize the apparent error by the Examiner, discussed in the following section of this Decision, in overlooking Rosenberger in the examination of application No., 16/171,495, which matured into the '330 patent.

Patent Owner made a similar argument in the related IPR2022-01594. In that case, Patent Owner argued that the frequency of citation of Rosenberger in the large family of applications warranted discretionary denial of the Petition in that case. *See* IPR2022-01594, Paper 6 (Patent Owner's Prelim. Resp.), 4–5 ("In total, during prosecution of the eleven applications in the '128 Patent family, Rosenberger was cited or considered fifty-four times."). The Board acknowledged this fact and stated "Rosenberger was repeatedly considered by the Office during consideration of the family of applications to which the '128 patent belongs." IPR2022-01594, Paper 9, 33. The Board also stated "[w]e find Rosenberger, which is asserted as anticipating all challenged claims, was previously presented to the Office." *Id.* The Board, however, found persuasive Petitioner's

argument that "[b]ecause the Examiner did not substantively evaluate Rosenberger during prosecution of the '128 Patent and assumed that the allowed claims required a limitation not found in the claims, the Examiner erred in a manner material to patentability." *Id.* Accordingly, mere frequency of citation of a reference does not preclude an analysis under Step 2 of *Advanced Bionics*. We reach a similar determination here.

Based on the record before us, there can be no reasonable dispute that Rosenberger was "previously presented to the Office during a proceeding pertaining to the challenged patent." *Advanced Bionics*, Paper 6 at 10.

b) Advanced Bionics Step 2: Factors (c), (e), and (f)

"If, after review of Factors (a), (b), and (d), it is determined that the same or substantially the same art or arguments previously were presented to the Office, then Factors (c), (e), and (f) relate to whether the petitioner has demonstrated a material error by the Office." *Id.*

In the second part of the *Advanced Bionics* framework, we consider whether Petitioner has sufficiently shown that the Office erred in a manner material to the patentability of the challenged claims. Examples of such errors may include misapprehending or overlooking specific material teachings of the relevant prior art or misapplying the law in a material way. *See Advanced Bionics*, Paper 6 at 8–9 n.9. For this analysis, *Becton, Dickinson* Factors (c), (e), and (f) are particularly relevant. *See id.* at 10.

Anticipating Patent Owner's § 325(d) arguments, Petitioner asserts "[t]he Board should not exercise its discretion to deny institution under § 325(d) because the USPTO *erred* in a manner material to patentability of the Challenged Claims." Pet. 7 (emphasis added). Petitioner asserts,

> During prosecution, the Examiner overlooked Rosenberger and Basye when allowing the '330 Patent. In fact, the Examiner neither discussed nor even cited Rosenberger and Basye[9], much less the combination of the two references, in rejecting the claims during prosecution. *See* Ex.1002, ¶¶32-35 (citing Ex.1004, 5, 16, 29). . . . The Examiner's *error* is evident in the reasons for allowance, where the Examiner erroneously concluded that the prior art taken alone or in combination fails to teach the elements of the independent claims without any discussion of Rosenberger or Basye.

Id. at 8–9 (emphasis added). Thus, it is clear that Petitioner is relying on *Advanced Bionics* Step 2, a material error by the Office, to assert that we should *not* exercise our discretion to deny the Petition under Section 325(d).

In this Step 2, we consider *Becton, Dickinson* factors: "(c) the extent to which the asserted art was evaluated during examination, including whether the prior art was the basis for rejection;" "(e) whether Petitioner has pointed out sufficiently how the Examiner erred in its evaluation of the asserted prior art;" and "(f) the extent to which additional evidence and facts presented in the Petition warrant reconsideration of the prior art or arguments." *Becton, Dickinson*, Paper 8 at 17–18; *see Advanced Bionics*, Paper 6 at 10.

Patent Owner acknowledges that Rosenberger was relied on to reject claims of Patent No. 10,909,987 (the "'987 patent") (Ex. 3005), which is based on a continuation application of the '330 patent. Prelim. Resp. 1 ("the same Examiner rejected the claims of a related application (the '987 Patent) as obvious in view of Rosenberger.") (citing Ex. 2008, at 76–86).

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[9] This statement is not correct. Although not applied by the Examiner against the claims or otherwise discussed, Rosenberger and Basye are listed as "References Cited" in the '330 patent. *See* Ex. 1001, pg. 2, code (56).

Patent Owner also acknowledges that prior to allowing the '987 patent, the Examiner issued a double patenting rejection over the allowed claims of the '330 patent. Prelim. Resp. 1.

We have not been directed to any persuasive evidence in the record before us that Rosenberger was relied on to reject any claim, or substantively discussed by the Examiner in the application which became the '330 patent. Thus, *Becton, Dickinson* factor (c) weighs in favor of a finding that Petitioner has shown material error by the Office.

Based on this history and acknowledged close relationship between the claims in the '330 patent and Rosenberger, Patent Owner speculates that "the more reasonable inference is that the Examiner simply (and correctly) concluded that Rosenberger failed to disclose the additional 'low power mode' limitations required by the claims of the '330 Patent." Prelim. Resp. 2. We disagree.

Rosenberger specifically discloses a "low power" mode. Ex. 1003, 3:45–48 ("Another object of this invention is to provide a totally hands-free, interactive, wireless speech recognition device and system that operate using *low-power*, low-data rate, wireless connections") (emphasis added); 8:16–20 ("Preferably, device D normally operates in a *low power 'listening' mode* in which it listens for a hands-free trigger phrase (e.g., "Hello Voice Control or "Home Automation') to be spoken by the system user.") (emphasis added); *see also, e.g.*, Pet. 15, 21, 28, 30 (all discussing the low power mode of Rosenberger); Ex. 1002, ¶¶ 47, 58, 84–88 (discussing the low power mode of Rosenberger). Thus, based on the evidence before us, *Becton, Dickinson* factor (e) weighs in favor of a finding that Petitioner has shown material error by the Office.

As we discuss in Section II.E of this Decision, based on the record before us, we determine that there is a reasonable likelihood that Rosenberger anticipates more than one claim of the '330 patent. This determination reinforces that the Examiner overlooked specific teachings of Rosenberger, such as its low power mode, that impact patentability of the challenged claims.

Based on the evidence of record, we determine, for purposes of this Decision, that (1) the lack of any substantive analysis or discussion of Rosenberger in the examination of the application that matured into the '330 patent, particularly Rosenberger's low power mode, (2) the prominent role of Rosenberger in this large family of related patents, (3) the double patenting rejection establishing a close relationship between the claims of the '330 patent and claims that were rejected based on Rosenberger in this family, and (4) our determination that there is a reasonable likelihood that Rosenberger anticipates several claims in the '330 patent collectively support Petitioner's assertion that the Examiner overlooked specific material disclosures in Rosenberger. See *Advanced Bionics*, Paper 6 at 8–9 n.9 ("An example of a material error may include . . . overlooking specific teachings of the relevant prior art where those teachings impact patentability of the challenged claims.").

Patent Owner also asserts that Petitioner's reliance on an Dr. Johnson's declaration testimony, "without more," is not "enough to avoid denial under § 325(d)." Prelim. Resp. 11. Here, as shown in Section II.E of this Decision, we determine that Rosenberger's disclosure, not Dr. Johnson's testimony, provides the primary evidence to support our determination that there is a reasonable likelihood that at least one challenged claim is

unpatentable. Moreover, under *Becton, Dickinson* factor (f), we may consider the extent to which "additional evidence and facts presented in the Petition," such as expert testimony, warrant reconsideration of the prior art or arguments. The fact that Patent Owner chose *not* to contest the merits of the Petition, and also chose *not* to introduce any testimonial or other evidence regarding the merits of the Petition, does not deprive us of considering all the evidence, including Dr. Johnson's testimony, on which Petitioner relies.

Because Rosenberger was not the basis for a rejection and was not evaluated substantively during examination, *Becton, Dickinson* factor (c) weighs in favor of a finding that Petitioner has shown material error by the Office. Based on our analysis above, we determine *Becton, Dickinson* factors (e) and (f) also weigh in favor of a finding that Petitioner has shown material error by the Office.

c) Conclusion for Discretionary Denial Under 35 U.S.C. § 325(d)

Based on the analysis above, we determine it is not appropriate to exercise our discretion under 35 U.S.C. § 325(d) to deny institution because of a material error by the Examiner in "misapprehending or overlooking specific teachings of the relevant prior art where those teachings impact patentability of the challenged claims." *Advanced Bionics*, Paper 6 at 8 n.9.[10]

[10] The Petition also argues that the Board should not exercise its discretion to deny institution under 35 U.S.C. § 314(a). *See* Pet. 5–7. Patent Owner does not request that the Board deny institution on this basis (*see generally* Prelim. Resp.), so we do not address this issue.

We now turn to the merits of Petitioner's two Grounds of asserted unpatentability.

E. Ground 1 – Claims 1–3, 5, 7, 9–11, 13, 15, 17, and 18 Based on Rosenberger

Petitioner asserts claims 1–3, 5, 7, 9–11, 13, 15, 17, and 18 are anticipated by Rosenberger. Pet. 22–60. First, we summarize the disclosure of Rosenberger.

1. Rosenberger (Ex. 1003)

Rosenberger is titled "Interactive Speech Recognition Device and System for Hands-Free Building Control." Ex. 1003, code (54). Rosenberger "relates to improvements in automated control systems" and, "[m]ore particularly, . . . to improvements in speech-recognizing control devices that respond to oral commands from a system user." *Id*. at 1:8–13.

As summarized in its Abstract, Rosenberger discloses:

> A self-contained wireless interactive speech recognition control device and system that integrates with automated systems and appliances to provide totally hands-free speech control capabilities for a given space. Preferably, each device comprises a programmable microcontroller having embedded speech recognition and audio output capabilities, a microphone, a speaker and a wireless communication system through which a plurality of devices can communicate with each other and with one or more system controllers or automated mechanisms. The device may be enclosed in a standalone housing or within a standard electrical wall box. Several devices may be installed in close proximity to one another to ensure hands-free coverage throughout the space. When two or more devices are triggered simultaneously by the same speech command, real time coordination ensures that only one device will respond to the command.

Ex. 1003, code (57).

As disclosed in Rosenberger, to provide complete hands-free speech recognition coverage and comfortable user interaction from anywhere in a building using speech recognition modules of this type, it would often be necessary to install many modules in reasonable proximity to one another. *Id.* at 2:42–47. In such an arrangement, it is inevitable that a given speech command would frequently be recognized simultaneously by two or more neighboring speech recognition modules. *Id.* at 2:47–50. If multiple modules were triggered and responded simultaneously, the target automated mechanism could be instructed by each triggered device to perform the same instruction. *Id.* at 2:50–56. For example, the speech command "Lower Room Temperature Two Degrees" could be executed separately by several modules causing a thermostat to lower by multiples of the requested two degrees. Ex. 1003, 2:56–59. This is referred to as a "duplicate response problem." Ex. 1003, 2:60. One of the objectives of the system disclosed in Rosenberger is to avoid the "duplicate response problem." *Id.* at 3:30–35.

Rosenberger discloses "a totally hands-free, interactive, wireless speech recognition device and system that operate using low-power, low-data rate, wireless connections." *Id.* at 3:45–49. The disclosed system allows the user to wirelessly control the operation of automated mechanisms using speech commands, so that "[w]hen a trigger phrase is detected, the system 'wakes up' and prompts the user to say one or more commands from an expected command phrase vocabulary." *Id.* at 1:63–2:9.

Rosenberger specifically discloses a "low power" mode. Ex. 1003, 3:45–48 ("Another object of this invention is to provide a totally hands-free, interactive, wireless speech recognition device and system that operate using *low-power*, low-data rate, wireless connections") (emphasis added); 8:16–20

("Preferably, device D normally operates in a *low power 'listening' mode* in which it listens for a hands-free trigger phrase (e.g., "Hello Voice Control or "Home Automation') to be spoken by the system user.") (emphasis added).

Figure 3 of Rosenberger is reproduced below.

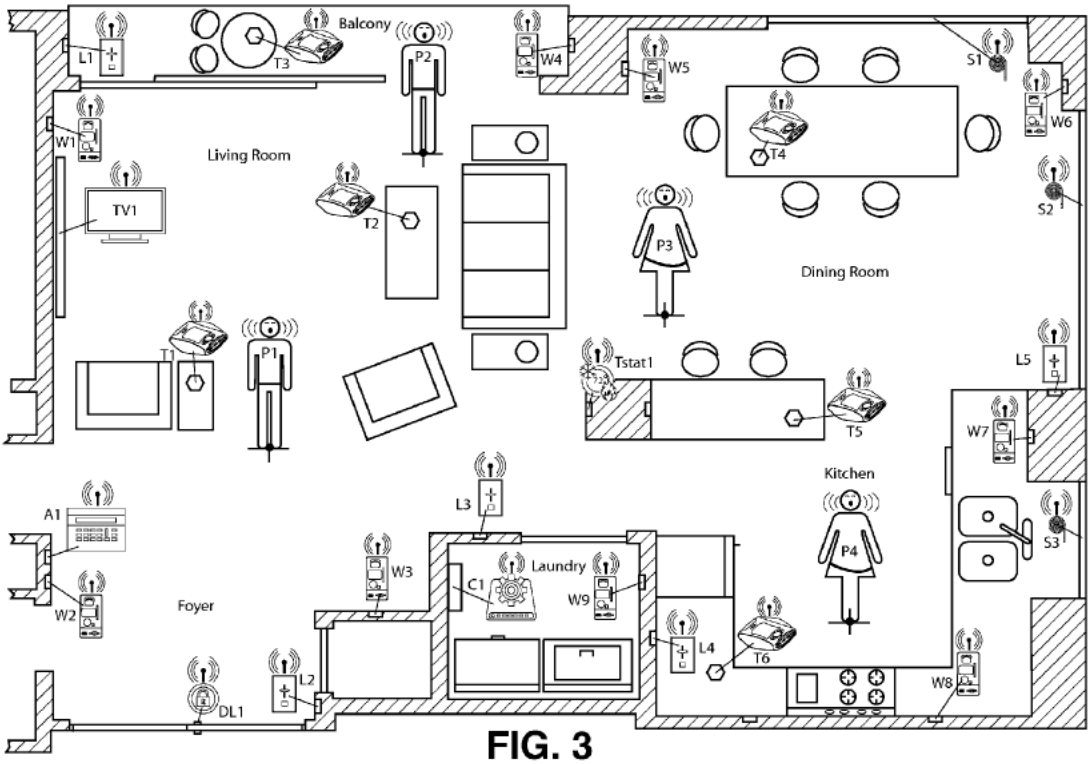

FIG. 3

Figure 3 "illustrates a residential floor plan showing a plurality of interactive speech recognition control devices at various locations that provide totally hands-free speech control of various automated mechanisms throughout the interior space." Ex. 1003, 5:41–44. A home-automation system includes table-top control devices T1–T6, electrical wall-box mounted control devices W1–W9, and automated mechanisms such as door lock DL1, security panel A1, television TV1, thermostat Tstat1, light dimmers L1–L5, and motorized shades S1–S3, that may all be controlled "hands-free" by persons P1–P4 using only speech commands. *Id.* at 9:37–

49. "Control signals may be sent directly from any speech recognition device to system controller C1, which in turn, sends appropriate control signals to the target automated mechanisms to implement the speech command" or "any speech recognition device can control the automated mechanisms directly using standard wireless communications and automation protocols." *Id.* at 9:50–56. Any of the table top devices T1–T6 and wall-boxes mounted control devices W1–W9 "may 'hear' and recognize" a "speech trigger" to operate the automated mechanisms. *Id.* at 9:57–10:4.

Rosenberger discloses that the control device "uses one of several different coordination methods to achieve the design goal of avoiding duplicate responses to the same speech command while selecting a single control device best able to successfully interact with the system user" and "[a]ll of the methods involve the calculation and production by the control device of a numeric weighted signal (WS) that quantifies the 'quality' of a just-recognized speech command." *Id.* at 10:34–41.

Preferably, device D normally operates in a low power listening mode in which it listens for a hands-free trigger phrase (e.g., "Hello Voice Control or "Home Automation') to be spoken by the system user. Ex. 1003, 8:16–20.

2. Analysis of Independent Claims 1, 9, and 17

Independent claims 1, 9, and 17 are substantially similar. We compare these claims in the chart below. We use Petitioner's claim paragraph numbering. As is evident, the only significant substantive difference among these three claims is their preamble.

CLAIM 1	CLAIM 9	CLAIM 17
[1.0] A computer-implemented method comprising:	[9.0] A system comprising: one or more computers; and one or more computers and one or more storage devices storing instructions that are operable, when executed by the one or more computers, to cause the one or more computers to perform operations comprising:	[17.0] A non-transitory computer-readable medium storing software comprising instructions executable by one or more computers which, upon such execution, cause the one or more computers to perform operations comprising:
[1.1] receiving, by a computing device that is in a low power mode, audio data that includes an utterance of a particular, predefined hotword;	[9.1] receiving, by a computing device that is in a low power mode, audio data that includes an utterance of a particular, predefined hotword;	[17.1] receiving, by a computing device that is in a low power mode, audio data that includes an utterance of a particular, predefined hotword;
[1.2] while the computing device remains in the low power mode, and in response to receiving the audio data that includes the utterance of the particular, predefined hotword, transmitting, by the computing device, a message;	[9.2] while the computing device remains in the low power mode, and in response to receiving the audio data that includes the utterance of the particular, predefined hotword, transmitting, by the computing device, a message;	[17.2] while the computing device remains in the low power mode, and in response to receiving the audio data that includes the utterance of the particular, predefined hotword, transmitting, by the computing device, a message;
[1.3] while the computing device	[9.3] while the computing device	[17.3] while the computing device

remains in the low power mode, receiving, by the computing device and from an additional computing device that is in a low power mode, an additional message; and	remains in the low power mode, receiving, by the computing device and from an additional computing device that is in a low power mode, an additional message; and	remains in the low power mode, receiving, by the computing device and from an additional computing device that is in a low power mode, an additional message; and
[1.4] based on the message and the additional message, determining, by the computing device, to exit the low power mode.	[9.4] based on the message and the additional message, determining, by the computing device, to exit the low power mode.	[17.4] based on the message and the additional message, determining, by the computing device, to exit the low power mode.

Petitioner argues claims 1, 9, and 17 collectively. *See* Pet. 22–49. Petitioner states that the "Petition addresses independent claim 9 first because it is the narrowest independent claim of the '330 Patent." Pet. 22. Petitioner then provides a clause-by-clause analysis of claim 9 mapping each element or limitation of claim 9 to what Petitioner asserts is the corresponding disclosure in Rosenberger. *Id.* at 22–46. We need not determine for this decision the claim construction issue of whether Petitioner's characterization of claim 9 as the "narrowest" independent claim is correct.

For independent claim 1, Petitioner asserts "elements 1.1, 1.2, 1.3, and 1.4 of claim 1 map to elements 9.1, 9.2, 9.3, and 9.4 of claim 9, respectively. Thus, Rosenberger discloses claim 1 for the same reasons it discloses claim 9." Pet. 47. Our claim chart confirms Petitioner's assertion.

For claim 17, Petitioner asserts "elements 17.0, 17.1, 17.2, 17.3, and 17.4 of claim 17 map to elements 9.0, 9.1, 9.2, 9.3, and 9.4 of claim 9, respectively. Thus, Rosenberger discloses claim 17 for the same reasons it discloses claim 9." Pet. 53. Our claim chart confirms Petitioner's assertion.

Throughout its analysis of claims 1, 9, and 17, Petitioner cites to the written description and drawings of Rosenberger and to the Declaration testimony of Dr. Johnson for evidentiary support. *See, e.g.*, *id.* at 24 (citing Ex. 1002 ¶ 74), .26 (citing Ex. 1002 ¶ 77).

We need not reproduce in this Decision the entirety of Petitioner's detailed, comprehensive, and substantive analysis. *See* Pet. 22–49. We have reviewed Petitioner's evidence and arguments, and for purposes of this Decision, based on the evidence and arguments before us, we determine for the reasons stated in the Petition (*id.*) that the evidence establishes a reasonable likelihood that Petitioner will prevail in establishing that independent claims 1, 9, and 17 are unpatentable.

a) Conclusion for Claims 1, 9, and 17

Based on the arguments and evidence in the record before us, we determine, for purposes of this Decision, Petitioner has established a reasonable likelihood that independent claims 1, 9, and 17 are anticipated by Rosenberger.

3. Dependent Claims 2, 3, 5, 7, 10, 11, 13, 15, and 18

Dependent claims 2, 3, 5, 7, 10, 11, 13, 15, and 18 depend from one of claims 1, 9, or 17. Petitioner provides a clause-by-clause analysis of where each element in dependent claims 2, 3, 5, 7, 10, 11, 13, 15, and 18 is disclosed in Rosenberger. Pet. 49–60.

Claims 2, 10, and 18 are identical and depend from claims 1, 9, and 17, respectively. Claims 2, 10, and 18 each state:

> based on the message and the additional message, performing, by the computing device, automated speech recognition processing on the audio data.

E.g., Ex. 1001, 16:41–44 (for claim 2).

Claims 3 and 11 are identical and depend from claims 1 and 9, respectively. Claims 3 and 11 each state:

> the computing device is configured to exit the low power mode in response to detecting an utterance of the particular, predefined hotword, and
>
> the additional computing device is configured to exit the low power mode in response to detecting an utterance of the particular, predefined hotword.

E.g., Ex. 1001, 16:45–51 (for claim 3).

Claims 5 and 13 are identical and depend from claims 1 and 9, respectively. Claims 5 and 13 each state:

> determining, by the computing device, a hotword score that reflects a likelihood that the audio data includes an utterance of the particular, predefined hotword,
>
> wherein the message includes the hotword score.

E.g., Ex. 1001, 16:57–61 (for claim 5).

Claims 7 and 15 are identical and depend from claims 1 and 9, respectively. Claims 7 and 15 each state:

> comparing, by the computing device, the message to the additional message;
>
> determining to exit the low power mode based on comparing the message to the additional message.

E.g., Ex. 1001, 17:3–7 (for claim 7).

As stated above, Patent Owner does not address the merits of any of the challenged claims.

We need not reproduce in this Decision the entirety of Petitioner's detailed, comprehensive, and substantive analysis. *See* Pet. 49–60. We have reviewed Petitioner's evidence and arguments, and for purposes of this Decision, based on the evidence and arguments before us, we determine for the reasons stated in the Petition (*id.*) that the evidence establishes a reasonable likelihood that Petitioner will prevail in establishing that dependent claims 2, 3, 5, 7, 10, 11, 13, 15, and 18 are not patentable.

F. Ground 2 – Claims 4, 6, 12, and 14 in View of Rosenberger and Basye

Petitioner asserts claims 4, 6, 12, and 14 are unpatentable under § 103 as obvious in view of Rosenberger and Basye. Pet. 61–70. We first summarize the disclosure in Basye.

1. Basye (Ex. 1013)

Basye is titled "Speech Recognition Power Management." Ex. 1013, code (54). Basye discloses that

> [p]ower consumption for a computing device may be managed by one or more keywords. For example, if an audio input obtained by the computing device includes a keyword, a network interface module and/or an application processing module of the computing device may be activated. The audio input may then be transmitted via the network interface module to a remote computing device. Such as a speech recognition server. Alternately, the computing device may be provided with a speech recognition engine configured to process the audio input for on-device speech recognition.

Id., code (57). Basye discloses using a speech processing module to "determine a score or confidence level whose value corresponds to a

likelihood that a keyword is actually present in the speech" and "[i]f the score satisfies a threshold, the speech processing module" may determine that the keyword is present in the speech but "if the score does not satisfy the threshold, the speech processing module" may determine that there is no keyword in the speech. *Id.* ¶ 27. Basye's focus, however, is on power management for the disclosed devices. As disclosed in Basye, "aspects of the present disclosure are directed to power management for speech recognition." *Id.* ¶ 10. A computing device may be provided with a "power management subsystem" that selectively activates or deactivates one or more modules of the computing device. *Id.* This activation may be responsive to an audio input that includes one or more pre-designated spoken words," which Basye refers to as "keywords. *Id.*

Basye also discloses:

> By selectively activating modules of the computing device, the power management Subsystem may advantageously improve the energy efficiency of the computing device. The power management Subsystem may further improve the energy efficiency of the computing device by selectively activating one or more of its own modules. While such implementations are particularly advantageous for computing devices that rely on battery power, all computing devices for which power management may be desirable can benefit from the principles of the present disclosure.

Id. ¶ 14.

2. Analysis of Claims 4, 6, 12, and 14

Claims 4 and 12 are identical and depend from claims 1 and 9, respectively. Claims 4 and 12 each state:

> determining, by the computing device, that the audio data includes an utterance of a particular, predefined hotword without

> performing automated speech recognition processing on the audio data.

E.g., Ex. 1001, 16:52–56 (for claim 4).

Claims 6 and 14 are identical and depend from claims 1 and 9, respectively. Claims 6 and 14 each state:

> determining, by the computing device, a hotword score that reflects a likelihood that the audio data includes an utterance of the particular, predefined hotword; and
>
> determining, by the computing device, that the hotword score satisfies a threshold,
>
> wherein transmitting the message is based on determining that the hotword score satisfies the threshold.

E.g., Ex. 1001, 16:60–17:12 (for claim 6).

Petitioner provides a clause-by-clause analysis of where each element or limitation in dependent claims 4, 6, 12, and 14 is disclosed in Rosenberger or Basye. Pet. 61–69. Petitioner also provides reasons why a person of ordinary skill would use the energy management technology of Basye in the Rosenberger device.

Petitioner asserts a person of ordinary skill "would have been motivated to modify Rosenberger to incorporate Basye's teachings such that the 'control device' of Rosenberger would transmit its WS [weighted signal] message based on determining that its hotword score satisfies a threshold." *Id.* at 69–70 (citing Ex. 1002 ¶¶ 212-16).

Petitioner also asserts a person of ordinary skill "would have been motivated to modify Rosenberger's 'control device' to utilize a threshold determination as a basis to transmit its WS messages over the network to help reduce 'false positive' detections of a 'trigger phrase' (or 'wakeword')." Pet. 70 (citing Ex. 1002, ¶214). The reason why a skilled

person would have made this modification, according to Petitioner, is that "Basye explains that the use of 'thresholding' can help reduce false positives, which is a situation where a computing device incorrectly determines that speech is present or that speech includes a wakeword." Pet. 70 (citing Ex. 1013 ¶¶ 51, 74–75). Moreover, Petitioner also asserts that, as Basye explains, this "helps to conserve power and/or processing resources." *Id.* (citing Ex. 1002 ¶ 215; Ex. 1013 ¶¶ 9–10, 38, 44).

As stated above, Patent Owner does not address the merits of any of the challenged claims.

We need not reproduce in this Decision the entirety of Petitioner's detailed, comprehensive, and substantive analysis. *See* Pet. 61–70. We have reviewed Petitioner's evidence and arguments, and for purposes of this Decision, based on the evidence and arguments before us, we determine for the reasons stated in the Petition (*id.*) that the evidence establishes a reasonable likelihood that Petitioner will prevail in establishing that dependent claims 4, 6, 12, and 14 are not patentable.

III. CONCLUSION

We have determined that there is a reasonable likelihood that Petitioner will prevail on at least one challenged claim. Accordingly, we institute an *inter partes* review on all challenged claims on each asserted ground. A decision to institute is "a simple yes-or-no institution choice respecting a petition, embracing all challenges included in the petition." *PGS Geophysical AS v. Iancu*, 891 F.3d 1354, 1360 (Fed. Cir. 2018).

Our review of the Petition under 35 U.S.C. § 314 is not to determine whether an individual asserted fact is indisputable or whether a preponderance of the evidence supports Petitioner. Our review is to

determine whether the totality of the information presented in the Petition and Preliminary Response shows that there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the claims challenged in the Petition. "The 'reasonable likelihood' standard is a somewhat flexible standard that allows the Board room to exercise judgment." Patent Trial and Appeal Board Consolidated Trial Practice Guide at 53 (Nov. 2019), *available at* https://www.uspto.gov/sites/default/files/documents/tpgnov.pdf.

This is a decision to institute an *inter partes* review under 35 U.S.C. § 314. Our determinations at this stage of the proceeding are preliminary, and based on the evidentiary record developed thus far. This is not a final decision as to the patentability of claims for which *inter partes* review is instituted. Any final decision will be based on the record as fully developed during trial, including all arguments and evidence in the Patent Owner's Response,[11] or submitted otherwise during trial, as permitted by our rules.

IV. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that, pursuant to 35 U.S.C. § 314(a), *inter partes* review is instituted as to claims 1–7, 9–15, 17, and 18 of the '330 patent on each ground 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 '330 patent shall commence

[11] *See In re Nuvasive, Inc.*, 842 F.3d 1376, 1381 (Fed. Cir. 2016) (explaining that a patent owner waives an issue presented in its preliminary response if it fails to renew the issue in its response after trial is instituted).

on the entry date of this Decision, and notice is hereby given of the institution of a trial.

FOR PETITIONER:

FOR PATENT OWNER: