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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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*Ex parte* EVAN HARRIS BENWAY and ERIK PEROTTI

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Appeal 2018-004827  
Application 14/243,814  
Technology Center 2600

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Before JOHN A. JEFFERY, DENISE M. POTHIER, and  
JUSTIN BUSCH, *Administrative Patent Judges*.

POTHIER, *Administrative Patent Judge*.

DECISION ON APPEAL  
STATEMENT OF THE CASE

Appellants<sup>1,2</sup> appeal under 35 U.S.C. § 134(a) from the Examiner’s rejection of claims 1–15 and 17–22. Appeal Br. 1. Claim 16 has been canceled. *Id.* We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

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<sup>1</sup> Throughout this Opinion, we refer to the Final Action (“Final Act.”) mailed June 15, 2017, the Appeal Brief (“Appeal Br.”) filed November 13, 2017, the Examiner’s Answer (“Ans.”) mailed February 8, 2018, and the Reply Brief (“Reply Br.”) filed April 5, 2018.

<sup>2</sup> Appellants identify the real party in interest as Plantronics, Incorporated. Appeal Br. 1.

*Invention*

Sound masking—introducing constant background noise to reduce undesirable sounds and increase privacy and comfort—is increasingly incorporated into workplaces. Spec. ¶ 3. According to the Specification, proper sound masking levels for designing a sound masking system are typically set during installation and infrequently adjusted. *Id.*

¶ 4. But, setting sound masking levels in this manner does not account for office noise fluctuations over time and by location. *Id.* Appellants’ invention aims to improve on current noise management systems. *Id.*

¶¶ 5–6, 18. In one example, an application program receives noise level measurements taken at mobile devices at different locations and adjusts the masking volume level output using a noise masking system. *Id.* ¶¶ 22, 35–36, Fig. 1.

Independent claim 1 exemplifies the claims at issue and reads as follows:

1. A method comprising:
  - receiving over an electronic communications link a plurality of noise level measurements taken with a plurality of microphones at a plurality of mobile devices located within a same building space;
  - receiving a plurality of location data, comprising receiving a location data associated with each mobile device in the plurality of mobile devices located within the same building space;
  - generating a map with a computing device, the map based upon the plurality of noise level measurements and the plurality of location data; and
  - electronically adjusting an output of a sound masking noise utilizing the plurality of noise level measurements.

Appeal Br. 27 (Claims App’x).

The Examiner relies on the following as evidence of unpatentability:

L'Esperance	US 2006/0009969 A1	Jan. 12, 2006
Barbieri	US 2007/0053527 A1	Mar. 8, 2007
Lloyd	US 2011/0307253 A1	Dec. 15, 2011
Swierk	US 2015/0179186 A1	June 25, 2015 (filed Dec. 20, 2013)
Gopalakrishnan	US 9,183,845 B1	Nov. 10, 2015 (filed June 12, 2012)

### *The Rejections*

Claims 1–15 and 17–22 are rejected under 35 U.S.C. § 101 as being directed to an abstract idea without significantly more. Final Act. 6–7.

Claims 1–5, 7–14, and 17–22 are rejected under 35 U.S.C. § 103 as being unpatentable over Swierk, Barbieri, and L'Esperance. Final Act. 7–11.

Claims 5 and 14 are additionally rejected under 35 U.S.C. § 103 as being unpatentable over Swierk, Barbieri, L'Esperance, and Lloyd. Final Act. 11–12.

Claims 6 and 15 are rejected under 35 U.S.C. § 103 as being unpatentable over Swierk, Barbieri, L'Esperance, and Gopalakrishnan. Final Act. 12–13.

### THE PATENT-ELIGIBILITY REJECTION

The Examiner determines that the claims are directed to an abstract idea of measuring noise levels and adjusting accordingly. Final Act. 4, 6. The Examiner indicates the claimed steps can be performed by the human mind and are essentially mental processes. Final Act. 4; Ans. 3–4. The Examiner also determines that the claims do not include additional elements

that add significantly more than the abstract idea but rather merely recite conventional computer functions. Final Act. 6; Ans. 4–5. Based on these determinations, the Examiner concludes that the claims are ineligible under § 101. Final Act. 6.

Appellants argue that the claimed invention is not directed to an abstract idea. *See* Appeal Br. at 7–10. According to Appellants, the Examiner fails to account for the specific recited limitations that are not directed to an abstract idea, and these limitations add significantly more to the purported abstract idea to render the claims eligible. *See id.* at 10–11.

We select independent claim 1 as illustrative.

#### ISSUE

Under § 101, has the Examiner erred in rejecting the claims by determining that the claims are directed to judicially excepted, patent ineligible subject matter?

#### PRINCIPLES OF LAW

An invention is patent eligible if it claims a “new and useful process, machine, manufacture, or composition of matter.” 35 U.S.C. § 101. However, the Supreme Court has long interpreted 35 U.S.C. § 101 to include implicit exceptions: “[L]aws of nature, natural phenomena, and abstract ideas” are not patentable. *Mayo Collaborative Servs. v. Prometheus Labs., Inc.*, 566 U.S. 66, 70 (2012) (brackets in original) (citing *Diamond v. Diehr*, 450 U.S. 175, 185 (1981)).

In determining whether a claim falls within an excluded category, we are guided by the Supreme Court’s two-step framework, described in *Mayo*

and *Alice*. *Alice Corp. Pty. Ltd. v. CLS Bank Int'l*, 573 U.S. 208, 217–18 (2014) (citing *Mayo*, 566 U.S. at 75–77). In accordance with that framework, we first determine what concept the claim is “directed to.” See *Alice*, 573 U.S. at 219 (“On their face, the claims before us are drawn to the concept of intermediated settlement, *i.e.*, the use of a third party to mitigate settlement risk.”); see also *Bilski v. Kappos*, 561 U.S. 593, 611 (2010) (“Claims 1 and 4 in petitioners’ application explain the basic concept of hedging, or protecting against risk.”).

Concepts determined to be abstract ideas, and thus patent ineligible, include certain methods of organizing human activity, such as fundamental economic practices (*Alice*, 573 U.S. at 219–20; *Bilski*, 561 U.S. at 611); mathematical formulas (*Parker v. Flook*, 437 U.S. 584, 594–95 (1978)); and mental processes (*Gottschalk v. Benson*, 409 U.S. 63, 69 (1972)). Concepts determined to be patent eligible include physical and chemical processes, such as “molding of rubber products” (*Diehr*, 450 U.S. at 193); “tanning, dyeing, making water-proof cloth, vulcanizing India rubber, smelting ores” (*id.* at 182 n.7 (quoting *Corning v. Burden*, 56 U.S. (15 How.) 252, 267–68 (1854))); and manufacturing flour (*Benson*, 409 U.S. at 69 (citing *Cochrane v. Deener*, 94 U.S. 780, 785 (1876))).

In *Diehr*, the claim at issue recited a mathematical formula, but the Supreme Court held that “a claim drawn to subject matter otherwise statutory does not become nonstatutory simply because it uses a mathematical formula.” *Diehr*, 450 U.S. at 187; see also *id.* at 191 (“We view respondents’ claims as nothing more than a process for molding rubber products and not as an attempt to patent a mathematical formula.”). That said, the Supreme Court also indicated that a claim “seeking patent

protection for that formula in the abstract . . . is not accorded the protection of our patent laws, . . . and this principle cannot be circumvented by attempting to limit the use of the formula to a particular technological environment.” *Id.* (citing *Benson* and *Flook*); *but see id.* at 187 (“It is now commonplace that an *application* of a law of nature or mathematical formula to a known structure or process may well be deserving of patent protection.”).

If the claim is “directed to” an abstract idea, we turn to the second step of the *Alice* and *Mayo* framework, where “we must examine the elements of the claim to determine whether it contains an ‘inventive concept’ sufficient to ‘transform’ the claimed abstract idea into a patent-eligible application.” *Alice*, 573 U.S. at 221 (quotation marks omitted). “A claim that recites an abstract idea must include ‘additional features’ to ensure ‘that the [claim] is more than a drafting effort designed to monopolize the [abstract idea].’” *Id.* (quoting *Mayo*, 566 U.S. at 77). “[M]erely requir[ing] generic computer implementation[] fail[s] to transform that abstract idea into a patent-eligible invention.” *Id.*

In January 2019, the USPTO published revised guidance on the application of § 101. *2019 Revised Patent Subject Matter Eligibility Guidance*, 84 Fed. Reg. 50 (Jan. 7, 2019) (“Revised Guidance”). Under that guidance, we first look to whether the claim recites:

- (1) any judicial exceptions, including certain groupings of abstract ideas (i.e., mathematical concepts, certain methods of organizing human activities such as a fundamental economic practice, or mental processes) (Revised Guidance, 84 Fed. Reg. at 52–54) (“Revised Step 2A - Prong 1”); and

(2) additional elements that integrate the judicial exception into a practical application (*see* MANUAL OF PATENT EXAMINING PROCEDURE (“MPEP”) §§ 2106.05(a)–(c), (e)–(h)) (Revised Guidance, 84 Fed. Reg. at 53–55) (“Revised Step 2A - Prong 2”).

Only if a claim (1) recites a judicial exception, and (2) does not integrate that exception into a practical application, do we then look to whether the claim:

(3) adds a specific limitation beyond the judicial exception that is not well-understood, routine, and conventional in the field (*see* MPEP § 2106.05(d)); or

(4) simply appends well-understood, routine, and conventional activities previously known to the industry, specified at a high level of generality, to the judicial exception.

*See* Revised Guidance, 84 Fed. Reg. at 56 (“Step 2B”).

## ANALYSIS

### *Alice Step One*

We must determine whether claim 1 as a whole is directed to a judicial exception, namely an abstract idea. *See Alice*, 573 U.S. at 217. To this end, we determine (1) whether claim 1 recites a judicial exception (Revised Step 2A - Prong 1,) and, if so, (2) whether the identified judicial exception is integrated into a practical application (Revised Step 2A - Prong 2). *See* Revised Guidance, 84 Fed. Reg. at 52–55.

#### *Revised Step 2A - Prong 1*

In Revised Step 2A - Prong 1, we identify the claim’s specific limitations that recite a judicial exception and determine whether the identified limitations fall within certain subject matter groupings, namely

(a) mathematical concepts (mathematical relationships, mathematical formulas, and mathematical calculations); (b) certain methods of organizing human activity (e.g., fundamental economic principles or practices, commercial or legal interactions, and managing personal behavior or relationships or interactions between people; or (c) mental processes (e.g., concepts performed in the human mind including an observation, evaluation, judgment, or opinion). *See Revised Guidance, 84 Fed. Reg. at 52.*

Claim 1 recites a method that comprises the following steps:

(A) “receiving . . . a plurality of noise level measurements . . . located within a same building space,” (B) “receiving a plurality of location data, comprising receiving a location data associated with each mobile device in the plurality of mobile devices located within the same building space,” (C) “generating a map . . . , the map based upon the plurality of noise level measurements and the plurality of location data,” and (D) “electronically adjusting an output of a sound masking noise utilizing the plurality of noise level measurements.” *Appeal Br. 27 (Claims App’x) (“steps (A)–(D)”)*.

As found by the Examiner (*see Final Act. 4; see also Ans. 3*), steps (A)–(C) recite processes that can be performed mentally. For example, “receiving . . . a plurality of noise level measurements . . . located within a same building space,” as step (A) recites, is a process that can be done in a human’s mind merely by *observing* noise levels within a same building space (e.g., hearing noise in different rooms within a building). Similarly, “receiving a plurality of location data, comprising receiving a location data . . . located within the same building space,” as step (B) recites, is a process that can be done mentally merely by *observing* location data in the same building space (e.g., mentally noting the noise locations in the different

rooms within the building). Likewise, “generating a map . . . , the map based upon the plurality of noise level measurements and the plurality of location data,” as step (C) recites, is a process that can be done mentally or with the aid of pen and paper by *evaluating* different observed noise level measurements and location data and then *correlating* the measurements and location data to build a map that includes the noise levels associated with the locations within the building.

Although steps (A)–(C) recite processes that can be performed mentally, we must “determine whether the claims at issue are *directed to* a patent-ineligible concept,” such as an abstract idea. *Alice*, 573 U.S. at 217 (emphasis added). The Examiner determines that claim 1 is directed to “measuring noise level.” Final Act. 6. Appellants disagree. Appeal Br. 7–10; Reply Br. 7–10.

This dispute implicates the “directed to” inquiry. The “directed to” inquiry cannot simply ask whether the claims involve a patent-ineligible concept, because almost every routinely patent-eligible claim involving physical products and actions involves a law of nature, natural phenomenon, or abstract idea. *See Mayo*, 566 U.S. at 71 (“For all inventions at some level embody, use, reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas.”). Rather, the “directed to” inquiry applies a stage-one filter to claims that “look[s] at the ‘focus’ of the claims” (*Elec. Power Grp., LLC v. Alstom S.A.*, 830 F.3d 1350, 1353 (Fed. Cir. 2016) (citing *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1335 (Fed. Cir. 2016); *see also SRI Int’l, Inc. v. Cisco Sys. Inc.*, 918 F.3d 1368, 1375 (Fed. Cir. 2019)) and whether “their character *as a whole* is directed to excluded subject matter” (*Internet Patents Corp. v. Active Network, Inc.*, 790 F.3d 1343, 1346 (Fed.

Cir. 2015) (emphasis added)). As explained below, when considered as a whole, claim 1 is not directed simply to measuring and mapping noise levels, but rather is focused on electronically adjusting outputs of sound masking noises using noise level measurements taken with mobile devices located within a building. *See* Reply Br. 26.

Notably, the Examiner indicates claim 1 is directed to “adjusting” a sound masking noise output. *See* Final Act. 4 (stating the claims are directed to “measuring noise level[s] and adjusting accordingly”); *see also* Ans. 3 (stating the claims are directed to “adjusting noise levels.”). We agree. For instance, claim 1’s focus is demonstrated in its final step (D), involving “electronically adjusting an output of a sound masking noise utilizing the plurality of noise level measurements,” which is a process that electronically adjusts a sound masking noise using “receiv[ed] . . . noise level measurements taken with a plurality of microphones at a plurality of mobile devices located within a same building space,” as step (A) recites. Appeal Br. 27 (Claims App’x). Yet, step (D)’s electronically adjusting sound masking noise output, which is the focus of the claim, is not directed to one of the Revised Guidance’s groupings of judicial exception. *See* Revised Guidance, 84 Fed. Reg. at 52; *see also id.* at 53 (“Claims that do not recite matter that falls within these enumerated groupings of abstract ideas should not be treated as reciting abstract ideas, except” in rare circumstances.).

More specifically, electronically adjusting sound masking noises using noise level measurements taken with mobile devices within a same building space is not a mathematical concept, because it is not a mathematical relationship, mathematical formula or equation, or mathematical calculation. *See id.* at 52. Nor is electronically adjusting

sound masking noises using noise level measurements taken with mobile devices within a same building space a method of organizing human activity, such as (i) a fundamental economic principle or practice (including hedging, insurance, mitigating risk), (ii) a commercial or legal interaction (including agreements in the form of contracts; legal obligations; advertising, marketing or sales activities or behaviors; business relations), or (iii) managing personal behavior or relationships or interactions between people (including social activities, teaching, and following rules or instructions). *See id.*

Furthermore, electronically adjusting sound masking noises using noise level measurements taken with mobile devices within a same building space is not a mental process, because this step is not a concept performed in the human mind (including an observation, evaluation, judgment, opinion). *See id.* To be sure, a person may be able to manually adjust sounds (whether or not the sounds are sound-masking noise) in a building by asking another user to speak up or controlling a volume level. *See* Final Act. 6 (stating “the user adjust[s] the noise level by controlling the user, muting devices, etc.”).<sup>3</sup> These actions may *partly* include some evaluating on the part of the user to determine what adjustments are needed. Regardless, the actual step of electronically adjusting a sound masking noise output in step (D), which is the focus of claim 1, involves *more* than a mental process and thus is not directed to one of the judicial exception groupings.

Also, “[t]he ‘abstract idea’ step of the inquiry calls upon us to look at the ‘focus of the claimed advance over the prior art’ to determine if the

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<sup>3</sup> The record does not demonstrate whether such adjustments would involve adjusting a “sound masking noise” output as step (D) claims.

claim's 'character as a whole' is directed to excluded subject matter.” *Affinity Labs of Tex., LLC v. DIRECTV, LLC*, 838 F.3d 1253, 1257 (Fed. Cir. 2016) (quoting *Elec. Power*, 830 F.3d at 1353); *see also English*, 822 F.3d at 1335, quoted in *Apple, Inc. v. Ameranth, Inc.*, 842 F.3d 1229, 1241 (Fed. Cir. 2016). The Specification assists in this determination.

The Background section discusses “[a]s real estate utilization increases and offices become more densely packed, speech noise is becoming an increasingly challenging problem.” Spec. ¶ 1. The Specification discloses sound masking is increasingly incorporated into offices, but that current sound masking systems never or infrequently adjust initial sound masking levels and typically set all speakers to the same level. *Id.* ¶¶ 3–4. These systems do not account for office noise fluctuations over time and by location, and do not use different masking levels for different areas at different times. *Id.* ¶ 4. To resolve these problems, noise masking levels can be adjusted more accurately by receiving noise level measurements from mobile devices (e.g., mobile devices 8 and headsets 10) in different locations and adjusting a sound masking volume level output accordingly. *Id.* ¶¶ 22–23, 28, 36, Fig. 1; *see also* Reply Br. 25–26.

In light of this description, the advance over the prior art by the claimed invention is the recited feature of “electronically adjusting an output of a sound masking noise utilizing the plurality of noise level measurements” taken with mobile devices located within the same building. The Examiner also notes the “application deals with adjusting an output based on the noise level of the environment.” Ans. 2. Thus, claim 1's character as a whole is directed to adjusting an output of sound masking noises using noise level measurements taken with mobile devices within a

building and is not directed to to excluded subject matter set forth in the Revised Guidance.

Likewise, independent claim 10's focus as a whole is directed to electronically adjusting an output of sound masking noises using noise level measurements taken with mobile devices located within the same building space. Appeal Br. 28 (Claims App'x). Claim 18's focus, as whole, similarly is directed to "adjust[ing] sound masking volume level of a sound masking noise output" using a processor. *Id.* at 29 (Claims App'x).

For the above-stated reasons, we determine the focus of claim 1 (or claims 10 and 18) is not directed to an abstract idea.

*Revised Step 2A - Prong 2*

Nonetheless, to the extent claim 1's focus as a whole is "directed to" an abstract idea (e.g., mental processes), we consider whether the abstract idea is integrated into a practical application, namely whether the claim applies, relies on, or uses the abstract idea in a manner that imposes a meaningful limit on the abstract idea, such that the claim is more than a drafting effort designed to monopolize the abstract idea. *See* Revised Guidance, 84 Fed. Reg. at 53. To this end, we (1) identify whether there are any additional, recited elements beyond the judicial exception, and (2) evaluate those elements individually and collectively to determine whether they integrate the exception into a practical application. *See id.* at 54–55. Considerations indicative that an additional element or combination of additional elements may have integrated the exception into a practical application include these elements reflect an improvement in the functioning of a computer or to other technology or technical field. *Id.*

Assuming step (D) is not part of claim 1's focus as the Examiner apparently finds (*see* Final Act. 6), the additionally recited elements beyond the judicial exception in claim 1 are “an electronic communications link,” “a plurality of microphones at a plurality of mobile devices,” “a computing device,” and “electronically adjusting an output of a sound masking noise utilizing the plurality of noise level measurements.” Appeal Br. 27 (Claims App'x). On this record, we determine these additional elements collectively improve another technology or technical field, such that the elements integrate the exception into a practical application.

Claims are patent eligible under § 101 when a claim containing a judicial exception implements or applies that exception “in a structure or process which, when considered as a whole, is performing a function which the patent laws were designed to protect.” *Diehr*, 450 U.S. at 192. According to *Thales Visionix Inc. v. United States*, 850 F.3d 1343 (Fed. Cir. 2017), the *Diehr* claims were not directed to the mathematical formula (or another judicial exception, such as a mental processes) alone, but rather to an improvement in the rubber curing process. *See Thales*, 850 F.3d at 1347–48; *see also Diehr*, 450 U.S. at 193 n.15.

Similar to “the claims in *Diehr* reduc[ing] the likelihood that the rubber molding process would result in ‘overcuring’ or ‘undercuring’” (*Thales*, 850 F.3d at 1348), Appellants' claims result in a method that reduces the chance that building noises will result in distractions by adjusting an output of sound masking noises for office noise fluctuations over time and by location. *See Spec.* ¶ 4. That is, as discussed above, claim 1's method is not directed merely to an abstract idea, but instead to an improvement in how a sound masking system adjusts sound masking noises.

Also, the court in *SRI International* held that the claims at issue in that case were not just directed to analyzing data from multiple sources to detect suspicious activity, but rather focused on a specific improvement in computer capabilities by using the data to detect large scale attacks automatically. *See SRI International*, 918 F.3d at 1375 (quoting *Enfish*, 822 F.3d at 1335–36). The court added that the specification bolstered the conclusion that the claims were directed to a technological solution, discussing how the claimed invention was directed to solving the weaknesses of the conventional networks and provided a framework for recognizing more global threats to connectivity. *See id.* Similarly, claim 1’s focus is not just on analyzing noise level measurements to detect noise at various locations in a building, but rather on a specific asserted improvement in noise masking technology that uses the measurements to adjust an output of a sound masking noise. Moreover, as previously discussed, the Specification bolsters this determination, discussing how the claimed invention is directed to solving the noise problems by accounting for office noise fluctuations over time and by location. *See id.* ¶¶ 1–4, 22–23, 28, 36, Fig. 1.

Thus, the additional elements in claim 1 reflect an improvement in the sound masking noise technology or the sound masking noise field as set forth in MPEP § 2106.05(a) and Revised Guidance, 84 Fed. Reg. at 55. Likewise, independent claims 10 and 18’s additional elements (e.g., adjusting an output of a sound masking noise, mobile devices, noise masking system, computing device, a processor, and memory) reflect an improvement in the sound masking noise technology or the sound masking noise field. Appeal Br. 28–29 (Claims App’x).

For the above-stated reasons, we determine the additional elements recited in claim 1 (as well as in claims 10 or 18) beyond the judicial exception, whether considered alone or in combination, integrate the abstract idea into a practical application.

*Conclusion*

For the foregoing reasons, Appellants have persuaded us of error in the rejection of (1) independent claim 1, (2) independent claims 10 and 18, which recite commensurate limitations, and (3) dependent claims 2–9, 11–15, 17, and 19–22 for similar reasons.

OBVIOUSNESS REJECTION OVER SWIERK, BARBIERI,  
AND L'ESPERANCE

*Claims 1, 5, 18, 20, and 21*

Appellants present the same arguments for independent claims 1 and 18. Appeal Br. 16–20, 23–24; Reply Br. 16–20, 23–24. Dependent claims 5, 20, and 21 are not separately argued. *See* Appeal Br. 24. We select claim 1 as representative. *See* 37 C.F.R. § 41.37(c)(1)(iv).

The Examiner finds Swierk teaches many of claim 1's limitations, including receiving (1) noise level measurements taken with microphones at mobile devices and (2) location data associated with each mobile device. *See* Final Act. 8 (citing Swierk Abstract, ¶¶ 27, 41–45, 73–90, Fig. 5). Although the Examiner acknowledges that Swierk's received noise level measurements and location data are not from mobile devices located within a same building space, the Examiner cites Barbieri in combination with the other references for teaching this feature. *See id.* at 8–9 (citing Barbieri ¶¶ 2–3, 12–16, 35–37, 43, 49). The Examiner also acknowledges that

Swierk's noise level measurements are not used to adjust a sound masking noise output electronically. *Id.* at 8. The Examiner, however, cites L'Esperance in combination with Swierk for teaching this feature in concluding that the claim would have been obvious. *See id.* (citing L'Esperance ¶¶ 5, 34–39).

Appellants argue (1) the Examiner improperly relies on impermissible hindsight in combining Swierk, Barbieri, and L'Esperance to arrive at the claimed invention, (2) combining L'Esperance with Swierk would frustrate one of Swierk's stated purposes, and (3) Swierk and Barbieri are non-analogous art. *See* Appeal Br. 16–20; Reply Br. 30–31.

## ISSUES

I. Under § 103, has the Examiner erred in determining Swierk and Barbieri are analogous art to the claimed invention?

II. Is the Examiner's reason to combine Swierk, Barbieri, and L'Esperance supported by articulated reasoning with some rational underpinning to justify the Examiner's obviousness conclusion?

## ANALYSIS

### I.

Appellants contend the Examiner's reliance Swierk and Barbieri is misplaced because Swierk and Barbieri are non-analogous art with respect to the claimed invention. *See* Appeal Br. 16–18; Reply Br. 16–18, 30–31. We are not persuaded of error.

In an obviousness analysis,

[t]wo separate tests define the scope of analogous prior art: (1) whether the art is from the same field of endeavor, regardless of the problem addressed and, (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular problem with which the inventor is involved.

*In re Klein*, 647 F.3d 1343, 1348 (Fed. Cir. 2011) (quoting *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004)). “A reference is reasonably pertinent if, even though it may be in a different field from that of the inventor's endeavor, it is one which, because of the matter with which it deals, logically would have commended itself to an inventor's attention in considering his problem.” *Klein*, 647 F.3d at 1348 (quoting *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992)).

We agree with Appellants that the claimed subject matter's field of endeavor encompasses “sound masking noise[]” field. Appeal Br. 17. Moreover, we agree with Appellants that the problems faced by the inventors include “setting [] sound masking noise levels.” *Id.* Even so, we disagree Swierk and Barbieri are non-analogous art.

Swierk is directed to “providing visual audio quality cues and context awareness in a virtual collaboration session.” Swierk, Abstract. Swierk's Figure 5 illustrates a screenshot of a moderator 501's graphical user interface (GUI) 500, which includes information about each participant 502's ambient noise level. *Id.* ¶ 88. Moderator 501 may manage the unwanted noise by controlling a participant's microphone, such as by muting unwanted noise. *See id.* ¶ 90. Thus, contrary to Appellants' argument (*see* Appeal Br. 17), we find Swierk and the claimed subject matter are within the same field of endeavor—noise removal or masking noise technology.

Swierk is also reasonably pertinent to the problem faced by Appellants. Contrary to Appellants' argument (*see* Appeal Br. 17), modifying a participant's unwanted noise level during a session as discussed in Swierk would have logically commended itself to the inventors' attention in considering the sound masking problems and setting proper sound masking noise levels. *See Klein*, 647 F.3d at 1348.

Barbieri relates to controlling a device's audio output. *See Barbieri* ¶ 1. Barbieri's Figure 1 illustrates a building 60 including devices 1a–1b in room A and devices 1c–1d in room B. *Id.*, Fig. 1. Device 1a in room A can produce muffled sounds in room B. *See id.* ¶ 35. When device 1c in room B receives an incoming call, Barbieri discloses device 1a's sound volume may be reduced, which reduces device 1a's muffled sound (e.g., noise) in room B. *See id.* ¶ 40. Thus, contrary to Appellants' argument (*see* Appeal Br. 18), we find Barbieri relates to the sound masking field, which is the claimed subject matter's field of endeavor. Barbieri also is reasonably pertinent to the problem Appellants faced, which is setting appropriate sound masking noise levels.

Accordingly, we find Swierk and Barbieri are analogous art to the claimed invention.

## II.

The Examiner concludes it would have been obvious to one of ordinary skill in the art to combine L'Esperance with Swierk "to take into account frequency features and correct acoustic response of a room." Final Act. 8 (citing L'Esperance ¶¶ 5, 34–39). In response, Appellants contend "[the] Examiner merely restates the purpose of the sound masking noise in *L'Esperance*, providing no reasoning why one would incorporate sound

masking noise *into the Swierk method.*” Appeal Br. 19. We are not persuaded of error.

We find the Examiner has articulated reasoning with some rational underpinning to combine L’Esperance with Swierk to support the conclusion of obviousness. As the Examiner explains in the Answer, Swierk teaches receiving and tracking noise levels to mute/filter noise makers and improve an audio experience (Ans. 6–7 (citing Swierk ¶¶ 73, 88–90, Fig. 5 (showing noise level 503 for different participants 502))), and L’Esperance teaches adjusting noise masking using a filter to correct acoustic responses through a room’s target masking noise comparison (Ans. 7 (citing L’Esperance ¶¶ 5, 34–39)). Appellants do not persuasively explain why L’Esperance’s teachings would not at least contribute to correcting a room’s acoustic response in Swierk as the Examiner proposes. *See* Final Act. 8. Nor have Appellants persuasively rebutted the Examiner’s conclusion that it would have been obvious to one of ordinary skill in the art to combine L’Esperance with Swierk to “provide[] adjustments to obtain a target masking noise in a room.” Ans. 7.

Moreover, one skilled in the art would have recognized applying L’Esperance’s noise masking technique to Swierk would have improved upon Swierk’s solution to address undesired noise. *See* Ans. 6–7; *see also KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 417 (2007) (stating “if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.”) Thus, to the extent Appellants contend that the

Examiner's rationale to combine the references is based solely on impermissible hindsight (*see* Appeal Br. 18), we disagree.

Appellants next contend because Swierk teaches muting an offending participant's audio, incorporating L'Esperance's sound masking noise into Swierk's method renders Swierk unable to operate as intended. *See* Appeal Br. 19; Reply Br. 31. According to Appellants, incorporating L'Esperance's sound masking noise into Swierk's method "would result in undesirable transmission of sound masking noise from one location to other remote locations . . . [and] would exacerbate the problem which Swierk is trying to solve." Appeal Br. 19; Reply Br. 31.

This argument is unavailing. First, Appellants' "undesirable transmission of sound masking noise" theory is unsubstantiated on this record. Arguments and conclusory statements unsupported by factual evidence are entitled to little probative value. *See In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997). Second, in addition to disclosing muting noise, Swierk also discloses (1) *filtering* noise (Swierk ¶ 73), (2) suggesting a participant find a quieter location (*id.* ¶ 81), and (3) suggesting a participant increase a participant's microphone gain (*id.*). Thus, contrary to Appellants' argument (*see* Appeal Br. 19; Reply Br. 31), we find Swierk allows for various forms of removing unwanted noises other than muting.

Appellants further contend one of ordinary skill in the art would not combine Swierk with L'Esperance because "Swierk *teaches away* from [the] Examiner's proposed combination." Appeal Br. 19. "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.” *In re Gurley*, 27 F.3d 551, 553 (Fed.Cir.1994); *see In re Kahn*, 441 F.3d 977, 990 (Fed. Cir. 2006). We disagree that Swierk discourages an artisan from using the sound masking noise adjustments disclosed by L’Esperance. As noted above, Swierk encourages noise masking adjustments using various approaches other than muting, including filtering and increasing microphone gain. *See Swierk* ¶¶ 73, 81.

Appellants’ arguments regarding Swierk’s alleged shortcomings with respect to optimizing sound masking noise output levels (*see* Appeal Br. 18–19) are unavailing, for these arguments are not germane to the purpose for which Swierk was cited. *See* Final Act 8. Nor are these arguments commensurate with claim 1’s scope, which does not recite optimizing output levels.

Lastly, Appellants contend it would not have been obvious to modify Swierk to include Barbieri’s teachings to determine where the sound is coming from and control it. Appeal Br. 19–20. Appellants assert Swierk is only concerned with the participant making the noise, not where the noise source is. *Id.* We disagree. For example, Swierk’s Figure 1 shows some participants are within a room (e.g., 102-A–102-N) while others are not (e.g., 105A–105-N), suggesting the moderator can locate the sound’s source as being either within, or remote from, a conference room. *See Swierk*, Figs. 1, 5. Also, as noted above, Swierk teaches providing a participant instructions to find a quieter location (*id.* ¶ 81), further suggesting that determining the noise’s source and controlling that noise to improve sessions are desirable in Swierk. *See id.* ¶ 81, Fig. 5. Thus, Barbieri’s teachings are reasonably applicable to Swierk as explained. *See* Final Act. 9; Ans. 7.

For the foregoing reasons, Appellants have not persuaded us of error in the rejection of claims 1, 5, 18, 20, and 21.

*Claim 2*

Claim 2 depends from claim 1 and recites, in pertinent part, “at least one noise level measurement . . . is a headset wearer speech level during a telephone call.” Appeal Br. 27 (Claims App’x). Appellants assert Swierk teaches measuring ambient noise and voice quality, but argue Swierk does not teach “measuring a headset wearer speech level as a noise level.” *Id.* at 20. We are unpersuaded.

Swierk’s GUI allows a moderator to see each participant’s noise level (e.g., 503), voice quality, and audio signal quality, including speaker loudness. *See id.* ¶¶ 73, 88–90, *cited in* Final Act. 9; *see also* Swierk, Fig. 5 (discussed in Swierk ¶ 90). Swierk further discusses or suggests a participant may be wearing a headset, which provides feedback information if the participant is introducing unwanted noise. *See id.* ¶¶ 83, 85, 90, *cited in* Final Act. 9. Swierk thus at least suggests the participant’s noise level shown in Figure 5 (the claimed “noise level measurement”) is a headset wearer speech level during a telephone call as claim 2 recites.

For the foregoing reasons, Appellants have not persuaded us of error in the rejection of claim 2.

*Claim 3*

Claim 3 recites “[t]he method of claim 1, further comprising: identifying a geographical area within the same building space having a higher noise level and a geographical area within the same building space having a lower noise level.” Appeal Br. 27 (Claims App’x). For this claim, Appellants assert the Examiner maps paragraphs 73–90 in Swierk to claim 3,

arguing “Swierk teaches measuring noise at different *remote locations*, not identifying geographical areas within a same building space having a higher and lower noise level.” *Id.* at 20–21.

We find no error in the Examiner’s findings and conclusion. First, although Swierk may suggest some participants may be outside the building in some embodiments (e.g., 105-A–105-N in Figure 1), Swierk also suggests these same participants may be within the same building but remote from a conference room. *See* Swierk ¶ 36, Fig. 1. Second, Appellants’ arguments fail to consider the Examiner’s reliance on Barbieri, when combined with Swierk, to teach receiving noise level measurements located within a same building space as recited in claim 1, from which claim 3 depends. *See* Final Act. 8–9 (citing Barbieri ¶¶ 2–3, 12–16, 35–37, 40, and 49). In particular, Barbieri teaches a control unit coordinates the sound output of various devices within a same building space (e.g., a living room and kitchen). *See* Barbieri ¶¶ 12–14, 34–37, 49, Fig. 1. Barbieri, when combined with Swierk, at least suggest “identifying a geographical area within the same building space having a higher noise level and a geographical area within the same building space having a lower noise level” as claim 3 recites. In this regard, Appellants’ arguments regarding Swierk’s alleged individual shortcomings (*see* Appeal Br. 20–21) are unavailing because the rejection is not based solely on Swierk individually, but rather on Swierk’s and Barbieri’s collective teachings. *See In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

For the foregoing reasons, Appellants have not persuaded us of error in the rejection of claim 3.

*Claims 10–12 and 14*

Appellants present arguments for independent claim 10. *See* Appeal Br. 22–23; Reply Br. 31. Dependent claims 11, 12, and 14 are not separately argued. *See* Appeal Br. 22–23. We select claim 10 as representative. *See* 37 C.F.R. § 41.37(c)(1)(iv).

In pertinent part, claim 10 recites “identifying with the computing device a geographical area within the same building space having a higher noise level and a geographical area within the same building space having a lower noise level.” Appeal Br. 28 (Claims App’x). This limitation is similar to that recited in claim 3, and Appellants present similar arguments. *See id.* at 23. We are not persuaded the rejection of claim 10 is in error and refer to the above discussion of claim 3 for more details.

Additionally, Appellants contend claim 10 is allowable for the reasons provided in claim 1. *See id.* We are not persuaded the rejection of claim 1 is in error and refer above for more details.

For the foregoing reasons, Appellants have not persuaded us of error in the rejection of claims 10–12 and 14.

*Claims 4, 13, and 22*

Claim 4 depends from claim 3 and further recites “providing location services to a user directing the user to the geographical area having the higher noise level or the geographical area having the lower noise level.” Appeal Br. 27 (Claims App’x). The Examiner finds paragraphs 73–90 of Swierk disclose the features in claim 4. *See* Final Act. 9–10 (citing Swierk ¶¶ 73–90). In response, Appellants contend paragraphs 73–90 of Swierk do not mention “providing directional location services” in claim 4. *See* Appeal Br. 21. We agree.

During examination of a patent application, a claim is given its broadest reasonable construction “in light of the specification as it would be interpreted by one of ordinary skill in the art.” *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (internal citations and quotations omitted). According to Appellants’ Specification, a location service directs a user to a geographical area having a higher or lower noise level. *See Spec.* ¶¶ 23 (disclosing “direct the user to the location of a ‘hot spot’ or ‘quiet zone’” using generated map), 38, 40, 77, 80, 83 (disclosing “directing the user 910 to room 902” within map of floor plan 900), Fig. 9. Thus, based on the Specification, “providing location services to a user directing the user to the geographical area” in claim 4 includes a service that directs a user to specific hot spot or zone using a generated map to navigate to its specific geographical area.

Given this claim construction, we find the Examiner’s reliance on Swierk insufficient. Swierk’s collaboration session at best suggests directing a moderator’s attention to a particular participant with high noise level and recommending that this participant find a quieter location. *See Swierk* ¶¶ 73–90. These teachings do not suggest sufficiently using a location service that directs a user to a specific hot spot or quiet zone, which is “an interpretation that is ‘consistent with the specification.’” *In re Smith Int’l, Inc.*, 871 F.3d 1375, 1382–83 (Fed. Cir. 2017) (quoting *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997)).

For the foregoing reasons, Appellants have persuaded us of error in the rejection of claim 4, and claims 13 and 22 which recite commensurate limitations.

*Claims 7, 8, 17, and 19*

Claim 7 depends from claim 1 and further recites “adjusting the output of a sound masking noise utilizing the plurality of noise level measurements comprises: adjusting a sound masking volume level.” Appeal Br. 28 (Claims App’x). Claim 8 depends from claim 1 and further recites “adjusting the output of a sound masking noise utilizing the plurality of noise level measurements comprises: adjusting a sound masking sound type from a first masking sound type to a second masking sound type.” *Id.*

The Examiner finds L’Esperance teaches these claim limitations. *See* Final Act. 10 (citing L’Esperance Abstract, ¶¶ 5, 34–39). For both claims 7 and 8, Appellants contend “[the] Examiner has articulated no reasoning why it would be obvious to modify Swierk to incorporate the teachings of L’Esperance.” Appeal Br. 21–22.

We are unpersuaded. Notably, Appellants’ contentions fail to consider the Examiner’s articulated reasoning to combine L’Esperance with Swierk with respect to claim 1. *See* Final Act. 8; Ans. 7. As discussed above, we find the Examiner has articulated reasoning with some rational underpinning to combine L’Esperance with Swierk to support the conclusion of obviousness, including improving upon Swierk’s solution to reduce undesired noises. *See* Ans. 6–7; *see also* *KSR*, 550 U.S. at 417.

For the foregoing reasons, Appellants have not persuaded us of error in the rejection of claims 7 and 8, and claims 17 and 19, which recite respective commensurate limitations.

*Claim 9*

Claim 9 depends from claim 1 and further recites “adjusting a lighting level or a lighting color in the same building space.” Appeal Br. 28 (Claims

App’x). For this claim, Appellants assert Swierk teaches adjusting colors on a screen, but argue Swierk does not teach adjusting lighting because the ordinary meaning of lighting is “equipment in a home, workplace, studio, theater or street for producing light.” *Id.* at 22 (citing “Google Definitions”).<sup>4</sup>

We are unpersuaded of error. Appellants do not explain why Swierk’s display (e.g., a monitor) fails to teach or suggest their proposed construction of “lighting” or why changing a color on Swierk’s display fails to teach or suggest adjusting a lighting color. Swierk’s Figure 5 illustrates a screenshot of GUI 500 that a moderator views. *See Swierk* ¶ 88, *cited in Final Act. 11*. Swierk’s GUI 500 provides the moderator visual cues of each participant’s voice quality. *See id.* ¶ 89, *cited in Final Act. 11*. Notably, the color red is displayed in GUI 500 if a participant’s voice quality is below a low threshold value, and the color green is displayed if the participant’s voice quality is above a high threshold value. *See id.* Swierk, then, at least suggests adjusting a lighting color in a same building space where the moderator’s GUI 500 is located. Moreover, Swierk’s screen-based display effectively functions as lighting, and is also equipment in a workplace. Thus, even under Appellants’ definition of the term “lighting” (Appeal Br. 22), Swierk at least suggests “adjusting . . . a lighting color in the same building space” as claim 9 broadly recites.

For the foregoing reasons, Appellants have not persuaded us of error in the rejection of claim 9.

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<sup>4</sup> We note the underlying source of definitions in “Google Definitions” is unclear from record.

OBVIOUSNESS REJECTION OVER SWIERK, BARBIERI,  
L'ESPERANCE, AND LLOYD

Claims 5 and 14 are additionally rejected under § 103 over Swierk, Barbieri, L'Esperance, and Lloyd. *See* Final Act. 11–12. Appellants do not separately argue this rejection. *See* Appeal Br. 24–25. We sustain the rejection for reasons similar to those discussed above for claims 1 and 10, from which claims 5 and 14 respectively depend.

OBVIOUSNESS REJECTION OVER SWIERK, BARBIERI,  
L'ESPERANCE, AND GOPALAKRISHNAN

Claims 6 and 15 are rejected under § 103 over Swierk, Barbieri, L'Esperance, and Gopalakrishnan. Final Act. 12–13. Appellants argue claims 6 and 15 as a group. *See* Appeal Br. 24–25. We select claim 6 as representative. *See* 37 C.F.R. § 41.37(c)(1)(iv).

Claim 6 depends from claim 1 and further recites, in pertinent part, “at least one mobile device in the plurality of mobile devices comprises a headset, the method further comprising: detecting a headset worn state of the headset.” Appeal Br. 27–28 (Claims App’x). Appellants argue Swierk does not teach “detecting the worn condition of a headset” because “[t]he ordinary meaning of ‘state’ is the ‘particular condition something is in.’” Appeal Br. 25 (citing “Google Definitions”).

We are unpersuaded of error. The phrase “headset worn state” in claim 6 is broader in scope than a *worn condition* of a headset as argued. *Id.* For example, Merriam-Webster Online Dictionary defines “worn” as the

“past participle of wear”<sup>5</sup> and “wear” as “to bear or have on the person.”<sup>6</sup> The Specification also discusses a headset donned or worn on the user’s ear. *See Spec.* ¶ 25. Thus, a broad, but reasonable construction of “a headset worn state” in light of the disclosure includes a state indicating the person has donned a headset. Swierk’s moderator receives context input including “a type of microphone or speaker apparatus being used (e.g., built-in microphone or headset).” Swierk ¶ 85, *cited in* Final Act. 12. Swierk, then, at least suggests detecting whether a headset is being worn by a participant (the claimed “headset worn state of the headset”) as recited.

For the foregoing reasons, Appellants have not persuaded us of error in the rejection of claims 6 and 15.

#### DECISION

We affirm the Examiner’s rejections of (1) claims 1–3, 5, 7–12, 14, and 17–21 under § 103 as unpatentable over Swierk, Barbieri, and L’Esperance, (2) claims 5 and 14 under § 103 as unpatentable over Swierk, Barbieri, L’Esperance, and Lloyd, and (3) claims 6 and 15 under § 103 as unpatentable over Swierk, Barbieri, L’Esperance, and Gopalakrishnan.

We reverse the Examiner’s rejections of (1) claims 1–15 and 17–22 under § 101, and (2) claims 4, 13, and 22 under § 103 as unpatentable over Swierk, Barbieri, and L’Esperance.

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<sup>5</sup>*Worn*, The Merriam-Webster Online Dictionary Dictionary, *available at* <https://www.merriam-webster.com/dictionary/worn> (last visited Apr. 5, 2019)

<sup>6</sup> *Wear*, The Merriam-Webster Online Dictionary Dictionary, *available at* <https://www.merriam-webster.com/dictionary/wear> (def. 1) (last visited Apr. 5, 2019).

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No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED-IN-PART