United States Court of Appeals for the Federal Circuit

COREPHOTONICS, LTD.,
Appellant

v.

APPLE INC.,
Appellee

2022-1340, 2022-1341

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2020-00487, IPR2020-00860.

COREPHOTONICS, LTD.,
Appellant

v.

APPLE INC.,
Appellee

2022-1455, 2022-1456

Appeals from the United States Patent and Trademark Office, Patent Trial and Appeal Board in Nos. IPR2020-00861, IPR2020-00862.

Decided: October 16, 2023

BRIAN DAVID LEDAHL, Russ August & Kabat, Los Angeles, CA, argued for appellant. Also represented by MARC A. FENSTER, NEIL RUBIN, JAMES S. TSUEI.

DEBRA JANECE MCCOMAS, Haynes and Boone, LLP, Dallas, TX, argued for appellee in 2022-1340. Also represented by ANDREW S. EHMKE; DAVID W. O'BRIEN, HONG SHI, Austin, TX; ANGELA M. OLIVER, Washington, DC. Also argued by ERIN MARIE BOYD LEACH, Orrick, Herrington & Sutcliffe LLP, Irvine, CA, in 2022-1455. Also represented by MARK S. DAVIES, Washington, DC.

Before STOLL, LINN, and STARK, *Circuit Judges*.

STARK, *Circuit Judge.*

Corephotonics, Ltd. ("Corephotonics") appeals final written decisions ("Decisions") of the Patent Trial and Appeal Board ("Board") concluding that claims of U.S. Patent Nos. 9,661,233 ("'233 patent"), 10,230,898 ("'898 patent"), 10,326,942 ("'942 patent"), and 10,356,332 ("'332 patent") (collectively, the "Challenged Patents") are unpatentable

as obvious. The Decisions were each issued in *inter partes* reviews ("IPR") initiated by Apple Inc. ("Apple").[1]

Corephotonics principally challenges the Board's analogous art findings, arguing that the Board made two procedural errors and one substantive error. In terms of procedure, Corephotonics contends that the Board erred (1) by permitting Apple to cure the legally flawed analogous art contention it made in its petition and (2) by making analogous art findings that deviated from the contentions Apple advocated for in its petition and reply. As for substance, Corephotonics asserts that prior art references U.S. Patent Application Publication No. 2012/0026366 ("Golan") and U.S. Patent No. 8,081,206 ("Martin") are not analogous art.

We identify no procedural error in the Board's handling of whether Golan and Martin are analogous art. We

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[1] Appeal Nos. 22-1340 and 22-1341 concern the '233 and '942 patents, respectively. Appeal Nos. 22-1455 and 22-1456 concern the '898 and '332 patents, respectively. We consolidated Appeal Nos. 22-1340 and 22-1341 and separately consolidated Appeal Nos. 22-1455 and 22-1456. Each of the consolidated appeals has its own Joint Appendix. For simplicity, when we cite to a reference included in both Joint Appendices, we include the citation only for No. 22-1340/1341. We make clear where we are citing solely to the appendix in No. 22-1455/1456 (which we refer to with the designation "No. 1455").

There are no material differences between the written descriptions of the '233 and '942 patents or between the written descriptions of the '898 and '332 patents. We cite to the '233 patent alone when describing both the '233 and '942 patents and to the '898 patent alone when describing both the '898 and '332 patents.

further hold that the Board's determination that Golan is analogous art is supported by substantial evidence. However, we vacate and remand the Board's obviousness determination for the Board to explain why Martin is (or is not) analogous art and how this finding affects its overall conclusion as to obviousness.

I

A

The Challenged Patents relate to dual-aperture camera systems and disclose techniques for using the images from both lenses when zooming while capturing video. '233 patent 3:28-30, 49-54; '898 patent 3:26-28, 36-41. Typically, a dual-aperture camera system includes a wide-lens camera and a tele-lens camera.[2] When zooming in, the disclosed dual-aperture camera systems can switch from the wide-lens camera to the tele-lens camera, and when zooming out the opposite can occur.

The wide-lens camera has a larger field of view than the tele-lens camera. "Field of view" refers to the extent of the observable world a camera system is capable of capturing; that is, whether the camera captures a relatively larger or smaller area. Generally**,** a wide-lens camera produces images with a larger field of view than a tele-lens camera can, as the tele-lens camera has greater magnification. Field of view is a mechanical property of the camera (including the lens) and does not change when the camera is moved to a different location.

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[2] Each imaging device in the camera system contains both a lens assembly and a sensor array. The field of view is determined by the lens assembly's properties. For simplicity, we refer to the imaging devices in their entirety based on their lenses.

Within a dual-aperture camera system, the wide-lens camera and the tele-lens camera are placed in different locations (e.g., adjacent to one another) and, thus, capture images from slightly different perspectives. This results in the wide-lens and tele-lens cameras having different points of view. In this context, "point of view" refers to how the observable world appears (and thus how it can be captured) from a particular location; that is, the perspective a camera captures from a location. A lens' point of view, therefore, changes when the camera's location is changed.

Consequently, when the dual-aperture camera system switches from the wide-lens camera to the tele-lens camera (or vice versa) while zooming in (or out), a user may see a "jump" or a discontinuous image change, because the tele lens and wide lens are in different locations and, thus, have different points of view. '233 patent 10:32-34; '898 patent 7:42-44. The Challenged Patents teach minimizing this "jump" effect by partially "matching the position, scale, brightness and color of the output image before and after the transition" from one lens to the other. '233 patent 10:36-40; *see also* '898 patent 7:46-50. In this regard, the patents explain that matching an entire image from one camera with an entire image from another camera is often impossible because the distance between an observed object and the two cameras will differ at least slightly. The patents teach that engaging in position matching only in the region of interest ("ROI") may generate a "smooth transition." '233 patent 10:43-46; *see also* '898 patent 7:53-56.

Within the portions of the field of view that are common to both the tele-lens camera and the wide-lens camera, the tele-lens camera often, but not always, produces a clearer image. *See, e.g.*, '898 patent 10:15-19. Where this is untrue – for example, if the subject of a video is out of focus in the tele-lens image – "there is no point in performing the transition [from wide-lens to tele-lens image] because no . . . resolution[] is gained." '898 Patent 10:16-17.

To account for such scenarios, the '898 and '332 patents teach *not* switching to the tele lens when the tele-lens camera's "effective resolution" is lower than that of the wide lens. '898 patent 10:2-7, 15-19. The patents explain that one way to implement the determination of when to engage in "no switching" is through calculating an "effective resolution score." '898 patent 6:16-24, 10:15-19.

Claim 1 of the '233 patent is illustrative of the claims in that patent, reciting:

> A multiple aperture zoom digital camera, comprising:
>
> > a) a Wide imaging section that includes a Wide sensor and a fixed focal length Wide lens with a Wide field of view (POV), the Wide imaging section operative to output a Wide image;
> >
> > b) a Tele imaging section that includes a Tele sensor and a fixed focal length Tele lens with a Tele POV that is narrower than the Wide POV, the Tele imaging section operative to output a Tele image; and
> >
> > c) a camera controller operatively coupled to the Wide and Tele imaging sections and configured to reduce an image jump effect seen in video output images and to provide continuous zoom video output images by executing registration between the Wide and Tele images for performing position matching to the video output images when switching from an output of the Tele imaging section to an output of the Wide imaging section or vice versa.

Claim 1 of the '942 patent is illustrative of the claims in that patent and is similar to claim 1 of the '233 patent, except that claim element c) in the '942 patent recites:

> a camera controller operatively coupled to the Wide and Tele imaging sections and configured, when providing video output images, to:
>
> > reduce an image jump effect seen in the video output images when switching from a Wide image to a Tele image by shifting the Tele image relative to the Wide image according to a distance of an object in a Tele image region of interest (ROI), and/or
> >
> > reduce an image jump effect seen in the video output images when switching from a Tele image to a Wide image by shifting the Wide image relative to the Tele image according to a distance of an object in a Wide image ROI.

Claim 1 of the '898 patent is illustrative of the claims in the '898 and '332 patents:

> A zoom digital camera comprising:
>
> > a) a Wide imaging section that includes a fixed focal length Wide lens with a Wide field of view (FOV) and a Wide sensor, the Wide imaging section operative to provide Wide image data of an object or scene;
> >
> > b) a Tele imaging section that includes a fixed focal length Tele lens with a Tele FOV that is narrower than the Wide FOV and a Tele sensor, the Tele imaging section operative to provide Tele image data of the object or scene; and
> >
> > c) a camera controller operatively coupled to the Wide and Tele imaging sections and configured to evaluate if a no-switching criterion is fulfilled or not fulfilled, wherein if the no-switching criterion is fulfilled in a zoom-in operation between a lower zoom factor (ZF) value and a higher ZF

> value at a zoom factor (ZF) higher than an up-transfer ZF, the camera controller is further configured to output a zoom video output image that includes only Wide image data, and wherein if the no-switching criterion is not fulfilled, the camera controller is further configured to output a zoom video output image that includes only transformed, digitally zoomed Tele image data.

Claims 4 and 15 of the '898 patent and claims 5 and 17 of the '332 patent (the "Effective Resolution Claims") further include the "effective resolution" "no-switching criterion" limitation. Claim 4 of the '898 patent is representative of the Effective Resolution Claims:

> The camera of claim 1; wherein the no-switching criterion includes an effective resolution of the Tele image being lower than an effective resolution of the Wide image.

B

Two prior art references are part of all of the obviousness grounds Apple presented in its IPR petitions: Golan and Martin.

Golan describes camera systems using multiple imaging sensors and lens assemblies to zoom without using a lens with a mechanically adjustable focal length. By providing "multiple imaging devices each with a different fixed field of view (FOV)," Golan's system "facilitates a light weight electronic zoom with a large lossless zooming range." J.A. 5525 (Golan ¶ 9). Specifically, Golan teaches digitally zooming with the wide lens until a higher resolution image is fully capturable with the tele lens and then digitally zooming with that higher resolution tele-lens image. To prevent a discontinuity or "jump" from occurring when switching between images while zooming, Golan teaches a one-time calibration technique to correct for the lenses' different points of view.

Martin describes methods "for producing two-dimensional images that, upon display, can be perceived to be three-dimensional without the use of special viewing aids." J.A. 5535 (Martin 1:17-20). Among other things, Martin teaches capturing images of the same scene from two different points of view (that is, parallax images) and then displaying the images in an alternating fashion to the viewer to create the appearance of three-dimensionality. Martin further discloses "critically aligning" the images to create a stable three-dimensional image. This alignment process requires manipulating the captured images so that "a region of interest in [one] image . . . is positioned such that it occupies the same location within the frame of" another image. J.A. 5536 (Martin 4:33-35).

Apple additionally relies on Japanese Patent Application No. JP2011-55246 ("Togo") for the teaching of the "effective resolution" "no-switching criterion" limitation in the Effective Resolution Claims.[3] Togo explains that using a wide lens together with a tele lens to zoom can create problems if the subject of the image is out of focus for one of the lenses. Typically, a tele lens is designed to have subjects that are far from the camera be in focus. This means that if the subject is close to the tele lens, the subject will be blurry. Togo teaches using a tele lens that is focused in the distance, but suggests not switching to it while zooming if the subject of the camera is sufficiently close.

C

Corephotonics filed suit against Apple alleging infringement of the Challenged Patents (among others). *See* Complaint, *Corephotonics, Ltd. v. Apple, Inc.*, No. 3:17-cv-06457 (N.D. Cal Nov. 6, 2017). In response, Apple

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[3] We rely on an English translation of Togo, the accuracy of which is not at issue in this appeal.

petitioned for IPR on all claims (i.e., claims 1-18) of the '233 patent; claims 1, 4, 8-12, 15, and 19-20 of the '898 patent; all claims (i.e., claims 1-25) of the '942 patent; and claims 1-2, 5, 9-14, 17, and 21-22 of the '332 patent. Each of Apple's grounds for unpatentability relied on combining Golan and Martin along with other references. With the exception of Togo, these other references are not relevant to the issues raised on appeal. The Board instituted the IPRs and ultimately found all challenged claims of the Challenged Patents unpatentable as obvious over Apple's combinations of prior art.

Broadly, three of the Board's conclusions are at issue on appeal. First, the Board found that both Golan and Martin are analogous prior art. Second, the Board construed "shifting the [t]ele image relative to the [w]ide image according to a distance of an object in a [t]ele image region of interest (ROI)" and "by shifting the [w]ide image relative to the [t]ele image according to a distance of an object in a [w]ide image ROI" in the '942 patent to include translating or shifting images based on indirect measures of distance (rather than only direct measures). Based in part on this understanding of the "shifting" terms, the Board found that Martin discloses the "shifting" limitation of the challenged claims of the '942 patent. Third, the Board rejected Corephotonics' proposed construction of "effective resolution" as "effective resolution score," construing it instead as "image quality including but not limited to blurriness and sharpness." Based on this construction, the Board found that Togo taught the "effective resolution" "no-switching criterion" limitation contained in the "Effective Resolution Claims."

Corephotonics timely appealed.[4]

II

A

We review Board decisions pursuant to the standards of the Administrative Procedure Act ("APA"), 5 U.S.C. § 550 et seq. Under the APA, we "hold unlawful and set aside agency action . . . not in accordance with law [or] . . . without observance of procedure required by law." 5 U.S.C. § 706. Thus, in an appeal from an IPR, we review the Board's legal determinations de novo and its factual findings for substantial evidence. *See Almirall, LLC v. Amneal Pharms. LLC*, 28 F.4th 265, 271 (Fed. Cir. 2022). Substantial evidence is "such relevant evidence as a reasonable mind might accept as adequate to support a conclusion." *Consol. Edison Co. v. NLRB*, 305 U.S. 197, 229 (1938). "[T]he possibility of drawing two inconsistent conclusions from the evidence does not prevent an administrative agency's finding from being supported by substantial evidence." *Consolo v. Fed. Mar. Comm'n*, 383 U.S. 607, 620 (1966).

Because IPRs are formal adjudications, the APA also requires that the parties to IPRs receive notice of arguments and evidence and have an opportunity to be heard with respect to them. *See Genzyme Therapeutic Prods. Ltd. v. Biomarin Pharm. Inc.*, 825 F.3d 1360, 1365-66 (Fed. Cir. 2016). "[F]air notice and an opportunity to respond" is required in "all aspects of an IPR proceeding." *Nike, Inc. v. Adidas AG*, 955 F.3d 45, 53 (Fed. Cir. 2020).

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[4] The Board had jurisdiction under 35 U.S.C. § 316(c). We have jurisdiction under 28 U.S.C. § 1295(a)(4)(A) and 35 U.S.C. §§ 141(c), 319.

IPR proceedings are creations of the America Invents Act (AIA), 35 U.S.C. § 311, and must also proceed according to the requirements set out by that statute. As the Supreme Court has stated, in an IPR "the petitioner's contentions, not the Director's discretion, define the scope of the litigation all the way from institution through to conclusion." *SAS Inst., Inc. v. Iancu*, 138 S. Ct. 1348, 1357 (2018); *see also* 35 U.S.C. § 312(a)(4). The IPR petition, thus, must provide an understandable explanation of the element-by-element specifics of the patentability challenges, including the identification of particular portions of prior art on which the petitioner is relying. *See* 35 U.S.C. § 312(a)(3); 37 C.F.R. §§ 42.22(a)(2), 42.104(b)(3)-(4); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363-64 (Fed. Cir. 2016); *Ariosa Diagnostics v. Verinata Health, Inc.*, 805 F.3d 1359, 1367 (Fed. Cir. 2015). "It is of the utmost importance that petitioners in the IPR proceedings adhere to the requirement that the initial petition identify 'with particularity' the 'evidence that supports the grounds for the challenge to each claim.'" *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369 (Fed. Cir. 2016) (quoting 35 U.S.C. § 312(a)(3)). "Unlike district court litigation – where parties have greater freedom to revise and develop their arguments over time and in response to newly discovered material – the expedited nature of IPRs bring with it an obligation for petitioners to make their case in their petition to institute." *Id.* Given these "strict . . . requirements," *id.*, the Board is not permitted to entertain "[s]hifting arguments" but must, instead, reject any "entirely new theory of *prima facie* obviousness absent from the petition," if the petitioner attempts to inject such a theory into the proceeding post-petition, *Wasica Fin. GmbH v. Cont'l Auto. Sys., Inc.*, 853 F.3d 1272, 1286 (Fed. Cir. 2017); *see also Sirona Dental Sys. GmbH v. Institut Straumann AG,* 892 F.3d 1349, 1356 (Fed. Cir. 2018) (stating Board is not permitted "to deviate from the grounds in the petition and raise its own obviousness theory"); *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1336 (Fed. Cir. 2020)

(holding Board erred by raising its own obviousness theory based on combination of references not provided in petition).

The patent owner may file a preliminary patent owner response to a petition. *See* 37 C.F.R. § 42.107(a). Thereafter, the Board makes a decision whether to institute the requested IPR, based on whether it finds, as a preliminary matter, a reasonable likelihood the petitioner will succeed. *See* 35 U.S.C. § 314. This institution decision is not reviewable. *See Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 276 (2016) ("We therefore conclude that § 314(d) bars Cuozzo's efforts to attack the Patent Office's determination to institute inter partes review in this case."). We may, however, "review determinations made during institution that are subsequently incorporated into the Board's final written decision." *In re Magnum Oil Tools Int'l, Ltd.*, 829 F.3d 1364, 1374 (Fed. Cir. 2016).

After institution, the patent owner files a response, to which the petitioner then replies. *See* 37 C.F.R. §§ 42.23(b), 42.120(a). The petitioner's "reply may only respond to arguments raised in the corresponding opposition, patent owner preliminary response, patent owner response, or decision on institution." § 42.23(b). "[A]n IPR petitioner may not raise in reply an entirely new rationale for why a claim would have been obvious." *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1330-31 (Fed. Cir. 2019) (internal quotation marks omitted). Any marked departure from the grounds identified with particularity in the petition would impose "unfair surprise" on the patent owner and, consequently, violate both the APA and the IPR statute. *Arthrex Inc. v. Smith & Nephew, Inc.*, 935 F.3d 1319, 1328 (Fed. Cir. 2019).

It is for the Board to determine what grounds are being articulated in a petition and what arguments and evidence are being referred to in the responses and any replies. *See,*

e.g., *Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1366 (Fed. Cir. 2023); *Ariosa Diagnostics*, 805 F.3d at 1368. In particular, the Board has discretion to determine "whether a [p]etition identified the specific evidence relied on in a [r]eply and when a [r]eply contention crosses the line from the responsive to the new." *Ariosa*, 805 F.3d at 1368. We review the Board's assessments of what has been argued to and put before it in an IPR for abuse of discretion. *See Yita*, 69 F.4th at 1366. The Board abuses its discretion when its decision "(1) is clearly unreasonable, arbitrary, or fanciful; (2) is based on an erroneous conclusion of law; (3) rests on clearly erroneous fact finding; or (4) involves a record that contains no evidence on which the Board could rationally base its decision." *Ericsson Inc. v. Intell. Ventures I LLC*, 901 F.3d 1374, 1379 (Fed. Cir. 2018).

Following completion of all briefing and oral hearing, the petitioner must prove invalidity of any challenged claim by a preponderance of the evidence. *See Magnum Oil*, 829 F.3d at 1375 (citing 35 U.S.C. § 316(e)). This burden of persuasion remains with the petitioner at all times. *See Sanofi-Aventis Deutschland GmbH v. Mylan Pharms. Inc.*, 66 F.4th 1373, 1377 (Fed. Cir. 2023). In evaluating whether the petitioner has met its burden, the Board must consider all evidence and argument properly submitted in connection with the petitioner's reply, as well as all that is submitted in connection with the petition. *See Magnum Oil*, 829 F.3d at 1376 ("[The] fact finder must consider *all* evidence of obviousness and nonobviousness before reaching a determination."). Once an issue is fairly presented in a petition and made the subject of dispute by the patent owner's response, the Board is free to make its own factual findings grounded in the evidence presented to it, without being bound to choose between the specific positions the parties advocated. *See Fanduel, Inc. v. Interactive Games LLC*, 966 F.3d 1334, 1344 (Fed. Cir. 2020) ("[I]n every case, it remains the Board's essential function to make factual findings *based on its view of the record*.") (emphasis added).

B

A patent is invalid as obvious "if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains." 35 U.S.C. § 103 (2011).[5] In determining whether a claim is invalid as obvious, we compare the prior art to the claim language, and if necessary, after the claim language has been properly construed when the meaning or scope is in dispute. *See U.S. Surgical Corp. v. Ethicon, Inc.*, 103 F.3d 1554, 1568 (Fed. Cir. 1997). Claim construction based solely on intrinsic evidence is a question of law. *See Teva Pharms. USA, Inc. v. Sandoz, Inc.*, 574 U.S. 318, 331 (2015).

"Obviousness is a legal question based on underlying findings of fact." *Fleming v. Cirrus Design Corp.*, 28 F.4th 1214, 1221 (Fed. Cir. 2022). Among those issues of fact is what the prior art discloses to an ordinarily skilled artisan. *See id.* "What the prior art discloses and whether a person of ordinary skill would have been motivated to combine prior-art references are both fact questions that we review for substantial evidence." *Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1378 (Fed. Cir. 2023); *see also Bot M8 LLC v. Sony Interactive Ent. LLC*, 66 F.4th 1380, 1384 (Fed. Cir. 2023).

Prior art references are applicable to the obviousness inquiry only when they are analogous to the claims being challenged. *See In re Clay*, 966 F.2d 656, 658 (Fed. Cir.

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[5] The Challenged Patents have effective filing dates later than March 16, 2013. Therefore, we apply § 103 as amended by the Leahy-Smith America Invents Act. *See* 35 U.S.C. § 100 note.

1992); *see also In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004). Art that is "too remote" from the patents being attacked cannot be treated as prior art. *In re Sovish*, 769 F.2d 738, 741 (Fed. Cir. 1985); *see also In re Oetiker*, 977 F.2d 1443, 1447 (Fed. Cir. 1992) ("The combination of elements from non-analogous sources, in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a *prima facie* case of obviousness."). We use "[t]wo separate tests [to] define the scope of analogous 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." *Airbus S.A.S. v. Firepass Corp.*, 941 F.3d 1374, 1379 (Fed. Cir. 2019) (internal quotation marks omitted). "The Board's determination that a prior art reference is analogous art . . . presents an issue of fact, reviewed for substantial evidence." *In re ICON Health & Fitness, Inc.*, 496 F.3d 1374, 1378 (Fed. Cir. 2007).

"To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petition must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness." *Magnum Oil*, 829 F.3d at 1380. It is not always necessary for a petition to expressly address analogousness. For instance, it may be clear from the petition's description of the references and the challenged claims that prior art is in the same field of endeavor as the challenged patent, or the pertinence of the prior art to the problem solved by the invention may be implicit in the petition's discussion of the challenged claims and why a person of ordinary skill would be motivated to combine the prior art references with a reasonable expectation of success.

III

Because it is central to the issues we must decide in this appeal, we carefully set out here what the parties and the Board said about the analogousness of Apple's prior art references at each stage of the proceedings below.

In its petitions, Apple said of Golan and Martin that these "references are analogous prior art and are in the *same field of endeavor* pertaining to imaging systems generating video output images using two imaging sections having different points of view." J.A. 1023-24 (emphasis added); *see also* J.A. 10023-24; No. 1455 J.A. 1024, 10023. Apple further explained that "Golan discloses providing continuous video output images using an image acquisition system 'having multiple imaging devices' having different points of view," and "[s]imilarly, Martin discusses 'display [of] alternating views of two or more parallax images' from cameras having different points of view to 'create a resultant moving image.'" J.A. 1023-24 (second bracketing in original); *see also* J.A. 10023-24; No. 1455 J.A. 1024, 10023. Apple's petitions were ambiguous; they did not make clear whether Apple was stating that Golan and Martin are in the same field of endeavor as the Challenged Patents or, instead, merely that Golan and Martin are in the same field of endeavor as one another.

This ambiguity was present in the expert declaration Apple attached to each of its petitions. In the declaration, Dr. Frédo Durand opined:

> [T]he references are analogous prior art and are in the same field of endeavor pertaining to imaging systems generating video output images using images from two imaging sections having different points of view . . . . [B]oth Golan and Martin disclose imaging systems for generating video output

> images using two imaging sections having different points of view.

J.A. 5410-11; *see also* J.A. 15457; No. 1455 J.A. 5462, 15228. There is no express reference in either Apple's petitions or attached expert declarations to the field of endeavor of the Challenged Patents themselves. Nor is there any explicit contention that Golan and Martin are analogous *because* they are pertinent to the problem faced by the inventors of the Challenged Patents.

Corephotonics did not call attention to these issues in its patent owner preliminary response. Instead, while Corephotonics opposed institution, and argued that the petition failed to demonstrate a motivation to combine Golan and Martin, and more generally failed to establish the reasonable likelihood that Apple could make out a *prima facie* case of obviousness, Corephotonics did not specifically argue that Apple's analogous art contentions were in any way deficient. *See Apple Inc. v. Corephotonics, Ltd.*, IPR2020-00860, Paper 6 at *10 (P.T.A.B. Aug. 6, 2020) ("The petition argues that Golan and Martin are 'analogous prior art and are in the same field of endeavor' . . . . Even if these arguments are accepted as true, they do not establish the necessary motivation to combine the two references.").

Unsurprisingly, then, in its institution decision, the Board also did not address the issue of whether Apple had said enough to satisfy its obligation to establish Golan and Martin are analogous art. The Board found that Apple's rationale for a motivation to combine the references was sufficient for the institution stage. *See Apple Inc. v. Corephotonics, Ltd.*, IPR2020-00860, Paper 7 at *19-27 (P.T.A.B. Nov. 5, 2020).

After the IPRs were instituted, Corephotonics filed its patent owner response, and there it pointed to what it contended was a deficiency in how Apple had addressed the analogous art issue at the petition stage. *See* J.A. 1246; J.A. 10205; No. 1455 J.A. 1499, 10507. Specifically,

Corephotonics suggested Dr. Durand's "analysis appears to be limited to comparing Golan and Martin *with one another* and opining that they are in the 'same field of endeavor,'" which "is insufficient because it fails to apply the correct legal test and yield the correct analysis for whether Golan and Martin are analogous art." J.A. 1246; *see also* J.A. 10205-06.

Thereafter, in its replies, Apple clarified its position, explicitly arguing that the Challenged Patents, Golan, and Martin are *all* in the same field of endeavor. J.A. 1279, 10265-66; No. 1455 J.A. 1264, 10264. Further, Apple's replies (which differed slightly across the IPRs but were materially identical) added, for the first time, that the two prior art references were also *pertinent to the problem* faced by the inventors of the Challenged Patents. The following excerpt, from the IPR related to the '233 patent, is representative of Apple's replies:

> [L]ike the '233 Patent, Golan and Martin are all in the *field of imaging systems*, and more specifically, imaging systems including digital cameras generating video output images using two imaging sections having different points of view . . . . [Also], Golan and Martin are each *pertinent to the problem* addressed in the '233 Patent, namely, "a 'jump' (discontinuous) image change" "[w]hen a dual-aperture camera switches the camera output between sub-cameras or points of view."

J.A. 1279-80 (emphasis added); *see also* J.A.10265-67 (reply in IPR of '942 patent); No. 1455 J.A. 1264, 10264 (replies in IPRs of '898 and '332 patents describing pertinent problem as "achieving a continuous, smooth zoom in video mode") (internal quotation marks omitted).

Corephotonics filed a sur-reply, complaining that Apple's reply "raises completely new arguments, supported by Dr. Durand's new reply declaration opinions, that Golan

and Martin are 'analogous art' to the . . . patent for purposes of its challenge." J.A. 1318. Corephotonics stated that it was prejudiced by being "prohibited from submitting expert opinion or factual evidence of its own to dispute Apple's new arguments and evidence." J.A. 1318-19. Still, Corephotonics proceeded to respond to Apple's allegedly new allegation that Martin was pertinent to the problem addressed by the Challenged Patents:

> [T]he problem addressed by the '233 patent is, in relevant part, image discontinuities perceived by a user of a digital camera on a display when the video image output switches between one camera and another *during zoom* . . . . Martin, in contrast to the '233 patent, is not concerned with reduction of jump effects in video output images when switching between cameras during zoom . . . . Because Martin is "directed to a different purpose" than the '233 patent, "the inventor would accordingly have had less motivation to consider it" to be "analogous art." *In re Clay*, 966 F.2d 656, 659 (Fed. Cir. 1992).

J.A. 1320-22 (sur-reply in IPR of '233 patent); *see also* J.A. 10315-18 (sur-reply in IPR of '942 patent); No. 1455 J.A. 1309-10, 10308-09 (sur-replies in IPRs of '898 and '332 patents).

The issue of analogous art received extensive attention during oral argument in each of the IPRs, mostly focused on whether Golan and Martin are analogous to the Challenged Patents. *See* J.A. 1514-16, 1525-26, 10575-76; No. 1455 J.A. 1363, 1399, 1402-03. But there was also some discussion of whether Apple had lost the opportunity even to try to satisfy the analogous art requirement, given how it had handled the matter in its petition. Corephotonics argued, in the IPR concerning the '233 patent, for example:

> [T]he petition failed to meet their prima facie case of showing that it's analogous art because, as they later admit, they didn't apply the right standard in

> their petition so they made no showing that Martin was analogous art. Using the proper standard they tried to do that on reply. That's all new, improper argument to meet their prima facie case.

J.A. 1514-16; *see also* J.A. 1525-26 ("[T]here really is no dispute that everything that they're relying on for analogous art is new from their reply."); J.A. 10575-76 ("[T]here's really no dispute that the petition failed to apply the correct legal test in determining whether or not the references were analogous for purposes of their prima facie case and so it's fascinating that in reply then petitioner came back and gave you a couple of pages of arguments, three pages in this case and five pages in the companion case, trying to convince the panel that, oh no, the references are in fact analogous to the '942 patent or the '233 patent."); No. 1455 J.A. 1402-03 ("[T]he petition failed to make the prima facie case. They applied the wrong standard and that's not really disputed.").

The Board squarely addressed the analogous art disputes in the Decisions. First, the Board agreed with Corephotonics that Apple's treatment of the analogous art issue in its petitions had been deficient. Because, at the petition stage, Apple and its expert had not explicitly mentioned or discussed the field of endeavor of the Challenged Patents, the Board understood Apple as improperly "compar[ing] Golan and Martin to each other instead of the claimed invention." J.A. 31, 102; *see also* No. 1455 J.A. 39, 113.

The Board went on, however, to explain that Apple's replies had "rectifie[d] the improper comparison and asserted that Golan and Martin are in the same field of endeavor as the claimed invention." J.A. 32, 102; *see also* No. 1455 J.A. 39, 113-14. The Board further held that Apple "properly replied to Patent Owner's criticism of its showing regarding analogous art." J.A. 32 n.11, 102 n.19; *see also* No. 1455 J.A. 39 n.20, 114 n.20. The Board considered all

of what Apple said about the analogousness of its prior art to be within the scope of a proper reply. *See* J.A. 32 n.11, 102 n.19; *see also* No. 1455 J.A. 39 n.20, 114 n.20.

On the merits, the Board's analogousness analysis was materially uniform across the four IPRs. In all of the Decisions, the Board was persuaded that:

> *Golan* is in the same *field of endeavor* as the claimed invention because it describes performing digital zoom using a wide image sensor array and lens and a tele image sensor array and lens with the goal of providing "continuous electronic zoom with uninterrupted imaging."

J.A. 32 (emphasis added); *see also* J.A. 103; No. 1455 J.A. 40, 114. The Board was also persuaded that:

> *Martin* is reasonably *pertinent to the problem* faced by the inventor: reducing an image jump effect seen in video output images when switching between cameras that have different fields of view. Both Golan and Martin have multiple cameras with differing fields of view. Martin describes the problem in terms of its solution: "[c]ritical alignment corresponds to a condition where the degree of alignment is sufficient to achieve a stable auto stereoscopic display" and "[s]tability of the whole image may not be required, as long as at least a particular region of interest in the auto stereoscopic display is stable."

J.A. 33 (emphasis added); *see also* J.A. 103; No. 1455 J.A. 40, 114-15.

IV

Corephotonics argues that the Board committed procedural and substantive errors in concluding Golan and Martin are analogous art. We find no procedural error. We also find that substantial evidence supports the Board's

findings with respect to Golan. With respect to whether Martin is analogous art, we remand for further proceedings.

A

Corephotonics argues that the Board committed various procedural errors in determining that Golan and Martin are analogous art.

1

The Board concluded that Apple's petition inadequately addressed the issue of analogous art, because it made a comparison only between Golan and Martin without comparing either reference to the Challenged Patents. *See* J.A. 31-32. As we recently explained in *Sanofi-Aventis Deutschland GmbH v. Mylan Pharms. Inc.*, 66 F.4th 1373, 1380 (Fed. Cir. 2023), a patent challenger cannot meet its burden of proving obviousness merely by arguing that a prior art reference "is analogous to another prior art reference and not the challenged patent." Whether Apple committed this error in its petitions is not an issue we must address. Rather, our review of how the Board interprets a petition is for abuse of discretion, *see Henny Penny*, 938 F.3d at 1330-31, and here we find no such abuse.

2

Corephotonics argues that the Board erred by permitting Apple to make new analogous art contentions in its reply. Specifically, Corephotonics contends the Board committed reversible error by: (1) allowing Apple to make express comparisons between Golan and Martin, on the one hand, and the Challenged Patents, on the other, when such comparisons were absent from the petition; (2) permitting Apple to expand its analogous art arguments from being based on field of endeavor to also being based on pertinence to the problem faced by the inventors of the Challenged Patents; and (3) finding that Golan and the Challenged

Patents share a field of endeavor different from the field argued by Apple, and finding that Martin is pertinent to a different problem faced by the inventors of the Challenged Patents than the problem Apple identified. We reject each of Corephotonics' contentions.

a

We begin by further explaining the permissible scope of an IPR petitioner's reply. The APA, the IPR statute, the Board's regulations, and our precedents collectively impose two separate, but related, restrictions on what a petitioner may include in its reply. First, the arguments and evidence in the reply must not be part of a *new* theory of unpatentability. Second, the arguments and evidence in the reply must be *responsive* to the patent owner's contentions or the Board's institution decision.

The "newness" restriction prohibits the petitioner from raising, in reply, "an entirely new theory of *prima facie* obviousness absent from the petition," even if the new theory is responsive to the patent owner's response or the Board's institution decision. *Wasica*, 853 F.3d at 1286; *see also* 35 U.S.C. § 312(a)(3) (requiring petition to identify "with particularity . . . the grounds on which the challenge to each claim is based"). Determining whether a reply has improperly raised a new theory or argument requires a comparison between the petitioner's petition and the petitioner's reply.

The "responsiveness" restriction limits the petitioner's reply to addressing issues presented in the patent owner responses or the Board's institution decision. That is, the reply "may only respond to arguments raised in the corresponding opposition, patent owner preliminary response, patent owner response, or decision on institution." 37 C.F.R. § 42.23(b); *see also Anacor Pharms., Inc. v. Iancu*, 889 F.3d 1372, 1380-82 (Fed. Cir. 2018) (stating petitioner "may introduce new evidence after the petition stage if the evidence is a legitimate reply to evidence introduced by the

patent owner"). Determining whether a reply is improperly non-responsive generally requires a comparison between the patent owner's and the Board's responses to the petition, on the one hand, and the petitioner's reply, on the other.

Our standard of review of the Board's application of the newness and responsiveness restrictions differs. The newness restriction stems from the statutory mandate that the petition govern the IPR proceeding, so "whether a ground the Board relied on [i]s 'new' . . . is a question of law" we review de novo. *In re Nuvasive, Inc.*, 841 F.3d 966, 970 (Fed. Cir. 2016); *see also SAS*, 138 S. Ct. at 1357. The responsiveness restriction is grounded in the Board's regulations, compliance with which we review for abuse of discretion. *See Yita LLC v. MacNeil IP LLC*, 69 F.4th 1356, 1366 (Fed. Cir. 2023).

Mindful of the newness and responsiveness restrictions, we have set down certain guideposts for what is permitted in a petitioner's reply. For example, the Board may not invalidate a patent based on a prior art reference that was not disclosed in a petition and was used in reply for a contention that was meaningfully distinct from what was identified in the petition. *See Ariosa*, 805 F.3d at 1368; *see also Rembrandt Diagnostics, LP v. Alere, Inc.*, 76 F.4th 1376, 1385 (Fed. Cir. 2023) ("[T]he petitioner in *Ariosa* relied on an embodiment of the prior art that was not discussed in the petition to switch theories between its petition and reply.") (internal quotation marks omitted). However, a reply argument is proper when it responds to the patent owner's arguments or the Board's observations without "point[ing] to any new embodiments" of a prior art reference not previously identified in the petition. *Rembrandt*, 76 F.4th at 1385 ; *see also Apple Inc. v. Andrea Elecs. Corp.*, 949 F.3d 697, 706 (Fed. Cir. 2020) ("Apple's legal ground did not change in its reply – its reply still asserted that claims . . . would have been obvious over [the same

prior art references]. Moreover, Apple's reply relies on the same algorithm from the same prior art reference to support the same legal argument."). As such, "a reply may be proper if it is responsive and simply expands on previously raised arguments." *Rembrandt*, 76 F.4th at 1384; *see also Chamberlain Grp. Inc. v. One World Techs. Inc.*, 944 F.3d 919, 925 (Fed. Cir. 2019) ("Parties are not barred from elaborating on their arguments on issues previously raised."). Furthermore, "there is no blanket prohibition against the introduction of new evidence during an IPR," provided it is an "expan[sion] on and . . . fair extension of . . . [a] previously raised . . . argument" and has a "nexus" (and is therefore responsive) to an argument made by the patent owner or the Board. *Rembrandt*, 76 F.4th at 1384-85; *see also Anacor Pharms.*, 889 F.3d at 1380-82 ("[Petitioner] may introduce new evidence after the petition stage if the evidence is a legitimate reply to evidence introduced by the patent owner . . . ."). Indeed, "the introduction of new evidence in the course of the trial is to be expected in *inter partes* review trial proceedings." *Genzyme*, 825 F.3d at 1366.

b

We now turn to the specific contentions presented in this appeal.

First, we reject Corephotonics' argument that the Board abused its discretion by permitting Apple to fix the error in its petition, which (in the Board's view) compared Golan and Martin only to one another and did not also contend that each reference was analogous to the Challenged Patents. "In evaluating whether a reference is analogous, we have consistently held that a patent challenger must compare the reference to the challenged patent." *Sanofi-Aventis*, 66 F.4th at 1377. In *Sanofi-Aventis*, the petitioner, Mylan, committed the same error, arguing that its petition satisfied the analogous art test by virtue of the comparisons it made between the prior art references themselves, without regard to the field of endeavor or problem of the

patent being challenged. *See id.* at 1378-80. After identifying this mistake, we explained that "[a] petitioner is not required to anticipate and raise analogous art arguments in its petition; instead a petitioner can use its reply" to respond to, for example, arguments raised in a patent owner response. *Id.* at 1379 (citing 37 C.F.R. § 42.23). Then we went on to consider whether Mylan had fixed its problem after filing its petition. *See id.* at 1379-80. While we concluded that nothing in Mylan's reply (or oral argument to the Board) was sufficient to cure the defect in the petition, we would not have even considered this issue had we thought it impermissible for a reply to fix the petition's error in this regard. *See id.* at 1380.

Second, we are not persuaded by Corephotonics that the Board erred in permitting Apple to argue in reply that its prior art references are analogous to the Challenged Patent because they satisfy *both* the field of endeavor and pertinent to the problem tests, even though Apple's petition only invoked the field of endeavor test. In reaching this conclusion, we rely, once again, on *Sanofi-Aventis*, which explained that a petitioner may "use its reply" to respond to the patent owner's response arguments against the references being analogous. *Id.* at 1379-80. Apple was not required to anticipate in its petition that Corephotonics would argue Golan and Martin were not in the same field of endeavor as the Challenged Patents. Once Corephotonics did so in its patent owner response, Apple was permitted to respond both by bolstering its field of endeavor argument and by adding that its prior art is pertinent to the problem faced by the inventors of the Challenged Patents.

This conclusion is consistent with the newness and responsiveness restrictions on IPR replies. There is nothing "entirely new" about arguing that the same combination of prior art references identified in a petition as being in the same field of endeavor as the patent being challenged are

also pertinent to the same problem faced by the inventor of the challenged patent. While "field of endeavor" and "pertinent problem" are "[t]wo separate tests [that] define the scope of analogous prior art," *Bigio*, 381 F.3d at 1325, they do not provide independent, different grounds for obviousness or new "rationales," but are, instead, related bases for the same, single ground of invalidation, obviousness, and are based on the same references identified with particularity in the petition. This is further reflected in the fact that the "pertinent problem" basis for analogousness is only relevant "if the reference is not within the field of the inventor's endeavor," which would make it unreasonable to require a petitioner to anticipate an attack on its field of endeavor contention and always have to address pertinent problem in the petition. *Id.*

Corephotonics had sufficient notice of Apple's position, that Golan and Martin satisfy the analogous art requirement, and adequate opportunity to respond to both the field of endeavor and pertinent to the problem aspects of it. Apple consistently relied on "the same references, the same disclosures, and the same obviousness theories advanced by the petition and debated by the parties." *Arthrex*, 935 F.3d at 1328. After receiving Apple's replies, Corephotonics deposed and cross-examined Apple's expert about the statements in his declaration that accompanied Apple's reply. Corephotonics then filed a sur-reply, in which it specifically addressed Apple's analogousness arguments. Thus, once again, we conclude that what occurred here satisfies the "newness" restriction on what is proper in an IPR reply. *See Henny Penny*, 938 F.3d at 1330–31.

Apple's reply argument, that its references are analogous prior art because they are pertinent to the problem addressed by the Challenged Patents (even if they are not found to be in the same fields of endeavor), was also properly responsive to Corephotonics' patent owner response. Corephotonics had contended in its patent owner response that Apple's handling of the analogous art issue

to that point in the process was "insufficient because it fails to apply the correct legal test and yield the correct analysis." J.A. 1246; *see also* J.A. 10205-06. This broad attack on Apple's showing made it appropriate for Apple to respond with an elaboration of the bases on which its prior art references satisfy the analogous art requirement, under one or both of the tests we have set out for doing so. *See Chamberlain*, 944 F.3d at 925 ("Parties are not barred from elaborating on their arguments on issues previously raised.").

We also disagree with Corephotonics that the Board erred by finding analogousness based on a different field of endeavor and different problem of the inventors than those expressly advocated for by Apple. Apple argued that Golan and the Challenged Patents' share the field of endeavor of "imaging systems, and more specifically, imaging systems including digital cameras [for] generating video output images using two imaging sections having different points of view," J.A. 1279 (internal quotation marks omitted); *see also* J.A. 10265; No. 1455 J.A. 1264, 10264,while the Board found their shared field of endeavor is "digital zoom using a wide image sensor array and lens and a tele image sensor array and lens with the goal of providing continuous electronic zoom with uninterrupted imaging," J.A. 32 (internal quotation marks omitted). Similarly, Apple contended that Martin was pertinent to the problem of "a jump (discontinuous) image change [w]hen a dual-aperture camera switches the camera output between sub-cameras or points of view," J.A. 1280 (internal quotation marks omitted), while the Board found that the pertinent problem Martin and the Challenged Patents' shared was "reducing an image jump effect seen in video output images when switching between cameras that have different fields of view," J.A. 33.

We find no procedural error in the Board's approach. As long as substantial evidence supported its findings – an

issue we turn to below, *see infra* Part IV.B[6] – the Board may resolve an issue the parties put in dispute by making findings supported by the evidence, regardless of whether any party advocated for that particularly expressed finding. *See Genzyme*, 825 F.3d at 1366 (Board has to make factual findings based on its view of the record); *Roku, Inc. v. Universal Elecs., Inc.*, 63 F.4th 1319, 1325 (Fed. Cir. 2023) ("The Board, in its role as factfinder in the first instance, was entitled to weigh the evidence in the record . . . ."); *see also Regents of Univ. of Cal. v. Broad Inst., Inc.*, 903 F.3d 1286, 1294 (Fed. Cir. 2018) ("It is not our role to ask whether substantial evidence supports fact-findings not made by the Board, but instead whether such evidence supports the findings that were in fact made."). While the Board may not invalidate patent claims on grounds it identifies *sua sponte* that are not actually raised by the petitioner, *see Magnum Oil*, 829 F.3d at 1381, the Board is not required to use the same words in explaining its findings as the petitioner uses in its proposed findings, *see Sirona Dental*, 892 F.3d at 1356 (explaining Board did not deviate from the petition because it used different wording). Just as the Board is not limited to selecting between the parties' proposed constructions of a disputed claim term, *see Western Geco LLC v. ION Geophysical Corp.*, 889 F.3d 1308, 1329 (Fed. Cir. 2018), so, too, the Board may make its own finding as to the field of endeavor or problem confronted by the inventors – when those issues are in dispute – even if its finding differs from the positions argued for by the parties.

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[6] The Board made no finding with respect to whether Golan is also reasonably pertinent to the problem faced by the inventors of the Challenged Patents, nor any finding as to whether Martin is also in the same field of endeavor as the Challenged Patents, even though Apple made arguments in its reply on both these points.

The Board's handling of the analogous art issue in the Decisions neither "markedly . . . departed" from the "evidence and theories presented by the petition or institution decision" nor "unfair[ly] surprise[d]" Corephotonics. *Arthrex.*, 935 F.3d at 1328. Instead, it did nothing more than resolve the factual disputes underlying obviousness that were presented to it by the parties. That its findings differed slightly from what was proposed by the petitioner, and its articulation of the field of endeavor and pertinent problem were not identical to Apple's advocacy, do not constitute error.

In sum, we find no procedural error in the Board's handling of the analogous art issue.

B

Having determined that the Board's analogousness decisions were procedurally proper, we now turn to whether substantial evidence supported its factual findings.

1

Apple argued in its replies that Golan is analogous art because it is in the same field of endeavor as the Challenged Patents and also because it is pertinent to the problem faced by the inventors. The Board agreed with Apple as to field of endeavor and chose not to address the alternative pertinent to the problem contention. Corephotonics attacks the Board's finding as not supported by substantial evidence. We agree with the Board.

The Board explained: "Golan is in the same field of endeavor as the claimed invention because it describes performing digital zoom using a wide image sensor array and lens and a tele image sensor array and lens with the goal of providing 'continuous electronic zoom with uninterrupted imaging.'" J.A. 32-33 (quoting J.A. 1280); *see also* J.A. 103 (same in decision for '942 patent); No. 1455 J.A. 40, 114 (same in decision for '898 and '332 patents). Golan

teaches that "the calibration of the alignment between the first image sensor array and the second image sensor array . . . facilitates continuous electronic zoom with uninterrupted imaging." J.A. 5525 (Golan ¶ 15). These teachings, as supplemented by the opinions of Apple's expert, *see* J.A. 6021, 16856-57, provide substantial evidence for the Board's determination that Golan and the Challenged Patents are in the same field of endeavor.

Corephotonics argues that the '898 and '332 patents are designed to "interrupt otherwise smooth transitioning during video zooming if a no-switching criterion is fulfilled," while Golan fails to describe not switching. Corephotonics maintains that because of these differences, the claimed inventions and Golan cannot be in the same field of endeavor. But the Board reasonably found that the field of endeavor for the '898 and '332 patents, and for Golan, is broader than Corephotonics characterizes it, and is not limited to use of no-switching criteria. *See* No. 1455 J.A. 4 (citing '898 patent 7:57-8:29); No. 1455 J.A. 78 (same for '332 patent).

Thus, we hold that Golan is in the same field of endeavor as the Challenged Patents.

2

Apple argued in its replies that Martin is analogous art because it is in the same field of endeavor as the Challenged Patents and is also pertinent to the problem faced by the inventors. The Board agreed with Apple as to the pertinent to the problem test and chose not to reach the field of endeavor contention. Corephotonics attacks the Board's finding on pertinence to the problem as not supported by substantial evidence. On the present record, we cannot determine whether substantial evidence supports the Board's conclusion that Martin is analogous art.

The Board wrote, "Martin is reasonably pertinent to the problem faced by the inventor: reducing an image jump

effect seen in video output images when switching between cameras that have different *fields of view*. Both Golan and Martin have multiple cameras with differing *fields of view*." J.A. 33, 103 (emphasis added); *see also* No. 1455 J.A. 40, 114. Apple and Corephotonics agree that these two sentences are, as written, incorrect: Martin does *not* disclose switching between cameras with different fields of view; rather, it is addressed to cameras with different *points of view*.[7] According to Apple, the Board's statement is a mere "typographical error" and, therefore, is harmless. No. 1455 Apple's Resp. Br. 57 n.6 ("Read in the proper context, the Board clearly intended to refer to the term 'points of view' rather than 'fields of view' in describing Martin's pertinence to a problem facing the inventors of the challenged patents."); *see also In re Watts*, 354 F.3d 1362, 1369 (Fed. Cir. 2004) (applying harmless error rule to Board).

We are unable to discern if the Board's error was, in fact, merely typographical and harmless or, instead, a potentially-impactful error of substance. This prevents us from concluding either that there is, or is not, substantial evidence to support the Board's conclusion that Martin is analogous art to the Challenged Patents.

Nowhere else in its Decisions does the Board treat the Challenged Patents as addressing a *point of view* problem. Rather, the Board emphasized elsewhere that the dual-

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[7] The Board's analogous art analysis is not the only place it appears it may have confused "field of view" and "point of view." In the section of the Decision on motivation to combine, the Board wrote, "Golan and Martin both involve parallax effects caused by two cameras with different *fields of view*," but, in fact, parallax effects arise from different *points of view*. J.A. 25, 98 (emphasis added); *see also* No. 1455 J.A. 33, 108.

aperture cameras described in the Challenged Patents use lenses with different *fields of view*. Thus, it seems possible that the Board truly meant to say "field of view" when describing the problem to which Martin is pertinent, since "field of view" is fully consistent with the Board's description of the Challenged Patents. Martin, however, makes no express reference to field of view, and the Board provides no explanation as to how Martin's approach to point of view can have anything to do with the field of view problem faced by the inventors of the Challenged Patents. This leaves us uncertain of the Board's reasoning.

In these circumstances, we have no record basis to conclude that the Board's error was a harmless typographical one and did not affect the outcome it reached. *See Carter v. McDonald*, 794 F.3d 1342, 1347 (Fed. Cir. 2015) (identifying error and remanding when we could not determine it was harmless). The Board's determination that Martin is pertinent to the problem that the inventors of the Challenged Patents faced may be based on its articulated view that Martin relates to field of view when, in fact, Martin relates to point of view. Accordingly, we remand to the Board for further explanation and, if needed, further fact-finding. We leave it to the Board to decide whether it should also consider Apple's contention that, regardless of whether Martin is pertinent to the problem faced by the inventors, it is in the same field of endeavor as the Challenged Patents.

V

Corephotonics raises two additional issues. First, it argues there is no substantial evidence to support the Board's finding that Martin teaches the "shifting . . . according to a distance of an object" limitation of the '942 patent. Second, Corephotonics contends that the Board adopted an incorrect construction of the claim term "effective resolution" and compounded that error by finding that Togo teaches the "effective resolution" "no-switching criterion"

limitation of claims 4 and 15 of the '898 patent and claims 5 and 17 of the '332 patent. We decline to reach these issues because they will be rendered moot if, on remand, the Board finds Martin is not analogous art.

VI

We have considered the parties' remaining arguments and find them unpersuasive. For the foregoing reasons, we vacate and remand for further proceedings consistent with this opinion. In particular, the Board must explain why Martin is (or is not) analogous art and how this finding affects its overall conclusion as to obviousness.

VACATED AND REMANDED

COSTS

No costs.