

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO. LTD.,
SAMSUNG ELECTRONICS AMERICA, INC.,
GOOGLE LLC, and MICROSOFT CORPORATION
Petitioners,

v.

EYESMATCH LTD.,
Patent Owner.

Case No. IPR2024-00810¹
U.S. Patent No. 8,982,110

**PATENT OWNER'S NOTICE OF APPEAL TO THE UNITED STATES
COURT OF APPEALS FOR THE FEDERAL CIRCUIT**

¹ IPR2025-00296 has been joined with this proceeding.

Pursuant to 35 U.S.C. §§ 141, 142, and 319; 28 U.S.C. § 1295; 37 C.F.R. §§ 90.2–90.3; Federal Rule of Appellate Procedure 15; and Federal Circuit Rule 15, Patent Owner EyesMatch Ltd. (“Patent Owner”) hereby provides notice that it appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“Board”) entered on November 21, 2025 in IPR2024-00810 (Paper No. 56) (“Final Written Decision”) (Attachment 1) and from all underlying findings, determinations, rulings, opinions, orders, issues, and decisions regarding the *inter partes* review of U.S. Patent No. 8,982,110 (the “110 Patent”). This notice is timely under 37 C.F.R. § 90.3(b)(1) and 37 C.F.R. § 42.75(e)(3), having been filed within 63 days after the Order Denying Patent Owner’s Request for Director Review of the Final Written Decision.

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), Petitioners state that the issues on appeal include:

- the Board’s determinations that the combination of U.S. Patent App. Publ. 2007/0040033 (“Rosenberg”) and U.S. Patent Application Publication No. 2007/0065039 A1 (“Park”), renders obvious claims 1–6, and 10–12 of the 110 Patent, and the claims are unpatentable;
- the Board’s determinations that the combination of U.S. Patent App. Publ. 2007/0040033 (“Rosenberg”), U.S. Patent Application Publication No. 2007/0065039 A1 (“Park”), and U.S. Patent

Application Publication No. 2011/0246329 A1 (“Geisner”) renders obvious claims 3, 4, 7–9, and 11–18 of the 110 Patent, and the claims are unpatentable;

- the Board’s denial of Patent Owner’s motion to strike;
- the Board’s decision to permit new argument and evidence in Reply concerning the limitation “mirror tracking mode”;
- the Board’s factual findings, conclusions of law, or other determinations supporting or related to the foregoing issues; and
- all other issues decided adversely to Patent Owner in any orders, decisions, rulings, or opinions underlying or supporting the Final Written Decision.

A copy of the Final Written Decision is attached to this Notice.

Pursuant to 37 C.F.R. § 90.2(a)(2), Federal Rule of Appellate Procedure 15, and Federal Circuit Rule 15, this Notice of Appeal is being e-filed with the Clerk’s Office for the United States Court of Appeals for the Federal Circuit, along with payment of the required docketing fees. In addition, a true and correct copy of this Notice of Appeal is being filed simultaneously with the Director of the United States Patent and Trademark Office pursuant to 35 U.S.C. § 142 and 37 C.F.R. § 90.2(a)(1).

Dated: May 19, 2026

Respectfully submitted.

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CERTIFICATION OF SERVICE (37 C.F.R. §§ 42.6(e), 42.105(a))

The undersigned hereby certifies that on May 19, 2026, in addition to being filed and served electronically through the Patent Trial and Appeal Board's P-TACTS System, this **PATENT OWNER'S NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT** was filed with and served on the Director of the United States Patent and Trademark Office via e-mail at the following:

Office of the General Counsel
U.S. Patent and Trademark Office
efileSO@uspto.gov

The undersigned also hereby certifies that on May 19, 2026, this **PATENT OWNER'S NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT** and the requisite docketing fees were filed with the Clerk's Office of the United States Court of Appeal for the Federal Circuit via CM/ECF.

The undersigned further certifies that on May 19, 2026, this **PATENT OWNER'S NOTICE OF APPEAL TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT** was served by electronic mail on the following counsel for Petitioner Google LLC:

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Attachment 1

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
Petitioner,

v.

EYESMATCH LTD.,
Patent Owner.

IPR2024-00810
Patent 8,982,110 B2

Before THOMAS L. GIANNETTI, NEIL T. POWELL, and
MICHAEL T. CYGAN, *Administrative Patent Judges*.

POWELL, *Administrative Patent Judge*.

DECISION
Final Written Decision
Determining All Challenged Claims Unpatentable
35 U.S.C. § 318(a)
ORDER
Denying Patent Owner's Motion to Strike
37 C.F.R. § 42.5

I. INTRODUCTION

A. BACKGROUND

Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Google LLC (collectively, “Petitioner”) filed a Petition for *inter partes* review of claims 1–18 of U.S. Patent No. 8,982,110 B2 (Ex. 1001, “the ’110 patent”). Paper 1 (“Pet.”). EyesMatch Ltd. (“Patent Owner”) filed a Preliminary Response. Paper 17 (“Prelim. Resp.”).

We instituted *inter partes* review as to all challenged claims of the ’110 patent and all of the asserted grounds of unpatentability. Paper 20 (“Institution Dec.”). Following institution of the trial, Patent Owner filed a Response (Paper 27, “PO Resp.”), Petitioner filed a Reply (Paper 32, “Reply”), and Patent Owner filed a Sur-reply (Paper 37, “Sur-reply”). Thereafter, petitioners Microsoft Corporation, Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc. were terminated from the proceeding, leaving Google LLC as the sole remaining Petitioner. Papers 48, 49.

An oral hearing with IPR2024-00856 was held on September 17, 2025. A transcript of the hearing is part of the record. Paper 54 (“Hearing Tr.”).

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision issued pursuant to 35 U.S.C. § 318(a). For the reasons we discuss below, we determine that Petitioner has proved by a preponderance of the evidence that claims 1–18 of the ’110 patent are unpatentable.

B. RELATED PROCEEDINGS

The parties indicate that the ’110 patent is involved in *EyesMatch Ltd. v. Samsung Electronics America, Inc.*, No. 2:23-cv-00363-JRG-RSP (E.D.

Tex.) (“the Litigation”). Pet. 1; Paper 7, 1. Petitioner also notes that the ’110 patent was involved in *EyesMatch Ltd. v. Facebook, Inc.*, No. 1:21-cv-00111-RGA-JLH (D. Del.). Pet. 1. Petitioner further notes that the ’110 patent was challenged in a petition in IPR2022-00490. Pet. 1–2. Additionally, we note that the ’110 patent is related to U.S. Patent No. 8,982,109 B2 (“the ’109 patent”), which was challenged in IPR2024-00856.

C. THE ’110 PATENT

The ’110 patent describes interactive imaging and display systems for retail or service environments. Ex. 1001, 1:43–46. The ’110 patent claims priority to and incorporates by reference U.S. Patent Application Serial Number 13/843,001 (“the ’001”) application.¹ *Id.* at 1:23–39. The ’110 patent “describe[s] a computerized technique that takes a video, a still, or a group of images, before or after the transformation described in [the ’001 application], and continue the computerized method to address additional functionalities.” *Id.* 2:15–19.

In one example, the ’110 patent discloses using “a camera and a flat panel display to provide the user with the experience of looking at a mirror.” *Id.* at 4:66–5:1. More specifically, the patent discloses manipulating, transforming, and displaying the camera’s image stream “to mimic a reflection in a mirror, rather than a recorded video stream.” *Id.* at 5:1–4. The patent shows “examples of a virtual mirror user interface (UI) flow that can be sequenced together to simulate a mirror experience” in Figures 14–16. *Id.* at 25:26–28. Figures 14 and 15 are reproduced below.

¹ The ’001 application issued as the ’109 patent, which, as noted above, is challenged in a petition in IPR2024-00856.

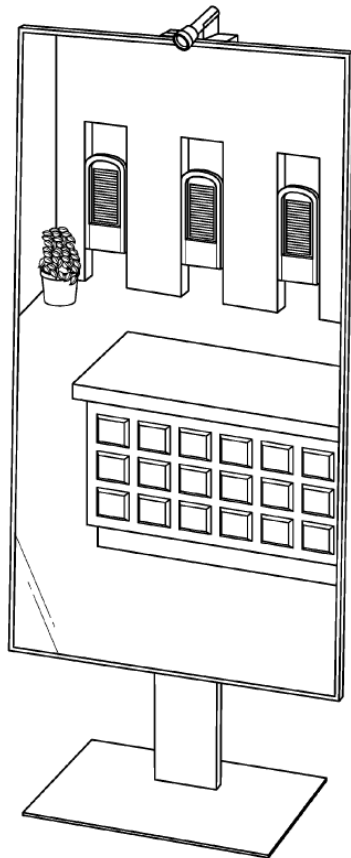


FIG. 14

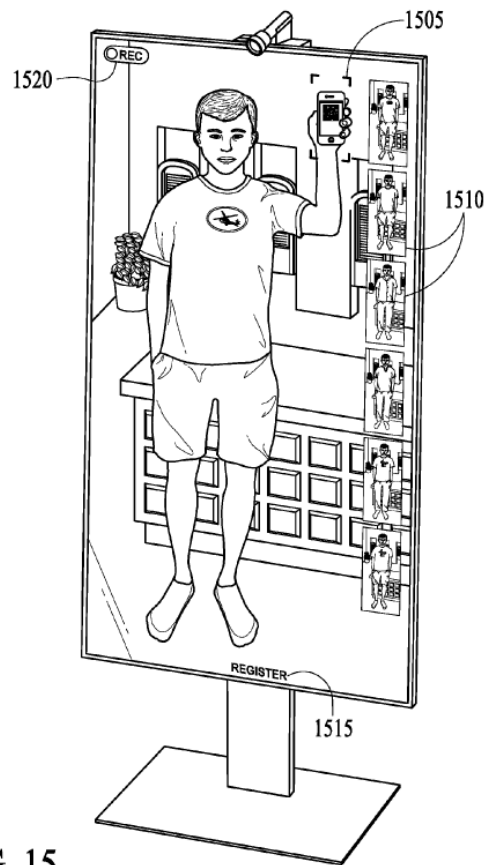


FIG. 15

“[Figure] 14 depicts an example of transformation on a camera stream to create a mirror effect on the background environment.” Ex. 1001, 4:41–43.

“[Figure] 15 illustrates an example of a virtual mirror with user recognition and authentication and with user interface.” *Id.* 4:44–45.

The system may operate in an idle mode or track a user in front of the camera:

[B]efore a user stands in front of the mirror, the system operates in an idle mode, during which the controller may or may not provide transformation to mimic a mirror reflection. Once the user enters a specified zone in front of the field of view of the camera, the processor is capable of tracking the user in the recorded image. Based on the tracking, the video engine of the processor can calculate a transformation of the image to mimic mirror behavior.

Id. at 25:36–43.

To generate an image mimicking a user looking into a mirror, the system may do distortion transformation:

The distortion transformation may include the steps: obtaining a digital image from the camera; flipping the image about a vertical axis so as to reverse right and left sides of the image; applying a transformation mapping to the image to modify the image such that it appears to mimic a reflection of a mirror; resizing the image to reduce variations caused by changes in the object's distance to the camera; and displaying the image on the monitor after performing the flipping, transformation mapping, and resizing.

Id. at 3:18–29. For example, the system may process the image to compensate for distortion stemming from the camera's setup geometry, as well as optic distortion:

[T]he image can be rearranged and transformed to compensate for distortion due to the setup geometry of the camera and optic distortion. Example of setup distortion factors include the user distance to the camera, the camera height, camera projection angle, the optics of the camera's FOV and other optic distortions.

Id. at 18:58–63.

An example of distortion from camera setup geometry appears in Figure 8 of the '001 application and '109 patent. This drawing is reproduced below.

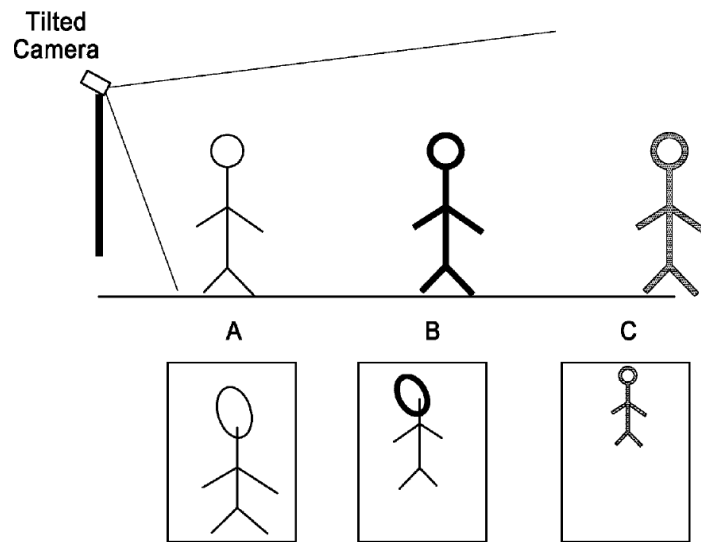


FIG. 8

Figure 8 of the '001 application and '109 patent “is a schematic illustrating a system wherein the camera is positioned above a monitor screen and is tilted downwards.” *Id.* at 4:25–27.

The '001 application discloses “performing tilt, elevation, and scale translations.” *Id.* at 24:4–5. A tilt transformation modifies an image from a downwardly pointed camera to look like the camera was directed horizontally straight. *Id.* at 23:46–51. An elevation transformation linearly modifies an image taken from a camera located outside the screen to look like an image taken from eye level. *Id.* at 23:53–58. “A scale transformation reduces the effect of size change with distance to the screen, so that the user sees almost constant size of himself in the screen, regardless of distance to the screen.” *Id.* at 23:65–24:1.

D. CHALLENGED CLAIMS

Of the challenged claims, claim 1 is independent. Each of claims 2–18 depends, directly or indirectly, from claim 1. Claim 1 is reproduced below with certain reformatting:²

1. [1[pre]] A computerized method for operating a display system, the display system having a camera, a monitor, and a processor, the method comprising:

[1[a]] operating the camera to generate a stream of images of the user;

[1[b]] operating the processor to detect the presence of the user in the stream of images;

[1[c]] operating the processor to apply adaptive transformation mapping to the stream of images captured by the camera to generate modified images that appear to be captured from a different point of view of the camera's actual point of view; and

[1[d]] displaying the modified images on the monitor;

[1[e]] wherein the different point of view corresponds to an image taken from a different angle and a different distance than the actual images captured by the camera; and

[1[f]] wherein during mirror tracking mode the processor utilizes the angle of the images captured by the camera and applies parametric input for a mapping transformation that changes imaging perspective of the images captured by the camera.

Ex. 1001, 35:52–36:5.

² We have added the same labels that Petitioner uses to identify portions of claim 1. *See* Pet. 4.

E. ASSERTED GROUNDS OF UNPATENTABILITY

The Petition sets forth the following grounds of unpatentability of the '110 patent's claims 1–18 (Pet. 8):

Ground	Claims Challenged	35 U.S.C. §	References
1	1–6, 10–12, 16, 17	103	Haan ³ , Francois ⁴
2	1–6, 10–12	103	Rosenberg ⁵ , Park ⁶
3 ⁷	1–18	103	Geisner ⁸ , Lizee ⁹
4	7–9, 13–15, 18	103	Haan, Francois, Geisner
5	3, 4, 7–9, 11–18	103	Rosenberg, Park, Geisner

In support of its challenges, Petitioner also relies on Declarations of Dr. Lina Karam, Ph.D. Ex. 1003; Ex. 1033. Patent Owner relies on a Declaration of Dr. David Forsyth. Ex. 2013. In addition, the parties have submitted deposition transcripts for these witnesses. Exhibit 1034 (“Forsyth Dep.”); Exhibit 2012 (“Karam Dep.”).

³ U.S. Patent Application Publication No. 2011/0298910 A1, published Dec. 8, 2011 (Ex. 1005, “Haan”).

⁴ Francois, *Software Architecture for Computer Vision: Beyond Pipes and Filters*, Institute for Robotics and Intelligent Systems, 2003 (Ex. 1009, “Francois”).

⁵ U.S. Patent Application Publication No. 2007/0040033 A1, published Feb. 22, 2007 (Ex. 1006, “Rosenberg”).

⁶ U.S. Patent Application Publication No. 2007/0065039 A1, published Mar. 22, 2007 (Ex. 1011, “Park”).

⁷ Petitioner has withdrawn this challenge. Ex. 3001.

⁸ U.S. Patent Application Publication No. 2011/0246329 A1, published Oct. 6, 2011 (Ex. 1007, “Geisner”).

⁹ International Patent Application Publication No. WO 2006/108278 A1, published Oct. 19, 2006 (Ex. 1008, “Lizee”).

II. ANALYSIS

A. LEVEL OF ORDINARY SKILL IN THE ART

According to Petitioner, a person of ordinary skill in the art “as of December 18, 2012, would have a bachelor’s degree in electrical or computer engineering, or a closely related field such as computer science, and two years of work experience with image capture and processing systems or related fields.” Pet. 7 (citing Karam Decl. ¶ 91). Petitioner adds that “[a] person with less and/or different education, but more relevant practical experience, or vice versa, may also meet this standard.” *Id.* According to Petitioner, [t]he prior art also evidences such level of skill.” *Id.*

Patent Owner states that it “applies Petitioners’ proposed level of skill for purposes of this Response.” PO Resp. 9 (citing Forsyth Decl. ¶¶ 53–54). For this Decision, we adopt the formulation of the level of ordinary skill in the art proposed by Petitioner and applied by Patent Owner as consistent with the prior art before us in this proceeding.¹⁰

B. CLAIM CONSTRUCTION

In this *inter partes* review, claims are construed using the same claim construction standard that would be used to construe the claims in a civil action under 35 U.S.C. § 282(b). 37 C.F.R. § 42.100(b) (2023). Under the principles set forth by the Federal Circuit, the “words of a claim ‘are

¹⁰ Dr. Forsyth testifies to a similar, but slightly more restrictive description of the person of ordinary skill, emphasizing experience with computer vision. Forsyth Decl. ¶ 53. We decline to adopt Dr. Forsyth’s description as too limited in light of the prior art before us, and especially in consideration of Patent Owner’s statement that it applied Petitioner’s description in its Response. However, we would reach the same result with either description.

generally given their ordinary and customary meaning,” as would be understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (quoting *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996)). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Prior to institution, neither party proposed specific claim constructions for our consideration. Petitioner stated that “[n]o terms require construction because the claims encompass the prior-art mappings under any reasonable construction.” Pet. 13. Patent Owner similarly contended that while “[c]laim construction briefing of certain terms proposed by both Samsung and Patent Owners in the pending district court litigation is ongoing,” “Patent Owner does not believe that resolution of any claim construction issue is necessary at this time to conclude that Petitioners have not shown that there is a reasonable likelihood that they would prevail with respect to at least one of the challenged claims.” Prelim. Resp. 10. However, “Patent Owner reserve[d] the right to raise claim construction should the Board grant institution.” *Id.* at 11.

We construe only those claim terms and phrases necessary to our decision. *See, e.g., Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the

controversy.’” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))). Accordingly, we did not construe any claim terms prior to institution. Institution Dec. 11–13.

Post-institution, Patent Owner invites us to construe limitation 1[f]’s recitation of “mirror tracking mode” and limitation 1[c]’s recitation of “adaptive transformation mapping.” PO Resp. 9–14. Regarding the latter, Patent Owner explains that “[i]n the District Court Litigation, ‘adaptive transformation mapping’ was construed as ‘continuously variable transformation mapping’ and ‘transformation mapping’ was construed as a ‘selected set of image transformations.’” *Id.* at 14 (citing Ex. 2008, 14, 37; Ex. 2013 ¶¶ 25, 27). Patent Owner does not, however, identify any way that those claim constructions affect our analysis of the parties’ patentability disputes. We find it unnecessary in resolving the parties’ patentability disputes to construe expressly limitation 1[c]’s recitation of “adaptive transformation mapping.”

On the other hand, we find it helpful to construe limitation 1[f]’s recitation of “mirror tracking mode.” The parties are at odds over the construction of this term, presenting highly nuanced arguments on this issue. Patent Owner contends that the Board should apply the construction proposed by Samsung and adopted by the District Court in the Samsung litigation and construe “mirror tracking mode” as “a mode of operation in which the user sees their reversed reflection at roughly double the distance from the camera and the reflection maintains roughly the same size regardless of the user movement.” PO Resp. 11–13 (citing the District Court’s claim construction order, Ex. 2008, 41). Patent Owner asserts that former petitioner Samsung argued for this construction, and “the District

Court effectively adopted Petitioner Samsung’s proposed construction.” *Id.* at 9–11. Patent Owner further asserts that Samsung “never told the Board that it was seeking a different construction in a parallel proceeding under the same claim construction standard.” *Id.* at 11–12. Patent Owner contends that “it is improper for Samsung to advance a broad construction in this proceeding to invalidate the claims, and at the same time advance a narrow one in district court to support a non-infringement case.” *Id.* at 12.

In response, Petitioner argues that it was “not required to construe the mirror mode limitation in the Petition, as it is not dispositive to the invalidity issues presented therein.” Reply 2 (citing *Samsung Elecs. Co. v. Collect, LLC* IPR2020-00476, Paper 14, 12–13 (PTAB July 31, 2020)). Petitioner further argues that Samsung’s “proposed constructions in the litigation are *consistent* with the mappings submitted in the Petition as intrinsic properties of a mirror.” *Id.* at 2–3. Consistent with its pre-institution position, Petitioner continues to assert that we “need not construe [‘mirror tracking mode’] because the prior art discloses each limitation under any reasonable construction.” *Id.* at 4.

We first address Patent Owner’s procedural concerns about the interplay between the claim-construction issues in this proceeding and in the District Court. PO Resp. 9–11. If a petitioner has proposed a claim construction in district court that is inconsistent with its claim-construction position in its Petition, that petitioner must justify its different position in the petition before the Board. *Revvo Techs., Inc. v. Cerebrum Sensor Techs., Inc.*, IPR2025-00632, Paper 20 at 3–5 (Director Nov. 3, 2025) (precedential). This concern does not apply here because the record does not reflect that Google, the only remaining Petitioner in this proceeding, was a

party to the related district court proceeding or proposed any claim construction there.¹¹ PO Resp. 9–11.

The District Court’s claim construction was proposed by Samsung, and Samsung is no longer a party to this proceeding. PO Resp. 9–10; Exs. 2009, 2010. Because Google was not part of Samsung’s District Court proceeding, it did not “argue[] different claim constructions before a district court and the Board.” *Revvo*, Paper 20, 4. Google could not control Samsung’s district court arguments, and Google did not engage in “gamesmanship.” *Id.* at 2. Google did not attempt to “to avoid infringement liability” with a narrow construction; Google only advanced in the Petition that no express construction was needed. *Revvo*, Paper 20, 4; Pet. 13–14. Additionally, the record does not reflect that Samsung had proposed the District Court’s claim construction at the time the Petition was filed. PO Resp. 9–11. Now that a more specific claim construction has been advanced and adopted by others in the district court proceeding, it is appropriate for Google to dispute patentability based on that construction. *See Revvo*, Paper 20, 5 (identifying district court’s adoption of different claim-construction as “sufficient reason” for petitioner to argue based on “court-adopted construction in a proceeding before the Board”); *Axonics, Inc. v. Medtronic, Inc.*, 75 F.4th 1374, 1383–84 (Fed. Cir. 2023).

Additionally, the record reflects that Patent Owner likely knew of Samsung’s proposed claim construction for the District Court before Patent Owner filed its Preliminary Response on August 29, 2024. *See, e.g.*, Ex. 1020, 4 (District Court Docket Control Order setting August 23, 2024

¹¹ At oral argument, Google denied adopting Samsung’s District Court claim construction. Hearing Tr. 20:24–21:7.

date for parties to “Exchange Preliminary Claim Constructions”); PO Resp. 9 (“On September 13, 2024, over two months before the Board instituted this proceeding based on Samsung’s Petition which contended that ‘[n]o terms require construction’ (Pet. at 13), Samsung submitted an expert declaration and briefing seeking narrow, non-plain meaning constructions of certain limitations of the same claims to the district court. *See, e.g.*, Ex.2010 (Myler declaration), ¶¶97-100 (concerning ‘mirror tracking mode’), 58-65 (concerning ‘it appears to mimic a reflection of a mirror’, for which it proposed the same construction).”). Yet, in its Preliminary Response, Patent Owner stated that it “does not believe that resolution of any claim construction issue is necessary at this time.” Prelim. Resp. 10. On these facts, we find inapposite Patent Owner’s concerns about procedural propriety with respect to claim construction.

Turning to the substantive issues, we find the District Court’s “mirror tracking mode” construction to be well-reasoned and supported by the record, and we therefore adopt that construction and its reasoning. As the District Court points out, both the “double the distance” and “same size” aspects of its construction are expressly discussed in the ’109 patent, which is incorporated in the ’110 patent. *See* Ex. 2008, 16 (citing Ex. 1021, 2:5–27, Figs. 5A, 5B), 40 (citing “same reasons set forth regarding the term ‘it appears to mimic a reflection of a mirror’” in support of construction of “mirror tracking mode”). So, too, is “flipping” or reversing of the image disclosed. *Id.* at 17 (citing Ex. 1021, 14:46–51, 15:41–47), 40.

Petitioner does not dispute that the ’109 patent, which is incorporated in the ’110 patent, discloses these aspects of “mirror-mimicking,” or even that the District Court’s claim construction is incorrect. Instead, Petitioner

contends that “[t]he Board need not construe any claim term, including the mirror mode limitation, because the prior art discloses each limitation under any reasonable construction.” Reply 3. Further, Petitioner argues that “the district court has not finally adopted the Magistrate’s claim constructions, and the case is stayed pending resolution of this IPR.” *Id.* at 6.¹²

We address *infra* whether the prior art discloses “mirror tracking mode” as construed by the District Court. We, however, disagree with Petitioner that we should not construe this term. Given the controversy over whether Petitioner has argued for a different construction in the District Court, we cannot agree that an explicit construction of “mirror-mimicking” is an unnecessary step toward resolving this controversy. *See Vivid Techs., Inc.*, 200 F.3d at 803.

We therefore adopt the District Court’s construction for “mirror tracking mode” requiring “a mode of operation in which the user sees their reversed reflection appearing at roughly double the distance from the camera and the reflection maintains roughly the same size regardless of the user movement.” Ex. 2008, 41.

C. GROUND 1: ALLEGED OBVIOUSNESS OVER HAAN AND FRANCOIS

1. *Overview of Haan*

Haan discloses that its “invention relates to a mirror device.” Ex. 1005 ¶ 1. Haan seeks to decrease certain problems with prior mirrors, including a difficulty when trying to closely view a particular part of the face

¹² Neither party points to any evidence that the Claim Construction Order by Magistrate Judge Roy S. Payne must be “adopted” by the District Judge to be effective. The Order itself suggests otherwise: “The Court adopts the constructions set forth in this opinion for the disputed terms of the patent-in-suit.” Ex. 2008, 44.

in a mirror: “[o]ne can get closer to the mirror, but often this will mean that the particular part gets out of sight and/or one cannot get the part in focus.”

Id. ¶¶ 4–5.

Haan explains that its mirror device can show a recorded image on a display screen. *Id.* ¶¶ 6–12. To generate the recorded image, the mirror device includes “at least one image recording device.” *Id.* ¶ 8. Additionally, the mirror device includes “a means to determine a position of a body part with respect to the display screen . . . said means outputting a indication signal to indicate the position of the body part of a viewer in front of the display screen.” *Id.* ¶ 9. The mirror device also includes “a means to change the view point from which the image is recorded in dependence on said indication signal” and “a means to display the recorded image.”

Id. ¶¶ 10–11.

Haan shows an embodiment in Figure 2, which is reproduced below.

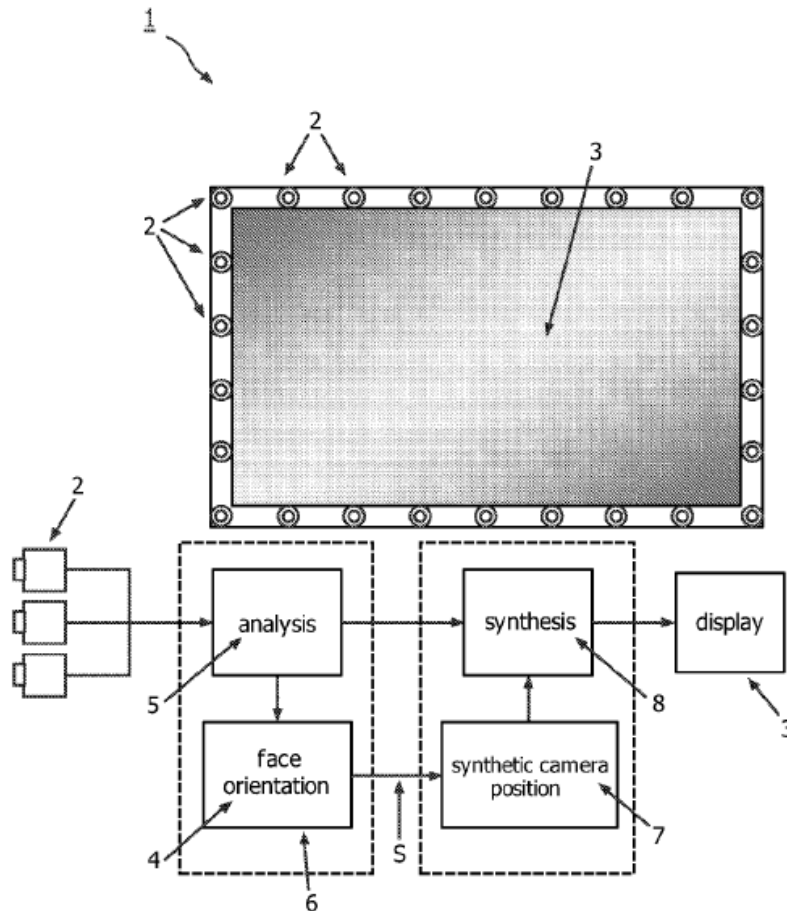


FIG. 2

Figure 2 shows mirror device 1, which includes cameras 2, a display 3, position determination means 4, analyzing means 5, face orientation determining means 6, magnification means 7, and synthesis means 8. *Id.* ¶¶ 56–58.

Cameras 2 record images, and mirror device 1 processes those recorded images. *Id.* ¶ 58. Mirror device 1 can combine data from multiple cameras 2 to create a single image from a virtual view point on display device 3. *Id.*

Haan further discusses its mirror device in connection with Figure 7, which is reproduced below.

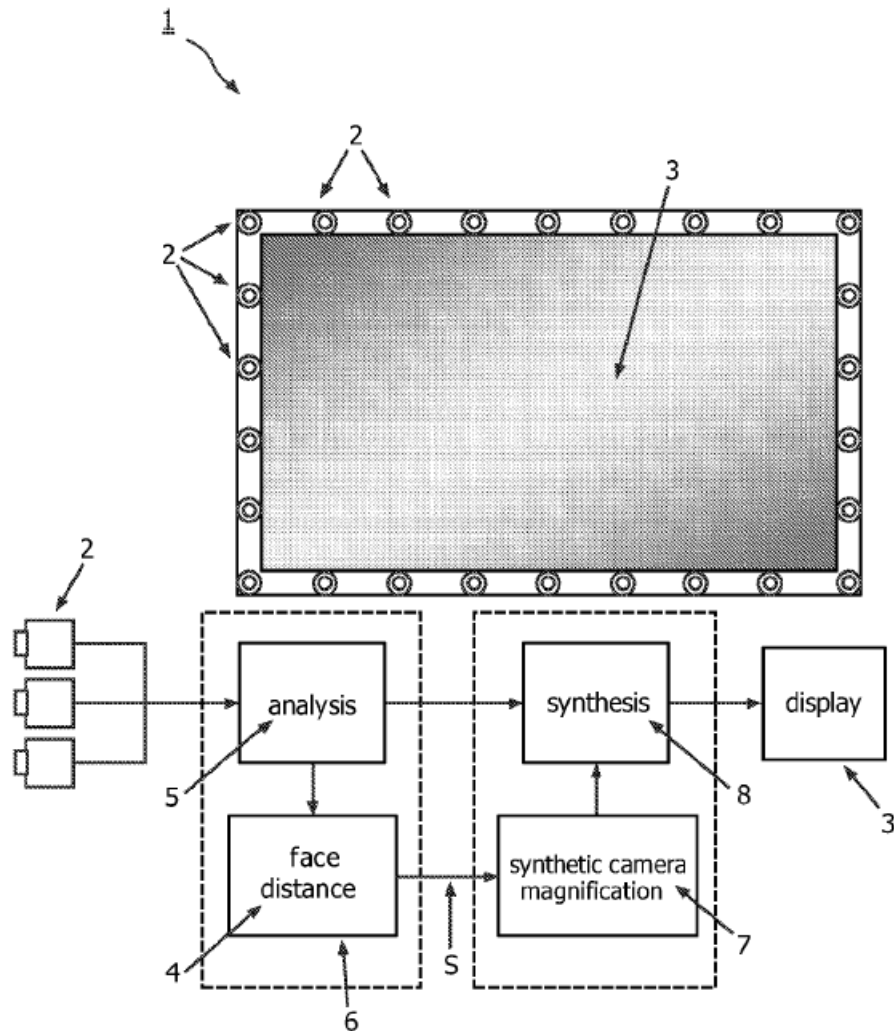


FIG. 7

Figure 7 shows mirror device 1 with a “face distance determining means,” which determines the distance of a face from the mirror device. *Id.* ¶ 73.

Mirror device 1 can display an image with varying degrees of magnification based on a user’s distance from mirror device 1. *Id.* ¶¶ 73–76. Haan discusses this in connection with Figure 8, which is reproduced below.

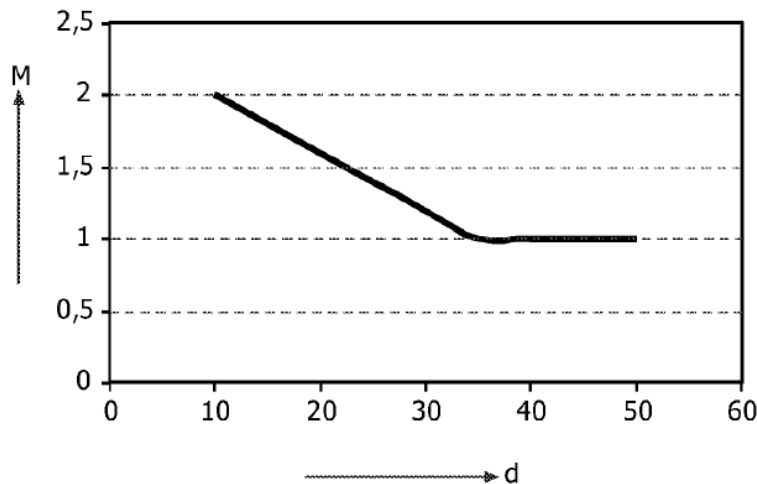


FIG. 8

Figure 8 shows “an exemplary relation between distance to the display screen and magnification of an image.” *Id.* ¶ 46.

Haan notes that “[w]hen a [viewer] wants to take a better look at a detail he/she reduces the distance to a mirror.” *Id.* ¶ 72. Given this, Haan’s Figure 8 shows that for distances smaller than 35 cm, “as the viewer moves his head or torso closer to the display screen, an enlarged image is displayed, i.e. with a magnification larger than 1.” *Id.* ¶ 76.

On the other hand, for distances greater than 35 cm, “the magnification is kept at a fixed value of, in this example 1. This can be done for instance by using the device as a simple mirror, i.e. not displaying an image on the display device, but using the device in the reflective mode.” *Id.* ¶ 76. Haan describes how mirror device 1 can operate in reflective mode as follows:

In preferred embodiments the mirror device is provided with a reflective, semi-transparent layer in front of the display screen. Preferably the means for displaying the recorded image are arranged such that for a first range of positions, no image is displayed, whereby the reflective layer acts as a mirror, and for a second range of positions, the recorded image is displayed.

Id. ¶ 29. Haan discloses effecting a “smooth transition” between the region in which mirror device 1 reflects without magnification and the region in which mirror device 1 displays a magnified image. *Id.* ¶ 76. This serves “[t]o avoid a sudden jump in the image.” *Id.*

2. *Overview of Francois*

Francois relates to software architecture and seeks to “provid[e] the Computer Vision community with a flexible and generic architectural model.” Ex. 1009, 2. To this end, Francois discloses “SAI (Software Architecture for Immersipresence),” “a new software architecture model for designing, analyzing and implementing applications performing distributed, asynchronous parallel processing of generic data streams.” *Id.* at 3. Francois “illustrates architectural patterns” by discussing “a number of demonstration projects.” *Id.* These include “[t]he Virtual Mirror project,” “a feasibility study for the development and construction of a handheld mirror simulation device.” *Id.* at 13. Francois shows a prototype in Figure 12, which is reproduced below.

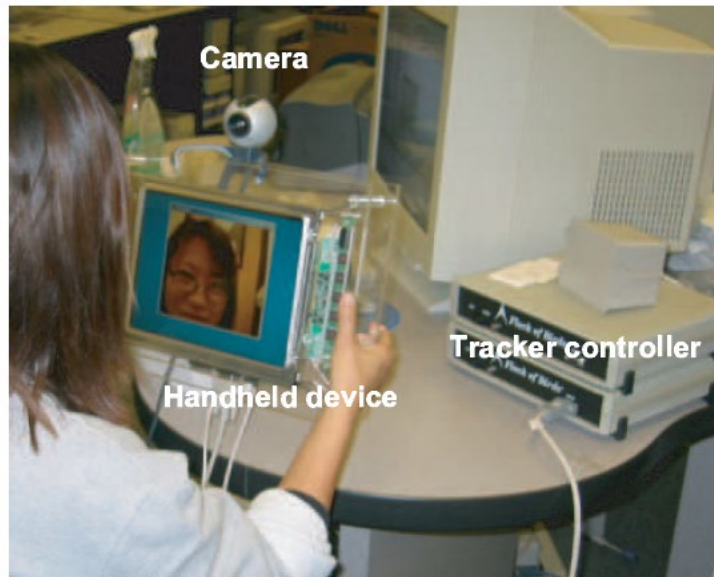


Figure 12: The handheld mirror simulation system (“Virtual Mirror”). Figure 12 shows a person holding a handheld device, which has “an LCD screen manipulated by the user, a single camera fixed on the screen, and a tracking device.” *Id.* at 13, 15.

The device processes a continuous input video stream for display: “The continuous input video stream and tracker data is used to synthesize, in real-time, a continuous video stream displayed on the LCD screen. The synthesized video stream is a close approximation of what the user would see on the screen surface if it were a real mirror.” *Id.* at 13.

3. Discussion

In asserting obviousness over Haan and Francois, Petitioner contends that Haan teaches most of the challenged claims’ limitations. Pet. 30–52. Petitioner cites Francois as teaching certain aspects of the challenged claims, such as the “processor” recited in claim 1’s preamble and the “stream of images” recited in limitation 1[a]. *Id.* at 31–32.

For this ground, the parties' primary dispute revolves around limitation 1[f]. Pet. 44–46; PO Resp. 15–27; Reply 7–15; Sur-reply 8–14. According to Petitioner, “Haan-Francois renders obvious ‘wherein during mirror tracking mode the processor utilizes the angle of the images captured by the camera and applies parametric input for a mapping transformation that changes imaging perspective of the images captured by the camera,’” as recited in limitation 1[f]. Pet. 44 (quoting Ex. 1001, 36:1–5). In support of this, Petitioner argues in its Petition that “Haan teaches the claimed mirror tracking mode,” citing Haan’s disclosure that “[f]or smaller [(than 35 cm)] distances, as the viewer moves his head or torso closer to the display screen, an enlarged image is displayed, i.e. with a magnification larger than 1.” *Id.* (citing Ex. 1005 ¶¶ 75–76, 93–94; Ex. 1003 ¶ 207). The Petition does not cite Francois when addressing limitation 1[f]’s “mirror tracking mode.” Pet. 44–46.

Patent Owner counters that Haan does not teach limitation 1[f]’s “mirror tracking mode” under the District Court’s construction (i.e., under the construction we adopt above in Section II.B). PO Resp. 21–22. Patent Owner argues that Haan’s magnification involves “changing the magnification of the user’s image as the user’s distance from the camera changes,” in contrast to the claimed “mirror tracking mode,” which lets the user see his or her reflection “roughly the same size regardless of the user movement.” *Id.*

In its Reply, Petitioner argues that the prior art teaches or renders obvious the claimed “mirror tracking mode.” Reply 7–17. Petitioner’s Reply takes the position that “Haan discloses its mirror device operating in various modes, including: a reflective mode, *where the device functions as a*

conventional mirror; and a dual mode, where the device transitions between *a conventional mirror* and an exaggerated mirror.” *Id.* at 8. According to the Reply, “[t]he reflective mode and the conventional mirror period in the dual mode both meet the mirror tracking limitation.” *Id.* Additionally, the Reply advances that Haan’s disclosure of transitioning smoothly between reflective mode and display mode would have rendered it “obvious to maintain the traditional and expected optical mirror properties while carrying out the preferable ‘smooth transition.’” *Id.* at 11. More generally, the Reply relies on Haan’s description of its device as a “mirror” as evidence that it would have been obvious to display images that would match a conventional mirror. *E.g., id.* at 10.

In its Sur-reply, Patent Owner maintains that Petitioner has not persuasively addressed limitation 1[f]. Sur-reply 8–14. Among other things, Patent Owner indicates that Petitioner fails to show that Haan discloses a mode in which its device displays images without magnifying them based on user position. *Id.* at 13–14. For example, Patent Owner argues that in Haan’s “disclosed dual mode, the ‘reflective’ mode is ***not manipulating or displaying any image at all***, as required by limitation 1(f). It is literally serving as a physical mirror, employing on the physically reflective properties of the device.” *Id.* (citing Ex. 1005 ¶¶ 29, 76, 92).

In view of the parties’ arguments and evidence, Petitioner does not persuasively address limitation 1[f]’s “mirror tracking mode.” In particular, Petitioner does not address persuasively the requirement, as explained in Section II.B above, that mirror tracking mode involves processing camera-captured images in a way that “maintains roughly the same size regardless of the user movement.” At odds with this requirement, Petitioner finds its

case on an assertion that “Haan teaches the claimed mirror tracking mode” because “if the viewer is within 35 cm of the camera, a tracking mode is entered, *applying resizing transformation.*” Pet. 44 (emphasis added) (citing Ex. 1005 ¶¶ 75–76, 80–82, 90–94, 97; Ex. 1003 ¶¶ 205–210). The resizing transformation Petitioner references actually involves magnifying the user’s image by an amount that changes based on the user’s position relative to the camera, quite the opposite of maintaining image size regardless of the user movement. Ex. 1005 ¶¶ 75–76, Fig. 8. Thus, Petitioner’s initial position is unpersuasive.

Petitioner’s shift to Haan’s “reflective mirror mode and conventional mirror period in the dual mode” is also unavailing. Reply 8. Consistent with Patent Owner’s arguments, Petitioner does not provide persuasive evidence that these operating states of Haan’s device involve any processing of camera-captured images. Sur-reply 13–14. To the contrary, Haan suggests that anytime its device provides an unmagnified image, it comes from a reflection off a physical reflective surface. *See, e.g.,* Ex.1005 ¶ 76 (“This can be done for instance by using the device as a simple mirror, i.e. *not displaying an image on the display device, but using the device in the reflective mode.*”) (emphasis added), ¶ 92 (“a simple reflective mode, to act as a mirror”), ¶ 29 (“for a first range of positions, *no image is displayed*, whereby the reflective layer acts as a mirror, and for a second range of positions, the recorded image is displayed.”) (emphasis added).

We also find unpersuasive Petitioner’s Reply arguments based on Haan’s disclosure of smoothly transitioning from “using the device as a simple mirror” (i.e., using a physical reflecting surface) to displaying a magnified image. Reply 11 (citing Ex. 1005 ¶¶ 76, 80). To the extent this

may establish a point around the transition at which Haan’s system displays an image with relatively little magnification, it does not establish that Haan teaches, suggests, or renders obvious holding the displayed size roughly constant, “regardless of the user movement.” Indeed, given Haan’s focus on helping the user see things more clearly with image magnification, Petitioner’s argument that it would have been obvious to hold the size of the image constant is not persuasive. *See, e.g.*, Ex. 1005 ¶ 4.

Thus, on the whole, Petitioner’s shifting, scattered arguments do not persuasively address limitation 1[f]. Accordingly, Petitioner has not shown by a preponderance of the evidence that claim 1 would have been obvious over Haan and Francois. And Petitioner’s arguments and evidence addressing claims 2–6, 10–12, 16, and 17 do not cure the foregoing deficiencies in the challenge of claim 1. Pet. 46–52. Accordingly, Petitioner has not shown by a preponderance of the evidence that any of claims 1–6, 10–12, 16, and 17 would have been obvious over Haan and Francois.

D. GROUND 2: ALLEGED OBVIOUSNESS OVER ROSENBERG AND PARK

1. *Overview of Rosenberg*

Rosenberg relates to “[a] digital mirror system . . . that emulates a traditional mirror by displaying real-time video imagery of a user who stands before it.” Ex. 1006, code (57). Embodiments of Rosenberg’s system “provide a wall-mounted flat panel display and one or more digital camera(s) configured to provide real-time images of a user who stands before the display.” *Id.* ¶ 26. The system’s camera may be “mounted directly above the screen area of the display, generally near the center,” which “is non-ideal because it provides the user with a view of himself or herself from a somewhat unnatural perspective as compared to a traditional

mirror.” *Id.* ¶ 27. “In more advanced embodiments the camera is mounted within the screen area of the display itself, approximately at eye-level of typical users, for example, positioned behind the display surface and aimed through a transparent portion of the display.” *Id.* This serves to “provide the user with a natural and accurate visual perspective of himself or herself.” *Id.*

Figure 3 of Rosenberg is reproduced below:

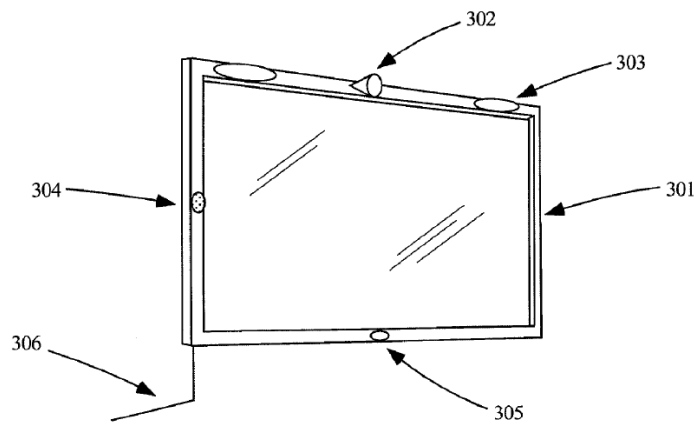


Figure 3 above illustrates wall mounted flat panel display 301 according to at least one embodiment. *Id.* ¶ 62. The display includes video camera 302, light sources 303, microphones 304, proximity and/or motion sensors 305, and network connection 306. *Id.* ¶¶ 62–64, 69, 74. Processor 1305 adjusts and/or modifies images that are displayed upon a screen to achieve mirroring features and functions not provided by a standard household wall mirror. *Id.* ¶¶ 35, 109, Fig. 13. In the embodiment of Figure 3, “the camera is mounted above the display screen.” *Id.* ¶ 75.

Rosenberg shows a different camera position in Figure 4, which is reproduced below:

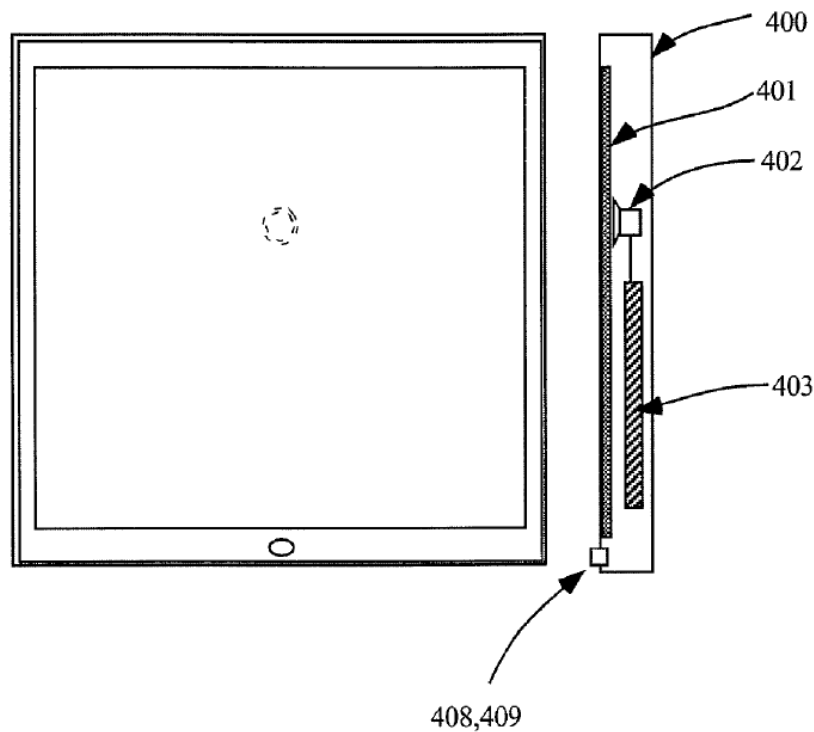


Fig. 4

Figure 4 above shows a digital mirror that has camera 402 mounted within the screen area. *Id.* ¶ 75. Camera 402 may capture an image taken “from a vantage point that is centered horizontally with respect to the display screen and at an elevation vertically that generally corresponds with a user’s typical eye level. In this way the user is looking straight at the camera 402 when standing centered before the digital mirror display screen.” *Id.* To allow such camera placement, “[a] number of different methods and/or technologies may be employed.” *Id.* “In some embodiments a small region of active screen area is removed to allow the camera 402 to capture an image through the screen surface.” *Id.* Alternatively, “[s]ome embodiments . . .

can be configured to capture camera imagery through the display screen without having the small dead region.” *Id.* ¶ 76.

A digital mirror system is shown in operation in Figure 5, which is reproduced below:

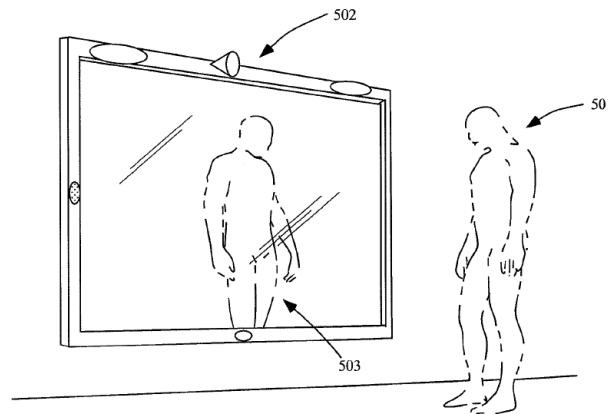


Figure 5 above illustrates a computer rendering of human user 501 standing in front of a wall-mounted embodiment of digital mirror system 502.

Id. ¶ 77. The user’s image is captured as a real-time video image by a camera, and a representation of that real-time video image is displayed on a screen of digital mirror 502 “with a displayed size and scaling such that it appears like a traditional life-size mirror image 503.” *Id.* “In a traditional mirror emulation mode, the real-time video image is left-right inverted prior to display upon the screen,” providing user 501 with a visual impression that he or she is standing before a traditional wall mirror. *Id.*

Rosenberg also discloses a proximity and/or motion sensor for detecting when a user is before the display screen and automatically switches operational states when the user is standing before the screen for a threshold amount of time. *Id.* ¶¶ 54, 69.

2. *Overview of Park*

Park “relates to an image capturing apparatus with image compensation and a method thereof.” Ex. 1011 ¶ 3. Park discusses certain issues related to capturing images of a person with a camera, such as a phone’s camera. *E.g., id.* ¶¶ 5–6. Park shows an image captured by a camera positioned in front of a user in Figure 1B, which is reproduced below.

FIG. 1B



IN FRONT OF USER' S FACE

Figure 1B shows an image “captured by a general video photography device” (Ex. 1011 ¶ 18) “in front of the user’s face” (*id.* ¶ 7). In contrast, Park shows an image captured from below in Figure 1A, which is reproduced below.

FIG. 1A



BELOW USER' S FACE

Figure 1A shows an image “captured by a general video photography device” (Ex. 1011 ¶ 18) “located below a user’s face” (*id.* ¶ 7). Here, “the user’s chin appears to be larger and the user’s forehead appears to be narrowed.” *Id.* Park explains users typically consider this distortion unnatural:

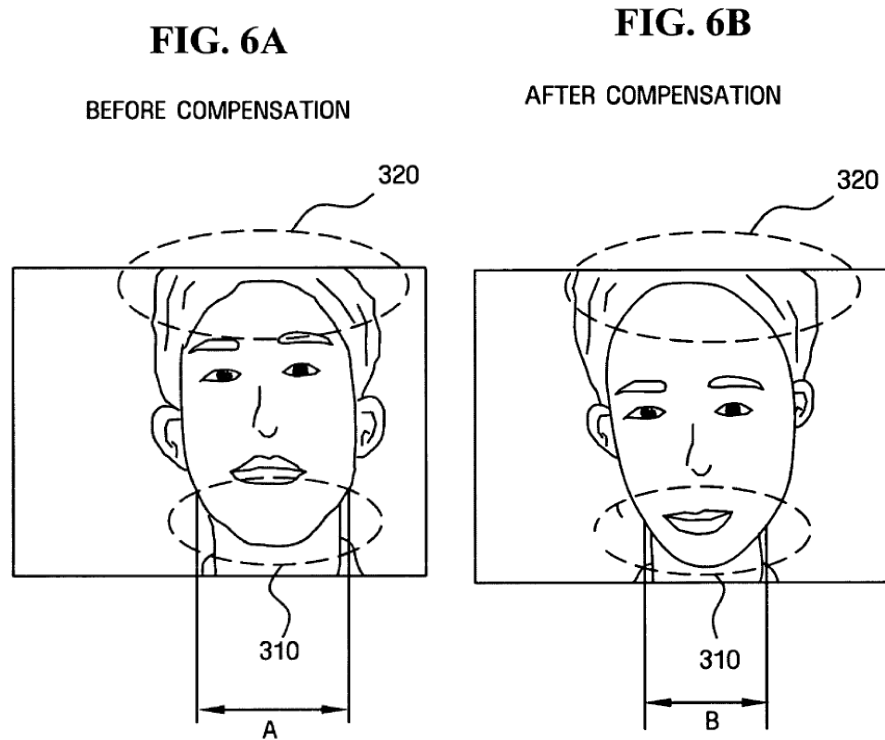
[T]he camera attached to the mobile communication device is mostly located below the user's face to capture the face of the user. In this case, the image of the user's face in three-dimensions is distorted in such a manner that user's chin appears to be larger than it actually is and user's forehead appears to be more narrow than it actually is. This phenomenon is called perspective. This distorted facial image is generally unnatural to users and may cause psychological rejection, which may delay the widespread use of video photography devices.

Id. ¶ 6.

Park addresses this in connection with an apparatus that includes an image capturing unit that captures an image of an object, along with a compensation unit. *Id.* ¶ 36. In an embodiment, “the object is a person.” *Id.* ¶ 38. Additionally, “[t]he image capturing unit . . . may be . . . a camera mounted in [a] mobile communication device.” *Id.* ¶ 39.

The image capturing unit can modify a distorted image, as discussed in connection with Figures 6A and 6B, which are reproduced below.

Id. ¶ 51.



In Figures 6A and 6B, Park shows “a captured image and a compensated image according to an embodiment.” *Id.* ¶ 23. In comparison to the captured image in Figure 6A, Figure 6B’s compensated image shows a smaller chin and a larger forehead:

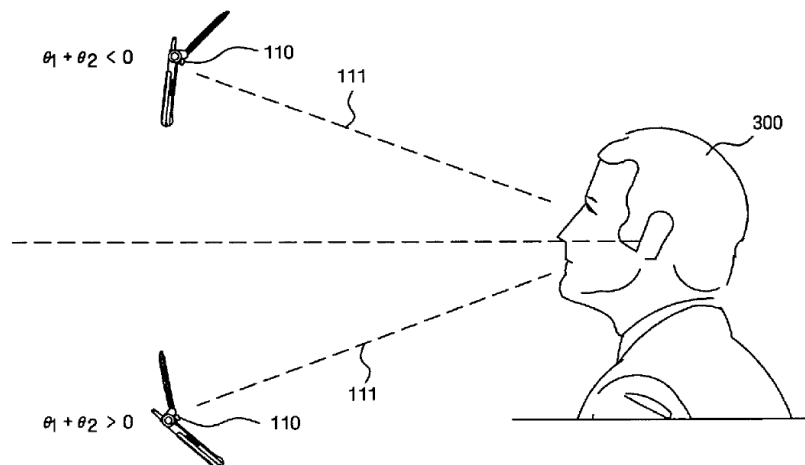
if the image capturing unit 110 that is located below the user's face has captured the user's facial image, as illustrated in [Figure] 6A, the captured image may be a distorted image in which the chin part 310 appears to be emphasized and the forehead part 320 appears to be narrowed. Accordingly, the compensation unit 140 performs perspective compensation on the image as illustrated in [Figure] 6A to provide a compensated image as illustrated in [Figure] 6B. In the compensated image of [Figure] 6B, the chin part 310 is reduced and the forehead part 320 is enlarged, in comparison to the distorted image of [Figure] 6A.

Id. ¶ 51.

Park's compensation unit "can perform the image compensation using a geometric transform technique and a perspective transform technique that is a kind of geometric transform technique." *Id.* ¶ 59. Park explains that "the perspective transform refers to typical matrix-based image transform algorithm." *Id.* ¶ 60. In an embodiment, the compensation involves matrix coefficients based on the tilt of the image capturing device, which has been determined with a tilt determining unit. *Id.* ¶ 61.

Park discusses determining tilt in connection with Figures 3–5. *Id.* ¶¶ 45–48. Figure 5 is reproduced below.

FIG. 5



Park's "[Figure] 5 is a view illustrating a mobile communication device that captures images of an object according to an embodiment." *Id.* ¶ 22. Using a tilt sensor, a tilt determining unit, and angle values Θ_1 and Θ_2 , the compensation unit ascertains whether the image capturing unit is above or below the object:

The compensation unit 140 determines whether the image capturing unit 110 is located over (i.e. above) the object or below the object through " $\Theta_1 + \Theta_2$ " that is the tilt calculated by the tilt determining unit 130. For example, if " $\Theta_1 + \Theta_2$ " is "0" on the

assumption that the angle of the ground is “0”, it is determined that the optical axis of the image capturing unit 110 is parallel to the ground 220. When the tilt sensing unit 120 is installed parallel to (i.e., in front of the optical axis of the image capturing unit 110, the tilt sensed by the tilt sensing unit 120 may be considered to be the tilt of the ground reference camera. Accordingly, as illustrated in [Figure] 5, it is determined that if the calculated tilt “ $\Theta_1 + \Theta_2$ ” has a negative value, the image capturing unit 110 is located over the object 300, while if the calculated tilt “ $\Theta_1 + \Theta_2$ ” has a positive value, the image capturing unit 110 is located below the object 300.

Id. ¶ 48.

3. *Discussion*

Petitioner argues that each limitation of independent claim 1 and each of dependent claims 2–6 and 10–12 was rendered obvious by Rosenberg and Park. Pet. 56–73. According to Petitioner, it would have been obvious to modify Rosenberg’s system of processing and displaying user images to use Park’s image compensation. *Id.* at 52–56. Petitioner suggests that the resulting combination would have included all limitations of claims 1–6 and 10–12 of the ’110 patent. *Id.* at 56–73. Patent Owner argues that Petitioner has not persuasively addressed limitations 1[c], 1[e], and 1[f]. PO Resp. 30–45.

Based on all of the record arguments and evidence, we find Petitioner has shown by a preponderance of the evidence that claims 1–6 and 10–12 would have been obvious over Rosenberg and Park. We turn now to detailed discussions of the parties’ disputes.

a) Limitations 1[c] and 1[e]

Addressing limitations 1[c] and 1[e], Petitioner contends that it would have been obvious to modify Rosenberg to use image transformation from Park, and that the combination would meet limitations 1[c] and 1[e].

Pet. 52–56, 58–64. Patent Owner argues that Petitioner has not shown an ordinarily skilled artisan would have been motivated to combine Rosenberg and Park. PO Resp. 40–45; Sur-reply 20–21. Patent Owner also argues that Rosenberg does not teach limitations 1[c] and 1[e]. Pet. 39–40; Sur-reply 19.

(1) Motivation

According to Petitioner, “[a person of ordinary skill in the art] would have found it obvious to combine Rosenberg and Park.” Pet. 52. Asserting that “Rosenberg recognizes that having a camera mounted above a screen is ‘non-ideal because it provides the user with. . . a somewhat unnatural perspective,’” Petitioner argues that Park supplies a “solution, which compensates ‘a perspective distortion of the facial image that is not desired by the user.’” *Id.* at 54 (quoting Ex. 1006 ¶ 27; Ex. 1011 ¶ 50). Observing that Park discloses performing image compensation “when the image capturing unit is ‘above or below the object,’” Petitioner asserts that Park’s approach covers Rosenberg’s “use case.” *Id.* (quoting Ex. 1011, cl. 44).

Petitioner argues that “[a person of ordinary skill in the art] would have been motivated to implement Park’s image compensation into Rosenberg to correct image distortions and provide a more realistic mirror image.” Pet. 54. Petitioner contends this would have provided certain benefits. *Id.* at 54–55. For example, Petitioner asserts that using Park’s digital approach would have reduced the cost and complexity associated with Rosenberg’s system. *Id.* at 54. Additionally, Petitioner argues that “[e]ven with [Rosenberg’s] behind-screen camera, the camera may not match each user’s eye-level, motivating a [person of ordinary skill in the art] to, as suggested in Park, use software to correct distortions from mismatched

eye-levels.” *Id.* at 55. Petitioner contends that a person of ordinary skill in the art would have had the skill to readily implement Park’s approach in Rosenberg’s system, which Petitioner contends would “improve[] similar devices in the same way” and “would have had known, predictable benefits.” *Id.*

Patent Owner counters that Petitioner “failed to demonstrate why a [person of ordinary skill in the art] would be motivated to combine Rosenberg and Park to meet . . . limitations 1(c) and 1(e).” PO Resp. 40. Patent Owner contends that Petitioner does not show that an ordinarily skilled artisan would have been motivated to modify Rosenberg’s teachings to use Park’s computer-based image modifications. *Id.* at 45.

According to Patent Owner, whereas Park discloses computer processing to change image perspective, Rosenberg focuses on proper physical camera placement. PO Resp. 41. Patent Owner argues that Rosenberg characterizes placing the camera at a user’s eye level as a “superior arrangement.” *Id.* (quoting Ex. 1006 ¶ 27). Patent Owner adds that Rosenberg even discloses that displaying an unmodified image from a camera above the mirror provides an “effective image” and “is sometimes advantageous.” *Id.* (quoting Ex. 1006 ¶¶ 27–28). Patent Owner contends that an ordinarily skilled artisan would have understood from Rosenberg that its reliance on physical camera placement is “sufficient” and “wholly adequate.” *Id.* at 43–45.

Patent Owner further argues that an ordinarily skilled artisan would have gleaned from Rosenberg that “physically based solutions are *the* preferable solution with respect to changes in perspective or angle.” PO Resp. 45. Patent Owner concludes that an ordinarily skilled artisan “would

not be motivated to combine Rosenberg with the computer processing based solution of Park with respect to limitations 1(c) and 1(e)” because “Rosenberg’s disclosures with respect to changes in image perspective and angle are all physically based despite the presence of computer-processing aspects to the invention.” *Id.*

Weighing the parties’ arguments and evidence, Petitioner persuades us that a person of ordinary skill in the art would have been motivated to modify Rosenberg with Park’s image compensation. Pet. 52–55; PO Resp. 40–45; Reply 19–20; Sur-reply 20–21. Petitioner provides persuasive evidence that Rosenberg conveys the desirability of providing an image without the distortion normally created by a camera above eye level. Pet. 54 (citing Ex. 1006 ¶ 27; Ex. 1003 ¶ 247). As Patent Owner argues, Rosenberg discloses one can achieve that desirable result by physically placing a camera at eye level. PO Resp. 41 (citing Ex. 1006 ¶¶ 27–28, 75; Ex. 2013 ¶ 122). At the same time, Petitioner shows that an ordinarily skilled artisan would have recognized Park’s image compensation as another way of achieving the same desirable result. Pet. 54 (citing Ex. 1003 ¶ 247–248; Ex. 1011 ¶¶ 34, 50, 51, cl. 44).

Indeed, Petitioner presents persuasive evidence that an ordinarily skilled artisan would have recognized certain advantages of Park’s image compensation over Rosenberg’s physical approach. Pet. 54–55 (citing Ex. 1003 ¶¶ 247–248; Ex. 1006 ¶¶ 27–28); Reply 21 (citing Ex. 1003 ¶¶ 247–248). For example, Petitioner persuades us that an ordinarily skilled artisan would have recognized potential to use Park’s image compensation to avoid image distortion while avoiding certain costs and complexity associated with Rosenberg’s disclosure of using hardware like “[v]arious

configurations of lenses, mirrors, and/or fiber optics” to place a camera behind the center of a display screen. Pet. 54–55 (citing Ex. 1003 ¶¶ 247–248; Ex. 1006 ¶¶ 27–28); Reply 21 (citing Ex. 1003 ¶¶ 247–248). Additionally, Petitioner persuades us that an ordinarily skilled artisan would have recognized that Park’s image compensation could better address different eye levels of different people than Rosenberg’s configuration with a camera fixed behind the display screen. Pet. 55 (citing Ex. 1003 ¶ 248). These factual showings soundly support Petitioner’s position that a person of ordinary skill in the art would have been motivated to modify Rosenberg with Park’s image compensation. Pet. 52–55; Reply 21–22.

Patent Owner’s arguments and evidence do not undermine Petitioner’s showing of a motivation. PO Resp. 40–45. To the extent Patent Owner views Rosenberg as teaching away from a computer-implemented approach like Park’s, we disagree. *See, e.g.*, PO Resp. 45. Patent Owner does not present arguments or evidence persuading us that Rosenberg in any way “criticize[s], discredit[s], or otherwise discourage[s]” using computer-based approach like Park’s. *In re Fulton*, 391 F.3d 1195, 1201 (Fed. Cir. 2004). And even if Patent Owner is correct that Rosenberg focuses on using physical approaches for avoiding distortion, that does not negate Petitioner’s showing of reasons that it would have been obvious to an ordinarily skilled artisan to apply Park’s computer-implemented approach with Rosenberg’s apparatus. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”). Even if “better alternatives exist in the prior art,” that does not make Petitioner’s proposed combination “inapt for obviousness.” *In re*

Mouttet, 686 F.3d 1322, 1334 (Fed. Cir. 2012) (citing *In re Gurley*, 27 F.3d 551, 553 (Fed. Cir. 1994)).

(2) *Whether Limitations 1[c] and 1[e] Were Taught by the Prior Art*

Petitioner argues that “Rosenberg-Park renders obvious” both limitation 1[c] and limitation 1[e]. Pet. 58, 61. Petitioner cites Park’s image compensation as teaching “adaptive transformation mapping” and other aspects of limitations 1[c] and 1[e]. Pet. 58–64; Reply 19–20. And, as discussed above in Section II.D.3.a).(1), Petitioner argues that it would have been obvious to add Park’s image compensation to Rosenberg’s system. Pet. 52–55, 59; Reply 21–22.

Patent Owner argues that “Rosenberg does not disclose ‘adaptive transformation mapping’ as construed in the District Court Litigation.” PO Resp. 39. According to Patent Owner, the only transformation Rosenberg does is inverting the image, which does not cause the image to “appear to be captured from a different point of view of the camera’s actual point of view,” as required by the claim limitations. *Id.*

In its Reply, Petitioner maintains that the combination of Rosenberg and Park would have rendered obvious limitations 1[c] and 1[e]. Reply 19–20. Arguing that Patent Owner “does not address the combination and improperly attacks the references individually,” Petitioner notes that “Dr. Forsyth admits that his declaration does not discuss Park regarding this section.” Reply 20.

In its Sur-reply, Patent Owner maintains that Rosenberg does not teach limitations 1[c] and 1[e]. Sur-reply 19. Patent Owner argues that Rosenberg’s resizing and zooming do not meet limitation 1[e]’s requirement that the “different point of view corresponds to an image taken from a

different angle and a different distance than the actual images captured by the camera.” *Id.* at 19.

Weighing the parties’ arguments and evidence, we find Petitioner shows by a preponderance of the evidence that limitations 1[c] and 1[e] are taught or suggested by Rosenberg and Park, in combination. Pet. 58–64; PO Resp. 39–40; Reply 19–20; Sur-reply 19. Petitioner persuades us that limitations 1[c] and 1[e], would have been obvious over Rosenberg and Park, *in combination*. Pet. 58–64; Reply 19–20.

Patent Owner’s counter arguments are unavailing for multiple reasons. Patent Owner’s arguments fail because they improperly attack Rosenberg’s teachings individually, rather than addressing Petitioner’s combination of the references. PO Resp. 39–40; Sur-reply 19. This is fatal to Patent Owner’s arguments. *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986).

Moreover, Petitioner presents persuasive arguments and evidence that the references, in combination, teach limitations 1[c] and 1[e], including persuasive evidence that the references’ tilting, resizing, and zooming meet the claim limitations’ “adaptive transformation mapping . . . to generate modified images that appear to be captured from a different point of view” that “corresponds to an image taken from a different angle and a different distance.” Pet. 58–64 (citing Ex. 1001, 3:26–28; Ex. 1003 ¶¶ 65–67, 253–268; Ex. 1006 ¶¶ 26–28, 50, 52, 61, 75 ; Ex. 1011 ¶¶ 50–51, 59, Figs. 6A–6B, 7, 8, 14, 15; Ex. 1019, 16–20; Ex. 1021, 2:19–27, 17:19–24, 21:60, 23:65–24:9, 25:46–48, 30:4–11, Fig. 11); Reply 19–20 (citing Ex. 1003 ¶¶ 253–268; Ex. 1021, 17:17–23; Ex. 2012, 63:13–22, 111:13–21). Regarding tilting, after noting the ’110 patent’s disclosure (incorporated

from the '109 patent) of performing tilt transformations (Pet. 10–11), Petitioner advances persuasive evidence that Park discloses such a tilting transformation, thereby teaching the claimed “different angle” (*id.* at 61–63).

Regarding resizing and zooming, citing extensive discussion in the '110 patent (incorporated from the '109 patent) of resizing and/or zooming to address the effects of varying distance between an object and a camera, Petitioner and Dr. Karam explain that the prior art’s zooming and resizing meet the claimed “different distance.” Pet. 63 (Ex. 1001, 3:26–28; Ex. 1021, 17:19–23, 21:57–60, 23:65–24:9, 25:46–48, 30:4–11, Fig. 11); Ex. 1003 ¶ 265 (citing Ex. 1001, 3:26–28; Ex. 1021, 17:19–23, 21:57–60, 23:65–24:9, 25:46–48, 30:4–11, Fig. 11). In its counterarguments, Patent Owner suggests that zooming and resizing do not account for “occlusion effects,” but Patent Owner does not persuasively tie this argument to the '110 patent, failing to cite any portion of the '110 patent that evinces its invention addresses such effects. PO Resp. 23–25, 39–40.

b) Limitation 1[f]

For limitation 1[f], Petitioner relies on Rosenberg and Park. Pet. 64–67. Petitioner argues that “a [person of ordinary skill in the art] would have been motivated to implement Park’s transformation mapping in Rosenberg as an efficient solution to the image distortion problem described in Rosenberg created by the angle of Rosenberg’s camera.” *Id.* at 67. Patent Owner responds that “[n]either Rosenberg nor Park, alone or in combination, meet limitation 1(f) under the District Court construction of ‘mirror tracking mode.’” PO Resp. 31.

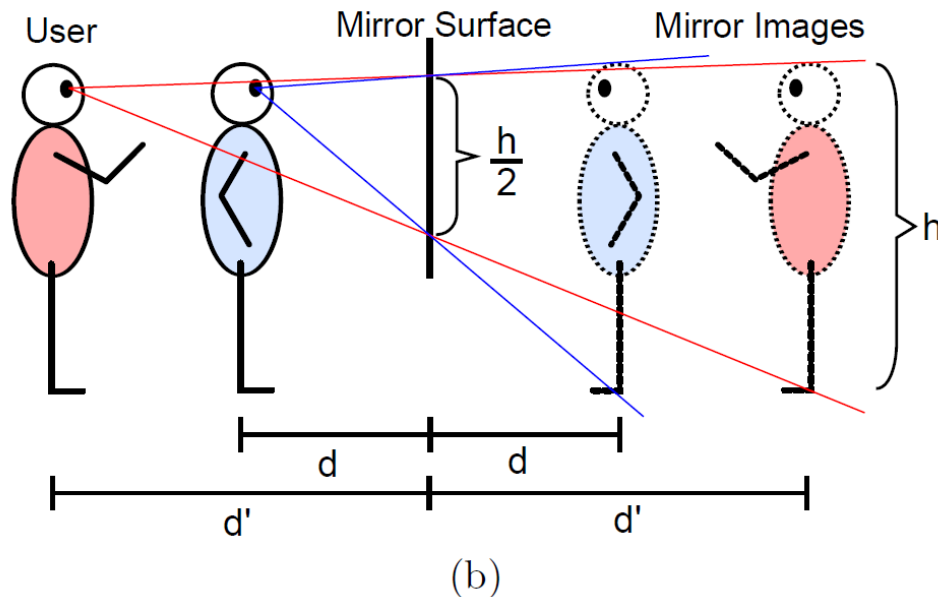
We first address the requirement of the “mirror tracking mode” for a reversed reflection. The parties agree that Rosenberg teaches flipping the

image on its vertical axis. *E.g.*, Pet. 68; PO Resp. 32; Reply 18. We find that Rosenberg’s disclosure of flipping the image on its vertical axis meets the requirement for a reversed reflection in “mirror tracking mode.” *E.g.*, Ex. 1006 ¶¶ 26, 35, 77; Ex. 1003 ¶ 277.

As to the other aspects of the District Court’s construction, namely the “double the distance” and “same size” features (*see supra*), Petitioner contends that the combination of Rosenberg and Park “gives the user the impression of ‘standing before a traditional wall mirror’ and provides ‘a highly realistic mirror replication image,’ which a [person of ordinary skill in the art] understands satisfies the [District Court’s] construction.” Reply 17 (citing Pet. 58–67; Ex. 1003 ¶¶ 253–267; Ex. 1006 ¶¶ 61, 77). Dr. Karam testifies that a person of ordinary skill would understand that a traditional mirror would have the characteristics of “flipping,” “same size,” and “double the distance.” Karam Dep. 62:7–22. We agree with Petitioner and find that the record before us demonstrates that a person of ordinary skill would have recognized that these features would at least be suggested if not expressly taught by Rosenberg alone or in combination with Park. Pet. Reply 17–19. Testimony from both parties’ experts supports this finding. Petitioner’s expert, Dr. Karam, describes the virtual “mirror effect” including “double the distance” and “same size” as “well known to a person of ordinary skill”:

A virtual mirror needs to simulate the properties of a real mirror as accurate as possible. When standing in front of a mirror at a distance *d*, the mirror image of oneself appears *exactly at the same distance but behind the mirror*. However, even though this distance can change, *the size of the user* in the mirror image when projected on the mirror surface *stays constant* at half the height *h* of the user.

Ex. 1033 ¶ 9 (quoting Ex. 1037 (Straka), 637) (emphases added). Dr. Karam illustrates this effect in the following figure from Straka:¹³



Ex. 1033 ¶ 9 (reproducing Ex. 1023 (Straka), Fig. 1(b)); *see also* Karam Dep. 180:10–16, 253:6–25; 261:16–262:5. This figure illustrates simulating a mirror image where d and d' are changing distances between the user and the mirror surface and h is the height of the user. Patent Owner’s expert, Dr. Forsyth, agrees, testifying that the optical properties of conventional mirrors (including the “double the distance” and “same size” features) have been known “for millennia”:

[DR. FORSYTH]: Why do I think they should have known? And what I’m referring to there is double the distance to the mirror and roughly the same size. Because those had been known for millennia and they’re standard simple exercises in geometry.

¹³ Dr. Karam relies on Straka as background art reflecting what a person of ordinary skill would have understood about conventional mirrors. Ex. 2012, 88:1–17. *See* Section III below.

Forsyth Dep. 157:7–11; *see also* Ex. 2013 ¶¶ 59–60 (describing “general optical properties of a conventional mirror” as including “double the distance” and “same size”). We find for the reasons given (and there is no dispute) that a person of ordinary skill would have recognized that a conventional mirror has these features.

Patent Owner counters with several arguments, none of which are availing. *See* Sur-reply 14–19. For example, Patent Owner argues that Petitioner fails to show that anything in Rosenberg “would be understood by a [person of ordinary skill in the art] to disclose the double distance, same size requirements.” *Id.* at 15. This argument is unavailing because it does not address Petitioner’s main argument that a person of ordinary skill would have recognized that these features are at least suggested by Rosenberg’s objective of providing “a traditional mirror emulation mode” in which “the digital mirror is operative to replicate the performance of a standard household mirror.” Ex. 1006 ¶ 27.

Patent Owner argues there is insufficient proof of a motivation to combine Rosenberg and Park with respect to limitation 1[f]. PO Resp. 38–39. Patent Owner bases arguments on Rosenberg’s disclosure of left-to-right inversion or “flipping.” PO Resp. 38–39; Sur-reply 15–16. For example, Patent Owner contends “[t]he fact that *some* non-specific scaling has been performed would not teach a [person of ordinary skill] that Rosenberg has implemented a scaling approach that ensures both that the image appears at double the distance, and at the same size.” Sur-reply 16. Also, “[a]s Dr. Forsyth has explained, Rosenberg’s disfavoring these properties would be regarded by a [person of ordinary skill in the art] as teaching away from implementing them and would especially be regarded as

doing so given that its ‘traditional mirror emulation mode’ only discloses image inversion.” *Id.* at 17 (citing Ex. 2013 ¶¶ 111–112).

We do not agree. Petitioner demonstrates persuasively that a person of ordinary skill would have combined these references “to correct image distortions and provide a more realistic mirror image.” Pet. 52–55; Ex. 1003 ¶¶ 242–249. We are not persuaded by Patent Owner that by specifically disclosing “flipping” the image, Rosenberg is discouraging or teaching away from performing other transformations to achieve its objective of “replicat[ing] the performance of a standard household mirror.” *See* PO Resp. 35, 38–39 (Patent Owner asserting lack of motivation to combine the references). 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.” *Galderma Lab'ys, L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013) (quoting *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 567 F.3d 1314, 1327 (Fed.Cir.2009)). “A reference does not teach away, however, if it merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into the invention claimed.” *Id.* Further, when conducting an obviousness analysis, the Board must consider a prior art reference “not only for what it expressly teaches, but also for what it fairly suggests.” *Bradium Techs. LLC v. Iancu*, 923 F.3d 1032, 1049 (Fed. Cir. 2019) (quoting *In re Baird*, 16 F.3d 380, 383 (Fed. Cir. 1994)). We are not convinced that the references before us “teach away” from performing the other transformations.

In sum, we find for the reasons given that Petitioner has demonstrated by a preponderance of evidence that to a person of ordinary skill, Rosenberg alone or with Park teaches or suggests limitation 1[f].

E. GROUND 3: ALLEGED OBVIOUSNESS OVER GEISNER AND LIZEE

Because Petitioner has withdrawn this ground, we need not reach it.
Ex. 3001.

F. GROUND 4: ALLEGED OBVIOUSNESS OVER HAAN, FRANCOIS,
AND GEISNER

Building from Ground 1’s assertion that claim 1 would have been obvious over Haan and Francois, Ground 4 asserts that dependent claims 7–9, 13–15, and 18 would have been obvious over Haan, Francois, and Geisner. Pet. 103–105. Arguing that “Haan in view of Francois renders obvious claim 1 (from with claims 7-9, 13-15, 18 depend),” Petitioner contends that “Geisner teaches the additional limitations in claims 7-9, 13-15, and 18.” *Id.* at 105.

As discussed in Section II.C above, Petitioner does not show that claim 1 would have been obvious over Haan and Francois. The deficiencies in Petitioner’s challenge of claim 1 over Haan and Francois are not cured by Petitioner’s argument that Geisner teaches limitations in dependent claims 7–9, 13–15, and 18. Accordingly, Petitioner does not show that claims 7–9, 13–15, and 18 would have been obvious over Haan, Francois, and Geisner.

G. GROUND 5: ALLEGED OBVIOUSNESS OVER ROSENBERG, PARK,
AND GEISNER

Building from Ground 2’s assertion that claim 1 would have been obvious over Rosenberg and Park, Ground 5 asserts that dependent claims 3, 4, 7–9, and 11–18 would have been obvious over Rosenberg, Park, and

Geisner. Pet. 105–107. In Ground 5, Petitioner cites Geisner as teaching limitations in the challenged dependent claims. *Id.* at 106–107.

Patent Owner only challenges Ground 5 by arguing that Petitioner does not persuasively address limitations 1[c], 1[e], and 1[f]. PO Resp. 58–60. Contrary to Patent Owner’s arguments, as discussed in Section II.D.3, Petitioner has persuasively addressed limitations 1[c], 1[e], and 1[f] in Ground 1. Based on all of the arguments and evidence of record, we find Petitioner shows by a preponderance of the evidence that claims 3, 4, 7–9, and 11–18 would have been obvious over Rosenberg, Park, and Geisner. Pet. 105–107; PO Resp. 58–60.

III. PATENT OWNER’S MOTION TO STRIKE

Patent Owner moves to strike various arguments and evidence offered by Petitioner in response to Patent Owner’s assertion that, because of the District Court’s construction of “mirror tracking mode,” the challenged claims are not unpatentable. Paper 42, Motion to Strike (“Motion”), 1–2. Patent Owner argues that Petitioner “belatedly seeks to remedy their failure of proof by presenting untimely new theories, argument, and evidence.” *Id.* at 1. Given this, Patent Owner moves to strike certain portions of Petitioner’s Reply that allegedly “advanc[e] previously undisclosed theories, arguments, and evidence,” along with associated evidence, including “Straka and Francois II as purported ‘background art,’” “the entirety of Dr. Karam’s Second Declaration discussing and offering opinions regarding these references,” and “the portions of Dr. Karam’s deposition advancing these new theories and references relied upon by Petitioners.” *Id.*

At the outset, we point out that motions to strike are not favored and are infrequently granted. As explain in our Trial Practice Guide:

In most cases, the Board is capable of identifying new issues or belatedly presented evidence when weighing the evidence at the close of trial, and disregarding any new issues or belatedly presented evidence that exceeds the proper scope of reply or sur-reply. *As such, striking the entirety or a portion of a party's brief is an exceptional remedy that the Board expects will be granted rarely.*

Patent Trial and Appeal Board Consolidated Trial Practice Guide (Nov. 2019), 80.

A. UNTIMELY NEW ARGUMENTS

Patent Owner contends that Petitioner “*chose* not to address the construction for ‘mirror tracking mode’ that Petitioner Samsung advocated for (and ultimately obtained) in the District Court Litigation.” Motion 2. Further, Patent Owner argues, “[t]hroughout their Reply, Petitioners make the entirely new arguments that the Double Distance, Same Size Requirement is either disclosed by, or rendered obvious by, the Asserted Grounds.” *Id.* at 3. According to Patent Owner “[t]hese new arguments are improper and should be stricken.” *Id.* at 5.

Patent Owner distinguishes the Federal Circuit’s decision in *Axonics*. Motion 4. In *Axonics*, the Federal Circuit vacated a Board decision and remanded to the Board with directions to consider reply arguments and evidence on a claim construction first advanced in a patent owner response. *Axonics*, 75 F.4th at 1383–84. According to Patent Owner, unlike in *Axonics*, “[i]n this case, the construction at issue is Petitioners’ own that it *chose* not to address, despite knowing its own position in the district court prior to Institution.” Motion 4. Patent Owner contends that by not addressing the District Court claim construction, Petitioner has suffered a “failure of proof.” *Id.* at 1.

Opposing the Motion, Petitioner refers to the features of mirror tracking mode in the District Court’s Claim Constriction Order (reversed reflection, double the distance, and same size). Paper 45 (“Opp.”), 1–2 (citing Ex. 2008, 41). Petitioner asserts that “[b]oth experts agree that these are known properties of conventional mirrors.” *Id.* at 2. Petitioner contends “Dr. Karam’s declaration submitted with the Petition explains how these features, which the ’110 patent admits were known, are features of conventional mirrors.” *Id.* (citing Ex. ¶¶ 53–54, 65–67).

Petitioner relies also on *Axonics*. Opp. 7–8. Petitioner points out that “Patent Owner is the one who now insists that the Board adopt the magistrate judge’s recommended construction.” *Id.* at 8. Petitioner reasons that “[t]he principles discussed in *Axonics* apply with full force here.” *Id.*

We agree with Petitioner that *Axonics* favors denying Patent Owner’s motion. We are not persuaded by Patent Owner’s attempt to distinguish *Axonics* because Petitioner “chose” not to address the District Court’s construction of “mirror tracking mode.” Motion 4. The Petition was filed before the District Court construed “mirror tracking mode.” *Compare* Paper 6 *with* Ex. 2008. And Patent Owner does not present evidence showing that Samsung had proposed a construction of “mirror tracking mode” at the District Court as of the time it filed the Petition. *See generally*, Motion. Furthermore, we are not persuaded that Petitioner’s reply arguments were not a fair response to a claim construction advanced, for the first time, in Patent Owner’s Response to the Petition. Motion 4–5. In that connection, we note that prior to institution, both Petitioner and Patent Owner took the position that no claim construction was necessary. *See* Section II.B, *supra*. Not until the filing of its Response did Patent Owner

urge us to adopt the District Court’s claim construction. *See* PO Resp. 14–19. Allowing Petitioner to respond to this construction in its Reply is necessary under *Axonics*.

B. ASSOCIATED EVIDENCE

Patent Owner also argues that Petitioner improperly advances new evidence from Dr. Karam’s deposition and her second declaration, as well as Straka and Francois II. Motion 5–8. According to Patent Owner, “[t]his improper evidence and opinion requires striking” the portions of Dr. Karam’s deposition testimony cited by Petitioner, along with Dr. Karam’s second declaration, Straka, and Francois II. *Id.* at 5.

We disagree. As Petitioner points out, “Patent Owner elicited Dr. Karam’s deposition testimony, introducing the magistrate judge’s order as an exhibit and repeatedly asking her questions about it.” Opp. 9; *see, e.g.*, Ex. 2012, 44:11–17; 187:25–188:2; 189:1–11; 192:25–193:4. We agree that Patent Owner opened the door to this testimony by cross-examining Dr. Karam on the District Court’s Order. We agree, also, that Patent Owner has failed to identify specific testimony that should be stricken. Opp. 9–10. Our Trial Practice Guide warns against this approach: “[S]triking the entirety or a portion of a party’s brief is an exceptional remedy that the Board expects will be granted rarely.” Trial Practice Guide, 80.

Subsequent to the deposition, Dr. Karam’s second Declaration and reliance on Straka and Francois II properly elaborated on the claim-construction subject raised by Patent Owner in the deposition and Patent Owner’s Response. For example, we see no impropriety in Dr.

Karam’s reliance on “background art” (*e.g.*, Straka). Motion 2, 5–6, 8–9.¹⁴ Petitioner’s discussion of Straka as background art is not “gap-filling,” and Dr. Karam’s testimony is not indicative of a “failure of proof.” *Id.* at 1, 7–8. The Federal Circuit recently observed that “our case law has long recognized numerous permissible uses for general background knowledge in an IPR such as, for example, furnishing a motivation to combine, or supplying a missing claim limitation.” *Shockwave Med., Inc. v. Cardiovascular Sys., Inc.*, 142 F.4th 1371, 1378–79 (Fed. Cir. 2025) (internal quotation marks omitted).

C. SUMMARY AND CONCLUSION

For the reasons given, Patent Owner has failed to demonstrate that the “exceptional remedy” of striking Petitioner’s arguments and evidence is warranted.

IV. CONCLUSION

For the foregoing reasons, we are persuaded that Petitioner has established by a preponderance of the evidence that claims 1–18 of the ’110 patent are unpatentable.

Ground	Claims	35 U.S.C. §	References/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
1	1–6, 10–12, 16, 17	103	Haan, Francois		1–6, 10–12, 16, 17
2	1–6, 10–12	103	Rosenberg, Park	1–6, 10–12	

¹⁴ Patent Owner cannot claim it was prejudiced by Petitioner’s use of Straka as background art. Straka was the subject of cross-examination by Patent Owner’s counsel. *See. e.g.*, Ex. 2012, 48:21–50:1, 71:24–73:5, 86:1–88:21; 103:24–111:4.

Ground	Claims	35 U.S.C. §	References/Basis	Claims Shown Unpatentable	Claims Not Shown Unpatentable
3 ¹⁵	1–18	103	Geisner, Lizee		
4	7–9, 13–15, 18	103	Haan, Francois, Geisner		7–9, 13–15, 18
5	3, 4, 7–9, 11–18	103	Rosenberg, Park, Geisner	3, 4, 7–9, 11–18	
Overall Outcome				1–18 ¹⁶	

V. ORDER

In consideration of the foregoing, it is:

ORDERED that claims 1–18 of the '110 patent have been shown to be unpatentable;

FURTHER ORDERED that, because this is a Final Written Decision, the parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2; and

FURTHER ORDERED that Patent Owner's Motion to Strike is *denied*.

¹⁵ Because Petitioner withdrew this ground, we need not reach it.

¹⁶ Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Bissell's attention to the April 2019 Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding, 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Bissell of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. §§ 42.8(a)(3), (b)(2).

IPR2024-00810
Patent 8,982,110 B2

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IPR2024-00810
Patent 8,982,110 B2

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