

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

GOOGLE LLC,
SAMSUNG ELECTRONICS CO., LTD., and
SAMSUNG ELECTRONICS AMERICA, INC.,
Petitioner,

v.

EYESMATCH LTD.,
Patent Owner.

IPR2024-00856
Patent 8,982,109 B2

Before THOMAS L. GIANNETTI, NEIL T. POWELL, and
SCOTT RAEVSKY, *Administrative Patent Judges*.

GIANNETTI, *Administrative Patent Judge*.

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

I. INTRODUCTION

Google LLC, Samsung Electronics Co., Ltd., and Samsung Electronics America, Inc. (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–18 (the “challenged claims”) of U.S. Patent No. 8,982,109 B2 (Ex. 1001, “the ’109 patent”). EyesMatch Ltd. (“Patent Owner”) filed a Preliminary Response (Paper 12, “Prelim. Resp.”).

The Board has authority to determine whether to institute *inter partes* review. *See* 35 U.S.C. § 314; 37 C.F.R. § 42.4(a) (2003). Under 35 U.S.C. § 314(a), we may not authorize an *inter partes* review unless the information in the petition and the preliminary response “shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.”

For the reasons stated below, we determine that Petitioner has established a reasonable likelihood that it would prevail with respect to at least one claim. We therefore institute *inter partes* review as to all of the challenged claims of the ’109 patent and all of the asserted grounds of unpatentability in the Petition.

II. BACKGROUND

A. Related Matters

The parties identify the following district court proceeding involving the ’109 patent: *EyesMatch Ltd. v. Samsung Electronics Co., Ltd. et al.*, No. 2:23-cv-00363 (E.D. Tex.). Pet. 94–95; Paper 6, 1.

Petitioner identifies the following additional district court proceeding involving the ’109 patent: *EyesMatch Ltd. et al. v. Facebook, Inc. et al.*, No. 1:21-cv-00111 (D. Del.). Pet. 94–95. Petitioner identifies the following

Board proceeding involving the '109 patent: *Meta Platforms, Inc. f/k/a Facebook, Inc. et al. v. EyesMatch Ltd. et al.*, IPR2022-00489 (PTAB) (terminated). *Id.* Further, Petitioner states a petition challenging the claims in related U.S. Patent No. 8,982,110 was filed in IPR2024-00810. *Id.*

B. Real Parties-in-Interest

Petitioner identifies Google LLC, Samsung Electronics Co., Ltd., Samsung Electronics America, Inc., and Samsung Research America, Inc. as the real parties-in-interest.¹ Pet. 94. Patent Owner identifies EyesMatch Ltd. as the real party-in-interest. Paper 6, 1. At this stage, neither party challenges those identifications.

C. The '109 Patent (Ex. 1001)

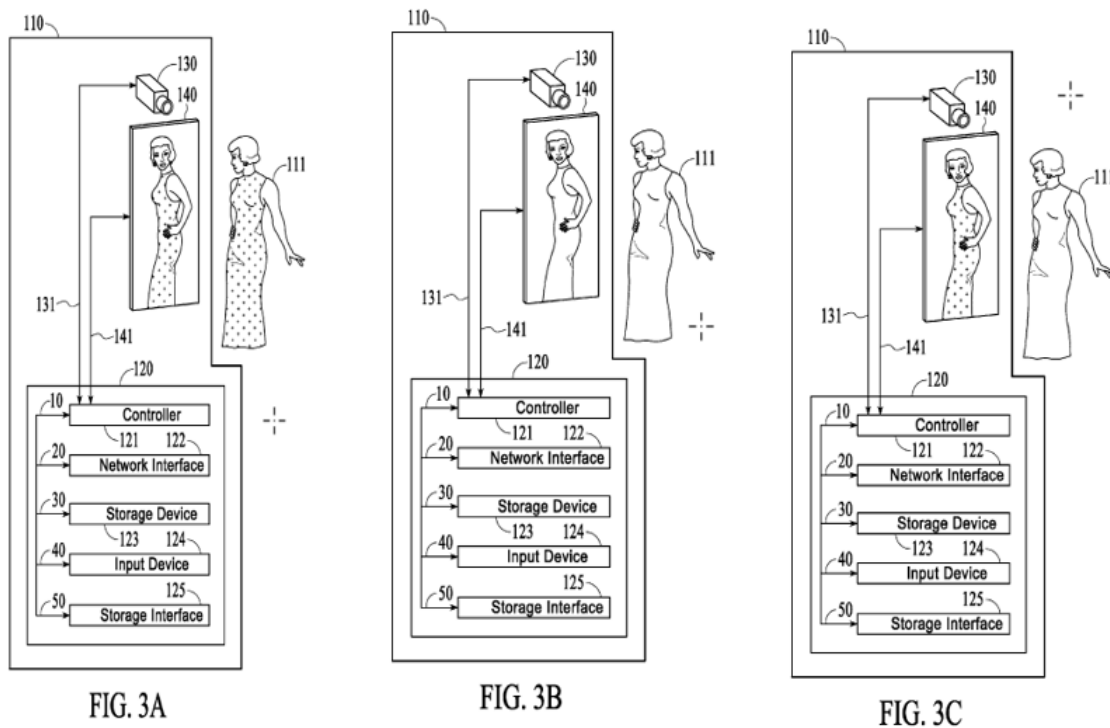
The '109 patent is titled “Devices, Systems and Methods of Capturing and Displaying Appearances.” Ex. 1001, code (54). The patent addresses a problem in shopping for certain consumer articles, such as clothes. *Id.* at 1:35–38. Prior to making a decision on which clothing article to buy, a customer may try on numerous articles, but have difficulty recalling their appearance with each article and have to repeatedly retry articles, resulting “in a frustrating and inefficient shopping experience.” *Id.* at 1:38–60.

Accordingly, the '109 patent describes interactive imaging and display systems for retail or service environments. Ex. 1001, 1:26–29. In particular, the patent describes a system that includes an imaging device for capturing a user’s appearance and a mirror-display device operating

¹ Petitioner states Google LLC is a subsidiary of XXVI Holdings Inc., which is a subsidiary of Alphabet Inc. Pet. 94 n.13. Petitioner asserts that XXVI Holdings Inc. and Alphabet Inc. are not real parties-in-interest to this proceeding. *Id.*

selectably as a mirror or a display. *Id.* at 5:20–23. In mirror mode, the mirror-display device allows the user to view a current user appearance, and in display mode, the mirror-display device allows the user to view one or more user appearances previously captured by the imaging device. *Id.* at 5:23–33.

An embodiment of the invention is shown in Figures 3A to 3C, which are reproduced below:



Figures 3A to 3C depict three sequential stages for comparing user appearances. Ex. 1001, 4:11–14. System 100 includes display station 110, control unit 120, and imaging device 130. *Id.* at 5:37–41. System 100 also includes mirror-display device 140, comprising, for example, a flat panel display. *Id.*

Figure 3A shows user 111 interacting with system 100 in which mirror-display device 140 operates in mirror mode. Ex. 1001, 12:62–64. In Figure 3A, the user is wearing a particular article of clothing in a first trial. *Id.* at 12:64–13:2. Upon receiving user input from input device 124, controller 121 may request that imaging device 130 capture an image of the user appearance, which image is stored in storage device 123. *Id.*

In Figure 3B, a user is wearing a different article of clothing in a second trial. Ex. 1001, 13:3–5. Initially, the user may view their appearance in the second trial with mirror-display device 140 in mirror mode. *Id.* With user input from input device 124, controller 121 may change mirror-display device 140 to display mode, as shown in Figure 3C, to display the image of the user appearance in the first trial. *Id.* at 13:5–12. “Therefore, by switching between operating modes of mirror-display device 140, user 111 may compare the user-appearance of the second trial with the user-appearance of the first trial and/or any other user-appearances previously stored in storage device 123.” *Id.* at 13:12–16.

Figure 2B shows another embodiment, and is reproduced below:

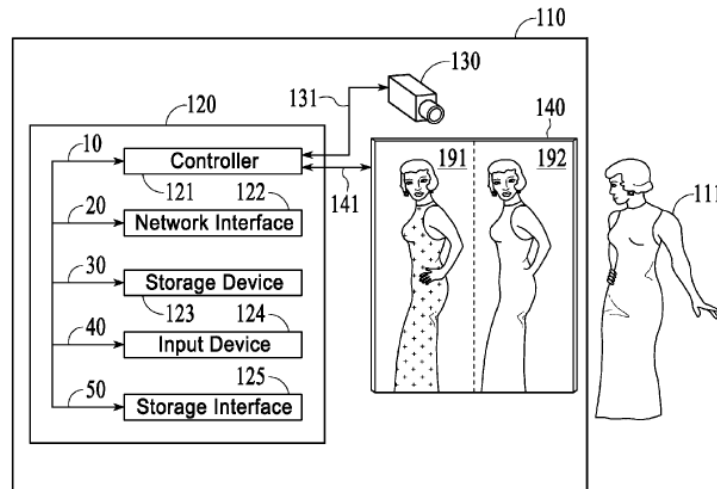


FIG. 2B

In Figure 2B, mirror-display device 140 may be “partitioned into two frames, wherein one frame may operate as a mirror frame 192 and another frame 191 may operate selectably as a mirror and as a display frame.” Ex. 1001, 12:44–48. In particular, user 111 may simultaneously view a stored image of a first trial user appearance in frame 191, “side-by-side with the normal mirror appearance of a second trial in frame 192, and compare between the first and the second trial.” *Id.* at 12:51–57.

The ’109 patent explains the use of a camera and a screen are not yet accepted as a replacement for the conventional mirror. Ex. 1001, 1:61–65. These techniques are not convincing as a reliable image of the individual as if they were looking at themselves in a conventional mirror. *Id.* at 1:65–2:3. For example, when a user approaches a mirror, the user sees themselves roughly at the same size, but closer. *Id.* at 2:4–23. In contrast, when a user gets closer to a camera, the user appears larger in the image. *Id.* at 2:23–27. As another example, when a user approaches a mirror, the reflection of the user’s eyes will always stay on the same virtual line into the mirror, whereas with a camera, depending on the camera’s height, as the user gets closer to the camera, the user’s eyes may appear at different levels. *Id.* at 2:28–33.

The ’109 patent discloses, in the described embodiments, transformation mapping that corrects the image obtained by the cameras and provides an image that mimics an image that would have been reflected from a mirror. Ex. 1001, 27:3–6. Mapping essentially reassigns new addresses to each pixel of an original image. *Id.* at 29:28–30; *see also id.* at 14:40–43. The transformation mapping renders an image appearing to have been taken from a camera positioned at eye-level height and pointing horizontally. *Id.* at 29:30–32.

An embodiment of the invention comprises a “scale transformation [that] 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.” Ex. 1001, 23:61–24:3. An embodiment comprises tilt and elevation transformations and transformation mapping when using a camera on top of a screen and tilted downwards. *Id.* at 24:22–34; *see also id.* at 19:31–52 (describing accommodating distortion due to closer body parts appearing larger and further body parts appearing smaller). The patent further describes an “embodiment, [wherein] if the user moved an amount of less than, say 25 cm, the transformation mapping is performed at a lower speed, say every x seconds, while if the user moved more than 25 cm, the transformation mapping is updating the parameters at a second, faster speed.” *Id.* at 27:54–58. In some embodiments an image is resized to reduce variations caused by changes in an object's distance to a camera. *Id.* at 28:49–29:6.

D. Illustrative Claim

The Petition challenges claims 1–18, of which claim 1 only is independent. Claim 1 is illustrative of the claimed subject matter and is reproduced below:²

1. [(pre)] A method for operating a system having a monitor, a camera, and a processor, so as to display a mirror-mimicking image on the monitor, by performing non-ordered steps comprising:

[1(a)] obtaining a digital image from a camera;

² References in brackets have been added tracking Petitioner's analysis. We have divided claim 1 into paragraphs for ease of understanding.

[1(b)] flipping the image about a vertical axis so as to reverse right and left sides of the image;

[1(c)] applying a transformation mapping to the image to modify the image such that it appears to mimic a reflection of a mirror;

[1(d)] resizing the image to reduce variations caused by changes in object's distance to the camera;

[1(e)] displaying the image on the monitor after performing the flipping, transformation mapping, and resizing;

[1(f)] wherein the non-ordered steps are performed on a series of images of a live video feed from the camera;

[1(g)] determining distance to a user appearing in the live video feed; and,

[1(h)] varying rate at which the non-ordered steps are performed on the series of images according to the distance.

Ex. 1001, 30:52–67.

E. Prior Art References and Other Evidence

Petitioner relies on the following references (Pet. 1–4):

1. U.S. Patent App. Publ. 2007/0040033 A1 (Feb. 22, 2007) (Ex. 1005, “Rosenberg”);
2. Japanese Patent App. Publ. 2007-6016 A (Jan. 11, 2007) (Ex. 1006, “Nakazawa³”);
3. Japanese Patent App. Publ. 2010-177777 A (Aug. 12, 2010) (Ex. 1008, “Hatanaka⁴”);
4. U.S. Patent 6,816,187 B1 (Nov. 9, 2004) (Ex. 1010, “Iwai”);
5. U.S. Patent App. Publ. 2011/0292018 A1 (Dec. 1, 2011) (Ex. 1011, “Kubota”);

³ We cite the certified translation of Nakazawa in Exhibit 1007.

⁴ We cite the certified translation of Hatanaka in Exhibit 1009.

6. U.S. Patent App. Publ. 2008/0239107 A1 (Oct. 2, 2008) (Ex. 1012, “Cho”);
7. U.S. Patent App. Publ. 2008/0253685 A1 (Oct. 16, 2008) (Ex. 1013, “Kuranov”);
8. U.S. Patent App. Publ. 2007/0081208 A1 (Apr. 12, 2007) (Ex. 1014, “Chang”);
9. U.S. Patent App. Publ. 2007/0065039 A1 (Mar. 22, 2007) (Ex. 1016, “Park”);
10. International Patent App. Publ. WO 2006/108279 A1 (Oct. 19, 2006) (Ex. 1017, “Lizee”); and
11. U.S. Patent 9,355,585 B2 (May 31, 2006) (Ex. 1040, “Tripathi”).

In addition to these references, Petitioner relies on a Declaration of Dr. Lina J. Karam. Ex. 1004 (“Karam Decl.”).

F. The Asserted Grounds of Unpatentability

Petitioner asserts the following grounds of unpatentability. Pet. 2–4.

Ground	Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1	1–6, 8, 17	103(a) ⁵	Rosenberg, Nakazawa
2	1–6, 8, 11, 17	103(a)	Rosenberg, Nakazawa, Hatanaka
3	1–6, 8, 17	103(a)	Rosenberg, Nakazawa, Tripathi
4	11	103(a)	Rosenberg, Nakazawa, Tripathi, Hatanaka

⁵ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. §103. Because the ’109 patent has a filing date prior to the effective date of the applicable AIA amendment, we refer to the pre-AIA version of §103.

5	7	103(a)	Rosenberg, Nakazawa, Iwai
6	7	103(a)	Rosenberg, Nakazawa, Hatanaka, Iwai
7	7	103(a)	Rosenberg, Nakazawa, Tripathi, Iwai
8	9	103(a)	Rosenberg, Nakazawa, Kubota
9	9	103(a)	Rosenberg, Nakazawa, Hatanaka, Kubota
10	9	103(a)	Rosenberg, Nakazawa, Tripathi, Kubota
11	10	103(a)	Rosenberg, Nakazawa, Cho
12	10	103(a)	Rosenberg, Nakazawa, Hatanaka, Cho
13	10	103(a)	Rosenberg, Nakazawa, Tripathi, Cho
14	12	103(a)	Rosenberg, Nakazawa, Park
15	12	103(a)	Rosenberg, Nakazawa, Hatanaka, Park
16	12	103(a)	Rosenberg, Nakazawa, Tripathi, Park
17	13–15	103(a)	Rosenberg, Nakazawa, Kuranov
18	13–15	103(a)	Rosenberg, Nakazawa, Hatanaka, Kuranov
19	13–15	103(a)	Rosenberg, Nakazawa, Tripathi, Kuranov
20	16	103(a)	Rosenberg, Nakazawa, Chang
21	16	103(a)	Rosenberg, Nakazawa, Hatanaka, Chang
22	16	103(a)	Rosenberg, Nakazawa, Tripathi, Chang
23	18	103(a)	Rosenberg, Nakazawa, Lizee

24	18	103(a)	Rosenberg, Nakazawa, Hatanaka, Lizee
25	18	103(a)	Rosenberg, Nakazawa, Tripathi, Lizee

III. REQUEST FOR DENIAL UNDER 35 U.S.C. § 314(a)

Institution of an *inter partes* review is discretionary. *See* 35 U.S.C. § 314(a) (authorizing institution of an *inter partes* review under particular circumstances, but not requiring institution under any circumstances); *Cuozzo Speed Techs., LLC v. Lee*, 579 U.S. 261, 273 (2016) (“[T]he agency’s decision to deny a petition is a matter committed to the Patent Office’s discretion.”); *SAS Inst. Inc. v. Iancu*, 584 U.S. 357, 365 (2018) (“[Section] 314(a) invests the Director with discretion on the question whether to institute review” (emphasis omitted)); *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1367 (Fed. Cir. 2016) (“[T]he PTO is permitted, but never compelled, to institute an IPR proceeding.”).

Patent Owner argues that we should exercise our discretion under 35 U.S.C. § 314(a) and not institute trial in view of the activities in the parallel district court litigation because (1) Patent Owner will oppose any motion for a stay in the district court; (2) there is every reason to believe that trial will occur more than six months before the Board’s projected statutory deadline for any final written decision; (3) the parties and district court will have substantially invested in claim construction and discovery; (4) with the exception of Google, the parties to this proceeding are also parties to the district court proceeding; and (5) Petitioner has failed to present a compelling unpatentability challenge. Prelim. Resp. 52–59.

When determining whether to exercise discretion to deny institution in view of a parallel proceeding, we consider the factors set forth in *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 5–6 (PTAB Mar. 20, 2020) (precedential) (“*Fintiv*”). “These factors relate to whether efficiency, fairness, and the merits support the exercise of authority to deny institution in view of an earlier trial date in the parallel proceeding.” *Id.* In evaluating the *Fintiv* factors, we take “a holistic view of whether efficiency and integrity of the system are best served by denying or instituting review,” recognizing that “there is some overlap among these factors” and that “[s]ome facts may be relevant to more than one factor.” *Id.* at 6.

In *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12 (PTAB Dec. 1, 2020) (precedential), the Board declined to exercise its discretion to deny review under *Fintiv* where the patent owner stipulated “if IPR is instituted, they will not pursue in the District Court Litigation any ground raised or that could have been reasonably raised in an IPR.” *Sotera Wireless*, Paper 12 at 18.

On June 21, 2022, the Director of the United States Patent and Trademark Office issued a Memorandum setting forth an “Interim Procedure for Discretionary Denials in AIA Post Grant Proceedings with Parallel District Court Litigation” (“Guidance Memo”).⁶ The Guidance Memo states that “[c]onsistent with *Sotera Wireless, Inc.*, the PTAB will not discretionarily deny institution in view of parallel district court litigation where a petitioner presents a stipulation not to pursue in a parallel

⁶ Available at https://www.uspto.gov/sites/default/files/documents/interim_proc_discretionary_denials_aia_parallel_district_court_litigation_memo_20220621_.pdf.

proceeding the same grounds or any grounds that could have reasonably been raised before the PTAB.” Guidance Memo 3 (footnote omitted).

Petitioner advises us that in the pending district court litigation, Petitioner has stipulated as follows:

Petitioners stipulate that, if the Patent Trial and Appeal Board institutes an IPR proceeding for U.S. Patent No. 8,982,109 on the grounds presented in the petition in IPR2024-00856, Petitioners will not pursue an invalidity defense in district court that the patent claims subject to the instituted IPR are invalid based on grounds that were raised or reasonably could have been raised in the IPR.

Paper 13 (Updated Mandatory Notices), 1 (citing Ex. 1044). We determine that this stipulation is consistent in scope with the stipulation in *Sotera Wireless* cited approvingly in the Guidance Memo. Consistent with the Guidance Memo, therefore, we decline to exercise our discretion to deny institution under *Fintiv* in view of the parallel district court proceeding.

IV. ANALYSIS OF THE CHALLENGED CLAIMS

A. *Obviousness*

A claim is unpatentable as obvious under 35 U.S.C. § 103 if “the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) so-called “secondary considerations,” including commercial success, long-felt but unsolved needs,

failure of others, and unexpected results. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). At this stage, neither party has presented any evidence on the fourth *Graham* factor.

B. 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. ¶¶ 65–67). Petitioner adds that “[a] person with less and/or different education, but more relevant practical experience, or vice versa, may also meet this standard. The prior art also evidences such level of skill.” *Id.*

Patent Owner states that it “applies Petitioners’ proposed level of skill for purposes of this Preliminary Response and reserves the right to propose a different level of skill should the Board grant institution.” Prelim. Resp. 13.

At this stage, 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.

C. 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 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).

Neither party has proposed claim constructions for our consideration. Petitioner states that “[n]o terms require construction because the claims encompass the prior-art mappings under any reasonable construction consistent with *Phillips*.” Pet. 8. Patent Owner similarly contends 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. 13. However, “Patent Owner reserves the right to raise claim construction should the Board grant institution.” *Id.*

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))). At this stage of the proceeding, we need not construe any claim terms and phrases to resolve a controversy. To the

extent further clarification or explanation of any claim term is necessary for this Decision, we will do so in the context of our analysis of that term *infra*.

D. Description of the Principal Prior Art References

1. Rosenberg (Ex. 1005)

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. 1005, code (57).

Figure 3 of Rosenberg is reproduced below:

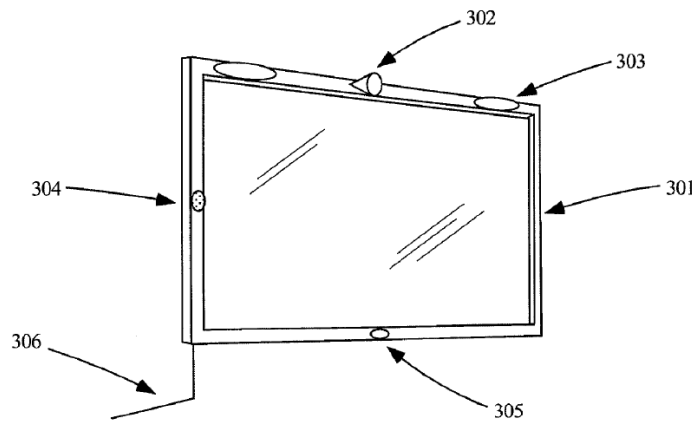


Figure 3 above illustrates wall mounted flat panel display 301 according to at least one embodiment. Ex. 1005 ¶ 62. The display includes video camera 302, light sources 303, microphones 304, proximity and/or motion sensors 305, and network connection 306. *Id.* ¶¶ 62–64, 69, 74. Processor 1305 adjusts 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.

Figure 5 of Rosenberg is reproduced below:

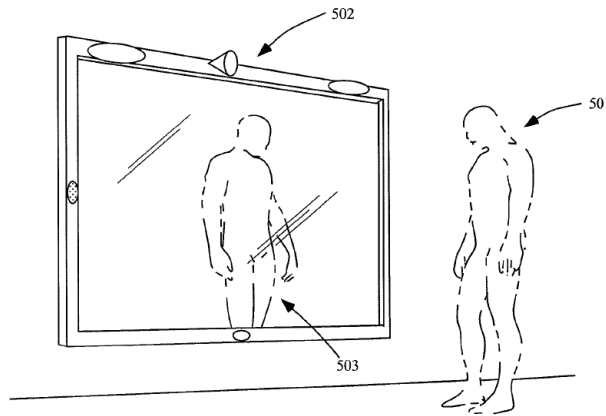


Figure 5 above illustrates a computer rendering of human user 501 standing in front of a wall-mounted embodiment of a digital mirror system 502. Ex. 1005 ¶ 77. The user's image is captured as a real-time video image by a camera, and a representation of that real-time video image is displayed on a screen 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. Ex. 1005 ¶¶ 54, 69.

2. Nakazawa (Ex. 1006, 1007)

Nakazawa relates to “a photographing device capable of correcting an image . . . when a deviation in the orientation of the face occurs when photographing.” Ex. 1007, code (57).

Figure 1 of Nakazawa is reproduced below:

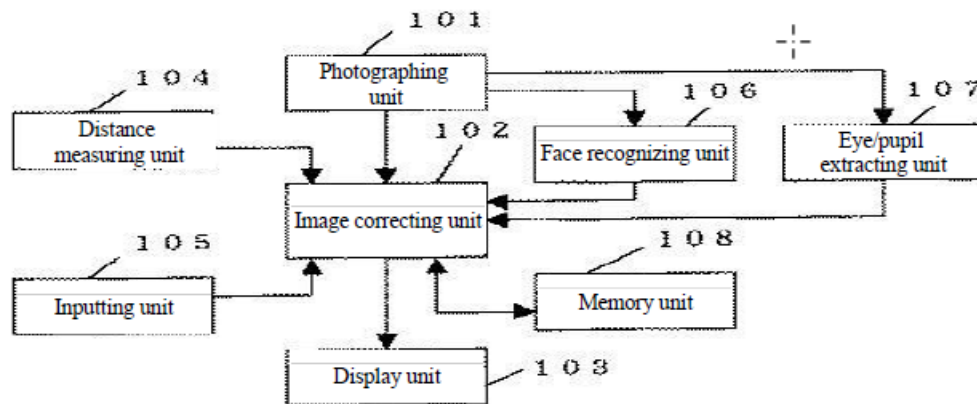
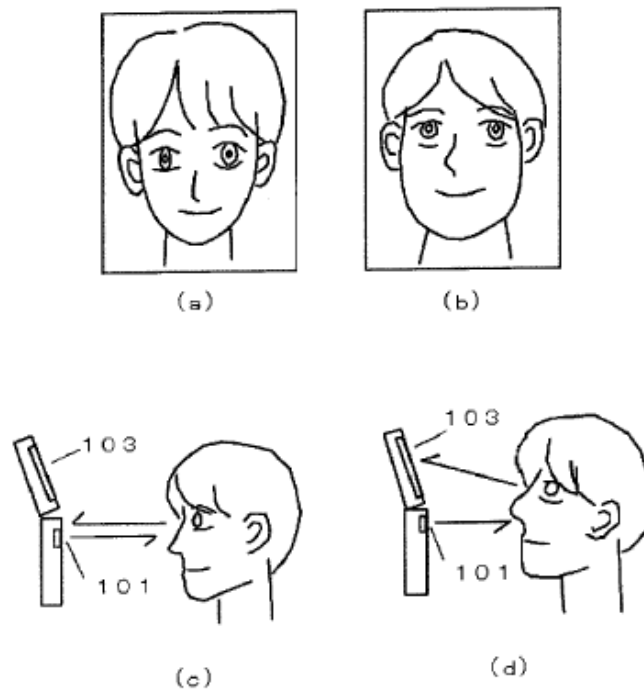


Figure 1 above is a block diagram of a photographing device in the form of a mobile phone equipped with a digital camera. Ex. 1007 ¶ 30. The photographing device includes photographing unit 101 in the form of a camera, display unit 103, image correcting unit 102 that corrects facial orientation deviation of a face image, and distance measurement unit 104 for measuring the distance between the user and the device. *Id.*

Figure 2 of Nakazawa is reproduced below:



In Figure 2(c), the user takes a picture while facing photographing unit 101, resulting in the image shown in Figure 2(a). Ex. 1007 ¶¶ 31, 32. In Figure 2(d), an image is captured while the user is looking at upper display unit 103, resulting in the image in Figure 2(b). *Id.*

Figure 3 of Nakazawa is reproduced below:

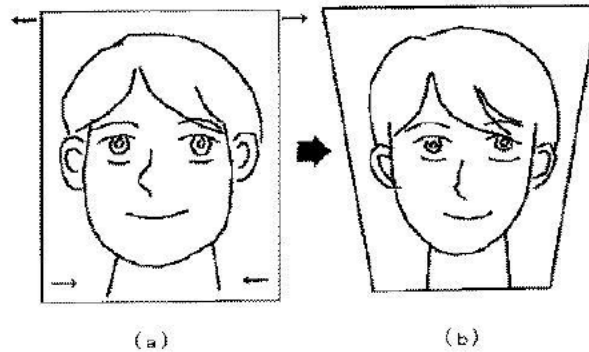


Figure 3 above illustrates correcting an image captured as depicted in Figure 2(d). Ex. 1007 ¶ 33. The image is corrected, as shown in Figure 3(a), by extending the width of the image while moving upwards from the center and narrowing the width of the image while moving downwards. *Id.* The corrected image is depicted in Figure 3(b). *Id.*

3. *Hatanaka* (Ex. 1008, 1009)

Hatanaka relates to an image communication system to reduce the throughput of image-data-related processing. Ex. 1009, codes (54), (57).

Figure 1 of Hatanaka is reproduced below:

Figure 1

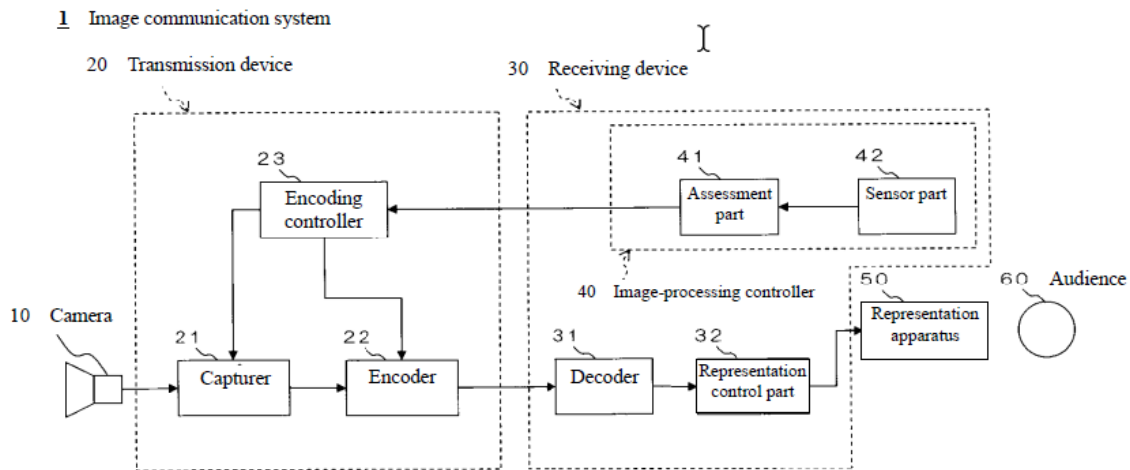


Figure 1 above illustrates camera 10 that captures video images, encoder 22, encoding controller 23, decoder 31, and representation apparatus 50, which may be a display. Ex. 1009, Fig. 1, ¶¶ 16, 18, 21. The system also includes sensor 41 that measures the distance between audience 60 and apparatus/display 50 and includes assessment part 42. *Id.* at Fig. 1,⁷ ¶¶ 29, 33, 34. Assessment part 42 provides encoding controller 23 with instructions so that encoding controller 23 adjusts the frame rate and other parameters according to viewing distance D. *Id.* ¶¶ 37, 38, 39. In an embodiment, assessment part 42 and encoding controller 23 control resolution of an image encoded by capturer 21 and encoder 22 in such a way that the resolution is lowered as viewing distance D increases. *Id.*

4. Tripathi (Ex. 1040)

Tripathi relates to electronic devices with adaptive frame rate displays. Ex. 1040, codes (54), (57). Control circuitry adjusts a display

⁷ In Figure 1, reference numbers 41 and 42 are reversed in comparison to the reference numbers used in the text. We use the numbers in the text as opposed to the numbers in Figure 1.

frame rate (sometimes referred to as the frame rate, the display refresh rate, or the refresh rate) in response to operational status information. *Id.* at 3:49–52. Control circuitry reduces the display frame rate in response to detection of, for example, static display content to be displayed. *Id.* at 1:60–2:8; *see also id.* at 5:52–57. Reducing the display frame rate may reduce power consumption for the device. *Id.* at 1:60–2:8; *see also id.* at 5:67–6:3. Control circuitry increases the display frame rate in response to detection of, for example, dynamic display content. *Id.* at 1:60–2:8; *see also id.* at 5:67–63. Increasing the display frame rate may result in a higher perceived display resolution for a user of the electric device. *Id.* at 1:60–2:8; *see also id.* at 5:65–67.

5. *Iwai (Ex. 1010)*

Iwai relates to a camera calibration apparatus and method. Ex. 1010, codes (54), (57). The camera calibration apparatus or method calculates a parameter representative of a characteristic of a camera and includes an image inputting step of inputting a picked-up image obtained by photographing a pattern with a predefined geometrical configuration through the use of a camera. *Id.* at 4:46–53. An image holding means holds a base image comprising the pattern with the predefined geometrical configuration. *Id.* at 4:53–55. A transformation parameter calculating means calculates a transformation parameter on the basis of an association (correspondence) of pixels between the picked-up image and the base image. *Id.* at 4:55–58. This technique may minimize a luminance (brightness) error between the corresponding pixels of the images. *Id.* at 5:16–24.

6. *Kubota (Ex. 1011)*

Kubota relates to a liquid crystal display device that includes a backlight for illuminating a liquid crystal panel for displaying images from behind and executes brightness adjustment of the backlight according to an image signal inputted for the displaying of the images. Ex. 1011 ¶ 4. The liquid crystal panel is segmented into a plurality of areas by dividing the pixels on the panel into a plurality of pixel groups, and the backlight is formed by a plurality of backlight cells corresponding to the areas, respectively. *Id.* ¶ 12. A shading control section corrects light control values so as to relatively lower brightness in a peripheral part of a screen of the liquid crystal panel in comparison with a central part of the screen. *Id.* ¶ 13; *see also id.* ¶¶ 30, 31, 38, 50, 66.

7. *Cho (Ex. 1012)*

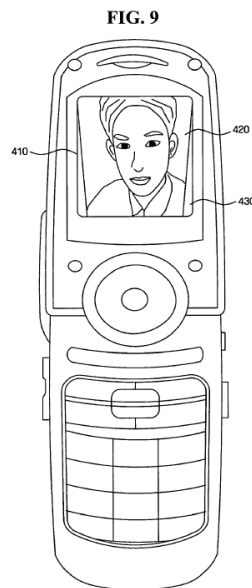
Cho relates to an imaging apparatus capable of correcting distortion, especially wide-angle distortion of a subject image. Ex. 1012 ¶ 1. Cho describes that capturing an image with a lens “at the wide-angle side will produce so-called barrel distortion (hereinafter, negative distortion) . . . where a figure is more reduced at the periphery of an image when compared to the ideal image.” *Id.* ¶ 71 (reference number omitted). “[N]egative distortion of an image is corrected by the image conversion processing to cause the positive distortion of the same magnitude.” *Id.* ¶ 73. “[W]ide-angle correction table 61 contains coefficients (parameters) of a coordinate transform function to correct wide-angle distortion of a captured image, and contains a plurality of coefficient sets for different magnitudes of the wide-angle distortion.” *Id.* ¶ 61; *see also id.* ¶¶ 18, 59.

8. *Park (Ex. 1016)*

Park relates to image capturing apparatus with image compensation that can perform compensation of a user's facial image that is distorted in accordance with a position of a camera relative to an imaged object.

Ex. 1016 ¶ 3. Park describes an image compensation unit performing image compensation using a perspective transform technique, which Park states is a typical matrix-based image transform algorithm. *Id.* ¶¶ 59–62; *see also id.* ¶¶ 50–53.

Figure 9 of Park is reproduced below:



In connection with Figure 9 above, Park further describes that a “compensation unit can perform [a] process on an empty region 430 occurring due to the different sizes of the display region 410 and the compensated image region 420.” Ex. 1016 ¶ 55. Park further describes “the empty region is filled with pixel values of the compensated image existing at the closest position in the same row.” *Id.* ¶ 56.

9. *Kuranov (Ex. 1013)*

Kuranov relates to image and video stitching and a technique “for joining and stitching multiple images or videos taken from different locations or angles and viewpoints.” Ex. 1013, code (54), ¶ 5. Output can be displayed on a screen. *Id.* ¶ 5. Mapping between overlapping source images or videos is described. *Id.* ¶¶ 65–71; *see also id.* ¶ 94 (“[i]t may be useful to determine which image better represents an overlapping area”). “[B]lending and smoothening is performed at the seams and interior for better realism.” *Id.* ¶ 73.

10. *Chang (Ex. 1014)*

Chang relates to a system and method for displaying a three-dimensional image. Ex. 1014, code (54).

Figure 1 below is a conceptual diagram illustrating a three-dimensional display system. Ex. 1014 ¶ 38.

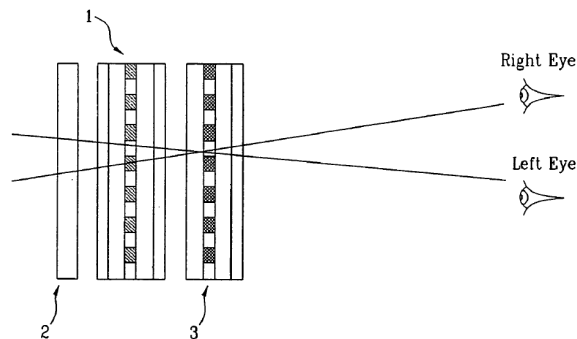


Figure 1 above illustrates display panel 1, light source 2, and filter 3. *Id.* ¶ 39. The filter 3 forms a predetermined barrier pattern according to regulations of a specific mode, and separates parallax images of several directions from each other, thereby implementing a three-dimensional image. *Id.* ¶ 47. The 3D display system can display a 2D image or a 3D image according to a selection command of a user. *Id.* ¶ 99.

11. Lizee (Ex. 1017)

Lizee relates to a system for generating, on a display, a virtual representation of a user positioned in front of the display. Ex. 1017 ¶ 12. The system includes an image capture device for capturing an image of the user, a computing device configured to generate a virtual representation using the user image and communicate the virtual representation to a display. *Id.* The virtual representation comprises a mirrored silhouette transformation of the user image such that the virtual representation shares a substantially same orientation as the user. *Id.*

A distance of the user from the image capture device is estimated by comparing a number of pixels used to render a silhouette image of a selected part or portion of the user at a given position (portions/parts including, but not limited to the user's head, arm, hand, torso or again any object carried by the user), with the number of pixels used to render a same part or portion at a known position. Ex. 1017 ¶ 43; *see also id.* ¶¶ 43–46.

*E. Obviousness of Claims 1–6, 8, and 17
Based on Rosenberg and Nakazawa (Ground 1)*

Petitioner contends claims 1–6, 8, and 17 would have been obvious over the combination of Rosenberg and Nakazawa. Pet. 8–45. Claim 1 is independent, and claims 2–6, 8, and 17 are directly or indirectly dependent on claim 1.

1. Motivation to Combine Rosenberg and Nakazawa

Petitioner contends that Rosenberg and Nakazawa are “analogous, in the same field of endeavor as each other and the ’109 Patent.” Pet. 14. Petitioner continues, “[a person of ordinary skill] would have been motivated to use Nakazawa’s correction in Rosenberg’s system to reduce distortion and provide a realistic mirror image.” *Id.* Petitioner argues that

“[d]oing so would have: (i) provided a more realistic replication of a true mirror image by correcting unnatural image perspectives captured by an above-screen camera; and (ii) giv[en] users an increased view of the top of their head by allowing a user to switch between images (uncorrected and corrected).” *Id.* (citations and internal quotation marks omitted) (second alteration in original).

Patent Owner responds that “Petitioners have failed to demonstrate why a [person of ordinary skill] would be motivated to combine Rosenberg and Nakazawa to meet the limitations of the challenged claims, including limitation 1(h).” Prelim. Resp. 14. Patent Owner argues that Rosenberg and Nakazawa are not “in the same field of endeavor.” *Id.* We disagree. Both Rosenberg and Nakazawa are directed to manipulating and correcting digital images produced by a camera for display. *See descriptions supra*, in Sections D.1 and D.2. Similarly, the ’109 patent discloses embodiments that transform digital images for display. *See, e.g.*, Ex. 1001, Figs. 9, 12, and accompanying text. We therefore disagree with Patent Owner that because Rosenberg (like the ’109 patent) applies image processing techniques to a digital mirror system, the relevant field of endeavor is narrowly limited to “replicating a mirror-like experience.” Prelim. Resp. 14; *see Netflix, Inc. v. DivX, LLC*, 80 F.4th 1352, 1358–1359 (Fed. Cir. 2023) (“The field of endeavor is ‘not limited to the specific point of novelty, the narrowest possible conception of the field, or the particular focus within a given field.’”) (quoting *Unwired Planet, LLC v. Google Inc.*, 841 F.3d 995, 1001, (Fed. Cir. 2016)).

Patent Owner’s argument that Petitioner has failed to demonstrate adequately a motivation to combine Rosenberg and Nakazawa is unavailing,

especially in light of the definition of the person of ordinary skill we have adopted and which both parties applied. *See supra*. Section IV.B. That person 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.” *Id.* Nowhere in that formulation is there mention limiting the relevant field to “replicating a mirror-like experience.” Instead, we determined that the relevant technology is defined more generally, as “image capture and processing systems or related fields.” *Id.*

The Supreme Court has explained that an obviousness analysis should not focus on a narrowly defined field of endeavor: “When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one.” *KSR Int’l. Co.*, 550 U.S. at 417. *KSR* continues: “[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.” *Id.*

Patent Owner argues that “[a person of ordinary skill] would not be motivated to combine the hardware-centric solution of Rosenberg with the software-based gaze correction solution of Nakazawa.” Prelim. Resp. 15. Patent Owner argues “the entire inventive concept of Rosenberg” involves placement of the camera. *Id.* Again, we disagree. Rosenberg emphasizes combining software as well as hardware to provide various features and functions: “The system employs electronic imaging hardware and software components to provide a diverse range of user-select able mirroring

capabilities to a person who stands before the wall mounted display.” Ex. 1005 ¶ 25. As previously defined, the person of ordinary skill “would have a bachelor’s degree in electrical or computer engineering, or a closely related field such as computer science,” and would therefore presumably be familiar with both computer software and hardware. *See* Section IV.B, *supra*.

Testimony by Dr. Karam supports Petitioner’s assertion of a motivation to combine these references. Karam Decl. ¶¶ 110–117. Dr. Karam testifies that “[l]ike Rosenberg, Nakazawa discloses a photographing device that captures images of the user and displays the captured images to the user.” *Id.* ¶ 116.⁸ Dr. Karam continues, “Nakazawa’s device performs similar image processing steps as in Rosenberg.” *Id.*

Specifically addressing limitation 1(h), Patent Owner argues that “[n]either Rosenberg nor Nakazawa disclose varying the frame rate or rate of performing processing steps at all, let alone varying them according to the distance to the user as recited by claims of the 109 Patent.” Prelim. Resp. 16. This is an argument on the merits of the references. We address such arguments in the following section.

2. *Claim 1*

Petitioner asserts that claim 1 would have been obvious in light of Rosenberg and Nakazawa. Pet. 8–34. Petitioner provides an element-by-element claim analysis, supported by expert testimony. *See id.*; Karam Decl. ¶¶ 36–52, 70–79, 109–155. Patent Owner disagrees and focuses its response on claim limitation 1(h) (“varying rate at which the non-ordered steps are

⁸ Throughout this Decision, we omit italicizing the reference names as they appear in the Karam Declaration and the Petition.

performed on the series of images according to the distance.”) Prelim Resp. 14–16. Following a discussion of the other limitations as background, our analysis of claim 1 *infra* will focus on the disputed limitation.

a) *Limitations 1[pre]–1[ff]*

Petitioner provides its analysis of these limitations at pages 17–32 of the Petition. Petitioner principally relies on Rosenberg for limitations 1[pre]–1[b], and 1[d].⁹ For limitation 1[c] (“applying a transformation mapping to the image to modify the image such that it appears to mimic a reflection of a mirror”), Petitioner relies on Rosenberg and Nakazawa. Pet. 21–25. Petitioner asserts “[a person of ordinary skill] would have been motivated to use Nakazawa’s transformation mapping in Rosenberg to correct the unnatural distortion in the image captured by Rosenberg’s camera with a reasonable expectation of success.” *Id.* at 25.

For limitation 1[e] (“displaying the image on the monitor after performing the flipping, transformation mapping, and resizing”), Petitioner relies on Rosenberg and Nakazawa. Pet. 27–28. Similarly, for limitation 1[f] (“wherein the non-ordered steps are performed on a series of images of a live video feed from the camera,”) Petitioner relies on those references in combination. *Id.* at 29–32.

Aside from its argument that Petitioner has provided insufficient motivation to combine Rosenberg and Nakazawa, Patent Owner does not challenge Petitioner’s analysis of these limitations.

⁹ For limitation 1[d] (“resizing the image to reduce variations caused by changes in object’s distance to the camera”), Petitioner alternatively relies on Rosenberg and Nakazawa. Pet. 26.

b) *Limitations 1[g] and 1[h]*

These limitations should be considered together. Limitation 1[g] provides “determining distance to a user appearing in the live video feed.” To meet this limitation, Petitioner cites Rosenberg’s proximity sensors. Pet. 30 (citing Ex. 1005 ¶¶ 25, 32, 33, 56, 69–73, 109, 114, Fig. 13). Petitioner explains, “[w]hen the [Rosenberg] sensor detects a user within a proximity range, the system automatically engages its digital mirror functionality.” *Id.* Petitioner continues, “[w]hen the sensor detects the user is no longer before the mirror for a threshold amount of time, the system automatically switches to a digital picture frame state or low power state.” *Id.*

Limitation 1[h], the only limitation in dispute at this stage, recites “varying rate at which the non-ordered steps are performed on the series of images according to the distance.” Ex. 1001, 30:65–67. The ’109 patent discloses an embodiment in which the transformation mapping varies with distance. *Id.* at 27:54–58; *see also* the description in Section II.C. *supra*. As described in the ’109 patent,

According to one embodiment, if the user moved an amount of less than, say 25 cm, the transformation mapping is performed at a lower speed, say every x seconds, while if the user moved more than 25 cm, the transformation mapping is updating the parameters at a second, faster speed.

Id. at 27:54–58.

Petitioner contends that limitation 1[h] is met by Rosenberg and Nakazawa. Pet. 32–34. Petitioner contends that transformation mapping in Rosenberg-Nakazawa “can be triggered when a user is detected in front of the camera or moving towards or away from the camera.” *Id.* at 33. Petitioner continues, “[a person of ordinary skill] would have understood

this distance-dependent transformation mapping is ‘varying [the] rate’ at which this step is performed.” *Id.* (quoting limitation 1[h]) (second alteration in original). Still further, Petitioner asserts, “[a]nd a [person of ordinary skill] would have understood, because determining whether to perform the transformation mapping is based on distance, the rate of performing the transformation would vary over a period of live video images as distance varies.” *Id.* (citing Karam Decl. ¶¶ 150–151). Petitioner concludes that the Rosenberg-Nakazawa combination “discloses such ‘varying rate.’” *Id.*

Petitioner explains that ‘Rosenberg’s system automatically engages the digital mirror state if the user approaches or is in front of the display at a certain distance.’ Pet. 33 (citing Ex. 1005 ¶¶ 25, 32, 33, 54–56, 69–73, 109, 114, Fig. 3). Petitioner continues, “[i]f the user is not in front of the display for a certain amount of time, Rosenberg’s system switches to a digital picture frame state, where the screen displays digital pictures.” *Id.* at 32–33 (citing Ex. 1005 ¶¶ 54–56, 112–114; Karam Decl. ¶ 152). Further, according to Petitioner,

[a person of ordinary skill] would have understood when Rosenberg’s digital mirror switches between the digital mirroring and digital picture frame states, the rate at which Rosenberg’s steps (“*the non-ordered steps*”) are performed on the real-time video images (“*the series of images*”) would vary. This is because Rosenberg’s steps are not performed at every set time interval over a period of the real-time video images, but rather depending on the distance of the user to the camera/screen (“*according to the distance*”).

Id. at 34 (citing Karam Decl. ¶ 155). Petitioner concludes that combining Rosenberg’s teachings with Nakazawa’s “transformation mapping” would have resulted in a system where “the combined steps would be performed on

the real-time video images captured by Rosenberg’s digital camera at a rate varying according to distance,” thus meeting limitation 1[h]. *Id.*

We find that Petitioner has demonstrated that there is a reasonable likelihood of prevailing on this argument because it is supported by the references cited by Petitioner and the testimony of Petitioner’s expert, Dr. Karam. We agree with Petitioner that the claim language “varying [the] rate” encompasses the frequency at which the “non ordered steps” (which would include the steps of “flipping the image” and “applying the transformation mapping”) are performed. *See* claim 1, *supra*, limitations 1[b] and 1[c]. We find support for this conclusion in the ’109 patent specification, which introduces the disclosure of the “varying rate” embodiment with this sentence: “Another feature that may be implemented in any of the above described embodiments is the *frequency* of transformation parameter update.” Ex. 1001, 27:41–43 (emphasis added).

This conclusion is supported by testimony from Dr. Karam. Karam Decl. ¶¶ 149–155. Dr. Karam testifies “a person of ordinary skill in the art would have known that Nakazawa’s transformation mapping step would be performed during Rosenberg’s digital mirror state, not the digital picture frame state, which would result in the image processing rate on the real-time video images varying according to the user’s distance to the camera.” *Id.* ¶ 155.

We have considered Patent Owner’s arguments directed to this limitation, and at this stage, find them lacking. Prelim. Resp. 16. Patent Owner contends that “Rosenberg does not disclose determining the distance to the user appearing in the live video feed to adjust the processes performed on the image nor to vary the rate at which those processes are performed.”

Id. Patent Owner contends that “Nakazawa does not disclose determining distance to a user appearing in the live video feed to vary the rate at which processes are performed.” *Id.* Patent Owner’s arguments are unavailing because they address the references separately, but fail to address the combination of Rosenberg with Nakazawa. A party cannot show nonobviousness by attacking references in a combination individually. *See In re Keller*, 642 F.2d 413, 426 (CCPA 1981); *In re Merck & Co., Inc.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986). Rather, the test for obviousness is what the combined teachings of the references would have suggested to those having ordinary skill in the art. *In re Mouttet*, 686 F.3d 1322, 1333 (Fed. Cir. 2012). Nor does Patent Owner present expert testimony to support its contentions or to rebut Dr. Karam’s opinions.

For the reasons given, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on this challenge.

3. *Dependent Claims 2–6, 8, and 17*

Petitioner provides separate analyses for each of these dependent claims. Pet. 35–46. At this stage, Patent Owner’s Response does not separately address these claims. “Where a party ‘does not raise any arguments with respect to any other claim limitation, nor does it separately argue [the] dependent claim,’ ‘[the] dependent claim . . . stands or falls together with [the] independent claim.’” *Incept LLC v. Palette Life Scis., Inc.*, 77 F.4th 1366, 1375 (Fed. Cir. 2023) (quoting *Genentech, Inc. v. Hospira, Inc.*, 946 F.3d 1333, 1340 (Fed. Cir. 2020) (alterations in original)).

For the reasons given for claim 1, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on its challenge to claims 2–6, 8, and 17 based on Rosenberg and Nakazawa.

4. *Conclusion on Claims 1–6, 8, and 17*

In sum, after considering the arguments presented in the Petition and Patent Owner’s responses, we determine that, for the reasons given, Petitioner has demonstrated a reasonable likelihood of prevailing on its challenge to these claims.

*F. Obviousness of Claims 1–6, 8, 11, and 17
Based on Rosenberg, Nakazawa, and Hatanaka (Ground 2)*

As discussed *supra*, claim 1 is independent. Claims 2–6, 8, 11, and 17 are directly or indirectly dependent on independent claim 1.

1. *Claim 1*

Petitioner asserts that claim 1 would have been obvious in light of Rosenberg, Nakazawa, and Hatanaka. Pet. 46–50. Petitioner provides an element-by-element claim analysis, supported by expert testimony. *See id.*; Karam Decl. ¶¶ 188–204. As in the case of the previous ground, Patent Owner disputes only limitation 1[h].

a) *[1(h)] varying rate at which the non-ordered steps are performed on the series of images according to the distance.*

Petitioner contends this limitation is met by Rosenberg, Nakazawa, and Hatanaka. Pet. 47–50. Petitioner contends Hatanaka’s image processing control device has a proximity sensor that measures viewing distance between the viewer and the display. *Id.* at 48–49 (citing Ex. 1009 ¶¶ 28–29, 32–36). Petitioner further contends that Hatanaka has an “assessment part” that “provides instructions to the encoding controller to reduce encoding throughput as the viewing distance increases, such as by adjusting frame rate and/or resolution.” *Id.* at 49 (citing Ex. 1009 ¶¶ 8, 12, 18, 23, 37–39). Petitioner concludes “[a person of ordinary skill] would

have understood reducing the frame rate and/or resolution of the video image [in Hatanaka] would reduce image data-related processing throughput because reducing resolution reduces the number of pixels in each image and reducing frame rate reduces the number of images in a video of a fixed length.” *Id.* (citing Ex. 1009 ¶ 12, Karam Decl. ¶¶ 83–85).

Petitioner presents supporting testimony from Dr. Karam. Karam Decl. ¶¶ 188–204. Dr. Karam testifies that “a person of ordinary skill in the art would have been motivated to combine Rosenberg and Nakazawa and would have achieved success in doing so.” *Id.* ¶ 188. Dr. Karam testifies that “Hatanaka teaches that, because the viewer is not always near the display while live video images are in display, its method allows for encoding/decoding processing at a lower frame rate and/or resolution when there is no viewer in the immediate vicinity of the display, thus reducing image-data-related processing throughput and enabling efficient processing of images.” *Id.* ¶ 190. Dr. Karam testifies that “[l]ike Hatanaka, Rosenberg teaches turning off a mirror display or switching to a lower power state when the proximity/motion sensor detects that the user is not within a certain area/region for a threshold amount of time so as not to ‘wast[e] power by continually displaying mirroring imagery when there is nobody looking in the mirror.’” *Id.* ¶ 191 (citing Ex. 1005 ¶¶ 25, 32, 56, 69, 72, 112–115) (second alteration in original). Dr. Karam continues that “[a] person of ordinary skill in the art would have found Hatanaka’s teaching of reducing image-related-data processing throughput as the viewing distance D (Rosenberg’s distance of the user) increases, such as by reducing the frame rate and/or resolution of the video images, a suitable alternative for

conserving power when the user/viewer is no longer in the vicinity of the display.” *Id.*

Patent Owner responds that Petitioner has “failed to demonstrate why a [person of ordinary skill] would be motivated to combine Rosenberg, Nakazawa, and Hatanaka to meet the limitations of the challenged claims, including limitation 1(h).” Prelim. Resp. 17. For the Rosenberg-Nakazawa combination, Patent Owner relies on its previous arguments, which we addressed in Section IV.E.1, *supra*. Patent Owner advances similar arguments responding to the addition of Hatanaka. *Id.* at 17–18. For example, Patent Owner contends “Hatanaka is also not in the same field of endeavor as either Rosenberg or Nakazawa. . . . Hatanaka is not directed to replicating a mirror-like experience for the user like Rosenberg nor is Hatanaka directed to gaze correction of the user like Nakazawa.” *Id.* at 17. We disagree that Hatanaka is in a different field. Hatanaka’s technology field is applicable generally to image processing applications: “This invention pertains to an image communication system as well as an image-processing control device and method.” Ex. 1009 ¶ 1 (describing Hatanaka’s “Technological Field”). As we observed previously, “[t]he field of endeavor is ‘not limited to the specific point of novelty, the narrowest possible conception of the field, or the particular focus within a given field.’” *See Netflix, Inc.*, 80 F.4th at 1358–1359.

Patent Owner’s other arguments are unavailing. Prelim. Resp. 18. For example, Patent Owner argues “[u]nlike Rosenberg or Nakazawa, Hatanaka is not directed toward manipulation of the captured images other than encoding them to reduce throughput.” *Id.* This is more an argument on the merits of Hatanaka as a reference than a reason why its teachings would

not be combined with Rosenberg and Nakazawa. Similarly, Patent Owner’s remaining “lack of motivation” arguments are really arguments on the merits of Hatanaka, e.g., “[t]he resizing disclosed in Hatanaka is . . . based on the display size.” *Id.*

For reasons previously given, we determined in Section IV.E.1, *supra*, that Petitioner has demonstrated a sufficient rationale to combine Rosenberg and Nakazawa. For similar reasons, we determine at this stage that Petitioner presents sufficient reasons to combine those references with Hatanaka. *See supra*; Karam Decl. ¶¶ 188–199.

Similarly, for the reasons given by Petitioner, we determine that the combination of Rosenberg, Nakazawa, and Hatanaka teaches or suggests limitation 1[h]. Pet. 47–50; Karam Decl. ¶¶ 201–204. Dr. Karam testifies that “[a] person of ordinary skill in the art would have reduced the rate of the image processing steps of Rosenberg (as modified by Nakazawa) that are performed on the real-time video images from the camera (‘varying rate at which the non-ordered steps are performed on the series of images’) when the user moves away from the display.” Karam Decl. ¶ 203 (emphasis omitted) (citing Ex. 1009, ¶¶ 49, 51; Ex. 1005, ¶¶ 56, 69, 114). At this stage, we determine that this un rebutted testimony sufficiently supports Petitioner’s arguments.

Patent Owner argues that “Hatanaka does not disclose limitation 1(h).” Prelim. Resp. 19. This argument fails to address the combination of references and is, therefore, unavailing. *In re Keller*, 642 F.2d at 426.

2. *Dependent Claims 2–6, 8, 11, and 17*

Petitioner argues that these claims would have been obvious over Rosenberg, Nakazawa, and Hatanaka. Pet. 50–52. At this stage, Patent

Owner's Response does not separately address these dependent claims. Therefore, at this stage, the dependent claims rise or fall with claim 1. *Incept LLC*, 77 F.4th at 1375.

3. *Conclusion on Claims 1–6, 8, 11, and 17*

For the reasons given, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on its challenge to claims 1–6, 8, 11, and 17 based on *Rosenberg*, *Nakazawa*, and *Hatanaka*.

G. Other Challenges

Petitioner presents twenty-three additional challenges to claims of the '109 patent. Pet. 2–4. Each of the additional challenges is based at least in part on the combination of *Rosenberg* and *Nakazawa*. *Id.*

For the foregoing reasons, we have determined that there is a reasonable likelihood that Petitioner would prevail with respect to at least two challenges to the '109 patent claims based at least in part on *Rosenberg* and *Nakazawa*. We, therefore, do not address these additional challenges at this stage and institute trial as to all challenged claims on all grounds stated in the Petition. *See SAS Inst. Inc.*, 584 U.S. at 365; 37 C.F.R. § 42.108(a) (“When instituting *inter partes* review, the Board will authorize the review to proceed on all of the challenged claims and on all grounds of unpatentability asserted for each claim.”).

V. CONCLUSION

For the foregoing reasons, we have determined that there is a reasonable likelihood that Petitioner would prevail with respect to at least one of the claims challenged in the Petition. We therefore institute trial as to all challenged claims on all grounds stated in the Petition.

VI. ORDER

Upon consideration of the record before us, it is:

ORDERED that *inter partes* review of claims 1–18 of the '109 patent is instituted on all grounds in the Petition;

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this decision.

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IPR2024-00856
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