

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

EYESMATCH LTD.,
Patent Owner

Case No. IPR2024-00810
U.S. Patent No. 8,982,110

**PATENT OWNER EYESMATCH LTD.'S RESPONSE TO PETITION FOR
INTER PARTES REVIEW OF U.S. PATENT NO. 8,982,110**

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2003	Declaration of Natasha M. Saputo in Support of Patent Owner's Unopposed Motion for <i>Pro Hac Vice</i> Admission
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I. INTRODUCTION

All of Petitioners' grounds fail to establish unpatentability of the challenged claims of the 110 Patent. Among other reasons, this is because, *at the same time* the Board was considering whether to institute this proceeding based on a Petition that urged a plain meaning construction for the claims, Petitioner was seeking from the district court, and ultimately obtained, a far narrower construction for Claim 1 that its Petition does not even attempt to show was disclosed in its asserted Grounds here. Because none of Petitioners' references disclose, either alone or in combination, all the required limitations of independent Claim 1, under the narrow construction Samsung obtained but did not tell the Board about, all of Samsung's asserted Grounds must fail.

II. BACKGROUND

Petitioners filed their Petition for *Inter Partes* Review of the 110 Patent on May 10, 2024 (Paper 1). Patent Owner filed its preliminary response on August 29, 2024 (Paper 17). The Patent Trial and Appeal Board issued its Decision Granting Institution on November 26, 2024 (Paper 20).

A. THE 110 PATENT

On March 17, 2015, the United States Patent and Trademark Office issued U.S. Patent No. 8,982,110 (the "110 Patent"), entitled "Method for Image Transformation, Augmented Reality, and Telepresence," to Ofer Saban and Nissi Vilcovsky. Ex.2013, ¶55.

The field of endeavor of U.S. Patent No. 8,982,110 (the “110 Patent”) is imaging and display systems, including digital mirror systems that emulate traditional mirrors and “situations where a natural appearance is preferable over standard video image, such as in, e.g., video conferencing.” (*See, e.g.*, Ex.1001 (110 Patent) at 1:43-51.) *See also*, Ex.2013, ¶¶58-65 (describing general optical properties of conventional mirrors). As the 110 Patent explains, a conventional mirror “is the common and most reliable tool” to evaluate one’s appearance (Ex.1001 (110 Patent) at 1:55-57) and while other techniques have emerged, they “are not convincing and are not yet accepted as a reliable image of the individual as if he was looking at himself in a conventional mirror. This is mainly because the image generated by a camera is very different from an image generated by a mirror.” *Id.* at 1:59-64. The 110 Patent is directed to methods of modifying a stream of images of a user with adaptive transformation mapping so that the images appear to be captured from a different point of view than that of the camera’s actual point of view, including by, for example, rotating, resizing, or varying image magnitude, additionally applying virtual effects to the user’s image including generating different backgrounds, and transmitting the images across a network for display. *See* Ex.1001 (110 Patent) at Claims 1, 5, 6, 10, 11, 12, 16, and 17. As the 110 Patent explains, this transformation technique “can be used to create a reliable video conference when the user/users on the other side of the line can see the participant as if the participant were looking

directly at them, rather than having an image from the view-point of the camera.”

Ex.1001 (110 Patent) at 7:35-41. *See also*, Ex.2013, ¶¶56-57.

Petitioners challenge all 18 claims as unpatentable as obvious. Specifically, Ground 1 of the Petition challenges claims 1-6, 10-12, and 16-17. Ground 2 of the Petition challenges claims 1-6 and 10-12. Ground 3 of the Petition challenges claims 1-18. Ground 4 of the Petition challenges claims 7-9, 13-15, and 18. And Ground 5 of the Petition challenges claims 3-4, 7-9, and 11-18.

Independent Claim 1 claims a computerized method for operating a display system having a camera, a monitor, and a processor with steps comprising: (i) operating the camera to generate a stream of images of the user; (ii) operating the processor to detect the presence of the user in the stream of images; (iii) 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, (iv) displaying the modified images on the monitor; (v) 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 (vi) 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. Claims 5-6, 10-11, 12, and 16-18 are all dependent directly or indirectly from Claim 1.

B. OVERVIEW OF THE REFERENCES

1. Haan

Haan is directed to a “mirror device” that determines the position of a body part and based on this position, the viewpoint from which the displayed image is recorded is changed. Ex.1005, Abstract. Haan’s preferred embodiment is a reflective physical mirror with semi-transparent surface that can switch between both states. Ex.1005, ¶0029, Ex.2013, ¶66.

Haan discloses both a single and a multiple camera embodiment. In the single camera embodiment the camera is physically moved to change the point of view. Ex.1005, ¶0026. The multiple camera embodiment synthesizes the images obtained from the several cameras to “construct a virtual camera position and/or magnification” Ex.1005, ¶0058. “The position of the virtual viewpoint is dependent on the determined face orientation”. Ex.1005, ¶0058. Haan does not disclose the mapping transformation of the captured image as required by claims of the 110 Patent. Although Haan discloses overlaying derived images – “a composite of the recorded image with some artificial compounds” Ex.1005, ¶0118 – on the user’s image to simulate application of makeup or alternative hairstyles or clothing [Ex.1005, ¶¶0110-0117], these modifications are performed on the image that is

generated by physical movement of the camera or a stitching together of images from multiple cameras. *See also*, Ex.2013, ¶67.

2. Francois

Francois is a paper discussing the development and application of demonstration projects of Software Architecture for Immersipresence (“SAI”). Ex.1009, §§ 1.2-1.3. Ex.2013, ¶68.

One of the demonstration projects disclosed in Francois is a virtual handheld mirror simulation comprised of an “LCD screen manipulated by the user, a single camera fixed on the screen, and a tracking device.” Ex.1009, § 4.3. The image displayed on the screen is described as a “close approximation of what the user would see on the screen surface if it were a real mirror.” Ex.1009, § 4.3, Figure 12. While Francois discloses an “image transform” that is “simple,” it does not disclose what that transformation is. Ex.1009, § 4.3. Specifically, Francois does not disclose modifying the image such that it appears to be captured from a different point of view than the camera’s actual point of view as required by Claim 1 of the 110 Patent. The mirror simulation detects the user’s face based on the magnetic trackers. Ex.1009, § 4.3. This is not a disclosure of detecting the user in the captured image as required by Claim 1 of the 110 Patent. *See also*, Ex.2013, ¶68-69.

Petitioners combine several different demonstration projects to meet the limitations of the challenged claims of the 110 Patent. However, Petitioners identify

no basis for how or why a person of ordinary skill in the art would combine these different demonstration projects discussed in Francois. In any event, in none of these demonstration projects does Francois disclose utilizing the angle of the images and modifying the image to change the apparent perspective or point of view as required by Claim 1.

3. Rosenberg

Rosenberg discloses a “digital mirror system” which “emulates a traditional mirror by displaying real-time video imagery of a user who stands before it.” Ex.1006, Abstract. Rosenberg’s mirror system is also “adapted to provide real-time captured images that approximate what a user would see when viewing an ordinary mirror, with the addition of various other image processing features.” Ex.1006, ¶¶0006, 0050, 0075, 0077. *See also, id.*, ¶0028. Ex.2013, ¶70. However, Rosenberg does not disclose modifying the image such that it appears to be captured from a different point of view than the camera’s actual point of view as required by claims of the 110 Patent because all the disclosed perspective manipulations in Rosenberg are performed based on physical manipulation of the camera but the resulting image of Rosenberg is still an image from the actual point of view of the camera. Ex.2013, ¶¶115-119.

Additionally, Rosenberg does not disclose modifying the user’s image or representation to change the apparent perspective or point of view as required by

claims of the 110 Patent. Rosenberg's transformation of images is limited to simply inverting the image. Ex.1006, ¶0026. *See also*, Ex.2013, ¶¶70, 118.

4. Park

Park is directed to an image capturing apparatus and image capturing method to compensate for 3D distortion which occurs when the user's image is captured while looking down towards a camera, such as a phone camera, based on the determined tilt of the device capturing the image. Ex.1011, ¶¶0009, 0010. Ex.2013, ¶71.

Park discloses a "tilt sensing unit 120 [that] can sense the tilt of the device in which the image capturing unit 110 is installed against a specified reference plane by using a device that can sense the tilt against the specified reference plane, such as, by way of a non-limiting example, a tilt sensor and an accelerometer." Ex.1011, ¶0041. Park's "perspective transform refers to typical matrix-based image transform algorithm" (Ex.1011, ¶0060) based on a provided algorithm in which the "transform matrix coefficients of Equation (1), are adjusted on the basis of the ground reference tilt of the image capturing unit 110" (Ex.1011, ¶0061). *See also*, Ex.2013, ¶¶71, 121.

5. Geisner

Geisner is directed to a shopping application of a virtual system with display interface on which a representation of a user is displayed. The user's motions are tracked, and an interface is provided allowing the user to interact with virtual articles.

Ex.1007, Abstract, ¶¶003, 0024. However, Geisner does not disclose modifying images to appear to have been captured from a different point of view than the camera's actual point of view, nor utilizing the angles of the captured images and modifying the user's image or representation to change the apparent perspective or point of view as required by Claim 1 of the 110 Patent. *See also*, Ex.2013, ¶¶72, 156.

6. Lizée

Lizée is directed to a virtual presence system. Ex.1008, Abstract. Lizée discloses an image capture device to capture a user's image "from which a virtual representation of the user may be generated and displayed" "by applying a mirrored silhouette transformation to the user image" Ex.1008, Abstract, ¶¶0012, 0014. Both the orientation of the user and directions of the user in the real world "are substantially the same in the virtual environment". Ex.1008, ¶0035. Unlike Claim 1, Lizée is not directed to displaying a user's image in the real world.

Lizée discloses that "the user silhouette could be replaced by a graphical representation of a character in the virtual environment" and that "additional objects and clothing may be added to the user representation". Ex.1008, ¶0074. Lizée further discloses the possibility of using "various visual enhancements" on the processed image including "image transparency, accessories, distortions, character overlays, add-ons". Ex.1008, ¶0088. However, unlike claims of the 110 Patent regarding generation of an avatar, the graphical representation of the character in Lizée is not

a representation of the user and is not based on the user's image at all. Rather, the user's image/silhouette is only used to animate such a character. Ex.1008, ¶¶0076. *See also*, Ex.2013, ¶¶73, 149.

III. PERSON HAVING ORDINARY SKILL IN THE ART (“POSITA”)

Petitioners propose a POSITA 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. A person with less and/or different education, but more relevant practical experience, or vice versa, may also meet this standard.” (Pet. at 8). Patent Owner applies Petitioners' proposed level of skill for purposes of this Response. Ex.2013, ¶¶53-54.

IV. CLAIM CONSTRUCTION

A. “mirror tracking mode” / “it appears to mimic a reflection of a mirror”

Petitioner Samsung is a defendant in a district court litigation involving the 110 Patent, *EyesMatch Ltd. v. Samsung Electronics Co., Ltd., et al.*, No. 2:23-cv-363 (E.D. Tex.) (“the District Court Litigation”). Ex.2013, ¶25. 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). On December 11, 2024, the District Court issued a claim construction order construing the term “mirror tracking mode” narrowly, as described below.

Limitation 1(f) requires: “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.” In the District Court Litigation, Samsung argued for a construction of “mirror tracking mode” that would require “a mode of operation in which the user sees their reversed reflection appearing at approximately double the distance from the camera and the reflection maintains approximately the same size regardless of user movement.” Ex.2009 at 27-28. Referring to its argument supporting its proposed construction for the term “it appears to mimic a reflection of a mirror” (Ex.2009 at 28), Samsung argued that because the 109 and 110 Patents aim to create a convincing mirror experience, “mimicking a mirror’s reflection requires more than simply displaying a reversed image/video of a user” (Ex.2009 at 13 (emphasis in original)). Samsung relied on disclosures in the 109 Patent describing a conventional mirror as generating a reflection of a user “as if he was standing at a distance that is double the distance from him to the mirror” and

“roughly the same size” regardless of distance to the mirror. Ex.2009 at 13-14. Samsung also submitted an expert declaration in support of this position. Ex.2010, ¶¶97-100. Samsung’s expert opined that a POSITA reading the disclosures in the 109 Patent describing a conventional mirror would have understood that “mirror mode” or “mirror mimicking mode” to require a user’s image to be: (1) reversed, i.e., flipped or mirrored; (2) appear to be double the distance from the mirror; and (3) appear to be the same size regardless of the user’s distance from the mirror. Ex.2010, ¶99.

During the claim construction hearing, the District Court noted that the 109 Patent’s description of the general optical mechanics of a conventional mirror were not “intuitive” specifically: “the fact that it [a user’s reflection] appears double the distance or that it maintains the same size, those are things I think the specification is describing that most people don’t know.” Ex.2011 at 39:15-20. Consequently, the District Court effectively adopted Petitioner Samsung’s proposed construction for “mirror tracking mode” verbatim, construing the term 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.” Ex.2008 at 41. *See also*, Ex.2013, ¶¶25-26.

In its Petition, Samsung did not contend that “mirror tracking mode” should be given the narrow construction it obtained from the district court, and during the

Board's consideration of the Petition, it never told the Board that it was seeking a different construction in a parallel proceeding under the same claim construction standard. 37 CFR §42.100 (b). In fact, Petitioners objected to EyesMatch's efforts to promptly bring the district court's claim construction order with this narrow construction to the attention of the Board, as required by the PTAB's Consolidated Trial Practice Guide (Nov. 2019). *See* Paper No. 24 at 2. As discussed below, Samsung's Petition and supporting expert declaration (Pet., Ex.1003) do not apply the claim construction it sought and obtained from the district court, or otherwise demonstrate how a POSITA would understand its proposed Grounds of unpatentability would achieve the claimed invention of Claim 1 and its dependent claims under that construction. Nor did Petitioners inform the Board that it had proposed a narrow construction of this limitation to the district court during the pendency of its Petition.

Fundamental fairness, and the black-letter principles of claim construction, validity, and infringement, dictate 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. "[I]t is axiomatic that claims are construed the same way for both validity and infringement." *Source Search Techs LLC v. Lending Tree, LLC*, 588 F.3d 1063, 1075 (Fed. Cir. 2009). Failing to apply a consistent claim construction between these parallel proceedings

would undermine the “predictability” of a patent’s claim scope, as well as the “‘integrity of the patent system’ overall.” *Kiosoft Techs., LLC v. PayRange, Inc.*, No. IPR2021-00086, Paper 12 at 16 (P.T.A.B. Mar. 22, 2021) (petitioner and its expert advocated for different constructions at the district court and the PTAB). *See also* Changes to the Claim Construction Standard for Interpreting Claims in Trial Proceedings Before the Patent Trial and Appeal Board, 83 Fed. Reg. 51340 at 51345 (identifying the same concerns); *Google LLC v. Virentem Ventures, LLC*, No. IPR2019-01247, Paper 34 at 11 (P.T.A.B. Mar. 5, 2021) (rejecting proposed construction in part because it would result in “construing the claims in a manner inconsistent with the District Court”); *OrthoPediatrics Corp. v. K2M, Inc.*, No. IPR2018-01548, Paper 9 at 11 (P.T.A.B. Mar. 1, 2019)(finding “it is incumbent upon Petitioner to address substantively the District Court’s claim construction of a limitation when construction of that limitation is likely to be a focal point of the *inter partes* review proceeding,” and that by “failing to reconcile its proffered claim construction here with its very different construction proffered in District Court—which the District Court agreed with—Petitioner fails to satisfy” its burden in its Petition.).

Having now obtained a narrow construction of “mirror tracking mode” in the district court, Samsung should be held to that construction and the same construction should be adopted here, for the reasons articulated by Samsung and its expert, and

adopted by the district court. Ex.2009 at 12-14, Ex.2010, ¶¶97-100 (concerning “mirror tracking mode”), ¶¶58-65 (concerning “it appears to mimic a reflection of a mirror”), Ex.2008 at 27-28 (concerning “mirror tracking mode”), 14-19 (concerning “it appears to mimic a reflection of a mirror”). As addressed below, given Samsung’s complete failure to address its own construction, and how its asserted Grounds meet that construction, the claims should be found not unpatentable for that reason alone.

B. “adaptive transformation mapping” / “transformation mapping”

Limitation 1(c) requires: “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*”. In 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”. Ex.2008 at 37, 14. *See also*, Ex.2013, ¶¶25, 27. The same constructions should be applied in these proceedings.

**V. PETITIONERS HAVE FAILED TO SHOW THAT ANY
INSTITUTED GROUNDS RENDER THE CLAIMS OF THE 110
PATENT UNPATENTABLE**

**A. Ground 1: Petitioners Fail to Show Unpatentability of Claims 1-6,
10-12, and 16-17 in View of Haan and Francois**

Neither Haan nor Francois alone, or in combination, disclose limitations 1(f) of the 110 Patent under the construction Samsung obtained from the district court

for the term “mirror tracking mode”. Ex.2013, ¶¶74-75, 79-80, *see generally id.*, 74-98. Samsung proposed this construction, submitted an expert declaration in support of this construction, and argued for this construction at the District Court Litigation Claim Construction Hearing. Exs. 2009 (Samsung Responsive Claim Construction Brief (Dkt. No. 47)); 2010 (Declaration of Harley R. Myler, Ph.D. Regarding Claim Construction (Dkt. No. 47-2)); 2011 (Claim Construction Hearing Transcript). All the claims challenged under this combination, directly or via claim dependency, require this limitation of Claim 1. Additionally, Francois does not disclose limitations 1(c) and 1(e) and Petitioners have failed to demonstrate why a POSITA would be motivated to combine Haan and Francois to meet the limitations of the challenged claims including limitations 1(c) and 1(e). Ex.2013, ¶¶ 85-96.

1. Neither Haan Nor Francois, Alone Or In Combination, Disclose Limitation 1(f)

Neither Haan nor Francois disclose limitation 1(f), which recites “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,” under the construction Samsung obtained from the district court. Ex.2013, ¶¶ 74-82. Section IV.A discussing claim construction in the District Court Litigation is incorporated herein by reference.

First, neither Samsung's Petition nor its expert's declaration ever *contends*, let alone demonstrates, that Haan, Francois, or the combination of those references (or any other) would achieve or disclose generating an "a mode of operation in which the user sees their reversed reflection appearing at approximately double the distance from the camera and the reflection maintains approximately the same size regardless of user movement," as limitation 1(f) requires under Samsung's construction of "mirror tracking mode." Those words, and the concepts they refer to, do not appear anywhere in the Petition, and certainly not in the Petition's discussion of limitation 1(f). *See* Pet. at 44-47. The same is true of Samsung's expert – Dr. Karam *never* opines that this construction would be met by the Haan/Francois combination (or any other). *See* Ex.1003 at ¶¶205-210.

Second, to the extent that Samsung's Petition and its expert address how the Haan/Francois combination discloses "mirror tracking mode", Samsung never demonstrates, let alone discusses, that Haan, Francois, or their combination teach any image transformation techniques that would result in generating an image that meets the "double distance, same size" requirements of the limitation in view of the district court's claim construction. *See* Pet. at 44, Ex.1003 at ¶¶205-210. In Haan, Samsung and its expert point assert (without more) that "Haan teaches the claimed mirror tracking mode," and in that Haan discloses a resizing transformation. Pet. at 44, Ex.1003 at ¶¶203-210. No contentions or opinions are provided concerning

whether, and how, Francois might disclose a “mirror tracking mode.” *See* Pet. at 44-47, Ex.1003 at ¶¶205-210. And Samsung and its experts never contend that a POSITA would understand Haan’s image transformation would result in an image that meets the specific requirements of “mirror tracking mode”, let alone explain how they would do so. In fact, in adopting Samsung’s proposed construction, the district court explicitly rejected the contention that a laundry list of image transformations could disclose mirror mimicking, *see* Ex.2008 at 14, and found that the “double distance, same size” requirements were required to “give effect to the word ‘mirror’”. *Id.* at 18. Samsung is silent on how the transformations disclosed in the Haan/Francois combination meet this requirement, and this Ground must fail as a result.

In cross-examination, Samsung’s expert Dr. Karam did not point to any opinion or discussion in her declaration that the Haan/Francois combination would disclose to a POSITA the specific requirements of its construction for “mirror tracking mode,” and a simple word search of the Petition and expert declaration confirm there is none. Instead, Dr. Karam offered two excuses, neither of which has merit. First, while acknowledging that she applied a “broader”, ordinary meaning construction of “mimic a mirror” and “mirror tracking mode” in her analysis, (Ex.2012, 50:13-19), not the narrow construction Samsung obtained in the district court, Dr. Karam testified that nonetheless her opinions were “consistent” with that

narrow construction, offering the following analogy: “Maybe to give you more clarification, if you say ‘office furniture,’ it could be a chair or a desk, but still it’s office furniture.” Ex.2012,50:20-23. Dr. Karam’s analogy only underscores Petitioner’s failure of proof: while she opined that the prior art combination disclosed a broad interpretation of mirror-mimicking (“furniture”), she did not opine or show that the prior art disclosed the narrower requirements of Samsung’s own construction (the “chair”) – or even analyze the question. Using her analogy, Samsung and Dr. Karam needed to show that prior art disclosed a chair, and at most (although this is disputed) they showed it disclosed furniture. That is a failure of proof. Second, Dr. Karam testified, for the first time, that the “knowledge of a POSITA” would fill in the gaps of the disclosures in the references to achieve “mirror tracking mode” under Samsung’s district court construction, relying on a discussion in the Technology Background section of her declaration in connection with the **109 Patent IPR** (IPR2024-00856) discussing the optical characteristics of conventional mirrors, including a background reference called Straka. Ex.2012, 180:5-16; 180:17-182:8; 173:19-175:1; 175:17-177:6. There are numerous problems with her testimony, which are again fatal to Petitioners. First, there is no such background discussion before the Panel in connection with the 110 Patent; that section is not found in Dr. Karam’s declaration. Second, Samsung and its expert never contended in the Petition and supporting declaration that the background

knowledge of a POSITA would supply the knowledge necessary to combine the image transformations of Haan and Francois to generate an image “where 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”. This is simply an improper attempt to belatedly make new arguments not contained in the original Petition, and should be rejected. 37 C.F.R. § 42.23(b) (“A reply may only respond to arguments raised in the corresponding opposition, patent owner preliminary response, patent owner response, or decision on institution.”). Instead, Samsung argued, without more, that “Haan-Francois renders obvious” the limitation. Pet. at 44. There is no mention, or even discussion, of “the knowledge of a POSITA,” or how such knowledge concerning the optical characteristics of a conventional mirror would lead them to add to Haan and Francois image transformations that achieved the specific requirements of “mirror tracking mode.”

This points to a more fundamental problem with Dr. Karam’s excuse. It is of no consequence that the optical properties of a conventional mirror were well-known in the art; the 109 Patent, incorporated by reference into the 110 Patent, concedes this. Ex.1021 at 2:4-46. That fact supplies *none* of what Samsung’s proof is missing, *i.e.*, that a POSITA would know that the disclosed Haan/Francois image transformations would produce images “where 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”, or what additional image transformations would be required, drawn from the purported “background knowledge” of a POSITA, to result in images that meet these requirements. Indeed, the primary object of the 109 Patent (incorporated by reference into the 110 Patent) is to describe the image transformations that can effectively “mimic a mirror,” and the 109 Patent reports that “so far no system has been provided for imitating a mirror convincingly.” Ex.1021, 2:49-50. *See also id.* at 15:59-61 (“Specifically, attempting to solve the virtual mirror problem by only flipping the image vertically as was proposed in the prior art is insufficient to create a mirror experience.”). So there is no basis, either procedurally or substantively, for Samsung to belatedly contend that the “knowledge of a POSITA” would fill in the gaps in its proof.

There are other problems. First, contrary to Samsung’s arguments, Haan fails to disclose that a user’s reflected image appears roughly double the distance to the camera and describes behavior of his invention that is contrary to how a mirror operates. Haan discloses that the magnification of the image that is based on the user distance from the display device can be less than 1. Ex.1005, ¶¶0075-0076, Fig. 8. “In embodiment there can be a range of distances for which the magnification factor is less than 1.” Ex.1005, ¶0075. Less than 1 is not “roughly double the distance” as

required under the District Court construction. A POSITA would also have understood Haan discloses behavior that is different from the optical property of a conventional mirror that the user's image appears to be roughly the same size regardless of the user movement. Ex.2013, ¶¶75-76. Haan discloses changing the magnification of the user's image as the user's distance from the camera changes. *See, e.g.*, Ex.1005, ¶¶0073, 0076 Fig. 8. A POSITA would understand this disclosure to mean that the size of the user's image would not appear roughly the same size as the user's distance from the camera changed. Ex.2013, ¶77. For example, Haan states: "For smaller 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." Ex.1005, ¶0076. This disclosure in Haan is opposed to how a conventional mirror operates and opposed to how the invention of the 110 Patent operates. Ex.2013, ¶¶77-78. In other words, a POSITA would have understood Haan to be teaching away from an implementation of this optical property of a conventional mirror. Ex.2013, ¶¶77-78. This is because a POSITA would have understood that with a conventional mirror, although a user may physically move closer to see something small on their face, like their iris, the actual size of the iris as displayed in the mirror does not change as the user gets closer. Ex.2013, ¶61. Instead, as the user gets closer the angle at which the user sees the iris changes such that the portion of the mirror occupied by the iris is greater, but the size of the displayed iris itself, i.e., the image

of the user, has not changed size. Ex.2013, ¶¶61, 76. Conversely, using the same example in the context of Haan's invention, the image of the user would be magnified and the size of the user's iris as displayed on the screen would also change as the user moved closer to the camera. Ex.2013, ¶¶61, 76. A POSITA would have been aware of this subtle, yet important difference in implementation between the 110 Patent and Haan. Ex.2013, ¶¶76. And a POSITA would not regard Haan as disclosing a reflection that maintains roughly the same size regardless of user movement as required by limitation 1(f). Ex.2013, ¶¶77-78.

Additionally, Haan contains a gross error in describing camera properties such that a POSITA would be disinclined to rely on Haan alone or in combination to meet limitation 1(f). Ex.2013, ¶79. In paragraph 73, Haan states: "It is remarked that magnification is in fact equivalent to moving a camera with fixed magnification closer to the object, so all applications can be seen, in fact as changing the point of view, or in other words the position of the camera, be it a real camera or a virtual camera." Ex.1005, ¶0073. A POSITA would immediately realize this is description is entirely inaccurate. Changing the position of a camera does change the point of view, but magnifying or zooming in on an image does not change point of view. Ex.2013, ¶79.

As Dr. Forsyth explains (Ex.2013, ¶¶ 62-65), the key geometric feature of a camera is the focal point, corresponding to the hole in the camera obscura model.

Light leaving a point in space passes through this focal point, and is then collected by the sensor. If the sensor is sufficiently large, rotating a camera about its focal point will change the image in a way that can be corrected using a form of transformation known as a homography. However, any movement of the camera in the scene that results in the focal point moving will produce a change in the image that cannot usually be corrected without detailed knowledge of the 3D geometry of the scene (exceptions include a plane scene). There is no pure transformation of an image that can reproduce the effect of moving a camera focal point toward or away from a scene, absent detailed 3D geometric information. In particular, moving a camera toward or away from a scene is not equivalent to making an image larger or smaller, because occlusion effects between objects in the scene change. Magnifying or zooming an image is not the same as changing the point of view or changing the perspective, as the example in the figures below illustrates. In the first image, the coffee shop will appear to be about 6 inches high (because this is where the blue ray that just touches the top of the coffee shop strikes the ruler), and the top feature on the coffee shop is visible to the camera (red ray). When the camera moves closer to the coffee shop (second image), the front of the coffee shop occludes the top feature, and the coffee shop appears to be about 10 inches high. This means that there are regions of the first image that cannot be seen in the second image (the top feature on the coffee shop; the section of the ruler from 6 inches to 10 inches), meaning that

reconstructing the second image from the first requires information that is not present in the first image. Therefore, magnification is **not** the equivalent to a change in camera position.



Image 1

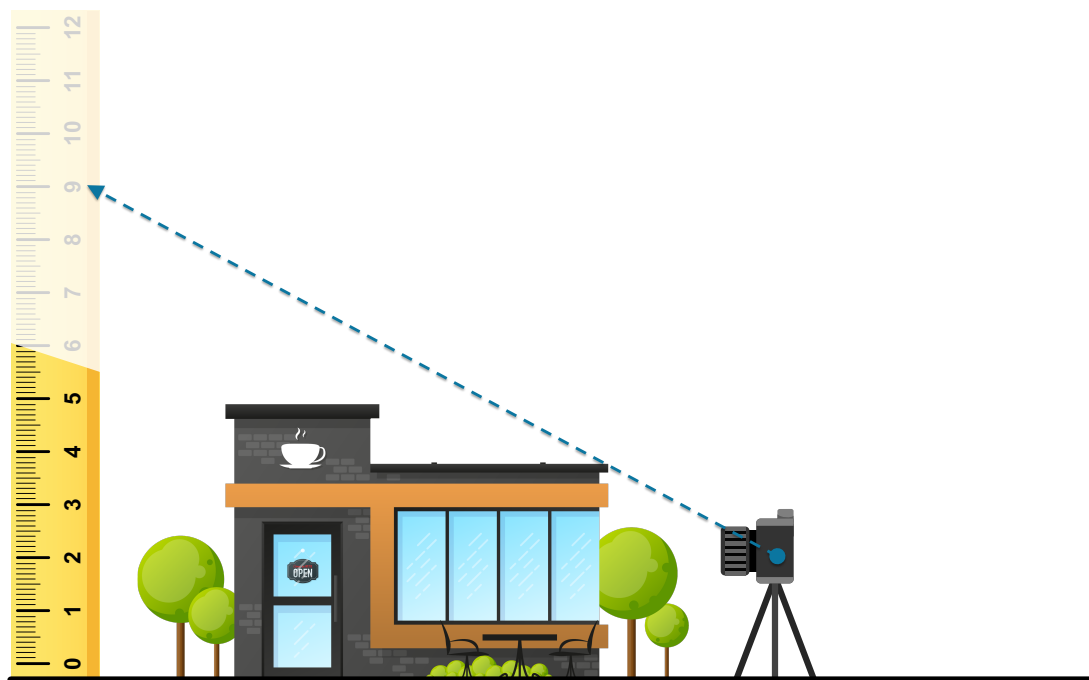


Image 2

Francois only discloses simple inversion of the user's image (Ex.1009, Fig. 13; *see also* Ex.1009, Fig. 12) Ex.2013, ¶81 – something that Samsung argued is insufficient to meet this limitation (Ex.2009 [Samsung Responsive Claim Construction Brief] at 27-28 (referring back to Ex.2009 at 13)). Because Francois is silent as to implementation of the optical property of a conventional mirror in which a user's image appears at roughly double the distance to the camera, or that the reflected image of the user remains at roughly the same size regardless of movement, a POSITA would not have understood Francois to have disclosed implementation of

this property. Ex.2013, ¶¶80, 82. Nor would any combination of these references disclose that limitation. Ex.2013, ¶¶ 74-82.

2. Petitioners Fail to Show Motivation to Combine Haan and Francois for Limitation 1(f)

Though their combination would disclose limitation 1(f), Petitioners have failed to demonstrate why a POSITA would be motivated to combine Haan and Francois to meet the limitations of the challenged claims in any event. Ex.2013, ¶¶83-84.

As discussed above, a POSITA would have regarded Haan as teaching away from having a user's image appear at roughly the same size regardless of the user's distance to the camera. And, a POSITA would understand Francois to only disclose basic image inversion. Therefore, a POSITA would not have been motivated to combine these references. Ex.2013, ¶85.

Any argument that it would have naturally occurred to a POSITA to implement known optical properties of a conventional mirror, i.e., the user's image being inverted and appearing roughly double the distance to the mirror and roughly the same size regardless of user movement, relies on hindsight bias. Ex.2013, ¶86. Although the optical properties of conventional mirrors have been known for millennia, a POSITA reading Haan and Francois would not have considered the relative *importance* of including these optical properties beyond simple inversion. *Id.* Given that Haan teaches away from incorporating the optical property of having

a user's image appear at roughly the same size regardless of the user's distance to the camera, this combination of references would not have suggested inclusion of this property to a POSITA. *Id.*, ¶¶85-86. Combining Haan (which teaches away from incorporating this property) with Francois (which does not even acknowledge this property) to meet limitation 1(f) as construed in the District Court Litigation to require, *inter alia*, that “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 user movement” (Ex.2008 at 41) would be impermissibly based on hindsight bias. *Id.*, ¶86. *In re Gartside*, 203 F.3d 1305, 1319 (Fed. Cir. 2000); *In re Dembiczak*, 175 F.3d 994, 999 (Fed. Cir. 1999) (“Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight.”).

3. Francois Does Not Disclose Limitations 1(c) and 1(e)

Francois does not disclose “adaptive transformation mapping” as construed in the District Court Litigation. Section IV.B discussing claim construction in the District Court Litigation is incorporated herein by reference. Francois discloses only reversing or mirroring a user's image. Ex.1009, Fig. 13; *see also* Ex.1010, Fig. 12. Aside from reversing the user's image there is no other disclosure of transforming the image. Simply reversing the image does not make it “appear to be captured from

a different point of view than the camera’s actual point of view” as required by limitation 1(c). Ex.2013, ¶¶89-90.

Limitation 1(e) requires “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”. As discussed above, Francois makes no disclosure of transforming the user’s image beyond merely reversing it. Ex.2013, ¶90. Merely reversing the image does not make it to appear to be “from a different angle and a different distance” as required by limitation 1(e). Ex.2013, ¶¶89-90.

4. Petitioners Fail to Show Motivation to Combine Haan and Francois for Limitations 1(c) and 1(e)

Petitioners have failed to demonstrate why a POSITA would be motivated to combine Haan and Francois to meet the limitations of the challenged claims, including limitations 1(c) and 1(e).

A POSITA would understand that Francois discloses, at most, primitive mirroring functionality with inversion of the user’s image as the only modification. Ex.2013, ¶92. Furthermore, a POSITA would understand Francois’ primary concern to be not with transforming the image of the user but rather with the accomplishment of synchronizing input streams and image rendering with low latency. Ex.1009, § 4.3; Ex.2013, ¶93. Conversely, Haan is directed to manipulating physical camera positioning and stitching images together to modify the captured images. Ex.1005, ¶¶0024-0027; Ex.2013, ¶94.

A POSITA would not regard a combination with Haan as improving Francois. Ex.2013, ¶95. Haan's physical manipulations of a camera(s) and/or stitching together images from multiple cameras (*see, e.g.* Ex.1005, ¶¶0026-0027) would be cumbersome, impractical, and beyond a POSITA's skill to implement in the handheld mirror of Francois. *Id.* A POSITA would have recognized the commercial value and demand of a handheld digital mirror. *Id.* It would not have plausibly occurred to a POSITA to combine the physical manipulations of a camera, let alone multiple cameras, of Haan with the handheld mirror of Francois, a device associated with portability and convenience. *Id.*, ¶¶95-96. As a POSITA would have seen in Figure 12 of Francois, the device described in that paper is large and at the outer range of what can be held in the hand. For example, the view of the user's grip of the device in the user's right hand (the left hand is obscured) suggests the device requires two hands to hold. Further, the camera displayed there is a substantial component of the device's bulk. Adding cameras to the top or side of the device would have made it difficult or impossible to manipulate. *Id.* Moreover, at the relevant time period, it would not have been practical and likely outside of a POSITA's skill set to implement such an elaborate system for a handheld device. *Id.*, ¶97. For example, Francois' description of the device in Figure 12 as handheld is ambitious; the device is tethered by a variety of communication cables, strongly suggesting that the video processing was not on the device. As Dr. Forsyth has opined, he is not aware of any

computing system that, at the time of Francois, could have performed the processing required on a handheld device. *Id.* Furthermore, Francois affirmatively states that “to simulate a real mirror on a computer screen . . . consistent with the viewer’s position . . . in-real time” is “geometrically impossible”. Ex.1009, § 4.3. A POSITA would have regarded this statement as discouraging attempts to simulate a real mirror beyond what was disclosed in Francois. *Id.*, ¶98.

At least because Petitioners have not shown that the Ground 1 references establish unpatentability of Claim 1, this Ground also fails for Claims 1-6, 10-12, and 16-17, each of which depends from Claim 1.

B. Ground 2: Petitioners Fail to Show Unpatentability of Claims 1-6 and 10-12 in View of Rosenberg and Park

Neither Rosenberg nor Park, alone or in combination, disclose limitation 1(f) of the 110 Patent under the District Court Litigation Claim Construction Order (Ex.2008) with respect to the term “mirror tracking mode”. Ex.2013, ¶99, *see generally id.* ¶¶99-128. All the claims challenged under this combination, directly or via claim dependency, require this limitation of Claim 1. Additionally, Rosenberg does not disclose limitations 1(c) and 1(e) of the 110 Patent and Petitioners have failed to demonstrate why a POSITA would be motivated to combine Rosenberg and Park to meet the limitations of the challenged claims including limitations 1(c) and 1(e). All the claims challenged under this combination, directly or via claim dependency, require these limitations of Claim 1.

**1. Neither Rosenberg Nor Park, Alone Or In Combination,
Disclose Limitation 1(f)**

Neither Rosenberg nor Park, alone or in combination, meet limitation 1(f) under the District Court construction of “mirror tracking mode” – a construction that Petitioner Samsung proposed. Ex.2013, ¶99. Section IV.A discussing claim construction in the District Court Litigation is incorporated herein by reference. For all of the reasons stated in Ground 1, herein incorporated by reference, neither Samsung’s Petition nor its expert’s declaration ever *contends*, let alone demonstrates, that:

- Rosenberg and Park, either alone or in combination (or any other combination of references), would achieve or disclose generating an “image where the user sees their reversed reflection appearing at approximately double the distance from the camera and the reflection maintains approximately the same size regardless of user movement,” as limitation 1(f) requires under Samsung’s own construction, or how they would (*see* Pet. at 64-67; Ex.1003, ¶¶269-276);
- The “knowledge of a POSITA” would fill in the gaps of the disclosures in these references to achieve “mirror tracking mode” under Samsung’s district court construction, let alone how that knowledge would do so. As described in connection with Ground 1, any such theory, articulated for the first time in cross-examination, is an improper attempt to introduce new argument that could have been made in the Petition but was not.

In Rosenberg, Samsung and its expert point to purported disclosures of flipping an image along a vertical axis, and a scaling operation. Pet. at 64-65, Ex.1003 at ¶270. In Park, they contend that a tilt transformation is disclosed, but nothing more. Pet. at 65-66, Ex.1004 at ¶¶272-276. But Samsung and its experts never contend that a POSITA would understand these image transformations would result in an image that meets the specific requirements of “mirror tracking mode”, let alone explain how they would do so. In fact, in adopting Samsung’s proposed construction, the district court explicitly rejected the contention that a laundry list of image transformations could disclose “appears to mimic a mirror,” *see* Ex.2008 at 14, and found that the “double distance, same size” requirements were required to “give effect to the word ‘mirror’”. *Id.* at 18. Samsung is silent on how the transformations disclosed in the Rosenberg/Park combination meet this requirement, and this Ground must fail as a result.

There are other problems with Samsung’s arguments and evidence. First, contrary to Samsung’s arguments, Rosenberg discloses only a rudimentary form of mirror-mimicking – flipping the image on its axis – which meets neither Samsung’s district court construction or a broader, plain meaning construction of this limitation. Rosenberg states: it “is particularly useful for a user who wishes to change his or her distance and/or location with respect to the mirror to get a better view of his or her image, but NOT have the image change as the user moves.” Ex.1006, ¶0039

(capitalization in original). This would suggest to a POSITA that Rosenberg regards it as undesirable for an image to change as the user moves closer to the image. Ex.2013, ¶103. Moreover, a POSITA would understand that Rosenberg does not want the user's appearance to appear at double the distance to the camera because Rosenberg does not want the view to change. Rosenberg regards this feature of a conventional mirror as undesirable and inconvenient and Rosenberg makes clear that this is not how his system operates. Ex.1006, ¶0039; Ex.2013, ¶¶103-104. A POSITA would therefore understand Rosenberg to find the optical property of a conventional mirror whereby the person looking into the mirror appears at double the distance from the mirror to be undesirable because it does not permit the benefits (such as closer inspection of the user's own image) that Rosenberg is trying to achieve. Ex.2013, ¶104. And, not including the properties that Petitioners' own expert, Dr. Karam, testified would be required to mimic a conventional mirror. Ex.2012, 180:5-16.

Rosenberg discloses two primary inventive methods: (1) mirror-image freeze and (2) mirror-image buffering. Ex.1006, ¶0037. In mirror-image freeze the user can selectively freeze a current mirror image of the user which is then statically displayed on the device. Ex.1006, ¶0039. Regardless of the user's distance to the camera, the displayed image will not change size. In mirror-image buffering, a certain number of real-time images of the user are stored which the user can play back. Ex.1006,

¶0044. Regardless of the user's distance to the camera, the played-back buffered images will not change. Similarly, in multi-view mirroring, in which a composite of the user is created based on frozen or buffered images, regardless of the user's distance to the camera, the composite image(s) will not change. Ex.1006, ¶0048. Additionally, the zoom-in and/or zoom-out functionality disclosed in Rosenberg is not based on the user's distance to the camera at all but rather on a user's affirmative commands and can render an image that appears to be much greater or much less than roughly double the user's distance to the camera. Ex.1006, ¶0050. *See*, Ex.2013, ¶¶100-102.

Rosenberg does not disclose producing an image that appears at roughly double the user's distance to the camera as required by the District Court's claim construction of the term "mirror tracking mode". Ex.2013, ¶103. And, as discussed above, Rosenberg regards that optical property of a conventional mirror as inconvenient and does not incorporate it into his system. Ex.2013, ¶104. Rather, Rosenberg only discloses inversion of the user's image (Ex.1006, ¶¶0026-0027) – something that Samsung argued is insufficient to meet this limitation (Ex.2009 at 27-28 (referring back to Ex.2009 at 13)). Rosenberg repeatedly describes a standard or traditional mirror as simply one that inverts the user's image. "This left-right inversion process is performed to present the user with a traditional mirror image view of himself or herself, **inverted in a similar was [sic] as it would be seen in a**

traditional mirror.” Ex.1006, ¶0026. “In a basic mode of operation, referred to herein a traditional mirror emulation mode, the digital mirror is operative to replicate the performance of a standard household mirror, **providing the user with a left-right reversed frontal image** of himself or herself when standing before the display.” Ex.1006, ¶0027. A POSITA would have understood Rosenberg to disclose only primitive mirror-mimicking and would not have understood Rosenberg to address the more difficult technical issue of having the inverted image appear at roughly double the distance of the user to the camera and at roughly the same size. Ex.2013, ¶¶105-106. Moreover, a POSITA would have regarded Rosenberg as discouraging addressing the issue of attempting to replicate this property of a mirror, i.e., having the user’s image appear at double the distance to the camera, because Rosenberg describes this property of a mirror as something he does not seek to imitate (Ex.1006, ¶0039). Ex.2013, ¶¶103-104. This property of a conventional mirror does not permit the benefits (such as closer inspection of the user’s own image) that Rosenberg is trying to achieve. Ex.1006, ¶0039. Ex.2013, ¶¶103-104.

Petitioners assert that Rosenberg discloses a user appearing at double the distance based on a disclosure in paragraph 77 of Rosenberg that “A representation of that real-time video image is then displayed upon the wall mounted screen of the digital mirror 502 **with a displayed size and scaling such that it appears like a traditional life-size mirror image** 503.” *See, e.g.,* Pet. at 63-64; Ex.1006,

¶0077;Ex.2012, 81:7-84:6. But this is not what paragraph 77 discloses. Rather, paragraph 77 makes clear just what Rosenberg regards as constituting a “traditional mirror emulation” – simple left-right inversion, nothing more. Given that Rosenberg’s “traditional mirror mode” discloses only flipping an image, it is apparent that Rosenberg did not consider the importance of addressing these optical properties, or implement them. Ex.2013, ¶106.

[0077] FIG. 5 illustrates a computer rendering of a human user 501 standing in front of a wall-mounted embodiment of the advanced digital mirror system 502 according to at least one embodiment of the present invention. The user's image is captured as a real-time video image by a camera upon or within the digital mirror 502 as described previously. A representation of that real-time video image is then displayed upon the wall mounted screen of the digital mirror 502 **with a displayed size and scaling such that it appears like a traditional life-size mirror image 503. In a traditional mirror emulation mode, the real-time video image is left-right inverted prior to display upon the screen.** Thus the user 501 standing before the digital display is given the visual impression that he or she is standing before a traditional wall mirror, viewing a traditional mirror image of himself or herself.

Ex.1006, ¶0077.

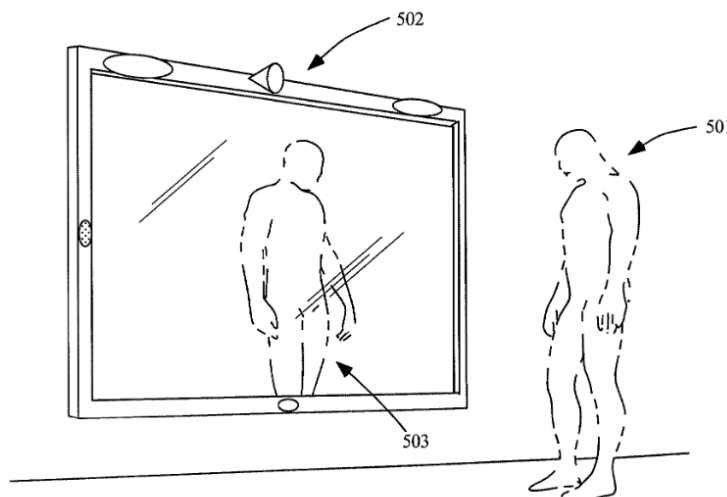


Fig. 5

Ex.1006, Fig. 5

Park also does not disclose “mirror tracking mode” as construed in the District Court Litigation in accordance with Petitioner Samsung’s proposed construction. Park is directed to tilt correction in a mobile device. *See, e.g.*, Ex.1011, ¶0010. Park does not disclose anything about mirroring the user’s appearance at the basic level of simply inverting the image, let alone disclose more advanced mirror mimicking required by Samsung’s own construction. At most a POSITA may have understood that the user’s image in Park could be mirrored. Ex.2013, ¶¶107-108. But a POSITA would not have understood Park to have disclosed the more difficult technical issue of having the inverted image appear at roughly double the distance of the user to the camera. *Id.* Nor would any combination of these references disclose that limitation. Ex.2013, ¶¶99-108.

2. Petitioners Fail to Show Motivation to Combine Rosenberg and Park as to Limitation 1(f)

Petitioners have failed to demonstrate why a POSITA would be motivated to combine Rosenberg and Park to meet the limitations of the challenged claims, including limitation 1(f). Ex.2013, ¶¶109-112.

As discussed above, a POSITA would have regarded Rosenberg as teaching away from having a user's image appear at roughly double the distance of the user to the camera. Ex.2013, ¶112. And, a POSITA would understand Park to disclose, at most, basic image inversion. *Id.* Although the optical properties of conventional mirrors have been known for millennia, it is likely that a POSITA reading Rosenberg and Park would not have considered the relative *importance* of including these optical properties beyond simple inversion. *Id.* It would not have been suggested to a POSITA reading Rosenberg and Park that it was even worthwhile to have the user's image appear roughly double the distance to the camera or roughly the same size regardless of distance. *Id.* Given that Rosenberg teaches away from incorporating the optical property of having a user's image appear at roughly double the distance of the user to the camera, this combination of references would have suggested *not* including of this property to a POSITA. *Id.*

Combining Rosenberg (which teaches away from incorporating this property) with Park (which does not even acknowledge this property) to meet limitation 1(f) as construed in the District Court Litigation to require, *inter alia*, that “the user sees

their reversed reflection appearing at roughly double the distance from the camera” (Ex.2008 at 41) would be impermissibly based on hindsight bias. Ex.2013, ¶112. *In re Gartside*, 203 F.3d at 1319; *In re Dembiczak*, 175 F.3d at 999 (“Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight.”).

3. Rosenberg Does Not Disclose Limitations 1(c) and 1(e)

Rosenberg does not disclose “adaptive transformation mapping” as construed in the District Court Litigation. Ex.2013, ¶¶113-119. Section IV.B discussing claim construction in the District Court Litigation is incorporated herein by reference. Rosenberg discloses inversion of the user’s image, viewing a previously captured image(s) of the user, composite of an image, and zoom-in and/or zoom-out. Ex.1006, ¶¶0026-0027, 0039, 0045-0046, 0048, 0050. A POSITA would regard only the inversion of the image as a transformation, the other disclosures do not alter the image as captured – freezing the image, playback of images, composite image, or zoom in on the image does not change what the camera captured (as discussed above for Image 1 and Image 2). Ex.2013, ¶118. And a POSITA would not regard any of these disclosures as modifying images such that they “appear to be captured from a different point of view of the camera's actual point of view” as required by limitation 1(c) or appear to be “from a different angle and a different distance” as required by

limitation 1(e). Ex.2013, ¶¶118-119. Inversion of the user's captured image does not make the image appear as if it were captured from a different point of view than the camera's actual point of view. *Id.*, ¶118. Simply viewing previously captured images also does not change the apparent point of view from which those previously captured images were taken. *Id.*, ¶115. Even Rosenberg's disclosure of a composite image makes no mention of manipulating the image to have it appear to be from a different perspective or captured from a different angle than that of the actual camera. *Id.*, ¶116. Given the complexity of such a manipulation, a POSITA would regard Rosenberg's silence to constitute lack of disclosure. *Id.* And zooming in or out on a image also does not change the apparent point of view of the camera. *Id.*, ¶117. When a camera physically moves closer to the object it is photographing the angle changes such that more of the background is occluded by the object. *Id.* Conversely, a zoom-in or zoom-out of a captured image does not change the angle as demonstrated by the fact that the background in a zoom-in or zoom-out does not change. *Id.*

4. Petitioners Fail to Show Motivation to Combine Rosenberg and Park as to Limitation 1(c) and 1(e)

Petitioners have failed to demonstrate why a POSITA would be motivated to combine Rosenberg and Park to meet the limitations of the challenged claims, including limitations 1(c) and 1(e). Ex.2013, ¶¶ 120-128.

A POSITA would regard Park as presenting a wholly computer processing based solution to changing image perspective and angle. Ex.2013, ¶121. Park discloses a compensation unit that performs tilt compensation on the captured image based on the determined tilt. *See, e.g.*, Ex.1011, ¶0036, Fig. 3. Park also discloses that the compensation techniques are implemented by computer processing and can include geometric transform techniques. Ex.1011, ¶¶0059, 0088. Ex.2013, ¶121.

A POSITA would understand Rosenberg's inventive concept to be ideal physical placement of a camera to replicate a traditional mirror. Ex.2013, ¶ 122. "Such embodiments of the present invention often *strive to achieve placement of the camera* such that the image captured by the camera is 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." Ex.1006, ¶¶0028, 0075. Rosenberg describes such embodiments as "a superior arrangement." Ex.1006, ¶0027. Nevertheless, even for "basic embodiments" in which the camera is mounted above the display screen, Rosenberg explicitly states not only that such a placement "may still be configured to provide an effective image" but also that such a "raised vantage point is sometimes advantageous." Ex.1006, ¶¶0027, 0028. A POSITA would regard Rosenberg as disclosing a physical arrangement to achieve a digital mirror experience. Ex.2013, ¶123. This is because although Rosenberg discloses rudimentary image processing for other modes, like left-right flip about a

vertical axis, Rosenberg never suggests or discloses using more advanced image processing techniques to accomplish a perspective change. Ex.2013, ¶¶124-126. Consequently, a POSITA would understand that issues related to perspective to be solved in Rosenberg by physical placement of the camera. *Id.*

By way of further example, Rosenberg states that in basic embodiments physical placement of the camera on the top of the display screen will result in a vantage point higher than eye-level. *See, e.g.*, Ex.1006, ¶¶0027, 0061. This contrasts with more advanced or preferred embodiments in which the camera is mounted within the display to provide a vantage point that more closely approximates eye-level. *See, e.g.*, Ex.1006, ¶¶0027, 0061. Rosenberg explicitly discloses that although the camera is mounted on top of the display it will still produce an “effective image, ***but the vantage point will simply being slightly higher*** than the eye-level vantage point with which users are familiar.” Ex.1006, ¶0027. This disclosure would lead a POSITA to conclude that no additional digital image transformations were being performed to “fix” this vantage point that is “slightly higher” than what Rosenberg regards as ideal. Ex.2013, ¶126. In her deposition, Dr. Karam asserted that because more of the figures in Rosenberg show the basic embodiment, there must be additional digital image transformations taking place. Ex.2012, 69:14-70:18. However, because Rosenberg repeatedly discusses the slightly elevated vantage point of the basic embodiment and never once discloses a process to digitally

transform that vantage point – offering as the only disclosed alternative to physically place the camera within the screen – the fact that more of Rosenberg’s figures depict that embodiment supports the conclusion that Rosenberg regards physical placement of the camera with basic inversion as sufficient to emulate a traditional mirror. Ex.2013, ¶127. Dr. Karam conceded that Rosenberg does not explicitly disclose any such digital transformation. Ex.2012, 58:2-12 (“Q. So Rosenberg does not disclose trying to adjust the vantage point of this basic embodiment, the basic embodiment being the one where the camera is mounted above the display, above the screen? He does not disclose trying to adjust that vantage point by computer processing means, correct? A. You know, it does not explicitly disclose.”).

Moreover, Rosenberg discloses either physical movement of the camera to change angle (Ex.1006, ¶0061) or having the user physically turn around or side to side while the static camera captures images that the user can then display on the screen to view the different perspectives (Ex.1006, ¶¶0042-0043, 0046). A POSITA would find it notable that although Rosenberg discloses computer processing solutions for certain aspects of his invention, such as arranging multiple images on the display (Ex.1006, ¶0049), Rosenberg does not disclose computer processing solutions to change the angle or perspective of captured images. Ex.2013, ¶¶123-126. Rosenberg discloses *physical* solutions, i.e., physically moving the camera or having the user physically move around, to change the angle or perspective. *See,*

e.g., Ex.1006, ¶¶0042-0043, 0046, 0061. A POSITA would regard Rosenberg as presenting these *physical* solutions to allow users to see angles and perspectives of themselves not possible with a conventional mirror. Ex.2013, ¶¶123-126. Rosenberg makes no suggestion that computer-processing based adjustment of the camera angle or apparent perspective is needed or even desirable. Ex.2013, ¶¶123-126. Rather, Rosenberg discloses that viewing angle is adjusted by physical movement of the camera or by having the user physically move about. Ex.1006, ¶¶0061, 0042-0043, 0046.

To view a right profile view of himself or herself, the user can turn and face to his left He or she then engages the image freeze feature The user then turns back toward the mirror and views it in a normal manner. Upon the display will be the user's right profile view.

Ex.1006, ¶0043.

Using the digital mirror with the mirror image buffering feature, however, a user can slowly turn around in front of the mirror, exposing a range of angles of his or her body to the mirror surface, and then view the stream of captured imagery right afterwards while looking directly at the screen. The user interface makes this a very simple operation of the user. To view himself while turning around in front of the mirror, the user simply turns around, for example, in a slow 360 degree spin, directly in front of the digital mirror display screen. The user then engages the mirror

image buffering display feature, by for example uttering the word “replay” while looking at the screen.

Ex.1006, ¶0046.

A POSITA would not regard Rosenberg’s disclosure as discouraging a computer-processing based solution because a POSITA would have regarded Rosenberg as teaching that a physical solution was wholly adequate. Ex.2013, ¶¶122-126. The fact that Rosenberg does have computer-processing based components to the system, such as for example, speech recognition and image-freeze software, but does not disclose such solutions for perspective and distortion issues would further support a POSITA’s impression that Rosenberg’s physically based solutions are *the* preferable solution with respect to changes in perspective or angle. *Id.* As 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 a POSITA would not be motivated to combine Rosenberg with the computer processing based solution of Park with respect to limitations 1(c) and 1(e). Ex.2013, ¶128.

At least because Petitioners have not shown that the Ground 2 references establish unpatentability of Claim 1, this Ground also fails for Claims 1-6, and 10-12, each of which depends from Claim 1.

C. Ground 3: Petitioners Fail to Show Unpatentability of Claims 1-18 in View of Geisner and Lizee

Neither Geisner nor Lizee, alone or in combination, disclose limitation 1(f) of the 110 Patent under the District Court Litigation Claim Construction Order (Ex.2008) with respect to the term “mirror tracking mode”. Ex.2013, ¶129, *see generally id.* ¶¶129-160. Petitioner Samsung submitted an expert declaration in support of this construction and argued for this construction at the District Court Litigation Claim Construction Hearing. Exs. 2009-2011. All the claims challenged under this combination, directly or via claim dependency, require this limitation of Claim 1. Additionally, Geisner does not disclose limitations 1(c) and 1(e) and Petitioners have failed to demonstrate why a POSITA would be motivated to combine Geisner and Lizee to meet the limitations of the challenged claims including limitations 1(c), 1(e), and 1(f). All the claims challenged under this combination, directly or via claim dependency, require these limitations of Claim 1. Therefore, Petitioners have failed to establish invalidity of Claims 1-18.

1. Neither Geisner Nor Lizee, Alone Or In Combination, Disclose Limitation 1(f)

Neither Geisner nor Lizee, alone or in combination, discloses limitation 1(f) under the District Court construction – a construction that Petitioner Samsung proposed. Section IV. discussing claim construction in the District Court Litigation is incorporated herein by reference.

For all of the reasons stated in Ground 1, herein incorporated by reference, neither Samsung's Petition nor its expert's declaration ever *contends*, let alone demonstrates, that:

- Geisner and Lizée, either alone or in combination (or any other combination of references), would achieve or disclose generating an “image where the user sees their reversed reflection appearing at approximately double the distance from the camera and the reflection maintains approximately the same size regardless of user movement,” as limitation 1(f) requires under Samsung's own construction, or how they would (*see* Pet. at 89-91; Ex.1003, ¶¶339-343);
- The “knowledge of a POSITA” would fill in the gaps of the disclosures in these references to achieve “mirror tracking mode” under Samsung's district court construction, let alone how that knowledge would do so. As described in connection with Ground 1, any such theory, articulated for the first time in cross-examination, is an improper attempt to introduce new argument that could have been made in the Petition but was not.

In Geisner, Samsung and its expert point to purported disclosures of “positioning, or scaling [of] the target” to generate a 3D avatar – but do not contend that it discloses even rudimentary forms of mirror mimicking, such as merely flipping an image. Pet. at 91, Ex.1003 at ¶342. In Lizée, they contend that flipping the image is disclosed, but nothing more that would meet Samsung's own

construction. Pet. at 85, Ex.1003 at ¶332. But Samsung and its experts never contend that a POSITA would understand these image transformations would result in an image that meets the specific requirements of “mirror tracking mode”, let alone explain how they would do so. In fact, in adopting Samsung’s proposed construction, the district court explicitly rejected the contention that a laundry list of image transformations could disclose “appears to mimic a mirror” or “mirror tracking mode,” *see* Ex.2008 at 14, and found that the “double distance, same size” requirements were required to “give effect to the word ‘mirror’”. *Id.* at 18. Samsung is silent on how the transformations disclosed in the Geisner/Lizee combination meet this requirement, and this Ground must fail as a result.

There are other problems with Samsung’s arguments and evidence. Geisner does not disclose a user seeing “their reversed reflection” as required by the construction of “mirror tracking mode” in the District Court Litigation. Rather, Geisner discloses creating an “on-screen representation” or “model” of the user such as an “avatar or on-screen character”. Ex.1007, Abstract, ¶¶0028, 0030, 0031, 0101, 0103, 0105. An avatar of a user does not appear as the user does in the mirror, an avatar is a representation or caricature of the user, it is not mirror reflection of the user’s real-life appearance. Ex.2013, ¶¶131-132. It is irrelevant that the avatar tracks the user’s movements in real-life because the avatar does not constitute a reflection of the user’s real-life appearance and a POSITA would not consider this to be a

“reversed reflection” within the meaning of the 110 Patent, as construed in the District Court Litigation. Ex.2013, ¶133. In addition to failing to disclose a user’s “reversed reflection” as required by the construction in the District Court Litigation, Geisner also makes no disclosure that the user’s avatar appears at “roughly double the distance from the camera” as required by limitation 1(f). A POSITA would regard Geisner’s silence with respect to this optical property of a conventional mirror to be a lack of disclosure. Ex.2013, ¶134.

Similarly, Lizee does not disclose a user seeing “their reversed reflection” as required by the construction of “mirror tracking mode” in the District Court Litigation. Ex.2013, ¶ 135. Rather, Lizee discloses “a virtual representation of the user may be generated and displayed” by capturing the user’s image to create a silhouette image that is placed in a virtual environment. Ex.1008, Abstract. ¶¶0012, 0013, 0029, 0088, Fig. 7. Ex.2013, ¶¶136-137. Unlike the 110 Patent, Lizee does not use the actual image of the user, but rather uses the user’s silhouette: “it would be harder to respect the artistic direction of the virtual environment 22 if an *actual image* was used to overlay the virtual environment graphics.” Ex.1008, ¶0073. Lizee goes on to state that unlike a “true image overlay” which “may be intimidating for some users” using silhouettes “provides a less threatening experience accessible to all”. Ex.1008, ¶0073. A POSITA would regard this disclosure as teaching away from use of a user’s actual image at all, let alone to provide a “reversed reflection” as

required by the construction of “mirror tracking mode” in the District Court Litigation. Ex.2013, ¶¶137-138. Moreover, unlike the 110 Patent which seeks to replicate what a person would see in a conventional mirror, Lizée does not seek to replicate a user’s appearance as would be seen in a conventional mirror. *Id.*, 138. Lizée uses a silhouette of the user rather than the user’s actual image not because a silhouette is less threatening but because the silhouette is only used to provide “an adequate identification of the user on the screen”. Ex.1008, ¶0073. This reinforces the point that unlike the 110 Patent, Lizée is not directed to replicating a user’s image as it would be seen in a conventional mirror. Ex.2013, ¶¶137-138.

Moreover, in Lizée’s invention, “the projected image 26 is viewed by a virtual camera 28 positioned *behind* the silhouette model 24 and providing a *rear view* thereof”. Ex.1008, ¶0039; *see also id.* ¶¶0071, 0072, 0083. It is irrelevant that the silhouette representation of the user disclosed in Lizée is captured from the front (Ex.10008, ¶0072) and inverted (*id.*, ¶0034) because the user is not seeing their “reversed reflection” as though it were in a conventional mirror. Ex.2013, ¶¶139-144. Indeed, in Lizée’s virtual environment the user experiences their silhouette image as if it has been captured from behind so that “the user is provided with a better sense of direction and can thus better interact within the virtual environment.” Ex.1008, ¶0071. And “the virtual camera projecting the silhouette image 20 remains behind the virtual user”. Ex.1008, ¶0083. A POSITA would not regard the virtual

camera positioned behind the user's representation to disclose rendering an image that mimics a mirror as construed in the District Court Litigation. *Id.*, ¶144.

Because both Geisner and Lizee are silent as to implementation of the optical property of a conventional mirror “in which the user sees their reversed reflection appearing at roughly double the distance from the camera” (Ex.2008 at 41), a POSITA would not have understood them to disclose implementation of this property. Ex.2013, ¶145. Consequently, neither Geisner nor Lizee, either alone or in combination, disclose limitation 1(f) of the 110 Patent as construed in the District Court Litigation. Ex.2013, ¶146.

2. Petitioners Fail to Show Motivation to Combine Geisner and Lizee for Limitation 1(f)

Petitioners have failed to demonstrate why a POSITA would be motivated to combine Geisner and Lizee to meet the limitations of the challenged claims, including limitation 1(f). Ex.2013, ¶¶147-148.

Unlike the 110 Patent, neither Geisner nor Lizee are directed to replicating an image that a user would see in a conventional mirror. Rather, both are directed to creating a virtual representation of a user and placing that representation in a virtual environment. *See, e.g.*, Ex.1007, ¶¶0024, 0030-0033, 0037, 0045; Ex.1008, Abstract, ¶¶0012, 0014, 0039, 0060. This difference is key to limitation 1(f) which requires, *inter alia*, “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 user movement”. Ex.2008 at 41. Unlike the 110 Patent, which aims to provide a real-life representation of the user as if the user was looking into a mirror, Geisner and Lizée are not directed to that goal at all. In fact, Lizée explicitly teaches away from using the user’s actual image to create the representation of the user. Ex.1008, ¶0073. Moreover, a POSITA would understand that the rendering of a user avatar in a virtual environment would not be the same as rendering a user’s image to appear as if it were in a conventional mirror; it would be substantially different. Ex.2013, ¶¶149-150. An avatar of a user does not appear as the user does in the mirror, an avatar is a representation or caricature of the user, it is not mirror reflection of the user’s real-life appearance. Ex.2013, ¶150. A POSITA would know that the skills and techniques used to create the virtual avatars in Geisner and Lizée would be substantially different from those needed to render a user’s image as it would be reflected in a conventional mirror as in the 110 Patent. *Id.* Additionally, a POSITA would regard Geisner’s and Lizée’s silence as to implementation of the optical property of a conventional mirror “in which the user sees their reversed reflection appearing at roughly double the distance from the camera”, to be nondisclosure. Ex.2013, ¶151. Consequently, a POSITA would not be motivated to combine these two references to meet limitation 1(f) of the 110 Patent. Ex.2013, ¶¶151-152.

3. Geisner Does Not Disclose Limitations 1(c) and 1(e)

Geisner does not disclose “adaptive transformation mapping” as construed in the District Court Litigation. Ex.2013, ¶155. Section IV.B discussing claim construction in the District Court Litigation is incorporated herein by reference.

Geisner does not disclose modifying the user’s image to appear to have been captured from a different point of view than the camera’s actual point of view. Rather, Geisner discloses physical positioning of multiple cameras to capture different angles or having the user physically turn and move while the camera(s) captures the user’s image from multiple angles. Ex.1007, ¶¶0039, 0103. There is no disclosure that these images are modified to change point of view as required by limitation 1(c) or are modified to appear to be “from a different angle and a different distance” as required by limitation 1(e). Because Geisner is silent as to such modifications, a POSITA would not have understood Geisner to have disclosed implementation of such modifications. Ex.2013, ¶156.

4. Petitioners Fail to Show Motivation to Combine Geisner and Lizee for Limitations 1(c) and 1(e)

Petitioners have failed to demonstrate why a POSITA would be motivated to combine Geisner and Lizee to meet the limitations of the challenged claims, including limitations 1(c) and 1(e). Ex.2013, ¶157.

Unlike the 110 Patent, which aims to provide a real-life representation of the user as if the user was looking into a mirror, Geisner and Lizee are not directed to

that goal at all. Geisner discloses rendering an avatar of a user (*see, e.g.*, Ex.1007, ¶0072 (“may be displayed as an avatar or other on screen representation of the user”) which does not appear as the user does in the mirror – an avatar is a representation or caricature of the user, it is not a mirror reflection of the user’s real-life appearance. Ex.2013, ¶158. And, Lizée explicitly teaches away from using the user’s actual image to create the representation of the user. Ex.1008, ¶0073. Ex.2013, ¶158. Moreover, a POSITA would understand that the rendering of a user avatar in a virtual environment would not be the same as rendering a user’s image to appear as if it were in a conventional mirror; it would be substantially different. *Id.* Consequently, a POSITA would not be motivated to combine these two references to meet limitations 1(c) and 1(e) of the 110 Patent. *Id.*

Aside from the difference with the 110 Patent, a POSITA would understand Geisner and Lizée to disclose opposing ways of depicting a user in a virtual environment such that a POSITA would not be motivated to combine these references at all, let alone with respect to limitations 1(c) and 1(e). Ex.2013, ¶159.

Geisner is directed to creating a model of the user and using a camera to track a user’s movements to interact with virtual articles. Ex.1007, ¶0024. The focus of Geisner is on user movement for virtual interaction and control of an avatar in a virtual experience. *See, e.g.*, Ex.1007, ¶¶0030-0033, 0037, 0045. Conversely, Lizée discloses the capture of a user’s image only for purposes of generating a silhouette

that can then be used to control a wholly virtual and derived user representation in an entirely virtual world. *See, e.g.*, Ex.1008, Abstract, ¶¶0012, 0014, 0039, 0060. Lizee explicitly teaches away from using the actual image of the user to create the representation of the user (as in Geisner) in favor of a silhouette, stating that “it would be harder to respect the artistic direction of the virtual environment 22 if an *actual image* was used to overlay the virtual environment graphics”. Ex.1008, ¶0073. Lizee further explicitly teaches away from Geisner by asserting that the silhouette model “avoids the complex analysis of the captured image 14 to infer the posture of the user” thereby reducing “computational load” and increasing “system responsiveness.” Ex.1008, ¶0076. Petitioners provide no reason why a POSITA would be motivated to combine these divergent approaches, and a POSITA would not be motivated to do so. Ex.2013, ¶160.

At least because Petitioners have not shown that the Ground 2 references establish unpatentability of Claim 1, this Ground also fails for Claims 1-18, each of which depends from Claim 1.

D. Ground 4: Petitioners Fail to Show Unpatentability of Claims 7-9, 13-15 and 18 in View of Haan, Francois, and Geisner

As discussed above in Section V.A. (Ground 1) incorporated herein by reference, Petitioners have failed to show unpatentability of Claim 1, from which the challenged claims in this ground depend, based on Haan and Francois, including with respect to limitations 1(c), 1(e), and 1(f). As discussed in Sections V.A.

(Ground 1) and V.C. (Ground 3) incorporated herein by reference, neither Francois nor Geisner disclose limitations 1(c) and 1(e) and none of Haan, Francois, or Geisner disclose limitation 1(f), either alone or in combination. Ex.2013, ¶161, *see generally id.* ¶¶161-166.

A POSITA would not have been motivated to combine Haan and Francois with Geisner to meet limitation 1(f) of the 110 Patent because, as discussed above, a POSITA would not have regarded any of those references as disclosing this limitation. Ex.2013, ¶162. As none of Haan, Francois, or Geisner disclose limitation 1(f), even assuming motivation to combine, which there is not, the combination necessarily would not meet limitation 1(f). *Id.* Additionally, a POSITA would not be motivated to combine Haan and Francois with Geisner with respect to limitation 1(f) because both Haan and Francois are directed to digital mirror devices whereas Geisner is directed to a tracking a user's movement to control a virtual on-screen representation of the user (*see, e.g.,* Ex.1007, ¶0024). Ex.2013, ¶163. A POSITA would not have been motivated to combine Haan and Francois with Geisner because a POSITA would understand that the rendering of a user avatar in a virtual environment would not be the same as rendering a user's image to appear as if it were in a conventional mirror; it would be substantially different. *Id.* A POSITA would know that the skills and techniques used to create the virtual avatar in Geisner would be substantially different from those needed to render a user's image as it

would be reflected in a conventional mirror as in the 110 Patent or in Haan or Francois. *Id.* Consequently, a POSITA would not be motivated to combine these references to meet limitation 1(f) of the 110 Patent. *Id.*

There would also be no motivation to combine Haan and Francois with Geisner with respect to limitations 1(c) and 1(e). Ex.2013, ¶164. The 110 Patent, Haan, and Francois are all directed to capturing and displaying a user image and depicting the user in the context of a mirror device. *See, e.g.,* Ex.1001, Abstract, Ex.1005, Abstract, Ex.1009, §4.3. Conversely, Geisner is directed to directed to tracking a user’s movement to control a virtual on-screen representation of the user. *See, e.g.,* Ex.1007, Abstract. Ex.2013, ¶165. A POSITA would understand that the rendering of a user avatar in a virtual environment (Geisner) would not be the same as rendering a user’s image to appear as if it were in a mirror (110 Patent; Francois; Haan), it would be substantially different. Ex.2013, ¶ 166. Consequently, a POSITA would understand that meeting the requirements of modifying the images such that they “appear to be captured from a different point of view than the camera’s actual point of view” (limitation 1(c)) “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” (limitation 1(e)) would also require substantially different techniques. *Id.* Therefore, a POSITA would not be

motivated to combine these three references to meet limitations 1(c) and 1(e) of the 110 Patent. *Id.*

All the claims challenged under this combination, directly or via claim dependency, require these limitations of Claim 1. Claims 7-9, 13-15 and 18 are dependent on Claim 1 and therefore, Petitioners have failed to establish invalidity of Claims 7-9, 13-15 and 18.

E. Ground 5: Petitioners Fail to Show Unpatentability of Claims 3-4, 7-9, and 11-18 in View of Rosenberg, Park, and Geisner

As discussed above in Section V.B. (Ground 2) incorporated herein by reference, Petitioners have failed to show unpatentability of Claim 1 based on Rosenberg and Park. As discussed in Sections V.B. (Ground 2 and V.C. (Ground 3) incorporated herein by reference, neither Rosenberg nor Geisner disclose limitations 1(c) and 1(e) and none of Rosenberg, Park, or Geisner disclose limitation 1(f). As none of Rosenberg, Park, or Geisner disclose limitation 1(f), even assuming motivation to combine, which there is not, the combination necessarily would not meet limitation 1(f). Ex.2013, ¶167, *see generally id.* ¶¶167-169. Additionally, a POSITA would not be motivated to combine Rosenberg and Park with Geisner with respect to limitation 1(f) because both Rosenberg and Park are directed to digital devices that display a user's real-life image whereas Geisner is directed to a tracking a user's movement to control a virtual on-screen representation of the user (*see, e.g.*, Ex.1007, ¶0024). Ex.2013, ¶168. A POSITA would not have been motivated to

combine Rosenberg and Park with Geisner because a POSITA would understand that the rendering of a user avatar in a virtual environment would not be the same as rendering a user's real life image on a digital display; it would be substantially different. *Id.* A POSITA would know that the skills and techniques used to create the virtual avatar in Geisner would be substantially different from those needed to render a user's image on a digital display as in the 110 Patent or in Rosenberg or Park. *Id.* Consequently, a POSITA would not be motivated to combine these references to meet limitation 1(f) of the 110 Patent. *Id.*

There would also be no motivation to combine Rosenberg and Park with Geisner with respect to limitations 1(c) and 1(e). Ex.2013, ¶169. The 110 Patent and Rosenberg are directed to capturing and displaying a user image in the context of a mirror device. *See, e.g.,* Ex.1001, Abstract, Ex.1006, Abstract. Even Park, while not necessarily depicting the user's image in a mirror device, displays the user's real-life image with some adjustments for tilt distortion. *See, e.g.,* Ex.1011, Abstract.

A POSITA would understand that the rendering of a user avatar in a virtual environment (Geisner) would not be the same as rendering a user's image to appear as if it were in a mirror (110 Patent; Rosenberg) or as the user appears in real-life (Park), it would be substantially different. Ex.2013, ¶169. Consequently, a POSITA would understand that meeting the requirements of modifying the images such that they "appear to be captured from a different point of view than the camera's actual

point of view” (limitation 1(c)) “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” (limitation 1(e)) would also require substantially different techniques. *Id.* Therefore, a POSITA would not be motivated to combine these three references to meet limitations 1(c) and 1(e) of the 110 Patent. *Id.*

All the claims challenged under this combination, directly or via claim dependency, require these limitations of Claim 1. Claims 3-4, 7-9, and 11-18 are dependent on Claim 1 and therefore, Petitioners have failed to establish invalidity of Claims 3-4, 7-9, and 11-18.

VI. CONCLUSION

All of Petitioners’ grounds fail to establish invalidity or obviousness of the challenged claims of the 110 Patent. Consequently, all of Petitioners’ grounds should be rejected.

Dated: March 6, 2025

Respectfully submitted.

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CERTIFICATION OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(b)(1) and (d), the undersigned hereby certifies that the Patent Owner's Preliminary Response complies with the type-volume limitation 37 C.F.R. § 42.24(b)(1) permitting a response of up to 14,000 words because, exclusive of the exempted portions, the response contains 13,928 words, as identified by Microsoft Word's word-counting feature.

Dated: March 6, 2025

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

The undersigned hereby certifies that on March 6, 2025, copies of the foregoing were served via Electronic Mail to the following:

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