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Paper 85
Entered: April 14, 2016

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

MASTERIMAGE 3D, INC. and
MASTERIMAGE 3D ASIA, LLC,
Petitioner,

v.

REALD INC.,
Patent Owner.

IPR2015-00040
Patent 8,220,934 B2

Before JAMESON LEE, JAMES B. ARPIN, and
BART A. GERSTENBLITH, *Administrative Patent Judges*.

LEE, *Administrative Patent Judge*.

FINAL WRITTEN DECISION
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

I. BACKGROUND[1]

A. Introduction

MasterImage 3D, Inc. and MasterImage 3D Asia, LLC ("Petitioner") filed a Petition (Paper 3, "Pet.") to institute an *inter partes* review of claims 1–20 of U.S. Patent No. 8,220,934 B2 (Ex. 1001, "the '934 patent"). RealD Inc. ("Patent Owner") filed a Preliminary Response (Paper 7). We issued a Decision (Paper 16 "Inst. Dec.") instituting trial on claims 1, 6–10, and 18–20. Thereafter, Patent Owner filed a Patent Owner Response (Paper 40, "PO Resp."), and Petitioner filed a Reply (Paper 52, "Reply"). Patent Owner also filed a Motion to Amend (Paper 43), which is opposed by Petitioner.

Oral hearing was held on December 10, 2015, together with the oral hearing for Case IPR2015-00035. A transcript of the joint, oral hearing is included in the record. Paper 82 ("Tr.").

Petitioner has shown by a preponderance of the evidence that each of claims 1, 6–10, and 18–20 of the '934 patent is unpatentable. Patent Owner has not shown by a preponderance of the evidence, however, that either one of its proposed, substitute claims 21 and 22 is patentable.

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[1] Petitioner and Patent Owner together identify the following related cases involving U.S. Patent No. 8,220,934 B2: (1) *RealD Inc. v. MasterImage 3D, Inc.*, No. 2:14-CV-02304 (C.D. Cal.); (2) *RealD Inc. v. Volfoni, Inc.*, No. 2:14-CV-02303 (C.D. Cal.); and (3) *In the Matter of Certain Three-Dimensional Cinema Sys. and Components Thereof*, Inv. No. 337-TA-939 (USITC). Pet. 1; Paper 6.

B. The ’934 Patent

The ’934 patent relates to polarization conversion of light for stereoscopic projection, and is titled: “Polarization Conversion Systems for Stereoscopic Projection.” Ex. 1001, [54]. Independent claim 1 is directed to “[a] stereoscopic system” (*id.* at 7:65), and independent claim 18 is directed to “[a] method for stereoscopic image projection” (*id.* at 9:7).

Each of independent claims 1 and 18 requires receiving light and splitting it, according to polarization, into a portion directed to a first light path and another portion directed to a second light path, and rotating or transforming the polarization of light in the second light path. Each of independent claims 1 and 18 further requires that the polarization of light in the second light path is made into the same polarization as that of the light in the first light path, and that the polarization states of the light from the first and second light paths are translated, selectively, into a first output state of polarization and a second output state of polarization.

According to the Summary portion of the Specification, the disclosed polarization systems “present a brighter screen image in cinematic applications utilizing polarized light for three-dimensional viewing.” Ex. 1001, 2:1–4.

Figure 2A of the ’934 patent is reproduced below.

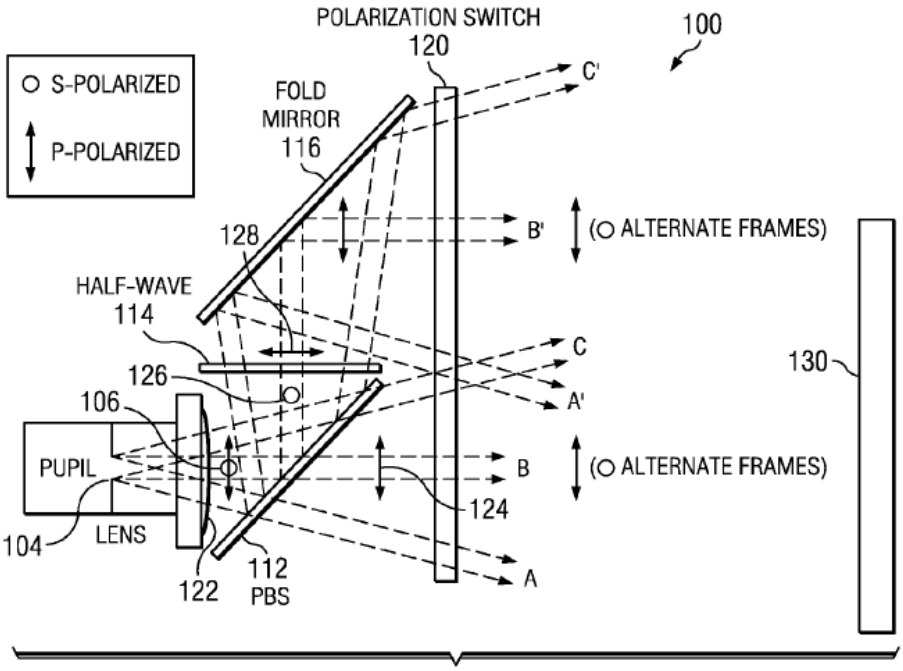


FIG. 2A

Figure 2A illustrates a schematic diagram of polarization conversion system 100 for cinematic projection according to one embodiment of the '934 patent. *Id.* at 2:41–43. Polarization conversion system 100 is shown, that includes polarizing beam splitter ("PBS") 112; polarization rotator 114, such as a half-wave plate; reflecting element, such as a fold mirror; and polarization switch 120, arranged as illustrated. *Id.* at 3:12–18. System 100 may receive images from a conventional projector with projection lens 122. *Id.* at 3:18–20.

The operation of polarization conversion system 100 shown in Figure 2A is described as follows in the Specification:

> In operation, ray bundles A, B, and C emerge randomly polarized from the lens 122 and are projected toward a screen 130 to form an image. In this embodiment, a PBS 112 is inserted in place of the polarizer 22 shown in FIG.1. The PBS 112 transmits P-polarized light 124, and reflects S-polarized light 126. The P-polarized light 124 passes through the polarization switch (bundles A, B, and C) and is rotated by the polarization

> switch in alternating frames, same as bundles A, B, and C in FIG.1.
>
> The S-polarized light 126 reflected by the PBS 112 passes through a polarization rotator 114 (e.g., a half-wave plate, preferably achromatic in some embodiments) and is rotated to p-polarized light 128. The new p-polarized light 128 passes to a fold mirror 116. The fold mirror 116 reflects the new p-polarized light 128 and passes it to polarization switch 120. The polarization switch 120, acting on p-polarized ray bundles A', B', and C', rotates the polarization of the ray bundles in alternating frames, in synchronization with the rotation of bundles A, B, and C. The position of bundles A', B', and C' at the screen may be adjusted (e.g., by adjusting the tilt of the fold mirror 116) to closely or exactly coincide with the positions of bundles A, B, and C at the screen.

Ex. 1001, 3:21–42. The Specification explains that, because nearly all of the light from the projector lens are imaged at the screen with a single polarization state, the resulting image "is approximately two times brighter than the image at the screen for the system in FIG. 1 [depicting prior art]." *Id.* at 3:42–47.

Independent claims 1 and 18 are reproduced below:

> 1. A stereoscopic system comprising:
>
> a polarization beam splitter (PBS) operable to direct light bundles having a first state of polarization (SOP) along a first light path, and direct second light bundles having a second SOP along a second light path;
>
> a polarization rotator located on the second light path, the polarization rotator being operable to translate the second SOP to the first SOP; and
>
> a polarization switch subsystem operable to receive first and second light bundles from the first and second light paths respectively, and to selectively translate both the polarization states of the first and second light bundles to one of a first output SOP and a second output SOP.

18. A method for stereoscopic image projection, comprising:

receiving randomly-polarized light from a projector;

directing first state of polarization (SOP) light on a first light path;

directing second SOP light on a second light path;

transforming the second SOP light on the second light path to first SOP light; and

selectively translating the first SOP light on both light paths to one of a first output SOP and a second output SOP.

Ex. 1001, 7:65–8:11, 9:7–10:4.

C. Evidence Relied Upon by Petitioner

Petitioner relies on the following prior art:

Reference		Date	Exhibit No.
Silverstein	US Pat. No. 7,559,653 B2	07/14/2009	Ex. 1002
Tani	US Pat. No. 6,190,013 B1	02/20/2001	Ex. 1003
Liptoh[2]	US Pat. No. 4,792,850	12/20/1988	Ex. 1004
Wentz	US Pat. No. 4,515,441	05/07/1985	Ex. 1005
APA[3]	alleged "Admitted Prior Art"		

[2] Petitioner refers to Liptoh as "Lipton." *See, e.g.*, Pet. 3.

[3] Patent Owner asserts that inventors of the '934 patent admitted that wire grids were known at the time of filing of the '934 patent. Pet. 47. The assertion is not disputed by Patent Owner. By "APA," we refer to the alleged admission that wire grids were known at the time of filing.

Petitioner also relies on the Declarations of Matthew S. Brennesholtz (Exs. 1009 and 1024). Exhibit 1009 was filed in support of the Petition, and Exhibit 1024 was filed in support of Petitioner's Reply.

D. The Asserted Grounds of Unpatentability

Basis	Reference(s)	Claim(s)
§ 103(a)	Silverstein	1 and 7–9
§ 103(a)	Liptoh and Tani	1, 6, 7, 10, and 18–20
§ 103(a)	Liptoh, Tani, and APA	8
§ 103(a)	Liptoh, Tani, and Wentz	9

II. ANALYSIS

A. Claim Construction

In an *inter partes* review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1278 (Fed. Cir. 2015), *cert. granted sub nom. Cuozzo Speed Techs. LLC v. Lee*, 136 S. Ct. 890 (mem.) (2016). Even under the rule of broadest reasonable interpretation, claim terms are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc*., 504 F.3d 1249, 1257 (Fed. Cir. 2007); *In re Morris*, 127 F.3d 1048, 1054 (Fed. Cir. 1997).

However, although understanding the claim language may be aided by explanations contained in the written description, it is important not to import claim limitations that are not part of the claim. *SuperGuide Corp. v.*

DirecTV Enters., Inc., 358 F.3d 870, 875 (Fed. Cir. 2004). For example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment. *Id.*; *see also In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).[4] That is no different even if the patent specification describes only a single embodiment. *See Hill-Rom Servs., Inc. v. Stryker Corp.*, 755 F.3d 1367, 1372–73 (Fed. Cir. 2014); *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1369 (Fed. Cir. 2004); *Liebel-Flarsheim Co. v. Medrad Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004).

If a feature is not necessary to give meaning to what the inventor means by a claim term, it would be "extraneous" and should not be read into the claim. *Hoganas AB v. Dresser Indus., Inc.*, 9 F.3d 948, 950 (Fed. Cir. 1993); *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1433 (Fed. Cir. 1988).

If a patentee desires to be his or her own lexicographer, the purported definition must be set forth in either the specification or prosecution history. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002). Such a definition must be set forth with reasonable clarity, deliberateness, and precision. *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998); *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). "Absent claim language carrying a narrow meaning, the [Patent and Trademark Office] should only limit the claim based on the specification or

[4] A patent applicant is not required to describe explicitly in the specification every embodiment of the invention. *See LizardTech, Inc. v. Earth Res. Mapping, Inc.*, 424 F.3d 1336, 1345 (Fed. Cir. 2005).

prosecution history when those sources expressly disclaim the broader definition." *In re Bigio*, 381 F.3d 1320, 1325 (Fed. Cir. 2004).

Only terms which are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Wellman, Inc. v. Eastman Chem. Co.*, 642 F.3d 1355, 1361 (Fed. Cir. 2011); *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc*., 200 F.3d 795, 803 (Fed. Cir. 1999).

1. Assorted Terms

Petitioner proposes an interpretation for: (1) "polarization beam splitter," (2) "rotator," (3) "polarization switch panel," and (4) "switch subsystem." Pet. 5. The proposed constructions, however, are entirely functional. When a claim limitation is defined in purely functional terms, it can raise difficult questions. *Halliburton Energy Servs., Inc. v. M-I LLC*, 514 F.3d 1244, 1255 (Fed. Cir. 2008). Here, the '934 patent has not defined these terms in purely functional terms, and the parties have not provided sufficient reasons to regard each term as a purely functional limitation. We discern no reason to accord each term a purely functional meaning. Rather, each of these terms identifies a structural device known to and recognizable by one with ordinary skill in the art. Inst. Dec. 10. No additional construction of these terms is necessary. In the Decision instituting trial, we determined the same. *Id.* Neither Petitioner nor Patent Owner has contested that determination.

2. "projector" / "projection lens"

In the Decision instituting trial, we disagreed with Patent Owner's initial position that a projector or a projection lens must output image light. Inst. Dec. 14. We observed that Patent Owner does not contend that a projector or projection lens is incapable of transmitting or outputting raw or

non-image illumination light. *Id.* We determined that a projector and a projection lens merely are *capable* of outputting image light. *Id.* Neither Petitioner nor Patent Owner challenges our construction. We adopt the same in this Final Written Decision. The term "projector" is recited in claims 6, 10, 18, and 20, and the term "projection lens" is recited in claim 10.

3. "light from a projector"

The term "light from a projector" appears only in claim 18. Each of claims 19 and 20 depends from claim 18. Patent Owner proposes that "light from a projector" be construed as *image light from a projector*. PO Resp. 21–35. It is not necessary to construe the term "light from a projector," because the prior art applied to claims 18–20, i.e., the combined teachings of Liptoh and Tani as discussed below, account for the "light from a projector" limitation by disclosure of *image light from a projector*.

Nevertheless, we note that a "projector," as discussed above, may output raw or non-image illumination light, and that "light," as discussed below, is not necessarily image light. Thus, "light from a projector" is not limited to image light. Patent Owner states that one of ordinary skill in the art would understand "light from a projector," as used in the '934 patent, as referring to "image light from a projector." *Id.* at 23. The contention is misplaced, because it does not address whether one with ordinary skill in the art would have regarded as unreasonable reading "light from a projector" broadly to encompass non-image light as well as image light. The pertinent question concerns whether "light from a projector" can also encompass non-image light, while covering image light.

4. "light bundles"

In the Decision instituting trial, we construed "light" which appears in each of independent claims 1 and 18. Inst. Dec. 11–14. We rejected Patent Owner's contention that the term "light" must be limited to image light. *Id.* at 14. In the Patent Owner Response, Patent Owner shifted its focus to "light bundles" and contends the same, i.e., that "light bundles" must be limited to image light bundles. PO Resp. 24–35; *see* Ex. 2005 ¶ 23. The issue still concerns "light" and does not have much, if anything, to do with how "bundles" is construed. We queried counsel for Patent Owner at oral hearing in that regard, and confirmed that it is inconsequential whether it is "light" or "light bundles," that is construed. Tr. 135:14–136:2. Counsel for Petitioner did not argue otherwise. Thus, we discuss the issue below, only in the context of the term "light."

5. "light"

We find no express definition in the Specification of the '934 patent or in any of the prosecution history identified by Patent Owner, for the term "light" or any term including the word "light," much less an explicit definition, the meaning of which is set forth with reasonable clarity, deliberateness, and precision. If a patentee desires to be his or her own lexicographer, the purported definition must be set forth in the specification or prosecution history. *CCS Fitness, Inc.*, 288 F.3d at 1366. Such a definition must be set forth with reasonable clarity, deliberateness, and precision. *Renishaw PLC*, 158 F.3d at 1249; *Paulsen*, 30 F.3d at 1480. Patent Owner also identifies nothing in the Specification or prosecution history of the '934 patent that constitutes a disclaimer or disavowal with regard to "light" or any term including the word "light."

Thus, the plain and ordinary meaning of "light" applies, as would be understood in the context of the Specification of the '934 patent. Because "light" may or may not carry an image, and because "light" is not modified in the claims by anything requiring that it carries an image, the broadest reasonable interpretation of "light" is that it is not limited to image light and that it encompasses raw, non-image illumination light.

Patent Owner argues that the applicants for the '934 patent did in fact act as their own lexicographers in confining light to image light, "by (1) ***explicitly*** defining a term 'cinematic projection' and (2) limiting the embodiments of '934 Patent to systems having a polarization beamsplitter (PBS) placed **after** a microdisplay." PO Resp. 24. This argument is unpersuasive, for reasons discussed below.

The '934 patent defines "cinematic projection" as follows:

> As used herein, the term "cinematic projection" refers to the **projection of images** using front and/or rear projection techniques, and includes, but is not limited to, applications for cinema, home theatre, simulators, instrumentation, head-up displays, and other projection environments where stereoscopic images are displayed.

Ex. 1001, 7:23–28 (emphasis added). How the above-quoted definition for "cinematic projection" amounts to defining "light" as "image light" or "light bundles" as "image light bundles" is inadequately explained. Patent Owner merely states that each disclosed embodiment in the '934 patent is disclosed as "involving 'cinematic projection.'" PO Resp. 25. Even assuming that is true, what matters is the subject matter claimed, not just what is disclosed. Also, the definition of "cinematic projection" is broad in that it requires only the projection of an image, and does not exclude non-image light in the system.

Based on the above-quoted definition, so long as a system includes projection of images and implements a display of stereoscopic images, whether it also includes a light source that generates non-image light at an earlier step in the system is irrelevant. The word "light" does not even appear in the above-quoted definition of "cinematic projection." There is little, if any, understanding of the meaning of "light" that can be drawn implicitly from the above-quoted definition of "cinematic projection." Thus, the definition of "cinematic projection" does not restrict "light" to "image light," or "light bundles" to "image light bundles."

Quoting *SkinMedica, Inc. v. Histogen Inc.*, 727 F.3d 1187, 1196 (Fed. Cir. 2013), Patent Owner states: "The specification acts as a dictionary when it expressly defines terms used in the claims **or when it defines terms by implication**." PO Resp. 24 (emphasis added). Patent Owner explains that, in *SkinMedica*, there was implicit definition of the term "culturing in three-dimensions" to exclude the use of "beads," even though it was well known in the art that three-dimensional cellular cultures could involve use of beads, because (1) each time the specification referred to culturing with beads, the method was distinguished as not being three-dimensional culturing; (2) each time "beads" was used in a list, it was used as an alternative to three-dimensional cultures; and (3) the applicants emphasized that the chemical superiority of their three-dimensional culture in comparison to cells grown on beads was a point of novelty. *Id.* at 24–25.

The factual circumstance of this case substantially differs from that in *SkinMedica*, as outlined above by Patent Owner. First, Patent Owner does not point to any instance in the Specification of the '934 patent, in which a distinction is made between image light and non-image light insofar as

passing light through a polarization beam splitter (independent claim 1) or receiving randomly-polarized light from a projector (independent claim 18) is concerned. Second, Patent Owner does not point to any instance in the Specification of the '934 patent, in which non-image light is referred to either as different from or as an alternative to "light." Third, Patent Owner does not point to any instance in the Specification of the '934 patent, in which the applicants attributed the superiority of their claimed apparatus or method to not receiving or processing non-image light. Thus, Patent Owner has not, in this case, shown definition by implication, or disclaimer or disavowal of claim scope, as was shown in the case of *SkinMedica*.

Patent Owner additionally relies on the fact that the Specification of the '934 patent, discloses only embodiments having a PBS placed after a microdisplay. The '934 patent does not describe an embodiment that commences by receiving raw or non-image light. But that is insufficient to justify, under the rule of broadest reasonable interpretation, excluding non-image light from the scope of "light" or "light bundles." The applicants could have recited "image light" in the claims, but did not do so. In patent law, "the name of the game is the claim." *In re Hiniker Co*., 150 F.3d 1362, 1369 (Fed. Cir. 1998). Section 112 of the 1952 Patent Act requires that the claims themselves set forth the limits of the patent grant. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1323 (Fed. Cir. 2005) (en banc).

It is well settled that a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment. *SuperGuide Corp.*, 358 F.3d at 875; *In re Van Geuns*, 988 F.2d at 1184. That is no different even if the patent specification describes only a single embodiment. *See Hill-Rom Servs., Inc.*, 755 F.3d at

1372–73 ("[e]ven when the specification describes only a single embodiment, the claims of the patent will not be read restrictively unless the patentee has demonstrated a clear intention to limit the claim scope using 'words or expressions of manifest exclusion or restriction'"); *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d at 1369 ("We have cautioned against reading limitations into a claim from the preferred embodiment described in the specification, even if it is the only embodiment described, absent clear disclaimer in the specification."); *Liebel-Flarsheim Co.*, 358 F.3d at 906. As the U.S. Court of Appeals for the Federal Circuit stated, "[a]bsent claim language carrying a narrow meaning, the PTO should only limit the claim based on the specification or prosecution history when those sources expressly disclaim the broader definition." *In re Bigio*, 381 F.3d at 1325. No such disclaimer or disavowal has been shown by Patent Owner.

Patent Owner cites to *Wang Labs., Inc. v. Am. Online, Inc.*, 197 F.3d 1377, 1383 (Fed. Cir. 1999), as supporting the position that a claim is appropriately limited in scope to a single embodiment when "the subject matter that is claimed" is the only subject matter described in and enabled by the specification. PO Resp. 26. Assuming that *Wang Labs.* stands for that proposition, the proposition is not helpful to Patent Owner. Patent Owner has not presented a threshold amount of evidence—that the Specification of the '934 patent does not enable one with ordinary skill in the art to make and use an embodiment that receives and acts first on non-image light—sufficient to shift the burden of going forward on the enablement issue to Petitioner. Patent applicants need not disclose, and preferably should omit from the specification, that which is well known in the art. *Spectra-Physics,*

Inc. v. Coherent, Inc., 827 F.2d 1524, 1534 (Fed. Cir. 1987); *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1384 (Fed. Cir. 1986).

Wang Labs. also is distinguishable from this case for other reasons. As is pointed out by Petitioner (Reply 5), in *Wang Labs.*, the prosecution history reflects an express disclaimer by the applicants of broader subject matter when explicit statement was made to exclude another embodiment. *Wang Labs.*, 197 F.3d at 1384. Furthermore, the Court applied a principle applicable in civil actions before district courts, which is not applicable in proceedings before the Board, i.e., "[C]laims should be construed, when feasible, to sustain their validity." *Id.* at 1383.

Other cases cited by Patent Owner, i.e., *Anderson Corp. v. Fiber Composites, LLC*, 474 F.3d 1361, 1367 (Fed. Cir. 2007) ("The Group I common specification repeatedly states that the steps of linear protrusion or palletization are not merely embodiments, but are essential features of the claimed composite composition."), and *Alloc, Inc. v. ITC*, 342 F.3d 1361, 1372 (Fed. Cir. 2003) ("The applicant expressly disavowed systems without play during prosecution of the parent '621 application."), are inapposite, because they involve disclaimers or disavowals not present in this case.

Patent Owner further argues that one with ordinary skill in the art would understand that image light bundles is the broadest reasonable interpretation of the term "light bundles" in the claims. PO Resp. 29. The argument is unpersuasive.

First, Patent Owner contends that Petitioner's expert agrees that "light bundles" should be construed as "image light bundles." PO Resp. 29–30. That is not a reasonable characterization of Mr. Brennesholtz's testimony. We find that the cross-examination testimony of Mr. Brennesholtz, cited by

Patent Owner (PO Resp. 30–31), refers to what is conveyed by the disclosed embodiments of the '934 patent, rather than what is required by a claim term, and Mr. Brennesholtz expressly indicated that the claim terminology is silent in that regard. A portion of that testimony is reproduced below:

> Q. Based on your analysis of the '934 patent and given what we just discussed about a stereoscopic system and your understanding of that, if you continue to read Claim 1, do you see the portion saying "The polarization beamsplitter (PBS) operable to direct first light bundles"?
> A. Yes.
> Q. **Is that referring to image light bundles?**
> A. **You can't tell from the claim terminology as is, because stereoscopic systems can have polarization beamsplitters before or after the imager**.
> Q. In the context of the 34 patent, does that change your view?
> MR. FINKEL: Objection; form.
> THE WITNESS: Knowing the use of what this patent describes, the polarization – or the first light bundles would include the image, yes. The – whole patent is directed at after the microdisplay, not before it.

Ex. 2006, 216:7–217:1 (emphasis added). Patent Owner points out that stereoscopic systems necessarily involve images. PO Resp. 30. That fact, however, does not establish that a stereoscopic system must begin with a device outputting image light. In that regard, Mr. Brennesholtz testifies that stereoscopic systems can have polarization beam splitters before "the imager." Ex. 2006, 216:15–18. That means a PBS can receive and split non-image light. We have also reviewed Paragraphs 58–62 of the Declaration of Patent Owner's technical witness, Dr. Robert McLeod (Ex. 2005 ¶¶ 55–56, 58–62), on the issue of claim construction, and find the reasoning deficient for

improperly reading preferred embodiments into the claim, as we have discussed above. Notably, the cited testimony of Dr. McLeod does not dispute the position expressed by Mr. Brennesholtz that stereoscopic systems can have polarization beamsplitters before or after the device that generates the image.

Second, Mr. Brennesholtz testified as follows:

> 16. The term "light" is well understood by those skilled in the art to encompass all types of light, including raw or non-image light used as a source of illumination. When a term like "light" is used without qualification or limitation, it is generally understood to refer to any light type.
>
> 17. Although the embodiments of the '934 patent all involve "image" light, one of skill in the art would not understand the '934 patent to be limited only to image light.

Ex. 1024 ¶¶ 16–17. We credit the above-quoted testimony of Mr. Brennesholtz and are persuaded thereby.

In the Decision instituting trial, we compared claim 6 with claim 1, and determined that the doctrine of claim differentiation also supports not limiting "light" in claim 1, inputted to the PBS, to image light. Claim 6 recites, in pertinent part: "wherein the polarization switch subsystem selects between the first and the second output SOP in synchronization with transmission of an image frame by a projector." Ex. 1001, 8:22–25. Patent Owner argues, however, that "nothing in claim 1 speaks to syncing the polarization switch subsystem with the emission of SOP." PO Resp. 37. Patent Owner contends that because claim 6 includes at least one aspect that is not found within the scope of claim 1, the doctrine of claim differentiation does not apply. *Id.* In its Reply, Petitioner contends that

"synchronization is inherent in a claim directed at displaying stereographic images." Reply 9 (citing Ex. 1024 ¶ 26).

We have reviewed both claims 1 and 6 and the contentions of Petitioner and Patent Owner, and determine that the doctrine of claim differentiation does not apply in the circumstances of this case. That is because the limitation added by claim 6 does not impose a requirement on any light recited in claim 1, particularly the light received by the PBS of claim 1.

Nevertheless, for reasons already discussed above, the broadest reasonable interpretation of "light" in the claims of the '934 patent is that it is not limited to image light and that it encompasses raw, non-image illumination light.

B. Obviousness of Claims 1 and 7–9 over Silverstein

A patent claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter 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 said 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 ordinary skill in the art; and (4) objective evidence of nonobviousness. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

Petitioner and Patent Owner agree on the level of ordinary skill in the art. Ex. 1009 ¶ 10; Ex. 2005 ¶ 7. It is stated as:

> A person of ordinary skill in the art in the field of the '934 patent would be someone with a good working knowledge of optics and display systems in general, and stereoscopic (stereographic[5]) projection systems in particular. The person would have gained this knowledge through an undergraduate or graduate education in physics, optics, or a comparable field, in combination with further training and several years of practical working experience.

Ex. 1009 ¶ 10. We adopt the same for purposes of this Decision.

Silverstein

Silverstein is directed to a stereoscopic imaging apparatus. Ex. 1002, Abstr. Figure 2 of Silverstein is reproduced below.

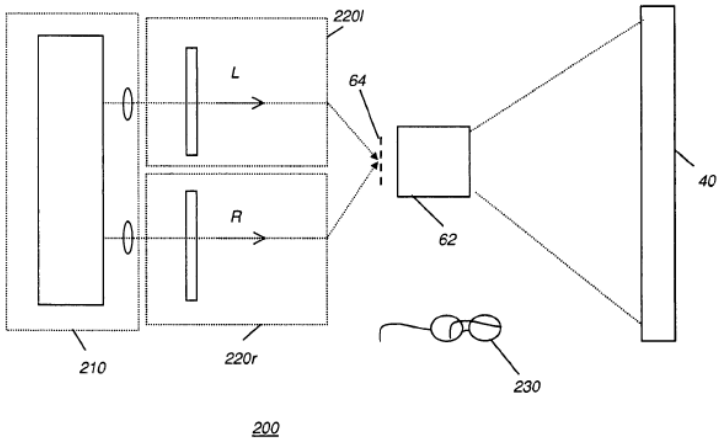


FIG. 2

Figure 2 is a block diagram of stereoscopic imaging apparatus 200 according to a disclosed embodiment in Silverstein. Ex. 1002, 6:44–45. Illumination source 210 splits light, by polarization, into a left channel and a right

[5] Petitioner includes a footnote that reads: "While 'stereoscopic' is currently the preferred term for these systems, 'Stereographic' is used in some of the references. The two terms will be used interchangeably in this Declaration." Ex. 1009 ¶ 10 n.1.

channel. *Id.* at 7:26–29. The left channel leads to modulation apparatus 220l; the right channel leads to modulation apparatus 220r; and the two together form intermediate image 64, which is projected onto display surface 40 by projection lens 62. *Id.* at 7:29–34. Silverstein indicates that Figure 2 provides the basic model for all embodiments. *Id.* at 7:39–40.

Figure 3 of Silverstein is reproduced below.

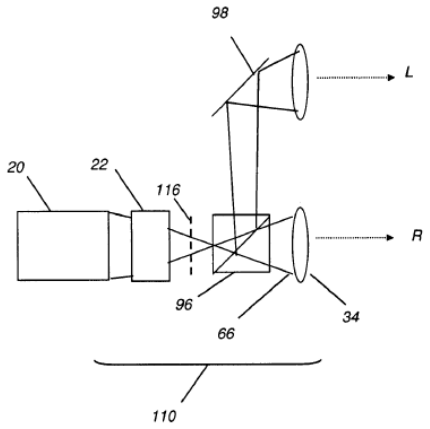


FIG. 3

Figure 3 of Silverstein is a block diagram of a polarized light providing apparatus. *Id.* at 6:46–47. Figure 3 shows polarized light providing apparatus 110 that could be used as illumination source 210 such as that in Figure 2, to provide left and right channels outputting light having different polarization states. Ex. 1002, 7:51–56. Specifically, Silverstein states:

> Light from a light source 20 is uniformized by a uniformizing element 22 that spatially distributes or homogenizes the light to provide a more uniform illumination field. The uniformized light is directed to a shutter 116 and a polarizer 96 that **transmits light having one polarization, such as p-polarization in one embodiment, to one modulation channel, labeled R for the right channel in FIGS. 2 and 3, as a substantially polarized illumination beam 66**. Polarizer 96 reflects light having the

> orthogonal polarization (s-polarization in this example) for the other modulation channel. A mirror 98, or reflective polarization sensitive coating, then **directs the light having orthogonal polarization to the other modulation channel, labeled L in FIGS. 2 and 3**. Lens 34 directs the polarized light into the appropriate modulation channel.

Id. at 7:56–8:3 (emphases added).

Figure 16 of Silverstein is reproduced below.

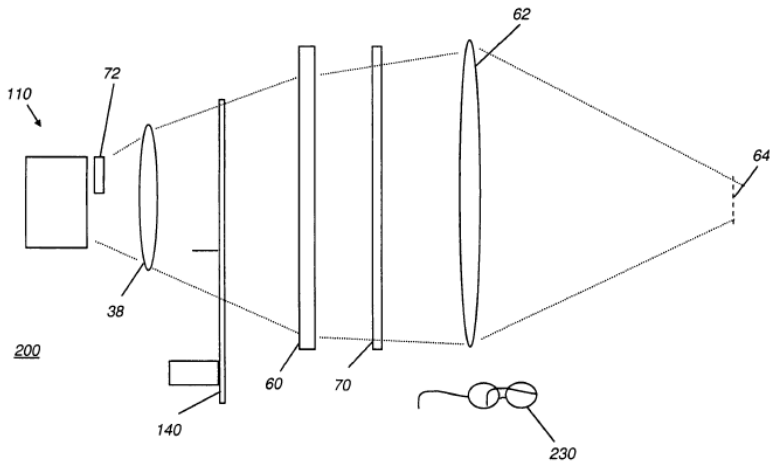


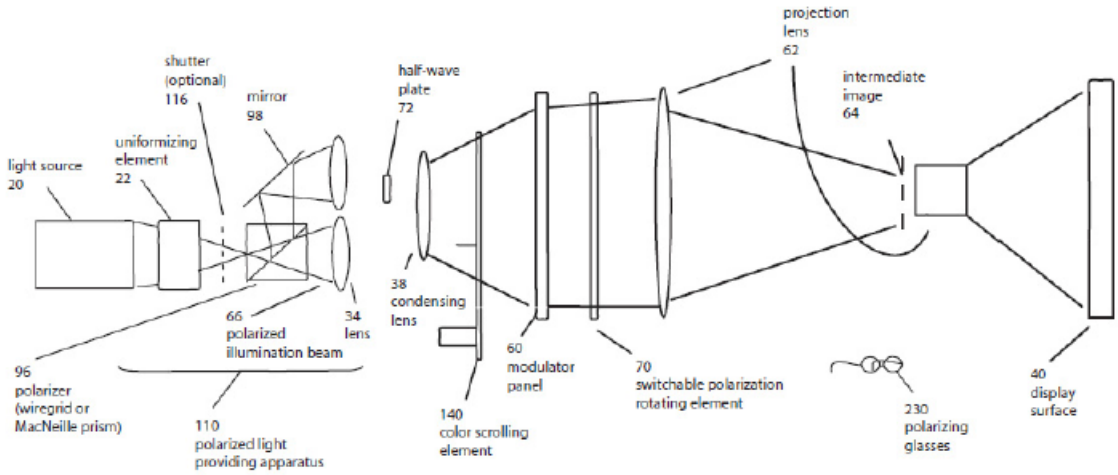
FIG. 16

Figure 16 of Silverstein illustrates an alternative embodiment making use of switchable polarization rotating element 70. *Id.* at 7:12–14. The Figure shows the embodiment extending from light source 110 to intermediate image 64. It is understood that the remainder of stereoscopic imaging system 200 is as shown in Figure 2.

Half-wave plate 72 is used to change the polarization state of a portion of the light from light providing apparatus 110. Ex. 1002, 16:23–25. "[A] switchable polarization rotating element 70 is employed to switch polarization states rapidly, alternating between left- and right-eye polarization states at sufficient speed in cooperation with images formed on

modular panel 60 that, in turn, cooperates with color scrolling element 140." *Id.* at 16:17–24.

A full illustration of the partial embodiment presented in Silverstein's Figure 16, extending from light source 20 at one end to projection screen 40 on the other end, as shown by Petitioner, is reproduced below.



Pet. 17. The combined figures above show the full illustration of the embodiment of Silverstein's Figure 16, extending from polarized light providing apparatus 110, including light source 20, to display surface 40. Polarizer 96 splits light from illumination source 20 into an "L" channel and an "R" channel, and in one embodiment, s-polarized light is confined to the "L" channel and p-polarized light is confined to the "R" channel. Ex. 1002, 7:59–8:3. The illustration is a fair representation of the complete embodiment of Figure 16, given that Figure 16 covers only the components from a light source to an intermediate image, and that Figure 3 illustrates an apparatus that can be used as light source 210 in Figure 2. *Id.* at 7:51–56.

1. Claims 1, 7, 8, and 9 – Arguments Based on Silverstein

Claim 1 is independent, and each of claims 7–9 depends directly from claim 1. Silverstein is directed to a stereoscopic system as is recited in the preamble of claim 1. Ex. 1002, Abstr. Claim 1 recites: "a polarization beamsplitter (PBS) operable to direct first light bundles having a first state of polarization (SOP) along a first light path, and direct second light bundles having a second SOP along a second light path." Ex. 1001, 7:66–8:2. Petitioner identifies Silverstein's polarizer 96 as a polarizing beam splitter that receives randomly polarized light, and directs first light bundles having a first state of polarization along a first light path, and second light bundles having a second state of polarization along a second light path. Pet. 15, 18, 25–26.

Claim 1 recites: "a polarization rotator located on the second light path, the polarization rotator being operable to translate the second SOP to the first SOP." Ex. 1001, 8:3–5. Petitioner identifies Silverstein's half-wave plate 72 as a rotator, which is located on the second light path and translates the polarization state of the light on the second light path. *Id.* at 16, 18–19, 26. With regard to half-wave plate 72, Petitioner asserts:

> In Fig. 16, Silverstein discloses that a **half-wave plate 72 is used to change the state of a portion of the light from the light providing apparatus 110**. Ex. 1002, Silverstein, 16:16-35. It would have been apparent to one of ordinary skill in the art that **the "portion of light" referenced in Silverstein is one of the L or R channels** [shown in Figure 3]. A person of skill in the art would place the half-wave plate 72 in only one channel so that after the operation of the half-wave plate, both the L and R channels would have the same state of polarization, thereby increasing the brightness of the image projected onto the screen 40. Ex. 1009, Brennesholtz Decl. ¶ 30. It would also be obvious to one of ordinary skill in the art since the system described

> utilizes a switchable polarization rotating element 70, which would be understood to require a single state of polarization for operation. Ex. 1009, Brennesholtz Decl. ¶ 30; Ex. 1002, Silverstein, 16:16-35.

Pet. 19 (emphases added). We find, on the basis of the evidence and explanation provided by Petitioner, and notwithstanding the contrary arguments and evidence of Patent Owner, which we address below, that Silverstein (1) discloses a stereoscopic system including a PBS as recited in claim 1, and (2) would have suggested to one with ordinary skill in the art a polarization rotator as is recited in claim 1.

Claim 1 recites: "a polarization switch subsystem operable to receive first and second light bundles from the first and second light paths respectively, and to selectively translate both the polarization states of the first and second light bundles to one of a first output SOP and a second output SOP." Ex. 1001, 8:6–10. Petitioner identifies and relies on Silverstein's switchable polarization rotating element 70 to meet the claimed polarization switch subsystem. *Id.* at 19–20. The disclosure of Silverstein, as discussed above, supports Petitioner's accounting of the claimed polarization switch subsystem. We conclude, notwithstanding the contrary arguments and evidence of Patent Owner, which we address below, that Silverstein suggests and renders obvious a polarization switch subsystem as is recited in claim 1.[6]

[6] This determination is based on positioning Silverstein's half-wave plate 72, such that it rotates one of the L and R channels of the light source shown in Silverstein's Figure 3. We are persuaded, for the reasons discussed above, that it would have been obvious to one with ordinary skill in the art to position half-wave plate 72 of Silverstein, such that it rotates one of the L or R channels of the light source shown in Silverstein's Figure 3.

Patent Owner makes several arguments. Patent Owner contends that because "light" has to be image light and "light bundles" have to be image light bundles, and because Silverstein's polarized beamsplitter neither receives nor outputs image light, Petitioner has failed to show that Silverstein renders obvious the subject matter of claim 1. PO Resp. 44–45. The argument is without merit because we have determined that the broadest reasonable interpretation of the claim term "light" is that it is not limited to image light and that it encompasses raw, non-image illumination light. *See supra* Sections II.A.4. and II.A.5.

Patent Owner argues that one with ordinary skill in the art would not have put together a system like that shown on page 17 of the Petition and reproduced above, which is a composite of the structures taken from Figures 2, 3, and 16 of Silverstein, and on the basis of which Petitioner alleges obviousness of claim 1. PO Resp. 37–42. Patent Owner refers to that system as a "hypothetical Silverstein composite system." *Id.* at 37. The argument is misplaced. There is no occasion to determine whether one with ordinary skill in the art would have, as a matter of obviousness, combined the structures of Silverstein's Figures 2, 3, and 16, because Silverstein expressly describes that its Figure 16 embodiment includes the structures shown in Figures 2 and 3. With regard to its Figure 16 embodiment, Silverstein states: "A half-wave plate 72 is used to change the polarization state of a portion of the light from light providing apparatus 110." Ex. 1002, 16:23–25. Figure 3 depicts polarized light providing apparatus 110. *Id.* at 6:46–47. Figure 16 does not illustrate the entire embodiment, because it includes only features up to intermediate image 64 which is not yet projected onto a screen. What remains, i.e., the portion from intermediate image 64

and the display screen, comes from Figure 2 because Silverstein expressly indicates that Figure 2 is the basic model for all of its disclosed embodiments. *Id.* at 7:40–41, 44–45. We find that the system shown in the composite figure is not a *hypothetical* embodiment, as Patent Owner contends, but is the *actual* embodiment of Silverstein's Figure 16, illustrated in full, without certain abbreviations or omissions embodied in Figure 16. The testimony of Mr. Brennesholtz supports that conclusion. Ex. 1009 ¶ 28.

Patent Owner asserts that, in the Figure 16 embodiment of Silverstein, shown in the composite diagram, switchable polarization rotating element 70, which Petitioner contends discloses the polarization switch subsystem of claim 1, does not receive first and second light bundles from the first and second light paths directed by the polarization beam splitter, as required by claim 1. PO Resp. 37–42. Patent Owner points to condensing lens 38, color scrolling element 140, and modulator panel 60, all positioned just prior to the switchable polarization rotating element, in that order, leading up to the switchable polarization rotating element. *Id.* at 39. According to Patent Owner, condensing lens 38 "would provide a 'uniformized polarized beam' output to downstream components—including switchable polarization rotating element 70." *Id.* Thus, Patent Owner contends that condensing lens 38 would uniformize the left and right channels outputted by polarizer 96 into "a single, uniformized, polarized path of light." *Id.* Patent Owner further contends that, even in the Figure 16 embodiment shown in the composite diagram above, the switchable polarization rotating element does not receive first and second light bundles from the first and second light paths as directed by the polarization beam splitter, as required by claim 1. *Id.* at 40. In support of this contention,

Patent Owner relies on the testimony of Dr. McLeod. Ex. 2005 ¶¶ 75, 76, 83–85.

Petitioner disagrees with Patent Owner's contention, and states:

> Contrary to Patent Owner's contention, the lens 38 does not merge the two light paths into one. Ex. 1024 ¶ 35. Lens 38 is not [] a diffuser. *Id.* Like the prisms discussed in the '934 patent, lens 38 is used to affect the direction of the light paths. *Id.* For a lens like lens 38, each light path is independently maintained through the lens and independently affected by the lens. *Id.* That is, if the direction for one light path input to the condensing lens is changed, there will be a corresponding change to the direction of light path at the output of the lens. *Id.* Indeed, Silverstein confirms in its summary of the invention that the left channel and right channel are maintained until the projector lens superimposes the image from the left channel with the image from the right channel on a display surface. Ex. 1002, 6:10–15.
>
> . . . .
>
> Dr. McLeod's statement that a condensing lens creates "homogenized" light and cannot carry multiple paths of light is simply wrong and misses the point. A condensing lens is used to direct light, as the Silverstein reference itself makes clear. Ex. 1002 at 8:38–45 (stating that condensing lens 38 and 42r, 42g, 42b "direct" the light). Dr. McLeod does not explain what he means by stating that a condensing lens "homogenizes" light, but to the extent he is referring to "mixing" the first and second light paths into one path, *see* Ex. 2005 ¶¶ 75–76, he is wrong. Ex. 1024 ¶ 36.

Reply 12–13.

The parties' declarants, Mr. Brennesholtz for Petitioner and Dr. McLeod for Patent Owner, directly contradict each other. We credit the testimony of Mr. Brennesholtz over that of Dr. McLeod.

Generally, we find Dr. McLeod's testimony is not sufficiently specific regarding the deficiencies in the composite figure; and, in

particular, Dr. McLeod's testimony is ambiguous, as compared to that of Mr. Brennesholtz, with regard to the effect of condensing lens 38 on input light and input light paths. *See* Ex. 2005 ¶¶ 75–76. Mr. Brennesholtz unequivocally testifies: "The condensing lens 38 does not merge the two light paths into one. Condensing lens 38 is not [] a diffuser. . . . For a lens like condensing lens 38, each light path is independently maintained through the lens and independently affected by the lens." Ex. 1024 ¶ 35. Mr. Brennesholtz further explains: "[I]f the direction for one light path input to the condensing lens is changed, there will be a corresponding change to the direction of light path at the output of the lens." *Id.*

In contrast, Dr. McLeod testifies: "A condensing lens is exclusively used in illumination systems to acquire, concentrate (that is 'condense') and homogenize light from a 'light providing apparatus' and is not used to carry multiple light bundles or paths." Ex. 2005 ¶ 75. Dr. McLeod not only does not explain what he means by "homogenize," but also addresses only the "intended use" of a condensing lens, which is not the same as what actually occurs to light paths as light enters the condensing lens and then emerges on the other side of the lens. Dr. McLeod's testimony is one step removed from what is claimed and also ambiguous, as compared to Mr. Brennesholtz's testimony. Homogenizing light may not necessarily mean merging separate light paths, if all it takes to homogenize light is to smooth out irregularities. In light of the above discussion, we find Mr. Brennesholtz's testimony more creditable than that of Dr. McLeod.

Patent Owner also relies on this description in Silverstein with regard to Silverstein's Figure 4 (PO Resp. 39): "A condensing lens 38 then directs a uniformized polarized beam 76 to a color separator 78 that separates the multiple wavelengths into . . . ." Ex. 1002, 8:43–45. That reliance is misplaced. The description references Silverstein's Figure 4, which depicts a modulation apparatus for only one channel. *Id.* at 8:38–40. Silverstein states: "Referring to Figure 4, there is shown channel modulation apparatus 220*l* for the left eye; channel modulation apparatus 220*r* for the right eye would be similarly constructed." *Id.* The cited disclosure does not convey that condensing lens 38 merges two incoming light paths into one. We find that condensing lens 38 in Silverstein does not merge two incoming light paths into one.

Patent Owner notes that, after passing through condensing lens 38, the light passes through color scrolling element 140. PO Resp. 40. Patent Owner states that the color scrolling element "would further condition the uniformized light beam output of the condensing lens 38 by sequentially scanning and filtering the uniformized light beam to produce a single light path output of two or more colors in a sequential manner." *Id.* Patent Owner relies on the testimony of Dr. McLeod. *Id.* (citing Ex. 2005 ¶ 77). Neither Patent Owner's argument nor Dr. McLeod's testimony, in that regard, is persuasive, because both presume that the input to color scrolling element 140 is only a single beam of light on a single light path.
Dr. McLeod does not explain what happens when light impinges on the color scrolling element on two separate light paths. Mr. Brennesholtz testifies, however, that the color scrolling element merely conditions the light by colorizing it and does not combine first and second input light paths into one

path. Ex. 1024 ¶ 37. That testimony is more on point than Dr. McLeod's testimony, and is persuasive. We find that color scrolling element 140 in Silverstein does not combine or merge two light paths into one.

Patent Owner further notes that after passing through color scrolling element 140, the light passes through modulator panel 60. PO Resp. 42. Relying on the testimony of Dr. McLeod, Patent Owner states: "The modulator panel 60 also outputs a single light path that ultimately reaches switchable polarization rotating element 70." *Id.* (citing Ex. 2005 ¶ 75). Paragraph 75 of Dr. McLeod's Declaration, however, addresses condensing lens 38 rather than modulator panel 60. Patent Owner's argument is unpersuasive, because it assumes that the input to modulator panel 60 is only a single beam of light on "a single light path." *Id.* Patent Owner does not explain what happens when light impinges on modulator panel 60 in two separate light paths. Mr. Brennesholtz testifies, however, that modulator panel 60 modulates light and does not combine first and second input light paths into one path. Ex. 1024 ¶ 37. Mr. Brennesholtz's testimony is more on point than Dr. McLeod's testimony, and is persuasive. Note also that during cross-examination, Dr. McLeod testified that separate paths may be "modulated with a single modulator first into either left or right circular, or as shown in this particular diagram, S or P." Ex. 2016, 26:20–27:5. We find that modulator panel 60 does not combine or merge two light paths into one.

With regard to dependent claims 7–9, we similarly are persuaded by the arguments and evidence presented by Petitioner. Patent Owner does not present any argument apart from those it presents for independent claim 1. We consider Patent Owner to have admitted those aspects of the ground of unpatentability that are uncontested by Patent Owner and are material facts.

See 37 C.F.R. § 42.23(a); *see also* Paper 18, 3 ("The patent owner is cautioned that any arguments for patentability not raised in the response will be deemed waived.").

2. Secondary Considerations

We also must consider objective evidence of nonobviousness, i.e., secondary considerations, if there is any such evidence presented by the parties for consideration. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). A nexus is required between the merits of the claimed invention and any objective evidence of nonobviousness, if that evidence is to be given substantial weight in reaching a conclusion on obviousness. *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1539 (Fed. Cir. 1983). Evidence of secondary considerations is only significant if there is a nexus with respect to the claimed invention. *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311–12 (Fed. Cir. 2006).

Nexus is a legally and factually sufficient connection between the objective evidence and the claimed invention, such that the objective evidence should be considered in the determination of nonobviousness. *See Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988). For instance, commercial success is relevant only if it flows from the merits of the invention claimed. *Sjolund v. Musland*, 847 F.2d 1573, 1582 (Fed. Cir. 1988). The burden of showing nexus is on the patent owner. *In re Huang*, 100 F.3d 135, 139–40 (Fed. Cir. 1996). Objective evidence of nonobviousness also must be commensurate in scope with the claims for which the evidence is offered to support. *In re Kulling*, 897 F.2d 1147, 1149 (Fed. Cir. 1990); *In re Lintner*, 458 F.2d 1013, 1015 (CCPA 1972); *In re Tiffin*, 448 F.2d 791, 791–92 (CCPA 1971) (holding that

evidence directed to "cups" was not commensurate in scope with claims drawn to "containers" generally).

a. Alleged Commercial Success

Patent Owner asserts commercial success as an objective factor indicating nonobviousness. The evidence presented by Patent Owner, however, is inadequate to establish sufficient nexus between the alleged commercial success and the claimed invention. Patent Owner asserts that as of September 2013, it "had market dominance—holding over 80% of the U.S. Domestic 3D Box Office EX—*suggesting* that such market dominance is directly related to the RealD XL product." PO Resp. 58 (emphasis added). The contention is unpersuasive, for reasons discussed below.

Patent Owner does not represent that it has only one commercial product, the RealD XL product, in the United States. Therefore, the market share in total box office receipts is not sufficiently tied to the RealD XL product. Patent Owner does not represent that its share of the total Box Office receipts is derived solely from use of the RealD XL product. Thus, from the evidence provided, we cannot determine what portion of that estimated market share is derived from a product that embodies the claimed invention. Also, Patent Owner does not indicate what its market share was prior to introduction of the RealD XL product. That lack of information substantially undermines the assertion that commercial success was due to the RealD XL product. The alleged over 80% market share may be significant or insignificant, depending on RealD's previous market share.

Without substantive analysis, Dr. McLeod declares that based on his "personal observation," the RealD XL product "embodies at least the following instituted claims — Claim 1, 6, 7, 8, 10, 18, 19, and 20."

Ex. 2005 ¶ 117. We are unpersuaded by such unexplained and conclusory opinion. Patent Owner further asserts that Mr. Brennesholtz, on cross-examination, "admits that the RealD XL product encompasses the elements of at least independent claim 1 of the '934 Patent." PO Resp. 58. Our review of the cited testimony indicates, however, that Mr. Brennesholtz is of the opinion that at most only a single-projector version of the RealD XL product would embody all elements of claim 1, but a dual-projector version of the RealD XL product would not. Specifically, Mr. Brennesholtz stated: "My understanding is the XL system includes the rotator, and all single-projector versions of the XL system will include the polarization switch. But the dual-projector version of it will not include a polarization switch." Ex. 2006, 159. Patent Owner has not indicated that it had no dual-projector versions of the RealD XL product or that such dual-projector versions of the RealD XL product were not included in its estimate of over 80% market share.

For the foregoing reasons, Patent Owner has not established sufficient nexus between the claimed invention and the alleged over 80% market share. Patent Owner also has failed to establish the significance of the over 80% market share, given that it has offered no information on its market share prior to introduction of the RealD XL product.

b. Alleged Copying

Patent Owner alleges copying by Petitioner as an objective factor indicating nonobviousness. PO Resp. 59–60. Copying as an objective indicia of nonobviousness "requires evidence of **efforts to replicate a specific product**, which may be demonstrated through internal company documents, direct evidence such as disassembling a patented prototype,

photographing its features, and using the photograph as a blue print to build a replica, or access to the patented product combined with substantial similarity to the patented product." *Wyers v. Master Lock Co.*, 616 F.3d 1231, 1246 (Fed. Cir. 2010) (emphasis added). Also, even a showing of copying "is only equivocal evidence of non-obviousness in the absence of more compelling objective indicia of other secondary considerations." *Ecolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1380 (Fed. Cir. 2000).

Patent Owner asserts that Petitioner introduced its "Horizon 3D" system six years after Patent Owner's introduction of Patent Owner's RealD XL product. PO Resp. 59. Dr. McLeod testifies: "In 2014, as [Petitioner] was introducing the MI-Horizon3D system, which is [Petitioner's] take on a 'light doubling,' system, it is clear that they were targeting the RealD XL design." Ex. 2005 ¶ 133. That testimony is conclusory and not supported by adequate explanation of underlying facts. Dr. McLeod also identifies an article written by Mr. Brennesholtz (Ex. 2008), in which Mr. Brennesholtz, after having a chance to talk to Richard Garbett, Director of Engineering of "MasterImage 3D," and Scott Archambault, Director of Marketing of "MasterImage 3D," reported: (1) "the [MI-Horizon3D] system is *based on* a polarizing beamsplitter, *much like* the RealD XL 3D cinema system," and (2) "the RealD XL system was used as a performance target for the development of the [MI-Horizon3d] system" (emphases added). Ex. 2005 ¶ 134 (quoting Ex. 2008).

The above-noted statements of Mr. Brennesholtz, based on an interview he had with Officers of Petitioner, are not sufficiently specific to establish substantial structural similarity of the MI-Horizon3D system with

the RealD XL system. The evidence is insufficient to establish that Petitioner attempted to replicate the RealD XL system. Patent Owner has not identified sufficient evidence to show the structure of the MI-Horizon3D system. Even assuming that it is "based on" a polarizing beamsplitter, and "much like" the RealD XL system, that does not provide sufficient specificity on the structural configuration of the MI-Horizon3D system. Also, even the structure of Patent Owner's RealD XL system is not entirely clear. As discussed above, Mr. Brennesholtz has testified about two different versions of Patent Owner's RealD XL system, a single-projector version and a dual-projector version. Ex. 2006, 159. According to Mr. Brennesholtz, "the dual-projector version of [the RealD XL system] will not include a polarization switch." *Id.* Even assuming that Petitioner attempted to replicate Patent Owner's product, it is uncertain which product was involved, one falling within the scope of the claims or one outside of the scope of the claims. Moreover, Patent Owner has not explained why targeting the *performance* of a competitor's product necessarily yields something substantially similar in *structural design and configuration*.

For reasons discussed above, Patent Owner has not established copying by Petitioner of any specific product of Patent Owner.

c. Alleged Industry Praise

Within the section in the Patent Owner Response captioned "EVIDENCE OF COMMERCIAL SUCCESS OF THE REALD XL PRODUCT ESTABLISHES THAT THE '934 PATENT IS NON-OBVIOUS," Patent Owner adds that Mr. Brennesholtz acknowledges that Patent Owner's RealD XL product "has received industry praise." PO Resp. 58. As support for that statement, Patent Owner adds: "*see also* McLeod at ¶¶ 119–24 (testifying to industry

praise)."[7] *Id.* Patent Owner refers to Mr. Brennesholtz's acknowledgment as "admitted industry praise." *Id.* Other than these few phrases in the section labeled for commercial success, the Patent Owner Response includes nothing else about alleged industry praise. Petitioner did not respond to these representations about industry praise, included in the section of the Petition captioned as addressing commercial success.

We accept as true that Patent Owner's RealD XL product has received industry praise. That, however, is not meaningful without additional details contained in the Patent Owner Response about who praised the product, in what setting, why, and what exactly is the structure of the product. It is widespread recognition in the field that constitutes meaningful evidence of nonobviousness, *see, e.g., Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 1574 (Fed. Cir. 1986), not just isolated praises that are not industry-wide. The Patent Owner Response does not identify and explain such widespread peer recognition in the art. That Patent Owner's RealD XL product has received some industry praise is insufficient to establish meaningful evidence of nonobviousness. Additionally, the structure and configuration of the RealD XL system has not been adequately established.

To the extent that Paragraphs 119–124 of Dr. McLeod's Declaration (Ex. 2005) contain more specific information about the alleged industry praise, we decline to consider them. That is because to be considered such

[7] The signal *see also* "is commonly used to cite an authority supporting a proposition when authorities that state or directly support *the proposition already have been cited or discussed*." The Bluebook: A Uniform System of Citation R. 1.2(a) at 59 (Harvard Law Review Ass'n, 20th ed. 2015) (emphasis added).

evidence has to be explained in the Patent Owner Response (and/or the Motion to Amend). We cannot add to the Patent Owner Response explanations not made by Patent Owner, even if such explanations may be suggested elsewhere in the record. The argument presented in the Patent Owner Response is merely that the RealD XL product has received industry praise. Further, going beyond that general assertion to take more specific arguments spanning five pages of the Declaration of Dr. McLeod would amount to incorporation of material from one document by reference into another, which is inappropriate under 37 C.F.R. § 42.6(a)(3). Also, per 37 C.F.R. § 42.24(b), the page limit of a patent owner response is 60 pages, and the Patent Owner Response already is 60 pages in length. Considering the declaration paragraphs as though they were expressly set out in the Patent Owner Response would be unjust to Petitioner. We give credit to Patent Owner for what it has explained in the Patent Owner Response, i.e., that the RealD XL Product has received some industry praise, but not beyond that insofar as more specific details are concerned.

Dr. McLeod's Declaration contain additional paragraphs pertaining to alleged nexus between the alleged industry praise and the claimed invention of the '934 patent, e.g., Ex. 2005 ¶¶ 125, 127. But they were not identified and explained in the Patent Owner Response in connection with alleged industry praise. In that regard, we note that "[a] brief must make all arguments accessible to the judges, rather than ask them to play archeologist with the record." *See DeSilva v. Dileonardi*, 181 F.3d 865, 866–67 (7th Cir. 1999).

3. Conclusion

We have considered all of the arguments of Petitioner and Patent Owner, and both the evidence for and against patentability, including the evidence of secondary considerations explained in the Patent Owner Response. We have weighed and assessed the entirety of the evidence as a whole, and determine that Petitioner has shown, by a preponderance of the evidence, that claims 1 and 7–9 of the '934 patent are unpatentable under 35 U.S.C. § 103(a) as obvious over Silverstein.

C. Obviousness of Claims 1, 6, 7, 10, and 18–20 over Liptoh and Tani

Tani

Tani is directed to a polarized beam splitter, and a projector and illumination optical system including the polarized beam splitter. Ex. 1003, 1:14–18. It is an object of Tani to provide an illumination optical system that can illuminate a specimen brightly with visible light having an aligned polarization direction. *Id.* at 2:39–42. To provide an image for projection onto a screen, the output of the polarized beam splitter is used as illuminating light on liquid crystal panels on which the image has been formed. *Id.* at 1:38–63. As a result, the amount of light emerging from the liquid crystal panels is increased to make the image projected on the screen brighter. *Id.* at 14:45–51. Tani increases polarized illumination brightness by converting p-polarized light that is split from illumination light, into s-polarized light, and outputting that together with the original s-polarized light split from the illumination light. *Id.* at 13:20–67.

Tani's Figure 10 is reproduced below.

FIG. 10

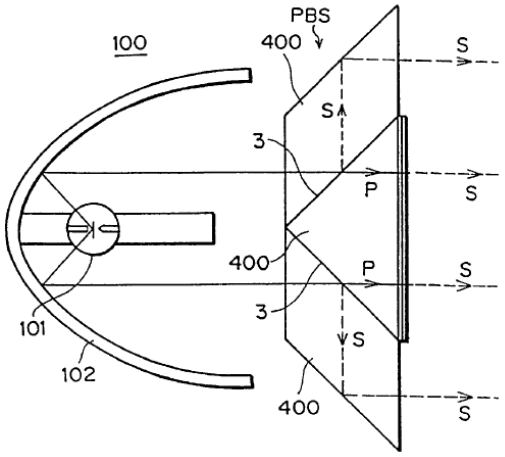


Figure 10 illustrates Tani's illumination optical system. *Id.* at 6:44–45. It includes light source 101 and parabolic mirror 102. *Id.* at 12:64–67. Parabolic mirror 102 reflects light from light source 101. *Id.* at 13:1–14. PBS includes multilayered films 3 and transparent prisms 400. *Id.* at 14:57–62. Illumination light from light source 101 is split by the PBS first into p-polarized light and s-polarized light. *Id.* at 14:62–67. The s-polarized light takes a reflected path through prism 400 before exiting the PBS, and the p-polarized light takes a direct path straight through to a half-wave plate to convert its polarization to s-polarization before exiting the PBS. Ex. 1009 ¶ 52 (citing Ex. 1003, Fig. 10).

Liptoh

Liptoh is directed to a light modulator for producing a stereoscopic image. Ex. 1004, Abstr. Figure 6 of Liptoh is reproduced below.

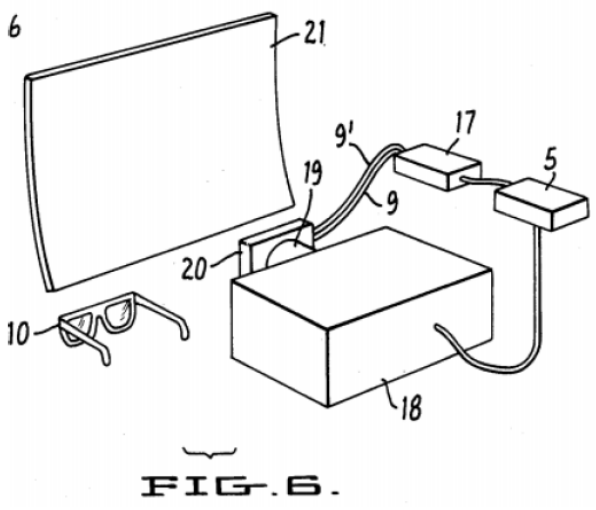


FIG. 6.

Figure 6 shows a schematic layout of a video projector according to Liptoh, in which push-pull modulator 20 is installed in front of projection lens 19 of projector 18. *Id.* at 10:28–31. Liptoh states, with respect to Figure 6, that video source 5, driver unit 17, cables 9 and 9' and the push-pull modulator are of the same type, and serve the same function as the corresponding parts in the Figure 3 embodiment. *Id.* at 10:36–38. Push-pull modulator 20 corresponds to linear polarizer 3 and liquid crystal cell devices 15 and 16 in Figure 3. Liptoh's Figure 3 is reproduced below.

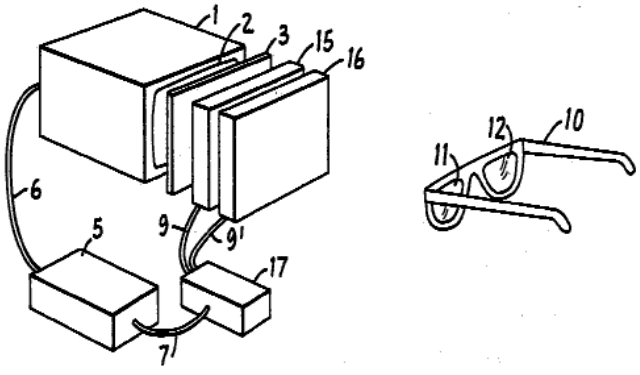


Figure 3 illustrates Liptoh's use of a push-pull modulator that includes a linear polarizer 3. Ex. 1004, 5:53–59. Specifically, the push-pull modulator includes liquid crystal cells 15 and 16 and linear polarizer 3, and is placed in

front of display screen 2 of monitor 1. *Id.* at 6:29–32. Operation of the modulator is explained as follows:

> Driver 17 observes the sync pulses of the video signal output by source 5, and triggers the drive voltages to cells 15 and 16 in synchronization with the sync pulses so that the polarized light emerging from cells 15 and 16 will be in synchronization with the video fields produced by source 5. Conventional video signals include sync pulses of the type suitable for this purpose.

Id. at 6:45–51.

Liptoh and Tani

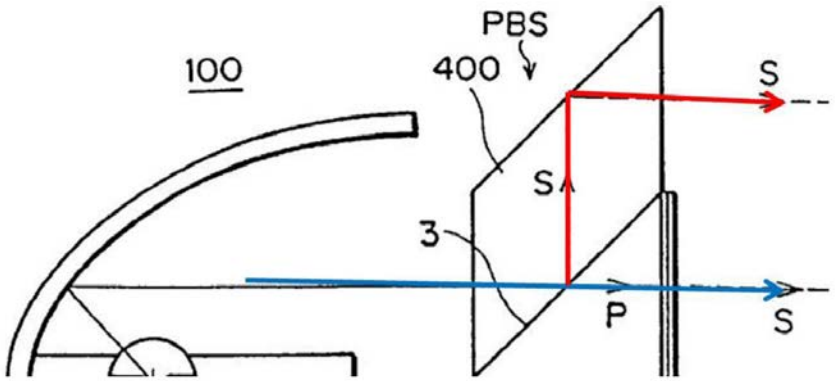
In an obviousness analysis, it is not necessary to find precise teachings in the prior art directed to the specific subject matter claimed because inferences and creative steps that a person of ordinary skill in the art would employ can be taken into account. *See KSR Int'l Co.*, 550 U.S. at 418. A basis to combine teachings need not be stated expressly in any prior art reference. *In re Kahn*, 441 F.3d 977, 989 (Fed. Cir. 2006). However, there must be articulated reasoning with rational underpinning to support a conclusion of obviousness. *KSR*, 550 U.S. at 418 (quoting *In re Kahn*, 441 F.3d at 988).

For the alleged ground of obviousness of claims 1, 6, 7, 10, and 18–20 over Liptoh and Tani, Petitioner asserts that it would have been obvious to one with ordinary skill in the art to combine the modulated, stereoscopic system of Liptoh's Figure 6 with the polarized light recombination teaching of Tani, such that Liptoh's linear polarizer 3 would be replaced by a simplified form of Tani's beam splitting and recombination arrangement. Pet. 40. Petitioner cites to the testimony of Mr. Brennesholtz, who testifies: "One would be motivated to do so because a simplified form of the Tani beam splitting arrangement of Tani Figure 10 in place of [Liptoh's] linear

polarizer 3 would recapture much of the light inherently lost by the use of a linear polarizer." *Id.* (citing Ex. 1009 ¶ 53). In other words, the recapture through beam splitting and recombination, as taught by Tani, is also applicable in Liptoh. Notwithstanding Patent Owner's contrary argument, which we discuss below, Petitioner has articulated sufficient reasoning with rational underpinning for combining the teachings of Liptoh and Tani in the manner proposed by Petitioner.

1. Claims 1, 6, 7, 10, and 18–20

Claim 1 is independent, and each of claims 6, 7, and 10 depends directly from claim 1. Claim 1 recites a stereoscopic system. As discussed above, Liptoh discloses a stereoscopic system. Claim 1 recites: "a polarization beamsplitter (PBS) operable to direct first light bundles having a first state of polarization (SOP) along a first light path, and direct second light bundles having a second SOP along a second light path." Ex. 1001, 7:66–8:2. As discussed above, in Petitioner's combined system of Liptoh and Tani, a simplified version of Tani's beam splitting and recombination arrangement would be used in Liptoh in place of Liptoh's linear polarizer 3. That simplified version of Tani's beam splitting and recombination arrangement is reproduced below as it is presented in the Petition at page 40:



The illustration shows half of Tani's PBS in Figure 10, with color coding added by Petitioner to designate first and second light paths. The other half would be substantially the same, pertaining to additional light paths through the full PBS.

As is explained by Petitioner (Pet. 41), Tani's simplified PBS, when used in place of Liptoh's linear polarizer 3 to receive image light from projection lens 19 of projector 18 in Liptoh's Figure 6 embodiment, is a polarized beamsplitter that directs first light bundles having a first state of polarization (SOP) along a first light path, and second light bundles having a second SOP along a second light path. We find that to be the case, notwithstanding contrary arguments of Patent Owner, which we discuss below. We find that, as is shown in the above illustration, at the junction where incoming light splits into a blue path and a red path, the PBS directs first light bundles with "S" polarization down a first light path (red) and second light bundles with "P" polarization down a second light path (blue).

Claim 1 recites: "a polarization rotator located on the second light path, the polarization rotator being operable to translate the second SOP to the first SOP." Ex. 1001, 8:3–5. As explained by Petitioner (Pet. 41), and shown in the above illustration, a half wave plate (not numbered) rotates the "P" polarized light on the second light path into "S" polarized light exiting the PBS. Notwithstanding contrary arguments of Patent Owner, which we discuss below, we find that the simplified version of Tani's PBS does include a polarization rotator on the second light path, which translates "P" polarization (second SOP) of light on the second light path to "S" polarization (first SOP).

Claim 1 recites: "a polarization switch subsystem operable to receive first and second light bundles from the first and second light paths respectively, and to selectively translate both the polarization states of the first and second light bundles to one of a first output SOP and a second output SOP." Ex. 1001, 8:6–10. As explained by Petitioner (Pet. 42), the light bundles from the first and second light paths are selectively collectively rotated between a first state of polarization and a second state of polarization by push-pull modulator 20. Notwithstanding contrary arguments of Patent Owner, which we discuss below, we find that Liptoh's push-pull modulator 20 is a polarization switch subsystem operable to receive first and second light bundles from the first and second light paths, respectively, and to selectively translate both the polarization states of the first and second light bundles to one of a first output SOP and a second output SOP.

With regard to dependent claims 6, 7, and 10, we are similarly persuaded by the arguments and evidence presented by Petitioner. Patent Owner does not present any argument apart from those it presents for independent claim 1. We consider Patent Owner to have admitted the aspects of these grounds of unpatentability that are uncontested by Patent Owner and are material facts. *See* 37 C.F.R. § 42.23(a); *see also* Paper 18, 3 ("The patent owner is cautioned that any arguments for patentability not raised in the response will be deemed waived.").

Claim 18 is directed to a method. The method steps recited therein essentially correspond to the functions performed by the polarization beam splitter, the polarization rotator, and the polarization switch subsystem of claim 1. Ex. 1001, 9:7–10:4. Thus, claim 1 is representative insofar as the application of prior art is concerned. The above discussion with respect to

claim 1 applies. However, beyond the foregoing, there is one difference between claim 18 and claim 1. Claim 18 expressly recites an initial step of "receiving randomly-polarized light from a projector." *Id.* at 9:9. The above analysis for claim 1, however, already accounts for this limitation even though it is not present in claim 1 because Liptoh's Figure 6 embodiment uses projector 18 to output image light to push-pull modulator 20. *See* Pet. 44 (citing Ex. 1003, 12:64–13:3; Ex. 1004, 10:28–31, Fig. 6). According to Petitioner, the output of projector 18 is randomly polarized, i.e., unpolarized. Pet. 44. That assertion is not disputed by Patent Owner. We are persuaded by Petitioner, considering also that to polarize the output of the projector, Liptoh directs that output image light to the push-pull modulator, which includes a polarizer. Ex. 1004, 10:28–41.

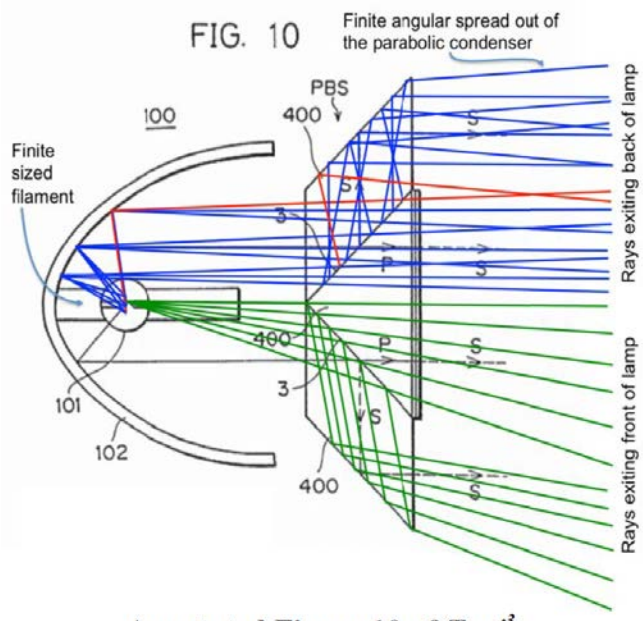
Claim 19 depends from claim 18 and further recites the step of: "directing the first and second light paths toward a projection screen." Ex. 1001, 10:5–7. Petitioner persuasively points to screen 21 in Liptoh's Figure 6 embodiment as the location to which the first and second light paths from push-pull modulator 20 are directed. Pet. 46.

Claim 20 depends from 18 and further recites: "further comprising synchronizing the first output SOP and second output SOP with transmission of an image frame from the projector." *Id.* at 10:8–11. For this limitation, Petitioner persuasively relies (Pet. 46) on the following disclosure of Liptoh:

> Driver 17 observes the sync pulses of the video signal output by source 5, and triggers the drive voltages to cells 15 and 16 in synchronization with the sync pulses so that the polarized light emerging from cells 15 and 16 will be in synchronization with the video fields produced by source 5. Conventional video signals include sync pulses of the type suitable for this purpose.

Ex. 1004, 6:45–51. We find that Liptoh discloses the additional limitations of claim 20.

Patent Owner makes two arguments. First, according to Patent Owner, Tani's Figure 10 gives the superficial appearance of four separate light beams, when in fact the output merely is one single, approximately homogenous, light bundle. PO Resp. 46–47. Patent Owner produces an annotated version of Tani's Figure 10, which supposedly is more complete, with more light rays shown in the illustration. *Id.* at 47. It is reproduced below:



Annotated Figure 10 of *Tani*[3]

The Figure is an annotated version of Tani's Figure 10, with color, presented by Patent Owner on page 47 of the Patent Owner Response. According to Patent Owner, citing the testimony of Dr. McLeod (Ex. 2005 ¶¶ 103–104), based on the more complete set of light rays illustrated above, the final output of Tani's lighting arrangement on the right-hand side of the Figure is merely a "single, approximately homogenous, light bundle." PO Resp. 47. Patent Owner also identifies disclosure in Tani that indicates system 100 in

Figure 10 is intended to provide "uniformized "light. *Id.* at 48 (citing Ex. 1003, 2:25–42). Patent Owner further relies on the testimony of Dr. McLeod (Ex. 2005 ¶¶ 104–107) and states that the structure shown in Figure 10 of Tani "results in a substantially homogenized light beam output." PO Resp. 48.

We are unpersuaded by Patent Owner's argument about Tani's providing a homogeneous light output. The argument is misplaced, and suffers deficiencies similar to those for the argument advanced by Patent Owner in the context of the alleged unpatentability over Silverstein, i.e., that the output of a condenser lens is a single beam of light, which we have already rejected. The difficulty with Patent Owner's argument is that it changes the proper focus from separate light paths, as claimed, to how the light looks in general. It is an oversimplification to discuss general appearance of light when the claims pertain to separate paths of light, and it is uncertain what Patent Owner means by "homogenous." *See supra* Section II.B.1. Even in the figure annotated by Patent Owner, there is a light path going straight through to the half wave plate to exit the PBS, and a separate, reflected, light path through prism 400 to exit the PBS, both at the upper half of the figure and at the bottom half of the figure. The fact that the collective output may look homogeneous does not mean there is only a single light path.

For instance, even if traffic flow in four lanes of highway are substantially uniform, and even "homogeneous," there still are four lanes of traffic. Similarly, when planes fly in formation and have a uniform and homogeneous look in the collective, they still are separate planes flying on their own respective paths. Patent Owner has identified no testimony from

Dr. McLeod to the effect that the pass-through path and the reflected path in Tani's Figure 10 represent one and the same light path. Even overlapping paths are still separate paths. In that regard, we credit the testimony of Mr. Brennesholtz who states that "[t]wo light paths do not become one light path merely because they overlap." Ex. 1024 ¶ 51.

Patent Owner argues that neither Liptoh nor Tani discloses passing image light or light from a projector through a polarization beam splitter. PO Resp. 53. Claim 1 does not require passing image light or light from a projector through a polarization beam splitter. Claim 18 does require splitting light from a projector based on polarization into separate paths. However, Patent Owner's argument is unpersuasive because it attacks the disclosure of the references individually rather than in the collective. One cannot show non-obviousness by attacking references individually where the ground of unpatentability is based on combinations of references. *In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986); *In re Keller*, 642 F.2d 413, 426 (CCPA 1981). Neither Liptoh nor Tani, by itself, must disclose any particular limitation, so long as the combined teachings, based on reasoning having rational underpinning, account for the claim limitation.

Patent Owner states that "the optical specifications for manipulation of image light [sic[8]] are dramatically different than those for the manipulation of image light." PO Resp. 51. Patent Owner argues that, because Tani's PBS was designed for splitting illumination light, it would

[8] It is evident that Patent Owner intended to assert that the optical specifications for manipulation of "illumination light" are dramatically different than those for the manipulation of "image light." That appears to have been Petitioner's understanding in its Reply as well. *See* Reply 8–9.

not be suitable for splitting image light. *Id.* at 52. The argument is unpersuasive, because determination of obviousness is not based on "body-incorporation" of the exact structures illustrated in one prior art reference into another, without adjustments known to one with ordinary skill in the art. *See, e.g.*, *In re Yamamoto*, 740 F.2d 1569, 1573 (Fed. Cir. 1984); *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983); *In re Nievelt*, 482 F.2d 965, 968 (1973) ("Combining the *teachings* of references does not involve an ability to combine their specific structures."). "Claims may be obvious in view of a combination of references, even if the features of one reference cannot be substituted physically into the structure of the other reference." *Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1013 (Fed. Cir. 1983).

Mr. Brennesholtz testifies that "[i]t was well understood that stereoscopic systems that polarize light can polarize the light in the illumination path (i.e., pre-image) or in the image path." Ex. 1024 ¶ 18. Mr. Brennesholtz further testifies:

> As discussed above, it was well understood that the same types of components that are used to achieve polarization in an illumination path can be used to achieve that effect in an image path, and vice versa. The only difference is that the specifications on those components may be different.

Ex. 1024 ¶ 56. We find this testimony credible. Mr. Brennesholtz also testifies: "Every person in the art in 2006 would know and understand that a polarizing beam splitter described in the context of an illumination path could be used in an image light path with minimal effort." *Id.* ¶ 59. We also find that testimony credible. Mr. Brennesholtz also identifies various specifications that may differ depending on whether the device is located on an illumination path or an imaging path, and explains that the adjustment of

such properties are well within the capabilities of those skilled in the art. *Id.* ¶¶ 57–58. We find that testimony credible as well. Mr. Brennesholtz explains that even the disclosure of the '934 patent does not specifically indicate such properties and specifications because they are well within the capabilities of those skilled in the art. *Id.* ¶ 58.

Additionally, Petitioner notes that Tani teaches that its PBS could be used in an image light path context. Reply 21. Tani states:

> Although the illumination optical system is constructed using the inventive polarized beam splitter in the above description, the polarized beam splitter is not limited to its application to illumination optical systems. For example, in a projection type stereoscopic television receiver disclosed in Japanese Examined Patent Publication No. 5-73116, P-polarized light and S-polarized light are projected onto a screen while being overlapped so as to have the same optical axis by the polarized beam splitter. The inventive polarized beam splitter can be used as such a polarized beam splitter. By using the inventive polarized beam splitter, the P- and S-polarized lights can efficiently be introduced to the screen, thereby forming a bright image on the screen.

Ex. 1003, 15:1–13. For all of the above-discussed reasons, Patent Owner's argument that Tani's polarized beam splitter is unsuitable for splitting image light is unpersuasive.

Finally, Patent Owner notes that Liptoh's projector is significantly larger than Tani's illumination light source, and argues on that basis that Tani's PBS would not fit Liptoh's projector. PO Resp. 52. The argument is misplaced, because it relies on inappropriate "body-incorporation" of the components of the prior art from one reference into another, which we rejected above. Based on the testimony of Mr. Brennesholtz, discussed above, we find moreover that one with ordinary skill in the art would have

known to configure components of suitable corresponding sizes. *See KSR*, 550 U.S. at 420–21 ("Common sense teaches, however, that familiar items may have obvious uses beyond their primary purposes, and in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle. . . . A person of ordinary skill is also a person of ordinary creativity, not an automaton.").

Patent Owner also argues that making a PBS of larger size to fit Liptoh's projector would be more expensive, and "may be cost prohibitive." *Id.* The argument is misplaced. Achieving an economic profit is not a requirement for obviousness. In that regard, the United States Court of Appeals for the Federal Circuit stated:

> [T]he fact that the two disclosed apparatus would not be combined by businessmen for economic reasons is not the same as saying that it could not be done because skilled persons in the art felt that there was some technical incompatibility that prevented their combination. Only the latter fact is telling on the issue of nonobviousness.

Orthopedic Equip., 702 F.2d at 1013. Moreover, it is uncertain what Patent Owner means by "cost prohibitive." It is only established that a larger PBS would cost more than a smaller PBS. Also, even Patent Owner uses the permissive modifier "may be" in front of the term "cost prohibitive." For these reasons, Patent Owner's argument is unpersuasive.

2. Secondary Considerations

We must also consider objective evidence of nonobviousness, i.e., secondary considerations. The same analysis provided above, in Section II.B.2., *supra*, applies with equal force here for the alleged ground of unpatentability based on Liptoh and Tani.

3. Conclusion

We have considered the evidence both for and against obviousness, with respect to the subject matter of claims 1, 6, 7, 10, and 18–20, including the evidence appropriately presented by Patent Owner on secondary considerations. *See supra* Section II.B.2. We determine that, on balance, the evidence of obviousness outweighs the evidence of nonobviousness, and that Petitioner has established by a preponderance of the evidence that each of claims 1, 6, 7, 10, and 18–20 of the '934 patent is unpatentable under 35 U.S.C. § 103(a) as obvious over Liptoh and Tani.

D. Obviousness of Claim 8 over Liptoh, Tani, and APA

Claim 8 depends from claim 1 and further recites that the polarization beam splitter includes a wire grid layer. Ex. 1001, 8:28–29. Petitioner accounts for the limitations of claim 1 by reliance on Liptoh and Tani, as discussed above. Pet. 47. With respect to the requirement that the polarization beam splitter includes a wire grid layer, Petitioner points to a reference, contained with the Specification of the '934 patent, to a **pre-existing** wire grid polarizer with an identified source. *Id.* (citing Ex. 1001, 3:50–55). Patent Owner does not dispute that assertion of admitted prior art. We find that, indeed, Patent Owner has admitted that wire grid polarizers were known to one with ordinary skill in the art prior to the effective filing date of the '934 patent. Petitioner also relies on the testimony of Mr. Brennesholtz. Mr. Brennesholtz identifies a pre-existing wire grid polarizer, and states that "one of ordinary skill in the art would have been motivated to use a wire grid polarizer in order to improve polarization quality (i.e. better separation of the reflected and transmitted beam with each beam contaminated with less of the other polarization type),

and to reduce system cost." Ex. 1009 ¶ 55. The stated reasoning of Mr. Brennesholtz is supported by rational underpinning. For the benefits identified by Mr. Brennesholtz, one with ordinary skill in the art would have known to use a wire grid polarizer.

We have considered the evidence both for and against obviousness, with respect to the subject matter of claim 8, including the evidence appropriately presented by Patent Owner on secondary considerations. *See supra* Section II.B.2. Our discussion above with respect to the limitations of claim 1 applies, both respect to the evidence of obviousness and the evidence of secondary considerations. Patent Owner does not present any argument here not already addressed above in the discussion of claim 1. We determine that, on balance, the evidence of obviousness outweighs the evidence of nonobviousness, and that Petitioner has established by a preponderance of the evidence that claim 8 is unpatentable over Liptoh, Tani, and APA.

E. Obviousness of Claim 9 over Liptoh, Tani, and Wentz

Claim 9 depends from claim 1 and further recites that the polarization beam splitter includes a "multi-dielectric layer." Ex. 1001, 8:30–31. Petitioner accounts for the features of claim 1 by reliance on Liptoh and Tani, as discussed above. Pet. 54–55. With respect to the requirement that the polarization beam splitter includes a multi-dielectric layer, Petitioner relies on the teachings of Wentz. *Id.* Petitioner also relies on the testimony of Mr. Brennesholtz. Mr. Brennesholtz refers to the Abstract of Wentz. Ex. 1009 ¶ 56. In its Abstract, Wentz describes a dielectric optical polarizer comprising a substrate with a first dielectric layer and a second dielectric

layer. Ex. 1005, Abstr. Based on this evidence, we find that Wentz discloses a dielectric optical polarizer including a multi-dielectric layer.

Mr. Brennesholtz testifies: "It would have been obvious for a person of ordinary skill in the art to utilize the multi-dielectric beam splitter taught by Wentz in [the] system taught by the combination of Lipto[h] and Tani, to reduce the effect of high optical power on the beam splitting component." Ex. 1009 ¶ 56. Based on the testimony of Mr. Brennesholtz, we determine that in light of the benefits described in Wentz for its multi-dielectric beam splitter, it would have been obvious to one with ordinary skill in the art to use such a beam splitter in the combined system of Liptoh and Tani.

We have considered the evidence both for and against obviousness, with respect to the subject matter of claim 9, including the evidence appropriately presented by Patent Owner on secondary considerations. *See supra* Section II.B.2. Our discussion above with respect to the limitations of claim 1 applies, both respect to the evidence of obviousness and the evidence of secondary considerations. Patent Owner does not present any argument here not already addressed above in the discussion of claim 1. We determine that, on balance, the evidence of obviousness outweighs the evidence of nonobviousness, and that Petitioner has established by a preponderance of the evidence that claim 9 is unpatentable over Liptoh, Tani, and Wentz.

F. Patent Owner's Motion to Amend

Patent Owner has filed a "Contingent Motion to Amend Pursuant to 37 C.F.R. § 42.121." Paper 43. Petitioner filed an Opposition to this Motion. Paper 54. Patent Owner filed a Reply. Paper 59.

For the following reasons, the Motion is *denied*.

Patent Owner seeks to substitute proposed claim 21 for claim 6, if claim 6 is determined unpatentable, and to substitute proposed claim 22 for claim 20, if claim 20 is determined unpatentable. *Id.* For a motion to amend claims, the burden is on the patent owner, as the moving party, to show that its proposed claims are patentable. *See* 37 C.F.R. § 42.20(c); *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1333–34 (Fed. Cir. 2016); *Prolitec, Inc. v. Scentair Technologies, Inc.*, 807 F.3d 1353, 1362 (Fed. Cir. 2015); *Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1307 (Fed. Cir. 2015). Patent Owner must patentably distinguish its proposed amended claims from the art of record, and art that Patent Owner is aware of and deems sufficiently material to place into the record to satisfy its duty of candor and good faith under 37 C.F.R. § 42.11. *See MasterImage 3D, Inc. v. RealD Inc.*, Case IPR2015-00040, slip op. at 2–3 (PTAB July 15, 2015) (Paper 42) (Representative).

Claim 6 depends from claim 1. Proposed, substitute claim 21 rewrites claim 6 in independent form, and inserts the word "image" in front of each instance of "light bundles," "light path," and "light paths." Claim 20 depends from claim 18. Proposed, substitute claim 22 rewrites claim 20 in independent form, and inserts the word "image" in front of each instance of "light," "light path," and "light paths."

1. Liptoh and Tani

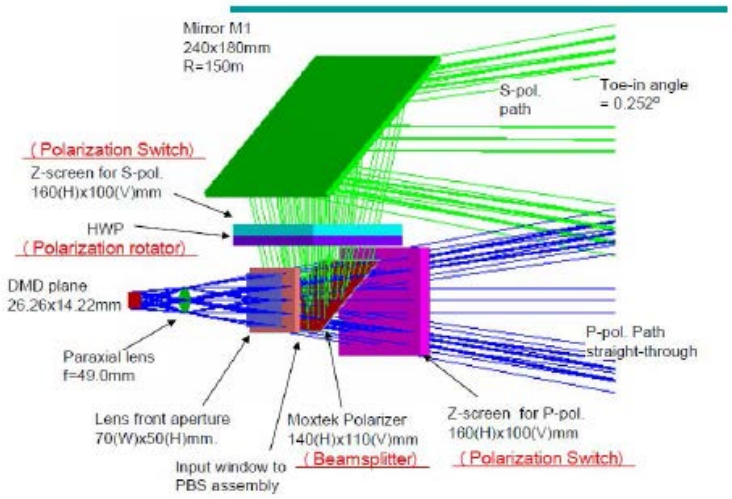
At the outset, we note that the insertion of the word "image" in front of each instance of "light bundles," "light path," and "light paths," in the independent form of claim 6 is inconsequential insofar as patentably distinguishing from the combined teachings of Liptoh and Tani, as applied to challenged claim 6. Also, the insertion of the word "image" in front of each

instance of "light," "light path," and "light paths," in the independent form of claim 20 is inconsequential insofar as patentably distinguishing from the combined teachings of Liptoh and Tani, as applied to challenged claim 20. That is because Liptoh and Tani, as applied against claims 6 and 20 and discussed above, already show "image" light as input to a PBS. *E.g.*, Ex. 1003, 1:38–63, 14:45–51; *see supra* Section II.C. All of the light referred to in the Liptoh and Tani combination are "image" light, and all of the light paths referred to in the Liptoh and Tani combination are "image" light paths. Patent Owner's arguments, attempting to distinguish substitute claims 21 and 22 from the combined teachings of Liptoh and Tani, are essentially the same as those already found unpersuasive in the context of challenged claims 6 and 20. For this reason alone, Patent Owner has not shown that either proposed, substitute claim 21 or proposed, substitute claim 22 is patentable.

2. Section 102(g) – Prior Invention

There is a second independent reason why Patent Owner has not shown that proposed, substitute claims 21 and 22 are patentable. In its Motion to Amend, Patent Owner described an item of prior art ostensibly under 35 U.S.C. § 102(g), referred to as "prior invention by the '455 Patent inventors. Paper 43, 20–24. The term "the '455 Patent" refers to U.S. Patent 7,857,455 B2 ("the '455 patent"), a patent also assigned to Patent Owner. As discussed below, Patent Owner has not made a sufficient showing that proposed, substitute claims 21 and 22 are patentable over this "prior invention" of the patentees of the '455 patent.

Patent Owner illustrates this "prior invention" as follows:[9]



Id. at 21. The illustration reflects what Patent Owner regards as applicable prior art. Patent Owner states:

> The chief difference between the proposed substitute claims of the '934 Patent and the prior invention by the inventors of the '455 Patent is that the proposed substitute claims include a polarization switch subsystem (or method) that selectively translates both the polarization states of the first and second image light bundles to one of a first output SOP and a second output SOP. In contrast, the above illustration of the prior invention by the inventors of the '455 Patent was for a polarization conversion system in which circular polarizing switches (Z-screens) were to be placed in separate light paths, and by necessity (from the polarization rotation induced by the fold mirror) driven out of phase with each other. *See* McLeod ¶¶ 51–52. That is, a fold mirror changes the "handedness" of the polarization of circularly polarized light. *Id.* Accordingly, if the switches of the prior system were driven in phase (such that the same state of polarization was output from each switch), the image light arriving at the projection screen would not have the same state of polarization due to the change in "handedness" at

[9] Patent Owner refers to this "prior invention" as "relating to Figure 3 of the '455 Patent." Paper 59, 5.

> the fold mirror and thus would not be properly decoded by a viewer wearing polarization glasses. *Id.*
>
> So if the switches in the prior art system were collectively considered to be a "polarization switch subsystem" as recited by the proposed claims, they specifically would be selectively translating the polarization states of the first and second light bundles to <u>different</u> output SOPs – NOT driving them to one of a first output SOP and a second output SOP.

Id. at 21–22. We understand Patent Owner's explanation.

Simply put, because mirror M1 changes the "handedness" of the polarization of circularly polarized light, having both circular polarizing switches (Z-screens), one on each path, driven in phase, such that the switches output the same state of polarization would end up with light not having the same state of polarization arriving at the projection screen, which is undesirable. Thus, according to Patent Owner, in this "prior invention," if the two circular polarizing switches (Z-screens) collectively constitute a polarization switch subsystem, the switches would be translating selectively the polarization states of the first and second light bundles into different output SOPs and not, as claimed, commonly to one of a first output SOP and a second output SOP.

We are unpersuaded by Patent Owner's explanation. The distinction drawn by the Patent Owner depends entirely on excluding mirror M1 as a part of the polarization switch subsystem. If mirror M1 is regarded as a part of the polarization switch subsystem that also includes the two circular polarizing switches (Z-screens), then following Patent Owner's logic and reasoning, as noted above, there would be similarly polarized light arriving from two different paths on the projection screen, which can be decoded by viewers wearing polarization glasses. Petitioner notes that the sole

distinction relied on by the Patent Owner disappears when mirror M1 is considered a part of the polarization switch subsystem. Paper 54, 5–6. Patent Owner does not dispute that assertion by Petitioner, but only argues that the mirror cannot be a part of the polarization switch subsystem.

We discern no reason to exclude mirror M1 as a part of a "polarization switch subsystem." Indeed, under the rule of broadest reasonable interpretation, we would not read "polarization switch subsystem" to exclude a mirror. Nothing in the Specification of the '934 patent or any prosecution history cited to us by the parties indicates that a "polarization switch subsystem" may not include a mirror or that the last stage within such a subsystem may not be comprised of a mirror that adjusts both the path and polarization of the output. Patent Owner is incorrect in contending (Paper 59, 6) that construing "polarization switch subsystem" to include a mirror is not consistent with the disclosure of the '934 patent. The fact that the '934 patent does not expressly disclose such a mirror does not prohibit the presence of such a mirror in polarization switch subsystems. Also, we are not construing "polarization switch subsystem" narrowly to require a mirror as a constituent. Rather, the term is broadly, but reasonably, construed, to permit *the presence or the absence* of a mirror in the system.

Patent Owner argues application of the doctrine of claim differentiation would suggest the absence of a mirror from the "polarization switch subsystem," because the presence of a mirror in such a system would render claim 2 redundant. Paper 59, 6. In that regard, we note that claim 2 depends from claim 1 and further recites: "further comprising a reflector located on the second light path, operable to direct second light bundles to substantially similar locations on a projection screen as the first light

bundles." The argument is without merit. If we construed "polarization switch subsystem" *to require* the reflector recited in claim 2, Patent Owner's argument might have some merit. As explained above, however, we have not construed "polarization switch subsystem" *to require* a mirror. Thus, nothing is inconsistent with the doctrine of claim differentiation. The term "polarization switch subsystem" simply is sufficiently broad to allow the presence or the absence of a mirror, and a claim depending from a claim already reciting "polarization switch subsystem" can further specify that a mirror or reflector is *required* and how it is to be positioned.

Finally, Patent Owner argues:

> First, the prior invention evidence relating to Figure 3 of the '455 Patent is silent with respect to the outputs of the polarization modulators. Ex. 2035, Brenn. Dep. at 14:9–16:17. MasterImage's expert conceded that the "Fig. 3 Embodiment" depicted in Exhibit 2026 (the figure used by MasterImage in Section III.B.1. of the opposition) does not indicate how the Z-Screens are driven. Ex. 2035, Brenn. Dep. at 14:9–16:17. Mr. Brennesholtz further conceded that the July Final design Review, Ex. 1025, "does not discuss the driving of the Zscreens at all. So, the answer is no, you can't tell" if the Zscreens are operating in phase or out of phase with respect to one another. *See* Ex. 235, Brenn. Dep. at 178:9–11. Exhibit 1025 contains the identical figure relied upon by MasterImage in its Fig. 3 Embodiment arguments. *Compare* Ex. 1025 at Fig. 4 with Ex. 2026 at 17. There simply is no teaching or suggestion that the Z-screens in the '455 Patent invention development documents selectively translate image light bundles on both paths to the same output SOP. *Id.*

Paper 59, 5–6. The argument is unpersuasive for four separate reasons.

First, it is misplaced for not focusing on a polarization switch subsystem that may include mirror M1. Second, the prior art at issue is applied under 35 U.S.C. § 102(g). That means the "prior invention" had to

have been "made," i.e., reduced to practice. If there is insufficient information on how the Z-screens are driven, then it seems Patent Owner should have provided more information. Third, based on representations in Patent Owner's Motion to Amend, it appears that Patent Owner already assumed how the two Z-screens would be driven, in light of *the presence* of mirror M1, to put a viewable image on the projection screen. Paper 43, 22. Fourth, even if the material of record does not reveal exactly how the two Z-screens are driven, Patent Owner would have to address how one with ordinary skill in the art would have known to drive them, to put a viewable image on the projection screen.

For the foregoing reasons, the sole basis of patentable distinction presented by Patent Owner with respect to its identified "prior invention" is unpersuasive.[10] On this additional basis alone, Patent Owner has not shown that proposed, substitute claims 21 and 22 are patentable.

Petitioner additionally argues that the so-called "prior invention" would have rendered obvious proposed, substitute claims 21 and 22, because "[i]f linear polarization switches are used in the Fig. 3 Embodiment, the switches are driven in phase and the polarization switch subsystem translates

[10] Petitioner also refers to the "prior invention" identified by Patent Owner as "the Fig. 3 Embodiment" of the '455 patent. Paper 54, 4. Petitioner asserts that Dr. McLeod admitted on cross-examination that, if the polarization switch subsystem is understood to include Mirror M1 in addition to the two Z-screens, proposed, substitute claims 21 and 22 then would be anticipated by the prior invention. Paper 54, 6. We have reviewed the cited portions of the deposition transcript and do not find any such admission. The absence of such an admission, however, is not dispositive. The issue is whether Patent Owner has demonstrated patentability over the prior art. Here, it has not.

and outputs both image light bundles with the same SOP at the same time, exactly as recited in claims 21 and 22." Paper 54, 13–14. Nevertheless, the burden is not on Petitioner to prove the unpatentability of the proposed, substitute claims. Petitioner merely has raised a point that should be addressed by Patent Owner.

In its Motion to Amend, Patent Owner explained that because circular polarized light from a Z-screen polarization switch would have its polarization changed by mirror M1, the polarization outputs from the two Z-screen polarization switches cannot be the same or else there would not be a an image on the projection screen viewable by people with polarized glasses. Paper 43, 21–22. Mr. Brennesholtz testifies, however, that the polarization of linearly polarized light does not change when it is incident upon a mirror. Ex. 1031 ¶ 90. Dr. McLeod also testifies that linear polarized light, either s-polarized or p-polarized, does not change its polarization when reflected off a mirror. Ex. 1016, 107:10–16. Thus, the pertinent question for Patent Owner to address is why it would not have been obvious for one with ordinary skill in the art to use in the "prior invention" a linear polarizer in place of each of the two Z-screen polarization switches.

Mr. Brennesholtz testifies: "It would have been well known to a person of ordinary skill in the art at the time of the '934 Patent to replace the Z-Screens of the Fig. 3 Embodiment (which output circularly polarized light) with linear polarization switches." Ex. 1031 ¶ 47. The '455 patent, filed prior to the filing of the '934 patent, states: "The polarizing device may be linear polarizers, circular polarizers, or a ZScreen and are typically of the sheet polarizer type." Ex. 1017, 4:26–28. Dr. McLeod also answered affirmatively when he was asked, on cross-examination, whether one with

ordinary skill in the art in the fall of 2006 would have understood that "linear polarization modulators could be used in place of Z-screens." Ex. 1016, 107:17–108:3.

> Patent Owner argues:
>
> [T]he inventors of the '455 Patent were not able to make their linear polarization switches work for purposes of the PBS Project. Ex. 2040, Lipton Decl. ¶ 7. This contradicts Petitioners' arguments regarding how substitutable linear polarization switches are, given that inventors are considered to have extraordinary skill. *See also Std. Oil Co. v. Am. Cyanamid Co.*, 774 F.2d 448, 454 (Fed. Cir. 1985).

Paper 59, 8. The argument is conclusory and lacks sufficient explanation as to what difficulties were encountered when the patentees of the '455 patent attempted to use linear polarizers. It appears from the testimony of Dr. McLeod that it was not a matter of the system not working with linear polarizers, but a matter of achieving certain performance standards. Ex. 1016, 107:21–108:3. Mr. Leonard Lipton, one of the named inventors of the '455 patent testifies: "Matt Cowan, Jerry Carollo, and I were not able to figure out how to make linear polarization modulators work for purposes of the PBS project or for purposes of the '455 Patent." Ex. 2040 ¶ 7. That testimony also is conclusory and lacks meaningful explanation. We simply do not know enough, on this record, about why the named-inventors of the '455 patent had some problems with using linear polarizers. We observe that, despite such alleged problems, the '455 patent itself describes that "linear polarizers, circular polarizers, or a ZScreen" may be used. Ex. 1017, 4:26–28.

We credit the testimony of both Mr. Brennesholtz and Dr. McLeod, identified above, that it would have been obvious to one with ordinary skill

in the art to replace a Z-screen with a linear polarizer. Patent Owner has not presented sufficient reasoning to explain, satisfactorily, why it would not have been obvious to one with ordinary skill in the art to replace each Z-screen with a linear polarizer, yielding a polarization switch subsystem that satisfies each proposed, substitute claim. In that regard, we also credit the testimony of Mr. Brennesholtz that the cost of a pair of glasses for viewing linearly polarized image light is less than that of the cost of a pair of glasses for viewing circularly polarized image light. Ex. 1031 ¶¶ 51–52.

For this additional reason, Patent Owner has not shown that proposed, substitute claims 21 and 22 are patentable over the "prior invention" it has identified in its Motion to Amend.

3. Additional Assertion of Section 102(g) Prior Art

Petitioner asserts that there are additional prior art under 35 U.S.C. § 102(g), that has not been accounted for by Patent Owner. Paper 54, 3. Specifically, Petitioner explains:

> The work by the inventors that led to U.S. Patent No. 7,875,455 to Cowan et al (Ex. 1017, "the '455 Patent") represents the 102(g) prior art that is relevant to the substitute claims of the MTA. Patent Owner claims that the '934 Patent is entitled to a filing date of September 29, 2006. There are at least three 102(g) embodiments of the '455 Patent that, according to Patent owner, were invented prior to this date, and that are critical to the present MTA, generally known as: 1) the "Fig. 3 Embodiment"; 2) the "Fig. 6A Embodiment"; and 3) the "Single Z-Screen Embodiment" [footnote omitted]. Patent Owner's MTA, however, discloses and addresses patentability over only a single embodiment – the Fig. 3 Embodiment.

Id. Petitioner further asserts: "By failing to disclose and address all three embodiments of the known 102(g) art in its [Motion to Amend], Patent Owner has failed to comply with its duty of candor." *Id.* at 4; *see Nike*,

812 F.3d at 1350–51 ("At the heart of *Idle Free*, as interpreted by *MasterImage 3D*, is the question of whether the patent owner has submitted the necessary information to comply with its duty of candor to the office.").

Petitioner has not persuaded us that Patent Owner breached its duty of candor and good faith under 37 C.F.R. § 42.11. Patent Owner revealed and discussed what "prior invention" it had reduced to practice prior to the effective filing date of the '934 patent, i.e., the Fig. 3 Embodiment. With regard to the Fig. 6A Embodiment," and the "Single Z-Screen Embodiment," Petitioner has not identified evidence in the record that according to Patent Owner they were made or reduced to practice prior to the effective date of the '934 patent. Evidence in the record in that regard tends to indicate the contrary. Ex. 2036 ¶¶ 6, 13; Ex. 2040 ¶ 11. For instance, Mr. Leonard Lipton, a named-inventor of the '455 patent, testified: "Until we began preparing our patent application in early October 2006, Matt, Jerry, and I did not pursue a design in which a single large Z-Screen was positioned at the output of the system as part of the PBS Project." Ex. 2040 ¶ 11.

Citing *Bemis Mfg. v. Dornoch Med. Sys., Inc.*, 21 Fed. Appx. 930, 937–38 (Fed. Cir. 2001), Petitioner argues that because Patent Owner admits to having diligently reduced to practice the Fig. 3 Embodiment, it follows that the Fig. 6A and Single Z-Screen Embodiments also qualify as prior art under 35 U.S.C. § 102(g). Paper 54, 3. We disagree. *Bemis* does not stand for the proposition that reduction to practice of one embodiment equals reduction to practice of all related embodiments. The issue is fact based, depending on the circumstance. It also is not clear from *Bemis* whether there was any dispute between the parties that the alleged prior inventions had been reduced to practice. Thus, *Bemis* does not support Petitioner's

contention, particularly where, as here, there is some evidence in the record that Patent Owner did *not* diligently reduce to practice the *related* embodiments until *after* the effective filing date of the '934 patent. On the record before us, the so-called Fig. 6A Embodiment and the Single Z-Screen Embodiment are not prior art that has to be distinguished by Patent Owner.

4. Silverstein

Petitioner further asserts that Patent Owner has not patentably distinguished proposed, substitute claims 21 and 22 from Silverstein, because Patent Owner did not address a patent that was incorporated by reference into Silverstein, i.e., U.S. Patent No. 7,198,373 B2 (the "'373 patent"). Paper 54, 16. Specifically, Petitioner asserts that in the '373 patent, there is disclosure of using a PBS to receive light from a modulator panel. *Id.*

We are persuaded that Patent Owner has distinguished proposed, substitute claims 21 and 22 sufficiently from Silverstein. Petitioner has not meaningfully explained the significance of the cited disclosure from the '373 patent, incorporated by reference into Silverstein. As Patent Owner has observed, Figure 16 of the '373 patent relates to a portion of one color channel using a reflective PBS 148 as an analyzer, and not a PBS that splits image light into two paths that are ultimately recombined at a projection screen. Paper 59, 10 (citing Ex. 1013, 13:55–59). Petitioner has not made clear just how the disclosure of the '373 patent would render unpatentable proposed, substitute claims 21 and 22. We do not see that there is anything in the '373 patent that Patent Owner has to address further. Patent Owner has sufficiently distinguished proposed, substitute claims 21 and 22 from Silverstein.

III. MOTIONS TO EXCLUDE

A. Petitioner's Motion to Exclude

Petitioner filed a Motion to Exclude. Paper 64. Patent Owner filed an Opposition. Paper 68. Petitioner did not file a Reply. For the reasons discussed below, the motion is *denied*.

Petitioner seeks to exclude Exhibit 2036, a declaration of Mr. Ying-Moh Liu, filed by Patent Owner in support of Patent Owner's Reply to Petitioner's Opposition to Patent Owner's Motion to Amend. According to Petitioner, the Declaration of Mr. Liu improperly incorporates by reference material from his declaration filed in IPR2015-00035, with regard to Mr. Liu's credentials, experience, and relationship to this proceeding, and also with regard to what Mr. Liu means by "PBS Project." Paper 64, 2. Petitioner explains that incorporation by reference is prohibited by 37 C.F.R. § 42.6(a)(3). Paper 64, 3.

Patent Owner in its Opposition explains that the alleged problem, if a problem at all, was cured by service of Supplemental Evidence under 37 C.F.R. § 42.64(b)(2), in the form of an "Amended Liu Declaration," which did not change the substance of the original declaration but merely added Mr. Liu's credentials and an explanation of what he means when referring to "the PBS Project." Paper 68, 5. That Supplemental Evidence was filed on November 25, 2015. Petitioner's Motion to Exclude did not address this Supplemental Evidence, and Petitioner did not file a reply to Patent Owner's Opposition to Petitioner's Motion to Exclude.

On this record, the deficiency alleged by Petitioner has been obviated by Patent Owner's Supplemental Evidence. Accordingly, Petitioner's Motion to Exclude is *denied*.

B. Patent Owner's Motion to Exclude

Patent Owner filed a Motion to Exclude. Paper 62. Petitioner filed an Opposition. Paper 70. Patent Owner filed a Reply. Paper 72. Patent Owner seeks to exclude each of Exhibits 1021, 1025, 1026, 1029, and 1030, in its entirety, and parts of each of Exhibits 1024 and 1031. For reasons discussed below, the motion is *denied*.

1. Exhibit 1021

Exhibit 1021 is the deposition transcript of Matt Cowan, taken in IPR2015-00035. Patent Owner objected to that evidence (1) because the deposition was noticed for IPR2015-00035, not IPR2015-00040, (2) because the evidence includes confidential information, and (3) because the Protective Order entered in IPR2015-00035 permits use of confidential information only in connection with that proceeding and for no other purpose. Paper 56, 1–2.

Patent Owner should have taken up the alleged violation of the Protective Order in IPR2015-00035 with the panel in IPR2015-00035, at the time it made the objection. We do not stand in the shoes of that panel, at this juncture, to determine whether there is a violation of the Protective Order in IPR2015-00035 or what consequences would follow if there is a violation. Possibly, any violation may not be consequential, if that panel decides that the Protective Order in that case should be modified to permit Petitioner's reliance on the deposition transcript in a related proceeding before the Board. If there is a violation, and if that violation is consequential, it would be up to the panel in IPR2015-00035 to determine an appropriate sanction. Given that Patent Owner does not allege violation of any Order in the record of this proceeding, we decline to exclude Exhibit 1021.

2. Exhibit 1031

Exhibit 1031 is the Declaration of Matthew S. Brennesholtz in support of Petitioner's Opposition to Patent Owner's Motion to Amend. Patent Owner seeks to exclude ¶¶ 58, 60, 61, 62, and 111 of this Declaration. Paper 62, 10. Patent Owner objected to that evidence because Mr. Brennesholtz relies on confidential portions of Exhibit 1021, the deposition testimony of Matthew Cowan in IPR2015-00035, which we discussed above. Paper 56, 5. In summary, Patent Owner believes that Exhibit 1021 should be excluded, and, therefore, that those portions of Exhibit 1031 which refer to and rely on Exhibit 1021 also should be excluded.

As we discussed above, however, Exhibit 1021 will not be excluded. Thus, there is no reason to exclude those portions of Exhibit 1031 that refer to and rely on Exhibit 1021. Therefore, we decline to exclude any portion of Exhibit 1031.

3. Exhibits 1025, 1026, 1029, and 1030

Patent Owner asserts that each of these documents is irrelevant. Paper 62, 8. Patent Owner acknowledges that evidence is relevant if it has a "tendency to make a fact more or less probable than it would be without the evidence." *Id.* at 7. Patent Owner reasons that none of these documents is relevant because none has been referred to in (1) Petitioner's Petition, (2) Petitioner's Reply to Patent Owner's Response, and (3) Petitioner's Opposition to Patent Owner's Motion to Amend. *Id.* at 8. Such an analysis is an oversimplification of the issue.

As Patent Owner also has recognized, each of these exhibits is cited in the Declaration of Matthew S. Brennesholtz in support of Petitioner's Opposition to Patent Owner's Motion to Amend. *Id.* Patent Owner

contends, however, that such citation is inappropriate, as it amounts to improper incorporation by reference and circumvention of applicable page limits. *Id.* at 9. We disagree.

There is no rule that precludes a declarant from discussing the underlying basis for his or her testimony. On the contrary, we encourage testimony that identifies its support. *See* 37 C.F.R. § 42.65(a). It is not always necessary that underlying support has to be discussed separately in the substantive paper referring to the content of the Declaration. Although it is possible that abuses may occur, such that a party engages in improper incorporation by reference, Patent Owner has not established that to be the case here. We are not persuaded that any of these four exhibits rises to the level requiring direct discussion with respect thereto in a substantive paper. It is not clearly inappropriate for Petitioner to have referenced them only in the Declaration of Matthew S. Brennesholtz (Ex. 1031).

Patent Owner also has failed to demonstrate that any of these four documents has no tendency whatsoever to make a fact more or less probable than it would be without the document. Therefore, we decline to exclude any one of Exhibits 1025, 1026, 1029, and 1030, as not relevant.

4. Exhibit 1024

Exhibit 1024 is the Declaration of Matthew S. Brennesholtz in support of Petitioner's Reply to the Patent Owner Response. Patent Owner seeks to exclude ¶¶ 18–46, 48, 50–53, and 55–60 of Exhibit 1024. Paper 62, 5. According to Patent Owner, these paragraphs of the Declaration "exceed the scope of evidence permitted on reply" and "should have been submitted much earlier." *Id.* at 6. Specifically, Patent Owner argues: "A careful parsing of these paragraphs, however, reveals that they are related to the

alleged obviousness of the claims in view of the cited references." *Id.* Evidently, Patent Owner believes that material concerning obviousness of the claimed invention over the applied references must be submitted *only* in the Petition, and *never* in the Reply. That simply is incorrect. Petitioner is entitled to respond to arguments and evidence presented by Patent Owner in the Patent Owner Response. *See* 37 C.F.R. § 42.23(b). Petitioner generally gets the last word because it is the party charged with the burden of proof with respect to its claim challenges.

Moreover, in an Order dated May 15, 2015, summarizing an initial conference call, we stated: "We advised counsel for each party that a proper Motion to Exclude Evidence should not include arguments alleging that a reply exceeds the scope of a proper reply. If such an issue arises, the parties should initiate a joint conference call to the Board." Paper 26, 3. Patent Owner chose to raise, in its Motion to Exclude, the matter of improper scope of a reply, contrary to our Order. If Patent Owner had initiated a conference call with the Board, we would have had an opportunity to address the matter in a more efficient and effective manner.

We do not excuse Patent Owner's failure to comply with our Order. Accordingly, the question whether Petitioner exceeded the proper scope of a reply will not be considered in the context of Patent Owner's Motion to Exclude.[11] *See* 37 C.F.R. §§ 42.12(a)(1), 42.12(b)(3).

[11] Entirely apart from Patent Owner's Motion to Exclude, we have reviewed the identified paragraphs of Exhibit 1024 and find each of them to be responsive to arguments and evidence raised in the Patent Owner Response. *See* 37 C.F.R. § 42.23(b).

IV. AMENDED MOTION TO SEAL

Patent Owner filed an Amended Motion to Seal. Paper 73. Petitioner filed an Opposition. Paper 75. Patent Owner did not file a reply.

There is a strong public policy in favor of making information filed in an *inter partes* review open to the public, especially because the proceeding determines the patentability of claims in an issued patent and, therefore, affects the rights of the public. *See Garmin Int'l v. Garmin Speed Tech's, LLC*, Case IPR2012-00001 (PTAB Mar. 14, 2013) (Paper 34). Under 35 U.S.C. § 316(a)(1) and 37 C.F.R. § 42.14, the default rule is that all papers filed in an *inter partes* review are open and available for access by the public. A party, however, may file a concurrent motion to seal, and the information at issue is sealed pending the outcome of the motion.

It is only "confidential information" that may be protected from disclosure, 35 U.S.C. § 316(a)(7), and, even then, there is a public interest in "maintaining a complete and understandable file history" of the proceeding. Office Patent Trial Practice Guide, 77 Fed. Reg. 48,756, 48,760 (Aug. 14, 2012). The standard for granting a motion to seal is "for good cause." 37 C.F.R. § 42.54(a). The party moving to seal bears the burden of proof in showing entitlement to the requested relief. 37 C.F.R. § 42.20(c).

Patent Owner seeks to place under seal the following information:

1. These portions of the deposition transcript of Matt Cowan (Ex. 2042): 65:25–66:13; 66:21–25; 67:19–68:11; 68:25–69:3; 69:13–18; 71:25–74:17; 89:6–90:25; 104:18–105:20; and 208:15–209:14.

2. These portions of the deposition transcript of Matthew S. Brennesholtz (Ex. 2043): 86:21–87:13; 88:15–89:7; 90:20–91:16; 92:6–13; 93:10–23; 94:7–14; 95:9–25; and 97:16–98:9.

3. This portion of the transcript of the conference call with the Board, held on October 2, 2015 (Ex. 2041): 30:13–17.

Paper 73, 2–3. Patent Owner notes that it only seeks to seal "14 pages from the 216 page Cowan transcript," "5 lines of the October 2 hearing transcript," and "7 pages of the 185 page Brennesholtz transcript." Paper 73, 5. However, we note simply that the sealing of even just one page that should not be sealed is one page too many.

According to Patent Owner, the portions of Ex. 2042 sought to be sealed contain confidential information; the portions of Ex. 2043 sought to be sealed refer to and include the confidential information from Ex. 2042; and the portion of Ex. 2041 sought to be sealed also refers to confidential information from Ex. 2042. Paper 73, 2–3. Specifically, Patent Owner explains that the confidential information "relate to designs and concepts that were considered by Patent Owner, but were ultimately not commercially pursued for various technical and business reasons." *Id.* at 3. With regard to potential harm due to disclosure, Patent Owner states:

> Such disclosure would publicly describe the embodiments and designs that were not commercially pursued by Patent owner and would provide a road-map to a competitor on which designs not to pursue for a competitive product. This would provide a significant short-cut to a competitor seeking to enter a highly-competitive market for stereoscopic imagers. This competitive harm cannot be cured by any means other than maintaining the confidentiality of these alternative designs under seal.

Id. at 3–4.

According to Petitioner, "[t]he purported confidential portions of Mr. Cowan's testimony all relate to the Figure 6(a) embodiment [of the '455 patent]." Paper 75, 2–4. The contention is that, if the Figure 6(a) embodiment of the '455 patent is not confidential, then neither is this other information. Petitioner also argues that because these alleged pre-existing designs are nearly a decade old, Patent Owner did not commercially pursue them is readily apparent from the fact that they are not within Patent Owner's commercial products. *Id.* at 5. Petitioner states: "Given the passage of time and that RealD['s] products are publically available, there is nothing confidential about what designs RealD chose not to pursue commercially." *Id.*

Patent Owner has taken the necessary steps under our Rules and provides the necessary evidence, including a certification that the information sought to be sealed has not been published or otherwise made public. Paper 73, 6. Although we appreciate the similarities between Mr. Cowan's testimony and the Figure 6(a) embodiment, as identified by Petitioner, we are not persuaded sufficiently that his testimony was directed to the Figure 6(a) embodiment. In addition, the burden to the public from sealing the limited material identified in Patent Owner's Amended Motion is minimal, particularly because we need not identify those portions of Mr. Cowan's testimony to address the issues in this case. Moreover, Petitioner has not established that Patent Owner reduced to practice the alleged "prior invention" represented by the alleged confidential material prior to the effective filing date of the '934 patent. Thus, the material is not Section 102(g) type prior art that Patent Owner had to address in its Motion

to Amend, and we have not addressed this material in our substantive analysis.

We have balanced Patent Owner's assertion of confidentiality with the public's interest in a sufficiently understandable record with respect to the substantive decisions made regarding patentability. We find that the potential harm to Patent Owner outweighs the minimal public interest for access to the information at issue. Accordingly, Patent Owner's Amended Motion to Seal (Paper 73) is *granted*.

V. ORDER

For the reasons given, it is:

ORDERED that claims 1, 6–10, and 18–20 of U.S. Patent No. 8,220,934 B2 have been shown by a preponderance of the evidence to be unpatentable as follows;

Claims 1 and 7–9 are unpatentable under 35 U.S.C. § 103(a) as obvious over Silverstein;

Claims 1, 6, 7, 10, and 18–20 are unpatentable under 35 U.S.C. § 103(a) as obvious over Liptoh and Tani;

Claim 8 is unpatentable under 35 U.S.C. § 103(a) as obvious over Liptoh, Tani, and APA; and

Claim 9 is unpatentable under 35 U.S.C. § 103(a) as obvious over Liptoh, Tani, and Wentz.

FURTHER ORDERED that Patent Owner's Motion to Amend is *denied*;

FURTHER ORDERED that Patent Owner's Motion to Exclude is *denied*;

FURTHER ORDERED that Petitioner' Motion to Exclude is *denied*;

FURTHER ORDERED that Patent Owner's Amended Motion to Seal is *granted*; and

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

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