

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.

Case IPR2015-00877
Patent 8,220,934 B2

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

LEE, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
37 C.F.R. § 42.108

I. INTRODUCTION

A. Background

On March 12, 2015, MasterImage 3D, Inc. and MasterImage 3D Asia, LLC (“Petitioner” or “MasterImage”) filed a Petition (Paper 1, “Pet.”) to institute *inter partes* review of claims 1–11 and 18–20 of U.S. Patent No. 8,220,934 B2 (Ex. 1001, “the ’934 patent”). On June 23, 2015, RealD Inc. (“Patent Owner” or “RealD”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”).

The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a):

THRESHOLD.—The Director may not authorize an inter partes review to be instituted unless the Director determines that the information presented in the petition filed under section 311 and any response filed under section 313 shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.

Upon consideration of the Petition and Preliminary Response, with the accompanying evidence, we are not persuaded, under 35 U.S.C. § 314(a), that Petitioner has demonstrated a reasonable likelihood that it would prevail in showing the unpatentability of any of claims 1–11 and 18–20 of the ’934 patent. Accordingly, we do not institute an *inter partes* review of the ’934 patent.

B. Related Matters

MasterImage and RealD together identify the following related cases involving the ’934 patent: (1) *RealD Inc. v. MasterImage 3D, Inc.*, No. 2:14-CV-02304 (C.D. Cal.); (2) *RealD Inc. v. Volfoni*, No. 2:14-CV-

02303 (C.D. Cal.); and (3) *In the Matter of Certain Three-Dimensional Cinema Systems and Components Thereof*, Inv. No. 337-TA-339 (USITC). Papers 4, 5. The '934 patent also is the challenged patent in *inter partes* review IPR2015-00040, instituted on April 15, 2015.

C. 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 recites 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. *Id.* at 7:66–8:5, 9:10–10:2. Each of independent claims 1 and 18 further recites 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. *Id.* at 8:3–10, 10:1–4. Independent method claim 18 recites a step of receiving randomly-polarized light from a projector. *Id.* at 9:9.

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.” *Id.* at 2:1–4.

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

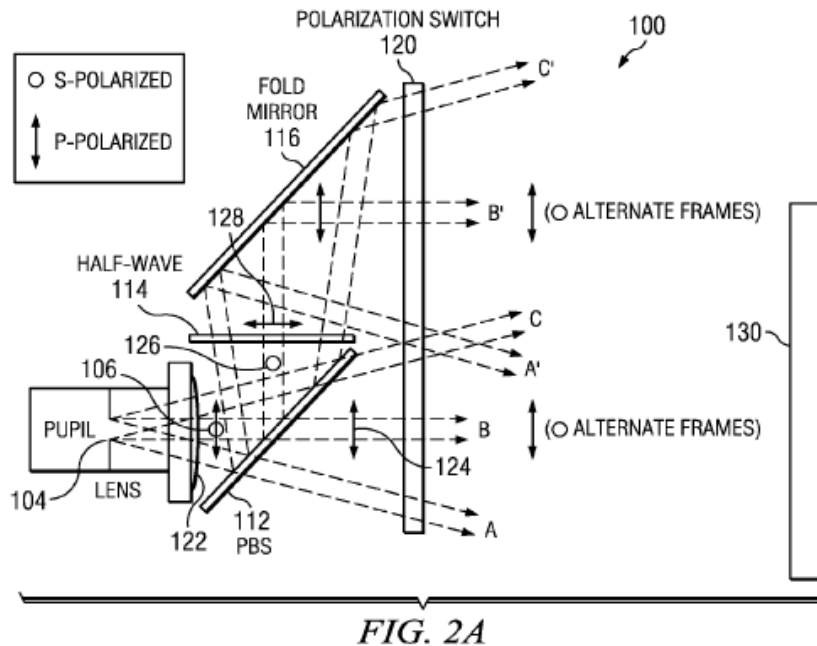


Figure 2A illustrates a schematic diagram of polarization conversion system 100 for cinematic projection according to one embodiment of the ’934 patent. *Id.* at 2:41–43. Polarization conversion system 100 is shown, that includes polarizing beam splitter (“PBS”) 112; polarization rotator 114, such as a half-wave plate; reflecting element, such as fold mirror 116; 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, as 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.

Id. at 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 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;

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.

Id. at 7:65–8:11, 9:7–10:4 (emphases added).

C. References Relied Upon

Petitioner relies on the following references:¹

Reference		Date	Exhibit
Svardal	U.S. Patent No. 6,547,396 B1	Apr. 15, 2003	Ex. 1004
Bierhuizen	U.S. Patent No. 6,839,095 B2	Jan. 4, 2005	Ex. 1005

D. The Asserted Grounds

Petitioner asserts the following grounds of unpatentability:

Reference(s)	Basis	Claims Challenged
Svardal	§ 102(b)	1–6
Svardal and Bierhuizen (first rationale) ²	§ 103(a)	1–6
Svardal	§ 103(a)	1, 2, 6–11, and 18–20
Svardal and Bierhuizen (second rationale) ³	§ 103(a)	1, 2, and 6–11

¹ Petitioner also relies on the Declaration of Matthew S. Brennesholtz (Ex. 1003).

² Petitioner presents two different theories of obviousness based on Svardal and Bierhuizen. This theory relies on the embodiment of Svardal's Figure 3.

³ Petitioner presents two different theories of obviousness based on Svardal and Bierhuizen. This theory relies on the embodiment of Svardal's Figure 3, as well as the embodiment of Svardal's Figure 6.

II. ANALYSIS

A. Claim Construction

The Board interprets claims of an unexpired patent using the broadest reasonable construction in light of the specification of the patent in which they appear. *See* 37 C.F.R. § 42.100(b); *In re Cuozzo Speed Techs., LLC*, 793 F.3d 1268, 1277 (Fed. Cir. 2015). Even under the rule of broadest reasonable interpretation, claim terms generally 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. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Only those terms which are in controversy need to be construed, and only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999). In the context of this case, we need not construe any claim term expressly.

B. Alleged Anticipation of Claims 1–6 by Svardal

To establish anticipation, each and every element in a claim, arranged as recited in the claim, must be found in a single prior art reference. *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008); *Karsten Mfg. Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001). While the elements must be arranged or combined in the same way as in the claim, “the [prior art] reference need not satisfy an *ipsissimis verbis* test,” i.e., identity of terminology is not required. *In re Gleave*, 560 F.3d 1331, 1334 (Fed. Cir. 2009); *In re Bond*, 910 F.2d 831, 832 (Fed. Cir. 1990).

Moreover, prior art references must be “considered together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). It is proper to take into account not only specific teachings of the reference, but also the inferences which one skilled in the art would reasonably be expected to draw therefrom. *In re Preda*, 401 F.2d 825, 826 (CCPA 1968).

The term “cleanup polarizer” does not appear in any claim, but is used many times in the Specification of the ’934 patent, as well as in Svardal. Our analysis depends on the meaning of “cleanup polarizer” as would be understood by one with ordinary skill in the art. Petitioner proposes that “cleanup polarizer” should be understood as “an optical device which removes undesired polarization characteristics from light having one predominate polarization state of potentially insufficient purity.” Pet. 14. Patent Owner agrees with Petitioner’s proposed construction for purposes of this proceeding. Prelim. Resp. 18.

For purposes of this Decision, we apply Petitioner’s proposed construction for the term “cleanup polarizer.”⁴

Svardal

Svardal’s disclosure is directed to a stereographic projection system. Ex. 1004, Abstr. Petitioner relies on the embodiment of Svardal’s Figure 3, which builds on an embodiment shown in Figure 2, reproduced below:

⁴ Although we adopt Petitioner’s construction for purposes of this Decision, we do not express an opinion on whether one of ordinary skill in the art would agree with Petitioner’s proposal.

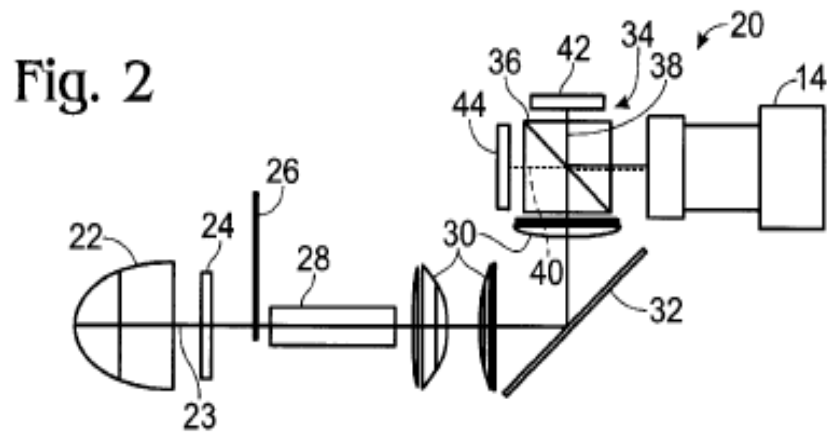


Figure 2 is a schematic diagram of a first embodiment of Svardal's projection system. Optical system 20 includes light source 22 configured to produce beam of light 23. *Id.* at 3:50–51. Optical system 20 also may include filter 24, such as an infrared filter or an ultraviolet filter, to filter out unwanted parts of the emission spectra of the light source. *Id.* at 57–60.

Light beam 23 may be directed through color wheel 26, which imparts color into the light by use of color filters. *Id.* at 3:61–4:3. Light beam 23 also may be passed through integrator 28, which levels the intensity distribution of beam 23 across the width of the beam. *Id.* at 4:22–26. Thereafter, light beam 23 may be directed, through one or more relay lenses 30 or mirrors 32, or both, to image engine 34. *Id.* at 4:46–49.

Image engine 34 is described as follows:

Image engine 34 of the depicted embodiment is configured to project the left-eye image and right-eye image via light of different polarities. In FIG. 2, this is accomplished via the use of a polarizing beam splitter 36 to split beam of light 23 into a first beam of a first polarity, indicated by solid ray 38, and a second beam of a second polarity, indicated by dashed ray 40. First polarized beam 38 is then directed toward a left

image-producing element 42, and second polarized beam 40 is directed toward a right image-producing element 44.

* * *

When left image beam 38 strikes left image-producing element 42, selected portions of the beam that strike activated pixels on the LCOS [liquid crystal on silicon] panel are optically rotated. The reflective backing of the panel then reflects left image beam 38 back toward polarizing beam filter 36. Optically rotated portions of left image beam 38 may then be reflected by polarizing beam 36 splitter toward projection lens 14, while unrotated portions of the beam are not reflected toward the projection lens. Likewise, when right image beam 40 strikes right image-producing element 44, selected portions of the right image beam that strike active pixels are optically rotated. The optically rotated portions of right image beam 40 then may pass through polarizing beam splitter 36 and through projection lens 14.

Id. at 4:60–5:59.

The embodiment shown in Figure 2 is configured to project the left-eye image and right-eye image onto the viewing surface at the same time. *Id.* at 6:17–18. In another embodiment, as shown in Figure 3, the left-eye image and the right-eye image are projected onto the viewing surface in an alternating manner. *Id.* at 6:17–23. The frequency of the alteration between the left-eye and right-eye images is sufficiently high for them to appear as a single stereoscopic image to the human eye. *Id.* at 6:23–26. Figure 3 is reproduced below:

manner, optical system 100 enables stereographic image production through a single projection lens.

Id. at 7:4–18. Svardal does not describe expressly the function and use of PCA 116. It is stated only that PCA 116 is “for further modifying the beam of light.” *Id.* at 6:41–42. In that connection, Svardal refers to a function to be performed without noting the component performing the function:

The use of variable retarder 132 allows the image intensity to be increased through polarization recovery. Polarization recovery is performed by splitting an unpolarized beam of light into two polarized beams, rotating the polarization of one beam to match the polarization of the other, and then recombining the beams into a single polarized beam.

Id. at 7:23–28. As discussed below, Petitioner contends, and Patent Owner does not dispute, that one with ordinary skill in the art would understand, from Svardal’s disclosure, that PCA 116 performs the polarization recovery noted in the text quoted above. The record supports that contention.

Discussion

Claim 1 recites a polarization beam splitter operable to direct first light bundles having a first state of polarization along a first path, and to direct second light bundles having a second state of polarization along a second light path. Ex. 1001, 7:66–8:2. Claim 1 recites a polarization rotator, located on the second light path, that is operable to translate the second SOP to the first SOP. *Id.* at 8:3–5.

Relying on the testimony of Mr. Brennesholtz, Petitioner asserts that one with ordinary skill in the art would have understood from Svardal’s disclosure that PCA 116 modifies unpolarized light by using polarization recovery. Pet. 18. Also, relying on the testimony of Mr. Brennesholtz,

Petitioner asserts that one with ordinary skill in the art would have understood Svardal as disclosing that PCA 116 includes a polarization beam splitter, a half wave retarder, and a reflector. *Id.* at 19. Further, relying on the testimony of Mr. Brennesholtz, Petitioner asserts that one with ordinary skill in the art would have understood from Svardal's disclosure that PCA 116 performs: (1) splitting an unpolarized beam of light into two polarized beams on different paths by use of a polarized beam splitter within PCA 116, (2) rotating the polarization of one beam to match the polarization of the other beam, by use of the half-wave retarder as a rotator, within PCA 116, and (3) recombining the beams into a single polarized beam by use of a reflector within PCA 116. *Id.* at 18–19.

According to Petitioner, PCA 116 necessarily, and, thus, inherently, includes a polarizing beam splitter, a half-wave retarder (as a rotator), and a reflector, for performing the polarization recovery steps of splitting a beam by polarization, rotating the polarization of one split beam to match the polarization of the other split beam, and recombining the two beams. *Id.* at 19. That contention is not disputed by Patent Owner.

We are persuaded sufficiently by Petitioner that Svardal discloses the above-noted elements of claim 1. However, claim 1 further 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 (emphasis added). We are not persuaded sufficiently by Petitioner that the italicized portion of the above-quoted limitation is disclosed by Svardal.

Petitioner regards variable retarder 132 in Svardal's Figure 3 as the claimed polarization switch subsystem. Pet. 23. According to Petitioner, variable retarder 132 receives from PCA 116 the two polarized light beams after the polarization of one of the beams has been rotated to match the polarization of the other. *Id.* Even assuming that as true, Petitioner does not account for the requirement that the polarization switch subsystem is *operable to receive first and second light bundles from the first and second light paths, respectively*. For instance, Petitioner acknowledges that the output from PCA 116 is a single beam of polarized light. *Id.* at 20. As discussed above, the two separate beams of light generated within PCA 116, on two different light paths, are recombined into a single beam on a single path prior to exiting PCA 116. The Petition identifies no disclosure of anything other than a single polarized beam as outputted by PCA 116.

Furthermore, as is noted by Patent Owner, the output light beam from PCA 116 is not provided immediately to variable retarder 132. Prelim. Resp. 24. Rather, it is passed through lens 118, reflected by mirror 120, and then acted on by clean-up polarizer 130, prior to reaching variable retarder 132. Ex. 1004, Fig. 3. Patent Owner correctly notes that Svardal's description of light traveling from the output of PCA 116 to the input of variable retarder 132 refers only to a single beam, i.e., beam 104. Prelim. Resp. 24; *see* Ex. 1004, 6:43–54. To the extent that there are separate light paths for multiple beams within PCA 116, Petitioner has not shown that the paths extend beyond PCA 116 to components downstream of PCA 116.

It is important to note that the pertinent limitation of claim 1 refers to the polarization switch subsystem being operable to receive first and second

light bundles from first and second light paths, “*respectively*.” Even under the rule of broadest reasonable interpretation, that limitation is not met when what is received by the variable retarder, as the polarization switch subsystem, is a single polarized light beam traveling on a single light path. Construing the limitation broadly to cover receiving a single beam on a single light path is unreasonable, in the context of the Specification.

Each of claims 2, 3, and 6 depends from claim 1, and each of claims 4 and 5 depends from claim 3. For the foregoing reasons, Petitioner has not shown a reasonable likelihood that it would prevail in establishing that any of claims 1–6 of the ’934 patent is unpatentable, under 35 U.S.C. § 102(b), as anticipated by Svardal.

*C. Alleged Obviousness of Claims 1–6
over Svardal and Bierhuizen (first rationale)*

Alternatively, rather than relying on its assertion that PCA 116 inherently includes a polarization beam splitter, a polarization rotator, and a reflector, Petitioner relies on Bierhuizen’s disclosure of a polarization conversion assembly (“PCA”) to establish the structure and operation of PCA 116 in Svardal. Pet. 25–30. Petitioner notes that Bierhuizen and the ’934 patent were issued to the same entity and that Benny S. Svardal is a common inventor for the two patents. *Id.* at 26.

Petitioner’s reliance on Bierhuizen to establish the internal structure of PCA 116 in Svardal, however, does not cure the deficiency discussed above, with respect to the limitation in claim 1 that the polarization switch subsystem is operable to receive first and second light bundles from the first and second light paths, *respectively*. Accordingly, Petitioner has not shown

a reasonable likelihood that it would prevail in establishing the unpatentability of any of claims 1–6 as rendered obvious over Svardal and Bierhuizen.

D. Alleged Obviousness of Claims 1, 2, 6–11, and 18–20 as Obvious over Svardal

This alleged ground of obviousness relies on a combination of Svardal's Figure 6 embodiment and Svardal's Figure 3 embodiment. Pet. 34. Specifically, Petitioner starts with Svardal's Figure 6 embodiment, and proposes to make a modification based on the teachings of Svardal's Figure 3 embodiment, and also on a general statement in Svardal that "polarization recovery techniques may be used to increase the intensity of the projected image." *Id.* Each of claims 2 and 6–11 depends, directly or indirectly, from claim 1. Each of claims 19 and 20 depends from claim 18.

Figure 6 of Svardal is reproduced below:

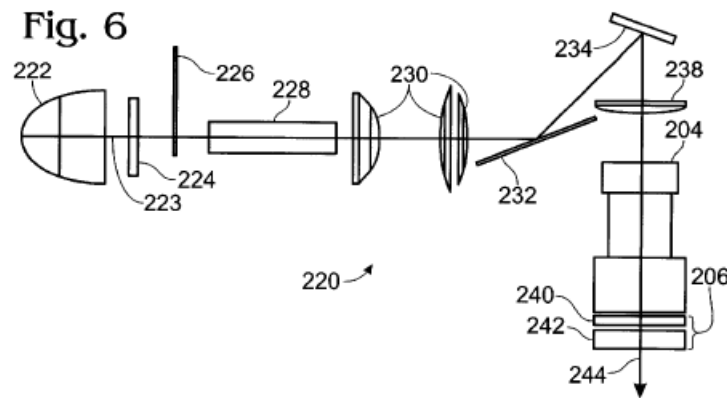


Figure 6 shows a schematic diagram of an embodiment of the stereoscopic projection system of Svardal. Ex. 1004, 2:63–65. Light source 222 produces beam 223, which passes through UV/IR filter 224, color wheel 226, integrator 228, relay lenses 230, and mirror 232, much the same

as in the Figure 2 embodiment described above. *Id.* at 7:50–58. Beam 223 then is directed to image-producing element 234. *Id.* at 58.

Image-producing element 234 is a reflective element, such as a micromirror device (DMD), a liquid crystal on silicon (LCOS) panel, or any other suitable image-producing device, such as a cathode ray tube or a transmissive LCD panel. *Id.* at 7:62–67. Downstream of the image-producing element is field lens 238 and projection lens 204. *Id.* at 8:4–7.

Downstream of projection lens 204 is stereographic adaptor 206. *Id.* at 8:5–7. As shown, it is removable from projection lens 204, but it may be configured as non-removable from the projection lens if that is desired. *Id.* at 8:41–43. Adaptor 226 includes, in order of proximity to the projection lens, clean-up polarizer 240, which acts on beam 223 as it exits projection lens 204, and variable retarder 242, which changes the polarity of the light in an alternating manner. *Id.* at 8:7–12. The coordination between image-producing element 234 and variable retarder 242 is described as follows:

Image-producing element 234 is configured to produce alternating left-eye and right-eye images, in a manner synchronized with the changes in state of variable retarder 242. In other words, image-producing element 234 is configured to produce the left-eye image whenever variable retarder 242 is in the first [state], and to produce the right-eye image whenever variable retarder 242 is in the second state. In this manner, left-eye and right-eye images are projected onto the viewing surface in an alternating manner. When the frequency of alternation is sufficiently fast, the left-eye and right-eye images may appear to a viewer to compose a single stereographic image.

Id. at 8:28–39.

Claim 1 recites a PBS operable to direct first light bundles having a first SOP along a first light path, and direct second light bundles having a second SOP along a second light path, and a polarization rotator located on the second light path, which is operable to translate the second SOP to the first SOP. Ex. 1001, 7:66–8:5. Similarly, claim 18 recites the steps of (1) directing first SOP light on a first light path, (2) directing second SOP light on a second light path, and (3) transforming the second SOP light on the second light path to first SOP light. *Id.* at 9:10–10:2. To satisfy these claim limitations, Petitioner proposes to add a device that performs polarization recovery, such as PCA 116 in the Figure 3 embodiment of Svoldal, to the Figure 6 embodiment of Svoldal, between projection lens 204 and clean-up polarizer 240. Pet. 41–42.

At the outset, we note that even assuming that it would have been rendered obvious to one with ordinary skill in the art to add PCA 116 from the Figure 3 embodiment to the Figure 6 embodiment between projection lens 204 and clean-up polarizer 240, Petitioner still has not accounted sufficiently for this limitation of claim 1: “a polarization switch subsystem *operable to receive first and second light bundles from the first and second light paths respectively.*” Ex. 1001, 8:6–8 (emphasis added). The reason already is explained above, in the discussion of the alleged anticipation of claims 1–6 by Svoldal. Specifically, PCA 116 of the Figure 3 embodiment outputs only a single polarized beam, and, thus, would not provide first and second light bundles on first and second light paths, respectively, to variable retarder 242 as the polarization switch subsystem, as is required by claim 1.

In any event, for reasons discussed below, Petitioner's contention that it would have been rendered obvious to one with ordinary skill in the art to add PCA 116 from the Figure 3 embodiment to the Figure 6 embodiment, between projection lens 204 and clean-up polarizer 240 is unpersuasive and not sufficiently supported by evidence.

According to Petitioner, even though the Figure 6 embodiment is described as including clean-up polarizer 240, whether reference numeral 240 really is a clean-up polarizer⁵ or simply a polarizer that acts on unpolarized light depends on the choice of the particular imaging element 234. Pet. 39. For instance, Petitioner contends that, in the case where the imaging element is an LCOS, clean-up polarizer 240 would really be a "clean-up polarizer," but that, in the case where imaging element 234 is a digital micromirror device (DMD), the reference to element 240 as a "clean-up polarizer" is inaccurate, e.g., a mistake, and that what is referenced as a clean-up polarizer would be just a polarizer that acts on randomly polarized image light. *Id.* The bases for Petitioner's contention are (1) that clean-up polarizers receive and act on input light that has just one predominate polarization state, and (2) that LCOS, as the imaging element, outputs light predominately having just one polarization state, but DMD, as the imaging element, outputs randomly polarized light. *Id.*

Petitioner asserts that in the case where a referenced clean-up polarizer is not a clean-up polarizer, but a polarizer instead, one with

⁵ The parties agree that a clean-up polarizer necessarily receives and acts on light that already is predominately polarized. Pet. 14; Prelim. Resp. 18.

ordinary skill in the art would have known to add PCA 116 from the Figure 3 embodiment to the Figure 6 embodiment between imaging element 234 and clean-up polarizer 240, immediately upstream of clean-up polarizer 240. *Id.* at 41. Petitioner's explanation is that a polarizer would cut light intensity by up to 50%, which is undesirable, that Svardal acknowledges the benefit of applying polarization recovery as a solution to the problem of reduced light intensity due to the process of polarization, and that PCA 116 in the Figure 3 embodiment performs polarization recovery. *Id.* at 39–41. Petitioner further notes that inserting PCA 116 would allow clean-up polarizer 240 to act as a “clean-up polarizer,” as it is purported to be, because it would act on the output of PCA 116 and enhance the polarization achieved by PCA 116. *Id.* at 41.

As discussed below, Petitioner's reasoning for adding PCA 116 from Svardal's Figure 3 embodiment to Svardal's Figure 6 embodiment, at a location just upstream of clean-up polarizer 240, is not based on sufficiently rational underpinnings, but on hindsight in light of Patent Owner's claimed invention.

First, Petitioner rewrites the disclosure of Svardal, on the basis of an alleged inaccuracy or mistake in the description within Svardal, and does not sufficiently explore alternative ways to read Svardal's disclosure that do not manifest an inaccuracy or mistake. Second, Petitioner regards Svardal's Figure 6 as an engineering blueprint used for production purposes, rather than as what it actually is, i.e., a schematic diagram that shows the significant components, but may not show all components, that one with ordinary skill in the art would recognize as present in a more detailed

production blueprint. These two incorrect premises combine to create the erroneous basis on which Petitioner proposes its rationale to add PCA 116 from Svardal's Figure 3 embodiment to Svardal's Figure 6 embodiment, immediately upstream of clean-up polarizer 240. Petitioner's approach and reasoning reflect reliance on hindsight in view of Patent Owner's claimed invention, which is inappropriate for an obviousness analysis.

More specifically, Svardal's disclosure is not that there may or may not be clean-up polarizer 240, in the Figure 6 embodiment, depending on what particular imaging element 234 is used. Rather, it is that clean-up polarizer 240 is there, in the Figure 6 embodiment, with no stated contingencies or dependence on the specific choice for imaging element 234. Thus, if the presence of clean-up polarizer 240 indicates that input light supplied to the clean-up polarizer already has one predominate polarization, which is the position Petitioner put forth regarding the meaning of a clean-up polarizer, then Petitioner should consider whether an initial polarizer also is present in the system, albeit not expressly illustrated in Figure 6. Neither Petitioner nor its declarant, Mr. Brennesholtz, sufficiently explored that scenario. The conclusion that the reference in Svardal's disclosure to clean-up polarizer 240 in the Figure 6 embodiment is inaccurate at least for one selection of the imaging element is not well supported.

Svardal's disclosure supports the position that not all components of its projection system may be expressly illustrated in its figures. For instance, Svardal states in connection with its Figure 2 embodiment that:

[A]n image engine using LCOS panels (or ordinary liquid crystal panels) typically also includes a polarizer positioned

optically upstream of the liquid crystal material to polarize the light beam before it is directed onto the LCOS panel.

Ex. 1004, 5:14–18. In that regard, no such polarizer is actually illustrated in Figure 2. Thus, it is incorrect to assume that a polarizer, if present at all in a system, necessarily must be illustrated in a corresponding figure.

Furthermore, Svardal describes in connection with its Figure 6 embodiment that clean-up polarizer 240 and variable retarder 244 may be located upstream of imaging element 234, rather than downstream as illustrated in the Figure. *Id.* at 8:44–51. Thus, an initial polarizer also may be present upstream of imaging element 234, regardless of which imaging element is selected.

Petitioner's approach to reading Svardal's disclosure appears not to be focused on making sense of that disclosure, even if it is possible to do so. Petitioner's assertion, that Svardal's disclosure with regard to its Figure 6 embodiment is inaccurate or a mistake in the event that a DMD is selected as imaging element 234, is not sufficiently supported by persuasive reasoning. We determine that the proposed combination of the Figure 3 embodiment of Svardal with the Figure 6 embodiment of Svardal is not based on rational underpinnings but, evidently, on hindsight in light of Patent Owner's claimed invention.

For the foregoing reasons, Petitioner has not shown a reasonable likelihood that it would prevail in establishing the unpatentability of any of claims 1, 2, 6–11, and 18–20 as rendered obvious over Svardal.

*E. Alleged Obviousness of Claims 1, 2, and 6–11
over Svardal and Bierhuizen (second rationale)*

This alleged ground of unpatentability adds to the ground discussed above based on alleged obviousness of the same claims over Svardal alone. Rather than relying on its assertion that MCA 116 inherently includes a polarization beam splitter, a polarization rotator, and a reflector, Petitioner relies on Bierhuizen's disclosure of a PCA to establish the structure and operation of PCA 116 in Svardal. Pet. 53. Petitioner's reliance on Bierhuizen to establish the internal structure of Svardal's PCA 116, however, does not cure the deficiency discussed above, with respect to the limitation in claim 1 that the polarization switch subsystem is operable to receive first and second light bundles from the first and second light paths, *respectively*. It further does not cure the deficiencies discussed above, with respect to inadequate motivation to combine the embodiment of Svardal's Figure 3 with the embodiment of Svardal's Figure 6, in the manner proposed by Petitioner.

Accordingly, Petitioner has not shown a reasonable likelihood that it would prevail in establishing the unpatentability of any of claims 1, 2, and 6–11 as rendered obvious over Svardal and Bierhuizen.

III. CONCLUSION

Petitioner has not established a reasonable likelihood that it would prevail in showing the unpatentability of any of claims 1–11 and 18–20 of the '934 patent.

IV. ORDER

Accordingly, it is

ORDERED that the Petition is *denied*, and no *inter partes* review is instituted as to any claim of the '934 patent.

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