

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

REALD INC.,  
Patent Owner.

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Case IPR2015-00033  
Patent 7,857,455 B2

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

GERSTENBLITH, *Administrative Patent Judge*.

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

## I. INTRODUCTION

### A. *Background*

MasterImage 3D, Inc. and MasterImage 3D Asia, LLC (collectively, “Petitioner”) filed a Petition (Paper 2, “Pet.”) requesting institution of *inter partes* review of claims 1–23 of U.S. Patent No. 7,857,455 B2 (Ex. 1001, “the ’455 patent”). RealD Inc. (“Patent Owner”) filed a Preliminary Response (Paper 8, “Prelim. Resp.”). We have jurisdiction under 35 U.S.C. § 314.

Under 35 U.S.C. § 314(a), an *inter partes* review may be instituted only if “the information presented in [the Petition] 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.” *See* 37 C.F.R. § 42.108(c).

For the reasons given below, on this record, we are persuaded that Petitioner has not established a reasonable likelihood of prevailing with respect to at least one challenged claim of the ’455 patent. Accordingly, we *deny* the Petition and decline to institute an *inter partes* review of the ’455 patent.

### B. *Related Proceedings*

The parties represent that the ’455 patent is asserted in *RealD Inc. v. MasterImage 3D, Inc. and MasterImage 3D Asia, LLC*, No. 2:14-CV-02304 (C.D. Cal.). Pet. 1; Paper 5, 1. Petitioner filed an additional petition for *inter partes* review of the ’455 patent in IPR2015-00035. Pet. 1; Paper 5, 1. Patent Owner also identifies *In the matter of Certain Three-Dimensional Cinema Systems and Components Thereof*, Inv. No. 337-TA-939 (USITC). Paper 7, 1. Additionally, Petitioner filed a petition for *inter partes* review, IPR2015-00036, of U.S. Patent No. 7,959,296 B2, which issued from a

continuation application based on the application that issued as the '455 patent. Pet. 1; Paper 5, 2.

*C. The Prior Art*

Petitioner relies on the following:

U.S. Patent No. 7,559,653 B2, issued July 14, 2009 (Ex. 1004, “Silverstein”); and

Alleged Admitted Prior Art (“APA”).

*D. The Asserted Grounds of Unpatentability*

Petitioner challenges the patentability of claims 1–23 of the '455 patent on the following grounds:<sup>1</sup>

Reference(s)	Basis	Claims challenged
Silverstein	§ 103(a)	1–13 and 15–22
Silverstein and APA	§ 103(a)	1–23

*E. The '455 Patent*

The '455 patent is directed to apparatus and methods for increasing “overall brightness in a projected stereoscopic image using polarization for image selection,” by creating “a dual path arrangement that can greatly increase the brightness of the image perceived by the viewer—in essence almost doubling the amount of light energy projected on the screen.”

Ex. 1001, 3:19–24. Figure 3 of the '455 patent is reproduced below:

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<sup>1</sup> Petitioner supports its challenge with a declaration executed by Matthew S. Brennesholtz on September 24, 2014 (Ex. 1003, “Brennesholtz Declaration”).

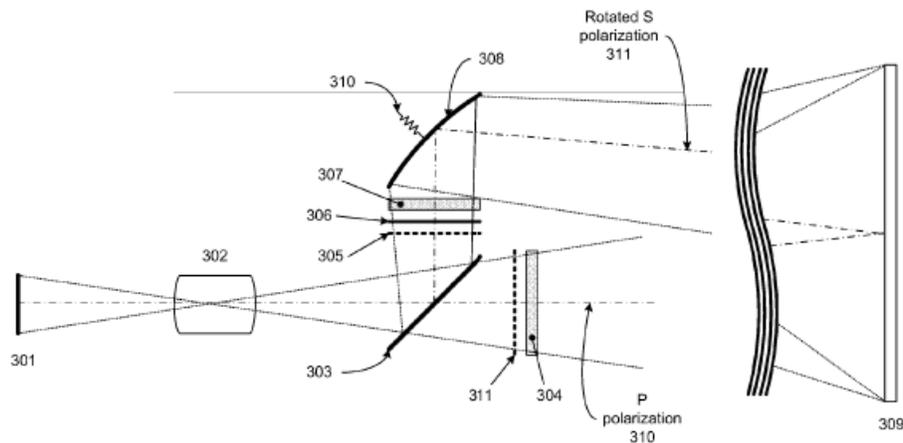


FIG. 3

Figure 3 “illustrates the . . . dual path projection system of the present design[.]” *Id.* at 2:51–52. The left side of Figure 3 depicts imaging surface 301, inside a projector, and projection lens 302. *Id.* at 5:6–8. Light from a source within the projector (not shown) is modulated by the imaging surface and sent to the projection lens. *Id.* at 5:8–10. Polarization beam splitter 303 “separates the light beam or light energy into two paths, a primary path P and a secondary path S, or more specifically into orthogonal polarization states[.]” *Id.* at 5:16–19. Light of P polarization passes to polarization modulator 304 (e.g., a ZScreen) and then to projection screen 309. *Id.* at 5:12–16. Light of S polarization is directed to half wave retarder 306 where the polarization is rotated 90 degrees. *Id.* at 5:27–28. The rotated S polarization light then passes to polarization modulator 307 and to mirror 308, where the rotated S polarization light 311 is reflected to projection surface 309. *Id.* at 6:8–11, 14–45.

Figure 6A of the '455 patent is shown below:

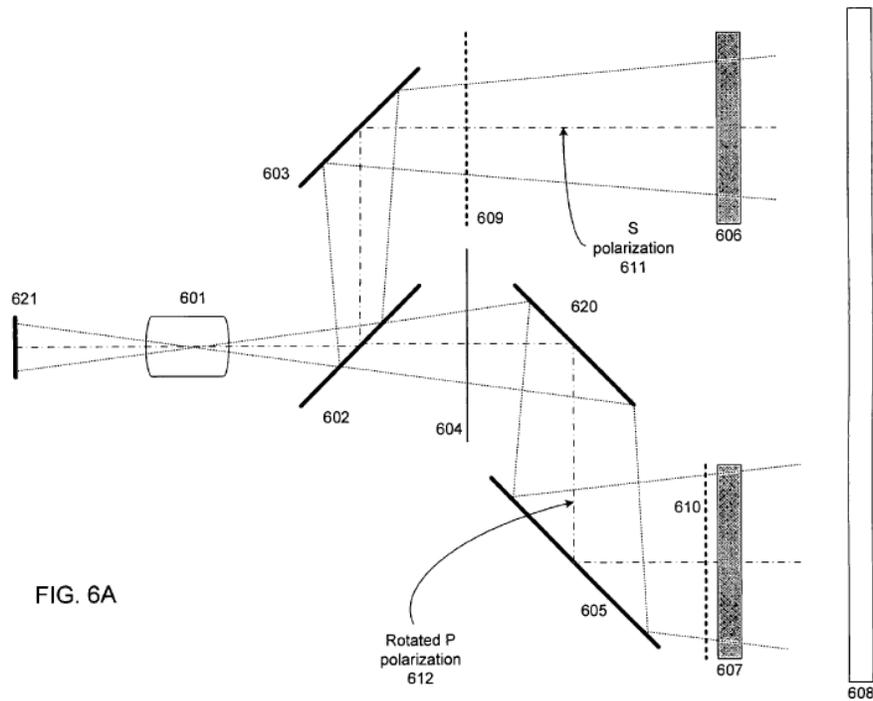


Figure 6A of the '455 patent shows “an alternative embodiment including elements to equalize the primary and secondary path lengths of light energy in an embodiment designed to achieve the same ends as those delineated in [Figure] 3[.]” *Id.* at 3:4–7. In particular, Figure 6A includes pair of prisms 605 and 620 (or front surface mirrors), which are “used to increase the path length of the transmitted beam [(i.e., the P beam)] in order to match the path length of the reflected beam” (i.e., the S beam). *Id.* at 9:49–52, 65–67. The beams are modulated using polarization modulators 606 and 607, and the light is projected to projection screen 608. *Id.* at 10:5–8.

*F. Illustrative Claims*

Claims 1, 16, 17, and 22 are the only independent claims challenged in this proceeding. Claims 2–15 depend directly or indirectly from claim 1; claims 18–21 depend from claim 17; and claim 23 depends from claim 22.

Independent claims 1 and 16 are illustrative of the claimed subject matter and are reproduced below:

1. An apparatus for projecting stereoscopic images, comprising:
  - a polarizing splitting element configured to receive image light energy and split the image light energy received into a primary path of light energy transmitted along a primary path and a secondary path of light energy transmitted along a secondary path;
  - a reflector configured to receive path light energy from one of primary path energy and secondary path light energy and to direct said path light energy toward a surface; and
  - a first polarization modulator positioned in the primary path and configured to receive the primary path of light energy, uniformly modulate the primary path of light energy into primary path modulated light energy, and transmit primary path modulated light energy toward the surface.

Ex. 1001, 12:20–35.

16. A method of projecting stereoscopic images, comprising:
  - receiving image light energy;
  - splitting the image light energy received into a primary path of light energy transmitted along a primary path and a secondary path of light energy transmitted along a secondary path;
  - receiving secondary path light energy and directing reflected secondary path light energy toward a surface; and
  - uniformly modulating the polarization of the primary path of light energy into primary path modulated light energy, and transmitting primary path modulated light energy toward the surface.

*Id.* at 13:15–29.

## II. CLAIM CONSTRUCTION

Although Petitioner presents constructions for several claim terms, no terms require express construction for purposes of this Decision.

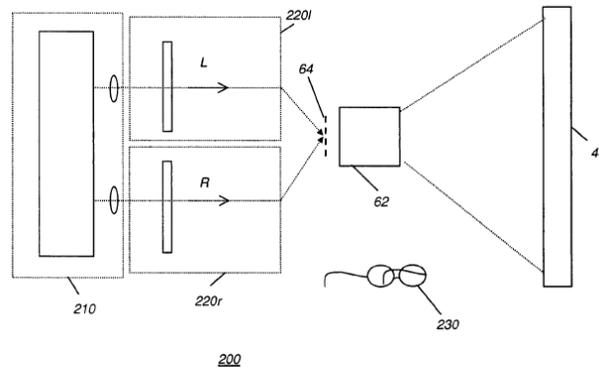
### III. ANALYSIS

#### A. *Obviousness of Claims 1–13 and 15–22 over Silverstein*

Petitioner asserts that Silverstein would have rendered the subject matter of claims 1–13 and 15–22 of the '455 patent obvious to one of ordinary skill in the art at the time of the invention. Pet. 14.

##### 1. *Silverstein*

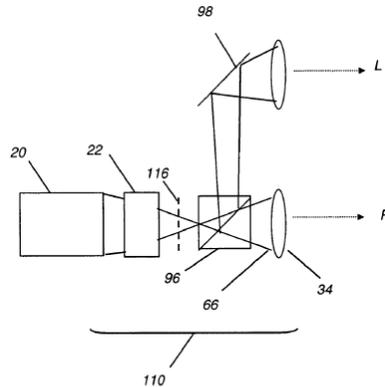
Silverstein is directed to a stereoscopic imaging apparatus. Ex. 1004, Abst. Figure 2 of Silverstein is reproduced below:



**FIG. 2**

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



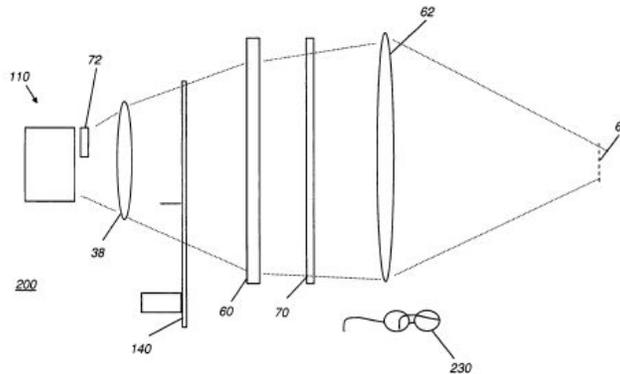
**FIG. 3**

Figure 3 of Silverstein is a block diagram of a polarized light providing apparatus. Ex. 1004, 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. *Id.* at 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.

Figure 16 of Silverstein is reproduced below:



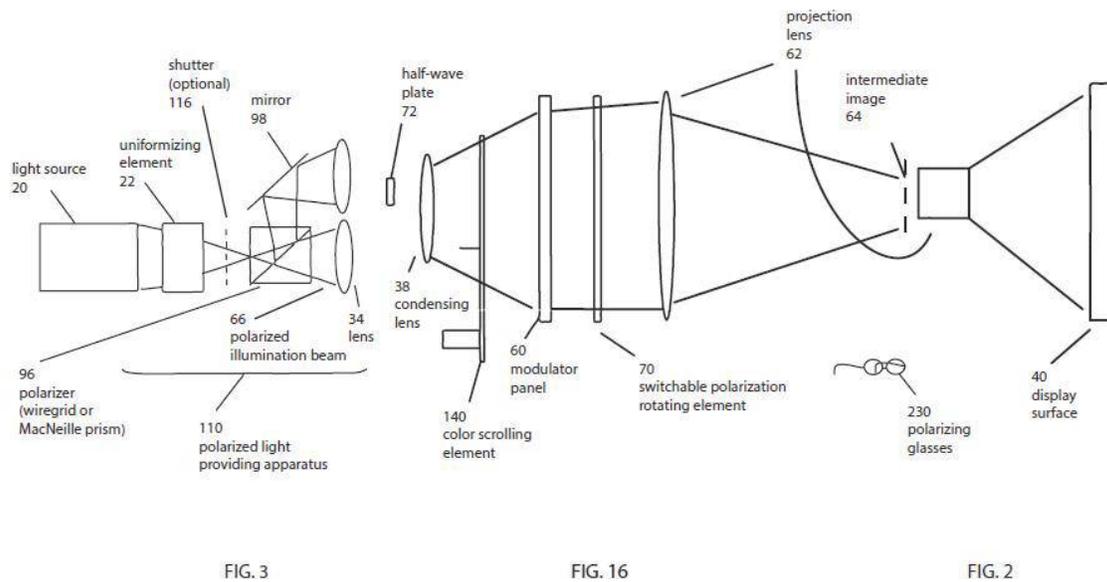
**FIG. 16**

Figure 16 of Silverstein illustrates an alternative embodiment making use of switchable polarization rotating element 70. Ex. 1004, 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. *Id.* at 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 16:17–22.

Petitioner prepared a composite illustration, which Petitioner refers to as “FIGs. 3/16/2,” that shows a combination of Figures 2, 3, and 16 extending from light source 20 at one end to projection screen 40 on the other end. Pet. 23. Petitioner’s “FIGs. 3/16/2” is shown below:<sup>2</sup>

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<sup>2</sup> Petitioner’s composite 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



The above-reproduced illustration shows the full embodiment of Silverstein’s Figure 16, extending from light source 110 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. 1004, 7:59–8:3.

## 2. Discussion

Claims 1–13, 15, and 22 recite, *inter alia*, “a polarizing splitting element configured to receive image light energy and split the image light energy[.]” Ex. 1001, 12:22–23, 14:17–18. Claim 16 recites, *inter alia*, “receiving image light energy” and “splitting the image light energy received[.]” *Id.* at 13:17–18. Claims 17–21 recite, *inter alia*, “a splitter configured to split the image received[.]” *Id.* at 13:32.

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apparatus that can be used as light source 210 in Figure 2. Ex. 1004, 7:51–56.

Petitioner contends that Silverstein discloses the subject matter of the claims, except that Silverstein “split[s] randomly polarized *white* light into s- and p- polarized light for downstream use in image formation, whereas the ’455 patent uses a polarizing splitter to split randomly polarized *image* light into s- and p- polarized light.” Pet. 23–24. Petitioner asserts, however, that it would have been obvious to one of ordinary skill in the art to move the image formation “up-front,” so that image light is projected to Silverstein’s polarizer. *Id.* at 26.

Petitioner asserts that one of ordinary skill in the art would have recognized that Silverstein discloses, via Petitioner’s composite figure “FIGs. 3/16/2,” “two subsystems which are conceptually separable.” Pet. 24. The first subsystem, directed to image modulation, includes color scrolling element 140 and modulator panel 60. *Id.* The second subsystem, directed to providing stereographic viewing of the modulated image, includes switchable polarization rotating element 70. *Id.* at 24–25. According to Petitioner, light source 20, polarizer 96, mirror 98, and half-wave plate 72 are “common to both the image modulation and the stereographic viewing subsystems.” *Id.* at 24. Additionally, Petitioner asserts that “Silverstein teaches that ‘this same type of polarization switching could provide alternating left- and right-eye images for stereographic viewing when used with other light modulation arrangements.’” *Id.* at 25 (quoting Ex. 1004, 16:31–34).

Thus, Petitioner contends:

Based on this disclosure and recognizing the separability of the FIGs. 3/16/2 image modulation and stereographic viewing subsystems, one of ordinary skill in the art in projection devices would have found it obvious to employ the stereographic viewing subsystems with a type of light modulation system in

which the light energy is modulated by the image and then projected to the polarizer 96.

*Id.* (citing Ex. 1003 ¶ 23).

Petitioner further asserts that, although Silverstein primarily concerns use of polarized light by a liquid crystal (“LC”) panel, Silverstein also describes “a competing technology, digital micromirror devices (DMD), in comparison to motion picture image formation based on the use of print film. *Id.* at 25–26 (citing Ex. 1004, 3:3–18). Petitioner contends that, because one of ordinary skill in the art would have known that DMD and print film modulate an image onto randomly polarized light and Silverstein’s light source 20 provides randomly polarized light, one of ordinary skill in the art would have been aware of “the potential use of either DMD or print film as ‘other light modulation arrangements’ to which the FIG. 16 polarization switching system is applicable.” *Id.* at 26. According to Petitioner, “[i]mplementation of DMD or print film modulation would have resulted in moving image formation ‘up-front’ so that image light is projected to the Silverstein FIG. 3 polarizer 96.” *Id.* (citing Ex. 1003 ¶ 24).

Patent Owner raises several arguments in response to this challenge by Petitioner, including that Petitioner fails to provide motivation “for applying Silverstein’s teachings to DMD technology.” Prelim. Resp. 17. Patent Owner also asserts that, even assuming that Silverstein’s disclosure can be divided into two separate subsystems and rearranged, as alleged in the Petition, Petitioner does not “provide reasons for why one would be motivated to do so.” *Id.* at 18–19.

We agree with Patent Owner that Petitioner fails to explain adequately why one of ordinary skill in the art would have been prompted to rearrange

Silverstein's elements as Petitioner proposes. First, Silverstein's indication that "the same type of polarization switching could provide alternating left- and right-eye images . . . when used with other light modulation arrangements" (Ex. 1004, 16:31–34), does not, in and of itself, provide a reason to modify Silverstein's arrangement in the specific manner proposed by Petitioner. Second, paragraphs 23 and 24 of the Brennesholtz Declaration do not provide an additional reason or explanation as to why one of ordinary skill in the art would have been prompted to rearrange Silverstein as proposed. Third, even if one of ordinary skill in the art would have been prompted to combine some or all of Silverstein's elements with DMD or print film modulation, Petitioner has not explained adequately why any such combination would have resulted necessarily in "moving image formation 'up-front' so that image light is projected to . . . Silverstein[']s . . . polarizer 96." Pet. 26. Petitioner's conclusory statement to that effect fails to provide a reason that such result would necessarily occur.

Accordingly, on the record before us, Petitioner has not established a reasonable likelihood of prevailing on the assertion that Silverstein would have rendered the subject matter of any of claims 1–13 and 15–22 obvious to one of ordinary skill in the art at the time of the invention.

*B. Obviousness of Claims 1–23 over Silverstein and APA*

Petitioner asserts that Silverstein and APA would have rendered the subject matter of claims 1–23 obvious to one of ordinary skill in the art at the time of the invention. Pet. 14. Petitioner's position on this ground is similar to that asserted with respect to the previous ground. Namely, Silverstein discloses the elements of the claims, except for "image light." *See id.* ("Applicant Admitted Prior Art Provides Additional Motivation To

Use Silverstein’s Stereographic Projection Technique With Image Light”). In the context of this challenge, however, Petitioner relies upon Figure 1A of the ’455 patent for its disclosure of image light. *See id.* at 37 (“Like the prior art projector system illustrated in FIG. 1A of the ’455 patent, in theater projection systems using DMD devices and print film produce an image in which the image light is not polarized, but the projector outputs a synchronization signal which can be used to drive a polarization modulator, such as a prior art ZScreen (*e.g.*, ZScreen 103 in prior art FIG. 1A . . . ).” (citing Ex. 1004, 3:3–18)).

Petitioner contends that its composite figure “FIGs. 3/16/2,” reproduced above (*see supra* Section III.A.1.), “illustrates [Silverstein’s] technique for increasing image brightness that includes three principal elements – polarizer (beam splitter) 96, mirror (reflector) 98, and half-wave plate (retarder) 72.” *Id.* at 36. Petitioner asserts that, in light of Silverstein’s teaching that the same type of polarization switching can be used with other light modulation arrangements, one of ordinary skill in the art would have been motivated to apply Silverstein’s “technique for increasing image brightness to such prior art stereoscopic image projection systems.” *Id.* (“[O]ne of ordinary skill in the art would have found it obvious, and would have been motivated, to generate the image, use Silverstein’s technique for increasing image brightness, and direct the brighter image to a polarization modulator (*e.g.*, ZScreen 103 in prior art FIG. 1A of the ’455 patent; polarization modulator 70 in FIGs. 3/16/2 of Silverstein) (citing Ex. 1004, 3:3–18)).

Additionally, Petitioner asserts that, “[s]tated another way, the reason to combine Silverstein with the [APA] is to increase efficiency (and

therefore brightness) in a projection apparatus having modulation elements which operates on a defined state of linearly polarized light.” Pet. 40. Petitioner contends that Silverstein “addresses the need for increasing efficiency by disclosing the arrangement of the polarizer 96, mirror 98, and half-wave plate 72, as shown in FIGs. 3 and 16, which is the same arrangement of the same components utilized in the ’455 patent.” *Id.*

Patent Owner raises several arguments in response to this challenge, including that Silverstein’s disclosure regarding other light modulation arrangements does not support Petitioner’s position that one of ordinary skill in the art would have been motivated to use Silverstein’s polarizer, mirror, and half-wave plate with the light modulation arrangement shown in Figure 1A of the ’455 patent. Prelim. Resp. 27–28.

*I. APA*

Figure 1A of the ’455 patent is shown below:

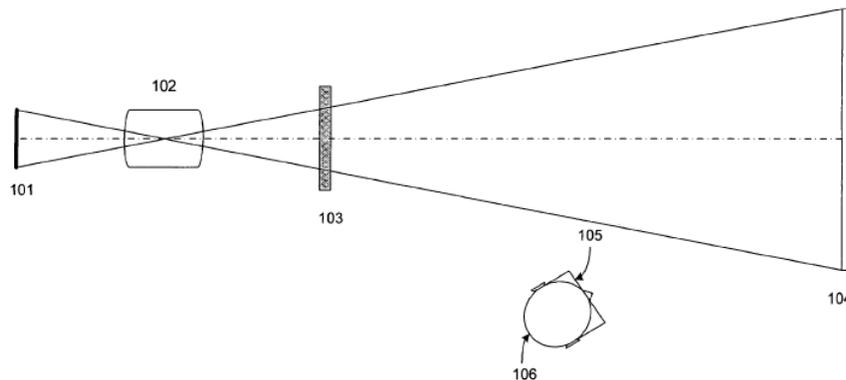


Figure 1A of the ’455 patent “illustrates a previous single path projection system design[.]” Ex. 1001, 2:44–45. Figure 1A “uses a single projector having imaging surface 101 and lens 102” and employs ZScreen 103, which “switches its characteristics of polarization at field rate between left and right handed circularly polarized light[.]” *Id.* at 3:25–27,

43–46. “Observer 106 wearing polarizing image selection eyewear 105 views the image projected on screen 104[.]” *Id.* at 3:35–37.

## 2. *Silverstein*

Silverstein’s Figure 16 is described above. *See supra* Section III.A.1. Silverstein’s disclosure at column 16, lines 16 through 31, principally describes switchable polarization rotating element 70 and alternatives, such as “an electrically induced retarder” and a “rotating half-wave plate[.]” that could be used “as switchable polarization rotating element 70.” Ex. 1004, 16:16–29. Silverstein then states “[t]his same type of polarization switching could provide alternating left- and right-eye images for stereoscopic viewing when used with other light modulation arrangements as well as with color scrolling element 140.” *Id.* at 16:31–35. As an example, Silverstein describes using a single modulator panel 60 and color separator 78 with polarization rotating element 70. *Id.* at 16:35–39.

## 3. *Discussion*

Petitioner’s citation to and reliance upon Silverstein’s teaching regarding Figure 16 and the use of the same type of polarization switching with other light modulation arrangements does not provide persuasive support as to why one of ordinary skill in the art would have been motivated to generate the image, use Silverstein’s technique for increasing image brightness, and direct the brighter image to a polarization modulator, as alleged by Petitioner. First, as argued by Patent Owner, the focus of Silverstein’s discussion is switchable polarization rotating element 70, not the alleged importance of polarizer 96, mirror 98, and half-wave plate 72. Polarizer 96 and mirror 98 are not shown in Figure 16 and are not discussed in Silverstein’s description of switchable polarization rotating element 70

and alternatives, such as “an electrically induced retarder” and a “rotating half-wave plate[,]” that could be used “as switchable polarization rotating element 70,” discussed above. Ex. 1004, 16:16–29. Thus, Petitioner’s argument relies upon an inadequately supported inferential leap that Silverstein’s disclosure suggests the modifications proposed by Petitioner’s combination. Second, because of this deficiency, Petitioner’s argument fails to explain persuasively why it would have been obvious to one of ordinary skill in the art to incorporate only polarizer 96, mirror 98, and half-wave plate 72 from Silverstein and combine them with the prior art design of Figure 1A of the ’455 patent in the particular manner proposed by Petitioner. Third, paragraphs 26 through 28 of the Brennesholtz Declaration are substantially identical to pages 36 through 38 of the Petition and, thus, do not provide evidence beyond the arguments discussed above.

The above-identified deficiencies in Petitioner’s arguments ultimately render Petitioner’s challenge on this ground unpersuasive for the reasons discussed above and for reasons similar to those explained in the context of Petitioner’s challenge based solely on Silverstein.

Petitioner also relies upon U.S. Patent No. 7,198,373 B2 (Ex. 1005, “Silverstein ’373”) in this challenge to claims 1–23 based on Silverstein and APA, but does not explain clearly Silverstein ’373’s applicability to Petitioner’s challenge. Having considered Petitioner’s arguments with regard to Silverstein ’373 and how it is applied, as well as Patent Owner’s responsive arguments directed thereto, we are not persuaded that Petitioner’s arguments regarding Silverstein ’373 help to support Petitioner’s position to show a reasonable likelihood of prevailing on the alleged ground based on Silverstein and APA.

Accordingly, on the record before us, Petitioner has not established a reasonable likelihood of prevailing on the assertion that Silverstein and APA would have rendered the subject matter of any of claims 1–23 obvious to one of ordinary skill in the art at the time of the invention.

#### IV. CONCLUSION

For the foregoing reasons, we conclude that the information presented in the Petition does not demonstrate that there is a reasonable likelihood that Petitioner would prevail in challenging any of claims 1–23 of the '455 patent as unpatentable under 35 U.S.C. § 103(a).

#### V. ORDER

In consideration of the foregoing, it is:

ORDERED that the Petition is *denied* as to all challenged claims of the '455 patent; and

FURTHER ORDERED that no *inter partes* review is instituted.

IPR2015-00033  
Patent 7,857,455 B2

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