
United States Court of Appeals
for the
Federal Circuit

CASCADES PROJECTION LLC,

Appellant,

— v. —

EPSON AMERICA, INC., SONY CORPORATION,

Appellees.

ON APPEAL FROM THE UNITED STATES PATENT AND TRADEMARK OFFICE
IN CASE Nos. IPR2015-01206 and IPR2015-01846

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SONY CORPORATION

2. Name of Real Party in interest (Please only include any real party in interest NOT identified in Question 3) represented by me is:

None

3. Parent corporations and publicly held companies that own 10% or more of stock in the party:

None

4. The names of all law firms and the partners or associates that appeared for the party or amicus now represented by me in the trial court or agency or are expected to appear in this court (and who have not or will not enter an appearance in this case) are:

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Parties

Cascades	Cascades Projection, LLC
Sony	Sony Corporation
Epson	Epson America, Inc.

Patents and References

'347 patent	U.S. Patent No. 7,688,347
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Defined Terms

APA	Administrative Procedure Act
Board	Patent Trial and Appeal Board
IFE	Image-forming element
USPTO	United States Patent and Trademark Office

STATEMENT OF RELATED CASES

Under Federal Circuit Rule 47.5, Appellee Sony Corporation identifies the following cases that might directly affect or be affected by this Court's decision:

- *Cascades Projection LLC v. Epson America, Inc. et al.*, Case No. 2:15-cv-00258-SJO-RZ (C.D. Cal.)
- *Epson America, Inc. v. Cascades Projection LLC*, No. IPR2015-01206 (PTAB)
- *Cascades Projection LLC v. Barco, Inc. et al.*, Case No. 2:15-cv-00271-SJO-RZ (C.D. Cal.)
- *Cascades Projection LLC v. Christie Digital Systems USA, Inc.*, Case No. 8:15-cv-00050-SJO-RZ (C.D. Cal.)
- *Cascades Projection LLC v. NEC Display Solutions of America, Inc.*, Case No. 2:15-cv-00273-SJO-RZ (C.D. Cal.)
- *Cascades Projection LLC v. Sony Corporation of America, Inc. et al.*, Case No. 2:15-cv-00274-SJO-RZ (C.D. Cal.)

STATEMENT OF THE ISSUES

The issues raised in this appeal are as follows:

1. Whether the Board correctly construed the three disputed claim terms of U.S. Patent No. 7,688,347 (“the ’347 patent”)—namely, (1) the “means for focusing” limitation of claim 29, (2) the “means for enhancing brightness” limitations of claims 47 and 69, and (3) “Fresnel polarizer” of claims 48 and 69.
2. Whether the Board’s invalidity determinations regarding the seven challenged claims of the ’347 patent are supported by substantial evidence.
3. Whether *inter partes* review of patent claims by the Patent Trial and Appeal Board (the “Board”) is a constitutional exercise of Article II power.

STATEMENT OF THE CASE

This is an appeal of the Board’s final written decision (the “Decision”), entered May 20, 2016, in IPR2015-01846, finding claims 29, 30, 32, 33, 47, 48, and 69 of the ’347 patent invalid as either anticipated or obvious. Appx67. The Board’s Decision came after a separate, but overlapping, panel found the same claims¹ invalid in light of different prior art asserted by Epson in a parallel *inter partes* review proceeding, IPR2015-01206. In both proceedings, the Board properly construed the disputed claim terms, weighed competing expert testimony, and correctly analyzed the prior art in finding the claims invalid.

On appeal, Cascades does not dispute most of the Board’s specific findings. Rather, Cascades focuses on a rehash of its erroneous claim construction arguments. Those arguments—presented and rejected during the two IPR proceedings—reflect little more than transparent attempts to avoid clearly invalidating prior art by (1) distorting the claims’ means-plus-function terms and (2) by importing limitations from the preferred embodiments into the claims. For the same reasons given by the Board, these claim construction arguments all fail as contrary to the record and the law.

¹ The *Epson* and *Sony* proceedings challenged the same claims of the ’347 patent, with the exception of claim 47, which only Sony challenged.

To the limited extent Cascades does raise arguments on appeal concerning the Board's fact finding, they stand in stark contrast to the substantial evidence in the record. These arguments also fail.

Cascades' effort to rewrite history regarding the named inventor's allegedly painstaking inventive efforts—all with virtually no support from the record and all new on appeal—does nothing to alter how the claims should be construed nor does it compel a different conclusion regarding the validity of the claims. The simple fact is, even if true, it would be too little, too late.

The Board was correct in determining that Sony had a reasonable likelihood of prevailing on its challenges, and also correct that Sony had shown by *at least* a preponderance of the evidence that claims 29, 30, 32, 33, 47, 48, and 69 are invalid as anticipated or obvious in light of the prior art. The Board's Decision should be affirmed in all respects.

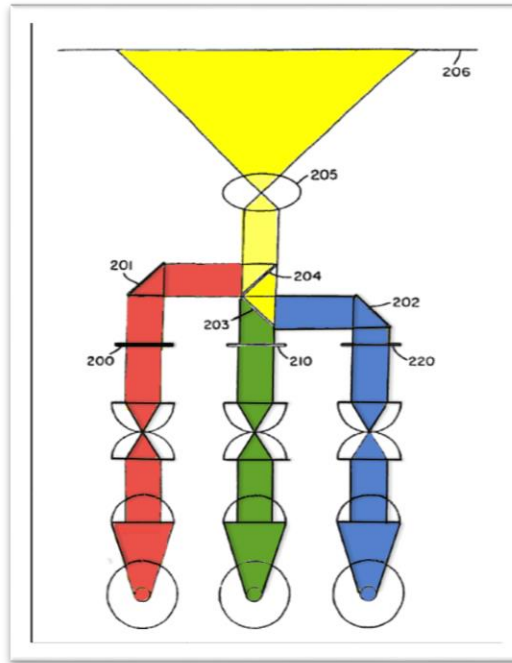
I. THE '347 PATENT

The '347 patent is entitled "High-Efficiency Display System Utilizing An Optical Element To Reshape Light With Color And Brightness Uniformity," and recites 73 claims, 22 of which are independent. It was filed on April 3, 2002, and issued on March 30, 2010, after nearly eight years of prosecution, with Eugene Dolgoff of Westbury, NY named as the sole named inventor. Appx2519.

On its face, the '347 patent claims priority to an application filed 11 years earlier on February 21, 1991. *Id.* Cascades, however, contends that the claimed inventions were not disclosed until three years later on April 4, 1994, which Cascades submits is also the correct priority date. Cascades takes that position in a Petition for Reconsideration and Final Agency Action currently pending before the United States Patent and Trademark Office ("USPTO"). For purposes of the proceeding below and this appeal, Sony has accepted the later priority date; the resolution of this appeal is not contingent on that issue.

The '347 patent is generally directed to projection-type display systems, such as liquid crystal display (LCD) projectors. *Id.* A projector's overall brightness is a function of light successfully making it from the light source to the projection lens. *See* Appx3586-3587 ¶74. Because of the number of different components in the optical path from the light source to the projection lens, the distance the light must travel from one end to the other, and the nature of light itself, much of the original light power emitted from the light source can be lost along the way. *Id.*

Figure 2, for example, depicts a schematic view of one projector embodiment of the invention, "in which the images of the three LCDs are internally superposed and projected onto a common screen employing one set of projection optics." Appx2572 6:25-27.



'347 Patent, Figure 2

Appx2522.² The Figure shows that light must pass through numerous elements before a full-color image can be projected. Specifically, after passing through a series of lenses, “[r]ed image information from light valve 200 reflects off front-surface mirror 201 to dichroic mirror 204 which reflects red light but passes blue and green light.” Appx2575 11:4-7. Similarly, blue light “from LCD 220 reflects off front surface mirror 202 and then off dichroic mirror 203, which reflects blue light but permits green light to pass and then passes through dichroic mirror 204.”

² For ease of understanding, the figure has been annotated with color. In actual operation, the light sources emit white light, which becomes red, green, or blue as it passes through light valves 200, 210, and 220. It is then recombined before being projected.

Id. at 11:8-10. Finally, a “totally registered full-color image is [] projected by projection optics 205 onto screen 206.” *Id.* at 11:10-12.

The '347 patent teaches that one known cause of light-use inefficiency in display systems “relates to the fact that each pixel of the frame is surrounded by an opaque border that contains addressing circuitry or physical structure.” Appx2571 4:18-20. Any light that is incident upon the opaque border, rather than the pixel hole, will not be transmitted through the pixel for projection. To focus more light on the pixels rather than the borders, one or more lens arrays are placed before the light valve to better illuminate the pixels, and thus get more light to the projection lens.

The '347 patent acknowledges that another “problem common to all projection systems is the efficiency of the light collection optics.” Appx2585 32:55-56. It explains that, because of the nature of the light sources used in those systems, “[u]sually, only a small percentage of the light produced . . . is actually collected and utilized” *Id.* at 32:56-58; *see also id.* at 32:58-67. To address this problem, the '347 patent teaches the use of internally reflective “light tunnels,” which generally operate along similar lines as fiber optic cables to transmit light. Appx2586 34:10-19. It further explains that light tunnels, which take many different shapes and sizes, can act as concentrators “to obtain . . . more uniform illumination

of the image forming element and [] shap[e] the light beam to conform to the shape of the IFE.” *Id.* at 34:15-20.

To improve display system efficiency, the ’347 patent also teaches an allegedly improved polarizer type called a “Fresnel polarizer.” LCD projection imaging systems polarize incident light, which can then be either blocked or passed by the light valve (*i.e.*, the image-forming element). Appx3584-3587 ¶¶69-74. As the ’347 patent explains, and as practitioners in the field already knew, “a better solution which [] alleviates the inefficiency of sheet polarizers is to use a MacNeille prism for polarization.” Appx2590 42:65-66. MacNeille prisms do not absorb light, which causes deleterious heating, and instead split polarized light into orthogonally polarized components allowing more light to be used by the system. *Id.* at 42:50-61; *see also* Appx3596-3597 ¶97. But this often “require[s] a heavy, large, solid beam splitter cube which is expensive to produce and consumes much space.” Appx2591 43:50-53.

To improve on this device, Dolgoff claims to have “devised a ‘Fresnel MacNeille prism,’ which functions as a MacNeille prism beam splitter but has . . . a multiplicity [o]f tiny saw-tooth surfaces, each behaving as a normal prism.” *Id.* at 44:2-6. This “Fresnel polarizer,” which is depicted in Figures 64, 78-82, and 85, is said to “weigh[] much less than a prism [and] consume[] less space” Appx2591

44:6-8; *see* Appx2562 figs.64A-B, Appx2566-2567 figs.78-82, and Appx2569 fig.85.

II. THE PATENT CLAIMS AT ISSUE

The claims at issue are specifically directed to projection-type display systems that purport to make use of the optical elements discussed above—pixels, input lens arrays, light tunnels/concentrators, and Fresnel polarizers.

There are three independent claims, each of which is directed to “a display system” and recites a means-plus-function limitation (identified in bold emphasis). Independent claim 29, recites the following:

A display system comprising:

a light source;

an element having pixels, said element being capable of having an image formed thereon; and

means for focusing different segments of a light beam emanating from said light source onto said element at proper angles such that light is focused onto the pixels of said element, comprising at least one input lens array located between said light source and said element

Appx2601 63:32-38.

Claims 30, 32, and 33 each depend from claim 29. Claim 30 recites another means-plus-function limitation, “means for bringing light from different sections of the light beam emanating from said light source to foci.” *Id.* at 63:39-41. Claim 32 recites “wherein the element has a size, wherein a focused image has the same size

as said element.” *Id.* at 63:45-47. Claim 33 recites “further comprising a field lens located near said element.” *Id.* at 63:48-49.

Independent claim 47, like claim 29, includes a mean-plus-function limitation, and recites the following elements:

A display system comprising:

a light source;

an [electronic image-forming] element capable of having an image formed thereon, said [electronic image-forming] element having a predetermined shape; and

means for enhancing brightness of an image by shaping a beam illuminating said [electronic] image-forming element such that the shape of the beam substantially matches the shape of said [electronic] image-forming element.

Id. at 64:32-39.

Independent claim 69 omits all the bracketed text above, but otherwise recites the same limitations as that of claim 47, with one exception. Claim 69 further recites the limitation that “said enhancing means also includes a Fresnel polarizer means,” as does dependent claim 48. Appx2602-2603 66:66-67:6; *see also* Appx2601 64:40-41.

III. THE PRIOR PROCEEDINGS

A. District Court Action Against Sony

On January 13, 2015, Cascades filed a complaint in the Central District of California, alleging that Sony Corporation of America and Sony Electronics Inc.

infringe the '347 patent by making, using, selling, offering to sell, and importing certain LCD projectors. Cascades initiated the action not as the owner of the '347 patent, but as an alleged exclusive licensee of Mr. Dolgoff. In that action, Cascades asserted claims 29, 30, 32, 33, 48, and 69 of the '347 patent against the Sony Defendants.

Cascades also filed virtually identical actions in the same district court against Epson America, Barco, Christie Digital Systems, and NEC Display Solutions. Pursuant to the actions initiated by Cascades in federal court, named defendants in each action petitioned the Board for *inter partes* review.³ In view of the *inter partes* review proceedings, and at the request of the parties, the district court stayed the litigation pending their resolution.

B. Sony's IPR Petition

Sony filed a petition for *inter partes* review on September 1, 2015, challenging claims 29, 30, 32, 33, 47, 48, and 69 and alleging three grounds of invalidity. In particular, Sony raised the following challenges:

- Ground 1: Claims 29, 30, 32, and 33 are unpatentable under former 35 U.S.C. § 102(e) over U.S. Patent 5,689,315 to Fushimi.

³ Epson and Sony challenged the same claims and asserted different prior art, with the exception of Sato. The *Epson* IPR was instituted (Appx1283), and the Board found each challenged claim invalid. See Appx30-31.

Fushimi discloses multiple embodiments of a light valve apparatus for use in a projection display system. Appx3155; *see also* Appx3182 3:43-47. The light valve apparatus comprises two or more lens arrays placed in series before the light valve itself. *See* Appx3156-3159 figs.1-4, Appx3183 6:5-39, and Appx3184 7:43-55. The arrays work together to direct light through the pixels, thus increasing the overall brightness of the projected images. Appx3185 9:25-35; *see also* Appx3181 2:18-28.

- Ground 2: Claim 47 is unpatentable under former 35 U.S.C. § 102(b) over U.S. Patent 4,912,614 to Goldenberg.

Goldenberg teaches the use of light tunnels to increase the amount of light that reaches the light valve. In particular, Goldenberg discloses a light tunnel in “the form of a non-imaging reflector having a rectangular output aperture.” Appx3194 (Goldenberg); *see also* Appx3197. The reflector is a hollow tunnel with internally reflective surfaces; the reflector’s output aperture matches the shape of the light valve. Appx3199 2:8-12.

- Ground 3: Claims 48 and 69 are unpatentable under former 35 U.S.C. § 103(a) over Goldenberg in view of either U.S. Patent No. 5,566,367 to Mitsutake or U.S. Patent No. 5,042,921 to Sato.

Mitsutake teaches replacing the conventional, cube-shaped polarizing beam splitters of prior art liquid crystal-based projection display systems with smaller, more compact beam-splitters that accomplish the same function. Appx3205 fig.2 (Mitsutake), Appx3214 1:54-61; *see also* Appx3218 9:52-58.

Likewise, Sato also “relates to an improvement in a liquid crystal display apparatus,” Appx3246 1:6-8 (Sato), and discloses means for more effectively utilizing the light from a light source. Appx3223. In particular, Sato teaches the use of a compact beam-splitting polarizer with a sawtooth interface that, together with other components, is capable of using nearly all the light from the light source. *See, e.g.,* Appx3229 fig.7; *see also* Appx3248 6:49-7:9 and Appx3249 7:23-25. As in Mitsutake, the beam-splitter of Sato has the advantage of being more compact than a conventional MacNeille prism beam splitter. *See* Appx3229 fig.8.

With its petition, Sony also filed a supporting declaration from Professor Alan Willner. *See* Appx3560. Dr. Willner is the Chaired Professor of Engineering at the University of Southern California, where he has been since 1992. Appx3720. Dr. Willner’s expertise lies in, among other subjects, optics and optical elements—the precise technical area covered by the ’347 patent.

C. Cascades’ Preliminary Response and the Board’s Institution Decision

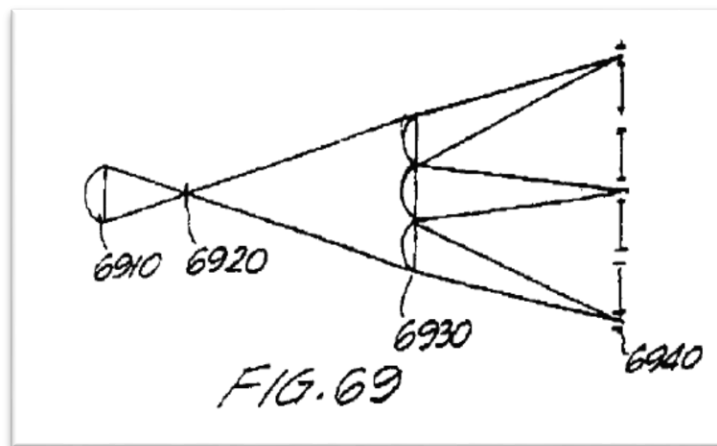
On December 14, 2015, Cascades filed a preliminary response, opposing each of the challenged grounds. *See* Appx3826-3902. Cascades’ arguments against institution were largely premised on claim construction positions regarding the means-plus-function limitations in claims 29, 30, 47, and 69.

The Board issued its decision to institute on February 26, 2016, concluding that Sony’s petition “demonstrates a reasonable likelihood of prevailing in

establishing that claims 29, 30, 32, 33, 47, 48, and 69 are unpatentable over the prior art.” Appx4097. The Board therefore instituted trial on all three of Sony’s grounds with respect to each of the asserted prior art references—Fushimi, Goldenberg, Mitsutake, and Sato.

1. *Institution of Ground 1: Anticipation of Claims 29, 30, 32, and 33 by Fushimi*

With respect to ground 1, the Board first addressed the parties’ dispute regarding the proper construction of the “means for focusing” limitation of claim 29. Citing Sony’s expert testimony, the Board agreed with Sony that Figure 69 of the ’347 patent (shown below) is corresponding structure, and that the element input lens array 6930 performed the recited function. Appx4086-4088.

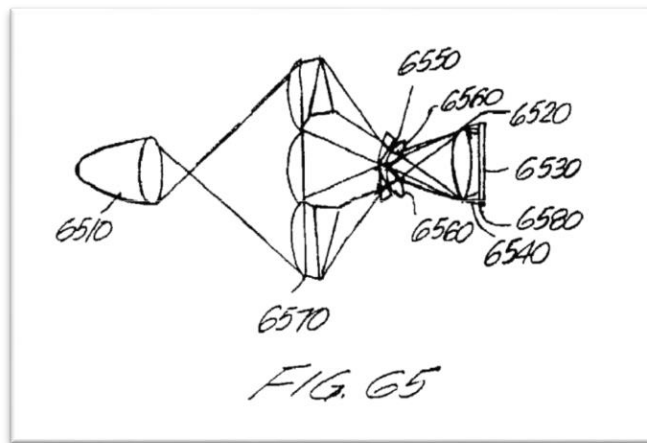


'347 Patent, Figure 69

Figure 69 depicts two input lens arrays arranged in series—input lens array 6910, followed by input lens array 6930. Appx2594-2595 50:67–51:2. The figure is intended to illustrate how the lens arrays, when properly positioned, focus light

(from a light source at left, not shown); for simplicity, it includes only one lens element of the first lens array and three of the second. Appx2594 50:67-15. The pixels 6940 of the IFE are at the right. Appx2595 51:2-4.

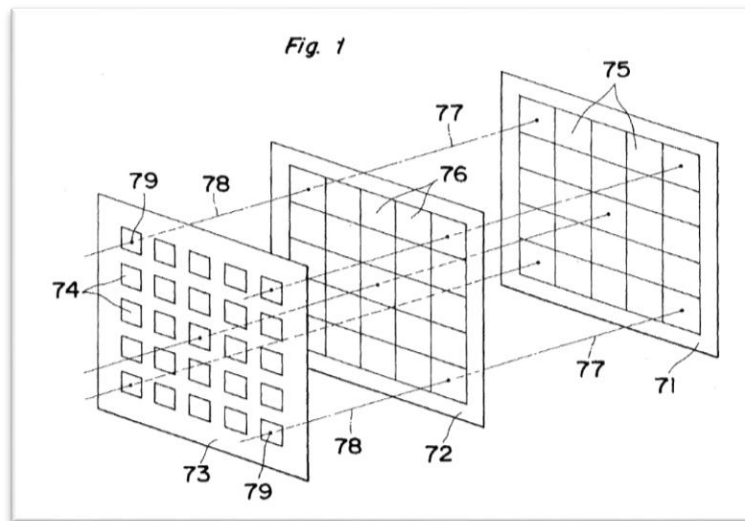
In reaching its conclusion regarding Figure 69 the Board first rejected Cascades' argument that Figure 69 focuses light into pixel holes, not "onto pixels." See Appx4086-4087. The Board noted that the Cascades itself did not distinguish between pixels and pixel holes, and was not persuaded that the claim amendment substituting "onto" for "into" changed the claim scope as urged by Cascades since "there was no discussion of this distinction by the applicant in the remarks cited by [Cascades]" *Id.* Second, the Board rejected Cascades' argument that "the Board's reliance on the Figure 65 embodiment in *Epson* precludes Petitioner's reliance here on Figure 69." Appx4087.



'347 Patent, Figure 65

Specifically, the Board found that “[w]here multiple embodiments in the specification correspond to the claimed function, the claims are not limited to any particular one of the disclosed embodiments.” *Id.*

The Board then turned to the anticipation of claim 29 and its dependent claims 30, 32, and 33 by Fushimi. It carefully analyzed Figures 1 and 2 of Fushimi, which disclose all of the elements of each of the claims. Appx4089-4092. Both Figures are reproduced below.

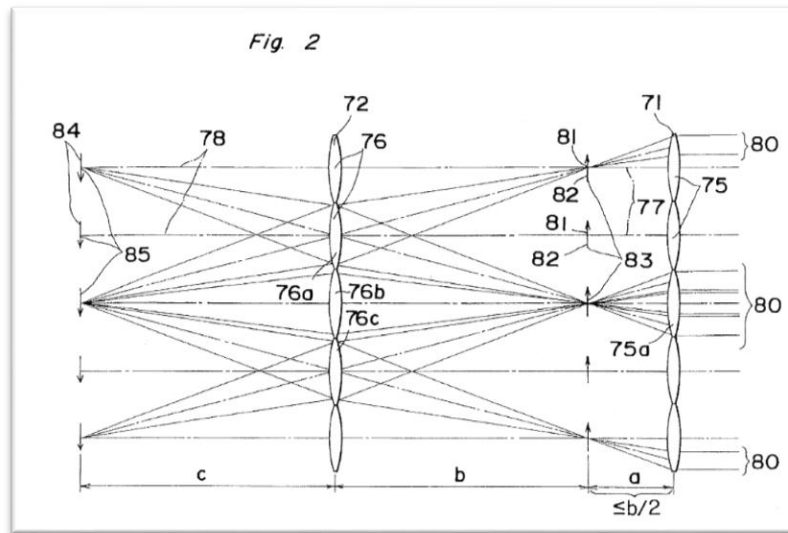


Fushimi, Figure 1

First, the Board explained that Figure 1 “shows a model of a light valve apparatus.” Appx4091 (*citing* Appx3248 at 6:5-6 (Fushimi)). As described by the Board, this figure depicts two lens arrays —arrays 71 and 72—arranged in series and placed on the light-source side of light valve 73, which itself is composed of pixels 74 in a square pattern. Each lens array is composed of multiple lens elements

75 and 76. Those elements are positioned so their optical axes (77 and 78) pass through the center of each pixel (79). Appx4091.

Second, the Board likewise explained that Figure 2 depicts “an optical path diagram corresponding to Figure 1.” *Id.* (citing Appx3248 6:27-28).



Fushimi, Figure 2

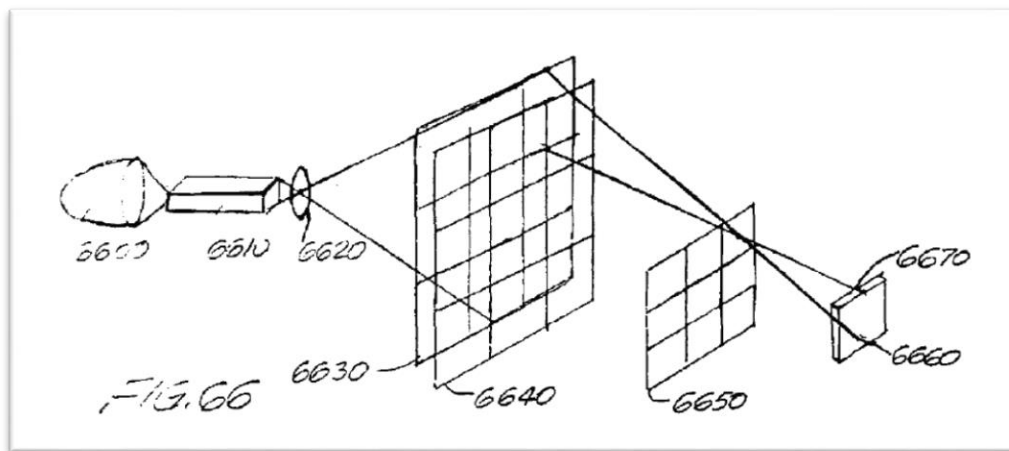
As described by the Board, this figure depicts light 80 from a light source (not shown, located at right) passing through both lens arrays (71 and 72), first being focused at each focal point 81 and then being focused into the pixels at 84, which are also not pictured. Appx4091-4092. The light from the second lens array (72) is made to “overlap[]” with the pixels. Appx4092. Like Figure 69 of the '347 patent, this figure shows only a few lens elements of each array for simplicity.

The Board was not persuaded by Cascades’ attempt to distinguish Fushimi based on the supposed distinction between focusing light *into pixels* and focusing light *onto pixels*. *Id.* The Board noted that Cascades had “not present[ed] any

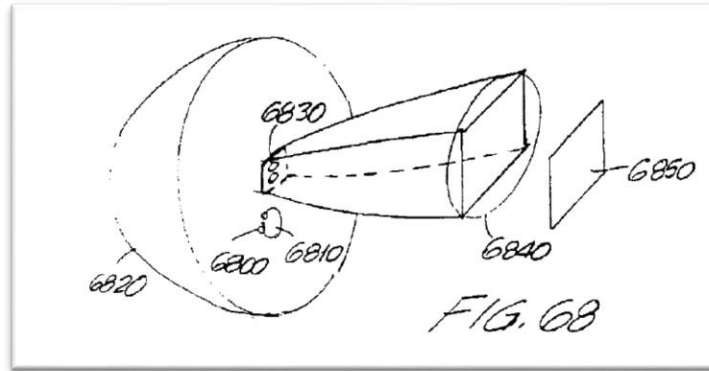
alternative arguments to distinguish Fushimi from” claims 29, 30, 32, and 33, and ruled that Sony had established a reasonable likelihood that it would prevail in its validity challenge based on Fushimi. Appx4093.

2. *Institution of Ground 2: Anticipation of Claim 47 by Goldenberg*

With respect to ground 2, the Board first addressed the proper construction of the “means for enhancing brightness” limitation of claim 47 (and also claim 69). The Board acknowledged that the parties did not dispute Sony’s identification of corresponding structure of the ’347 patent—namely, “the combination of light tunnel 6610 and lens 6620 in Figure 66 and [alternately] concentrator 6830 and lens 6840 in Figure 68.” Appx4088. These elements are shown below:



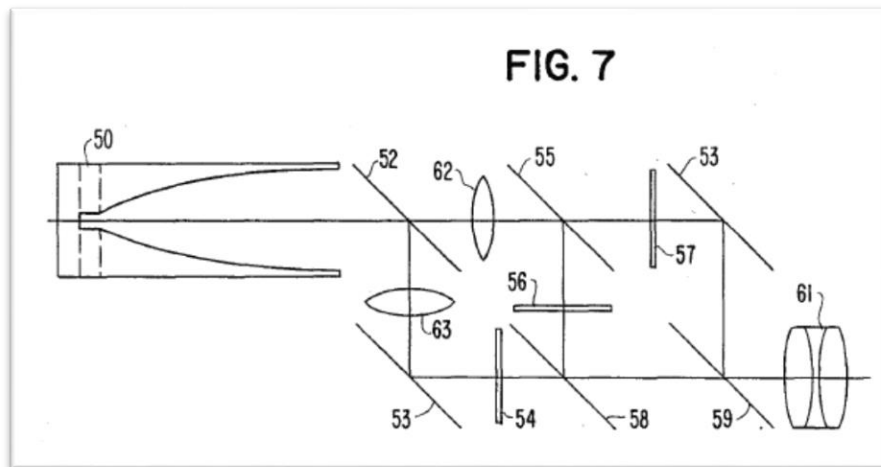
'347 Patent, Figure 66



'347 Patent, Figure 68

In the context of claim construction, Cascades had sought “a further definition of the term ‘light tunnel’” but, because the term “d[id] not appear” in the claims, the Board declined to construe it. *Id.* The Board did, however, discuss Cascades’ interpretation of this term specifically in the context of the Goldenberg prior art reference. *See* Appx4095-4096.

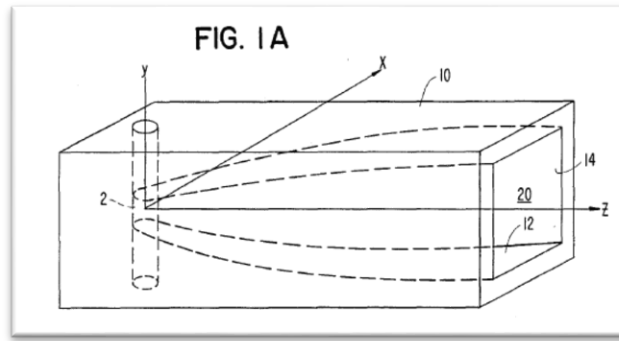
In addressing Sony’s anticipation argument regarding Goldenberg, the Board focused on Figure 7, shown below, which depicts a plan view of a single lamp system with dichroic filters for color separation and dichroic filters for combining the images. Appx3200 4:15-17.



Goldenberg, Figure 7

This figure shows a light source 50 within a non-imaging reflector (not numbered) with “a rectangular output aperture,” a series of dichroic filters 52, 55, 58, and 59, lenses 62 and 63, and three LCDs 54, 56, and 57. Appx4094 (Institution Decision). Red, green, and blue light is combined by lens 61, and then projected. *Id.*

Regarding the “means for enhancing brightness” limitation in particular, the Board acknowledged that Sony had identified “the combination of the [unnumbered] non-imaging reflector and lens 62” of Figure 7, together with the teaching that the reflector is “designed to have ‘a rectangular output aperture corresponding to the shape of the LCD.’” Appx4095. The latter teaching is reflected in Figure 1A below, which depicts the reflector in isolation:



Goldenberg, Figure 1A

Appx3195 fig.1A.

Cascades raised only a single argument to distinguish Goldenberg: that it did not meet the “means for enhancing brightness” limitation because it does not have a defined entrance and exit. The Board disagreed with Cascades, finding that “a light tunnel need not necessarily be a tube opened at both ends.” Appx4095. The Board noted that, even if it were to accept Cascades’ interpretation, “a person of ordinary skill would have considered that enclosing the light source in the reflector to be equivalent for at least the reasons set forth by [Sony’s expert] Dr. Willner.” Appx62 (citing Appx3689-3690 ¶¶330-332) (quotations omitted) .

The Board thus ruled that Sony had established a reasonable likelihood that it would prevail in its validity challenge based on Goldenberg. See Appx63.

3. *Institution of Ground 3: Obviousness of Claims 48 and 69 by Goldenberg in view Of Mitsutake or Sato*

With respect to ground 3, the Board agreed with Sony’s contention that Mitsutake and Sato each independently provide the one missing element in

Goldenberg—the “Fresnel Polarizer.” Appx4096-4097. The Board saw no reason to construe this disputed term any differently than it had in the *Epson* proceeding, and therefore adopted the construction “a polarizer constructed with stepped, sawtooth-like elements so as to have the optical properties of a much thicker polarizer.” Appx4089.

Pursuant to the Board’s scheduling order, Appx4102, Cascades filed its patent owner’s response on June 8, 2016, and Sony filed its reply brief on September 9, 2016. The parties each deposed the opposing side’s expert, and submitted the deposition transcripts as exhibits. *See* Appx4374, Appx5036. The Board held oral argument on November 21, 2016. *See* Appx4256-4310.

D. The Board’s Final Written Decision

The Board issued its 36-page final written decision on January 11, 2017, holding that all of the challenged claims are invalid. *See* Appx33-68.

1. *Claim 29: Construing “Means for Focusing” and Finding Anticipation by Fushimi*

The Board adopted the same construction for the “means for focusing” of claim 29 that it had in the Institution Decision, and found that Figure 69 was proper alternate corresponding structure because it was clearly linked to the recited function. Appx40-49. The Board further found that Fushimi disclosed all of the

limitations of claims 29, 30, 32, and 33, and thus that Sony had proven by a preponderance of the evidence that Fushimi anticipated those claims. Appx54-59.

Before the Board, Cascades made virtually no attempt to propose an affirmative construction and rather focused its arguments on the contention that Figure 69 could not serve as the corresponding structure for the “means for focusing.” According to Cascades, because the claim was modified to substitute “onto the pixels” for “into the pixel holes,” the claim term requires light to be ***brought to a focus*** on the surface of the IFE—***and nowhere else***. Appx4156-4161; *see also* Appx4832 103:3-14. Cascades further argued that “pixels” could not mean “pixel hole” because, according to it, some pixels allegedly have no depth, and thus cannot be considered to be a three-dimensional “hole.” Appx4158-4160.

The Board rejected each of Cascades’ arguments (Appx40-49), finding that the neither the intrinsic nor the extrinsic evidence gave rise to the distinction between ‘onto pixels’ and ‘into pixel holes’ urged by Cascades, or required any change from the construction set forth in the Institution Decision:

- *First*, the Board walked through each of the arguments raised by Cascades in connection with institution, primarily focused on an alleged difference between focusing light “into the pixel holes” and “onto the pixels,” and reaffirmed its rejection of those arguments and the support of the record for its analysis in the construction in the Institution Decision. Appx42-44.
- *Second*, the Board agreed that “means for focusing” limitation should not be interpreted to exclude focusing light into pixel holes. *Id.* Indeed, as recognized by the Board, the patent uses the terms “pixels” and

“pixel holes” interchangeably. Appx45; *see also* Appx4208-4210. And, the Board found that the amendment on which Cascades relied had in fact “effected no difference in claim scope.” Appx45. Pointing to a response to an office action subsequent to the amendment-at-issue, the Board found that the named inventor “continued to rely on the pre-amendment claim language ‘into pixel holes’ to distinguish prior art in post-amendment proceedings.” Appx44-45; *see* Appx3015 (’347 Patent Prosecution History) (“Faris does not disclose any means for focusing light at proper angles into pixel holes...”).

- *Third*, the Board rejected the testimony from Cascades’ expert as unsupportive of any distinction between pixels and pixel holes. *See* Appx45 (“Because it is both conclusory and evasive, we do not find this or the related testimony by Mr. Bohannon persuasive on this issue.”). And it credited Sony’s expert testimony that pixel holes and pixels are used interchangeably by the specification. *See* Appx46 (“In fact, after reviewing both experts’ testimony, we find Dr. Willner’s testimony more forthcoming and credible on these issues than Mr. Bohannon’s, and therefore credit it over Mr. Bohannon’s.”).
- *Fourth*, the Board rejected Cascades’ new argument that the claims must be construed such that light must be brought to focus on the surface of the IFE, and not in the pixel holes. Appx46-47. Consistent with the Institution Decision and its other findings, the Board found “this argument depends on making a distinction between pixels and pixel holes, which [the Board] determine[d] is not consistent with the ’347 patent or the record of this case. Appx46; *see also id.* (“[Cascades’ argument] lacks support in the ’347 patent specification for the further reason that it would exclude the input lens array in the Figure 65 embodiment preferred by Patent Owner, which the patent describes as focusing light ‘into the pixel holes.’”).

In contrast, the Board found Sony’s interpretation of the claim language to be wholly consistent with the ’347 patent specification. *See* Appx44, Appx49 (noting the ’347 patent’s interchangeable use of “pixels” and “pixel holes”). In particular, the Board cited numerous instances where the ’347 patent taught focusing light into

pixels rather than on the surrounding borders to avoid light waste. *See, e.g.*, Appx44 (citing Appx2588 37:2-5 ('347 Patent) ("Light focused by a lenslet ... instead of entering the pixel hole behind it, enters the next pixel over."), Appx2590 42:18-21 ("[A] separate lens array or arrays, as described later on herein, can focus each spectrum segment into its respective pixel so no light is wasted...."), Appx2593 48:7-9 ("To get around this problem, light must be crammed into the pixel holes, being made to miss the opaque areas between pixels."), Appx2595 51:10-12 ("All light goes through pixel holes and none is focused onto spaces between pixels.")).

Noting that a corresponding structure and the claim at issue need not use the same language to meet the clear linkage and association standard, the Board was "persuaded from Figure 69 itself, and the descriptions of lens array 6930 in the '347 patent, that a person of ordinary skill would identify that lens array with the claimed function" Appx47 (citing *Linear Tech. Corp. v. Impala Linear Corp.*, 379 F.3d 1311, 1322 (Fed. Cir. 2004)). In particular, the Board found that "input lens array 6930 performs the claimed function of focusing segments of a light beam into the pixel holes of element 6940 at a proper angle, such that light is not wasted." Appx47-48. Moreover, it found that the "patent specification describes the function of the input lens array arrangement in Figure 69 in terms that identify it with the claimed focusing means: '[a]ll light goes between pixel holes and none is focused into spaces between pixels.'" Appx47 (quoting Appx2595 51:10-11). Last, the

Board looked to the record and found that “credible testimony” offered by Sony’s expert supported finding Figure 69 as corresponding structure. Appx47-48; *see* Appx3635-3639 ¶¶196-206.

The Board also considered—and properly dismissed—Cascades’ argument, that besides not focusing light onto pixels, “input array 6930 does not focus beam segments emanating from a light source onto the [IFE].” Appx48; *see* Appx4156; *see also* BlueBr.52. The Board found that “testimony from [Cascades’ own] expert establishes the element [6930] performs the claimed function” of “focusing different segments of a light beam emanating from said light source.” Appx48 (quotations omitted). In particular, the Board found that Cascades’ expert testified both at deposition and in his sworn declaration “that lens arrays (such as element 6910 in Figure 69) split beams into separate segments.” *Id.* (citing Appx4797 68:7-8); *see also* Appx3572 ¶26. The Board also found that other testimony from Cascades’ expert “confirms that focusing of light beam segments by input lens array 6930 occurs when it focuses image 6920” Appx48 (quoting Appx4832 103:3-9).

Cascades raised two objections with respect to anticipation by Fushimi before the Board. *First*, it asserted its erroneous construction argument, contending that “the primary reason why Sony’s argument fails is that it put[s] all of its invalidity eggs into the wrong claim construction basket.” Appx56 (quoting Appx4178). The Board rejected Cascades’ argument for the reasons described above.

Second, Cascades argued below that Fushimi “does not disclose focusing any image – of anything – into pixel holes (whether or not this is the meaning of ‘onto the pixels’).” Appx57 (*quoting* Appx4178). Cascades contended that “Fushimi is silent about what relationship the second focal plane has with the light valve.” Appx4178. But after studying the competing expert testimony on this issue, the Board concluded that Sony’s expert was more credible and that his testimony “support[ed] [Sony’s] assertion that the ‘focusing means’ limitation is met by Fushimi.” Appx57; *see* Appx3656-3665 ¶¶251-270. Moreover, the Board found “further support for this conclusion [that Fushimi teaches focusing light into pixels] . . . in Figure 8 of Fushimi, which shows the focused rays incident on pixels 113a-113d.” Appx57; *see also* Appx3663-3664 ¶266, Appx3185 9:55-10:55. Apart from the predicate claim construction, the parties did not dispute that Fushimi met the additional limitations of claim 30.

The Board also found that Fushimi discloses the additional limitations of claims 32 and 33. Appx56-59. With respect to claim 32, the Board was not persuaded by Cascades’ argument that Fushimi does not disclose the limitation “the element has a size, wherein a focused image has the same size as said element” “because ‘Fushimi creates *a plurality* of much smaller focused images.’” Appx57 (*quoting* Appx4179-4180) (emphasis in original). On the contrary, the Board agreed with Sony that “Fushimi produces ‘an *overall focused image* on the IFE, which is

ultimately projected.” Appx57-58 (Final Decision) (*quoting* Appx4216) (emphasis in original); *see also* Appx3181 1:32-51, Appx3186 12:2-13. The Board found “support for this conclusion in the language of the claim itself” as well as “in the ’347 patent specification” and Sony’s expert’s testimony. Appx57-58; *see, e.g.*, Appx2563 fig.66, Appx2564 fig.69, and *id.* at fig.70 (showing formation of an image on the IFE), and Appx4889 160:4-7; *see also* Appx3671-3676 ¶¶287-296.

And with respect to claim 33, the Board rejected Cascades’ argument—which only addressed one of the eight lenses identified by Sony—that Fushimi does not disclose “‘a field lens located near said element having pixels’ *i.e.*, near the IFE” because of intervening optical elements. Appx58 (*quoting* Appx4180). The Board found instead that “[t]he claim does not require the field lens to be directly adjacent [to] the IFE and does not rule out intervening components.” Appx58. Relying on Sony’s “persuasive” expert testimony, the Board concluded that Fushimi did in fact disclose field lenses “near” to the liquid crystal panels, and thus satisfied the claim. Appx58-59; *see* Appx3676-3679 ¶¶297-304.

2. *Claim 47: Construing “Means for Enhancing Brightness” and Finding Anticipation by Goldenberg*

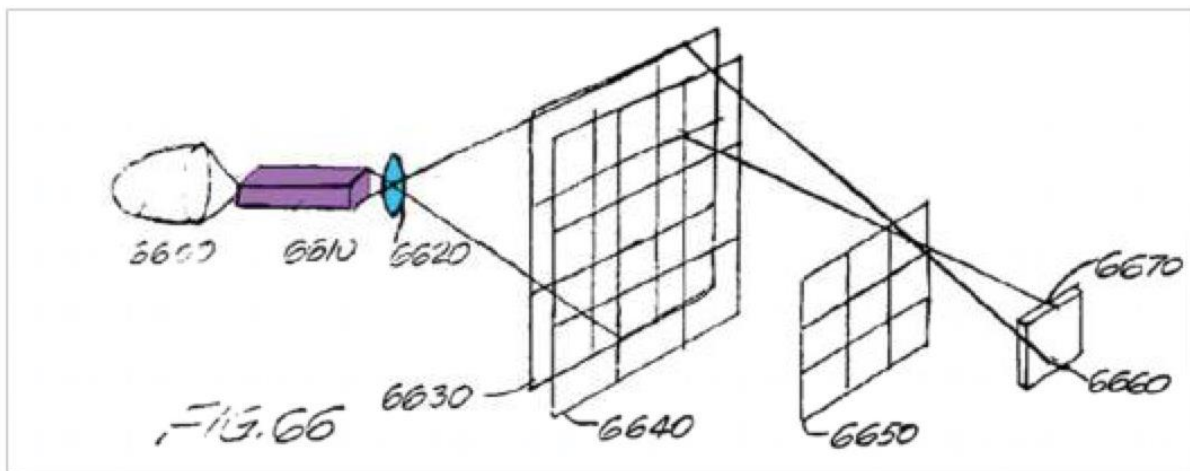
The Board also adopted the same construction for the “means for enhancing brightness” of claim 47 that it had in the Institution Decision, and agreed with the parties that Figures 66 and 68 of the ’347 patent each disclosed corresponding

structure. Appx49-51. Applying this construction, the Board found that Goldenberg disclosed all of the limitations of claim 47. Appx59-63.

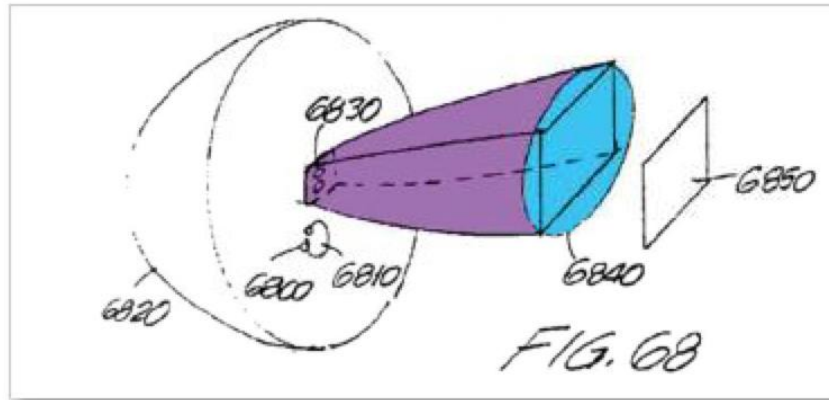
Before the Board, the parties and the Board agreed that the corresponding function for “means for enhancing brightness” is as stated in the claim itself:

[E]nhancing brightness of an image by shaping a beam illuminating said electronic image-forming element such that the shape of the beam substantially matches the shape of said electronic image-forming element.

Appx2481; *see also* Appx3889; Appx50. The Board and the parties further agreed that structures in the embodiments depicted in Figures 66 and 68, reproduced below, correspond to the “means for enhancing brightness” limiting function. *See* Appx2482-2484 and Appx3889.



347 Patent, Figure 66



'347 Patent, Figure 68

Specifically, the Board identified “the combination of light tunnel 6610 and lens 6620 in Figure 66” and “concentrator 6830 and lens 6840 in Figure 68” as corresponding structure. Appx50.

Despite the parties’ agreement, however, Cascades sought to distinguish Goldenberg by improperly imposing limitations using non-claim terms. Specifically, Cascades argued that, because “[t]he prosecution history provides an explicit definition for the [non-claim] term ‘light tunnel’ that amounts to both a definition and a disclaimer[,]” the claim must also be construed to include a tube having an entrance, exit, and external light source. BlueBr.25, 45-46; *see also* Appx4162-4164.

The Board properly rejected Cascades’ definition and disclaimer argument. *See* Appx50-51. Cascades relied on a single statement, made by the named inventor during prosecution to distinguish another reference (Faris), and directed to then-pending claim 44 (issued claim 38):

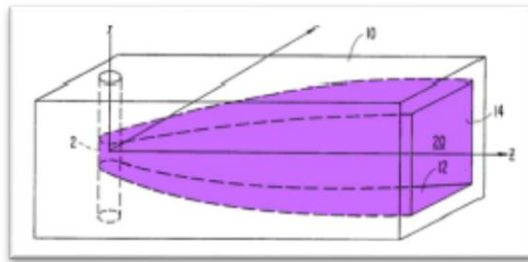
A light tunnel, as is known in the art, is a tube with a reflective inner surface that, when a light is shined into the entrance, causes the light to reflect multiple times and ultimately become ‘scrambled’ or homogenized before it exits the other end of the tunnel[.]

Appx4162-4163; *see* Appx3013, Appx3015-3016 (Response to Office Action). Cascades characterized this language as “both a definition and a disclaimer” of the light tunnels in Figures 66 and 68. Appx4162.

The Board, however, found that the named inventor’s statement did “not meet th[e] test” to qualify as a prosecution definition or disclaimer. Appx51. Applying the exacting threshold imposed by “[t]he doctrine of prosecution disclaimer[, which] only applies to unambiguous disavowals[.]” the Board identified specific aspects of the named inventor’s generic statement that precluded definition or disclaimer. Appx50 (*quoting Grober v. Mako Prods., Inc.*, 686 F.3d 1335, 1341 (Fed. Cir. 2012)). First, the Board found that “[Cascades] does not explain how distinguishing Faris’s ‘light pipes’ amounts to a disclaimer or disavowal of a light tunnel or concentrator with an enclosed light source.” Appx51 Second, the Board found that the named inventor’s description of light tunnels as a “tube” does not mean that light tunnels must have an entrance and an exit (and, therefore, an external light source). *Id.* (identifying other “tubes,” including “a tube of toothpaste[.]” whose constitutive elements do not include entrances and exits.) Thus, the Board correctly held that this generic statement did not effect a disavowal of light tunnels with enclosed light

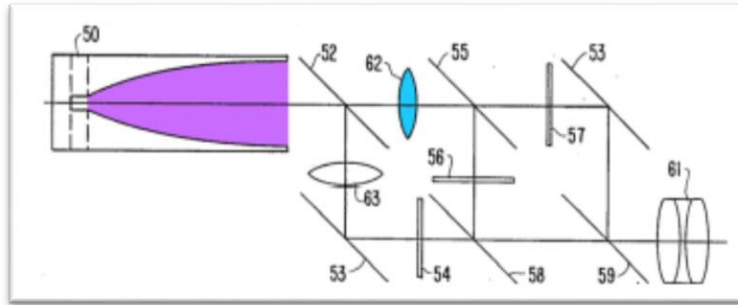
sources, and rejected Cascades’ improper attempt to narrow the corresponding structures.⁴

The Board also found that “[f]or each limitation of claim 47,” Goldenberg discloses corresponding elements. Appx60. Sony asserted that the functional limitation was met by the combination of the non-imaging reflector and lens 62 of Goldenberg’s Figure 7. Appx2499. Figure 7, reproduced below (along with Figure 1) with highlighting to indicate corresponding structure, depicts an LCD projector embodiment that uses mirrors and three LCD panels to project a full-color image.



Goldenberg, Figure 1A

⁴ Cascades’ Opening brief also contends the Board in *Sony* also misconstrued “the prisms shown in Figure 65[.]” BlueBr.43. That issue is not properly on appeal because it was not raised in the *Sony* proceeding below. See *Caterpillar Inc. v. Sturman Indus., Inc.*, 387 F.3d 1358, 1368 (Fed. Cir. 2004).



Goldenberg, Figure 7

The Board found support for its decision in Goldenberg’s description of the non-imaging reflector, which was described as being “designed to have a rectangular output aperture corresponding to the shape of the LCD,” Appx61, Appx63 (quotations omitted); *see* Appx3199 2:10-12, Appx3201 6:25-34 (Goldberg), as well as in the testimony offered by Sony’s expert. Appx61-62; *see* Appx3680-3690 ¶¶306-332.

Furthermore, the Board found that even if Cascades’ proffered interpretations were correct, Goldenberg and claim 47 are *at the very least* equivalent. Specifically, the Board found that even if Cascades’ “definition of ‘tunnel’ as a tube having two openings, one for receiving light from [an external] source” were accepted, “a person of ordinary skill would have considered enclosing the light source in the reflector, as in Goldenberg to be equivalent for at least the reasons set forth by [Sony’s expert].” Appx62 (quotations omitted). In particular, the Board agreed with Sony’s position that Goldenberg’s reflector shapes light to match the IFE in precisely the

same way as disclosed in claim 47: by the use of internally reflective surfaces and a rectangular output aperture. *See* Appx3200 4:20-27 (Goldenberg), Appx3689-3690 ¶¶330-32; *see also* Appx62.

Goldenberg’s reflector also achieves precisely the same result: light at the output aperture has been shaped to match the IFE, thus enhancing display system brightness. Appx3199 2:16-21; *see* Appx4857 128:17-19 (Bohannon Deposition); *see also* Appx62. Thus, the Board found that even if Cascades’ definition were accepted, “a person of ordinary skill would have considered enclosing the light source in the reflector, as in Goldenberg to be equivalent for at least the reasons set forth by [Sony’s expert].” Appx62 (quotations omitted); *see* Appx3689-3690 ¶¶330-332.

Finally, the Board rejected Cascades’ enablement attacks on Goldenberg—*e.g.*, that Goldenberg’s reflector was likely to explode or melt because it had an internal light source—which were found to be lacking in credible support and contradicted by the extrinsic evidence. Appx62-63. The Board thus concluded that Sony had proven by a preponderance of the evidence that Goldenberg anticipates claim 47 (and all of the corresponding elements in claim 69). *Id.*

3. *Claims 48 and 49: Construing “Fresnel polarizer” and Finding Obviousness by Goldenberg in view of Mitsutake or Sato*

The Board adopted the same construction of “Fresnel polarizer” as it had in the *Epson* proceeding—which was undisputed by Sony—and rejected Cascades’

importation of two narrowing limitations from the preferred embodiments. Appx52-53. Applying this construction, the Board found that each of Mitsutake and Sato disclosed a “Fresnel Polarizer”—the acknowledged missing element in Goldenberg. Appx63-66. It also found that one of ordinary skill in the art would have been motivated to combine Goldenberg’s LCD-projector embodiment with the polarizer elements in each of those references—*e.g.*, because doing so would achieve the benefits of a smaller-size projection system *without sacrificing brightness*. Appx65. The Board therefore found that Sony had proven by a preponderance of the evidence that Goldenberg in view of either Mitsutake or Sato rendered claims 48 and 69 obvious. Appx66.

In construing “Fresnel polarizer” as “a polarizer constructed with stepped, sawtooth-like elements so as to have the optical properties of a much thicker polarizer,” the Board first looked to the intrinsic record, finding that “Fresnel polarizer” is never expressly defined in the ’347 patent. Appx52. Lacking an express definition in the specification, the Board sought to determine how one of ordinary skill would understand the term in view of the specification, finding that the terms “Fresnel” and “polarizer” both did in fact have “customary meanings in the art.” Appx52-53; *see also* Appx3628-3630 ¶¶180-183 (Willner Declaration) and Appx4809-4810 80:17-81:4 (Bohannon Deposition) (testifying to the art’s familiarity with Fresnel lenses); *see also* Appx3596-3596 ¶¶96-97 (Willner

Declaration) and Appx4862 133:10-17 (Bohannon Deposition) (testifying to the established meaning of polarizer).

In particular, based on expert testimony, the Board found that “‘Fresnel’ was a well-known term used to describe optical elements such as lenses with a sawtooth construction performing a known function in a substantially thinner form.” Appx65; *see* Appx52-53; *see also* Appx3628-3630 ¶¶180, 183-84 (Willner Declaration) and Appx3342 (McGraw-Hill Dictionary). The Board further found that this meaning was consistent with the ’347 patent’s use of the term “Fresnel,” including the numerous embodiments of “Fresnel polarizers.” *See, e.g.*, Appx2562 figs.64A-B, Appx2566-2567 figs.78-82, and Appx2569 fig.85.

The Board similarly found, again relying on expert testimony, that the term “polarizer” refers to an optical element designed to pass one polarization state of incident light. Appx52-53; *see, e.g.*, Appx3596-3597 ¶¶96-97 (Willner Declaration), Appx4862 133:11-17 (Bohannon Deposition), Appx5303 268:9-25 (*Epson* Bohannon Deposition). As recognized by the Board, polarizing structures were well-known to those of ordinary skill in the art. Appx52-53.

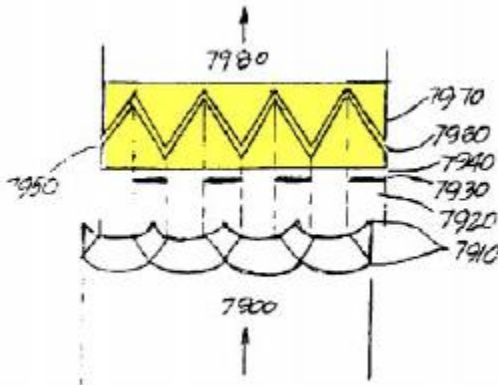
Cascades sought to impose additional limitations through its construction of “Fresnel Polarizer”: (1) “with one or more optical coating layers where two saw tooth-like elements touch[;]” and (2) “with polarization conversion of reflected incident light through a wave plate in a manner to cause nearly all incident light to

exit[.]” Appx4167. The Board properly rejected both of these limitations as “unwarranted.” Appx53. As noted by the Board, Cascades’ optical coating limitation would “exclude an embodiment of the Fresnel polarizer (Figure 78) disclosed in the ’347 patent.” *Id.* And it ignores that the ’347 patent teaches several ways of polarizing light that do not require optical coatings – including dielectric coatings, holograms, liquid crystal layers, and gratings. Appx2592 46:19-67.

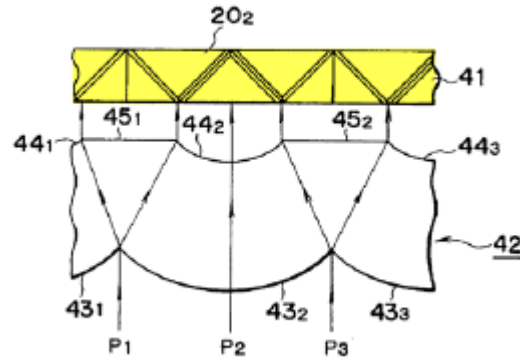
With respect to the “polarization conversion” limitation, the Board found that “a Fresnel Polarizer, by itself (*i.e.*, without additional elements), is not a polarization converter.” Appx53. This is confirmed by the specification, which teaches “Fresnel polarizers” that ***do not perform*** polarization conversion. *See, e.g.*, Appx2591 44:9-19. And it is additionally confirmed by ***the named inventor’s own work***, where the named inventor identified the exact structure disclosed in Figure 78—without the wave plate or mirror—as a “Fresnel polarizer.” Appx4725 (SPIE Conference Proceeding); Appx4712 (SPIE Conference Abstract); *see* Appx4896 167:7-23 (Bohannon Deposition).

After reviewing the record—including Figure 79 of the ’347 patent, Mitsutake Figures 2 and 10, and Sato Figure 7, each reproduced below—the Board agreed with Sony’s arguments that Mitsutake and Sato disclosed polarizing structures that met

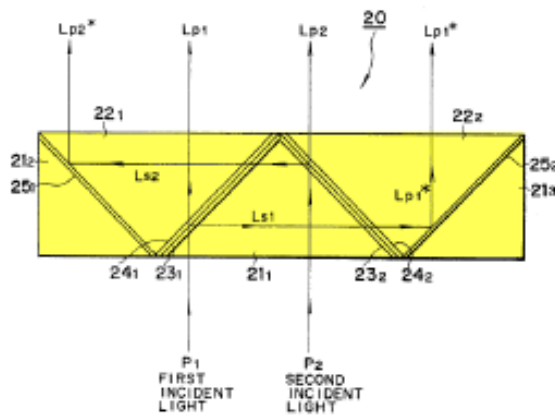
the Board's construction of "Fresnel Polarizer."⁵ The Board found "support[] [for] these contentions with testimony from [Sony's] expert." Appx63; *see* Appx3690-3717 ¶¶333-407.



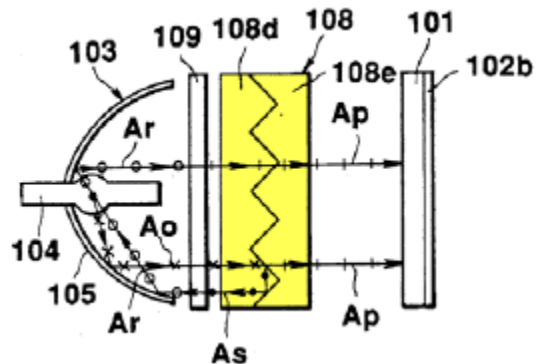
347 Patent, Figure 79



Mitsutake, Figure 10



Mitsutake, Figure 2



Sato, Figure 7

⁵ Substantial evidence also demonstrates that Mitsutake and Sato would meet the limitations of claims 48 and 69 as construed by Cascades. Both Mitsutake and Sato disclose "optical coatings" and perform polarization conversion. *See* Appx4226-4228 (Sony Reply).

In the proceedings before the Board, Cascades did not dispute that Mitsutake and Sato meet the claim language as construed by the Board; it only disputed that “[Sony’s] assertion is based on an incomplete construction of ‘Fresnel polarizer.’” Appx4171 (Cascades’ Response); *see also* Appx4174. Indeed, Cascades only argued that the prior art did not disclose optical coatings or perform polarization conversion—each of which only mattered if its narrow construction of “Fresnel Polarizer” were adopted. Appx4171-4176. The Board, however, rejected this construction, and properly found that both Mitsutake and Sato disclosed a “Fresnel polarizer.” Appx63-66.

SUMMARY OF ARGUMENT

The Board properly found that the challenged claims of the ’347 patent are invalid based on the asserted prior art, either as anticipated or obvious.

Claims 29, 30, 32, and 33. Cascades does not dispute the Board’s findings that these claims are invalid as anticipated by Fushimi, apart from challenging the predicate construction of claim 29’s means-plus-function limitation. But Cascades again proffers an erroneous construction of “means for focusing” that attempts to impermissibly narrow the claim language. *First*, Cascades seeks to construe the recited function to exclude focusing light into pixels, and limit it to focusing light onto pixels. The Board properly rejected this distinction because it is contrary to both the intrinsic and extrinsic evidence. *Second*, Cascades seeks to exclude Figure

69 as corresponding structure. But Cascades fails to offer any valid support for its contention; instead, it distorts the patent's objectives and re-asserts its erroneous claim construction. Indeed, the underlying factual support, including expert testimony from both parties, confirms that lens array 6930 of Figure 69 is corresponding structure to the "means for focusing," and substantial evidence confirms further that Fushimi discloses identical structure.

Claim 47. Although Cascades purports to challenge the Board's construction of the "means for enhancing brightness" limitation of claim 47 (and also 69), Cascades' arguments on appeal are, in reality, directed to the Board's anticipation analysis. This is a transparent attempt to shift the standard of review in its favor and should be rejected. Cascades' explicit attacks on anticipation fare no better in light of the substantial evidence supporting the Board's invalidity findings, including the Board's rejection of Cascades' implicit enablement attack.

Claims 48 and 69. Cascades does not take issue with the Board's findings that Goldenberg in light of Mitsutake or Sato renders obvious claims 48 and 69, except to challenge the predicate construction of the claims' "Fresnel polarizer" limitation. The Board, however, applied the proper legal standards of construction, and construed the term consistent with the undisputed underlying facts—including the customary meanings of "Fresnel" and "polarizer." The Board also correctly

rejected Cascades' attempt to graft on two unsupported narrowing limitations, which it had sought to import from preferred embodiments.

Constitutional challenges. Finally, Cascades' facial challenges to the constitutionality of *inter partes* proceedings should also be rejected. The panel decision concerning separation of powers in *MCM* is binding on this Court and the Supreme Court's grant of certiorari in *Oil States* does not relieve the Court of its obligation to adhere to the determinations of prior panels. Cascades raises a "due process" argument for the first time on appeal (presumably under the Fifth Amendment, although Cascades never specifies), which should be rejected as waived. Similarly, Cascades purports to raise a Seventh Amendment challenge in its statement of the issues, but the argument was never addressed in its Opening brief, and is therefore waived.

The Board's decision should therefore be affirmed in all respects.

STANDARD OF REVIEW

The Administrative Procedure Act (APA) governs this Court's review of agency actions. *See Dickinson v. Zurko*, 527 U.S. 150 (1990). Section 706 of the APA provides the relevant standards of review, and further requires that: "In making the foregoing determinations, the court shall review the whole record or those parts of it cited by a party, and due account shall be taken of the rule of prejudicial error." 5 U.S.C. § 706; *see also Universal Camera Corp. v. N.L.R.B.*, 340 U.S. 474, 488

(1951); *Jackson v. Veterans Admin.*, 768 F.2d 1325, 1330 (Fed. Cir. 1985) (“[W]e must determine whether, considering the record as a whole, the agency’s evidence is sufficient to be found by a reasonable fact-finder to meet the evidentiary burden applicable to the particular case.”).

In appeals from Board decisions, this Court reviews the Board’s “factual findings for substantial evidence and its legal conclusions *de novo*.” *Rambus Inc. v. Rea*, 731 F.3d 1248, 1251 (Fed. Cir. 2013). “Substantial evidence is something less than the weight of the evidence but more than a mere scintilla of evidence.” *In re Mouttet*, 686 F.3d 1322, 1331 (Fed. Cir. 2012).

On issues of claim construction, this Court reviews any underlying factual determinations concerning extrinsic evidence for substantial evidence and the ultimate construction *de novo*. *In re Cuozzo Speed Technologies, LLC*, 778 F.3d 1271, 1283 (Fed. Cir. 2015).

The Board’s conclusion on anticipation is a question of fact, and this Court reviews the Board’s findings for substantial evidence. *See In re Montgomery*, 677 F.3d 1375 (Fed. Cir. 2012). The Board’s conclusion on obviousness is a legal conclusion based on underlying factual findings. *See, e.g., Cuozzo*, 778 F.3d at 1283. This Court reviews the Board’s legal conclusion of obviousness *de novo* and the Board’s underlying factual findings for substantial evidence. *See, e.g., id.; In re Gartside*, 203 F.3d 1305, 1316 (Fed. Cir. 2000); 5 U.S.C. § 706. Motivation to

combine is a question of fact reviewed for substantial evidence. *See Merck & Cie v. Gnosis S.p.A.*, 808 F.3d 829, 833 (Fed. Cir. 2015).

ARGUMENT

I. CASCADES’ ARGUMENTS WITH RESPECT TO CLAIMS 29, 30, 32, AND 33 FAIL

Cascades’ argument that Fushimi does not anticipate claims 29, 30, 32, and 33 rests entirely on alleged error in the construction of the “means for focusing” limitation. BlueBr.24, 25, 29-30, 51-53. The Board was correct, however, to reject Cascades’ efforts to exclude Figure 69 as corresponding structure as contrary to the intrinsic and extrinsic evidence. Apart from the predicate construction, Cascades does not appeal the Board’s findings that claims 29, 30, 32, and 33 are anticipated by Fushimi.

A. The Board Properly Construed the “Means For Focusing” Limitation of Claim 29

The Board correctly construed both the function and the corresponding structure of the “means for focusing” limitation. The Board agreed with the parties that claim 29 recites a means-plus-function limitation (Appx42), and further agreed that the function of that limitation is as recited in the claim: “focusing different segments of a light beam emanating from said light source onto said element at proper angles such that light is focused onto the pixels of said element.” Appx47.

Though both parties nominally proposed the same function, they disagreed about the scope of the function. Sony argued, consistent with the ’347 patent

specification, that “light must be focused into the pixels at the ‘proper angles’ to miss the borders and instead enter the pixel holes.” Appx4207. Cascades contended, however, that focusing light “onto the pixels” requires focusing light directly onto the *planar surface of the* image-forming element (IFE), and *not into* pixel holes. See Appx4159 (“focusing light ‘onto the pixels’ means causing light to be focused in a plane that includes outside the pixel hole, which would include onto the opaque pixel border...”); see also Appx3883.

The Board properly rejected Cascades’ argument because “there is [no] material difference between focusing light ‘into the pixel holes’ and ‘onto the pixels’” and, indeed, Cascades could not point to “where . . . such a distinction is made.” Appx49. According to the Board, the terms “pixels” and “pixel holes” are used interchangeably⁶ and the named inventor continued to use “into the pixel holes” to distinguish prior art, even after the term had been substituted with “onto the pixels” by an amendment. Appx44-45; see Appx3009-3019.

Moreover, the Board was correct to reject Cascades’ argument because it is antithetical to the objectives of the ’347 patent, which seeks improve light-use efficiency by focusing light away from “the opaque areas between the pixels.”

⁶ Appx44-46; see Appx2588 37:2-5, *id.* at 37:42-48, Appx2590 42:18-21, Appx2593 48:7-9, *id.* at 48:10-15, and Appx2595 51:10-12 (’347 patent using ‘pixel,’ ‘pixels’ and ‘pixel hole’ interchangeably); see also Appx3882 (advocating for the interchangeability of “pixels” and “pixel holes”).

Appx49. Cascades’ interpretation, in which light is focused onto “the *opaque pixel border*” would teach the intentional loss of light. Appx4159 (emphasis added). Thus, the Board’s construction, which reflects the focus of light into pixels and miss the IFE’s opaque areas, is consistent with enhancing light-use efficiency.

B. Cascades’ Challenges to the Board’s Construction on Appeal Fail

On appeal, Cascades simply rehashes the same claim construction arguments it made before the Board, arguing again for a nonexistent distinction between focusing light “*onto* the pixels of [an image forming] element” focusing light *into* such pixels. For example, Cascades contends that the Board “ignored” and “casual[ly] ... dismiss[ed]” Cascades’ arguments against relying on Figure 69 as corresponding structure. BlueBr.18. Similarly, Cascades claims that, when it construed “means for focusing,” the Board “dismissed the opposing view of Cascades’ expert” “[w]ithout comment or analysis[.]” *Id.* at 30.

The record belies these accusations. Cascades’ arguments and its purported evidentiary support were thoroughly considered below, and the Board correctly rejected each argument on sound legal bases with underlying factual support. Appx38-49. Cascades has not given this Court any reason to reject the Board’s decision, nor offered any evidence to substantiate its claims of unfair treatment.

1. *Cascades’ Construction is Inconsistent with the ’347 Patent’s Prosecution History*

Cascades contends that its proffered construction—namely, that “onto the pixels” requires light to be **brought to a focus** on the surface of the IFE, **and nowhere else**⁷—should be adopted in light of the ’347 patent’s prosecution history. Specifically, Cascades argues that the named inventor’s substitution of “onto the pixels” for “into the pixel holes” “make[s] clear that the words . . . are not synonymous.” BlueBr.48-49; *see* Appx2970-2989 (Prosecution History). On the basis of that substitution, Cascades interprets “means for focusing” to focus light onto pixels, as distinct from focusing light into pixel holes.

Cascades is wrong about the inferences that should be drawn from the ’347 patent’s prosecution history. Rather, the prosecution history **confirms** the interchangeability of the terms “onto the pixels” and “into the pixel holes” in the context of the ’347 patent. Pointing to a response to an office action subsequent to the amendment-at-issue, the Board found that the named inventor “continued to rely on the pre-amendment claim language ‘into pixel holes’ to distinguish prior art in post-amendment proceedings.” Appx44-45; *see* Appx3009-3019 (“Faris does not disclose any means for focusing light at proper angles into pixel holes...”). Though Cascades purported to offer expert testimony supporting its position before the

⁷ Appx4156-4161; *see also* Appx4832 103:3-14.

Board, it has wisely dropped that contention on appeal. The Board specifically credited the testimony of Sony’s expert supporting no difference in scope between “into” and “onto,” and rejected Cascades’ expert as “conclusory and evasive.” Appx45-46. The Board was thus correct in its finding that amendment on which Cascades relies had in fact “effected no difference in claim scope” at all. Appx45.

Moreover, Cascades’ argument is plainly unsupported by the text of the patent. The Board noted that Cascades itself could not point to “where in the ’347 patent such a distinction is made.” Appx49. Indeed, as the Board found, *the patent uses the terms “pixels” and “pixel holes” interchangeably.* Appx44; *see* Appx2588 37:2-5, *id.* at 37:42-48, Appx2590 42:18-21, Appx2593 48:7-9, *id.* at 48:10-15, Appx2595 51:10-12. Cascades’ construction would similarly be antithetical to the ’347 patent’s primary objective of, as the Board found, “improving light-use efficiency, as indicated in title of the patent ... and [in] its stated objectives.” Appx49; *see* Appx2570 1:1.1 , *id.* at 2:52-53, Appx2572 5:26-27. Cascades itself has described the named inventor’s goal as “making maximum use of all available light[.]” BlueBr.24. Cascades’ proffered construction—that claim 29 requires the illumination of the *entire* IFE, “includ[ing] the *opaque pixel border*” (Appx4159)—would teach the intentional loss of light.

Finally, Cascades’ efforts on appeal are directly contrary to the position Cascades itself advocated for in its pre-institution papers. Appx42. In its

Preliminary Response, Cascades unequivocally stated that the distinction between “pixels” and “pixel holes” was both immaterial and non-existent. *See* Appx3882.

Cascades’ unsolicited rejection of such a distinction took up half a page in its Preliminary Response:

The specification of the ’347 Patent uses the terms ‘pixels’ and ‘pixel holes’ interchangeably. *E.g.*, Sony Ex. 1001 at 48:7-9 (‘To get around this problem, light must be crammed into the pixel holes, being made to miss the opaque areas between pixels.’); *id.* at 48:10-15 (‘The preferred technique to do this utilizes lenses to focus light ... into the pixel holes. For a given light valve, the pixel hole size is fixed. Selecting a bulb fixes the filament or arc size. To get as much light as possible from the selected light source into the pixel requires taking into account a few factors.’); *id.* at 37:42-48. ***Thus, because there is not a significant difference between the terms ‘pixels’ and ‘pixel holes,’ this preliminary response uses the terms ‘pixels’ and ‘pixel holes’ interchangeably.***

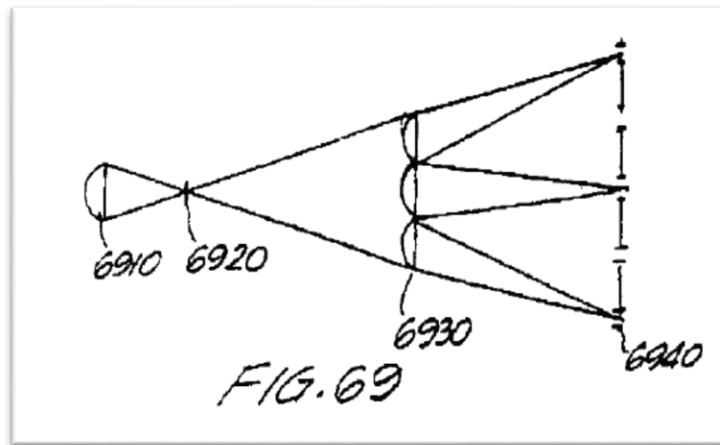
Id. (emphasis added). Despite this, in its post-institution papers, Cascades switched courses and argued that the terms are not only dissimilar, but that the (false) distinction between them connotes “deep[] significance” to the construction of claim 29. Appx4159. The Board saw through this abrupt and self-serving reversal in position, and the Court should do so here as well.

2. *The Board Correctly Looked to Figure 69 as Corresponding Structure*

Cascades’ contention that Figure 69 does not disclose the limitations of claim 29 similarly finds no support in the record or the law. Again, Cascades merely

recites the same flawed arguments that were rejected by the Board and should be rejected on appeal.

Aside from its flawed distinction between focusing light “into” and “onto” pixels, Cascades characterizes Figure 69 as principally concerned with solving the problem of reducing “glass thickness.” BlueBr.51-51. This is a red herring. Figure 69, reproduced below, is intended to illustrate how lens arrays, when properly positioned, can increase light-use efficiency by focusing light into pixel holes. The specification confirms this is the objective of the structures in Figure 69. Appx2594-2595 50:35-51:22.



‘346 Patent, Figure 69

But even if true, Cascades’ contention is immaterial. That Figure 69 may solve an additional problem does not mean that Figure 69 fails to disclose structure or is inconsistent with the requirements of the “means for focusing” limitation. As shown above, lens array 6930 “focus[es] different segments of a light beam emanating from

said light source onto said element at proper angles such that light is focused onto the pixels of said element.” Appx2594-2595 50:56-51:4; *see also* Appx4817-4818 88:22-89:19.

Cascades’ claim that Figure 69 “never uses terminology about different parts or segments of a light beam,” or “different parts or segments of a light beam,” or “light hitting at ‘proper angles,’” or “focusing ‘onto’ an image forming element,” does nothing to alter the plain disclosure in the specification. BlueBr.52. Corresponding structure need not be linked or associated with a function by use of the same language as the claim. *Amtel Corp. v. Info Storage Devices, Inc.*, 198 F.3d 1374, 1379-82 (Fed. Cir. 1999). And a figure—such as Figure 69—can supply the clear link or association. *See Aerotel, Ltd. v. Telco Grp, Inc.*, 433 Fed. Appx. 903, 919-20 (Fed. Cir. 2011).

Cascades makes the conclusory claim that it is “[i]mmediately apparent to one of skill in the art” that Figure 69 lacks this disclosure. BlueBr.52. Yet the record, supported by expert testimony from both parties, confirms the contrary. *See* Appx46-49; *see also* Appx3635-3639 ¶¶196-200. Cascades’ expert testified at deposition and in his sworn declaration “that lens arrays (such as element 6910 in Figure 69) split beams into separate segments.” Appx48; *see* Appx4633 ¶22, Appx4636-4637 ¶26, and Appx4640-4642 ¶¶29-30; *see also* Appx4797 68:4-11. He

also admitted that aerial image 6920 is focused light from the light source. Appx4819 90:2-16, Appx4828-4830 99:21-101:12.

Similarly, the '347 patent also confirms that the phrase "proper angles" in the "means for focusing" limitation refers to focusing light such that it *goes into pixel holes and misses the opaque borders*, as described in connection with (and as depicted in) Figure 69. Appx2594-2595 50:56-51:15; *see* Appx4849 120:9-14, Appx4850 121:4-9. The '347 patent uses similar language concerning "proper angles" with Figure 65 (Cascades' preferred corresponding structure) when referring to input lens array 6580. Appx2588-2589 38:67-39:2; *see* Appx4821 92:19-22, Appx4822 93:1-4, and Appx4834 105:4-24.

3. *Cascades' Additional Arguments Against "Means for Focusing" Relate Exclusively to the Board's Decision in Epson*

Each of Cascades' additional arguments concerning the Board's construction of claim 29 relate to issues exclusively considered in the *Epson* proceeding.⁸ This

⁸ Cascades contends that, "The Board in *Epson* Erred In Its Identification of the 'Input Lens Arrays.'" BlueBr.44-47. Cascades' argument concerns only the structures in Figure 65 and attendant construction issues. Neither Figure 65 nor its attendant construction issues were considered by the Board in the *Sony* decision, which considered only Figure 69. Cascades also contends that "The Board's Construction Of 'Means For Focusing' Is Inconsistent With The Disclosed 'Way' In Which 'Focusing' Is Actually Achieved In The '347 Patent," which, again, entirely references issues concerning Figure 65 and related expert testimony in the *Epson* proceeding. BlueBr.47-48. These issues and testimony were not before the Board in *Sony*. Last, Cascades argues that "Epson's Own Expert Agrees That Prisms Operate Differently From Lenses," and, again, references issues concerning Figure 65 and expert testimony not at issue before the Board in *Sony*. BlueBr.51.

Court's review of the Board's *Sony* decision is not contingent on the merits of those issues.

C. The Invalidity Determination as to Claims 29, 30, 32, and 33 was Supported by Substantial Evidence

On appeal, as before the Board, Cascades' sole argument regarding Fushimi is that, "[b]ecause the Board erred in its construction of 'means for focusing,' its analysis under Fushimi is, therefore, necessarily flawed, and the finding that Claims 29, 30, 32, and 33 are anticipated [] should be vacated."⁹ BlueBr.56. Cascades does not dispute that Fushimi, under the Board's construction, discloses embodiments that exactly match Figure 69, both in structure and function. BlueBr.24. Indeed, it has not appealed the Board's specific invalidity findings regarding Fushimi,¹⁰ nor said anything about those findings in its opening brief. Having failed to challenge the Board's anticipation findings regarding Fushimi on any ground other than the predicate construction of "means for focusing," Cascades has waived all other

⁹ In the proceeding below, Cascades made this same argument. *See* Appx4176 ; *see also* Appx56. The Board, citing its extensive analysis discussed in Section III(D)(1), *supra*, rejected Cascades' argument on the basis that it had "adopted [Sony's] claim construction[.]" Appx57.

¹⁰ The Board correctly found that Fushimi Figures 1 and 2 disclosed each limitation of claim 29. Appx54-57. The Board's findings are supported by substantial evidence. The Board examined Fushimi's disclosures (Appx54-56), studied the expert testimony (Appx56-59), and found Sony's expert credible and strongly supportive of the Board's invalidity findings. Appx56-57.

arguments concerning the Board’s invalidity analysis.¹¹ *See Pandrol USA, LP v. Airboss Ry. Prods.*, 320 F.3d 1354, 1366 n. 3 (Fed. Cir. 2003) (“[A]n issue not raised by an appellant in its opening brief ... is waived.”).

As Cascades’ argument is premised on the same false distinctions regarding the claim language that the Board properly rejected—namely, that focusing light “onto the pixels” excludes focusing light “into pixel holes”—the Court should affirm the Board’s determination that Sony had proven by a preponderance of evidence that claims 29, 30, 32, and 33 are anticipated by Fushimi.¹²

II. CASCADES’ ARGUMENTS WITH RESPECT TO CLAIM 47 FAIL

The Board properly construed claim 47 of the ’347 patent and Cascades does not raise any appealable issues concerning the Board’s construction. The Board correctly found that the Goldenberg reference discloses each claim limitation, including the “means of enhancing brightness” limitation, and the Board’s

¹¹ Cascades also contests the invalidity analyses of Claims 29, 30, 32, and 33 with respect to Brandt and Uchiyama. BlueBr.54-55. These prior art were only considered in the *Epson* proceeding, and were not at issue in *Sony*. The Court’s review of the Board’s decision in *Sony* is not contingent on the its review of these issues.

¹² Even if Cascades had taken issue with the Board’s findings regarding these claims, it would not have prevailed as the Board made no errors, legal or otherwise, in reaching those conclusions. The Board was correct to find that Fushimi anticipates each of dependent claims 30, 32, 33. The Board’s findings regarding these claims are supported in the record by substantial evidence, and should be affirmed. Appx56-59.

determination that claim 47 is invalid as anticipated should be affirmed. Appx59-63.

A. Cascades Does Not Challenge the Board’s Proper Construction of the “Means for Enhancing Brightness” Limitation on Appeal

In the proceeding below, the Board agreed with the parties that the “means for enhancing brightness” limitation of claim 47 is, just as the claim states:

enhancing brightness of an image by shaping a beam illuminating said electronic image-forming element such that the shape of the beam substantially matches the shape of said electronic image-forming element.

Compare Appx2481 (Sony Petition) (reciting same functional language) *with* Appx3889 (Cascades’ Preliminary Response) (reciting same functional language); *see also* Appx50 (“Patent Owner does not dispute this identification.”). The Board further agreed with the parties that the structures in the embodiments depicted in Figures 66 and 68 correspond to the “means for enhancing brightness” limiting function. Appx50; *compare* Appx2482-2484 *with* Appx3889-3890.

On appeal, in a transparent effort to shift the standard of review in its favor, Cascades purports to argue that “the Board in . . . Sony erred in its construction of ‘means for enhancing brightness.’” BlueBr.42. But the arguments Cascades offers in support of that proposition do not raise issues with the Board’s construction; rather, Cascades’ arguments point to purported infirmities in the Board’s anticipation analysis. As such, Cascades has waived any claim construction-based

argument and this Court should review the Board's anticipation findings for substantial evidence.¹³ *See Pandrol USA, LP*, 320 F.3d at 1366 n.3.

Cascades contends that despite the parties "general agreement" concerning corresponding structure, the Board "held that . . . the 'means for enhancing brightness' could be shown by a structure other than" the "light tunnel" and "concentrator" disclosed in Figures 66 and 68. BlueBr.42. Cascades takes particular issue with whether "the arc lamp enclosed within an aluminum tube shown by Goldenberg" meets the limitations of "light tunnel 6610 and lens 6620 in Figure 66 and concentrator 6830 and lens 6840 in Figure 68." BlueBr.42 (quotations omitted). Properly characterized, Cascades' argument challenges the anticipation of claim 47 by Goldenberg, *not* the Board's construction of Claim 47 or its corresponding structure.

Cascades also purports to contend that, "the Board in Sony failed to credit that the prisms shown in Figure 65, and the light tunnels shown in Figures 66 and 68 operate in a fundamentally different manner than the structure proposed by Goldenberg." BlueBr.43. Again, this challenge takes issue with the Board's anticipation findings, not the Board's construction of claim 47, which is undisputed.

¹³ Moreover, Cascades has not appealed the Board's rejection of Cascades' erroneous "definition and disclaimer" argument, which supposedly concerned the construction of non-claim term "light tunnel." *See* Appx50-51. That argument is also waived on appeal.

In addition, Cascades’ argument erroneously makes reference to Figure 65, which was definitively not at issue in the *Sony* proceeding’s construction of claim 47. *See* Appx49-51; *see also* Appx4161-4164.

B. The Board Correctly Rejected Cascades’ Attempt to Distinguish Goldenberg

On appeal, Cascades makes two related and equally undeveloped arguments. *First*, as described above, Cascades contends that the agreed-upon “means for enhancing brightness” structure is “directly and distinctly different from the structure proposed by Goldenberg.” BlueBr.44. *Second*, Cascades argues that “the structure proposed by Goldenberg—namely an extremely hot arc lamp confined within one end of a narrow aluminum tube—would not work and could not actually be practically built.” BlueBr.56. To the extent these arguments are even presented in sufficient fashion to merit review by this Court, the Board’s determinations are supported by substantial evidence and should be affirmed.

Cascades’ first argument is limited entirely to conclusory statements, unsupported by citation to the record, that the lamp enclosed within an aluminum tube shown by Goldenberg operate in a distinct fashion from the light tunnels shown in Figures 66 and 68. *See* BlueBr.44 (“In particular, neither prisms nor light tunnels contain a light source themselves. On the contrary, they receive and process light that is *externally* applied.”) (emphasis in original). As Sony explained to the Board, however, “[n]othing about the term ‘tunnel’ requires an open entrance or external

light source, and Goldenberg itself merely requires ‘a light source *used with* a non-imaging reflector.’” Appx4220 (*citing* Appx3200 3:38–49).

The Board agreed, rejecting Cascades’ un-appealed contention that a light tunnel need not be a tube opened at both ends and finding that “a person of ordinary skill would have considered enclosing the light source in the reflector, as in Goldenberg, to be equivalent for at least the reasons set forth by Dr. Willner.” Appx63; *see* Appx4565-4566 193:16–194:25. Cascades offers nothing more than conclusory attorney argument to challenge that specific factual finding on appeal. *See* Appx63 (“Thus, we find credible, and we rely on, Dr. Willner’s testimony to that effect.”). This is plainly insufficient to overturn a factual finding on appeal. *See Pennwalt Corp. v. Durand–Wayland, Inc.*, 833 F.2d 931, 936 (Fed. Cir. 1987), *cert. denied*, 485 U.S. 961 (1988) (equivalency of claim limitations and accused structure is a question of fact subject to substantial evidence review).

Correspondingly, Cascades complains that the Board rejected its “correct and accurate observation that in actual practice, the structure proposed by Goldenberg...would not work and could not actually be practically built.” BlueBr.56. Despite claims that it is “supported by the testimony of its expert,” Cascades offers no actual citation to evidence as support. *Id.* Nor does it make any effort to overcome the presumption that Goldenberg is presumptively enabled. *See*

In re Antor Media Corp., 689 F. 3d 1282, 1288-89 (Fed. Cir. 2012). As such, this Court should reject any such argument as waived on appeal.¹⁴

In any event, even if preserved, Cascades’ argument fails. Though Cascades makes no reference to enablement, nor any argument as to how its contentions overcome the burden to show lack of enablement, Cascades nonetheless contends that Goldenberg “would not work and could not actually be practically built.” Similarly, though it forms no part of its actual argument, Cascades claims that Goldenberg’s invention “would likely not work *anywhere* and [] has certainly never been successfully implemented in any commercial device.” BlueBr.26. And Cascades further claims that it provided expert testimony below that “placing an electric arc lamp inside an aluminum tube as directed by Goldenberg would melt the aluminum tube and destroy the device.” *Id.* But these concerns were considered and rejected by the Board, and that rejection is supported by substantial evidence. *See* Appx61-62; *see also* Appx4221-4222 (collecting sources).

Notwithstanding the false premise that Goldenberg’s design creates enhanced risks—which is unsupported by the record (*see id.*)—the Board correctly found that one of ordinary skill would have understood how to mitigate any potential risk

¹⁴ In connection with Cascades’ description of the proceedings below, Cascades offers vague reference to arguments raised before the Board. *See* BlueBr.26-26. But this forms no part of its actual argument, gives no indication as to what Cascades purports to appeal, and is insufficient for preservation purposes.

associated with the light source in Goldenberg. In particular, the Board determined that it would have been clear to one of ordinary skill that “other light sources besides metal halide arc lamps could be used with Goldenberg’s reflector and that other methods were available to avoid overheating.” Appx62-63.

In reaching its conclusion, the Board did not “adopt Sony’s speculations,” BlueBr.30, 26, but instead examined, “f[ound] credible,” and “rel[ied] on” Sony’s expert testimony “to that effect.” Appx63; *see* Appx4565-4566 193:16-194:25. Moreover, the Board properly noted that, ““in considering the disclosure of a reference, 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.”” Appx63 (*quoting In re Preda*, 401 F.2d 825, 826 (CCPA 1968)).

III. CASCADES’ ARGUMENTS CONCERNING CLAIMS 48 AND 69 FAIL

The Board correctly construed the disputed term “Fresnel Polarizer.” Apart from disputing the predicate construction of that term, Cascades does not raise issues on appeal concerning the Board’s conclusion that Goldenberg in view of either Sato or Mitsutake renders obvious all of the limitations of claims 48 and 69. Accordingly, the Board’s conclusion that those claims are invalid as obvious should be affirmed.

A. The Board Properly Construed the “Fresnel Polarizer” Limitation of Claims 48 and 69

Claims 48 and 69 each disclose the same limitations, including the disputed term “Fresnel Polarizer.” For that term, the Board adopted the same construction as it had in the *Epson* proceeding. BlueBr.20. Both parties agreed with this construction, although Cascades sought to add two additional narrowing limitations, only one of which it now argues for on appeal. For the reasons described below, the Board was correct to construe “Fresnel Polarizer” as it did, and to reject Cascades’ unsupported limitations.

1. *The Board Applied the Correct Legal Standard of Construction*

On appeal, Cascades misstates the legal significance of the named inventor’s use of the term “Fresnel polarizer.” Cascades contends the term was “coined” and, therefore, the Board “committed clear error by ignoring what the ’347 Patent actually says and, instead, construing [the] claim term by reference to technical dictionaries.” BlueBr.36-37. Cascades contends the term was “coined” because, before the ’347 patent, “there was no such thing as a ‘Fresnel polarizer[.]’” BlueBr.36. Cascades is wrong both legally and factually.

Unsurprisingly, Cascades cites no case law that would support treating “Fresnel polarizer” outside the bounds of normal claim construction. Whether or not the term “Fresnel polarizer” is coined, as Cascades contends, basic principles of construction require the meaning of a term to be determined by looking to the

intrinsic record, including the specification. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313-17 (Fed. Cir. 2005); *see* Appx52-53. Cascades makes no argument that named inventor acted as his own lexicographer, using the term “in a manner other than [its] ordinary meaning.” *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582 (Fed. Cir. 1996). Nor does it identify any “special definition of the term [that] is clearly stated in the patent specification or file history.” *Id.* In fact, not only does the ’347 patent never expressly define “Fresnel polarizer,” but Cascades fails to identify any disparity (other than the “coating” issue discussed below) between the Board’s construction and the way in which the term is used in the ’347 patent.

Lacking such lexicography, the well-established rule governs: words in a patent claim are to be given their ordinary and customary meaning. *Phillips*, 415 F.3d at 1313. Properly articulated, the “inquiry into how a person of ordinary skill understands a claim term provides an objective baseline from which to begin claim interpretation.” *Id.* Thus, the Board properly sought to determine how, in view of the specification, a person of ordinary skill would understand the term and whether the term would have had an ordinary and customary meaning. *See* Appx52-53.

Based on the testimony of *both* experts, the Board found that the terms “Fresnel” and “polarizer” both did, in fact, have “customary meanings in the art.” *Id.*; *see also* Appx3628-3630 ¶¶180-183 (Willner Declaration), Appx4809-4810 80:17-81:4 (Bohannon Deposition) (testifying to the art’s familiarity with Fresnel

lenses); *see also* Appx3596-3597 ¶¶96-97 (Willner Declaration), Appx4862 133:10-17 (Bohannon Deposition) (testifying to the established meaning of polarizer). This testimony, supporting the Board’s construction, is entitled to deference on appeal. *See McCurry v. Dep’t of Justice*, 612 F. App’x 991, 996 (Fed. Cir. 2015). Cascades has made no effort to challenge that determination and the Board’s construction should be affirmed.

2. *The Board Properly Rejected Cascades’ Attempt to Impose an Unsupported “Optical Coating” Limitation*

Cascades also repeats the unsupported argument that a “Fresnel polarizer” must have an optical coating. BlueBr.37-38. Specifically, Cascades argues for adding on the following limitation: “with one or more optical coating layers where two saw tooth-like elements touch[.]” Appx4167. Cascades purports to find support for its construction in a series of descriptions of Fresnel polarizers in the ’347 patent. BlueBr.37-38. No such support exists and the Board correctly determined that Cascades’ “optical coating” limitation is unwarranted. Appx63-65.

Indeed, the Board noted that Cascades’ construction, which expressly requires an optical coating where the saw-tooth elements *meet*, would “exclude an embodiment of the Fresnel polarizer (Figure 78) disclosed in the ’347 patent.” Appx53. Specifically, while the structure in Figure 78 has an optical coating, it does not have a coating *where the saw-tooth elements meet*. *See* Appx2591 44:9-24; *see also* BlueBr.37 (conceding that Figure 78 depicts a Fresnel polarizer).

In addition, Cascades’ construction ignores that the ’347 patent teaches several ways of polarizing light that do not require optical coatings—including dielectric coatings, holograms, liquid crystal layers, and gratings. *See* Appx2592 46:19-67; *see also* Appx4224. The claim language offers no basis to distinguish between these methods of polarizing light. Nor does the ’347 patent provide any reason to exclude from claims 48 and 69 other materials known to split incident light into S- and P- polarizations, such as films. *See e.g.*, Appx4994 6:1-5.

Moreover, experts in the *Sony* proceeding did not “agree” that a “Fresnel polarizer” requires an optical coating as Cascades contends. BlueBr.39. Cascades makes this argument on appeal, but cites only to a conclusory, one-word response to a deposition question by Epson’s expert. *See* BlueBr.40; *see also* Appx1497 74:10 (*Epson Kahn Deposition*). Indeed, Sony’s expert made clear that he did not understand the term “Fresnel polarizer” to include an optical coating. *See* Appx3596-3597 ¶¶96-97, Appx3628-3630 ¶¶178-184.

Last, Cascades argues that the Board erred by “h[olding] that the ‘hologram’ embodiments disclosed in the ’347 Patent are a form of ‘Fresnel polarizer’ lacking an optical coating.” BlueBr.40. Cascades purports to argue that the Board’s ‘holding’ was “Without Basis And Contradicts The Express Teaching Of The ’347 Patent,” (*id.*), because, according to Cascades, holograms are “simply [another] . . . form of optical coating.” BlueBr.42. The Board did not reach any such holding in

the *Sony* proceeding. And Cascades’ new argument on appeal ignores that, as described above, in addition to holograms the patent teaches other ways of polarizing light, including dielectric coatings, liquid crystal layers, and gratings. Appx2592 46:19-67. Thus, even if Cascades were right about holograms as optical coatings (and it is not), Cascades’ premise does not support its conclusion, because it has not rebutted the central claim: the ’347 patent teaches *several* ways of polarizing light that do not require optical coatings.

Thus, the Board properly rejected Cascades’ improper attempt to import an unsupported narrowing limitation from the specification. The Court should affirm the Board’s rejection.

B. Apart From Its Claim Construction Argument, Cascades Waives all Arguments on Appeal Against the Board’s Obviousness Findings

On appeal, as in the proceedings below, Cascades does not dispute that either Mitsutake or Sato meet the Board’s construction of “Fresnel polarizer.” Nor does Cascades contest the Board’s motivation to combine or obviousness findings, or the substantial evidence that supports its decision. Appx63-66. Cascades’ appeal presents the Court with only a single dispute: whether the Board erred in its construction of “Fresnel polarizer.” BlueBr.57 (appealing the Board’s invalidity decision as to Claims 48 and 69 because the Board “used a fundamentally flawed claim construction in its analysis[.]”); *see also* BlueBr.29.

Thus, apart from the predicate construction of “Fresnel polarizer,” Cascades has waived any argument with respect to the Board’s finding that Goldenberg, in combination with Mitsutake or Sato, render obvious claims 48 and 69. *See Pandrol USA, LP*, 320 F.3d at 1366 n.3. Because the Board correctly construed the term “Fresnel polarizer,” its invalidity findings should be affirmed.

IV. CONSTITUTIONAL CHALLENGE

In a last-ditch effort, Cascades asks this Court to revisit the separation of powers holdings in *MCM Portfolio v. Hewlett-Packard*, 812 F.3d 1284 (Fed. Cir. 2015). The occasion to review *MCM* was previously presented to this Court by way of Cascades’ petition for *en banc* review and was rejected. *See* Dkt. No. 19, Dkt. No. 55.

Cascades now seeks its second bite from the apple, ignoring the bedrock principle of *stare decisis* and asking this Court again to take up the issues decided in *MCM*. BlueBr.59. There can be no doubt that *MCM*’s resolution of separation of powers issues is binding on this Court because the *MCM* opinion was precedential, and this Court “is bound by the precedential decisions of prior panels.” *Deckers Corp. v. U.S.*, 752 F.3d 949, 964 (Fed. Cir. 2014). Cascades itself concedes that *MCM* “foreclosed further panel consideration of [Cascades’] Separation of Powers constitution objection.” BlueBr.59.

Neither exception to *stare decisis* applies here. A panel may not reconsider issues resolved by “prior panels ***unless and until overruled by an intervening Supreme Court or en banc decision.***” *Deckers Corp.*, 752 F.3d at 964 (emphasis added). After failing to secure an exception with its “initial *en banc* request,” Cascades now tries to fit a square peg—the granted writ of certiorari in *Oil States*¹⁵—into the round hole of exceptions made for panel decisions overruled by the Supreme Court. BlueBr.59.

The Supreme Court’s grant of certiorari in *Oil States* is not a decision of the Supreme Court that overrules *MCM*, and does not relieve this Court of its obligation to adhere to the determinations made by prior panels. *See Ritter v. Thigpen*, 828 F.2d 662, 665-66 (11th Cir. 1987) (“A grant of certiorari does not constitute new law”); *see also Bd. of Ed. of City Sch. Dist. of City of New York v. Hufstедler*, 641 F.2d 68, 70 (2d Cir. 1981) (“unless the Supreme Court grants certiorari ***and overturns*** [a circuit decision], that decision is the law of the circuit and we are bound to follow it.”) (emphasis added). Indeed, the grant of certiorari does not “suggest a view on the [underlying] merits” of the separation of powers issue, and the Court is therefore not “permitted to sweep aside binding circuit law based on [] speculation

¹⁵ The Supreme Court granted certiorari in *Oil States Energy Servs., LLC v. Greene’s Energy Grp., LLC*, No. 16-712, 2017 WL 2507340, at *1 (U.S. June 12, 2017) on the issue of “[w]hether inter partes review . . . violates the Constitution by extinguishing private property rights through a non-Article III forum without a jury.”

about what the Supreme Court may decide in another case and [on] conjecture about how that decision might affect the case in front of us[.]” *Schwab v. Sec’y, Dep’t of Corr.*, 507 F.3d 1297, 1299 (11th Cir. 2007). Cascades misunderstands the exception’s application, and Cascades’ position that the panel is now “free to rule on the [separation of powers] question as it sees fit” overlooks the importance of *stare decisis* to the consistency and uniformity of jurisprudence. *See Welch v. Tex. Dep’t of Highways & Pub. Transp.*, 483 U.S. 468, 494 (1987), *Payne v. Tennessee*, 501 U.S. 808, 827 (1991).

Simply put, “*MCM* was correctly decided” and the Supreme Court’s “recognition of patent rights as grounded in statutory law remains to this day.” Dkt. No. 55 (J. Prost, concurring). If the decision to grant certiorari in *Oil States* does “alter[] the judicial landscape of this case,” as Cascades contends (BlueBr.59), it is only because the grant of certiorari *counsels away from* this Court wading into issues on which the Supreme Court has indicated it will offer guidance.

Cascades’ purported objection to due process should also be rejected by this Court because it was waived. Cascades did not raise due process as an objection in the proceedings below. *See* Appx4189-4191. Cascades instead raises the issue for the first time in its Opening brief as a response to considerations raised by Judge Newman in this Court’s Order rejecting Cascades’ petition for *en banc* review. *See* Dkt. No. 55 (J. Newman, concurring). Arguments—including constitutional

challenges—not raised before the agency below are waived on appeal. *See In re DBC*, 545 F.3d 1373, 1377-80 (Fed. Cir. 2008).

Finally, other than merely mentioning the Seventh Amendment in its statement of issues (BlueBr.3), Cascades has not argued in its Opening brief that *inter partes* review violates the Seventh Amendment. BlueBr.58-63. That issue is waived as well. *See Pandrol USA, LP*, 320 F.3d at 1366 n.3.

CONCLUSION

For the foregoing reasons, the Board’s final written decision finding all the challenged claims of the ’347 patent invalid should be affirmed.

Dated: August 25, 2017

Respectfully submitted,

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on August 25, 2017, I caused the foregoing to be electronically filed with the Clerk of the Court for the United States Court of Appeals for the Federal Circuit by using the appellate CM/ECF system. I certify that all participants in the case are registered CM/ECF users and that service will be accomplished by the CM/ECF system.

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CERTIFICATE OF COMPLIANCE

UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

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