

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SONY CORPORATION,
Petitioner,

v.

CASCADES PROJECTION LLC,
Patent Owner.

Case IPR2015-01846
Patent 7,688,347 B2

Before THOMAS L. GIANNETTI, JAMES B. ARPIN, and
ROBERT L. KINDER, *Administrative Patent Judges*.

GIANNETTI, *Administrative Patent Judge*.

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

I. BACKGROUND

Sony Corporation (“Petitioner”) filed a request for an *inter partes* review of claims 29, 30, 32, 33, 47, 48, and 69 of U.S. Patent No. 7,688,347 B2 (Ex. 1001, “the ’347 patent”) under 35 U.S.C. §§ 311–319. Paper 1 (“Petition” or “Pet.”). Patent Owner Cascades Projection LLC filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).¹ The Board instituted this *inter partes* review of claims 29, 30, 32, 33, 47, 48, and 69 on the asserted grounds of anticipation and obviousness. Paper 13 (“Institution Decision”).

Subsequent to institution, Patent Owner filed a Patent Owner Response. Paper 21 (“PO Resp.”). Petitioner filed a Reply. Paper 25 (“Pet. Reply”).

An oral hearing concerning this case was held on November 21, 2016. The record contains a transcript of the hearing. Paper 31 (“Tr.”).

The Board has jurisdiction under 35 U.S.C. § 6(b). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons that follow, we determine that Petitioner has shown, by a preponderance of the evidence, that claims 29, 30, 32, 33, 47, 48, and 69 of the ’347 patent are unpatentable.

A. *Related Proceedings*

The parties identify multiple lawsuits involving the ’347 patent that are ongoing in the U.S. District Court for the Central District of California.

¹ Cascades Projection LLC has provided a statement from the owner of the ’347 patent, Eugene Dolgoff, confirming that Cascades is the exclusive licensee of the patent and has the exclusive right to defend the patent in this proceeding. Ex. 2001. We, therefore, refer to Cascades as “Patent Owner.”

Pet. 1; Paper 5, 1–2. Several other petitions seeking *inter partes* review of the '347 patent have been filed, and one trial has been instituted in *Epson America, Inc. v. Cascades Projection LLC*, IPR2015-01206 (“IPR-1206” or “*Epson*”). Pet. 1–2. On November 29, 2016, the Board entered a Final Written Decision in *Epson* determining that claims 29, 30, 32, 33, 48, and 69 of the '347 patent are unpatentable. IPR-1206, Paper 43.

B. The '347 Patent

The '347 patent relates to liquid crystal display (LCD) technology using an external light source and a light valve such as an active matrix LCD. The light valve modulates the light source, imposing image or data information on the light beam so that the beam can be projected onto a viewing surface. *See generally* Ex. 1001, at [57], col. 10, ll. 36–57. Using an arrangement similar to that of a cathode-ray tube (CRT) projection system, a properly constructed light valve projection system can produce an image brighter than that produced by a CRT projection system. *Id.* at col. 10, ll. 41–43.

According to the '347 patent, one problem of such systems is efficiency of the light collection optics:

One problem common to all projection systems is the efficiency of the light collection optics. Usually, only a small percentage of the light produced by a bulb is actually collected and utilized in the projection system. To further improve the efficiency of the system, various methods can be used to increase the amount of light that is captured from the bulb for use in projection.

Ex. 1001, col. 32, ll. 55–61. One solution to this problem described in the '347 patent is the use of input lens arrays between the light source and the image forming element (“IFE”):

Thus, an input lens array element may focus light into a pixel hole which is located horizontally or vertically next to the pixel directly in line with the input lens array element, or into a pixel hole which is displaced both vertically or horizontally from the pixel hole directly in line with the input lens array element by one or more pixels.

Id. at col. 32, ll. 36–42. The '347 patent describes this process as “cramming” or “squeezing” the light into the pixel holes to avoid the opaque areas between pixels:

A major loss of efficiency which is especially noticeable in an active matrix light valve occurs because there are spaces between pixels which do not transmit light. Light that hits these areas does not reach the screen, decreasing the brightness of the projected image and contributing to heating of the light valve. Typically between 25% and 45% of the light illuminating such a light valve actually passes through it. To get around this problem, light must be crammed into the pixel holes, being made to miss the opaque areas between pixels.

Id. at col. 48, ll. 1–9; *see also id.* at col. 50, ll. 11–12 (referring to “using a lens to squeeze the light through a pixel hole”).

C. Illustrative Claims

Claims 29 and 69, reproduced below, are illustrative.

29. 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.

69. A display system comprising:
a light source;
an element capable of having an image formed thereon, said element having a predetermined shape; and
means for enhancing brightness of an image by shaping a beam illuminating said image-forming element such that the shape of the beam substantially matches the shape of said image-forming element, wherein said enhancing means also includes a Fresnel polarizer means.

D. Asserted Prior Art

Fushimi et al. (“Fushimi”) (Ex. 1003)	US 5,689,315	July 14, 1993
Goldenberg (Ex. 1004)	US 4,912,614	Mar. 27, 1990
Mitsutake et al. (“Mitsutake”) (Ex. 1005)	US 5,566,367	Dec. 8, 1993
Sato et al. (“Sato”) (Ex. 1006)	US 5,042,921	Aug. 27, 1991

E. Asserted Grounds of Unpatentability

The Board instituted trial on the following grounds of unpatentability (Institution Decision 19):

Reference(s)	Basis	Claim(s)
Fushimi	35 U.S.C. § 102(e)	29, 30, 32, and 33
Goldenberg	35 U.S.C. § 102(b)	47
Goldenberg and Mitsutake or Sato	35 U.S.C. § 103(a)	48 and 69

II. ANALYSIS

A. Level of Ordinary Skill

Petitioner describes the level of skill in the art as follows:

The level of ordinary skill in the art of display systems in 1994 would have been that of a person with: (1) a bachelor's degree in optics or optical engineering and two years of experience working with the optical engineering of display or related optical systems; (2) a bachelor's degree in physics, electrical engineering, mechanical engineering, or equivalent and three years of experience working with the optical engineering of display or related optical systems; or (3) an advanced degree in one of the disciplines identified above in (1) and (2) and one year of experience working with the optical engineering of display or related optical systems.

Pet. 15 (citing Ex. 1015, Declaration of Alan E. Willner, Ph.D. (“Willner Decl.”) ¶ 114). The definition presented by Mr. Bohannon, Patent Owner's expert, is similar, but apparently would require specific experience designing or building a display system or projector. Ex. 2011 (“Bohannon Decl.”) ¶¶ 12–13; Ex. 1019 (“Bohannon Dep.”) 48:20–49:17. Although we agree with Petitioner that specific design experience on commercial projectors would not be required (Pet. Reply 4), we are satisfied that Petitioner's formulation, requiring experience “working with the optical engineering of display or related optical systems,” includes design activities, and is, therefore, sufficient. Consequently, we adopt Petitioner's definition of the level of skill in the art.

B. Claim Construction

The parties initially contended the claims of the '347 patent should be given their broadest reasonable construction. Pet. 15–16; Prelim. Resp. 10.

However, that standard is applicable only to unexpired patents. *See* 37 C.F.R. § 42.100(b) (“A claim in an unexpired patent shall be given its broadest reasonable construction in light of the specification of the patent in which it appears.”).

In our Institution Decision and in *Epson*, we concluded that the ’347 patent would expire no later than September 16, 2016. Institution Decision 5; IPR-1206 Paper 15, 4. Thus, the patent has now expired. Patent Owner has not challenged this determination in its Patent Owner Response, and, therefore, has waived its previous argument that the ’347 patent expires on October 29, 2019. Prelim. Resp. 2. *In re Nuvasive Inc.*, No. 2015-1670. 2016 WL 7118526, at *2 (Fed. Cir. Dec. 7, 2016). On this issue, we adopt the discussion and findings set forth in the Final Written Decision in *Epson*, Paper 43, 5–7.

For claims of an expired patent, the Board’s claim interpretation is similar to that of a district court. *See In re Rambus, Inc.*, 694 F.3d 42, 46 (Fed. Cir. 2012). “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–17 (Fed. Cir. 2005) (en banc)). However, there is a presumption that a claim term carries its ordinary and customary meaning. *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002).

We first address the means-plus-function claim elements. A petition for an *inter partes* review must identify how each challenged claim is to be construed. 37 C.F.R. § 42.104(b)(3). As part of that requirement, a

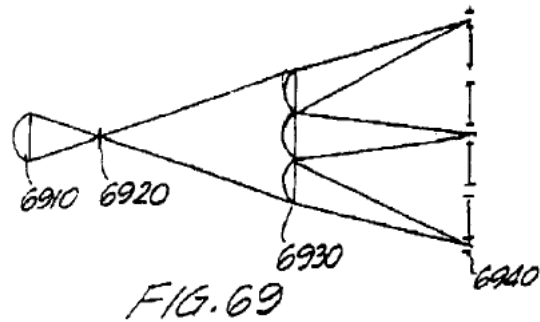
petitioner must “identify the specific portions of the specification that describe the structure, material, or acts corresponding to each claimed function” of any means-or step-plus-function limitation. *Id.*; *see also* 35 U.S.C. § 112 ¶ 6.²

1. Means for Focusing (Independent Claim 29)

Claim 29 recites “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.” Petitioner cites several embodiments in the ’347 patent that contain corresponding structures for performing the function for the “means for focusing.” Pet. 21. Petitioner identifies this function as: “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.” *Id.* at 22. For purposes of its challenge with respect to claims 29, 30, 32, and 33, Petitioner focuses its discussion on the structure set forth in the Figure 69 embodiment of the ’347 patent. *Id.* at 22–23.

Figure 69 of the ’347 patent is reproduced below.

² Section 4(c) of the Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”) re-designated 35 U.S.C. § 112 ¶ 6 as 35 U.S.C. § 112(f). Because the ’347 patent has a filing date prior to September 16, 2012, the effective date of § 4(c) of the AIA, we refer to the pre-AIA version of 35 U.S.C. § 112.



As described in the '347 patent, Figure 69 depicts a double input lens system with an image forming element. Ex. 1001, col. 9, ll. 53–54. Figure 69 depicts first lens array element 6910, aerial image 6920 of the source, second input array lens 6930, and pixel hole 6940, with the image formed at 6940 being the image of 6920. *Id.* at col. 50, l. 67–col. 51, l. 4. As stated in the description in the patent:

Making the image of the source at 6920 as small as the pixel hole increases the angles of light emanating from it so that the light is directed toward multiple lens array elements in the second lens array and is thereby focused into multiple pixels. Light from a single aerial image is, thus, directed in this arrangement to every other pixel (as shown). All light goes through pixel holes and none is focused onto spaces between pixels. In this case, the input angles of the light to the first lens array must be controlled carefully, or else alternating pixels will have a different brightness level than the remaining pixels. To reduce this dependence on careful control of the angles of input light, the lens array elements of the second lens array can be made the same size as the pixel holes (doubling the number of lens array elements in each direction) so that the light from the source image formed by the first input lens array element illuminates several lens array elements on the second array and the same number of pixel holes, without skipping any pixels.

Ex. 1001, col. 51, ll. 5–22. According to Petitioner, the specific structure of Figure 69 that performs the function of the “means for focusing” recited in the claims is input lens array 6930. Pet. 23.

Patent Owner initially responded by pointing out that the language of the claims requires the light to be focused “onto the pixels.” Prelim. Resp. 16–17. According to Patent Owner, in Figure 69, light is focused “into the pixel holes,” rather than “onto the pixels.” *Id.* Thus, Patent Owner concluded that “there is nothing in the specification that clearly links the structure of Figure 69 with performance of the claimed function.” *Id.* at 17.

In instituting trial, we were not persuaded by Patent Owner’s argument and agreed with Petitioner’s construction of the “means for focusing.” Institution Decision 9. First, we noted that Patent Owner’s Preliminary Response equated the terms “pixels” and “pixel holes.” *See* Prelim. Resp. 17 (“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.”). Given that Patent Owner did not distinguish between “pixels” and “pixel holes,” we were not persuaded by Patent Owner’s argument that focusing light “onto” a pixel is materially different from focusing light “into” a pixel hole. Institution Decision 8.

We further concluded that although, during prosecution, the claims were amended to substitute “onto the pixels” for “into the pixel holes” (Prelim. Resp. 17), we were not persuaded that there is a material difference in scope, as there was no discussion of this distinction by the applicant in the remarks cited by Patent Owner, only a brief reference to the asserted

antecedent basis for the amendment. Institution Decision 8–9; *see* Ex. 2005, 15. As the Federal Circuit cautioned:

Although prosecution history can be a useful tool for interpreting claim terms, it cannot be used to limit the scope of a claim unless the applicant took a position before the PTO that would lead a competitor to believe that the applicant had disavowed coverage of the relevant subject matter.

Schwing GmbH v. Putzmeister Aktiengesellschaft, 305 F.3d 1318, 1324 (Fed. Cir. 2002) (citations omitted).

Nor were we persuaded by Patent Owner’s argument (Prelim. Resp. 18–21) that the Board’s reliance on the Figure 65 embodiment in *Epson* precludes Petitioner’s reliance here on Figure 69. Institution Decision 9. In *Epson*, Petitioner’s obviousness challenge was based on the structure disclosed in the Figure 65 embodiment of the ’347 patent. Therefore, it was not necessary in *Epson* to consider the embodiment of Figure 69. Where multiple embodiments in the specification correspond to the claimed function, the claims are not limited to any particular one of the disclosed embodiments. *See Micro Chemical, Inc. v. Great Plains Chemical Co.*, 194 F.3d 1250, 1259 (Fed. Cir. 1999) (“Because alternative structures corresponding to the claimed function were described, the district court incorrectly limited ‘weighing means’ to the specific structures of the preferred embodiment.”); *Serrano v. Telular Corp.*, 111 F.3d 1578, 1583 (Fed. Cir. 1997) (holding that, although the specification disclosed discrete logic circuitry as a preferred embodiment, the invention was not limited to such circuitry because the specification also stated that the logic could be configured in software).

In addition to the information set forth in the Petition, Petitioner provided testimony supporting its construction of this term. Willner Decl. ¶¶ 201–206. Thus, on the record presented, we determined that the structure corresponding to the claim 29 “means for focusing” requirement is input lens array 6930 shown in Figure 69 of the ’347 patent. *See* Willner Decl. ¶¶ 205–206.

The Patent Owner Response continues to rely upon previous arguments contending there is a distinction between “pixels” and “pixel holes.” PO Resp. 20. For at least the reasons stated in our Institution Decision (summarized above) and those that follow, we are not persuaded by these arguments. We agree, instead, with Petitioner’s reasoning that the “means for focusing” limitation should not be interpreted to exclude focusing light into pixel holes. Pet. Reply 1–5.

There are several reasons why Patent Owner’s construction fails. As pointed out by Petitioner, the ’347 patent uses the terms “pixel” and “pixel hole” interchangeably to mean the same thing. *See, e.g.*, Ex. 1001, col. 37, ll. 2–5 (“Light focussed by a lenslet . . . instead of entering the pixel hole behind it, enters the next pixel over.”); *id.* at col. 42, ll. 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 . . .”); *id.* at col. 48, ll. 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 col. 51, ll. 10–12 (“All light goes through pixel holes and none is focused onto spaces between pixels.”) Pet. Reply 3–5. Furthermore, as Petitioner also points out (*id.* at 6), Patent Owner, before the PTO, continued to rely on the pre-amendment claim language “into pixel holes” to distinguish prior art

in a post-amendment response. Ex. 1002, 412. This supports a conclusion that the amendment effected no difference in claim scope.

Our conclusion is supported further by the testimony presented by the parties. In addition to the explanations of pixels and pixel holes set forth in his declaration, Petitioner's expert, Dr. Willner, testified as follows on cross-examination by Patent Owner's counsel when asked to explain remarks regarding pixel borders accompanying the amendment:

[Dr. Willner:] When Mr. Dolgoff mentions -- omits the recitation that the pixels have holes in light of the way he's using it, and in light of the way that it's described in the ['347] patent, what one can understand is that pixel holes and pixels are used interchangeably by him.

Ex. 2010 ("Willner Dep.") 104:10–15. In contrast, Patent Owner's expert gave the following testimony on this issue:

[Counsel for Petitioner:] So in your opinion, can a pixel have a border?

[Mr. Bohannon:] So what do you mean by "a border"?

....

[Counsel for Petitioner:] Now, what about with respect to a hole? Does a pixel necessarily have to have a hole?

[Mr. Bohannon:] What do you mean by "a hole"?

Ex. 1019, 148–9, 17:18–20. Because it is both conclusory and evasive, we do not find this or the related testimony by Mr. Bohannon persuasive on this issue.

We are not persuaded by Patent Owner's criticism of Dr. Willner's qualifications that we should give his testimony "no weight." PO Resp. 41.³

³ Patent Owner concedes that Dr. Willner "has academic credentials in optics generally." PO Resp. 41. In addition to having a Ph.D. and holding a chaired professorship in optical communications systems at USC, Dr.

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. It is within our discretion to assign the appropriate weight to testimony offered by the witnesses. *See, e.g., Yorkey v. Diab*, 601 F.3d 1279, 1284 (Fed. Cir. 2010) (holding the Board has discretion to give more weight to one item of evidence over another "unless no reasonable trier of fact could have done so").

Nor are we persuaded by Patent Owner's 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. PO Resp. 23–24. This argument depends on making a distinction between pixels and pixel holes, which we determine is not consistent with the '347 patent or the record of this case. It 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." Ex. 1001, col. 39, ll. 1–2.

In addition, Patent Owner contends that the '347 patent "contains no clear linkage or association between item 6930 and this functional language." PO Resp. 20. Petitioner responds that "corresponding structure

Willner has industry experience at Bell Labs. Ex. 1016, 2. Given his credentials and experience, the fact that he "admitted he has never designed a commercial display" does not convince us that his testimony should "receive no weight." PO Resp. 41; *cf. SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1373 (Fed. Cir. 2010) (district court did not abuse discretion in allowing testimony of infringement expert who lacked experience designing accused product).

need not be linked or associated with a function by use of the same language as the claim.” Pet. Reply 7. In addition, Petitioner contends that Figure 69, itself “can supply the clear link or association between function and structure.” *Id.* We agree with Petitioner on this issue and adopt Petitioner’s analysis (Pet. Reply 7–9) for at least the reasons that follow.

We are 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 “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.” As discussed *supra*, the purpose of having a lens array is to focus light into the pixel holes. *See Linear Tech. Corp. v. Impala Linear Corp.* 379 F.3d 1311, 1322 (Fed. Cir. 2004):

Contrary to Maxim’s argument, and the district court’s conclusion on summary judgment, PWM circuits are not excludable from the corresponding structure for failing to reference a specific structure Although the expression “PWM circuit” does not reference a specific circuit structure, persons of skill in the art would understand that “PWM circuit” references a discrete class of circuit structures that perform known functions. That the disputed term is not limited to a single structure does not disqualify it as a corresponding structure, as long as the class of structures is identifiable by a person of ordinary skill in the art.

Thus, the ’347 patent specification describes the function of the input lens array arrangement in Figure 69 in terms that identify it with the claimed focusing means: “All light goes between pixel holes and none is focused into spaces between pixels.” Ex. 2001, col. 51, ll. 10–11.

Furthermore, we agree with Petitioner’s analysis 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. Pet. Reply 2. This is apparent from the figure itself, the description quoted *supra*, and the credible testimony from Dr. Wilner. Willner Decl. ¶¶ 196–206.

Patent Owner asserts that input array 6930 does not focus beam segments emanating from a light source onto the image forming element. PO Resp. 20. However, testimony from Patent Owner’s expert establishes the element performs the claimed function. Mr. Bohannon testified that lens arrays (such as element 6910 in Figure 69) split beams into separate segments. Bohannon Dep. 68:7–8; Bohannon Decl. ¶ 26. Other testimony from Mr. Bohannon further confirms that focusing of light beam segments by input lens array 6930 occurs when it focuses image 6920:

[Counsel for Petitioner:] Is there a difference between bringing light to foci and focusing different segments of a light beam?

[Mr. Bohannon:] I don’t think so. I think there was a hearing on that as well, if you look back at somewhere along the way. I think maybe one of the cases people have argued about what bringing to focus and focusing versus foci. And I think the result was that it all means the same.

Bohannon Dep. 103:3–9. Thus, we are persuaded that input lens array 6930 also performs the claimed function “focusing different segments of a light beam emanating from said light source.” See PO Resp. 21. Moreover, we are persuaded that the descriptions cited above and the figure itself sufficiently link the structure to the function. *Linear Tech. Corp.*, 379 F.3d at 1322. Further, it is well established that the “specification must be read as a whole to determine the structure capable of performing the claimed

function.” *Budde v. Harley–Davidson, Inc.*, 250 F.3d 1369, 1379 (Fed. Cir. 2001).

In sum, we are not persuaded by Patent Owner’s argument that, in the ’347 patent, there is a material difference between focusing light “into the pixel holes” and “onto the pixels.” See PO Resp. 22–23. Patent Owner does not point us to where in the ’347 patent such a distinction is made. In fact, as the Final Written Decision in *Epson* makes clear, Patent Owner’s expert, Mr. Bohannon, has testified that lens array 6580 in the Figure 65 embodiment of the ’347 patent, relied on by Patent Owner, is used to “cram” light into the pixel holes.” IPR-1206, Paper 43, 11. Thus, in both Figures 65 and 69 of the ’347 patent, whether light is described as focused “into” pixel holes or “onto” pixels is immaterial, as the light is incident on the pixels—not on the opaque areas between the pixels. This finding is consistent with the goal of the ’347 patent of improving light-use efficiency, as indicated in title of the patent (“High-Efficiency Display System”) and its stated objectives. Ex. 1001, col. 1, l. 1, col. 2, ll. 52–53, col. 5, ll. 26–27. As Petitioner contends, at best, “onto the pixels” is a broader term that still would encompass the embodiment of Figure 69. Pet. Reply 9 (citing Bohannon Dep. 105:25–106:12).

Accordingly, we are not persuaded that our construction of this claim element in our Institution Decision was incorrect, and we, therefore, maintain that construction for the purposes of this Final Written Decision.

2. Means for Enhancing Brightness (Independent Claims 47, 48, and 69)

Claim 69 recites “means for enhancing brightness of an image by shaping a beam illuminating said image-forming element such that the shape

of the beam substantially matches the shape of said image-forming element.” Ex. 1001, col. 67, ll. 1–4. Independent claim 47, from which challenged claim 48 depends, recites the same limitation, except that the image-forming element is an “electronic” image-forming element. *Id.* at col. 64, ll. 35–39.

Petitioner identifies structures in the Figures 66 and 68 embodiments of the ’347 patent that correspond to the “means for enhancing brightness.” Pet. 26–28. Specifically, Petitioner identifies the combination of light tunnel 6610 and lens 6620 in Figure 66 and concentrator 6830 and lens 6840 in Figure 68. *Id.* Patent Owner does not dispute this identification. Patent Owner acknowledges, however, that the term “light tunnel” does not appear in the claims. PO Resp. 26. Accordingly, we did not see the need to construe this term in our Institution Decision.

Patent Owner now contends that “the prosecution history provides an explicit definition for the term ‘light tunnel’ that amounts to both a definition and a disclaimer.” PO Resp. 26. Specifically, Patent Owner alleges that a light tunnel with an enclosed light source was disclaimed during prosecution. *Id.* Patent Owner further contends “[t]he term [light tunnel] is undisputedly the name of the structure that all parties agree, for purposes of this proceeding, is the clearly linked corresponding structure for the relevant means term in claims 47, 48 and 69.” *Id.* at 28.

Petitioner responds that Patent Owner’s “general statement about a light tunnel” during prosecution is neither a disavowal nor a disclaimer. Pet. Reply 14. We agree for at least the following reasons. “[T]he doctrine of prosecution disclaimer only applies to unambiguous disavowals.” *Grober v. Mako Prods., Inc.*, 686 F.3d 1335, 1341 (Fed. Cir. 2012) (citation omitted). We find that the prosecution record cited by Patent Owner in this case does

not meet this test. Patent Owner refers to an argument made to the Examiner distinguishing a reference (Faris). PO Resp. 26–27; Ex. 2009, 19. Patent Owner described these structures in Faris as “light pipes,” i.e., “fluorescent, tube-shaped lights with light reflective mounts.” Ex. 2009, 18. Patent Owner 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. *See* Pet. Reply 14. Patent Owner further described a light tunnel as “a tube.” Ex. 2009, 18. As discussed in our Institution Decision, referring to a light tunnel as a “tube” does not necessarily mean it is open at both ends. *See* Institution Decision 17 (referring to a tube of toothpaste).

We, therefore, are not persuaded that the restrictions on this means-plus-function element suggested by Patent Owner should be adopted. We will, however, further discuss this limitation *infra* in connection with Goldenberg.

For the foregoing reasons, we are persuaded that the structures that Petitioner identifies as corresponding to the claimed functions represent a proper construction for this “means.”

3. Means for Bringing Light (Dependent Claim 30)

Claim 30 depends from claim 29 and recites “further comprising means for bringing light from different sections of the light beam emanating from said light source to foci.” For this element, Petitioner relies on the Figure 69 embodiment described by the ’347 patent, submitting that the structure corresponding to the means for bringing light is lens array 6910. Pet. 25; Willner Decl. ¶ 213.

Patent Owner did not address this construction in its Preliminary Response or its Patent Owner Response. We are persuaded that, for the

reasons set forth in the Petition, Petitioner has properly identified corresponding structure for the “means for bringing light.”

4. *Fresnel Polarizer (Claims 48 and 69)*

The term “Fresnel polarizer” appears in claims 48 and 69. In the Board’s Institution Decision in *Epson*, we construed “Fresnel polarizer” as “a polarizer constructed with stepped, sawtooth-like elements so as to have the optical properties of a much thicker polarizer.” Ex. 2008, 16. We adopted this same construction here in our Institution Decision. Institution Decision 11. Patent Owner now requests that we “revisit” this construction. PO Resp. 29.

Patent Owner contends that Fresnel polarizer is a “coined term.” *Id.* Patent Owner argues that, in addition to the Board’s construction, a Fresnel polarizer “must also involve an optical coating at the interfaces where sawtooth structures touch.” *Id.* at 30. It also must “transmit all incident polarized light.” *Id.* Thus, Patent Owner proposes the following “modified” claim construction for Fresnel polarizer:

[A] polarizer constructed with stepped, sawtooth-like elements so as to have the optical properties of a much thicker polarizer, with an optical coating layer where two sawtooth-like elements touch, and with polarization conversion of reflected incident light through a wave plate in a manner to cause nearly all incident light to exit with primarily one polarization.

PO Resp. 31.

Petitioner responds that whether or not Fresnel polarizer itself is a coined term, “both of the terms have customary meaning to those of ordinary skill.” Pet. Reply 18. Petitioner cites testimony from Dr. Willner (Willner Decl. ¶¶ 180–183) and Patent Owner’s expert, Mr. Bohannon (Bohannon Dep. 80:17–81:4), indicating familiarity of the art with Fresnel lenses.

Petitioner provides similar citations concerning established meaning for the term “polarizer,” including testimony from Dr. Willner (Willner Decl. ¶¶ 96–97) and Mr. Bohannon (Bohannon Dep. 133:10–17).

Moreover, Petitioner contends that the additional limitations proposed by Patent Owner should be rejected for several reasons. Pet. Reply 19–21. For example, Petitioner contends that the “optical coating” limitation would exclude an embodiment of the Fresnel polarizer (Figure 78) disclosed in the ’347 patent. *Id.* at 19. Petitioner further contends that the “polarization conversion” limitation is contrary to the disclosure of the ’347 patent and to an April 1995 article (Ex. 1018) by the named inventor of the patent. Pet. Reply 19–21. Specifically, Petitioner contends that a Fresnel polarizer does not perform polarization conversion unless a mirror and half-wave plate are added. *Id.* at 19.

We agree that the record shows the terms “Fresnel” and “polarizer” have customary meanings in the art, as Petitioner asserts. We agree, also, that both the ’347 patent specification and the April 1995 article demonstrate that a Fresnel polarizer, by itself (i.e., without additional elements), is not a polarization converter.

For at least the foregoing reasons, we agree with Petitioner that further limitations to the term Fresnel polarizer, as proposed by Patent Owner, are unwarranted, and adopt Petitioner’s reasoning that a person of ordinary skill familiar with Fresnel lenses and polarizers would understand the term Fresnel polarizer as a polarizer constructed with stepped, sawtooth-like elements so as to have the optical properties of a much thicker polarizer. Pet. 17–20; Willner Decl. ¶¶ 178–184.

C. Claims 29, 30, 32, and 33 — Fushimi

Petitioner asserts that these claims are anticipated by Fushimi. Pet. 29–40. Fushimi is titled “Light Valve Apparatus Which is Employed in a Production Display System and in a View-Finder System.” Because Fushimi was filed prior to April 4, 1994, the patent qualifies as a reference under 35 U.S.C. § 102(e). *Id.* at 29.

Figures 1 and 2 of Fushimi are reproduced below. Figure 1 shows a model of a light valve apparatus. Ex. 1003, col. 6, ll. 5–6. Figure 2 is an optical path diagram corresponding to Figure 1. *Id.* at col. 6, ll. 27–28.

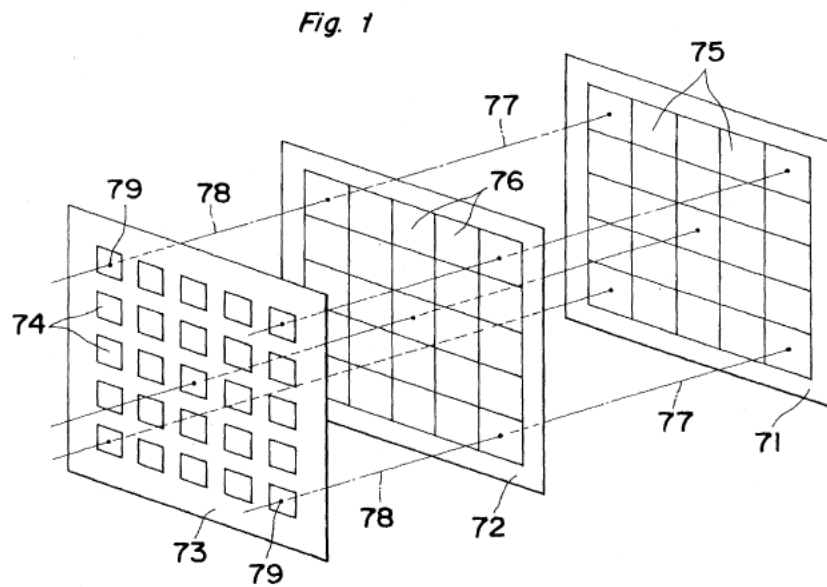
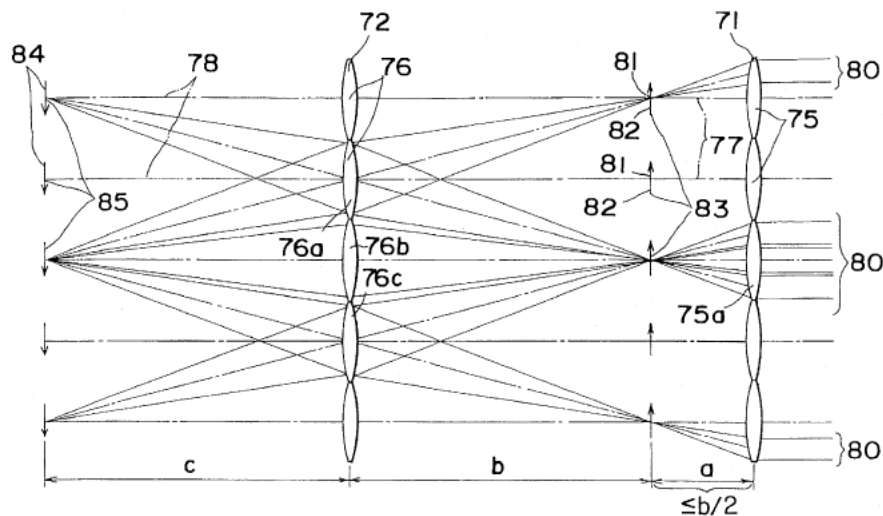


Figure 1 shows first lens array 71, second lens array 72, and light valve 73 sequentially disposed from a light incident side (the right side of the Figure). Each of the light valve, first lens array, and second lens array is described in the patent as very thin, with air spaces between. *Id.* at col. 6, ll. 7–11. Light valve 73 has its pixels arranged in a square pattern. *Id.* at col. 6, ll. 11–12. In first lens array 71 and second lens array 72, square micro lens elements 75

and 76, respectively, are arranged in a square pattern. Elements 75 and 76 as described are thin, ideal lenses without aberrations. *Id.* at col. 6, ll. 12–17. The pitches of micro lens elements 75 and 76 are exactly the same as the pitch of pixels 74. *Id.* at col. 6, ll. 18–21. Moreover, optical axis 77 of each micro lens element 75 and optical axis 78 of corresponding micro lens elements 76 are aligned with each other. *Id.* at col. 6, ll. 22–25. Furthermore, each of optical axes 77 and 78 passes through center 79 of a pixel 74. *Id.* at col. 6, ll. 25–26.

Fig. 2



In Figure 2, when light 80 from a light source (not shown here) is incident on first lens array 71, each of micro lens elements 75 forms a small real image 82 which corresponds to the light source on each focal point 81. Ex. 1003, col. 6, ll. 28–32. Each of micro lens elements 76 of second lens array 72 forms an equal size real image 84 of small light source 82 rotated by 180°. *Id.* at col. 6, ll. 34–36. Thus, a second small light source group 85 is formed at the emitting side of second lens array 72. *Id.* at col. 6, ll. 36–38.

The pitch of first light source group 83 and the pitch of second light source group 85 are described as equal to each other. *Id.* at col. 6, ll. 39–42. Where the optical axis 77 of each of micro lens elements 75 is aligned with the optical axis 78 of corresponding micro lens element 76, second light source group 85 formed by the respective micro lens elements 76 entirely overlaps the respective small light sources 84. When the pixel pitch of light valve 73 is equal to the pitch of second light source group 85, the respective pixels 74 of the light valve 73 can be overlapped with the respective light sources 84 of second light source group 85. *Id.* at col. 6, ll. 42–52.

For each limitation of claims 29, 30, 32, and 33, Petitioner identifies corresponding elements in Fushimi’s Figures 1 and 2. Pet. 29–40. In support of this, Petitioner relies on testimony from its expert, Dr. Willner. *See Willner Decl.* ¶¶ 239–304. Thus, for example, Petitioner asserts that the “means for focusing” limitation is met by the structure shown in Figures 1 and 2. *Id.* at 30–34. Petitioner identifies second lens array 72 in Figure 1 of Fushimi as corresponding to input lens array 6930 of the ’347 patent. Pet. 32; Willner Decl. ¶¶ 250–70. We adopt Petitioner’s analysis and find that each limitation of these claims is met by Fushimi. We now address the disputed limitations. *See In re Nuvasive, Inc.*, 841 F.3d 966, 974 (Fed. Cir. 2016) (“The Board, having found the only disputed limitations together in one reference, was not required to address undisputed matters.”).

Patent Owner responds by arguing that Petitioner “uses the wrong claim construction,” referring back to the “means for focusing” argument discussed *supra*. PO Resp. 40. According to Patent Owner, “the primary reason why [Petitioner’s] argument fails is that it put all of its invalidity eggs into the wrong claim construction basket.” *Id.* at 42. For the reasons

discussed above, we adopted Petitioner’s claim construction, not Patent Owner’s. We are, therefore, not persuaded by this argument.

Patent Owner asserts further that “Fushimi does not disclose focusing any image – of anything – into pixel holes (whether or not this is the meaning of “onto the pixels”).” *Id.* According to Patent Owner, “Fushimi is silent about what relationship the second focal plane has with the light valve.” *Id.* We disagree with Patent Owner’s conclusion. Testimony from Dr. Willner supports Petitioner’s assertion that the “focusing means” limitation is met by Fushimi. Willner Decl. ¶¶ 251–270. Further support for this conclusion is found in Figure 8 of Fushimi, which shows the focused rays incident on pixels 113a-113d. *See* Willner Decl. ¶ 266; Ex. 1003, col. 9, l. 55– col. 10, l. 15.

Patent Owner’s next arguments are directed to dependent claims 32 and 33. PO Resp. 43. According to claim 32, depending from claim 29, “the element [having pixels] has a size, wherein a focused image has the same size as said element.” *Id.* Patent Owner asserts that Fushimi does not meet this limitation because “Fushimi creates *a plurality* of much smaller focused images.” PO Resp. 43–44. Petitioner responds that Fushimi produces “an *overall focused image* on the IFE, which is ultimately projected.” Pet. Reply 11. We agree with Petitioner’s analysis. Petitioner demonstrates that the “focused image” in claim 32 is not the same as the focused light beams referred to in claim 29, and that Fushimi therefore meets this limitation in claim 32. *Id.* (citing Ex. 1003, 1:32-51, 12:2–13). We find support for this conclusion in the language of the claim itself, referring to “a focused image” — as opposed to “the” or “said” focused image — and in the ’347 patent specification, describing projection systems having an

overall focused image on the IFE. *See, e.g.*, Ex. 1001, Figs. 66, 69, 70 (showing formation of an image on the IFE); Bohannon Dep. 160:4–7 (“Q Together the pixels form an image? Is that fair to say? A Yes. Like people in the stadium holding signs up to form an image of that.”). Testimony from Dr. Willner further supports this conclusion. Willner Decl. ¶¶ 287–296. As Dr. Willner credibly testifies:

One of ordinary skill in the art in 1994 would have known that a focused image the same size as the element will be created on the light valve (the “element”) itself. Fushimi, for example, expressly teaches that “an optical image, resulting from the variation of the rotatory polarization corresponding to the video signals, can be formed on the liquid crystal panel 104.”

Willner Decl. ¶ 287 (citations omitted).

Claim 33, also depending from claim 29, recites “a field lens located near said element [having pixels]” i.e., near the IFE. PO Resp. 44. According to Patent Owner, field lens 135 in Figure 10 of Fushimi is not “near” the image forming element as the claim requires. *Id.* at 44–45. Petitioner responds that Patent Owner does not address field lenses 160, 161, and 162 in Figure 11 of Fushimi. Pet. Reply 11–12. Further, Petitioner contends that Patent Owner does not address “the auxiliary lenses in Figures 10 (139) and 11 (181, 182, 183), each of which is located after the IFE.” *Id.* at 12. Still further, Petitioner contends field lens 135 in Figure 10 of Fushimi meets this limitation. *Id.*

We agree with Petitioner. The claim does not require the field lens to be directly adjacent the IFE and does not rule out intervening components. Pet. Reply 12. As explained by Dr. Willner, the field lenses in Figures 10 and 11 of Fushimi identified by Petitioner are “near” the liquid crystal panel. Willner Decl. ¶¶ 297–304. We find this testimony to be persuasive in its

discussion of Fushimi's Figures 10 and 11, and specifically the relation of the elements identified by Petitioner as field lenses to the light valve. In Fushimi's Figure 10, for example, there is only one optical element (a polarizer) between the field lens and the light valve (on which the lens array is stacked). *Id.* ¶ 299.

For at least the foregoing reasons, we find that Petitioner has demonstrated, by a preponderance of the evidence, that Fushimi anticipates claims 29, 30, 32, and 33.

D. Claim 47 – Goldenberg

Petitioner asserts that claim 47 is anticipated by Goldenberg. Pet. 40–45. Goldenberg is titled: “Light Valve Projection System with Non Imaging Optics for Illumination.” Because Goldenberg issued more than a year prior to April 4, 1994, the patent qualifies as a reference under 35 U.S.C. § 102(b). Pet. 40.

Goldenberg describes using non-imaging reflectors to enhance light projection systems. Ex. 1004, col. 2, l. 15 – col. 3, l. 64.

Figure 7 of Goldenberg is reproduced below:

FIG. 7

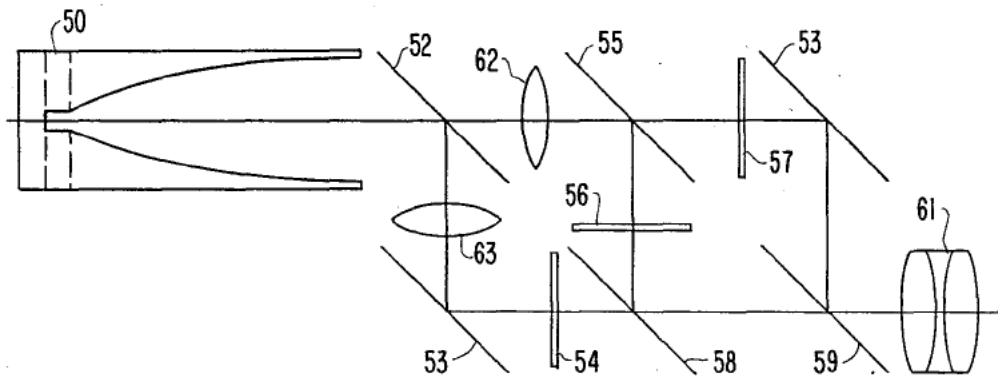


Figure 7 is a plan view of a single lamp system with dichroic filters for color separation and dichroic filters for combining the images. Ex. 1004, col. 4, ll. 15–17. Figure 7 shows white light source 50 and dichroic filters 52, 55, mirrors 53, and lenses 62, 63 to image the three channels (red, green, and blue) onto respective LCDs 54, 56, 57. *Id.* at col. 6, ll. 52–54. Dichroic filters 58, 59 are used to combine the images for projection by lens 61. *Id.* at col. 6, ll. 54–55. Also shown (unnumbered in this figure, but identified as 10 in Fig. 1) is a non-imaging reflector described as having a rectangular output aperture. *Id.* at col. 4, ll. 20–22.

For each limitation of claim 47, Petitioner identifies corresponding elements in Goldenberg. Pet. 41–45. In support, Petitioner relies on testimony from its expert, Dr. Willner. *See Willner Decl.* ¶¶ 306–332. We adopt Petitioner’s analysis in finding that each limitation of these claims is met by Goldenberg and now address the disputed limitations. *See In re Nuvasive, Inc., supra.*

Claim 47 includes the following limitation:

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.

Petitioner asserts that this limitation is met by the combination of the non-imaging reflector and lens 62 of Goldenberg's Figure 7. Pet. 43; Willner Decl. ¶ 325. Petitioner cites the description in Goldenberg of a non-imaging reflector being designed to have "a rectangular output aperture corresponding to the shape of the LCD." Pet. 43 (citing Ex. 1004, col. 2, ll. 10–12, col. 6, ll. 25–34).

Patent Owner responds that Goldenberg does not meet this limitation. PO Resp. 45. According to Patent Owner, the structure in the '347 patent corresponding to this function is a light tunnel, which Patent Owner equates to a tube with inner reflective surfaces, with "an entrance through which light is shined into the tunnel, and . . . an exit on the other end of the tunnel." *Id.* Patent Owner asserts: "Goldenberg teaches reflectors that do not contain entrances." *Id.* Further, Patent Owner observes Goldenberg's light source is housed inside the reflectors: "The other end of Goldenberg's reflectors is closed off, and an arc lamp – one of the hottest of all light sources, notoriously prone to explosion, even when cooled – is housed *inside* the reflectors." *Id.*

Patent Owner describes this arrangement in Goldenberg as "singularly dumb" and "a profoundly flawed design." *Id.* at 47. According to Patent Owner, "Goldenberg's design creates obvious and unacceptable burn risks, accelerates component degradation, and (worst of all) creates a high probability of explosion." *Id.* Patent Owner's expert characterizes the arrangement as "a dangerous bomb." Bohannon Decl. ¶ 95. Consequently,

Patent Owner contends Goldenberg's reflectors are "not identical" or even equivalent to the light tunnels depicted in the '347 patent, which are opened at both ends, and therefore do not meet this limitation. *Id.* at 47–48.

Petitioner responds that "a light tunnel does not cease to be one merely because it has an enclosed light source." Pet. Reply 15. Petitioner argues "[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.'" *Id.* (citing Ex. 1004, 3:38–49.)

Petitioner further responds that, in any case, Goldenberg's reflector is an equivalent structure to the corresponding structures in the '347 patent. Pet. Reply 15–17. Finally, Petitioner challenges Patent Owner's characterization of Goldenberg as a "bomb." *Id.* at 16–17. Among other reasons, "those of ordinary skill would have known that other light sources besides metal halide arc lamps could be used with Goldenberg's reflector in an LCD projector." *Id.* at 17.

We are not persuaded by Patent Owner's arguments distinguishing Goldenberg. As discussed *supra*, a light tunnel need not necessarily be a tube opened at both ends. But even if we were to accept Patent Owner's definition of "tunnel" as a tube having two openings, one for receiving light from a source, as we stated in our Institution Decision, "we are persuaded 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." Institution Decision 17–18 (citing Willner Decl. ¶¶ 330–332). Moreover, we agree with Petitioner's assertion (Pet. Reply 17) that a person of ordinary skill would have known 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. *See In re Preda*, 401 F.2d 825, 826 (CCPA 1968) (“[I]n 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.”). Thus, we find credible, and we rely on, Dr. Willner’s testimony to that effect. Willner Dep. 193:16–194:25.

For the reasons stated, we find that Petitioner has established by a preponderance of the evidence that claim 47 is anticipated by Goldenberg.

E. Claims 48 and 69 — Goldenberg and Mitsutake or Sato

Petitioner asserts that these claims would have been obvious over Goldenberg and either Mitsutake or Sato. Pet. 45–60.

Claims 48 (depending from claim 47) and independent claim 69 have the limitation of a “Fresnel polarizer means.” Petitioner relies on Mitsutake or Sato, “redundantly,” to provide this element missing from Goldenberg. Pet. 45. Petitioner contends that all limitations of these claims are met by Goldenberg and Mitsutake (or Goldenberg and Sato). Pet. 46–50. Petitioner further contends that a person of ordinary skill would have combined the references. *Id.* at 51–60. Petitioner supports these contentions with testimony from its expert. Willner Decl. ¶¶ 333–407.

Patent Owner responds by arguing “all nonequivalency arguments made in favor of claim 47 also apply to claims 48 and 69.” PO Resp. 49. These arguments are addressed *supra* in connection with our discussion of claim 47. In addition, Patent Owner argues that neither Sato nor Mitsutake describes the optical coating layer that Patent Owner’s construction of the

term “Fresnel polarizer” requires. Because we do not adopt that construction proposed by Patent Owner (see *supra*) this argument is unavailing.

Patent Owner argues that Petitioner and its expert “do not address that Sato’s system creates significant light waste, through absorption losses caused by the peculiar recycling and reflections within Sato’s device.” PO Resp. 50. Likewise, Patent Owner asserts Mitsutake is “highly inefficient, and inoperative for its stated goal.” *Id.* at 51. Petitioner disputes these criticisms of Sato and Mitsutake. Pet. Reply 21–25. Because we do not adopt Patent Owner’s construction for Fresnel polarizer requiring “polarization conversion . . . in a manner to cause nearly all incident light to exit with primarily one polarization,” (PO Resp. 31) these assertions, even if true, are not persuasive.

Finally, Patent Owner asserts that the combination of Goldenberg with Sato or Mitsutake “would not provide a reasonable expectation of success, since it would be too dangerous, and would thus not work for its intended purpose.” PO Resp. 51. In addition to disputing Patent Owner’s claims of inoperability, Petitioner responds that “[a] prior art reference need not disclose a commercially viable device to be invalidating, and ‘even an inoperative device . . . is prior art for all that it teaches.’” (citing *ABT Systems, LLC v. Emerson Elec. Co.*, 797 F.3d 1350, 1359 n.2 (Fed. Cir. 2015)(internal quotation marks omitted).

We are not persuaded by Patent Owner’s argument regarding these combinations. Petitioner’s expert, Dr. Willner, explains in detail the rationale for combining Mitsutake and Sato with Goldenberg. Willner Decl. ¶¶ 365–407. He concludes that:

Finally, it is my opinion that those of ordinary skill in the art in 1994 would have looked to the polarizing beam-splitter of either Mitsutake and Sato as a way of bringing the benefit of a conventional MacNeille polarizing beam-splitter to the projection display of Goldenberg but in a smaller form factor. When compared to conventional polarizing beam-splitters in use at the time, which were bulky, cube-shaped prisms, the polarizers of Mitsutake and Sato were significantly more compact, which means that they could save space and allow smaller projection display systems to be built without sacrificing brightness.

Willner Decl. ¶ 404. We find his testimony to be credible and adopt the rationale set forth by Dr. Willner. Our reasons follow. We find on this record 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. Pet. 18 (citing Willner Decl. ¶¶ 180, 183–184); Ex. 1008, 10. Likewise, we find that cube-shaped beam splitters, such as the MacNeille prism were well known. Pet. 19 (citing Ex. 1001, Figs. 44, 54). It follows, and we so find, that to achieve a smaller size in a projection system such as that in Goldenberg, without sacrificing brightness, a person of ordinary skill would have provided a conventional MacNeille beam splitter with sawtooth polarizers as shown in Mitsutake and Sato. *Nike, Inc. v. Adidas AG*, 812 F.3d 1326, 1337 (Fed. Cir. 2016) (affirming PTAB’s finding of a motivation to combine where a “skilled artisan interested in Nishida’s preference to minimize waste in the production process would have logically consulted the well-known practice of flat-knitting, which eliminates the cutting process altogether”); *Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (affirming PTAB’s explanation that “a skilled artisan could modify Caterpillar in view of Ogawa by treating the first jaw like the

second” to “allow[] for a greater degree of movement between the jaws, without impacting the quick change functionality” (citations omitted)).

We further conclude that a person of ordinary skill would not have been deterred from combining Mitsutake and Sato with Goldenberg by the alleged deficiencies in the references, even if true. We find that a person of ordinary skill would have had reason to make the necessary modifications. *ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1219 (Fed, Cir, 2016) (“[*KSR Int’l. Co. v. Teleflex Inc.*, 550 U.S. 398, 421 (2007)] does not require that a combination only unite old elements without changing their respective functions. Instead, *KSR* teaches that “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” (citations omitted)). We also are not persuaded by Patent Owner’s reliance (PO Resp. 52) on *U.S. v. Adams*, 383 U.S. 39 (1969). In *Adams*, there was evidence of skepticism of experts in the field and unexpected results not present here. *Id.* at 51–52. Here, in contrast, Patent Owner has not presented evidence of secondary considerations of non-obviousness.

We have considered Petitioner’s arguments in relation to claims 48 and 69 in view of the applied prior art. We are persuaded that Petitioner has demonstrated, by a preponderance of the evidence, that claims 48 and 69 would have been obvious over Goldenberg and either Mitsutake or Sato.

F. Other Challenges

Patent Owner’s Response includes a section headed “Constitutional Objection.” PO Resp. 53–55. Patent Owner’s stated purpose is to “make of record” certain objections to these proceedings under the United States Constitution. As acknowledged by Patent Owner (*id.* at 53–54), however,

the Federal Circuit has denied similar Constitutional challenges. Nevertheless, Patent Owner further “acknowledges that the Board lacks authority to rule on constitutional questions.” PO Resp. 53–54. We agree. Consequently, we do not address these questions in this decision.

III. CONCLUSION

Petitioner has demonstrated by a preponderance of the evidence that claims 29, 30, 32, 33, 47, 48, and 69 of the '347 patent are unpatentable over the prior art.

IV. ORDER

It is, therefore,

ORDERED that claims 29, 30, 32, and 33 of the '347 patent are anticipated by Fushimi and therefore unpatentable under 35 U.S.C. § 102(e);

FURTHER ORDERED that claim 47 of the '347 patent is anticipated by Goldenberg and therefore unpatentable under 35 U.S.C. § 102(b);

FURTHER ORDERED that claims 48 and 69 of the '347 patent would have been obvious over Goldenberg and Mitsutake or Sato and therefore are unpatentable under 35 U.S.C. § 103(a); and

FURTHER ORDERED that, because this is a Final Written Decision of the Board under 35 U.S.C. § 318(a), parties to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

IPR2015-01846
Patent 7,688,347 B2

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