

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HISENSE USA CORPORATION,
Petitioner,

v.

BRIGHTPLUS VENTURES LLC,
Patent Owner.

IPR2023-01311
Patent 8,177,382 B2

Before MICHELLE N. WORMMEESTER, KEVIN C. TROCK, and
JOHN D. HAMANN, *Administrative Patent Judges*.

WORMMEESTER, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Hisense USA Corporation (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting *inter partes* review of claims 1–20 of U.S. Patent No. 8,177,382 B2 (Ex. 1001, “the ’382 patent”). Brightplus Ventures LLC (“Patent Owner”) filed a Preliminary Response (Paper 6, “Prelim. Resp.”).

We have authority under 35 U.S.C. § 314 and 37 C.F.R. § 42.4(a). Pursuant to 35 U.S.C. § 314(a), an *inter partes* review may not be instituted “unless . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” For the reasons that follow, we institute an *inter partes* review as to all the challenged claims of the ’382 patent based on all the challenges presented.

II. BACKGROUND

A. *Related Proceedings*

The parties identify two pending federal district court cases. *See* Pet. 1; Paper 5 § I.b (Patent Owner’s mandatory notices).

B. *The ’382 Patent*

The ’382 patent describes solid state lighting devices. Ex. 1001, code (57), 1:34–41. To illustrate one embodiment, Figure 3 of the ’382 patent is reproduced below.

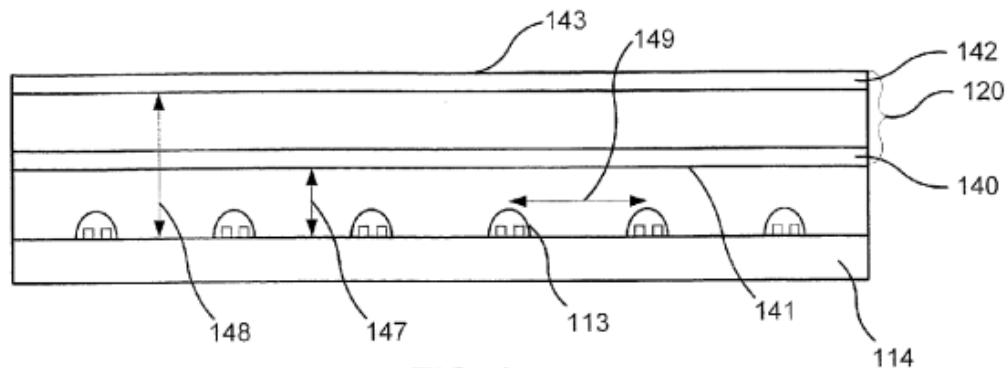


Figure 3 shows a cross section of a solid state lighting device that includes solid state light emitters 113 and multiplane light diffuser 120. *Id.* at 5:21–25, 5:47–48. Solid state light emitters 113 are supported on support structure 114. *Id.* at 5:23–25.

Multiplane light diffuser 120 has a first diffusion plane that includes diffuser plate 140 with first side 141 and a second diffusion plane that includes diffuser sheet 142 with second side 143, where the first and second diffusion planes are separated by a gap. Ex. 1001, 5:51–56, 5:61–62, 6:13–15, Fig. 3. Diffuser plate 140 may include a structured refractive diffuser with multiple refractive structures arranged on one or more surfaces of the plate. *Id.* at 6:1–4; *see also id.* at 7:60–8:14, Figs. 6A, 6B. In operation, multiplane light diffuser 120 receives light emitted from solid state light emitters 113 at first side 141 and transmits diffused light at second side 143. *Id.* at 5:47–51.

Diffuser plate 140 is positioned first distance 147 from a surface defined by solid state light emitters 113, and diffuser sheet 142 is positioned second distance 148 from the surface defined by solid state light emitters 113. Ex. 1001, 5:61–64, 6:13–19. Second distance 148 is greater than first distance 147. *Id.* at 6:16–19. Both first and second distances 147 and 148

may be determined as a function of third distance 149, which is the distance between adjacent solid state light emitters 113. *Id.* at 6:23–26.

The solid state lighting device may also include diffuser supports. Ex. 1001, 6:46–55. To illustrate one embodiment, Figure 5D is reproduced below.

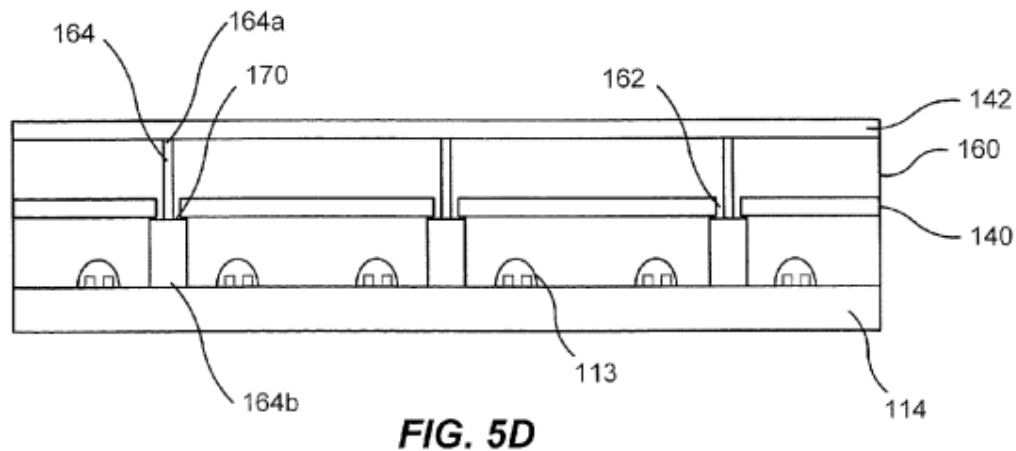


Figure 5D is a cross-sectional view of the solid state lighting device with diffuser supports 164. *Id.* at 6:46–49, 7:46–49. Each diffuser support 164 includes distal end 164a and proximal end 164b. *Id.* at 7:36–43. Distal end 164a is received by diffuser plate hole 162 and is configured to support diffuser sheet 142. *Id.* at 7:40–43. Proximal end 164b may be mounted on or formed integrally in support structure 114. *Id.* at 7:36–40. Each diffuser support 164 also includes diffuser plate support step 170, which positions diffuser plate 140 at first distance 147 from solid state light emitters 113. *Id.* at 7:46–49. The placement of support steps 170 determines first distance 147, while the length of diffuser supports 164 determines second distance 148. *Id.* at 7:56–59.

C. Illustrative Claim

Petitioner challenges claims 1–20 of the '382 patent, where claims 1, 13, and 17 are independent claims. Claim 1 is illustrative of the claimed invention and is reproduced below.

1. A solid state lighting device, comprising:
 - a plurality of solid state light emitters that are configured to emit light; and
 - a multiplane light diffuser including a first diffusion plane that is a first distance from the plurality of solid state emitters and a second diffusion plane that is a second distance from the plurality of solid state emitters that is different from the first distance, the multiplane light diffuser including [a] first side that corresponds to the first plane and that is configured to receive the light emitted from the plurality of solid state light emitters and a second side that corresponds to the second plane and that is configured to transmit diffused light;
- wherein the multiplane light diffuser comprises a diffuser plate that includes the first side of the multiplane light [diffuser], the diffuser plate configured to define the first diffusion plane, and
- wherein the plurality of solid state emitters comprise a third distance between adjacent ones of the plurality of solid state light emitters, and wherein the first distance is a function of the third distance.

Ex. 1001, 8:51–9:4.

D. Asserted Challenges to Patentability

Petitioner asserts twelve challenges to claims 1–20 of the ’382 patent as follows.¹ Pet. 4–5, 15–77.

Claims Challenged	35 U.S.C. § ²	References/Basis
1–3, 7, 9, 11–15	103(a)	Kobayashi ³
10, 16	103(a)	Kobayashi, Kirita ⁴
8	103(a)	Kobayashi, Lim ⁵
4–6, 17	103(a)	Kobayashi, Tabito ⁶
18, 20	103(a)	Kobayashi, Tabito, Onishi ⁷
19	103(a)	Kobayashi, Tabito, Onishi, Epstein ⁸
1–3, 7, 8, 11–15	103(a)	Schiavoni, ⁹ Lim

¹ For each of its asserted challenges, Petitioner additionally lists the knowledge of a person of ordinary skill in the art (POSITA). Pet. 4–5. We note that “the knowledge of such an artisan is part of the store of public knowledge that must be consulted when considering whether a claimed invention would have been obvious.” *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013). Accordingly, we consider the knowledge of a POSITA as part of our obviousness analysis.

² The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284 (2011), amended 35 U.S.C. § 103, effective March 16, 2013. Because the application from which the ’382 patent issued was filed before this date, the pre-AIA version of § 103 applies.

³ Kobayashi, JP Publ’n No. 2007/329016 A, published Dec. 20, 2007 (Dan McCourt trans., TransPerfect 2023) (Ex. 1006).

⁴ Kirita et al., U.S. Publ’n No. 2006/0050198 A1, published Mar. 9, 2006 (Ex. 1008).

⁵ Lim, U.S. Publ’n No. 2002/0071288 A1, published June 13, 2002 (Ex. 1013).

⁶ Tabito et al., U.S. Publ’n No. 2007/0103908 A1, published May 10, 2007 (Ex. 1007).

⁷ Onishi et al., U.S. Publ’n No. 2005/0243551 A1, published Nov. 3, 2005 (Ex. 1009).

⁸ Epstein et al., U.S. Publ’n No. 2005/0024754 A1, published Feb. 3, 2005 (Ex. 1010).

⁹ Schiavoni et al., PCT Publ’n No. WO 2008/025909 A1, published Mar. 6, 2008 (Jodeci Guzman trans., TransPerfect 2023) (Ex. 1012).

Claims Challenged	35 U.S.C. § ²	References/Basis
9	103(a)	Schiavoni, Lim, Kobayashi
10, 16	103(a)	Schiavoni, Lim, Kirita
4–6, 17	103(a)	Schiavoni, Lim, Tabito
18, 20	103(a)	Schiavoni, Lim, Tabito, Onishi
19	103(a)	Schiavoni, Lim, Tabito, Onishi, Epstein

We refer to the six challenges based primarily on Kobayashi as the Kobayashi challenges, and we refer to the six challenges based on Schiavoni and Lim as the Schiavoni-Lim challenges.

In support of its challenges, Petitioner relies on a Declaration of P. Morgan Pattison, Ph.D. (Ex. 1003). Patent Owner relies on a Declaration of William Bohannon (Ex. 2001) to support its Preliminary Response.

III. DISCUSSION

A. Principles of Law

A claim is unpatentable under § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective indicia of non-obviousness (i.e.,

secondary considerations).¹⁰ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966).

At this preliminary stage, we determine whether the information presented shows a reasonable likelihood that Petitioner would prevail in establishing that at least one of the challenged claims would have been unpatentable over the asserted prior art. We analyze Petitioner’s asserted challenges with the above-noted principles in mind.

B. Claim Construction

In an *inter partes* review proceeding, we construe a claim of a patent “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b).” *See* 37 C.F.R.

§ 42.100(b). That standard involves construing claims in accordance with the ordinary and customary meaning of such claims as would have been understood by one of ordinary skill in the art and the prosecution history pertaining to the patent. *See id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–14 (Fed. Cir. 2005) (en banc).

Petitioner asserts that it “believes that no claim term requires construction.” Pet. 8–9. Patent Owner similarly asserts that it “does not believe any claim construction is necessary.” Prelim. Resp. 5. For purposes of this Decision, we conclude that no claim term requires express interpretation to resolve any controversy in this proceeding. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (noting that “we need only construe terms ‘that are in

¹⁰ At this stage, neither party presents any objective indicia of non-obviousness.

controversy, and only to the extent necessary to resolve the controversy” (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999))).

C. Alleged Obviousness over Kobayashi

Turning now to Petitioner’s asserted challenges, we start with the Kobayashi-based challenges. Petitioner asserts that claims 1–3, 7, 9, and 11–15 of the ’382 patent would have been obvious over Kobayashi and the knowledge of a person of ordinary skill in the art. Pet. 15–27. Patent Owner disputes certain aspects of Petitioner’s analysis for claims 1, 7, 9, 11, and 13. Prelim. Resp. 10–20. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on its asserted challenge as to claims 1–3 and 11–15. At this stage, however, we are not persuaded by Petitioner’s showing for claims 7 and 9.

Before addressing the parties’ arguments, we provide an overview of the asserted reference, Kobayashi.

1. Overview of Kobayashi

Kobayashi describes backlight units for display devices. Ex. 1006, code (57). To illustrate one embodiment, Figure 1 of Kobayashi is reproduced below.

[FIG. 1]

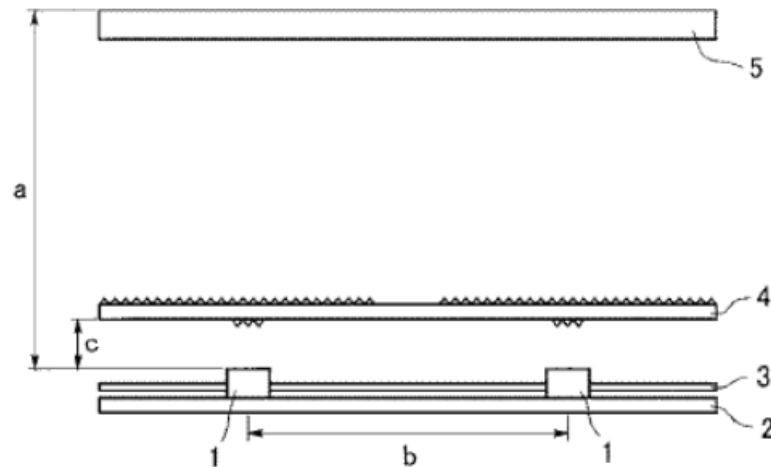


Figure 1 shows a cross section of a backlight unit that includes LEDs 1, base 2, reflector 3, and diffusing plates 4 and 5. *Id.* ¶ 18. Diffusing plate 4 has a lens shape on at least one surface. *Id.* ¶¶ 18, 34. The lens shape may be a pyramid shape, Fresnel lens shape, lenticular lens shape, or other lens shape. *Id.* ¶ 34. Diffusing plate 4 has a light diffusivity of 0.5 to 30%, whereas diffusing plate 5 has a light diffusivity of 70 to 90%. *Id.* ¶ 33.

As shown in Figure 1, distance a is the distance from the surface of LED 1 to the light emitting surface of diffusing plate 5. *Ex.* 1006 ¶ 19. Distance b is the distance between the respective centers of two adjacent LEDs 1. *Id.* Distance c is the distance from the surface of LED 1 to the lensed surface of diffusing plate 4 that is closest to LEDs 1. *Id.* Kobayashi explains that distance a is preferably 10 mm or more, that distance b is preferably 10 to 100 mm, and that distance c is 0.1 mm or more. *Id.* ¶ 20. Kobayashi also explains that the ratio of distance a to distance b is preferably in the range of 0.2 to 1.0. *Id.*

2. Analysis of Claims 1–3, 7, 9, and 11–15

a. Independent Claim 1

Claim 1 is directed to a “solid state lighting device” and recites various limitations that Petitioner designates as limitations 1A through 1E. We address each limitation in turn.

i. Limitation 1A: “plurality of solid state light emitters”

Claim 1 recites “a plurality of solid state light emitters that are configured to emit light.” For this limitation, which Petitioner designates as limitation 1A, Petitioner identifies Kobayashi’s LEDs 1 as “solid state light emitters.” Pet. 15. As support, Petitioner directs us to where Kobayashi teaches that “[m]ultiple LEDs 1 are placed on the base 2 at equal intervals.” *Id.* (citing Ex. 1006, code (57)).

At this stage, Patent Owner does not dispute Petitioner’s analysis for this limitation. *See generally* Prelim. Resp. Based on Petitioner’s argument and evidence, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that Kobayashi teaches limitation 1A.

ii. Limitation 1B: “multiplane light diffuser”

Claim 1 further recites “a multiplane light diffuser including a first diffusion plane that is a first distance from the plurality of solid state emitters and a second diffusion plane that is a second distance from the plurality of solid state emitters that is different from the first distance.” For this limitation, which Petitioner designates as limitation 1B, Petitioner directs us to Figure 1 of Kobayashi, which is reproduced below. Pet. 16.

[FIG. 1]

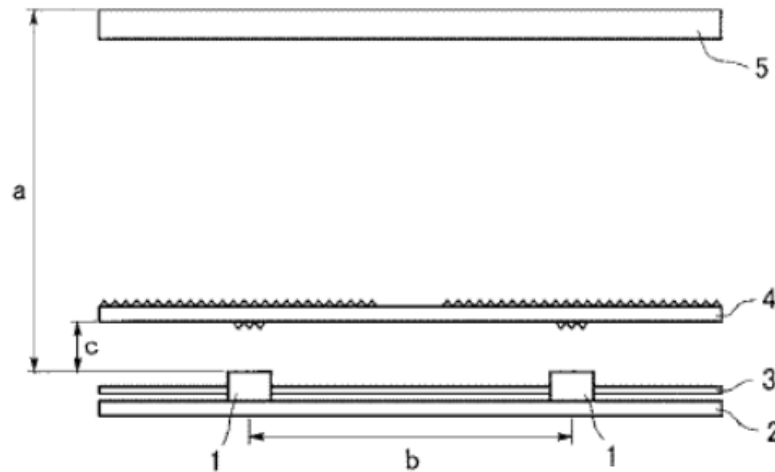


Figure 1 of Kobayashi shows a cross section of a backlight unit that includes diffusing plates 4 and 5. Ex. 1006 ¶ 18. Petitioner asserts that “[d]iffuser plate 4 is a ‘first plane’ and diffuser plate 5 is a ‘second plane’ of a multiplane light diffuser.” Pet. 16. Petitioner further asserts that “[t]he distances of the diffuser plates 4 and 5 from the plurality of LEDs 1 are ‘c’ and ‘a’ respectively as shown in [Kobayashi’s] Figure 1 . . . and they are different distances.” *Id.* Regarding the recited “second distance” between the second diffusion plane and the plurality of solid state emitters, Petitioner specifically states, “The second distance is [distance] a minus the thickness of diffusion plate 5, which is a different distance than [distance] c.” *Id.*

Patent Owner responds that “Kobayashi does not render obvious the first distance and second distance as claimed.” Prelim. Resp. 13. As support, Patent Owner directs us to Figure 3 of the ’382 patent, which is reproduced below. *Id.* at 11.

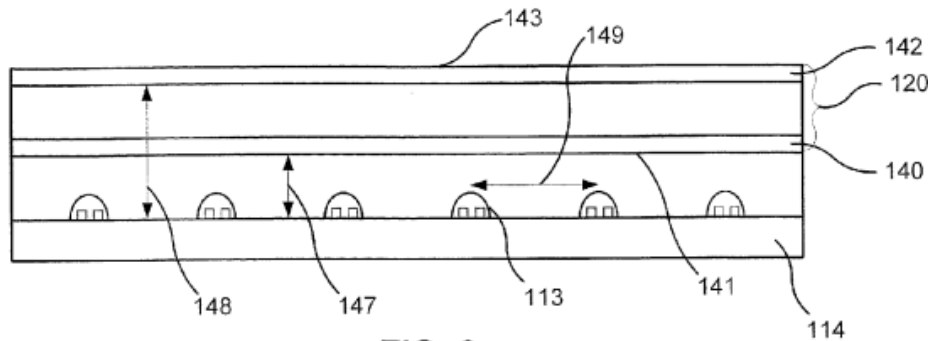


FIG. 3

Figure 3 of the '382 patent shows a cross section of a solid state lighting device that includes solid state light emitters 113 and multiplane light diffuser 120. *Id.* at 5:21–25, 5:47–48. Patent Owner asserts that the '382 patent's "first and second distance[s] ('147' and '148', respectively) are both measured from the bottom of the solid-state emitters 113 / top of the support structure 114," whereas "Kobayashi describes a distance (c of Fig. 1 of Kobayashi) from the *top of the light emitters 1 to the bottom of a first plane*[]" 4." Prelim. Resp. 11–12. According to Patent Owner, "[t]his measuring difference is significant because the backlighting for LCD displays is designed to be thin so a measurement difference of the thickness of a solid state emitter[] will alter the optimal distance and ideal illumination intended by the '382 Patent." *Id.* at 12.

At this stage, and on this record, we disagree with Patent Owner. Our reviewing court has emphasized that "the burden of precise claim drafting [is] squarely on the applicant." *In re Morris*, 127 F.3d 1048, 1056 (Fed. Cir. 1997). Claim 1 recites "a first diffusion plane that is a first distance *from the plurality of solid state emitters* and a second diffusion plane that is a second distance *from the plurality of solid state emitters*" (emphases added). If the applicant intended for these distances to be measured from the *bottom* of the solid state emitters, then the applicant should have included that limitation in

the claim during prosecution. Accordingly, Patent Owner's argument fails to undermine Petitioner's showing for limitation 1B.

We note Patent Owner's contention that the '382 patent's "first and second distance[s]" ('147' and '148', respectively) are both measured from the bottom of the solid-state emitters 113." Prelim. Resp. 11. This contention, however, is unavailing. Even though understanding the claim language may be aided by explanations in the specification and the drawings, "it is important not to import into a claim limitations that are not a part of the claim." *SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004); *see also Liebel-Flarsheim Co. v. Medrad, Inc.*, 358 F.3d 898, 906 (Fed. Cir. 2004) (expressly rejecting "the contention that if a patent describes only a single embodiment, the claims of the patent must be construed as being limited to that embodiment"); *Williamson v. Citrix Online, LLC*, 792 F.3d 1339, 1346–47 (Fed. Cir. 2015) ("caution[ing] against limiting the claimed invention to preferred embodiments or specific examples in the specification"). That is, a specific embodiment appearing in the specification or drawings may not be read into a claim when the claim language is broader than the embodiment. *SuperGuide*, 358 F.3d at 875.

In this case, the claim language recites nothing about measuring the first distance or the second distance from the bottom of the solid state emitters. As our reviewing court has explained, "it is the *claims*[...] . . . which define the scope of the patent right." *Laitram Corp. v. NEC Corp.*, 163 F.3d 1342, 1347 (Fed. Cir. 1998). Although Figure 3 of the '382 patent shows an embodiment where the first and second distances are measured from the bottom of the solid state emitters, nowhere does the specification limit "first distance" or "second distance" to that embodiment. Indeed, the specification

describes “a first diffusion plane that is a first distance from *the solid state light emitters*” and “a second diffusion plane that is a second distance from *the solid state light emitters*.” Ex. 1001, 8:19–21, 8:30–32 (emphases added). The specification further explains that “[t]he diffuser plate 140 may be positioned a first distance 147 from a *surface defined by the solid state light emitters 113*,” and that “[t]he diffuser sheet 142 may be positioned a second distance 148 from the *surface defined by the solid state light emitters 113*.” *Id.* at 5:62–64, 6:16–18 (emphases added). The specification merely describes distances from *the solid state light emitters* and distances from a *surface defined by the solid state light emitters*; it does not describe any distance from the *bottom* of the solid state light emitters or from a surface defined by the *bottom* of the solid state light emitters. Additionally, the specification emphasizes that “[e]mbodiments of the present invention . . . will be described more fully . . . with reference to the accompanying drawings, in which embodiments of the invention are shown,” but the “invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth [in the patent].” *Id.* at 3:40–45.

We further note Patent Owner’s contention that “a measurement difference of the thickness of a solid state emitter[] will alter the optimal distance and ideal illumination intended by the ’382 Patent.” Prelim. Resp. 12. This contention also is unavailing. Claim 1 does not say anything about “optimal distance” or “ideal illumination.” Moreover, the ’382 patent contemplates various first and second distances, which seems to cut against Patent Owner’s position. In particular, the ’382 patent teaches that “the diffuser plate 140 may include diffuser plate holes 162 including more than

one size,” where “one set of diffuser plate holes 162 may be sized to position the diffuser plate 140 at a smaller first distance 147 (Fig. 3) than another set of diffuser plate holes 162.” Ex. 1001, 7:18–25. The ’382 patent also teaches that “the overall length of the diffuser supports 164 may determine the second distance 148 (FIG. 3),” which “may be in a range including approximately 1.0 to 1.5 times the third distance value.” *Id.* at 7:56–59, 8:41–43. As discussed above, the third distance refers to the distance between adjacent solid state light emitters. *Id.* at 6:23–26.

For the reasons given, at this stage, Patent Owner’s arguments do not overcome Petitioner’s showing for limitation 1B. On the record before us, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that Kobayashi teaches limitation 1B.

iii. Limitation 1C: “first side” and “second side”

Claim 1 further recites “the multiplane light diffuser including [a] first side that corresponds to the first plane and that is configured to receive the light emitted from the plurality of solid state light emitters and a second side that corresponds to the second plane and that is configured to transmit diffused light.” For this limitation, which Petitioner designates as limitation 1C, Petitioner provides an annotated version of Figure 1 of Kobayashi, reproduced below. Pet. 17.

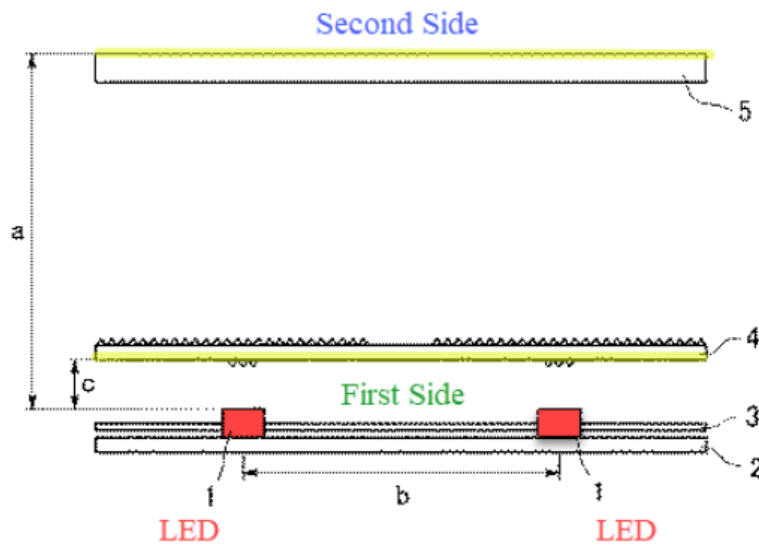


Figure 1 of Kobayashi, as annotated by Petitioner, shows a cross section of a backlight unit that includes diffusing plates 4 and 5. *See* Ex. 1006 ¶ 18. Petitioner asserts that “Kobayashi’s diffuser plate 4, i.e., the ‘first plane’, has a first side that is configured to receive light from the LEDs,” and that “Kobayashi’s diffusion plate 5, i.e., the ‘second plane,’ has a second side that is configured to transmit diffused light.” Pet. 17.

Patent Owner does not separately dispute Petitioner’s analysis for this limitation. *See generally* Prelim. Resp. Based on Petitioner’s argument and evidence, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that Kobayashi teaches limitation 1C.

iv. Limitation 1D: “diffuser plate”

Claim 1 further recites “the multiplane light diffuser comprises a diffuser plate that includes the first side of the multiplane light [diffuser], the diffuser plate configured to define the first diffusion plane.” For this limitation, which Petitioner designates as limitation 1D, Petitioner cross-references its discussion of limitation 1C. Pet. 18. In that discussion,

Petitioner asserts that “Kobayashi’s diffuser plate 4, i.e., the ‘first plane’, has a first side that is configured to receive light from the LEDs.” *Id.* at 17.

With respect to limitation 1D, Petitioner reiterates that “Kobayashi’s diffusion plate 4 has a first side, the side closest to LEDs 1,” and that “the diffusion plate 4 defines a diffusion plane.” *Id.* at 18. As support, Petitioner directs us to where Kobayashi teaches that its “diffusing plate 4 with a lens having a total light transmittance of 80 to 98% and a light diffusivity of 0.5 to 30% is placed on the side close to the LED 1.” *Id.* (quoting Ex. 1006, code (57)).

Patent Owner counters that “the ‘diffusion’ plate 4 of Kobayashi is not a diffuser as used in the ’382 Patent or understood by a POSITA.” Prelim. Resp. 13. As support, Patent Owner points to where Kobayashi describes its diffusing plate 4 as “having . . . a light diffusivity of 0.5 to 30% and having a lens shape on at least one surface,” where the lens shape is preferably a “Fresnel lens shape.” *Id.* (citing Ex. 1006 ¶ 34, claim 1). Patent Owner asserts that “a POSITA would understand a Fresnel lens, especially one with such a low light diffusivity[,], to not qualify as the [recited] ‘diffusion plate’” because “Fresnel lenses are typically used to collimate or maintain a tight beam of light.” *Id.* at 13–14. According to Patent Owner, “[t]his teaches away from the claimed diffuser plate in [limitation] 1D as the diffuser of the ’382 Patent is a ‘scattering diffuser’ . . . , which is intended to scatter and spread light emitted therethrough.” *Id.* at 14 (citing Ex. 1001, 5:1–2, Fig. 2). Patent Owner relies on the declaration testimony of Mr. Bohannon. *Id.* at 13–15 (citing Ex. 2001 ¶¶ 43–45, 58–59).

At this stage, and on this record, we disagree with Patent Owner. Even if “Fresnel lenses are typically used to collimate or maintain a tight

beam of light,” as Patent Owner contends, Kobayashi nonetheless teaches that its diffusing plate 4 has “a light diffusivity of 0.5 to 30%.” Prelim. Resp. 14; Ex. 1006, code (57). We thus find Kobayashi’s diffusing plate 4 is a diffuser because it diffuses light.

We note Patent Owner’s characterization of Kobayashi’s “light diffusivity of 0.5 to 30%” as “low light diffusivity.” *See* Prelim. Resp. 13. Assuming that were correct, however, neither Patent Owner nor its declarant Mr. Bohannon explains sufficiently why a diffusing plate with low light diffusivity would not satisfy the claimed diffuser plate. *See* Prelim. Resp. 13–15; Ex. 2001 ¶¶ 43–45, 58–59. The claim language says nothing about the level of light diffusivity of the diffuser plate. *See Laitram*, 163 F.3d at 1347 (“[I]t is the *claims*[] . . . which define the scope of the patent right.”). Additionally, the specification says nothing about the level of light diffusivity of the diffuser plate. We see no reason why the ’382 patent’s diffuser plate would exclude a diffusing plate with low light diffusivity.

Lastly, we find Patent Owner’s argument that Kobayashi’s Fresnel lenses teach away from the ’382 patent’s scattering diffuser to be unavailing. The ’382 patent does not require the diffuser plate to be a scattering diffuser, as Patent Owner contends. *See* Prelim. Resp. 14. The ’382 patent teaches instead that, “[i]n ***some embodiments***, the diffuser plate ***may*** be a simple scattering diffuser.” Ex. 1001, 4:67–5:2 (emphases added) (cited by Prelim. Resp. 14); *see also id.* at 5:64–65 (“The diffuser plate 140 may include a scattering diffuser.”); *id.* at 3:43–45 (“This invention may[] . . . be embodied in many different forms and should not be construed as limited to the embodiments set forth herein.”).

Moreover, Kobayashi does not require its diffusing plate 4 to have a Fresnel lens shape. Kobayashi teaches that its “diffusing plate 4 has a lens shape on at least one side, and various lens combinations are conceivable, such as general uneven R lens shape, *prism shape*, pyramid shape, glider lens shape, Fresnel lens shape, moseye lens shape, lenticular lens shape, etc.” Ex. 1006 ¶ 34 (emphasis added) (cited by Prelim. Resp. 13). The ’382 patent similarly teaches that its “diffuser plate 140 may include a structured refractive diffuser that may include multiple refractive structures arranged on one or more surfaces of the diffuser plate 140,” where “[s]ome embodiments provide that a structured refractive diffuser includes multiple crossed linear *prismatic lenselets*.” Ex. 1001, 6:1–9 (emphasis added). Thus, the ’382 patent contemplates a diffuser plate with a prism-shaped lens on at least one side of the diffuser plate, and Kobayashi’s diffusing plate 4 discloses just that.

For the reasons given, Patent Owner’s arguments do not overcome Petitioner’s showing for limitation 1D. On the record before us, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that Kobayashi teaches limitation 1D.

v. Limitation 1E: “third distance”

Claim 1 further recites “the plurality of solid state emitters comprise a third distance between adjacent ones of the plurality of solid state light emitters, and wherein the first distance is a function of the third distance.” For this limitation, which Petitioner designates as limitation 1E, Petitioner provides another annotated version of Figure 1 of Kobayashi, reproduced below. Pet. 19.

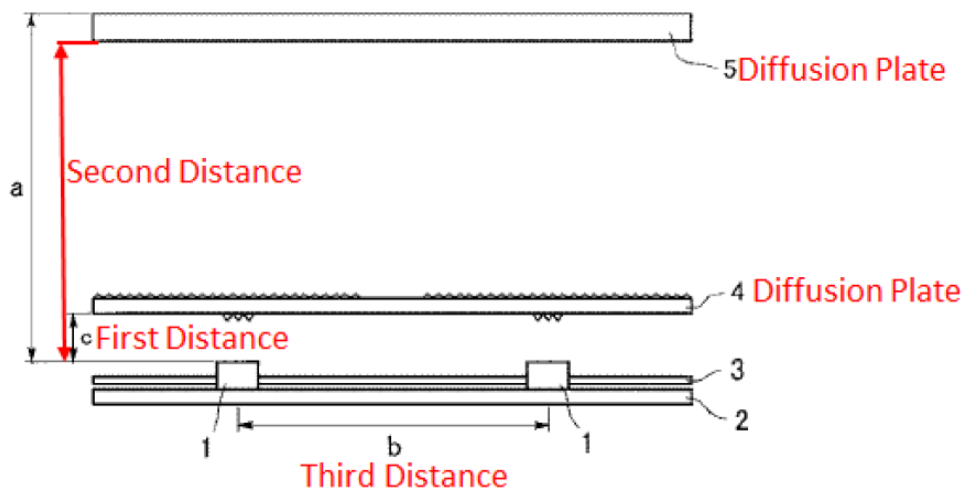


Figure 1 of Kobayashi, as annotated by Petitioner, shows a cross section of a backlight unit that includes LEDs 1 and diffusing plates 4 and 5. *See* Ex. 1006 ¶ 18. Petitioner asserts that “[distance] c is the first distance,” that “[distance] a minus the thickness of the diffusion plate 5 is the second distance,” and that “[distance] b is the third distance.” Pet. 19. As support, Petitioner points us to where Kobayashi describes distance a as “the distance from the surface of the LED 1 to the light emitting surface of the diffusing plate at the most exiting side,” distance b as “the distance between the center of two adjacent LEDs 1,” and distance c as “the distance from the surface of the LED 1 to the lensed diffusing plate 4.” *Id.* at 18 (citing Ex. 1006 ¶ 19).

Petitioner additionally points us to where Kobayashi teaches that “[t]he ratio of c/b is preferably in the range of 2×10^{-3} to 0.4.” Pet. 19 (citing Ex. 1006 ¶ 20). Petitioner asserts that “Kobayashi describes the distance c from the LEDs to the first diffusion plane divided by the distance between adjacent LEDs b is preferably equal to a value between 0.002 and 0.4, which according to basic algebraic properties means that c is preferably equal to distance b multiplied by a value between 0.002 and 0.4.” *Id.*

According to Petitioner, “Kobayashi thus teaches that distance *c* (the first distance) is a function of distance *b* (the third distance).” *Id.* at 19–20.

In response, Patent Owner cross-references its arguments regarding Petitioner’s analysis for limitation 1B and asserts that “because Kobayashi does not disclose a ‘first distance’ as claimed, Kobayashi does not meet this claim element.” Prelim. Resp. 15–16. As support, Patent Owner reiterates its argument that “FIG. 1 of Kobayashi discloses only that the distance from the light emitters to a first plane (*c*) is measured from the top of the light emitters, whereas FIG. 3 of the ’382 Patent discloses that the first distance is measured from the bottom of the light emitters / top of the support structure.” *Id.* at 16 (citing Ex. 1001, Fig. 3; Ex. 1006, Fig. 1).

For the reasons given above for limitation 1B, we are persuaded by Petitioner’s showing that Kobayashi’s distance *c* teaches the recited “first distance.” *See supra* Part III.C.2.a.ii. Accordingly, Patent Owner’s argument does not undermine Petitioner’s showing for limitation 1E.

On the record before us, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that Kobayashi teaches limitation 1E.

b. Dependent Claims 2 and 3

Claim 2 depends from claim 1 and recites “a diffuser sheet that includes the second side of the multiplane light diffuser and is positioned the second distance from the plurality of solid state light emitters, the diffuser sheet configured to define the second diffusion plane.” Claim 3 depends from claim 2 and adds that “the diffuser sheet comprises[] a substantially transparent plate[] and a diffuser film supported by the substantially

transparent plate.” Petitioner identifies Kobayashi’s diffusing plate 5 as the recited “diffuser sheet.” Pet. 20–21 (citing Ex. 1006 ¶¶ 19, 30, 43, Fig. 1).¹¹ To illustrate, Petitioner provides an annotated version of Figure 1 of Kobayashi, reproduced below. *Id.* at 20.

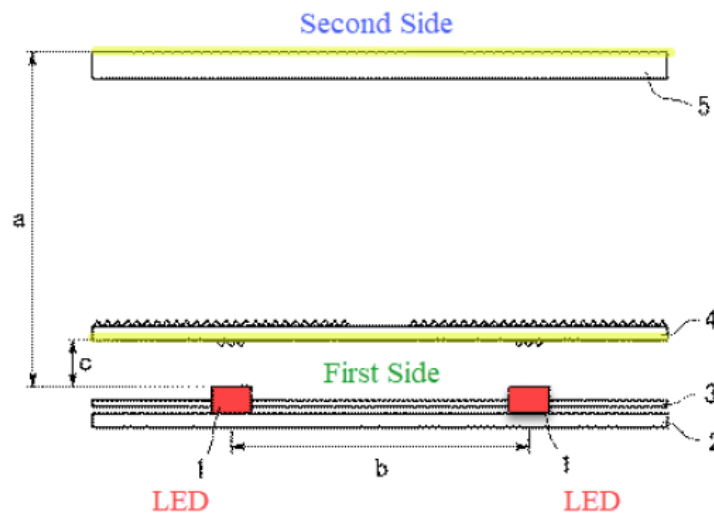


Figure 1 of Kobayashi, as annotated by Petitioner, shows a cross section of a backlight unit that includes diffusing plates 4 and 5. *See* Ex. 1006 ¶ 18.

Patent Owner does not separately dispute Petitioner’s analysis for claims 2 and 3. On this record, we are persuaded that Petitioner’s showing for these claims is sufficient for purposes of this Decision.

c. Dependent Claim 7

Claim 7 depends from claim 2 and recites “the diffuser sheet comprises a diffuser film, a brightness enhancing film, a polarizing film and a substantially clear plate configured to support the diffuser film, the brightness enhancing film, the polarizing film.” For this limitation,

¹¹ Petitioner cites paragraphs 31 and 44 of Exhibit 1006, but the cited teachings appear at paragraphs 13 and 43 of Exhibit 1006.

Petitioner directs us to where Kobayashi teaches that its “backlight unit . . . may further be used with a diffusing film, prism collection film, reflective polarizing film, printed sheet such as a letter plate, liquid crystal panel, etc., on the diffusing plate 5.” Pet. 21 (citing Ex. 1006 ¶ 43).¹² Petitioner also directs us to where Kobayashi teaches that its diffusing plates are “made of a thermoplastic transparent resin mixed with a light diffusing agent.” *Id.* (citing Ex. 1006 ¶ 13).¹³ Petitioner asserts that Kobayashi’s “‘prism collection film’ is a brightness enhancing film.” *Id.* Petitioner relies on the declaration testimony of Dr. Pattison. *Id.* (citing Ex. 1003 ¶¶ 62, 92).

Patent Owner counters that “Kobayashi does not disclose a brightness enhancement film.” Prelim. Resp. 17. According to Patent Owner, “[t]here is no standard definition of ‘prism collection film’ that would support equating it for ‘brightness enhancing film,’” and “neither the Petitioner nor its expert provide[s] support for this claim.” *Id.*

At this stage of the proceeding, we agree with Patent Owner. Petitioner states that Kobayashi’s “‘prism collection film’ is a brightness enhancing film.” Pet. 21. Similarly, Dr. Pattison states that “[a] person of ordinary skill in the art would recognize that the ‘prism collection film’ is a brightness enhancing film.” Ex. 1003 ¶ 62. As Patent Owner contends, neither Petitioner nor Dr. Pattison points to any evidence in support of their statements. Prelim. Resp. 17. We note that the ’382 patent refers to a “prismatic brightness enhancing film (BEF),” but it is not clear from the

¹² Petitioner cites paragraph 44 of Exhibit 1006, but the cited teaching appears at paragraph 43 of Exhibit 1006.

¹³ Petitioner cites paragraph 31 of Exhibit 1006, but the cited teaching appears at paragraph 13 of Exhibit 1006.

record that Kobayashi's "prism collection film" qualifies as a prismatic brightness enhancing film. Accordingly, at this stage, we are not persuaded by Petitioner's showing for claim 7.

d. Dependent Claim 9

Claim 9 depends from claim 2 and recites "the second distance comprises a distance in a range between the third distance and 1.5 times the third distance." For this limitation, Petitioner directs us to where Kobayashi teaches that distance a is 10 mm or more, distance b is 10 to 100 mm, and the ratio of distance a to distance b is 0.2 to 1.0. Pet. 22 (citing Ex. 1006 ¶ 20). As discussed above, Kobayashi's distance a minus the thickness of diffusing plate 5 corresponds to the recited "second distance," and Kobayashi's distance b corresponds to the recited "third distance." *Id.*

Petitioner further directs us to Dr. Pattison's declaration testimony. Pet. 22 (citing Ex. 1003 ¶¶ 70–71). In his declaration, Dr. Pattison asserts that "[w]hen [Kobayashi's distances] a and b are 10 mm, then $a/b = 1$," which means that "the third distance is almost exactly the same as the second distance ([distance] a minus the thickness of the diffusion plate 5)." Ex. 1003 ¶ 70. Dr. Pattison further asserts that "a person of ordinary skill in the art would have been motivated to make this distance slightly larger to be between the third distance and 1.5 times the third distance." *Id.* As support, Dr. Pattison testifies that "as the LEDs are closer together their emission profiles will overlap creating a more uniform emission pattern, but more LEDs will be used adding to cost." *Id.* ¶ 71. Dr. Pattison adds that "[w]ith closer spacing of the LEDs the secondary diffuser can be closer as well since less optical mixing is necessary in the space between the first and second

diffuser plates.” *Id.* According to Dr. Pattison, “[c]onsidering cost, emission uniformity, and thickness a person of ordinary skill in the art would be motivated to explore different distances of the multiple diffuser arrangement,” and “the choice of a specific combination[] of distances was nothing more than a design choice with predictable outcomes.” *Id.*

In light of Kobayashi’s teaching that “the ratio of a/b is preferably in the range of 0.2 to 1.0,” Patent Owner responds that, “[i]n Kobayashi, the maximum second distance (‘ a ’) is equal to the third distance (‘ b ’),” and, therefore, “[t]he second distance in Kobayashi (‘ a ’) is not between the third distance and 1.5 times the third distance.” Prelim. Resp. 17 (citing Ex. 1006 ¶ 20). Patent Owner further asserts that “[b]ecause Kobayashi explicitly discloses the ratio of the second distance to the third distance there would not [be] motivation for a POSITA to make the second distance greater than what is described in Kobayashi as it would negatively impact the performance of the backlight unit.” *Id.* at 17–18.

At this stage of the proceeding, we agree with Patent Owner. Neither Petitioner nor Dr. Pattison explains sufficiently why an ordinarily skilled artisan would have considered modifying Kobayashi’s distance a such that distance a minus the thickness of diffusing plate 5 (i.e., the “second distance”) would have been specifically between distance b (i.e., the “third distance”) and 1.5 times distance b . We recognize that cost, emission uniformity, and thickness may be factors that an ordinarily skilled artisan would have considered in “explor[ing] different distances,” but it is unclear from the record whether consideration of these factors would have led an ordinarily skilled artisan to arrive at a combination of distances where distance a minus the thickness of diffusing plate 5 would have been

specifically between distance b and 1.5 times the distance b . Accordingly, at this stage, we are not persuaded by Petitioner's showing for claim 9.

e. Dependent Claim 11

Claim 11 depends from claim 1 and recites “means for transmitting first diffused light from the first diffusion plane to the second diffusion plane.” For this limitation, Petitioner asserts that “[t]he ’382 Patent explains and discloses the use of supports and side walls to maintain a gap 160 that is used as a means to transmit light from the first plane to the second plane,” and that “Kobayashi also discloses a gap for transmitting first diffused light from the first diffusion plane, diffusing plate 4, to the second diffusion plane, diffusing plate 5.” Pet. 22–23 (citing Ex. 1001, 7:30–34; Ex. 1003 ¶¶ 72–73; Ex. 1006 ¶¶ 32, 42).¹⁴

Patent Owner counters that “Kobayashi does not disclose a first diffusion plate,” relying on its arguments for limitation 1D. Prelim. Resp. 18. Patent Owner adds that “the light emitted from ‘diffuser plate 4’ in Kobayashi is not ‘transmitted first diffused light,’ but rather focused light emitted from convex Fresnel lenses.” *Id.*

For the reasons given above for limitation 1D, we are persuaded by Petitioner's showing that Kobayashi's diffusing plate 4 teaches the recited “diffuser plate.” *See supra* Part III.C.2.a.iv. In particular, we note Kobayashi's teaching that its diffusing plate 4 has a light diffusivity of 0.5 to 30%. Ex. 1006, claim 1; *accord id.* ¶ 33. Although Patent Owner argues

¹⁴ Petitioner cites paragraph 71 of Exhibit 1003, but the cited declaration testimony appears at paragraphs 72 through 73 of Exhibit 1003.

this is “low light diffusivity” (*see* Prelim. Resp. 13), we find that diffusing plate 4 nonetheless transmits diffused light.

As to Patent Owner’s contention that Kobayashi’s diffusing plate 4 transmits focused light emitted from convex Fresnel lenses instead of diffused light, we disagree. Kobayashi explicitly teaches that its diffusing plate 4 has a light diffusivity of 0.5 to 30%, whether the lens shape of the diffusing plate is a Fresnel lens shape or a prism shape. Ex. 1006 ¶¶ 33–34, claim 1. Accordingly, Patent Owner’s contention fails to undermine Petitioner’s showing for claim 11.

On this record, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that Kobayashi teaches the recited limitation of claim 11.

f. Dependent Claim 12

Claim 12 depends from claim 1. Patent Owner does not separately dispute Petitioner’s analysis for this claim. *See* Prelim. Resp. 20. Having reviewed Petitioner’s arguments and evidence for claim 12, we are persuaded that Petitioner’s showing for this claim is sufficient for purposes of this Decision. *See* Pet. 23–24 (citing, e.g., Ex. 1006 ¶¶ 19, 43, Fig. 1).

g. Independent Claim 13

Claim 13 is directed to a “method of providing diffused light” and recites various limitations that Petitioner designates as limitations 13A through 13F. Pet. 24–26.

i. Similarly Recited Limitations

For the most part, claim 13 recites similar limitations as claims 1 and 11. For the similarly recited limitations 13A, 13B, 13D, 13E, and 13F, Petitioner relies on its analysis for claims 1 and 11. Pet. 24–26.

Patent Owner does not separately argue these limitations. *See* Prelim. Resp. 18–20. With respect to limitation 13F, we note that Patent Owner specifically reiterates its position that “Kobayashi fails to disclose . . . ‘wherein the plurality of solid state light emitters comprise a third distance between adjacent ones of the plurality of solid state light emitters, wherein the first distance is a function of the third distance,’” relying solely on its arguments for limitation 1E. *Id.* at 20 (capitalization and emphasis omitted).

On this record, and for the reasons given above for claims 1 and 11, we are persuaded that Petitioner’s showing for limitations 13A, 13B, 13D, 13E, and 13F is sufficient for purposes of this Decision. *See supra* Parts III.C.2.a (discussing claim 1), III.C.2.e (discussing claim 11).

ii. Limitation 13C: “structured refractive diffuser plate”

Unlike claims 1 and 11, claim 13 recites “transmitting first diffused light from a structured refractive diffuser plate at a second side of the first diffusion plane.” For this limitation, which Petitioner designates as limitation 13C, Petitioner asserts that “[t]he first diffusion plane comprises a lensed diffusing plate 4 where the lenses may be structured as prisms, pyramids, etc.” Pet. 25 (citing Ex. 1006 ¶ 34). To illustrate, Petitioner provides an annotated version of Figure 1 of Kobayashi, reproduced below. *Id.*

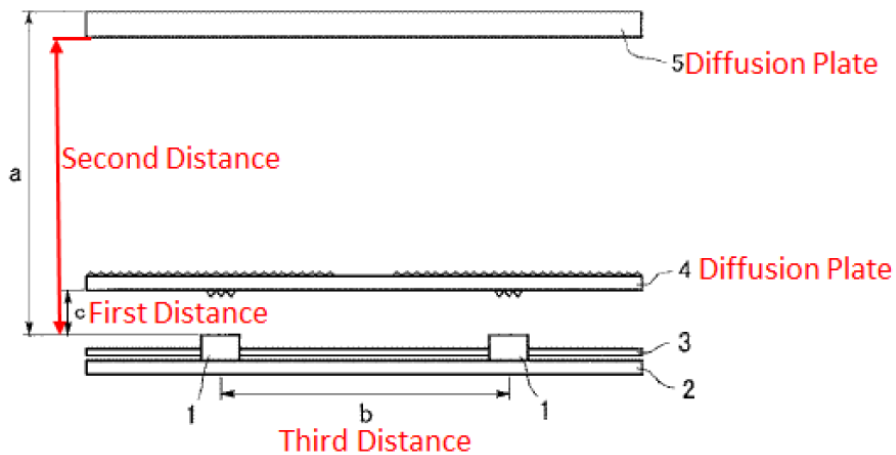


Figure 1 of Kobayashi, as annotated by Petitioner, shows a cross section of a backlight unit that includes diffusing plates 4 and 5. *See* Ex. 1006 ¶ 18. Petitioner points to where Kobayashi teaches that its “diffusing plate 4 with a lens having a total light transmittance of 80 to 98% and a light diffusivity of 0.5 to 30% is placed on the side close to the LED.” Pet. 25 (quoting Ex. 1006, code (57)). Petitioner asserts that “the diffusing plate has a first side th[at] receives light from the plurality of LEDs and a second si[de] that transmits light to the diffusion plate 5.” *Id.* According to Petitioner, Kobayashi thus teaches “[d]iffusing plate 4 is a structured refractive diffusing plate,” where “light passing through diffusing plate 4 is diffused light.” *Id.* at 25–26.

In response, Patent Owner cross-references its arguments for limitation 1D and reiterates its position that “the Fresnel lens of Kobayashi with a diffusivity of 0.5 to 30% does not actually qualify as a diffuser and there[fore] it does not ‘transmit[] a first diffused light.’” Prelim. Resp. 19.

For the reasons given above for limitation 1D, we are persuaded by Petitioner’s showing that Kobayashi’s diffusing plate 4 teaches the recited “diffuser plate.” *See supra* Part III.C.2.a.iv. We note in particular Kobayashi’s teaching that its diffusing plate 4 has a light diffusivity of 0.5 to

30%. Ex. 1006, claim 1; *accord id.* ¶ 33. Although Patent Owner argues this is “low light diffusivity” (*see* Prelim. Resp. 13), diffusing plate 4 nonetheless transmits diffused light.

Patent Owner further argues that “Kobayashi does not disclose a ‘structured refractive diffuse[r] plate’ as claimed.” Prelim. Resp. 19. As support, Patent Owner directs us to where Kobayashi teaches that “[t]he light diffusing agents used in the diffusing plates 4 and 5 may be the same as each other, different, alone or in combination,” and that “the refractive index of such light diffusing agents is not particularly limited.” *Id.* (quoting Ex. 1006 ¶ 28). Patent Owner asserts that Kobayashi “only discloses refractivity of diffusing agents inside the diffusing plates (4 and 5) and does not disclose any refractive structure.” *Id.* at 20. Patent Owner also asserts that “Kobayashi teaches that the diffusing plate 4 comprises lenses,” and that “the ’382 Patent accomplishes light diffusion without the use of lenses, but instead with a structured refractive diffuser plate.” *Id.* Patent Owner adds that the ’382 patent’s “structured refractive element helps to scatter and spread light,” whereas “[t]he convex lenses in Kobayashi[] . . . do the exact opposite and focus light.” *Id.*

At this stage, we disagree with Patent Owner. Claim 13 requires “transmitting first diffused light from a structured refractive diffuser plate.” As Patent Owner acknowledges, the ’382 patent teaches that its “structured refractive diffuser plate 180 may include multiple refractive extrusions 182.” Prelim. Resp. 19 (quoting Ex. 1001, 7:63–66). Patent Owner appears to overlook, however, the ’382 patent’s further teaching that “the refractive extrusions 182 may be considered as cross linear prismatic refractive lenselets.” Ex. 1001, 8:9–11. Kobayashi similarly teaches that its diffusing

plate 4 includes a lens shape on at least one side, where the lens shape may be a prism shape. Ex. 1006 ¶ 34 (cited by Pet. 25). Additionally, Kobayashi describes the diffusing plate 4 as having a light diffusivity of 0.5 to 30%. *Id.*, code (57) (cited by Pet. 25). This teaching in Kobayashi indicates that diffusing plate 4 transmits diffused light. It is unclear from the record why the recited “structured refractive diffuser plate” does not encompass Kobayashi’s diffusing plate 4. Accordingly, Patent Owner’s argument is unavailing.

On the record before us, we are persuaded that Petitioner’s showing for limitation 13C is sufficient for purposes of this Decision.

h. Dependent Claims 14 and 15

Claims 14 and 15 depend from claim 13. Patent Owner does not separately dispute Petitioner’s analysis for these claims. *See* Prelim. Resp. 20. Having reviewed Petitioner’s arguments and evidence for claims 14 and 15, we are persuaded that Petitioner’s showing for these claims is sufficient for purposes of this Decision. *See* Pet. 26–27 (citing, e.g., Ex. 1006 ¶ 44).¹⁵

3. Summary

In view of the foregoing, we determine that Petitioner has demonstrated a reasonable likelihood of showing that claims 1–3 and 11–15 would have been obvious over Kobayashi. At this stage, however, we are not persuaded by Petitioner’s showing for claims 7 and 9.

¹⁵ Petitioner cites paragraph 44 of Exhibit 1006, but the cited teaching appears at paragraph 43 of Exhibit 1006.

D. Alleged Obviousness over Kobayashi and Tabito

Petitioner asserts that claims 4–6 and 17 of the '382 patent would have been obvious over Kobayashi, Tabito, and the knowledge of a person of ordinary skill in the art. Pet. 33–41. Patent Owner disputes Petitioner's rationale for combining Kobayashi and Tabito. Prelim. Resp. 22–26. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on its asserted challenge.

We provided an overview of Kobayashi above. *See supra* Part III.C.1. Before addressing the parties' arguments, we additionally provide an overview of Tabito.

1. Overview of Tabito

Tabito describes a liquid crystal display apparatus. Ex. 1007 ¶ 1. To illustrate one embodiment, Figure 2 of Tabito is reproduced below.

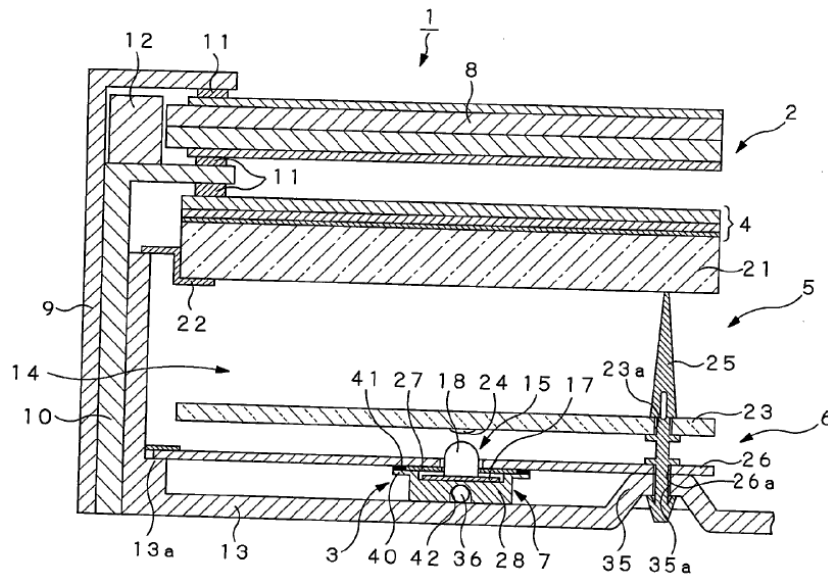


FIG. 2

Figure 2 shows a cross section of liquid crystal display apparatus 1, which includes liquid crystal panel unit 2, light guide section 5, and reflecting

section 6. Ex. 1007 ¶¶ 40, 46. Light guide section 5 includes light diffusing conducting plate 21 and light diffusing plate 23. *Id.* ¶ 60.

Light diffusing conducting plate 21 and light diffusing plate 23 are kept at a preset distance apart from each other by optical stud members 25. Ex. 1007 ¶ 60. To illustrate, Figure 6 of Tabito is reproduced below.

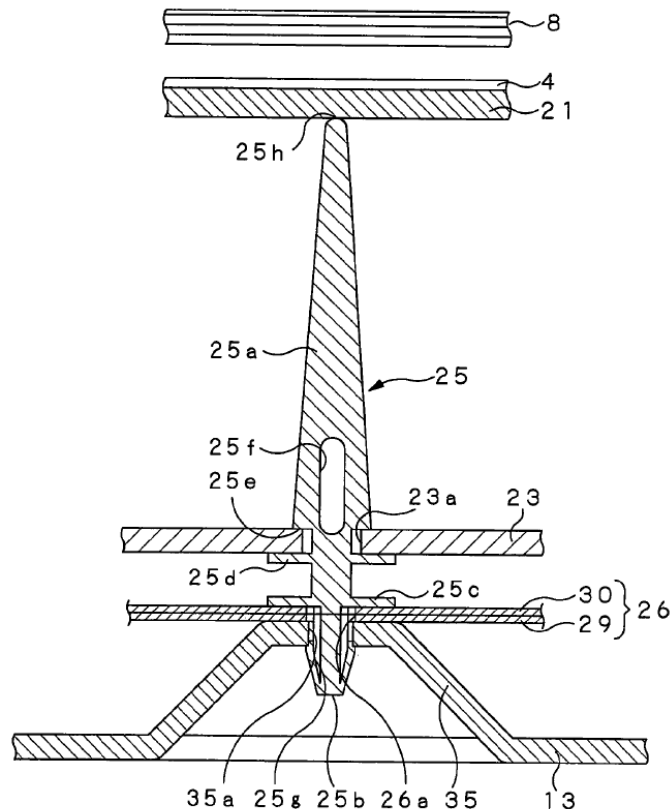


FIG. 6

Figure 6 shows a cross section of light guide section 5 and one optical stud member 25. Ex. 1007 ¶ 44. Each optical stud member 25 includes shaft-shaped base part 25a, fitting part 25b, flange-shaped first receiving plate part 25c, and flange-shaped second receiving plate part 25d. *Id.* ¶ 84. Step 25e is formed at a preset distance from second receiving plate part 25d. *Id.* Light diffusing plate 23 is assembled to each optical stud member 25 by fitting the plate at each fitting hole 23a from distal end 25h. *Id.* ¶ 90. Tabito

explains that slit 25f¹⁶ allows the large diameter portion of optical stud member 25 to contract as light diffusing plate 23 rides over step 25e. *Id.* After light diffusing plate 23 rides over step 25e to compress against second receiving plate part 25d, the large diameter portion of optical stud member 25 is restored to its natural state to clamp light diffusing plate 23 between step 25e and second receiving plate part 25d. *Id.*

2. *Analysis of Claims 4–6 and 17*

Claims 4–6, which depend indirectly from claim 1, recite various limitations regarding a “plurality of diffuser supports.” Independent claim 17 recites similar limitations as claims 1 and 13, as well as limitations regarding a “plurality of diffuser supports.”

With respect to the recited “plurality of diffuser supports,” Petitioner asserts that “Kobayashi describes light emitting elements and a diffuser structure but does not expressly disclose the mounting for that diffuser structure.” Pet. 33. Petitioner further asserts that “Tabito discloses a similar LCD backlighting structure including a reflecting plate 26, diffusing plate 23, light diffusing conducting plate 21, and optical converting section 4, all of which are supported by optical stud members 25, holder frame member 10, and holding bracket member 22.” *Id.* (citing Ex. 1007 ¶ 81, Fig. 2). To illustrate Tabito’s system, Petitioner provides an annotated version of Figure 2 of Tabito, reproduced below. *Id.*

¹⁶ Although the specification of Tabito refers to slit 17f, Figure 6 of Tabito labels the slit with “25f.” *Compare* Ex. 1007 ¶ 90, *with id.*, Fig. 6.

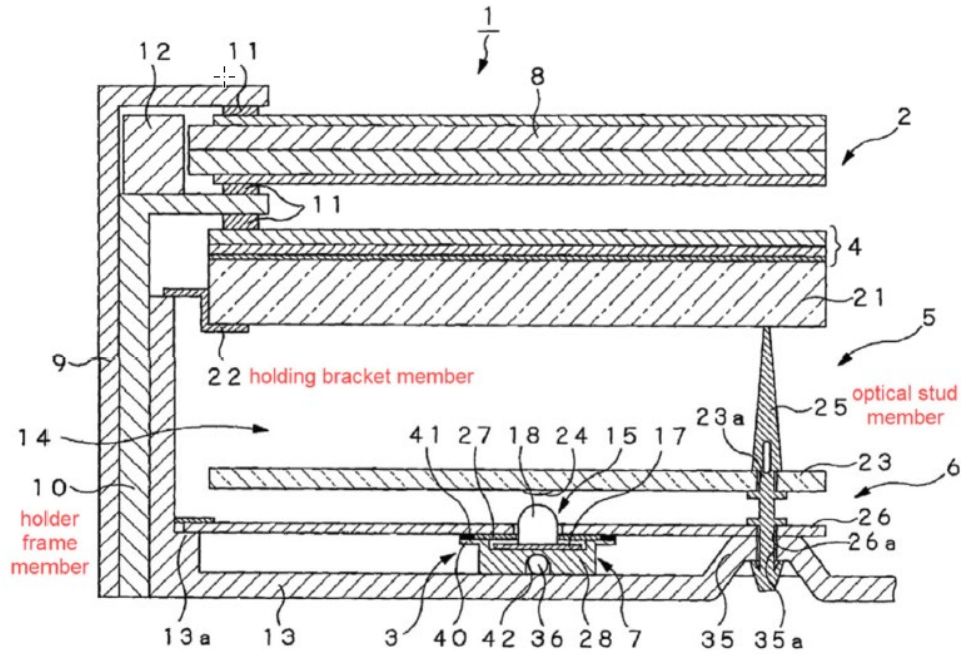


FIG.2

Figure 2 of Tabito, as annotated by Petitioner, shows a cross section of liquid crystal display apparatus 1. Ex. 1007 ¶40. Petitioner asserts that “Tabito’s method of supporting diffusing plates would also be suitable for use in supporting Kobayashi’s diffuser plates.” Pet. 33. According to Petitioner, “[a] POSITA would have been motivated to apply Tabito’s supports to Kobayashi to provide a more rigid mounting and support for the backlighting elements described in Kobayashi.” *Id.* at 34.

Patent Owner responds that “[e]mploying the optical stud members disclosed by Tabito into Kobayashi would result in completely different optical characteristics of [Kobayashi’s] lighting panel,” and “therefore a POSITA would not be motivated to combine the two.” Prelim. Resp. 23. As support, Patent Owner asserts that “Kobayashi provides direct guidance on how its backlight unit is intended to operate,” specifying “the ideal light transmittance of diffusing plate[s] 4 and 5,” and “exact distances between

the components inside the backlight unit.” *Id.* at 22. Patent Owner further asserts that “the optical stud members of Tabito are intended to absorb light and partially diffuse light.” *Id.* at 24 (citing Ex. 1007 ¶ 95). According to Patent Owner, “[i]f combined, the interaction between light emitted from the LEDs (Kobayashi) and the optical studs (Tabito) would cause the amount of light entering the diffusing plate to change, as well as the amount of internal reflection/interference of the light traveling in the regions between the plates.” *Id.* Patent Owner adds that “[i]t is not reasonable to assume that there would be an optimal relationship, in terms of backlight performance, between the two distances (b and c) in Kobayashi when optical studs are present.” *Id.* Patent Owner relies on the declaration testimony of Mr. Bohannon. *Id.* at 22–24 (citing Ex. 2001 ¶¶ 67–68).

At this stage, we disagree with Patent Owner. Regarding the arrangement of optical components in its backlight unit, Kobayashi specifies, for example, distance a from LED 1 to diffusing plate 5 and distance c from LED 1 to diffusing plate 4. Ex. 1006 ¶¶ 19–20, Fig. 1. Tabito teaches using optical stud members 25 to keep light diffusing plate 23 at a preset distance from light diffusing conducting plate 21. Ex. 1007 ¶ 60. That Kobayashi and Tabito both describe specific arrangements of optical components, and that the use of Tabito’s optical stud members was a known way to provide for such specific arrangements, is sufficient reason for combining Kobayashi and Tabito. Petitioner need only show that Tabito’s optical stud members would have been a “suitable option” for implementation in Kobayashi’s backlight unit. *See Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1381 (Fed. Cir. 2023).

We note Patent Owner’s contention that combining Kobayashi and Tabito “would result in completely different optical characteristics of [Kobayashi’s] lighting panel.” Prelim. Resp. 23. This contention, however, is unavailing. Our reviewing court has explained that “[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference,” but, “[r]ather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.” *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). Additionally, “[a] person of ordinary skill is also a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 421. Here, Kobayashi teaches keeping its diffusing plates 4, 5 and LED 1 separated by specific distances. Ex. 1006 ¶¶ 19–20. Tabito teaches using its optical stud members 25 to keep optical elements separated by a preset distance. Ex. 1007 ¶ 60. We find that an ordinarily skilled artisan, in implementing Tabito’s optical stud members in Kobayashi’s backlight unit, would have made any necessary modifications (e.g., selecting different materials for the optical stud members) to maintain Kobayashi’s desired backlight performance in order to realize the advantages of using Tabito’s optical stud members as a way to support Kobayashi’s diffusing plates.

On the record before us, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that its proposed combination of Kobayashi and Tabito teaches the recited limitations of claims 4–6 and 17, including the recited “diffuser supports.” *See* Pet. 34–41. We also are persuaded that Petitioner’s proffered reasoning for modifying Kobayashi’s backlight unit to include Tabito’s optical stud members, namely, to provide a way to implement Kobayashi’s specific arrangement of optical elements, is

sufficient for purposes of this Decision. *See* Pet. 33; *Intel*, 61 F.4th at 1381 (explaining that the petitioner need only show that the proposed combination would have provided a “suitable option”).

3. *Summary*

In view of the foregoing, we determine that Petitioner has demonstrated a reasonable likelihood of showing that claims 4–6 and 17 would have been obvious over Kobayashi and Tabito.

E. Remaining Kobayashi Challenges

Petitioner asserts four additional challenges based primarily on Kobayashi that are directed to claims 8, 10, 16, and 18–20, which depend from claims 1 or 13. Specifically, Petitioner asserts that claims 10 and 16 would have been obvious over Kobayashi, Kirita, and the knowledge of a person of ordinary skill in the art. Pet. 27–31. Petitioner asserts that claim 8 would have been obvious over Kobayashi, Lim, and the knowledge of a person of ordinary skill in the art. *Id.* at 31–32. Petitioner asserts that claims 18 and 20 would have been obvious over Kobayashi, Tabito, Onishi and the knowledge of a person of ordinary skill in the art. *Id.* at 41–45. Lastly, Petitioner asserts that claim 19 would have been obvious over Kobayashi, Tabito, Onishi, Epstein, and the knowledge of a person of ordinary skill in the art. *Id.* at 45–48.

At this stage, Patent Owner does not separately dispute Petitioner’s analysis for these challenges. *See* Prelim. Resp. 21–22, 27–28. Having reviewed Petitioner’s arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on the remaining

asserted Kobayashi challenges. *See* Pet. 27–32, 41–48 (citing, e.g., Ex. 1003 ¶¶ 69, 77, 84, 87–89, 91, 94–96, 103–106, 108–109, 143–145; Ex. 1006 ¶¶ 20, 34, 36, 42–43; Ex. 1008 ¶¶ 10, 63, 72, 75, Fig. 11; Ex. 1009 ¶¶ 57, 221, Fig. 7; Ex. 1010 ¶¶ 5, 213–214, Figs. 29A, 30A; Ex. 1013 ¶¶ 47, 57–59).

F. Alleged Obviousness over Schiavoni and Lim

We turn now to the Schiavoni-Lim challenges. Petitioner asserts that claims 1–3, 7, 8, and 11–15 of the '382 patent would have been obvious over Schiavoni, Lim, and the knowledge of a person of ordinary skill in the art. Pet. 48–65. Patent Owner disputes certain aspects of Petitioner's analysis for claim 1. Prelim. Resp. 28–35. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on its asserted challenge.

1. Overview Asserted Prior Art

Before addressing the parties' arguments, we provide an overview of Schiavoni and Lim.

a. Schiavoni

Schiavoni describes lighting devices. Ex. 1012, 1.¹⁷ To illustrate one embodiment, Figure 1a of Schiavoni is reproduced below.

¹⁷ Our citations to Schiavoni, as well as Petitioner's citations to Schiavoni, refer to the original page numbers in Schiavoni. Patent Owner's citations to Schiavoni refer to the assigned Bates numbers in Schiavoni.

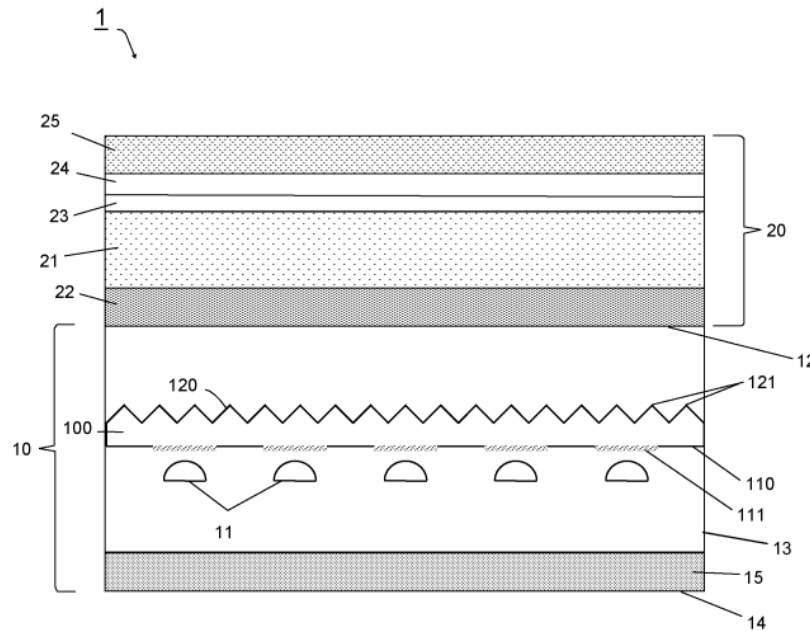


Figure 1a

Figure 1a shows lighting device 1, which includes enclosure 10 and optical structure 20. *Id.* at 14–15. Enclosure 10 includes light sources 11, open upper part 12, reflective side walls 13, bottom part 14, and reflector 15. *Id.* at 14. Light sources 11 are light emitting diodes that may emit in red, green, or blue. *Id.* at 15. Optical structure 20 is attached to open upper part 12, and includes a diffuser comprising substrate 21 and diffusing layer 22, diffusing film 23, BEF¹⁸ type element 24, and reflective polarizer 25. *Id.*

Optical element 100 is between light sources 11 and diffuser 21. Ex. 1012, 16. Optical element 100 includes upper face 120, which has grooves 121 “of the prism type with a triangular section.” *Id.* Optical element 100 also has lower face 110, which has diffusing areas 111. *Id.*

Schiavoni describes three distances: distance d1 between reflector 15 and sources 11, which is 15 mm or less; distance d2 between sources 11 and

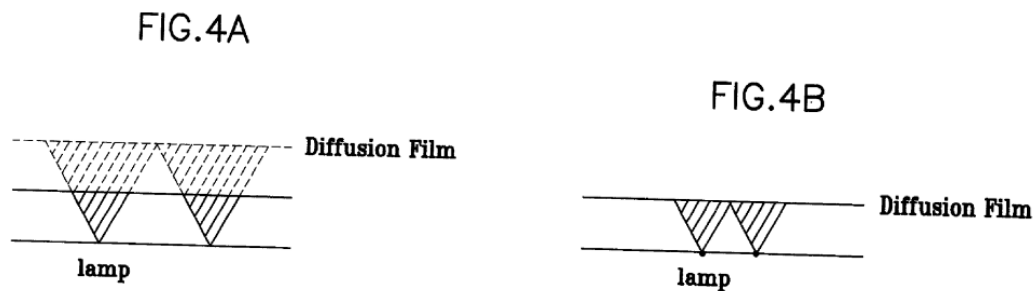
¹⁸ BEF stands for Brightness Enhancing Film. Ex. 1012, 13.

optical system 110, which is 10 mm or less; and distance d3 between optical system 100 and diffuser 21, which is 15 mm or less. Ex. 1012, 16.

b. Lim

Lim describes a lamp for use in a backlight unit in a liquid crystal display (LCD). Ex. 1013 ¶¶ 5, 46. As background, Lim explains that “LCD according to the related art has . . . problems.” *Id.* ¶ 19. For example, “as various LEDs, each of which represents only one color are used in combination, each interval between the lamps having the same color is so far that it is impossible to avoid leaving a long distance between a backlight and a diffusion plate to maintain uniform brightness,” which means “the backlight unit tends to be thicker.” *Id.* ¶ 20.

To illustrate, Figures 4A and 4B of Lim are reproduced below.



Figures 4A and 4B show “the relations between a diffusion plate and a lamp in accordance with a distance between lamps having the same visible angle.” Ex. 1013 ¶ 57. In particular, Figure 4A shows that “the farther the interval between the lamps realizing the same color is, the longer the interval between the lamp and the diffusion plate is.” *Id.* ¶ 58. Lim explains that “[a] plurality of diffusion plates are required for shortening the distance

between the lamp and diffusion plate, which eventually thickens the backlight unit as well as reduces brightness therefrom.” *Id.*

On the other hand, Figure 4B shows that “the closer the interval between the lamps is, the narrower the interval between the lamp and diffusion plate.” Ex. 1013 ¶ 59. Lim explains that “the total thickness of the backlight unit becomes thinner as the interval between the lamp and diffusion plate becomes narrower.” *Id.*

In order to “improv[e] light efficiency and brightness of the backlight, as well as reduc[e] the thickness of the backlight unit,” Lim provides a “single lamp or chip [that] enables R, G, and B colors.” Ex. 1013 ¶¶ 32, 45. To illustrate one embodiment, Figure 3A of Lim is reproduced below.

FIG. 3A

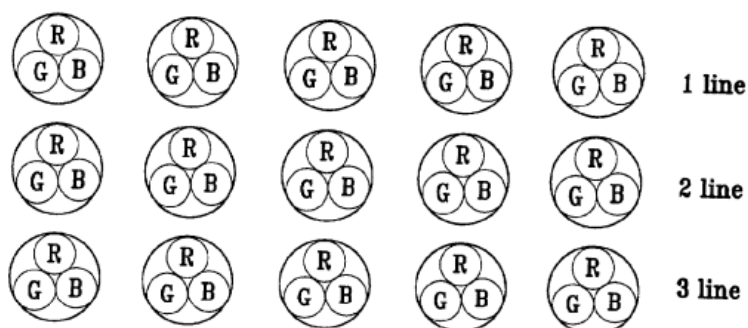


Figure 3A shows the layout of a lamp in a backlight unit. *Id.* ¶ 50. Lim explains that “[t]he respective LED chips realizing R, G, and B colors are built in a single chip,” and that a plurality of such chips are arranged in a matrix. *Id.* ¶ 51. According to Lim, “[c]ompared to the layout of the related art in which each of the lamps realizes only one of R, G, and B colors, the layout of the present invention shows that an interval between the lamps realizing the same color is shorter.” *Id.* ¶ 54. Lim specifies that “a distance

between the respective lamps or chips is designed to be within 10 mm, inclusive, and another distance between an LED lamp (or chip) and a diffusion plate is designed to be within 5 mm, inclusive.” *Id.* ¶47.

2. Analysis of Claims 1–3, 7, 8, and 11–15

a. Independent Claim 1

As discussed above, claim 1 is directed to a “solid state lighting device” and recites various limitations, which Petitioner designates as limitations 1A through 1E. We address these limitations in turn.

i. Limitation 1A: “plurality of solid state light emitters”

Claim 1 recites “a plurality of solid state light emitters that are configured to emit light.” For this limitation, Petitioner identifies Schiavoni’s sources 11 as a “plurality of solid state light emitters.” Pet. 50 (citing Ex. 1012, code (57), Fig. 1a).

Patent Owner does not dispute Petitioner’s analysis for this limitation. *See generally* Prelim. Resp. Based on Petitioner’s argument and evidence, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that Schiavoni teaches limitation 1A.

ii. Limitation 1B: “multiplane light diffuser”

Claim 1 further recites “a multiplane light diffuser including a first diffusion plane that is a first distance from the plurality of solid state emitters and a second diffusion plane that is a second distance from the plurality of solid state emitters that is different from the first distance.” For this limitation, Petitioner identifies Schiavoni’s optical element 100 as

teaching a “first diffusion plane,” and Schiavoni’s diffusing layer 22 as teaching a “second diffusion plane.” Pet. 51–52. As support, Petitioner provides an annotated version of Figure 1a of Schiavoni, reproduced below. *Id.* at 51.

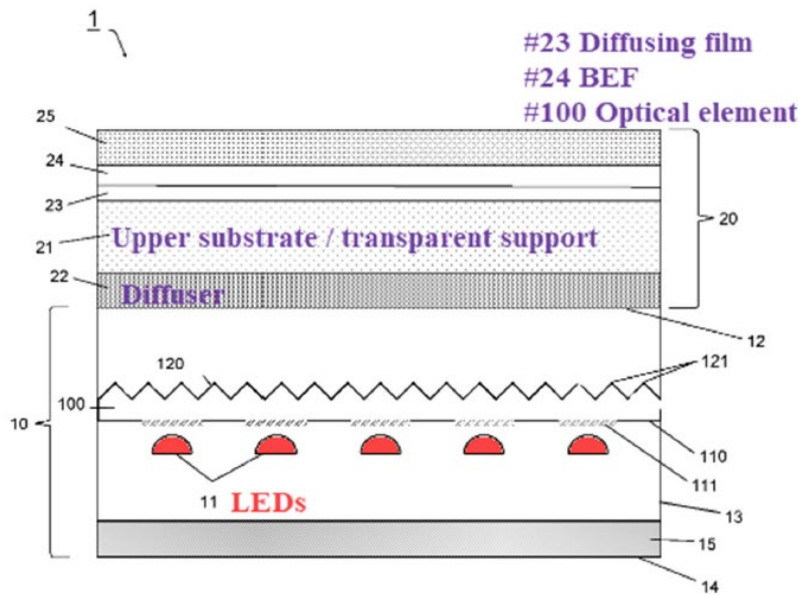


Figure 1a

Figure 1a of Schiavoni, as annotated by Petitioner, shows lighting device 1, which includes sources 11, diffusing layer 22, and optical element 100. *See* Ex. 1012, 14–16. Petitioner asserts that “optical element 100 and substantially plan[a]r diffuser 22 are different distances from the LEDs.” *Id.* at 52. Petitioner points to where Schiavoni teaches that its “first optical element 100 **is placed between** the sources 11 and the rigid diffuser 21,” where “a diffusing layer 22, . . . [is] arranged on the lower face (side of the enclosure) or top of the substrate 21, these two elements 21, 22 making it possible to homogenize the light.” *Id.* (quoting Ex. 1012, 15–16). Petitioner further points to where Schiavoni teaches that “[t]he first optical element is

usually a rigid diffuser intended to homogenize the normal luminance.” *Id.* at 51 (citing Ex. 1012, 1).

In response, Patent Owner argues that “Schiavoni does not teach the first diffusion plane, but rather an optical element that sectorizes light.” Prelim. Resp. 31. As support, Patent Owner asserts that Schiavoni’s optical element 100 “is not a diffuser.” *Id.* at 29–30. Patent Owner directs us to where Schiavoni teaches that its optical element 100 functions to “control the sectorization of the normal luminance, so that, for a given row of point sources (or a given extended source occupying a row), the average of the profile of the normal luminance along a direction orthogonal to the sources does not mix significantly with the average luminance profile of a neighboring row (or of a neighboring source).” *Id.* at 30 (citing Ex. 1012, 5–6). According to Patent Owner, “[t]he purpose of optical system 100 in Schiavoni is to ensure that the light from light sources 11 do not ‘significantly mix,’” which “is antithetical to the purpose of a diffuser of the ’382 patent which is to spread out the light from the light sources to achieve an even luminance profile.” *Id.* at 31.

At this stage, we disagree with Patent Owner. Although Schiavoni’s optical element 100 functions to “control the sectorization of the normal luminance,” it *also* functions to “reinforc[e] the homogenization of the luminance, so that, for each row of point sources (or each extended source occupying a row), the average of the normal luminance profile along a direction orthogonal to the sources is sufficiently wide, meaning that the curve of a total luminance along a direction orthogonal to the sources is then sufficiently planar.” Ex. 1012, 3–4 (cited by Prelim. Resp. 30). That is, Schiavoni’s optical element 100 has a “double function.” *Id.* at 3.

Moreover, Schiavoni explicitly characterizes its optical element as a “rigid diffuser intended to homogenize the normal luminance.” *Id.* at 1 (cited by Pet. 51). Accordingly, Patent Owner’s argument does not undermine Petitioner’s showing for limitation 1B.

On the record before us, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that Schiavoni teaches limitation 1B.

iii. Limitation 1C: “first side” and “second side”

Claim 1 further recites “the multiplane light diffuser including [a] first side that corresponds to the first plane and that is configured to receive the light emitted from the plurality of solid state light emitters and a second side that corresponds to the second plane and that is configured to transmit diffused light.” For this limitation, Petitioner asserts that Schiavoni’s “[o]ptical element 100 comprises a first side corresponding to a first plane configured to receive light from the plurality of LEDs and that diffusing layer 22 comprises a second side corresponding to a second plane that is configured to transmit diffused light.” Pet. 52–53 (citing Ex. 1012, 16, Fig. 1a).

At this stage, Patent Owner does not separately dispute Petitioner’s analysis for this limitation. *See generally* Prelim. Resp. Based on Petitioner’s argument and evidence, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that Schiavoni teaches limitation 1C.

iv. Limitation 1D: “diffuser plate”

Claim 1 further recites “the multiplane light diffuser comprises a diffuser plate that includes the first side of the multiplane light [diffuser], the diffuser plate configured to define the first diffusion plane.” For this limitation, Petitioner asserts that Schiavoni’s “substantially planar optical element 100 comprises a diffuser plate 111,” and that “[t]he diffuser plate 111 comprises a first side 110 with the diffuser plate 111 defining the first diffusion plane.” Pet. 53–54 (citing Ex. 1012, 16, Figs. 1, 6).

Patent Owner does not separately dispute Petitioner’s analysis for this limitation. *See generally* Prelim. Resp. Based on Petitioner’s argument and evidence, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that Schiavoni teaches limitation 1D.

v. Limitation 1E: “third distance”

Claim 1 further recites that “the plurality of solid state emitters comprise a third distance between adjacent ones of the plurality of solid state light emitters, and wherein the first distance is a function of the third distance.” For this limitation, Petitioner provides an annotated version of Figure 1a of Schiavoni, reproduced below. Pet. 55.

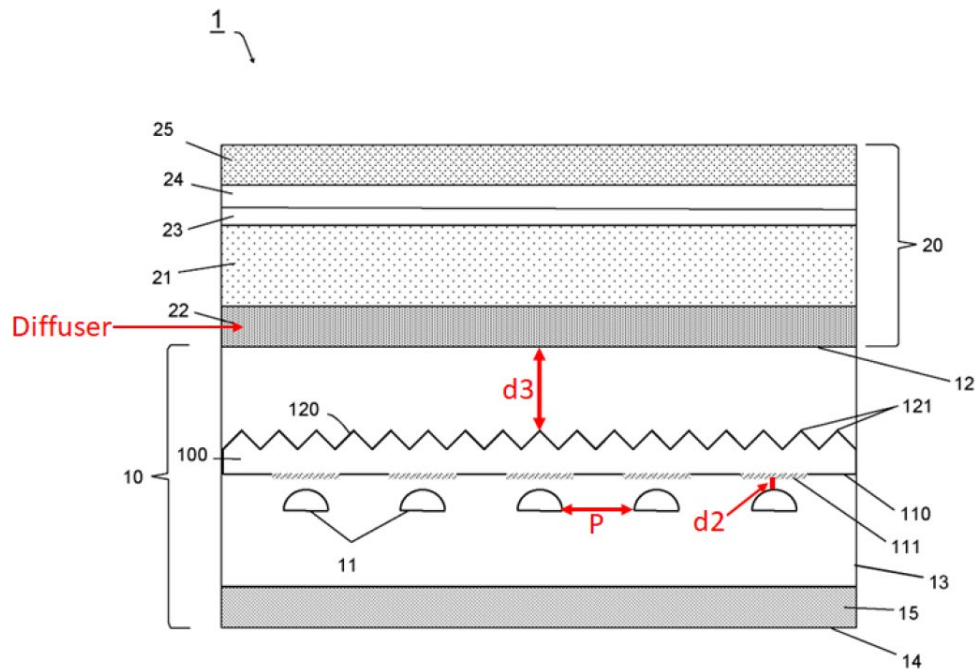


Figure 1a of Schiavoni, as annotated by Petitioner, shows lighting device 1, which includes sources 11, diffusing layer 22, and optical element 100. *See* Ex. 1012, 14–16. As the annotated figure shows, Petitioner has labeled three distances d_2 , d_3 , and P in red. Pet. 55. Petitioner points to where Schiavoni describes these three distances as “[t]he distance d_2 between the sources 11 and the optical system 100,” “[t]he distance d_3 between the optical system 100 and the diffuser 21,”¹⁹ and “spacing P between said lit extended source and another adjacent extended source or between said lit row and an adjacent row of point sources.” *Id.* at 54–55 (quoting Ex. 1012, 16, 23). Petitioner identifies Schiavoni’s distance d_2 as the recited “first distance,” and Schiavoni’s spacing P as the recited “third distance.” *Id.* at 55.

¹⁹ We understand Schiavoni’s reference to “diffuser 21” (*see* Ex. 1012, 16) as referring to the diffuser “formed of a transparent support 21 . . . and a diffusing layer 22” (*see id.* at 15).

Petitioner asserts that “Schiavoni does not directly disclose a relationship between these distances, but Schiavoni in combination with Lim describes that ‘the first distance [d2] is a function of the third distance [P].’” Pet. 56. As support, Petitioner directs us to where Lim describes the relationship “between a diffusion plate and a lamp in accordance with a distance between lamps having the same visible angle.” *Id.* (quoting Ex. 1013 ¶ 57). Lim teaches in particular that “the closer the interval between the lamps is, the narrower the interval between the lamp and diffusion plate.” *Id.* (quoting Ex. 1013 ¶¶ 58–59, Figs. 4A, 4B). According to Petitioner, “[a] POSITA would be motivated to modify the backlighting system of Schiavoni to include the spacing relationship described by Lim because this enables the overall backlight structure to . . . have a thinner structure.” *Id.* at 49.

In response, Patent Owner argues that “the optical system/element 100 of Schiavoni is not a diffuser and as such Schiavoni does not describe the relationship between the distance of adjacent solid state lighting emitters to the spacing between the bottom of the plurality of solid state emitters/top of the support structure and the first diffusion plane.” Prelim. Resp. 32.

Patent Owner’s argument in this regard is unavailing. As discussed above with respect to limitation 1B, we find that Schiavoni’s optical element 100 is a diffuser. *See supra* Part III.F.2.a.ii. We note in particular Schiavoni’s explicit teaching that its optical element is a “rigid diffuser intended to homogenize the normal luminance.” *Id.* at 1 (cited by Pet. 51). Moreover, Petitioner does not rely on Schiavoni alone to teach the portion of limitation 1E requiring that “the first distance is a function of the third

distance.” Pet. 56. Petitioner relies instead on the combined teachings of Schiavoni and Lim. *Id.*

Patent Owner further argues that “Lim also does not disclose this element.” Prelim. Resp. 32. Patent Owner asserts that Lim’s discussion about the relationship between a diffusion plate and a lamp is “in the context of color mixing,” as “the light sources of Lim are R,G,B (red, green, blue) LEDs” that “do not emit white light as those in the ’382 patent.” *Id.*

According to Patent Owner, “[t]he relationship between the spacing of the light sources and the distance from the light sources to the diffuser in color mixing is different from the relationship in the use of white light sources such as in the claimed invention.” *Id.* at 33. Patent Owner adds that “[t]he purpose of the distance between the light sources and the diffusion plate in the ’382 patent is intended to achieve optimal illumination of the LCD panel, whereas the purpose of the distance between the light source and diffuser in Lim is [to] ensure optimal color mixing.” *Id.* at 33–34.

Patent Owner’s argument in this regard also is unavailing. As explained above, “it is important not to import into a claim limitations that are not a part of the claim.” *SuperGuide*, 358 F.3d at 875; *see also Williamson*, 792 F.3d at 1346–47 (“caution[ing] against limiting the claimed invention to preferred embodiments or specific examples in the specification”). Here, claim 1 recites “a plurality of solid state light emitters that are configured to emit light.” The claim says nothing about emitting *white* light. Although the specification describes embodiments where the solid state light emitters are configured to emit white light, nowhere does the specification limit the solid state light emitters to those embodiments. *See* Ex. 1001, 5:35–46 (“The solid state light emitters 113 may include one or

more LED emitter chips that are configured to emit light having one or more dominant wavelengths. In some embodiments, solid state light emitters 113 *may include white LED lamps . . . [whose] resulting light[] . . . may appear white* to an observer.”); *see also id.* at 3:43–45 (“This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein.”).

Lastly, Patent Owner argues that “[t]he combination of Schiavoni with Lim is inappropriate” because “Petitioner does not make clear or even imply that optical system/element 100 of Schiavoni would be functional in the context of an R,G,B lighting system.” Prelim. Resp. 28. Patent Owner reasons that “Schiavoni’s LEDs are used to make white light, whereas Lim’s multiple RGB LEDs are used for R-G-B separately, line by line in a field sequential type of LCD system which Schiavoni does not operate with.” *Id.* Patent Owner adds that Petitioner also does not “demonstrate or imply that the light sources 11 of Schiavoni would achieve optimal illumination of an LCD panel by employing the distance relationship between the light sources and the diffusion film of Lim.” *Id.*

At this stage, we disagree with Patent Owner. By focusing on differences between the systems in Schiavoni and Lim, Patent Owner disregards Lim’s broader teaching about “the relations between a diffusion plate and a lamp in accordance with a distance between lamps having the same visible angle.” Ex. 1013 ¶¶ 57–59. As discussed above, “[t]he test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference,” but, “[r]ather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.” *Keller*, 642 F.2d at 425.

Additionally, those of ordinary skill in the art are also persons of ordinary creativity, not automatons. *KSR*, 550 U.S. at 421. Here, Schiavoni teaches placing its optical element 100 between sources 11 and rigid diffuser 21 “to both reinforce the homogeneity of the normal luminance L (while reducing the total thickness of the enclosure by bringing the diodes closer to the diffuser) and to sufficiently sectorize the normal luminance L from one row to another.” Ex. 1012, 16 (cited by Pet. 54–55). Lim also describes reducing “total thickness.” In particular, Lim explains that “the closer the interval between the lamps is, the narrower the interval between the lamp and diffusion plate,” meaning “the total thickness of the backlight unit becomes thinner.” Ex. 1013 ¶ 59 (cited by Pet. 56). We find that an ordinarily skilled artisan, in applying Lim’s teaching about the arrangement of lamps and diffusers in the context of Schiavoni’s system, would have made the necessary modifications to provide for optimal illumination. *See* Ex. 1012, 16 (describing reinforcing homogeneity and sufficiently sectorizing the normal luminance). Accordingly, Patent Owner’s argument does not undermine Petitioner’s showing for limitation 1E.

On the record before us, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that its proposed combination of Schiavoni and Lim teaches limitation 1E. We also are persuaded that Petitioner’s proffered reasoning for applying Lim’s teaching about the arrangement of lamps and diffusers in the context of Schiavoni’s system, namely, to reduce overall thickness of the lighting device, is sufficient to support institution. *See In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) (“[T]here must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.”).

b. Claims 2, 3, 7, 8, and 11–15

Claims 2, 3, 7, 8, 11, and 12 depend from claim 1. Independent claim 13 is directed to a “method of providing diffused light” and recites similar limitations as claim 1. Claims 14 and 15 depend from claim 13. Patent Owner does not separately dispute Petitioner’s analysis for these claims, relying solely on its arguments for claim 1. *See generally* Prelim. Resp. 34–35. Having reviewed Petitioner’s arguments and evidence for claims 2, 3, 7, 8, and 11–15, we are persuaded that Petitioner’s showing for these claims is sufficient for purposes of this Decision. *See* Pet. 57–65 (citing, e.g., Ex. 1012, 3, 13, 15–17, 20, Fig. 1a; Ex. 1013 ¶ 47).

3. Summary

In view of the foregoing, we determine that Petitioner has demonstrated a reasonable likelihood of showing that claims 1–3, 7, 8, and 11–15 would have been obvious over Schiavoni and Lim.

G. Alleged Obviousness over Schiavoni, Lim, and Kobayashi

Petitioner asserts that claim 9 of the ’382 patent would have been obvious over Schiavoni, Lim, Kobayashi, and the knowledge of a person of ordinary skill in the art. Patent Owner disputes Petitioner’s rationale for combining the references. Prelim. Resp. 35. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on its asserted challenge.

We provided an overview of Schiavoni, Lim, and Kobayashi above. *See supra* Parts III.C.1, III.F.1.

1. Analysis of Claim 9

Claim 9 recites “the second distance comprises a distance in a range between the third distance and 1.5 times the third distance.” As discussed above, Schiavoni’s distance d2 (from optical element 110 to source 11) corresponds to the “first distance,” and Schiavoni’s spacing P (between adjacent sources 11) corresponds to the “third distance.” Pet. 55.

Petitioner cross-references its discussion of claim 9 with respect to obviousness over Kobayashi. Pet. 66. In that discussion, Petitioner directs us to where Kobayashi teaches that distance a (from diffusing plate 5 to LED 1) is 10 mm or more, distance b (between adjacent LEDs 1) is 10 to 100 mm, and the ratio of distance a to distance b is 0.2 to 1.0. *Id.* at 22 (citing Ex. 1006 ¶ 20). When this ratio is 1.0, distances a and b are the same. *See id.*²⁰ Petitioner further asserts that “[a] POSITA would be motivated to modify the Schiavoni-Lim combination based on Kobayashi, which discloses or suggests that [the] second distance is equal to the [third] distance, and thus the second distance comprises a distance in a range between the third distance and 1.5 times the third distance.” *Id.* at 66. Petitioner reasons that the “POSITA would be motivated to apply the ratio of distances suggested by Kobayashi to the Schiavoni-Lim combination to provide a higher quality light output.” *Id.* Petitioner relies on the declaration testimony of Dr. Pattison. *Id.* at 65–66 (citing Ex. 1003 ¶¶ 119–121).

²⁰ Petitioner asserts that “[a] person of ordinary skill in the art would recognize that . . . Kobayashi would disclose or suggest that the second distance is equal to the first distance.” Pet. 22. Petitioner’s reference to the *first* distance instead of the *third* distance appears to be a typographical error.

Patent Owner responds that “[t]here is no[] motivation to combine Schiavoni and/or Kobayashi with Lim,” given that “Lim’s RGB lamps use[] R-G-B separately, line by line in a field sequential type of LCD system which Schiavoni, Kobayashi . . . do[] not.” Prelim. Resp. 35.

At this stage, we disagree with Patent Owner. For the reasons given above regarding limitation 1E, we find that Petitioner’s rationale for applying Lim’s teaching about the arrangement of lamps and diffusers to systems like those in Schiavoni and Kobayashi, namely, to reduce overall thickness of the lighting device, is sufficient to support institution. *See supra* Part III.F.2.a.v; *see also Keller*, 642 F.2d at 425 (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference . . . Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”); *KSR*, 550 U.S. at 421 (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”). Accordingly, Patent Owner’s argument does not undermine Petitioner’s showing for claim 9.

On the record before us, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that its proposed combination of Schiavoni, Lim, and Kobayashi teaches the recited limitation of claim 9. We also are persuaded that Petitioner’s proffered reasoning for applying Kobayashi’s teaching about the ratio of distances in the context of the proposed Schiavoni-Lim system, namely, to provide a higher quality light output, is sufficient to support institution. *See Kahn*, 441 F.3d at 988.

2. Summary

In view of the foregoing, we determine that Petitioner has demonstrated a reasonable likelihood of showing that claim 9 would have been obvious over Schiavoni, Lim, and Kobayashi.

H. Alleged Obviousness over Schiavoni, Lim, and Kirita

Petitioner asserts that claims 10 and 16 of the '382 patent would have been obvious over Schiavoni, Lim, and Kirita. Pet. 66–68. Patent Owner disputes Petitioner's rationale for combining the references. Prelim. Resp. 36. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on its asserted challenge.

We provided an overview of Schiavoni and Lim above. *See supra* Part III.F.1. Before addressing the parties' arguments, we additionally provide an overview of Kirita.

1. Overview of Kirita

Kirita describes liquid crystal displays. Ex. 1008 ¶ 3. To illustrate one embodiment, Figure 11 of Kirita is reproduced below.

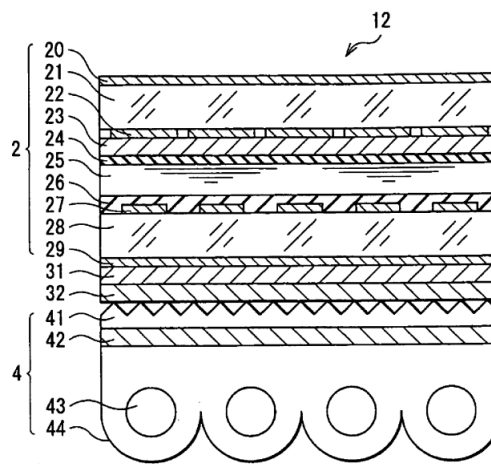


FIG. 11

Figure 11 shows a cross section of liquid crystal display 12, which includes liquid crystal panel 2 and luminaire 4, where diffusion sheet 31 and light selective transmission filter 32 are arranged between liquid crystal panel 2 and luminaire 4. *Id.* ¶ 98.

In operation, light emitted from lamps 43 is reflected by lamp reflectors 44. Ex. 1008 ¶ 74. The reflected light is directed toward liquid crystal panel 2, evenly diffused by diffusion sheet 42, and oriented by prism sheet 41. *Id.* Light in specific wavelength regions is then selectively transmitted by light selected transmission filter 32. *Id.* ¶ 75. The selectively transmitted light enters liquid crystal panel 2, where “light having a light volume based on the voltage applied for every pixel between the transparent pixel electrode 27 and the transparent electrode 23 as an opposed electrode is transmitted and color-separated by using the color filter 22, and thereby color images are displayed.” *Id.* ¶ 76.

Kirita explains that, “[b]y providing the light selective transmission filter 32, the color purity of illumination light can be improved,” which means “the NTSC ratio can be improved, and the color reproduction range can be expanded.” Ex. 1008 ¶ 63. In Kirita, NTSC stands for National Television System Committee, and the NTSC ratio is “one of the indices showing color reproducibility in displays.” *Id.* ¶ 15.

2. Analysis of Claims 10 and 16

Claims 10 and 16 depend from claims 1 and 13, respectively. Claim 10 recites “the diffuser plate comprises a plate including a light filter color.” Claim 16 similarly recites “transmitting the first diffused light comprises transmitting scattered diffusion light from a plate including a light

filter color.” For these limitations, Petitioner identifies Kirita’s light selective transmission filter 32 as a “light filter color,” and cross-references its discussion of claims 10 and 16 with respect to obviousness over Kobayashi and Kirita. Pet. 66–68. In that discussion, Petitioner asserts that “Kirita discloses LED light sources . . . transmitting from a luminaire to a light selective transmission filter 32 and diffusion sheet 31 between prism sheet 41 and liquid crystal panel 2, where the light selection transmission filter allows select wavelengths of light (colors) to pass from the luminaire 4 through the liquid crystal panel 2.” *Id.* at 29 (citing Ex. 1008 ¶¶ 72, 75, Fig. 11). Petitioner further contends that “[a] POSITA would be motivated to apply Kirita’s light selective transmission filter 32 to the Schiavoni-Lim combination to obtain the benefits discussed in Kirita, i.e., improved purity of the illumination light provided by the backlight, improved NTSC ratio, and expanded reproduction range.” *Id.* at 67 (citing Ex. 1008 ¶ 63).

Patent Owner responds that that “[t]here is no[] motivation to combine Schiavoni and/or Kirita with Lim,” given that “Lim’s RGB lamps use[] R-G-B separately, line by line in a field sequential type of LCD system which Schiavoni, Kirita . . . do[] not.” Prelim. Resp. 36.

At this stage, we disagree with Patent Owner. For the reasons given above regarding limitation 1E, we find that Petitioner’s rationale for applying Lim’s teaching about the arrangement of lamps and diffusers to systems like those in Schiavoni and Kirita, namely, to reduce overall thickness of the lighting device, is sufficient to support institution. *See supra* Part III.F.2.a.v; *see also Keller*, 642 F.2d at 425 (“The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference . . . Rather,

the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art.”); *KSR*, 550 U.S. at 421 (“A person of ordinary skill is also a person of ordinary creativity, not an automaton.”). Accordingly, Patent Owner’s argument does not undermine Petitioner’s showing for claims 10 and 16.

On the record before us, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that its proposed combination of Schiavoni, Lim, and Kirita teaches the recited limitations of claims 10 and 16. We also are persuaded that Petitioner’s proffered reasoning for modifying the proposed Schiavoni-Lim system to include Kirita’s light selective transmission filter, namely, to improve color purity, is sufficient to support institution. *See Kahn*, 441 F.3d at 988.

3. *Summary*

In view of the foregoing, we determine that Petitioner has demonstrated a reasonable likelihood of showing that claims 10 and 16 would have been obvious over Schiavoni, Lim, and Kirita.

I. Alleged Obviousness over Schiavoni, Lim, and Tabito

Petitioner asserts that claims 4–6 and 17 of the ’382 patent would have been obvious over Schiavoni, Lim, and Tabito. Pet. 68–72. Patent Owner disputes Petitioner’s rationale for combining the references as well as certain aspects of Petitioner’s analysis for claim 17. Prelim. Resp. 37–40. For the reasons explained below, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on its asserted challenge.

We provided an overview of Schiavoni, Lim, and Tabito above. *See supra* Parts III.D.1, III.F.1.

1. Analysis of Claims 4–6 and 17

As discussed above, claims 4–6 and 17 recite a “plurality of diffuser supports.” Petitioner asserts that “[t]he Schiavoni-Lim combination discloses light emitting elements and a diffuser structure but does not expressly disclose the mounting for that diffuser structure.” Pet. 68. Petitioner further asserts that, “[l]ike Schiavoni and Lim, Tabito discloses a backlighting structure for a display including a reflecting plate 26, diffusing plate 23, light diffusing conducting plate 21, and optical converting section 4, all of which [are] supported by optical stud members 25, holder frame member 10, and holding bracket member 22.” *Id.* at 68–69 (citing Ex. 1007 ¶ 81, Fig. 2). To illustrate Tabito’s system, Petitioner provides an annotated version of Figure 2 of Tabito, reproduced below. *Id.* at 69.

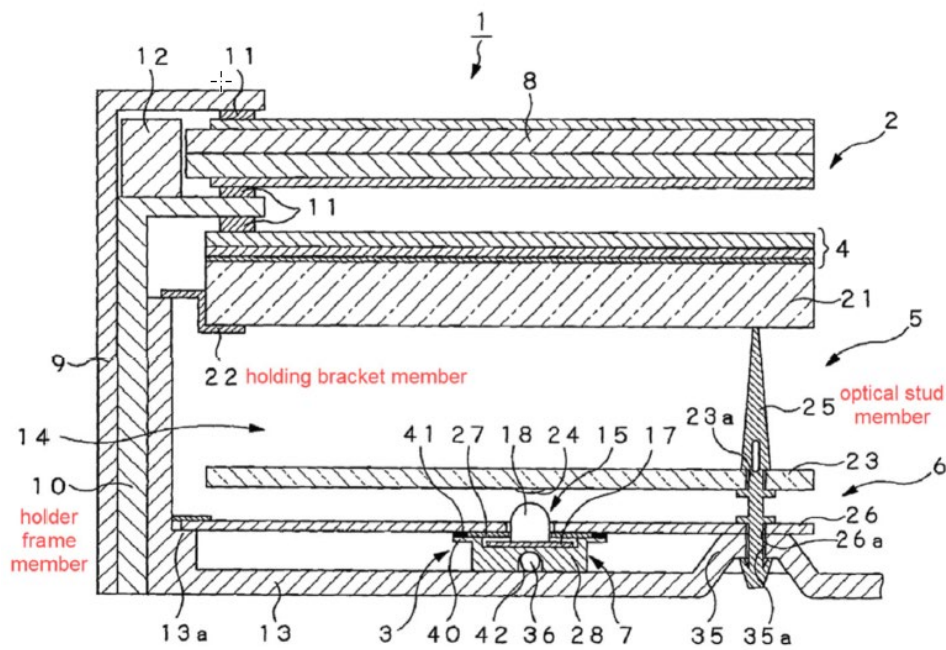


Figure 2 of Tabito, as annotated by Petitioner, shows a cross section of liquid crystal display apparatus 1. Ex. 1007 ¶ 40. Petitioner asserts that “Tabito’s method of supporting diffusing plates would also be suitable for use in supporting Schiavoni’s diffuser plates.” Pet. 69. According to Petitioner, “[a] POSITA would have been motivated to combine Tabito’s structure to the Schiavoni-Lim combination to improve the strength and resiliency of supports for the backlight of the display.” *Id.* at 69–70.

Patent Owner counters that “[a] POSITA would not be motivated to combine Tabito and Schiavoni as the combination would lead to potential faults in the invention of Schiavoni.” Prelim. Resp. 37. As support, Patent Owner points to Schiavoni’s optical element 100 and diffusing layer 22. With respect to Schiavoni’s optical element 100, Patent Owner reiterates its position that “optical system/element 100 of Schiavoni is not a diffuser within the meaning of the ’382 patent.” *Id.* at 38. Nevertheless, Patent Owner further asserts that Schiavoni’s “optical system 100[] is ‘preferably glass, 3mm thick’ and its ‘upper face 120 is textured . . . to obtain grooves 121 of the prism type with a triangular section,’” meaning that “it would be unworkable to insert Tabito’s diffuser supports through this glass optical element” because “[g]lass is not an optimal material for the holes that are required for mounting the diffuser supports.” *Id.* at 37 (citing Ex. 1012, 18). Patent Owner adds that “Tabito’s diffuser supports would disrupt the triangular grooves of Schiavoni, thus reducing the efficacy of the optical system.” *Id.*

With respect to Schiavoni’s diffusing layer 22, Patent Owner asserts that “[a] diffuser support that passed through Schiavoni’s diffusing layer 22 would punch into the ‘transparent support 21 preferably glass,’” which “is

obviously unworkable as it would cause the structure to be more fragile.” Prelim. Resp. 38. Patent Owner relies on the declaration testimony of Mr. Bohannon. *Id.* at 37–38 (citing Ex. 2001 ¶¶ 74–75).

At this stage, we disagree with Patent Owner. For the reasons given above for limitation 1B, Schiavoni’s optical element 100 is a diffuser. *See supra* Part III.F.2.a.ii. As to Patent Owner’s contention that using Tabito’s diffuser supports with Schiavoni’s *glass* diffusers would be “unworkable” (*see* Prelim. Resp. 37–38), we find that an ordinarily skilled artisan would have made any necessary modifications (e.g., selecting different materials for optical element 100 and diffusing layer 22) when combining Schiavoni and Tabito in order to realize as much as possible the advantages of using Tabito’s diffuser supports in the first place. *See Keller*, 642 F.2d at 425; *KSR*, 550 U.S. at 421. Indeed, Schiavoni does not require its optical element 100 or diffusing layer 22 to be made of glass. *See* Ex. 1012, 16 (“The system 100 consists of a plastic or preferably a glass substrate.”); *id.* at 15 (describing “a surface diffuser, formed of a transparent support 21 preferably made of glass and a diffusing layer 22, preferably mineral”). Accordingly, Patent Owner’s contention does not undermine Petitioner’s obviousness showing.

We note Patent Owner’s further contention that “Tabito’s diffuser supports would disrupt the triangular grooves of Schiavoni, thus reducing the efficacy of the optical system.” *See* Prelim. Resp. 37. Even if this were true, however, Patent Owner essentially alleges there would be tradeoffs in combining Schiavoni and Tabito to provide a way to support Schiavoni’s optical element 100 and diffusing layer 22. Our reviewing court has explained that “[t]he fact that [a] motivating benefit comes at the expense of

another benefit . . . should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another.” *See Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000). The relative advantages (e.g., providing a way to support optical elements) and disadvantages (e.g., “reducing the efficacy of the optical system”) of modifying Schiavoni’s system to include Tabito’s diffuser supports amount to a tradeoff, a decision well within the level of an ordinarily skilled. Accordingly, Patent Owner’s contention in this regard also does not undermine Petitioner’s obviousness showing.

Regarding claim 17 specifically, Patent Owner additionally contends that “[t]he diffuser supports of Tabito (optical stud member 25) are inserted through the support structure (back panel 13) and through a first light diffusing plate 23 which is mounted above the lighting elements (LEDs 18),” whereas “the diffuser supports of the ’382 patent are mounted on, not through, the support structure as per figure 5B of the [’382 patent].” Prelim. Resp. 38–39.

Patent Owner’s contention is unavailing. Claim 17 recites “a plurality of diffuser supports configured to support a first diffuser plane structure at a first distance from the plurality of solid state light emitters and to support a second diffuser plane structure at a second distance from the plurality of solid state light emitters, wherein the second distance is greater than the first distance.” The claim language says nothing about mounting the diffuser supports themselves, let alone mounting them on a support structure. Although the drawings show embodiments where the diffuser supports are mounted on a support structure, nowhere does the specification limit the diffuser supports to those embodiments. *See SuperGuide*, 358 F.3d at 875

(“[I]t is important not to import into a claim limitations that are not a part of the claim.”); *Williamson*, 792 F.3d at 1346–47 (“caution[ing] against limiting the claimed invention to preferred embodiments or specific examples in the specification”). Indeed, the ’382 patent explains that, “[i]n some embodiments, the diffuser supports 164 may include a proximal end 164b that is configured to engage, contact, attach to, mount on, and/or be integrally formed in the support structure 114.” Ex. 1001, 7:36–40; *see also id.* at 3:43–45 (“This invention may[] . . . be embodied in many different forms and should not be construed as limited to the embodiments set forth herein.”).

On the record before us, we are persuaded that Petitioner has shown sufficiently for purposes of this Decision that its proposed combination of Schiavoni, Lim, and Tabito teaches the recited limitations of claims 4–6 and 17, including the recited “diffuser supports.” *See* Pet. 68–72. We also are persuaded that Petitioner’s proffered reasoning for modifying the proposed Schiavoni-Lim system to include Tabito’s diffuser supports, namely, to provide a way to support Schiavoni’s optical element 100 and diffusing layer 22, is sufficient for purposes of this Decision. *See* Pet. 69; *Intel*, 61 F.4th at 1381 (explaining that the petitioner need only show that the proposed combination would have provided a “suitable option”).

2. Summary

For the reasons given above, we determine that Petitioner has demonstrated a reasonable likelihood of showing that claims 4–6 and 17 would have been obvious over Schiavoni, Lim, and Tabito.

J. Remaining Schiavoni-Lim Challenges

Petitioner asserts two additional challenges based on Schiavoni and Lim that are directed to claims 18–20, which depend directly or indirectly from claim 1. Specifically, Petitioner asserts that claims 18 and 20 would have been obvious over Schiavoni, Lim, Tabito, Onishi, and the knowledge of a person of ordinary skill in the art. Pet. 73–75. Petitioner also asserts that claim 19 would have been obvious over Schiavoni, Lim, Tabito, Onishi, Epstein, and the knowledge of a person of ordinary skill in the art. *Id.* at 75–77.

At this stage, Patent Owner does not separately dispute Petitioner’s analysis for these challenges. *See* Prelim. Resp. 40–41. Having reviewed Petitioner’s arguments and evidence, we determine that Petitioner has demonstrated a reasonable likelihood of prevailing on the remaining asserted Schiavoni-Lim challenges. *See* Pet. 73–77 (citing, e.g., Ex. 1003 ¶¶ 85–87, 90, 132–135, 138–140; Ex. 1009 ¶¶ 57, 221; Ex. 1010 ¶¶ 5, 214; Ex. 1012, 7, 9, 16).

IV. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated on the record before us a reasonable likelihood that it will prevail in showing at least one of the challenged claims of the ’382 patent is unpatentable. We have not, however, made a final determination with respect to the patentability of the challenged claims or the constructions of any claim terms.

V. ORDER

For the reasons given, it is

ORDERED that *inter partes* review is instituted as to all challenged claims of the '382 patent, namely, claims 1–20, based on all challenges presented in the Petition; and

FURTHER ORDERED that, pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial will commence on the entry date of this Decision.

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