

Petition for *Inter Partes* Review
U.S. Patent No. 8,177,382

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Hisense USA Corporation
Petitioner

v.

Brightplus Ventures LLC
Patent Owner

Patent No. 8,177,382
Filing Date: March 11, 2008
Issue Date: May 15, 2012
Title: Apparatus and Methods for Multiplanar Optical Diffusers and Display
Panels for Using the Same

Inter Partes Review No. IPR2023-01311

PETITION FOR *INTER PARTES* REVIEW

TABLE OF CONTENTS

I.	Mandatory Notices (37 C.F.R. § 42.8(b))	1
A.	Real Party-in-Interest (37 C.F.R. § 42.8(b)(1)).....	1
B.	Related Matters (37 C.F.R. § 42.8(b)(2)).....	1
C.	Designation of Lead and Backup Counsel (37 C.F.R. § 42.8(b)(3)) and Service Information (37 C.F.R. § 42.8(b)(4)).	2
II.	Introduction.....	2
III.	IPR Requirements	3
B.	Fees (37 C.F.R. § 42.103)	3
C.	Challenge Under 37 C.F.R. § 42.104(b)	3
IV.	Background.....	5
A.	The '382 Patent	5
B.	Prosecution of the '382 Patent.	6
V.	Expert Testimony, Level of Skill in the Art, and Claim Construction.....	8
A.	Declaration Evidence	8
B.	Person of Ordinary Skill in the Art	8
C.	Claim Construction	8
VI.	Prior Art.....	9
A.	Kobayashi.....	9
B.	Tabito.....	10
C.	Kirita.....	11
D.	Onishi	12

E.	Epstein	13
F.	Schiavoni	13
G.	Lim	15
VII.	Full Statement of the Reasons for the Relief Requested	15
A.	Ground 1 – Claims 1-3, 7-9, and 11-15 are Obvious Under 35 U.S.C. § 103 Over Kobayashi in view of the Knowledge of a POSITA.	15
B.	Ground 2 – Claims 10 and 16 are Obvious Under 35 U.S.C. § 103 Over Kobayashi and Kirita in view of the Knowledge of a POSITA.	27
C.	Ground 3 – Claim 8 is Obvious Under 35 U.S.C. § 103 Over Kobayashi and Lim in view of the Knowledge of a POSITA.	31
D.	Ground 4 – Claims 4 and 17 are Obvious Under 35 U.S.C. § 103 Over Kobayashi and Tabito in view of the Knowledge of a POSITA.	33
E.	Ground 5 – Claims 18 and 20 are Obvious Under 35 U.S.C. § 103 Over Kobayashi, Tabito, and Onishi in view of the Knowledge of a POSITA.	41
F.	Ground 6 – Claim 19 is Obvious Under 35 U.S.C. § 103 Over Kobayashi, Tabito, Onishi, and Epstein in view of the Knowledge of a POSITA.	45
G.	Ground 7 – Claims 1-2, 7-8, and 11-15 are Obvious Under 35 U.S.C. § 103 Over Schiavoni and Lim in view of the Knowledge of a POSITA.	48
H.	Ground 8 – Claim 9 is Obvious Under 35 U.S.C. § 103 Over Schiavoni, Lim, and Kobayashi in view of the Knowledge of a POSITA.	65
I.	Ground 9 – Claims 10 and 16 are Obvious Under 35 U.S.C. § 103 Over Schiavoni, Lim, and Kirita in view of the Knowledge of a POSITA.	66

J.	Ground 10 – Claims 4 and 17 are Obvious Under 35 U.S.C. § 103 Over Schiavoni, Lim, and Tabito in view of the Knowledge of a POSITA.	68
K.	Ground 11 – Claims 18 and 20 are Obvious Under 35 U.S.C. § 103 Over Schiavoni, Lim, Tabito, and Onishi in view of the Knowledge of a POSITA.	73
L.	Ground 12 – Claim 19 is Obvious Under 35 U.S.C. § 103 Over Schiavoni, Lim, Tabito, Onishi, and Epstein in view of the Knowledge of a POSITA.	75
VIII.	Any Secondary Considerations Cannot Overcome the Clear Evidence of Obviousness.....	77
IX.	Discretionary Denial is Inappropriate.	77
X.	Denial Under Section 325(d) is Inappropriate.....	80
XI.	Conclusion	80

LIST OF EXHIBITS

EXHIBIT	DESCRIPTION
1001	U.S. Patent No. 8,177,382 (“the ’382 Patent”)
1002	Prosecution History of U.S. Patent No. 8,177,382
1003	Declaration of Morgan Pattison, Ph.D.
1004	Curriculum Vitae of Morgan Pattison, Ph.D.
1005	JP 2007-329016 to Kobayashi (“Kobayashi”)
1006	Certified Translation of Kobayashi
1007	US 2007/0103908 to Tabito <i>et al.</i> (“Tabito”)
1008	US 2006/0050198 to Kirita <i>et al.</i> (“Kirita”)
1009	US 2005/0243551 to Onishi <i>et al.</i> (“Onishi”)
1010	US 2005/0024754 to Epstein <i>et al.</i> (“Epstein”)
1011	WO 2008/025909 to Schiavoni <i>et al.</i> (“Schiavoni”)
1012	Certified Translation of Schiavoni
1013	US 2002/0071288 to Lim (“Lim”)
1014	Counterclaim filed by Patent Owner in <i>Hisense USA Corp. v. Brightplus Ventures LLC</i> , No. 1:22-cv-02774, Dkt. 9 (N.D. Ga. Sep. 16, 2022)
1015	Scheduling Order in <i>Hisense USA Corp. v. Brightplus Ventures LLC</i> , No. 1:22-cv-02774, Dkt. 35 (N.D. Ga.)
1016	Judicial Caseload Profile for the Northern District of Georgia
1017	Cover Pleading to Patent Owner’s Infringement Contentions in <i>Hisense USA Corp. v. Brightplus Ventures LLC</i> , No. 1:22-cv-02774 (N.D. Ga.)
1018	Cover Pleading to Patent Owner’s Supplemental Infringement Contentions in <i>Hisense USA Corp. v. Brightplus Ventures LLC</i> , No. 1:22-cv-02774 (N.D. Ga.) served June 21, 2023

I. Mandatory Notices (37 C.F.R. § 42.8(b))

A. Real Party-in-Interest (37 C.F.R. § 42.8(b)(1))

The petitioner Hisense USA Corporation, is a Georgia corporation with a principal place of business at 7310 McGinnis Ferry Road, Suwanee, GA, 30024. Petitioner is a subsidiary of Hisense Group, which is organized under the laws of China. Other privies or real parties in interest include companies within the Hisense Group, including Hisense International (Hong Kong) America Investment Co., Ltd.; Hisense Group Holdings Co., Ltd.; Hisense Visual Technology Co., Ltd.; Hisense International (Hong Kong) America Investment Co., Ltd.; Hisense International (HK) Co., Ltd.; Hisense International Co., Ltd.; TVS REGZA Corporation.

B. Related Matters (37 C.F.R. § 42.8(b)(2))

The '382 Patent is asserted against Petitioner in a Counterclaim in *Hisense USA Corp. v. Brightplus Ventures LLC*, No. 1:22-cv-02774 (N.D. Ga.) (the “Underlying Litigation”). The Underlying Litigation was initially filed by Petitioner on July 14, 2022, and the '382 Patent was first asserted in a Counterclaim filed in the Underlying Litigation on September 16, 2022. *See* Ex. 1014. The current schedule in the Underlying Litigation is attached as Exhibit 1015. In addition to Petitioner, the following entities are Counterclaim defendants

in the Underlying Litigation: Hisense Co., Ltd. Hisense International (HK) Co. Ltd., Hisense Visual Technology Co. Ltd., and TVS Regza Corp.

On July 14, 2023, Petitioner filed a petition for IPR challenging certain claims of U.S. 9,605,835, which is also asserted in the Underlying Litigation. That petition has been assigned proceeding no. IPR2023-01168.

C. Designation of Lead and Backup Counsel (37 C.F.R. § 42.8(b)(3)) and Service Information (37 C.F.R. § 42.8(b)(4)).

<u>Lead Counsel</u>	<u>Backup Counsel</u>
Matias Ferrario Reg. No. 51,082 1001 W. 4 th Street Winston-Salem, NC 27101 Office: 336.607.7475 Fax: 336.734.2651 MFerrario@kilpatricktownsend.com	Michael T. Morlock Reg. No. 62,245 1100 Peachtree St. NE, Suite 2800 Atlanta, GA 30309-4528 Office: 404.815.6003 Fax: 336.734.2756 MMorlock@kilpatricktownsend.com

Petitioner may be served via email to its lead and backup counsel at the email addresses above.

II. Introduction

The '382 patent is invalid. The independent claims recite little more than a plurality of Light Emitting Diodes (“LEDs”) that direct light toward a multi-plane light diffuser that includes two diffusion planes. Both LEDs and diffusion planes were well-known in the art long before the '382 Patent’s earliest claimed priority date in March 2008. Further, the only purported point of novelty—that “a first distance” between the LEDs and a first diffusion plane “is a function” of “a third distance” between adjacent LEDs is insufficient to confer patentability. Indeed,

there is no claimed “function.” Rather the claim simply states “wherein the first distance is a function of the third distance.” This is nothing more than a relationship between the two distances, and the prior art discloses actual mathematical formulas showing the relationship between these distances. The challenged claims should be cancelled as obvious.

III. IPR Requirements

A. Standing (37 C.F.R. § 42.104(a))

Petitioner certifies that the '382 Patent is available for IPR and that Petitioner is not barred or estopped from requesting IPR. The '382 Patent issued on May 15, 2012, and this Petition is filed within one year of service of the Complaint against Petitioner alleging infringement of the '382 Patent (*see* Ex. 1014) and is not barred under 35 U.S.C. §315(b).

B. Fees (37 C.F.R. § 42.103)

This Petition requests review of twenty (20) claims of the '382 Patent and is accompanied by a payment of \$41,500, which includes the \$19,000 IPR request fee, and the \$22,500 post-institution fee. This Petition meets the fee requirements under 35 U.S.C. § 312(a)(1). The Board is hereby authorized to charge any additional fees required by this action to Deposit Account No. 20-1430.

C. Challenge Under 37 C.F.R. § 42.104(b)

This petition requests cancellation of claims 1-20 as rendered obvious under 35 U.S.C. § 103 based on the following prior art references:

- JP 2007-329016 to Kobayashi (“Kobayashi”) (Exs. 1005-1006);
- US 2007/0103908 to Tabito (“Tabito”) (Ex. 1007);
- US 2006/0050198 to Kirita (“Kirita”) (Ex. 1008);
- US 2005/0243551 to Onishi (“Onishi”) (Ex. 1009);
- US 2005/0024754 to Epstein (“Epstein”) (Ex. 1010);
- WO 2008/025909 to Schiavoni (“Schiavoni”) (Exs. 1011-1012); and
- US 2002/0071288 to Lim (“Lim”) (Ex. 1013).

The statutory grounds for the challenge of each claim are set forth below:

Ground	35 U.S.C.	Claims	References
1	103	1-3, 7, 9, and 11-15	Kobayashi in view of the Knowledge of a POSITA
2	103	10 and 16	Kobayashi and Kirita in view of the Knowledge of a POSITA
3	103	8	Kobayashi and Lim in view of the Knowledge of a POSITA
4	103	4-6 and 17	Kobayashi and Tabito in view of the Knowledge of a POSITA
5	103	18 and 20	Kobayashi, Tabito, and Onishi in view of the Knowledge of a POSITA
6	103	19	Kobayashi, Tabito, Onishi, and Epstein in view of the Knowledge of a POSITA
7	103	1-3, 7-8, and 11-15	Schiavoni and Lim in view of the Knowledge of a POSITA
8	103	9	Schiavoni, Lim, and Kobayashi in view of the Knowledge of a POSITA
9	103	10 and 16	Schiavoni, Lim, and Kirita in view of the Knowledge of a POSITA

10	103	4-6 and 17	Schiavoni, Lim, and Tabito in view of the Knowledge of a POSITA
11	103	18 and 20	Schiavoni, Lim, Tabito, and Onishi in view of the Knowledge of a POSITA
12	103	19	Schiavoni, Lim, Tabito, Onishi, and Epstein in view of the Knowledge of a POSITA

The record establishes a reasonable likelihood of prevailing as to each ground of invalidity with respect to the Challenged Claims.

IV. Background

A. The '382 Patent

The '382 Patent was filed on March 11, 2008 and issued as a patent on May 15, 2012. The '382 Patent describes using solid state lighting elements (e.g., LEDs) in conjunction with diffusers to provide backlight for an LCD display. As shown in Figure 2 below, a plurality of light emitters 112 are positioned on a support structure 114. Light passes from light emitters 112 to “a first diffusion plane 122 that is configured to receive light from the light emitters 112 and to transmit first diffused light 126.” '382 Patent, col. 4:63-65. The diffused light subsequently passes to “a second diffusion plane 124 that is configured to receive the first diffused light from the first diffusion plane 122 and to transmit second diffused light 128 to the LCD display panel 102.” *Id.*, col. 5:9-12.

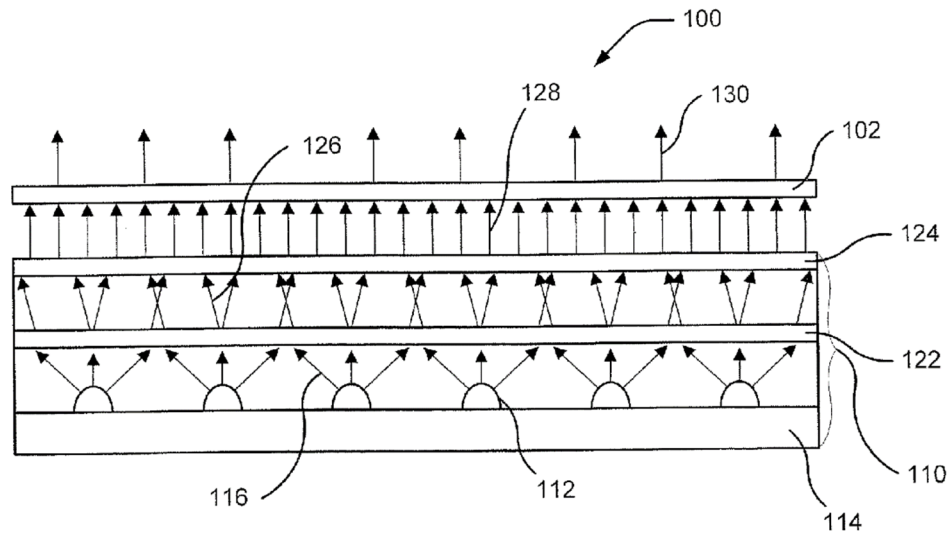


FIG. 2

Id., Fig. 2.

B. Prosecution of the '382 Patent.

During prosecution the Examiner rejected the as-filed claims as anticipated under Section 102 by U.S. 7,036,956 to Chou (“Chou”). In response, the Applicant amended the independent claims to further require “a structured refractive diffuser,” and argued that the cited prior art did not disclose this element. In the next office action the Examiner rejected the claims as obvious based on Chou in view of U.S. 2007/0019419 to Hafuka (“Hafuka”). In response, the Applicant further amended the “structured refractive diffuser” recited by independent claims 1 and 20 to “include[] a plurality of extrusion peaks that are divided by a plurality of extrusion grooves.” Ex. 1002, at 202.

The Examiner subsequently issued a third office action rejecting the claims over Chou and U.S. 2004/0105251 to Yu (“Yu”). In response, the Applicant

deleted the prior amendments regarding “a structured refractive diffuser” and instead amended claims 1 and 14 to recite that the first diffusion plane is “a first distance from the plurality of solid state light emitters,” that the second diffusion plane “is a second distance from the plurality of solid statement emitters,” and 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.” The Examiner went on to reject the amended claims over Chou and Yu. The Applicant filed a pre-appeal brief and then a full appeal brief.

In response, the Examiner issued a notice of allowance that included an Examiner’s amendment, amending independent claims 14 and 20 to recite a third distance between the plurality of solid state light emitters, “wherein the first distance is a function of the third distance,” as recited by claim 1. The Examiner stated that “[t]he prior art fails to show or teach the lighting device as recited in claims 1, 14, and 20 wherein a display includes a plurality of light sources and a multiplane diffuser, wherein the distance from the light sources to the first diffuser is a first distance and the distance between the light sources is a third distance wherein the first distance is a function of the third distance.” Ex. 1002, at 35.

V. Expert Testimony, Level of Skill in the Art, and Claim Construction

A. Declaration Evidence

This petition is supported by the declaration of P. Morgan Pattison, Ph.D, an expert with extensive experience in the relevant industry. Ex. 1003. Dr. Pattison has over 25 years of experience in the areas of light emitting diodes (LEDs), organic light emitting diodes (OLEDs), lighting, solid state lighting (SSL), displays, lasers, and optoelectronic materials and devices. Ex. 1003, ¶7.

B. Person of Ordinary Skill in the Art

A person of ordinary skill in the art of the '382 Patent would have had at least a graduate degree in mechanical engineering, physics, materials science, electrical engineering, or a related discipline, coupled with at least four years' experience in designing backlighting systems for displays; the level of ordinary skill in the art is approximate and additional education could make up for a lack of experience or vice-versa. In the Underlying Litigation Patent Owner asserted a slightly different level of skill in the art. As Dr. Pattison testifies, '382 Patent would be obvious under either level of skill. *See* Ex. 1003, ¶¶25-28.

C. Claim Construction

Nothing in the specification or prosecution history of the '382 Patent expressly defines any term appearing in any claim of the '382 Patent that is of consequence to the prior art in this Petition. Further, the Board does not need to

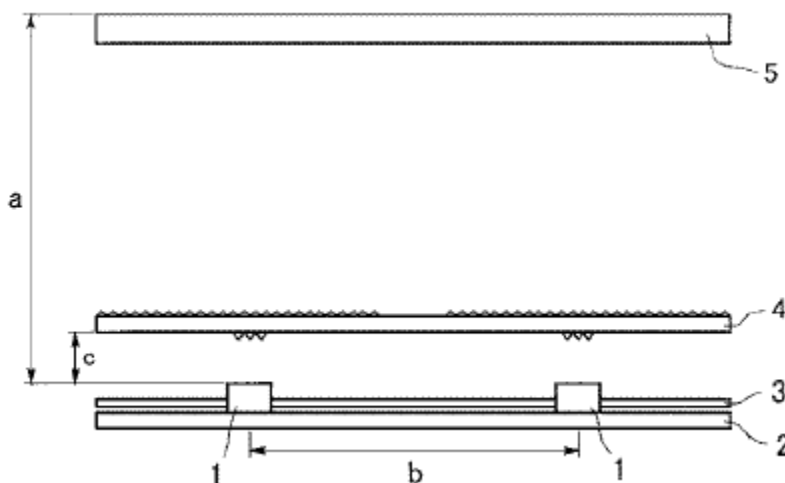
construe any claim term for purposes of evaluating the prior art in this Petition, and thus for purposes of this proceeding only, Petitioner believes that no claim term requires construction.

VI. Prior Art

A. Kobayashi

Kobayashi was filed on June 8, 2006, and published on December 20, 2007, and thus is prior art to the '382 Patent under at least 35 U.S.C. § 102(a).

Kobayashi describes “a backlight unit for a display device and in which an LED is used as a light source.” Kobayashi at Abstract. Kobayashi describes at least two diffusion planes, including “a thermoplastic transparent resin disposed on the light output side of the LEDs, and a light diffusing agent. And at least two diffusers....” Kobayashi, [0018]. Kobayashi further discloses a specific ratio, i.e., a function, between a “distance from the surface of the LED 1 to the lensed diffusing plate 4” and a “distance between the center of two adjacent LEDs 1.” *Id.*, [0019]:

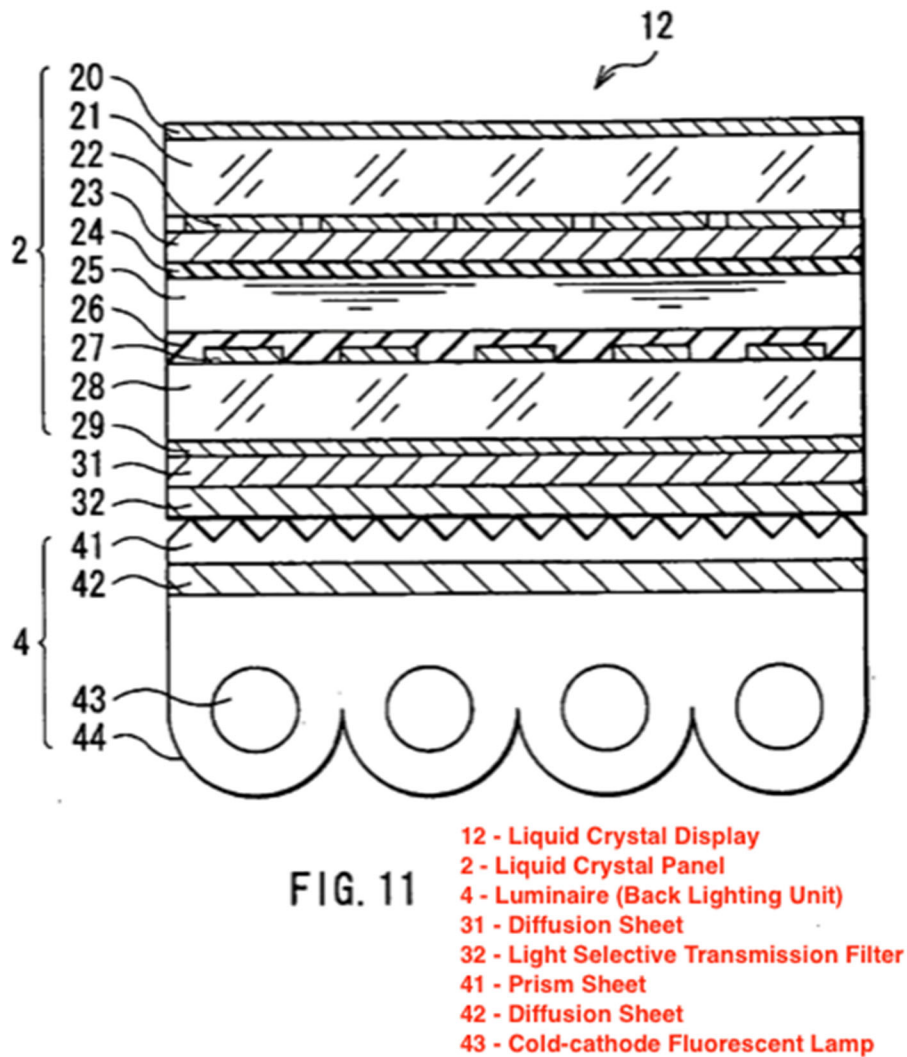


Tabito, Fig. 2 (annotated).

C. Kirita

Kirita claims priority to a Japanese Application filed on September 6, 2004, the U.S. Application was filed on September 2, 2005, and published on March 9, 2006. Thus, Kirita is prior art to the '382 Patent under at least 35 U.S.C. § 102(b).

Kirita disclose LED light sources (Kirita, [0010]) transmitting from a luminaire to a light selective transmission filter 32 and diffusion sheet 31 between prism sheet 41 and the 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. Kirita, [0075]. This is shown in annotated Figure 11, below.



Kirita, Fig. 11 (annotated).

D. Onishi

Onishi was published on November 3, 2005. Thus, Onishi is prior art to the '382 Patent under at least 35 U.S.C. § 102(b).

Onishi discloses extrusion molding structures on the diffuser plate. Onishi, [0057] ("Since the light diffusion plate has the parallel principal planes, it is also

appropriate for a continuous molding such as an extrusion molding.”). Further, given these extrusion structures are convexoconcave, they comprise both extrusion peaks and grooves. Onishi, [0221].

E. Epstein

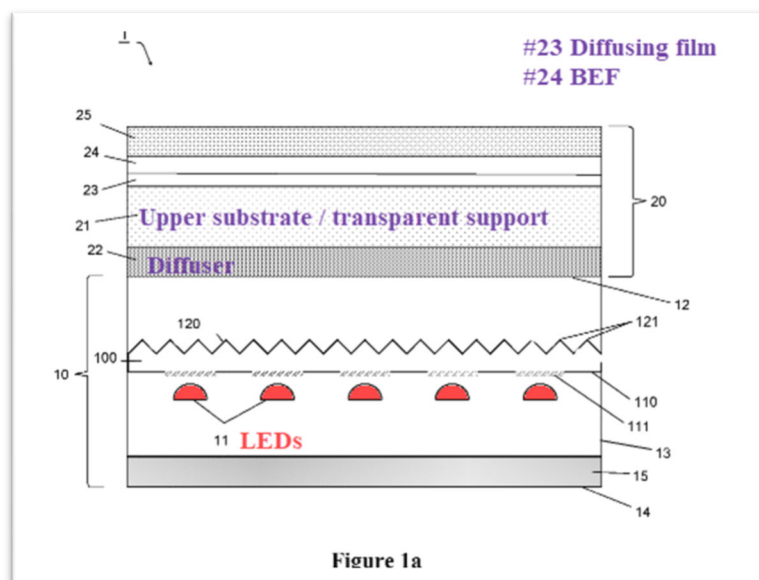
Epstein was published on February 3, 2005. Thus, Epstein is prior art to the ’382 Patent under at least 35 U.S.C. § 102(b).

Epstein discloses that the refractive diffuser comprises a plurality of crossed linear prismatic lenselets. *See* Epstein, [0213] (“Examples 24 through 29 are examples of films having a plurality of pyramidal prisms.”); [0214] (“prisms 1640 are symmetric, isosceles prisms having straight face verbatims in both the XZ and YZ planes. Each prism 1640 has a first face 1641, a second face 1642, a third face 1643 and a fourth face 1644. The four faces meet at apex 1645.”); [0215] (“Example 25 in FIG. 30A, prisms 1740 are symmetrical, four sided prisms having curved or arced faces in both the XZ and YZ planes.”).

F. Schiavoni

Schiavoni is an International Application that claims priority to a French application filed on August 31, 2006. The International Application was filed on July 25, 2007 and published on March 6, 2008. Thus, Schiavoni is prior art under at least 35 U.S.C. § 102(a).

Schiavoni describes “an optical system (100) for a lighting device having one or more sources (11) of visible and/or ultraviolet radiation which consist of light-emitting diodes, especially for backlighting a liquid-crystal display screen[.]” Schiavoni, Abstract. Schiavoni describes at least two diffusion planes. “[A] first substantially planar optical element (100) transparent to said radiation and intended to be installed between said sources and a substantially planar diffuser [22] that makes the normal luminance uniform, the first optical element being approximately parallel to the diffuser and being capable of contributing to making the normal luminance output by the diffuser uniform.” *Id.* Schiavoni makes clear that the first optical element 100 and the planar diffuser both include diffusing layers. *See, e.g., id.* at 17.



Id., Fig. 1a (annotated).

G. Lim

Lim is a publication of a U.S. Application filed on June 29, 2001 and published on June 13, 2002. Lim is thus prior art under at least 35 U.S.C. § 102(b).

Lim discloses a relationship “between a diffusion plate and a lamp in accordance with the distance between lamps having the same visible angle.” Lim, [0057]. Lim acknowledges 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.*, [0058]. “[A]s shown in FIG. 4B, [of Lim] the closer the interval between the lamps is, the narrower the interval between the lamp and diffusion plate.” *Id.*, [0059].

VII. Full Statement of the Reasons for the Relief Requested

A. Ground 1 – Claims 1-3, 7-9, and 11-15 are Obvious Under 35 U.S.C. § 103 Over Kobayashi in view of the Knowledge of a POSITA.

1. Independent Claim 1.

[1 Preamble] A solid state lighting device, comprising:

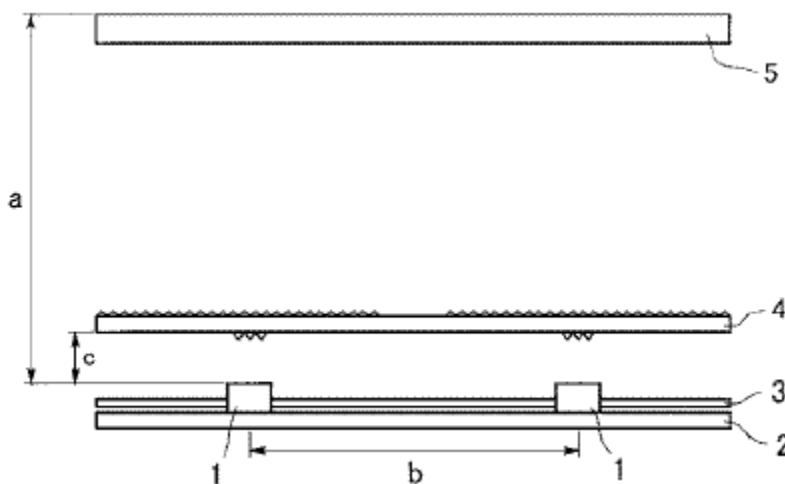
Kobayashi describes “a backlight unit for a display device and in which an LED is used as a light source.” Kobayashi at Abstract. Ex. 1003, ¶44.

[1A] a plurality of solid state light emitters that are configured to emit light; and

Kobayashi describes using a “plurality of LEDs 1 ... arranged in equal spacings on a base 2.” Kobayashi at Abstract; Ex. 1003, ¶44; ¶92, Claim 1A.

[1B] 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,

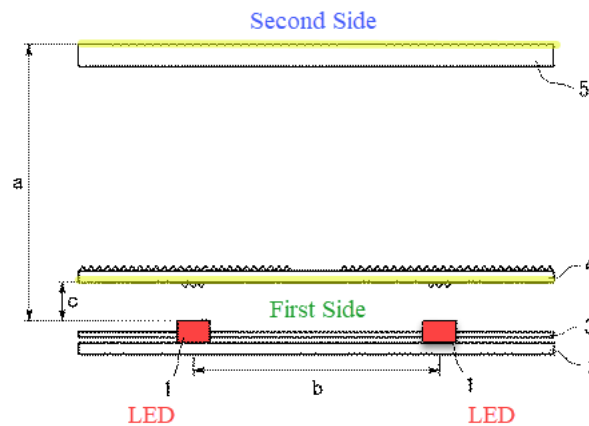
Kobayashi describes two diffusion planes. Kobayashi, [0018]. Each diffuser plate 4 and 5 is a diffusion plane and they are each at different distances from the plurality of LEDs. Diffuser plate 4 is a “first plane” and diffuser plate 5 is a “second plane” of a multiplane light diffuser. Ex. 1003, ¶47. The distances of the diffuser plates 4 and 5 from the plurality of LEDs 1 are “c” and “a” respectively as shown in Figure 1 below, and they are different distances. The second distance is a minus the thickness of diffusion plate 5, which is a different distance than c.



Kobayashi, Fig. 1; Ex. 1003, ¶47; ¶92, Claim 1B.

[1C] the multiplane light diffuser including 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,

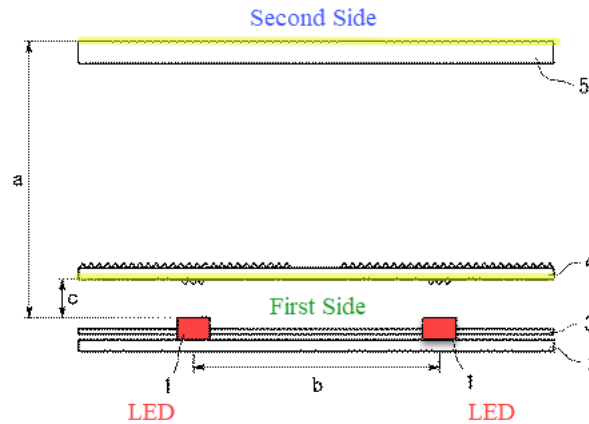
Kobayashi discloses a diffuser plate 4 which is a “first plane” and diffuser plate 5 which is a “second plane” of a multiplane light diffuser. Ex. 1003, ¶48. The first and second planes are configured to transmit diffused light. *See* Kobayashi, Abstract. Kobayashi’s diffuser plate 4, i.e., the “first plane”, has a first side that is configured to receive light from the LEDs. Kobayashi, [0047] and Fig. 1. Kobayashi’s diffusion plate 5, i.e., the “second plane,” has a second side that is configured to transmit diffused light. *See id.*, Abstract, and annotated Figure 1 below.



Kobayashi, Fig. 1 (annotated); Ex. 1003, ¶48; ¶92, Claim 1C.

[1D] wherein the multiplane light diffuser comprises a diffuser plate that includes the first side of the multiplane light, the diffuser plate configured to define the first diffusion plane, and

See claim element 1[C]. Kobayashi's diffusion plate 4 has a first side, the side closest to LEDs 1, the diffusion plate 4 defines a diffusion plane. See Kobayashi at Abstract (“a 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”); Ex. 1003, ¶48.



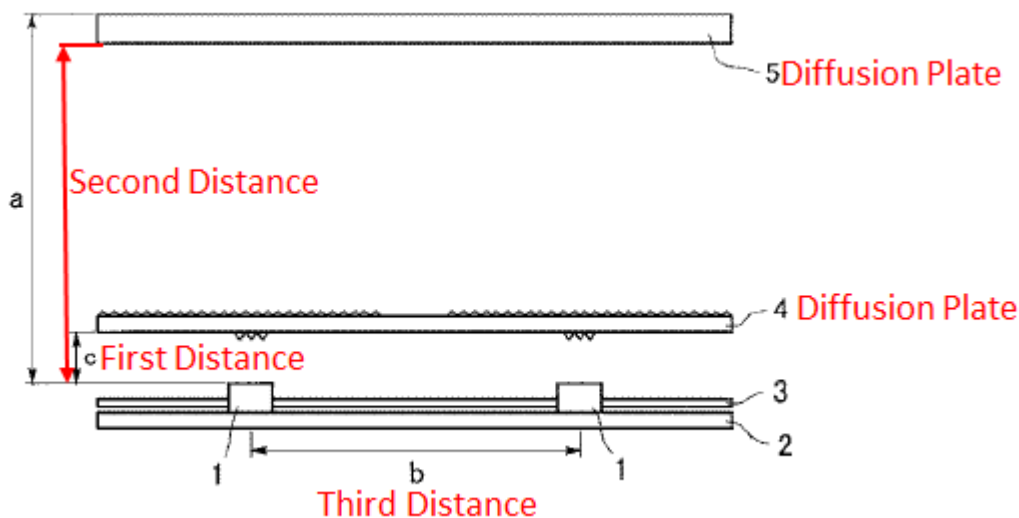
Kobayashi, Fig. 1 (annotated); Ex. 1003, ¶92, Claim 1D.

[1E] 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.

Kobayashi defines the following three distances in [0019]:

a	“the distance from the surface of the LED 1 to the light emitting surface of the diffusing plate at the most exiting side”
b	“distance between the center of two adjacent LEDs 1”
c	“distance from the surface of the LED 1 to the lensed diffusing plate 4”

These distances are also shown graphically in Figure 1 below:



Kobayashi, Fig. 1 (annotated); Ex. 1003, ¶55. Thus, Kobayashi describes (1) that c is the first distance, (2) that a minus the thickness of the diffusion plate 5 is the second distance, and (3) that b is the third distance as recited by the claims of the '382 Patent. *Id.*

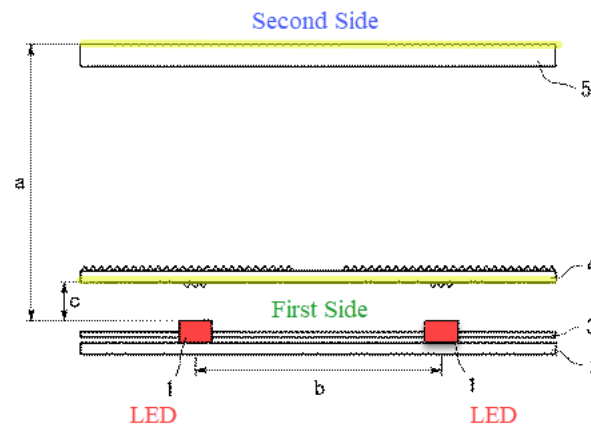
Kobayashi further describes that the “ratio of c / b is preferably in the range of 2×10^{-3} to 0.4.” Kobayashi, [0020]. Thus, Kobayashi describes the distance c from the LEDs to the first diffusion plane divided by the distance between adjacent LEDs b is preferably equal to a value between 0.002 and 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. Kobayashi thus teaches that distance c (the first

distance) is a function of distance b (the third distance). Ex. 1003, ¶56; ¶92, Claim 1D.

2. Dependent Claim 2.

[2] The device of claim 1, wherein the multiplane light diffuser comprises: 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.

See Element 1[C]. Kobayashi describes a diffuser plate 5 which is a “second plane” of a multiplane light diffuser and the second plane is positioned a second distance from the LEDs. *See* Kobayashi, [0019]. The diffuser plate 5 defines a second diffusion plane of the multiplane light diffuser.



Kobayashi, Fig. 1 (annotated); Ex. 1003, ¶60; ¶92, Claim 2.

3. Dependent Claim 3.

[3] The device of claim 2, wherein the diffuser sheet comprises: a substantially transparent plate; and a diffuser film supported by the substantially transparent plate.

Kobayashi describes “a diffusing film ... on the diffusing plate 5,” indicating that the diffuser is supported by the diffusing plate 5. Kobayashi, [0044]; Ex. 1003, ¶75. Kobayashi describes its diffusing plate as transparent. Kobayashi, [0031] (“at least two diffusing plates made of a thermoplastic *transparent* resin mixed with a light diffusing agent”); Ex. 1003, ¶92, Claim 3.

4. Dependent Claim 7.

[7] The device of claim 2, wherein 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.

Kobayashi discloses that the diffuser sheet discussed above with regard to claim 2 may further include “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.” Kobayashi, [0044]. Since these films are “on the diffusing plate 5,” the diffusing plate 5 supports them, and the diffusing plate 5 is a substantially clear plate. *See id.*, [0031] (“at least two diffusing plates made of a thermoplastic transparent resin mixed with a light diffusing agent”). The “prism collection film” is a brightness enhancing film. Ex. 1003, ¶62; ¶92, Claim 7.

5. Dependent Claim 9.

[9] The device of claim 2, wherein the second distance comprises a distance in a range between the third distance and 1.5 times the third distance.

Kobayashi discloses that a , is “10 mm or more” and the third distance, b , is “10 to 100 mm.” Kobayashi, [0020]. When both a and b are 10 mm, then $a/b=1$. Further Kobayashi describes that “the ratio of a/b is preferably in the range of 0.2 to 1.0.” Kobayashi, [0020].

The third distance is b , and the second distance is a minus the thickness of the diffusion plate 5. A person of ordinary skill in the art would recognize that diffusion plate is thin and thus Kobayashi would disclose or suggest that the second distance is equal to the first distance. Ex. 1003, ¶70. A POSITA would be motivated to make the distance to the diffusion plate 5 (a minus the thickness of that diffusion plate 5) slightly larger to be between the third distance and 1.5 times the third distance. Ex. 1003, ¶71; ¶92, Claim 9.

6. Dependent Claim 11.

[11] The device of claim 1, further comprising means for transmitting first diffused light from the first diffusion plane to the second diffusion plane.

The '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. *See* '382 Patent, Col. 7, ll. 30-34. No other means are disclosed.

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. Ex. 1003, ¶71. First diffused light is supplied from the “diffuser near the LED [which] is a diffuser with a lens having a total light transmittance of 80 to 98%, a light diffusivity of 0.5 to 30%,” while the “diffuser plate on the side farther than the LED has a total light transmittance of 40 to 80%.” Kobayashi, [0032]. Further, Kobayashi describes that “when each of the diffusion plates 4 and 5 is configured as a set, a plurality of the diffusion plates 4 and 5 may be used in an overlapping manner....” *Id.*, [0042]; Ex. 1003, ¶71; ¶92, Claim 11.

7. Dependent Claim 12.

[12A] The device of claim 1, wherein the multiplane light diffuser comprises: the first diffuser plate positioned at a first distance from the plurality of solid state emitters;

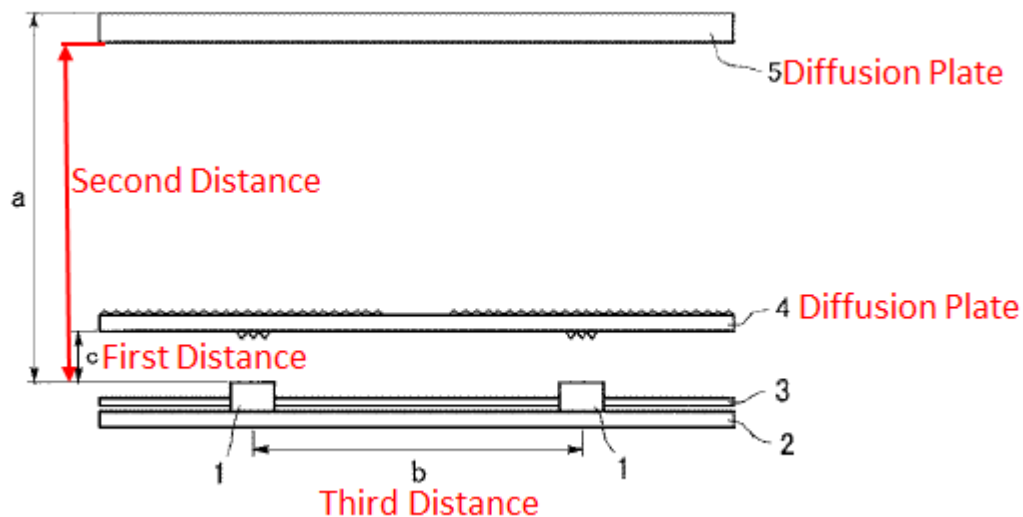
Kobayashi discloses a first distance *c* “from the surface of the LED 1 to the lensed diffusing plate 4.” Kobayashi, [0019]; Ex. 1003, ¶47; ¶92, Claim 12A.

[12B] a second diffuser plate positioned at a second distance from the plurality of solid state emitters; and

Kobayashi discloses diffusing plate 5 at a distance *a* from the surface of the LED 1. The second distance is *a* minus the thickness of the diffusing plate 5. Kobayashi, [0019]; Ex. 1003, ¶47; ¶92, Claim 12B.

[12C] a diffuser sheet supported by the second diffuser plate, wherein the first distance is less than the second distance.

Kobayashi discloses that the first distance c is less than the second distance (a minus the thickness of the diffusing plate 5).



Kobayashi, Fig. 1 (annotated). Kobayashi further describes that a “diffusion film” may be included on the diffuser plate 5. Kobayashi, [0043]; Ex. 1003, ¶60; ¶92, Claim 12C.

8. Independent Claim 13.

[13 Preamble] A method of providing diffused light comprising:

See claim 1[preamble], 1[A], and 1[B].

[13A] emitting light from a plurality of solid state light emitters arranged in a planar configuration;

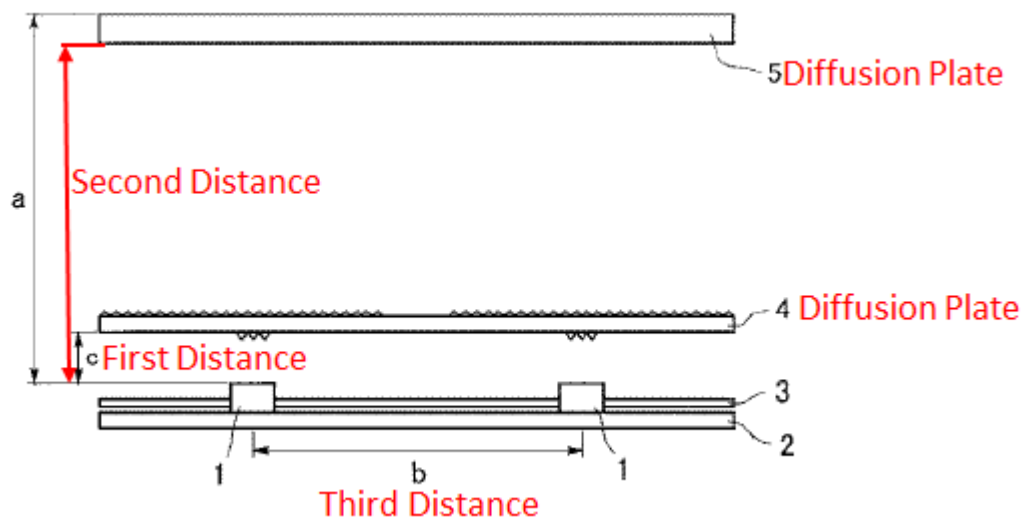
See claim 1[A] and 1[B].

[13B] receiving the emitted light at a first side of a first diffusion plane that is a first distance from the plurality of solid state light emitters;

See claim 1[A].

[13C] transmitting first diffused light from a structured refractive diffuser plate at a second side of the first diffusion plane;

See claim 1[B] and 1[C]. Kobayashi discloses a 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.” Kobayashi at Abstract. As shown below the diffusing plate has a first side the receives light from the plurality of LEDs and a second sight that transmits light to the diffusion plate 5.



Kobayashi, Fig. 1 (annotated); Ex. 1003, ¶48. The first diffusion plane comprises a lensed diffusing plate 4 where the lenses may be structured as prisms, pyramids, etc. Kobayashi, [0034]. Diffusing plate 4 is a structured refractive diffusing plate,

as indicated in the figure above, and light passing through diffusing plate 4 is diffused light. Ex. 1003, ¶48; ¶92, Claim 13C.

[13D] receiving the first diffused light from the first diffusion plane at a first side of a second diffusion plane that is a second distance from the plurality of solid state light emitters; and

See claims 11 and 13[C] above. Kobayashi discloses an air layer for transmitting first diffused light from the first diffusion plane, diffusing plate 4, to the second diffusion plane, diffusing plate 5. Kobayashi further describes that the diffusing plate 5 is a distance *a* from the surface of the LEDs. Kobayashi, [0019]; Ex. 1003, ¶73; ¶92, Claim 13D.

[13E] transmitting second diffused light from a second side of the second diffusion plane,

See claim 11.

[13F] 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.

See claim 1[E].

9. Dependent Claim 14.

[14] The method of claim 13, wherein transmitting the first diffused light comprises transmitting the first diffused light from a diffuser plate and wherein transmitting the second diffused light comprises transmitting the second diffused light from a diffuser sheet that is supported by a substantially transparent sheet.

See claims 2-3, and 7; Ex. 1003, ¶92, Claim 14.

10. Dependent Claim 15.

[15] The method of claim 13, wherein transmitting the first diffused light comprises transmitting light from a first diffuser plate and wherein transmitting the second diffused light comprises transmitting light from a diffuser sheet that is supported by a second diffuser plate.

See claim 7. Kobayashi discloses transmitting light from a first diffusion plate 4 to a second diffusion plate 5. Kobayashi further discloses “a diffusing film ... on the diffusing plate 5.” Kobayashi, [0044]. The use of “on” discloses or suggests that the diffusing plate 5 supports the diffusing film. Ex. 1003, ¶48; ¶92, Claim 15.

B. Ground 2 – Claims 10 and 16 are Obvious Under 35 U.S.C. § 103 Over Kobayashi and Kirita in view of the Knowledge of a POSITA.

1. Motivation to Combine Kobayashi and Kirita.

A combination of familiar elements according to known methods which yields no more than predictable results is likely obvious to one of skill in the art. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007). One rationale to support a conclusion of obviousness is the use of a known technique to improve similar devices (methods, or products) in the same way. *See id.* at 417-18; *see also* MPEP 2143(C). To establish that a modification is the use of a known technique to improve similar devices and methods in the same way, it is necessary to establish (1) that the prior art contained a “base” device/method upon which the claimed

invention can be seen as an “improvement,” (2) a finding that the prior art contained a “comparable” device/method that is not the same as the base device/method and that has been improved in the same way as the claimed invention, and (3) that the skilled artisan could have applied the known “improvement” technique in the same way to the base device/method with predictable results. *See* MPEP 2143(C); *KSR*, 550 U.S. at 415-421.

A POSITA would be motivated to combine Kobayashi and Kirita. Both Kobayashi and Kirita disclose backlight assemblies for displays, however, Kobayashi does not expressly disclose a light filter color, i.e., a color-selective filter. In a similar field, Kirita discloses a “light selective transmission filter 32.” Kirita, [0063]. As Kirita explains, “[b]y providing the light selective transmission filter 32, the color purity of illumination light can be improved.” *Id.* Thus, “the NTSC [National Television System Committee] ratio can be improved, and the color reproduction range can be expanded.” *Id.* A POSITA would be motivated to apply Kirita’s light selective transmission filter 32 to the design of Kobayashi to obtain these benefits, i.e., improved purity of the illumination light provided by the backlight, improved NTSC ratio, and expanded reproduction range. Ex. 1003, ¶94.

A POSITA would have been motivated to combine Kirita’s structure to Kobayashi’s system to improve the resultant image the viewer sees. Ex. 1003, ¶95. Kobayashi notes that numerous optical elements treated in various manners,

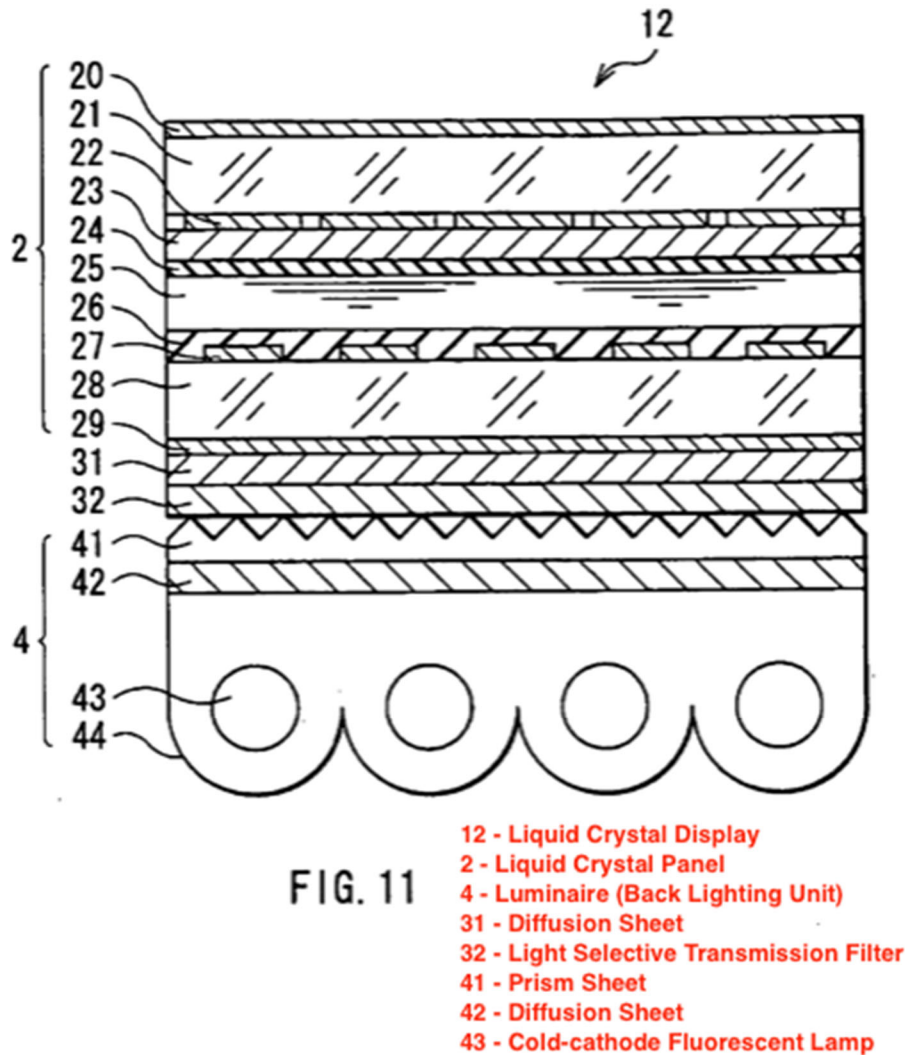
including in a manner allowing a diffuser to absorb select wavelengths (ultraviolet absorber) may be added to Kobayashi's "base" system. Kobayashi, [0042]-[0043]; Ex. 1003, ¶95. Thus, Kobayashi provides an additional motivation to include Kirita's light selective transmission filter 32 in Kobayashi's system. This combination is nothing more than the use of a known improvement in a similar field of endeavor, and this combination would have been within the skillset of a POSITA. *Id.*, ¶96.

2. Dependent Claim 10.

[10] The device of claim 1, wherein the diffuser plate comprises a plate including a light filter color.

Kirita discloses LED light sources (Kirita, [0010]) transmitting from a luminaire to a light selective transmission filter 32 and diffusion sheet 31 between prism sheet 41 and the 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. Kirita, [0075] ("Next, among the light emitted from the luminaire 4, light in the specific wavelength regions based on the wavelength selective transmission characteristics is selectively transmitted and emitted to the liquid crystal panel 2 by the light selective transmission filter 32."); [0072] ("By arranging the light selective transmission filter 32 formed as above between the luminaire 4 and the diffusion sheet 31 shown in FIG. 4, the liquid

crystal display 1 of this embodiment can be manufactured.”). This is shown in annotated Figure 11, below.



Kirita, Fig. 11 (annotated). Ex. 1003, ¶77; ¶97, Claim 10. A POSITA would be motivated to apply Kirita’s light filter to the diffusing plate 4 of Kobayashi as discussed above.

3. Dependent Claim 16.

[16] The method of claim 13, wherein transmitting the first diffused light comprises transmitting scattered diffusion light from a plate including a light filter color.

See claim 10. Kirita disclose LED light sources (Kirita, [0010]) transmitting from a luminaire to a light selective transmission filter 32 and diffusion sheet 31 between prism sheet 41 and the 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. Kirita, [0075]. A POSITA would be motivated to apply Kirita's light filter to the diffusing plate 4 of Kobayashi. Ex. 1003, ¶¶77; ¶97, Claim 16

C. Ground 3 – Claim 8 is Obvious Under 35 U.S.C. § 103 Over Kobayashi and Lim in view of the Knowledge of a POSITA.

1. Motivation to Combine Kobayashi and Lim.

Kobayashi describes light emitting elements and a diffuser structure, but does not explicitly disclose a third distance that is one half the first distance. Lim explicitly discloses this ratio of distances. Lim, [0047] (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.”).

A POSITA would be motivated to apply Kobayashi's lighting elements and panel structure with Lim's explicit distance teachings to provide a higher quality

light output, as described in both Kobayashi and Lim. *See* Kobayashi, [0020]; Lim, [0057]-[0059]; Ex. 1003, ¶143. “As Lim shows, and as was well known in the practice of optical engineering, the distance of an optical element from a light source or group of light sources affects the interaction of the optical element with the light source, as shown by Lim figures 4A and 4B.” Ex. 1003, ¶145. “[T]he use of the distance relationships expressly disclosed by Lim in the Kobayashi system is nothing more than a design choice.” *Id.* This modification is nothing more than positioning components are already disclosed in Kobayashi (i.e., diffuser plates) and using its teachings on distances to explicitly include the ratio Lim discloses. Ex. 1003, ¶144.

2. Dependent Claim 8.

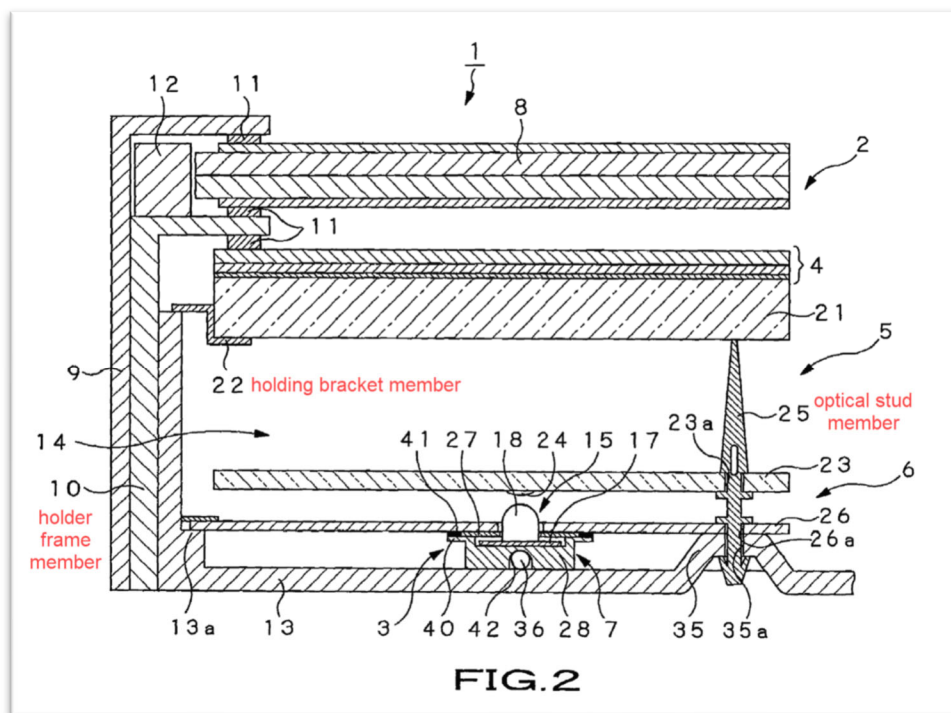
[8] The device of claim 2, wherein the plurality of solid state emitters comprise a third distance between adjacent ones of the plurality of solid state light emitters, and wherein the first distance comprises approximately one half the third distance.

See supra Ground 1, claim 1. A POSITA would be motivated to modify the positioning of Kobayashi’s diffuser plate 5 based on Lim, which discloses that the first distance of 5 mm is one half the third distance of 10 mm. Lim, [0047]; Ex. 1003, ¶69; ¶146, Claim 8.

D. Ground 4 – Claims 4 and 17 are Obvious Under 35 U.S.C. § 103 Over Kobayashi and Tabito in view of the Knowledge of a POSITA.

1. Motivation to Combine Kobayashi and Tabito.

Kobayashi describes light emitting elements and a diffuser structure but does not expressly disclose the mounting for that diffuser structure. Like Kobayashi, 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. *See* Tabito, [0081].



Tabito, Fig. 2 (annotated); Ex. 1003, ¶99. Tabito's method of supporting diffusing plates would also be suitable for use in supporting Kobayashi's diffuser plates. *Id.*

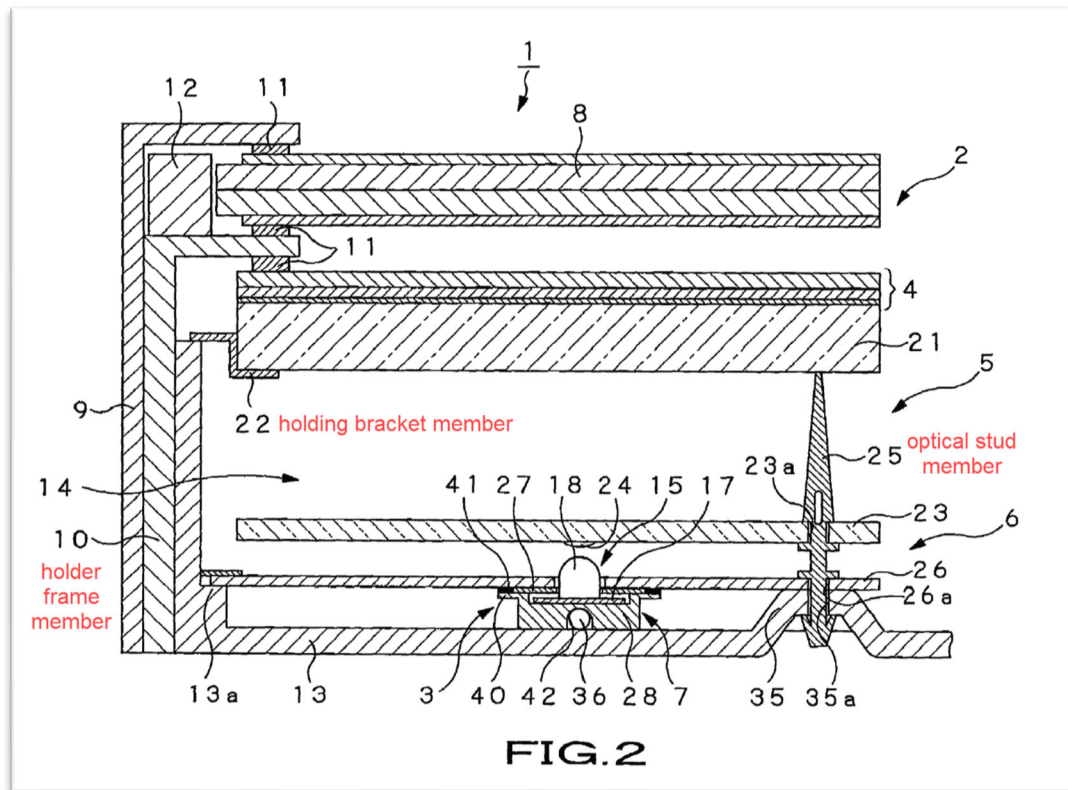
A POSITA would have been motivated to apply Tabito's supports to Kobayashi to provide a more rigid mounting and support for the backlighting elements described in Kobayashi. *Id.*

Both Kobayashi and Tabito are in the same field of backlight assembly units for display devices, and both Kobayashi and Tabito aim to improve brightness inconsistencies in backlit display devices using similar structures. Kobayashi, Abstract; Tabito, [0006]; Ex. 1003, ¶100. Thus, a POSITA would have been motivated to combine Tabito's structure to Kobayashi to improve the strength and resiliency of supports for the backlight of the display. *Id.*

2. Dependent Claim 4.

[4A] The device of claim 2, comprising a plurality of diffuser supports, wherein the diffuser supports comprise:

Kobayashi describes light emitting elements and a diffuser structure, but does not expressly disclose the mounting for that diffuser structure. Tabito discloses a light transmitting LCD with a reflecting plate 26, diffusing plate 23, light diffusing conducting plate 21, and optical converting section 4 being supported by optical stud members 25, holder frame member 10, and holding bracket member 22. *See* Tabito, [0081].



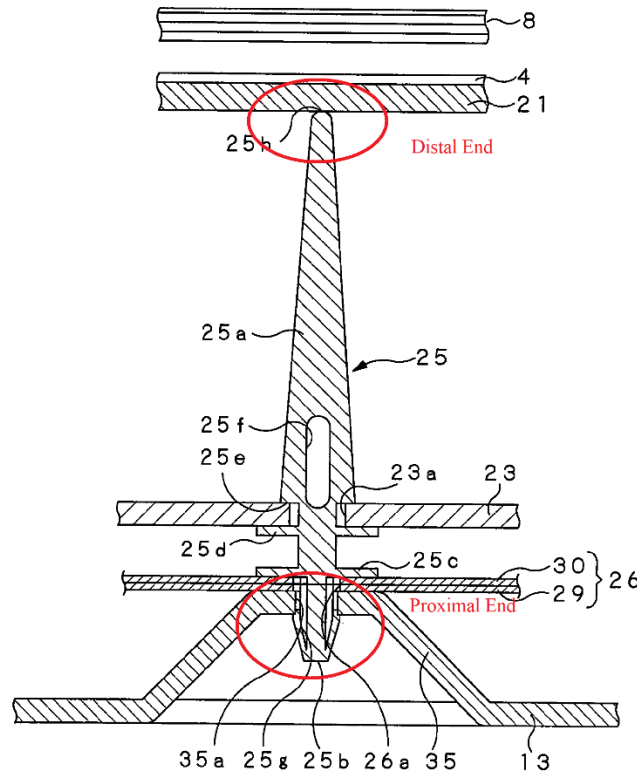
Tabito, Fig. 2 (annotated); Ex. 1003, ¶78. The optical stud members are diffuser supports. *See, e.g.,* Tabito, [0090] (“The light diffusing plate 23 is then assembled to each optical stud member 25 by fitting the light diffusing plate at the fitting holes 23a from the distal end 25h.”); Ex. 1003, ¶101, Claim 4A.

[4B] a proximal end that is configured to be positioned proximate the plurality of solid state light emitters; and a distal end that is configured to support the diffuser sheet.

Tabito describes that “each optical stud member 25 is made up by a shaft-shaped base part 25a, a fitting part 25b, formed to the distal end of the shaft-shaped base part 25a, a flange-shaped first receiving plate part 25c, formed as one with the lateral surface of the shaft-shaped base part 25a, with a preset spacing from the

fitting part 25b, and a flange-shaped second receiving plate part 25d, formed as one with the lateral surface of the shaft-shaped base part 25a, with a preset spacing from the first receiving plate part 25c.” Tabito, [0084]. The wider portion of base which is closest to the receiving plate 25d is a proximal end and is positioned proximate to the LEDs. Ex. 1003, ¶79.

Tabito describes the distal end of the optical stud member 25 supporting numerous functional optical sheets. Tabito, [0092] (“The light diffusing conducting plate 21, comprised of a laminate of functional optical sheets, is assembled to the distal end 25h of each optical stud member 25, with the bottom side of the light diffusing conducting plate 21 abutting against the distal end 25.”).



Tabito, Fig. 6; Ex. 1003, ¶78; ¶101, Claim 4B.

3. Dependent Claim 5.

[5] The device of claim 4, wherein the diffuser plate comprises a plurality of diffuser plate holes that are configured to receive the plurality of diffuser supports.

Tabito shows holes 23a in its diffuser plate 23, which are configured to receive the plurality of diffuser supports. *See* Tabito, [0082].

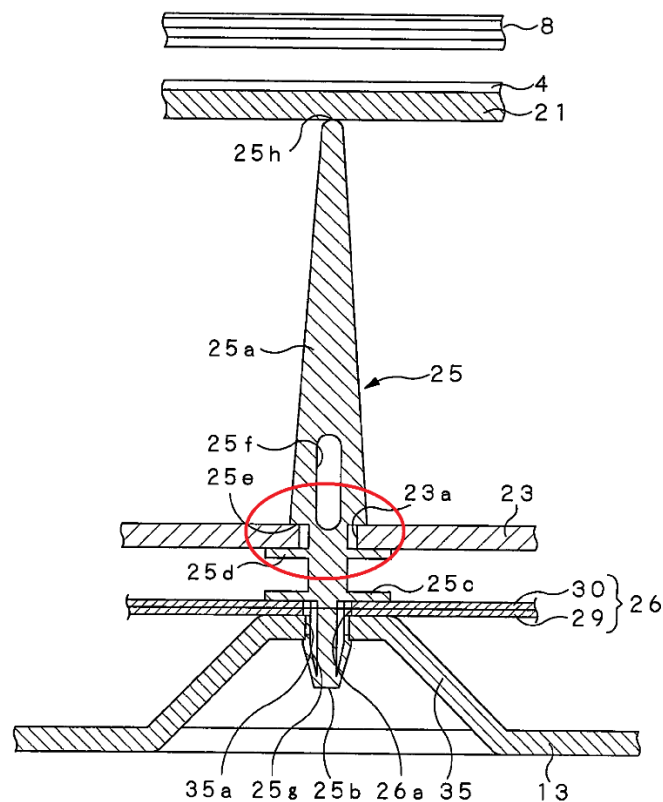


FIG. 6

Tabito, Fig. 6 (annotated).

4. Dependent Claim 6.

[6] The device of claim 4, wherein the plurality of diffuser supports comprise steps for supporting, at the first distance from

the plurality of solid state light emitters, the diffuser plate via the plurality of holes.

As shown in Figure 6 below, Tabito shows steps in the optical stud members 25 for supporting, at the first distance from the plurality of solid state light emitters, the diffuser plate 23 via the plurality of holes 23a. Tabito further describes step 25d in the optical stud members 25. *See* Tabito, [0085], [0090].

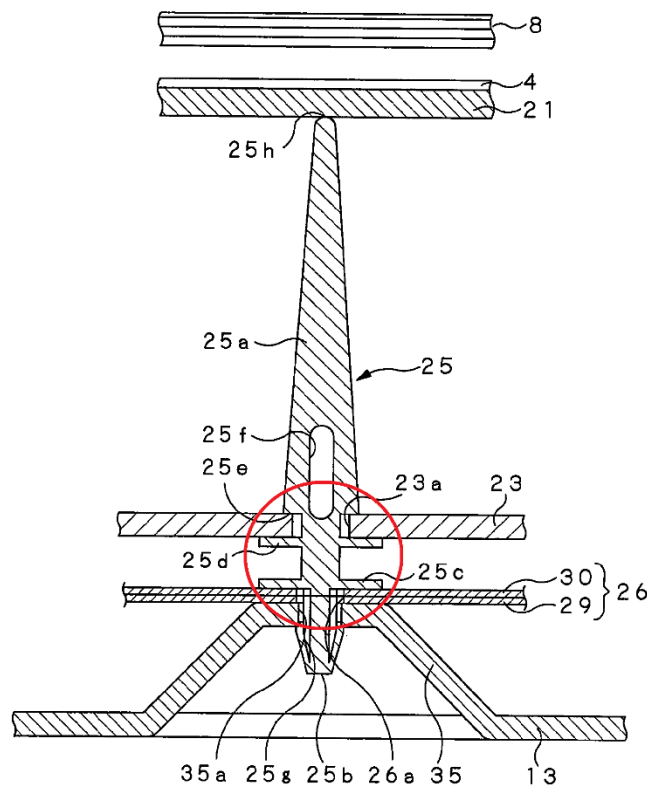


FIG. 6

Tabito, Fig. 6 (annotated).

5. Independent Claim 17.

[17 Preamble] A display comprising:

Kobayashi describes “a backlight unit for a display device.” Kobayashi, Abstract.

[17A] a backlighting panel comprising

See claim 17 Preamble.

[17B] a plurality of solid state light emitters arranged in a substantially planar configuration including a third distance between adjacent ones of the plurality of solid state light emitters,

See Claim 1[A] and 1[E].

[17C] a first diffusion plane that is configured to receive light from the plurality of solid state light emitters and to transmit first diffused light, the first diffusion plane including a diffuser plate that is positioned a first distance from the plurality of solid state light;

See claims 1[B] and 11.

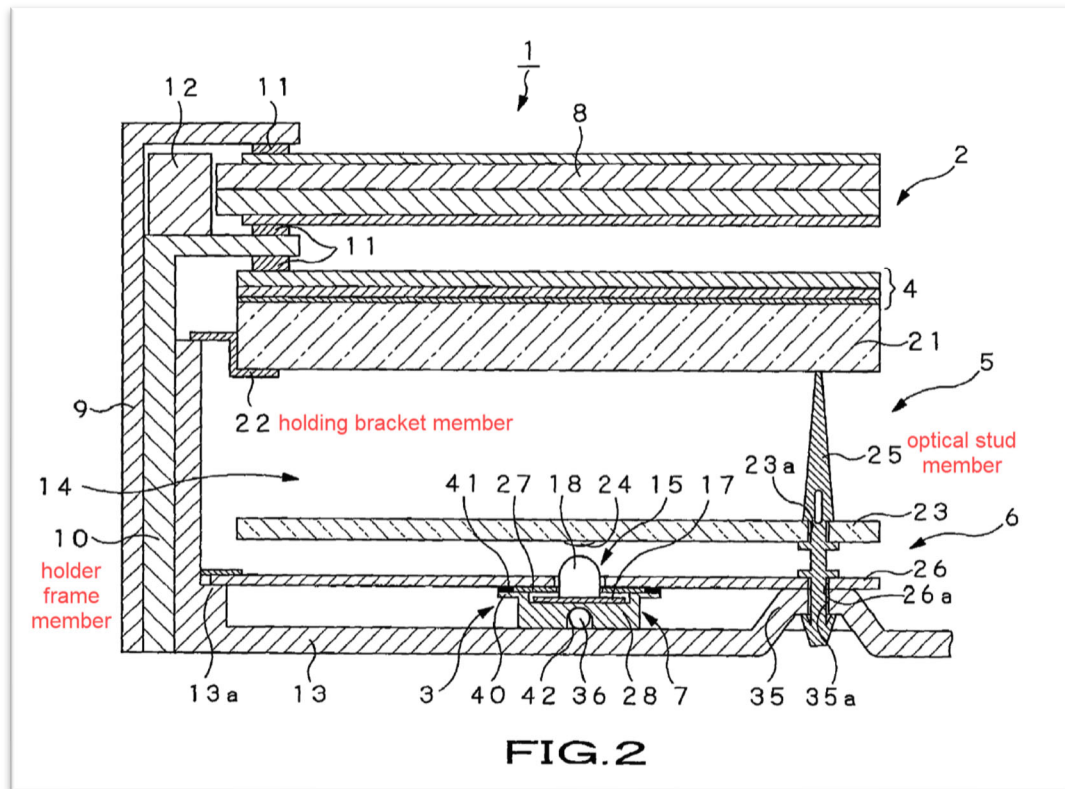
[17D] a second diffusion plane that is configured to receive the first diffused light and to transmit second diffused light

See claims 1[B] and 1[C].

[17E] 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; and

See claims 1[C], 4, and 8. Kobayashi describes light emitting elements and a diffuser structure, but does not expressly disclose the mounting for that diffuser

structure. Tabito discloses a light transmitting LCD with a reflecting plate 26, diffusing plate 23, light diffusing conducting plate 21, and optical converting section 4 being supported by optical stud members 25, holder frame member 10, and holding bracket member 22. *See* Tabito, [0081]; Fig. 2.



Tabito, Fig. 2 (annotated); Ex. 1003, ¶78. The optical stud members are diffuser supports. *See, e.g.,* Tabito, [0090]. Further, as shown above, the light diffusing plate 23 and diffusing conducting plate 21 are kept at different distances from the LED 18. Ex. 1003, ¶101, Claim 17E.

[17F] a LCD display panel that is configured to receive the second diffused light and selectively transmit received light as display content,

See claims 10, 13[C], 13[D]. Kobayashi is designed as a backlight unit for display devices. *See, e.g.,* Kobayashi, Abstract (“This is a backlight unit for display devices, and LED is used as a light source to provide a unit that reduces the eye-catching lamp image.”). Ex. 1003, ¶81. LCD displays operate by selectively transmitting received light as display content and were well-known in the art and expressly disclosed by Tabito. *See, e.g.,* Tabito, Abstract (“Disclosed is a light transmitting liquid crystal display apparatus used with advantage with a television receiver having a large-sized display not less than 30 inch. A backlight section (3) sending out illuminating light is formed by a plural number of rows made up of many light emitting units (15) arranged on the back surface of a liquid crystal display panel (8).”); Ex. 1003, ¶82-83; ¶101, Claim 17F.

[17G] wherein the first distance is a function of the third distance.

See claim 1[E].

E. Ground 5 – Claims 18 and 20 are Obvious Under 35 U.S.C. § 103 Over Kobayashi, Tabito, and Onishi in view of the Knowledge of a POSITA.

1. Motivation to Combine Onishi to the Kobayashi-Tabito combination.

A POSITA would be motivated to combine Onishi to the Kobayashi-Tabito combination. Both Kobayashi and Tabito disclose backlight assemblies for

displays. Kobayashi does not expressly disclose that its diffuser plate comprises a plurality of extrusion peaks that are divided by a plurality of extrusion grooves or that the extrusion peaks include a peak angle in a range of about 120 degrees to 170 degrees. Onishi describes convexoconcave extrusion structures that will produce a diffusion plate with extrusion peaks that are divided by a plurality of extrusion grooves (Onishi, [0057]) including “a convexoconcave portion formed of prism having an apex angle 140 degrees.” *Id.*, [0221]; Ex. 1003, ¶103.

A POSITA would have been motivated to combine Onishi’s extruded prismatic structures to Kobayashi’s diffusing plate 4. Kobayashi describes including a “prism shape, pyramid shape ... [and] Fresnel shape” lens combinations on the lensed diffuser 4. Kobayashi, [0034]. Onishi describes additional extruded prismatic structures in connection with a diffuser plate. *See* Onishi, [0057]. A POSITA would be motivated to modify Kobayashi to include these prismatic structures to improve the total light transmittance of the light diffusion plane. *See id.* (“the convex structures are periodically formed so that desirable optical property can be obtained at any point on the incident plane... the total light transmittance of the light diffusion plate is dependent on only the incident angle but independent of the incident position so that it is not necessary to finely align the light diffusion plate with the other members such as the light source.”); Ex. 1003, ¶103-104.

This combination is nothing more than combining a known improvement in display backlighting as disclosed by Onishi and applying that improvement to the backlight diffusers disclosed by Kobayashi. Ex. 1003, ¶105-106.

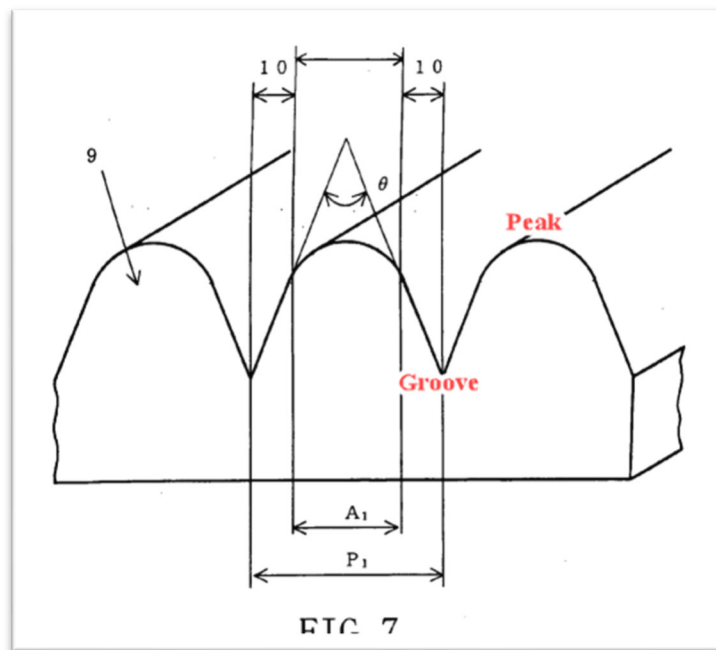
2. Dependent Claim 18.

[18] The device of claim 1, wherein the diffuser plate comprises a structured refractive diffuser that includes a plurality of extrusion peaks that are divided by a plurality of extrusion grooves.

See claim 13[C]. Kobayashi discloses that the “diffuser plate 4 with a lens has a lens shape on at least one surface, and such lens shapes include a general concave / convex R lens shape, prism shape, pyramid shape, saddle lens shape, Fresnel lens shape, and moth-eye lens shape.” Kobayashi, [0034]. Further, the “method for applying the lens shape to the diffusing plate 4 is preferably ... an extrusion method.” *Id.*, [0036]; Ex. 1003, ¶84.

Onishi discloses extrusion molding structures on the diffuser plate. Onishi, [0057] (“Since the light diffusion plate has the parallel principal planes, it is also appropriate for a continuous molding such as an extrusion molding.”). Further, given these extrusion structures are convexoconcave, they comprise both extrusion peaks and grooves created by the peaks and grooves in the cutting die. *See, e.g.*, Onishi, [0221] (“Firstly, in order to mold a prism plane composed of a prism portion having an apex angle 40 degrees and flat portions disposed equally between each prism portion by a ratio of 30% to the whole plane and a

convexoconcave portion formed of prism having an apex angle 140 degrees, respectively, a die having a plurality of grooves corresponding to each prism shape is manufactured by cutting work. Where, the plurality of grooves provided at intervals of 50 μm . The surface shape of the die manufactured by cutting work is formed of symmetry corresponding to the prism shape. The depth of the symmetric grooves is fixed in the plane”); Ex. 1003, ¶87. Extrusion peaks and grooves are further illustrated in Figure 7.



Onishi, Fig. 7 (annotated); Ex. 1003, ¶107, Claim 18.

3. Dependent Claim 20.

[20] The device of claim 18, wherein ones of the plurality of extrusion peaks include a peak angle in a range of about 120 degrees to 170 degrees.

See claims 1, 18, and 19 which disclose a plurality of extrusion peaks in both prism and pyramid shapes. Kobayashi does not disclose limits on the types of prismatic structures that may be used. Kobayashi, [0034]. A POSITA would recognize that a heptagonal prism resting on any side (and not the heptagon base) would provide an apex of 128° and a regular nonagonal prism resting on any side (and not the nine-sided base) would provide an apex of 140°. Ex. 1003, ¶87, 88.

To the extent Kobayashi does not disclose this element, Onishi discloses convexoconcave extrusion structures with apex angles of 140°. Onishi, [0221] (“Next, ... to mold a prism plane composed of a prism portion having an apex angle 40 degrees and flat portions disposed equally between each prism portion by a ratio of 30% to the whole plane and a convexoconcave portion formed of prism having *an apex angle 140 degrees...*”). Ex. 1003, ¶88; ¶107, Claim 20.

F. Ground 6 – Claim 19 is Obvious Under 35 U.S.C. § 103 Over Kobayashi, Tabito, Onishi, and Epstein in view of the Knowledge of a POSITA.

1. Motivation to Combine Epstein to the Kobayashi-Tabito-Onishi combination.

A POSITA would be motivated to combine Epstein to the Kobayashi-Tabito-Onishi combination. Ex. 1003, ¶108. Kobayashi discloses a display for

backlight assemblies. Kobayashi does not expressly disclose that the structured refractive diffuser comprises a plurality of crossed linear prismatic lenselets. However, Epstein is similarly in the field of LCD displays. *See* Epstein, Abstract. Epstein discloses “symmetrical, four sided prisms having curved or arced faces in both the XZ and YZ planes” for use in LCD displays. *See* Epstein, [0214]; Ex. 1003, ¶109.

A POSITA would be motivated to apply these structures to Kobayashi’s diffusing plate 4. This combination is nothing more than combining a known improvement in the same field (display technology) to Kobayashi’s device in the same technical area. Ex. 1003, ¶110. Further, a POSITA would be motivated to make this combination to provide improved lighting characteristics and viewing angles. *Id.* As Epstein describes, use of its “disclosed structures also have the advantage of reducing the effects of glare, since they enable the image to be viewed from positions outside of the areas receiving unwanted specularly reflected light from the various surfaces and interfaces of the display.” Epstein, [0005]. A POSITA would be motivated to apply Epstein’s structures to Kobayashi’s diffusing plate 4 to take advantage of these improvements. This combination is the application of a known improvement in a similar field and would be within the skillset of a POSITA. Ex. 1003, ¶111.

2. Dependent Claim 19.

[19] The device of claim 18, wherein the structured refractive diffuser comprises a plurality of crossed linear prismatic lenselets.

Kobayashi discloses that the “diffuser plate 4 with a lens has a lens shape on at least one surface, and such lens shapes include a general concave / convex R lens shape, prism shape, pyramid shape, saddle lens shape, Fresnel lens shape, and moth-eye lens shape.” Kobayashi, [0034]. Ex. 1003, ¶89. Kobayashi does not expressly disclose that the refractive diffuser comprises a plurality of crossed linear prismatic lenselets, but such a shape is disclosed in Epstein. *See* Epstein, [0213] (“Examples 24 through 29 are examples of films having a plurality of pyramidal prisms.”); [0214] (“prisms 1640 are symmetric, isosceles prisms having straight face verbatims in both the XZ and YZ planes. Each prism 1640 has a first face 1641, a second face 1642, a third face 1643 and a fourth face 1644. The four faces meet at apex 1645.”); [0215] (“Example 25 in FIG. 30A, prisms 1740 are symmetrical, four sided prisms having curved or arced faces in both the XZ and YZ planes.”).

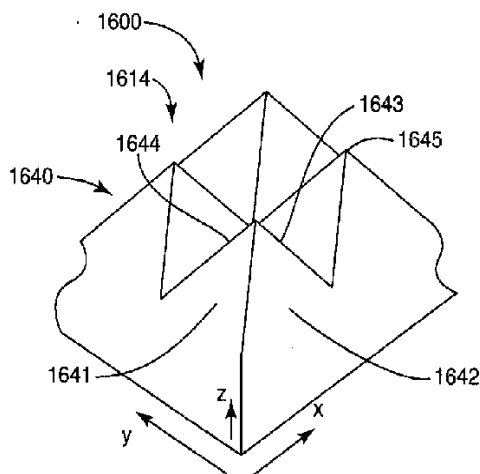


Fig. 29A

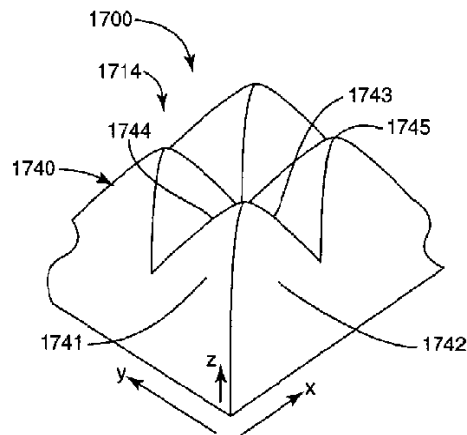


Fig. 30A

Epstein, Fig. 29A & 30A; Ex. 1003, ¶91; ¶112, Claim 19. A POSITA would be motivated to apply these lens shapes to Kobayashi.

G. Ground 7 – Claims 1-2, 7-8, and 11-15 are Obvious Under 35 U.S.C. § 103 Over Schiavoni and Lim in view of the Knowledge of a POSITA.

1. Motivation to Combine Schiavoni and Lim.

A POSITA would be motivated to modify Schiavoni's optical element (100), substantially planar diffuser [22], and spacing of light sources (11) to include the spacing disclosed by Lim. Ex. 1003, ¶114. Schiavoni discloses a backlighting system including a multi-plane light diffuser and describes specific distances between the light sources and the optical system 100 and the diffuser 21 and a spacing "P" between the light sources. Schiavoni, [0022]-[0023]. Lim similarly discloses a diffusion plate and a lighting source and expressly discloses a relationship "between a diffusion plate and a lamp in accordance with the distance

between lamps having the same visible angle.” Lim, [0057]. Lim acknowledges 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.*, [0058]. Additionally, “as shown in [Lim’s] FIG. 4B, the closer the interval between the lamps is, the narrower the interval between the lamp and diffusion plate.” *Id.*, [0059]; Ex. 1003, ¶114. Lim further discloses that the first distance of 5mm is one half the third distance of 10mm. Lim, [0047] (“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.”).

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 be designed with fewer diffuser plates and have a thinner structure. *Id.*, [0057]-[0059]; Ex. 1003, ¶115-116. This combination is nothing more than the application of a known distance relationship in a backlighting structure as taught by Lim to another known backlighting structure as taught by Schiavoni. *Id.* This combination would have been within the skillset of a POSITA and is nothing more than modifying the positioning of elements already described in Schiavoni. *Id.*

2. Independent Claim 1.

[1 Preamble] A solid state lighting device, comprising:

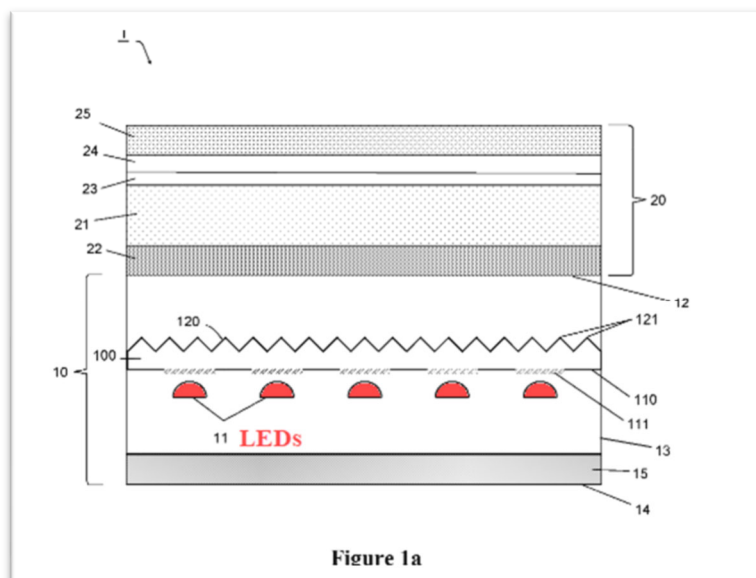
Schiavoni describes “an optical system (100) for a lighting device having one or more sources (11) of visible and/or ultraviolet radiation which consist of light-emitting diodes, especially for backlighting a liquid-crystal display screen[.]”

Schiavoni, Abstract; Ex. 1003, ¶45; ¶117, Claim 1.

[1A] a plurality of solid state light emitters that are configured to emit light; and

Figure 1a of Schiavoni also shows five LEDs 11 arranged in a row.

Schiavoni, p. 2.



Schiavoni, Fig. 1a; Ex. 1003, ¶45; ¶117, Claim 1A.

[1B] 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,

Schiavoni describes a multiplane light diffuser that includes “a first substantially planar optical element (100) transparent to said radiation and intended to be installed between said sources and a substantially planar diffuser [22] that makes the normal luminance uniform...” Schiavoni, Abstract. Schiavoni makes clear that the first optical element 100 and the planar diffuser 22 both include diffusing layers. *See, e.g., id.* at 1 (“The first optical element is usually a rigid diffuser intended to homogenize the normal luminance”); 17 (“The diffusing layer 22, 111 is deposited by any technique known to those skilled in the art, such as by screen printing, by coating with a paint, by dip-coating, by spin-coating, by spraying, or by flow-coating.”); Ex. 1003, ¶50. These diffusing layers are shown in Figure 1a:

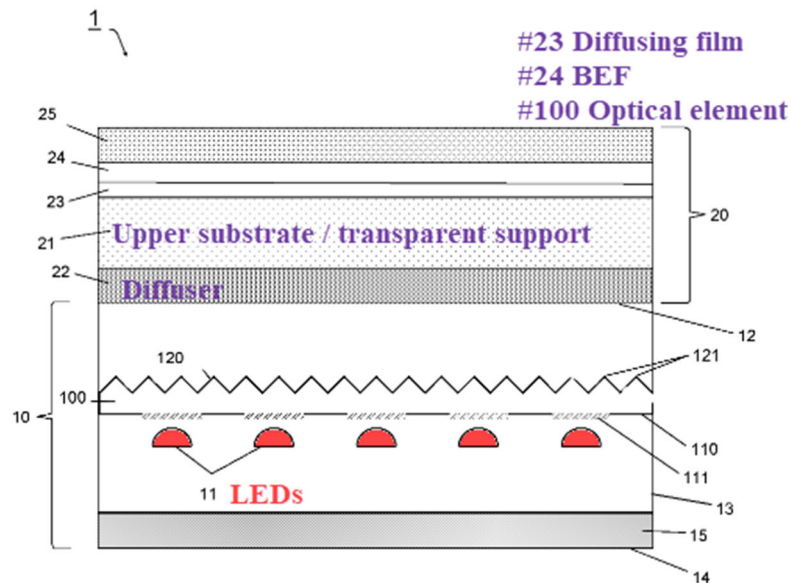
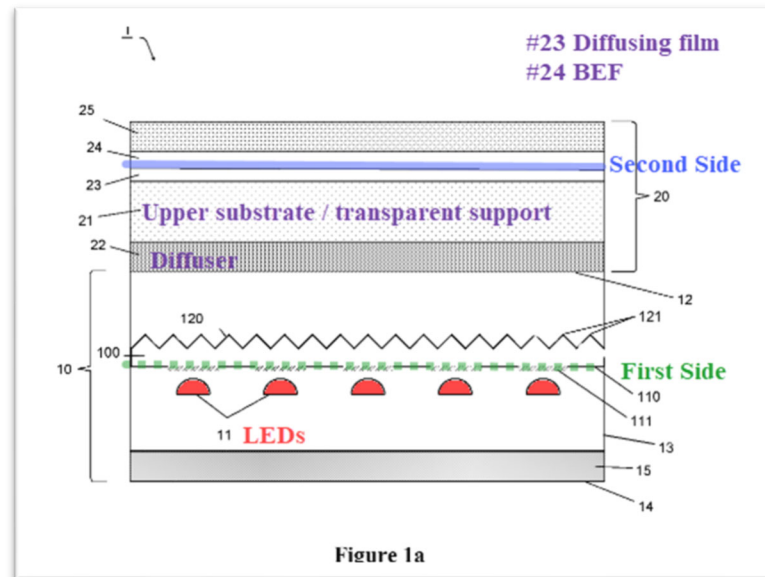


Figure 1a

Id., Fig. 1a (annotated). As shown above, optical element 100 and substantially planer diffuser 22 are different distances from the LEDs. Schiavoni describes that “a first optical element 100 *is placed between* the sources 11 and the rigid diffuser 21,” and that rigid diffuser 21 is “formed of a transparent support 21 preferably made of glass and a diffusing layer 22, ... 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.* at 15-16 (emphasis added); Ex. 1003, ¶51; ¶117, Claim 1B.

[1C] the multiplane light diffuser including 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,

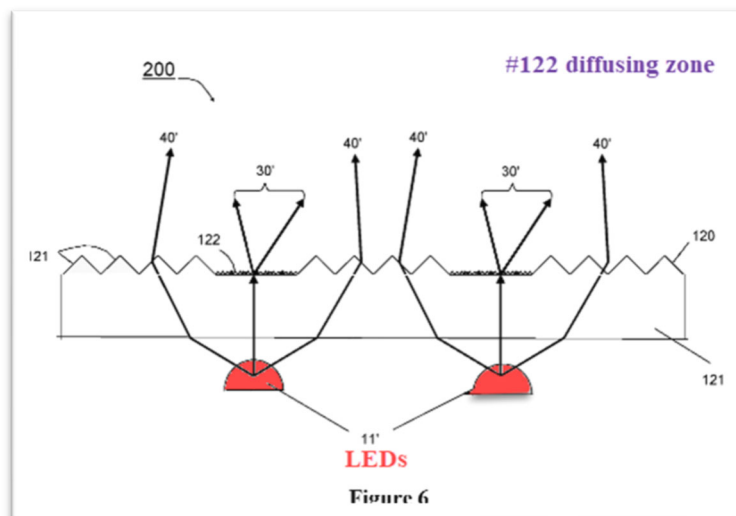
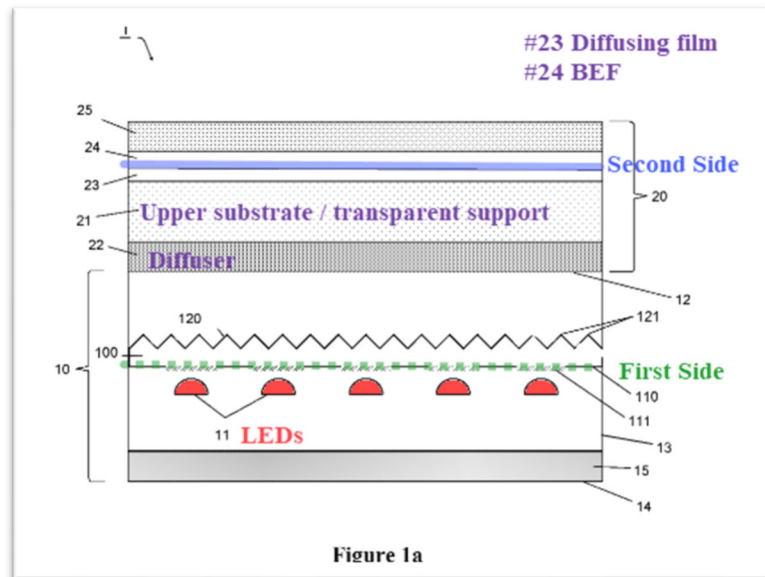
Optical element 100 comprises a first side corresponding to a first plane configured to receive light from the plurality of LEDs and that diffusing layer 22 comprises a second side corresponding to a second plane that is configured to transmit diffused light. *See, e.g., id.* at 16 (“The diffusing layer 22, 111 can comprise a binder and diffusing particles, whose nature of the material and their volume make it possible to let the wavelengths of the visible domain pass while diffusing the light.”); Ex. 1003, ¶52.



Schiavoni, Fig. 1a (annotated); Ex. 1003, ¶117, Claim 1C.

[1D] wherein the multiplane light diffuser comprises a diffuser plate that includes the first side of the multiplane light, the diffuser plate configured to define the first diffusion plane, and

The substantially planar optical element 100 comprises a diffuser plate 111 that includes the first side of the multiplane light diffuser. *See, e.g., id.* at 16 (“The diffusing layer 22, 111 can comprise a binder and diffusing particles, whose nature of the material and their volume make it possible to let the wavelengths of the visible domain pass while diffusing the light.”). The diffuser plate 111 comprises a first side 110 with the diffuser plate 111 defining the first diffusion plane. *See* Figs. 1a and 6; Ex. 1003, ¶53.



Id., Fig. 1a & 6 (annotated); Ex. 1003, ¶117, Claim 1D.

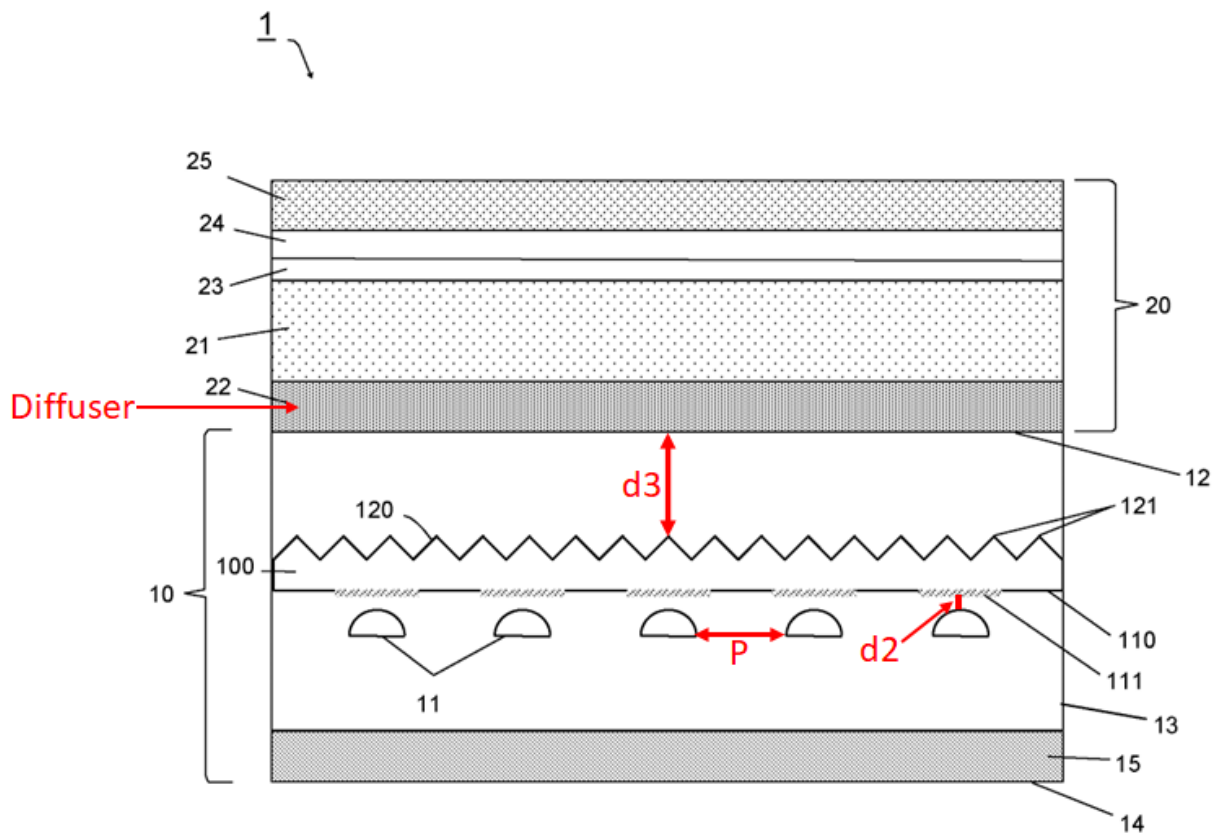
[1E] wherein the plurality of solid state emitters comprise a third distance between adjacent ones of the plurality of solid state light emitters, and wherein the first distance is a function of the third distance.

Schiavoni defines the following four distances:

h1	Plastic/glass substrate, about 3mm thick with grooves, “the prism type with a triangular section ... of height h1” Schiavoni, p. 16.
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d2	“The distance d2 between the sources 11 and the optical system 100” <i>Id.</i>
d3	“The distance d3 between the optical system 100 and the diffuser 21” <i>Id.</i>
P	“spacing P between said lit extended source and another adjacent extended source or between said lit row and an adjacent row of point sources” <i>Id.</i> at 23.

These distances are also shown graphically in Figure 1a below.

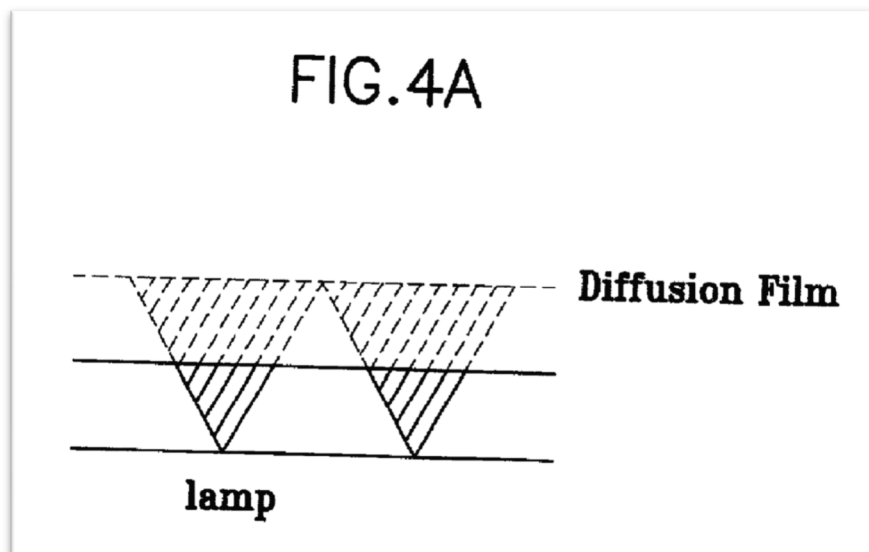


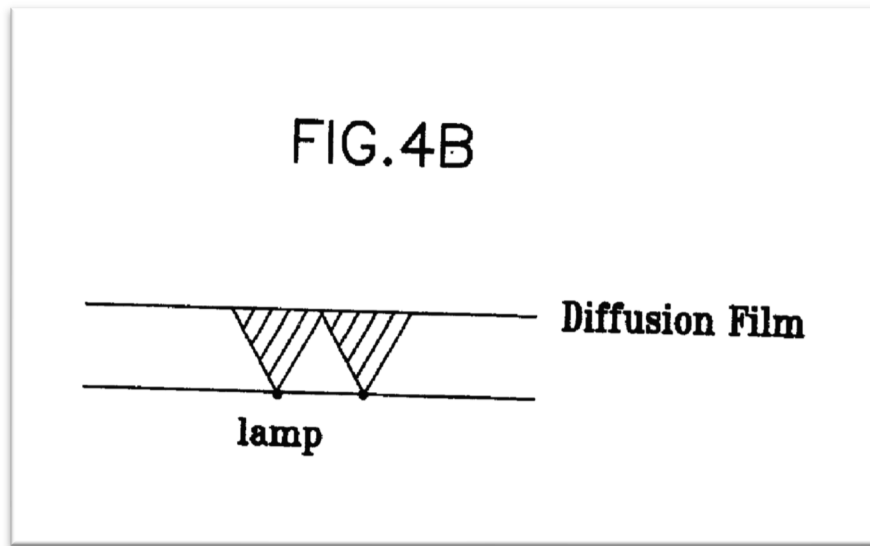
Schiavoni, Fig. 1a (annotated); Ex. 1003, ¶57.

Thus, as described by Schiavoni, the third distance is P, the spacing between the light sources. Schiavoni, p. 23. The first distance is d2, “[t]he distance ... between the sources 11 and the optical system 100.” *Id.* at 16. Schiavoni thus describes the spacing, P, between the optical sources and further describes the

distance d_2 between the optical sources and the optical system 100. 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].” Ex. 1003, ¶58.

Lim further discloses a relationship “between a diffusion plate and a lamp in accordance with the distance between lamps having the same visible angle.” Lim, [0057]. Lim acknowledges 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.*, [0058]. Additionally, “as shown in FIG. 4B, the closer the interval between the lamps is, the narrower the interval between the lamp and diffusion plate.” *Id.*, [0059]; Ex. 1003, ¶59.



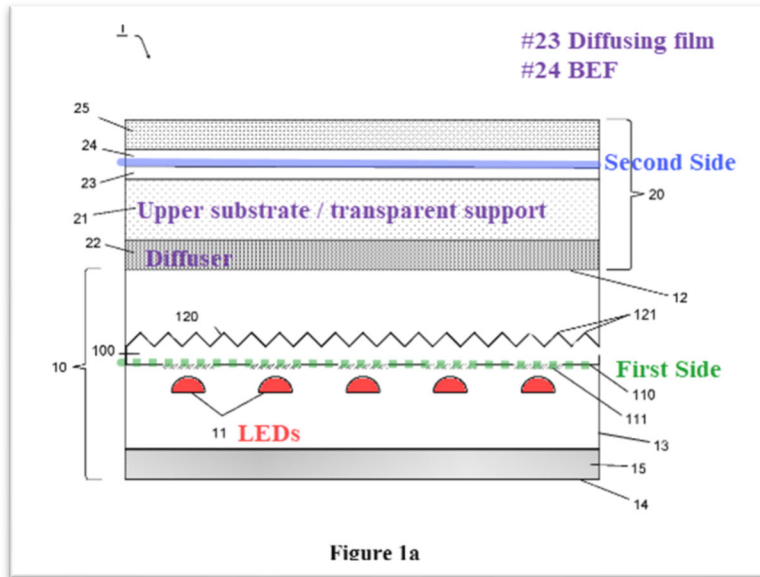


Lim, Figs. 4A-4B. Ex. 1003, ¶117, Claim 1E. A POSITA would have been motivated to modify the lighting system of Schiavoni with Lim's teaching as to spacing as Lim teaches how to maximize efficiency and light coverage.

3. Dependent Claim 2.

[2] The device of claim 1, wherein the multiplane light diffuser comprises: 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.

Schiavoni describes a diffusing layer 22 that is supported by glass substrate 21. *See* Schiavoni, p. 20 (“The glass substrate 21 is thus used as a support substrate for the diffusing layer 22....”). As shown below, the diffusing layer 22 contains a second side of the multiplane light diffuser and is a second distance from the plurality of LEDs.



Schiavoni, Fig. 1a (annotated); Ex. 1003, ¶61; ¶117, Claim 2.

4. Dependent Claim 3.

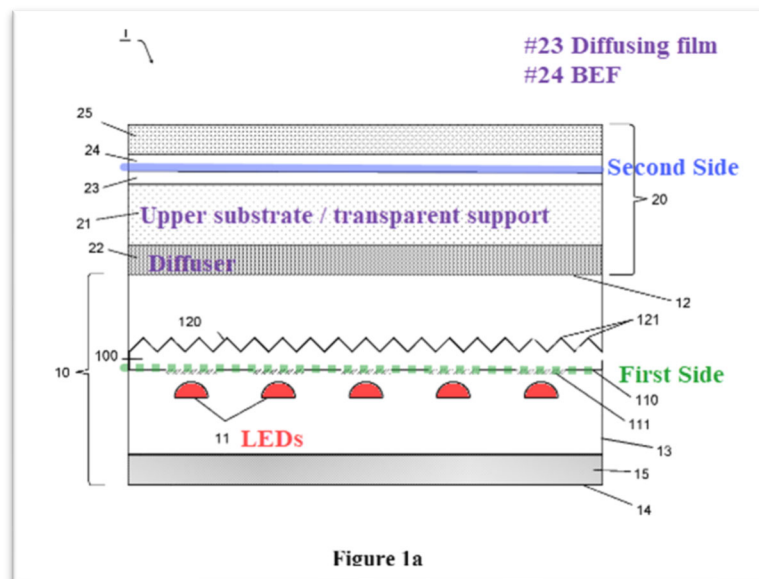
[3] The device of claim 2, wherein the diffuser sheet comprises: a substantially transparent plate; and a diffuser film supported by the substantially transparent plate.

Schiavoni describes optical structure 20 where a diffuser is “formed of a transparent support 21 preferably made of glass and a diffusing layer 22” with diffusing film 23 on the diffuser. Schiavoni, p. 15. Ex. 1003, ¶63; Ex. 1003, ¶117, Claim 2.

5. Dependent Claim 7.

[7] The device of claim 2, wherein 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.

Schiavoni describes optical structure 20 where a diffuser is “formed of a transparent support 21 preferably made of glass and a diffusing layer 22” with diffusing film 23 on the diffuser. Schiavoni, p. 15. Ex. 1003, ¶63. Schiavoni additionally notes that “the diffusing structure further comprises, after the diffuser, an element for redirecting the light towards the normal to the substrate, of the ‘BEF’ type (‘Brightness Enhancing Film’)... And, preferably, it also comprises a reflective polarizer placed on the ‘BEF’ type element.” Schiavoni, p. 13. This is illustrated below.



Schiavoni, Fig. 1a. (annotated); Ex. 1003, ¶117, Claim 7.

6. Dependent Claim 8.

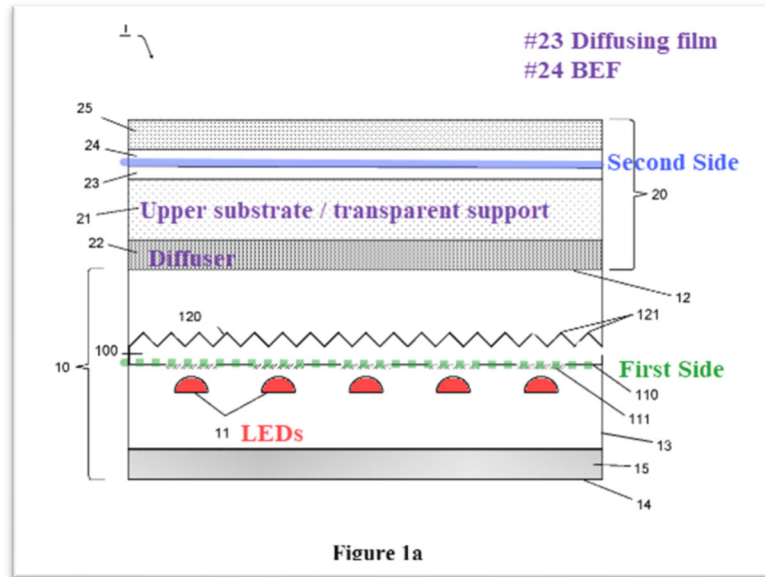
[8] The device of claim 2, wherein the plurality of solid state emitters comprise a third distance between adjacent ones of the plurality of solid state light emitters, and wherein the first distance comprises approximately one half the third distance.

See claim 1[E] detailing the relationship between the first distance and the third distance. Lim further discloses that the first distance of 5mm is one half the third distance of 10mm. Lim, [0047] (“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.”); Ex. 1003, ¶¶69; ¶117, Claim 8.

7. Dependent Claim 11.

[11] The device of claim 1, further comprising means for transmitting first diffused light from the first diffusion plane to the second diffusion plane.

Schiavoni discloses light transmitting from the LEDs through the first diffusion plane. Schiavoni, p. 3. Schiavoni discloses transmitting first diffused light from the first diffusion plane (light emitted from optical element 100) to the second diffusion plane (i.e. the transparent support and the diffusing layer 22). *See e.g.*, Fig. 1a.



Schiavoni, Fig. 1a. (annotated); Ex. 1003, ¶74, ¶117, Claim 11.

8. Dependent Claim 12.

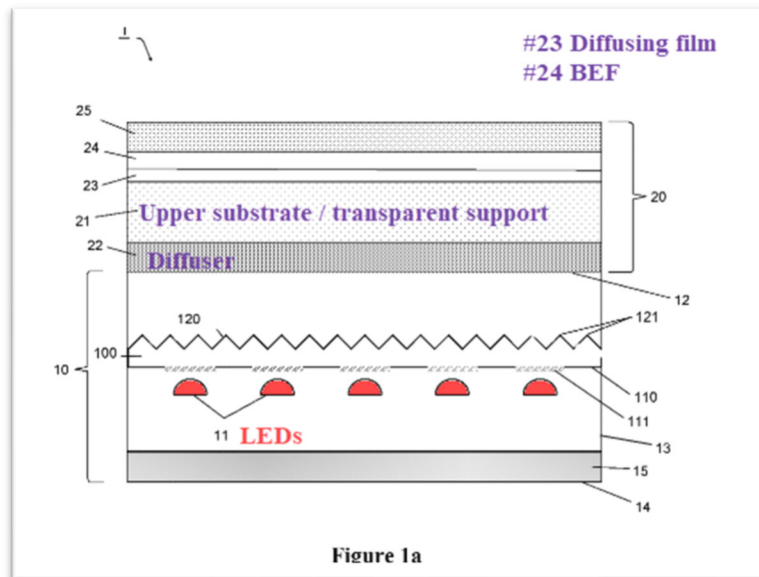
[12A] The device of claim 1, wherein the multiplane light diffuser comprises: the first diffuser plate positioned at a first distance from the plurality of solid state emitters;

Schiavoni describes that the multiplane light diffuser comprises a first diffuser plate 100 comprising a diffusing layer 111 positioned a first distance from the LEDs. *See, e.g.,* Schiavoni, p. 17; Ex. 1003, ¶51.

[12B] a second diffuser plate positioned at a second distance from the plurality of solid state emitters; and

Schiavoni describes that the multiplane light diffuser comprises a second diffuser plate 22 positioned a second distance from the LEDs. Schiavoni describes that “a first optical element 100 *is placed between* the sources 11 and the rigid diffuser 21,” and that rigid diffuser 21 is “formed of a transparent support 21

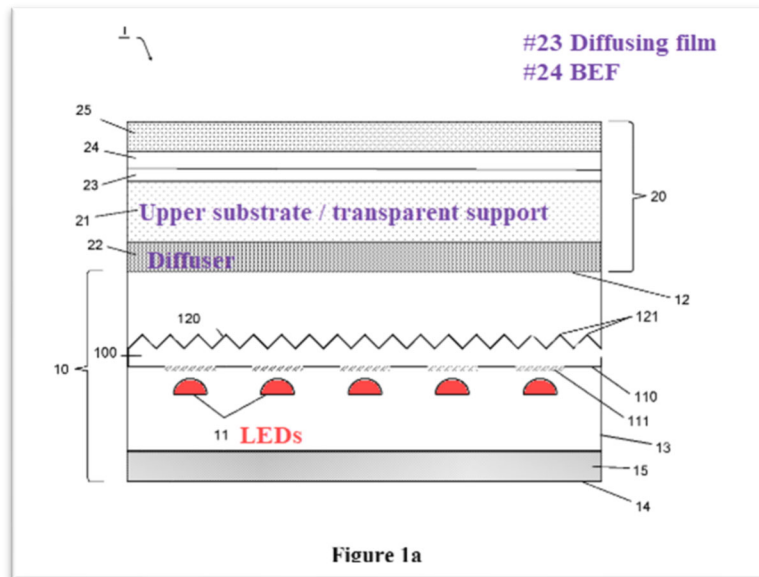
preferably made of glass and a diffusing layer 22, ... arranged on the lower face (side of the enclosure) or top of the substrate 21, these two elements 21, 22 making it possible to homogenize the light.” Schiavoni, p. 15-16 (emphasis added).



Schiavoni, Fig. 1a. (annotated); Ex. 1003, ¶52.

[I2C] a diffuser sheet supported by the second diffuser plate, wherein the first distance is less than the second distance.

Schiavoni describes that the multiplane light diffuser comprises a second diffuser plate 22 positioned a second distance from the LEDs. Schiavoni discloses that the first distance is less than the second distance.



Schiavoni, Fig. 1a; Ex. 1003, ¶50-51.

9. Independent Claim 13.

[13 Preamble] A method of providing diffused light comprising:

See claim 1[preamble], 1[A], and 1[B].

[13A] emitting light from a plurality of solid state light emitters arranged in a planar configuration;

See claim 1[A] and 1[B].

[13B] receiving the emitted light at a first side of a first diffusion plane that is a first distance from the plurality of solid state light emitters;

See claim 1[B].

[13C] transmitting first diffused light from a structured refractive diffuser plate at a second side of the first diffusion plane;

See claim 1[B] and 1[C]. Schiavoni, Abstract (“a first substantially planar optical element (100) transparent to said radiation and intended to be installed

between said sources and a substantially planar diffuser [22] that makes the normal luminance uniform.”). Schiavoni describes that its system includes a structured refractive diffuser, explaining an “upper face 120 [of optical element 100] is texturized, for example by printing a laminated glass, to obtain the grooves 121 of the prism type with a triangular section, with an apex angle of preferably 90°, of height h_1 equal to 1 mm for example.” Schiavoni, p. 16; Ex. 1003, ¶¶50-51.

[13D] receiving the first diffused light from the first diffusion plane at a first side of a second diffusion plane that is a second distance from the plurality of solid state light emitters; and

See claims 11 and 13[C] above. Schiavoni’s diffusing layer 22 receives light from optical element 100.

[13E] transmitting second diffused light from a second side of the second diffusion plane,

See claim 11.

[13F] 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.

See claim 1[E].

10. Dependent Claim 14.

[14] The method of claim 13, wherein transmitting the first diffused light comprises transmitting the first diffused light from a diffuser plate and wherein transmitting the second diffused light comprises transmitting the second diffused light from a diffuser sheet that is supported by a substantially transparent sheet.

See claims 2-3, 7, and 11.

11. Dependent Claim 15.

[15] The method of claim 13, wherein transmitting the first diffused light comprises transmitting light from a first diffuser plate and wherein transmitting the second diffused light comprises transmitting light from a diffuser sheet that is supported by a second diffuser plate.

See claim 7.

H. Ground 8 – Claim 9 is Obvious Under 35 U.S.C. § 103 Over Schiavoni, Lim, and Kobayashi in view of the Knowledge of a POSITA.

1. Motivation to Combine Kobayashi to the Schiavoni-Lim Combination.

The Schiavoni-Lim combination discloses light emitting elements and a multi-plane diffuser structure, and Lim discloses a diffusion plate and a lighting source and expressly discloses a relationship “between a diffusion plate and a lamp in accordance with the distance between lamps having the same visible angle.” Lim, [0057]; Ex. 1003, ¶119. The Schiavoni-Lim combination does not expressly disclose the second distance comprises a distance in a range between the third distance and 1.5 times the third distance.

Kobayashi similarly discloses a light emitting elements and a multi-plane diffuser structure. Kobayashi suggests to a POSITA that the second distance is equal to the first distance, and thus that the second distance comprises a distance in a range between the third distance and 1.5 times the third distance. Ex. 1003, ¶119.

A 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, as described in both Kobayashi and Lim. *See* Kobayashi, [0020]; Lim, [0057]-[0059]; Ex. 1003, ¶120. This modification is nothing more than positioning components that are already disclosed in Schiavoni according to distances suggested by Kobayashi to achieve a predictable result. A POSITA would be motivated to make this modification, and the combination would be well within the technical skillset of a POSITA. Ex. 1003, ¶121.

2. Dependent Claim 9.

[9] The device of claim 2, wherein the second distance comprises a distance in a range between the third distance and 1.5 times the third distance.

A POSITA would be motivated to modify the Schiavoni-Lim combination based on Kobayashi, which discloses or suggests that second distance is equal to the first distance, and thus that the second distance comprises a distance in a range between the third distance and 1.5 times the third distance. *See supra* Ground 1, Claim 9.

I. Ground 9 – Claims 10 and 16 are Obvious Under 35 U.S.C. § 103 Over Schiavoni, Lim, and Kirita in view of the Knowledge of a POSITA.

1. Motivation to Combine Kirita to the Schiavoni-Lim Combination.

A POSITA would be motivated to combine Kirita to the Schiavoni-Lim combination. Both Schiavoni and Lim describe backlight assemblies for displays.

However, Schiavoni and Lim do not expressly disclose a light filter color, i.e., a color-selective filter. Ex. 1003, ¶124. In a similar field, Kirita discloses a “light selective transmission filter 32.” Kirita, [0063]. 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.*; Ex. 1003, ¶124-125.

This modification is nothing more than applying a known filter explicitly disclosed in Kirita to similar systems described in Schiavoni and Lim to achieve a predictable result. A POSITA would be motivated to make this modification, and the combination would be well within the technical skillset of a POSITA. Ex. 1003, ¶125.

2. Dependent Claim 10.

[10] The device of claim 1, wherein the diffuser plate comprises a plate including a light filter color.

Kirita discloses the the diffuser plate comprises a plate including a light filter color. *See supra*, Ground 2, Claim 10.

3. Dependent Claim 16.

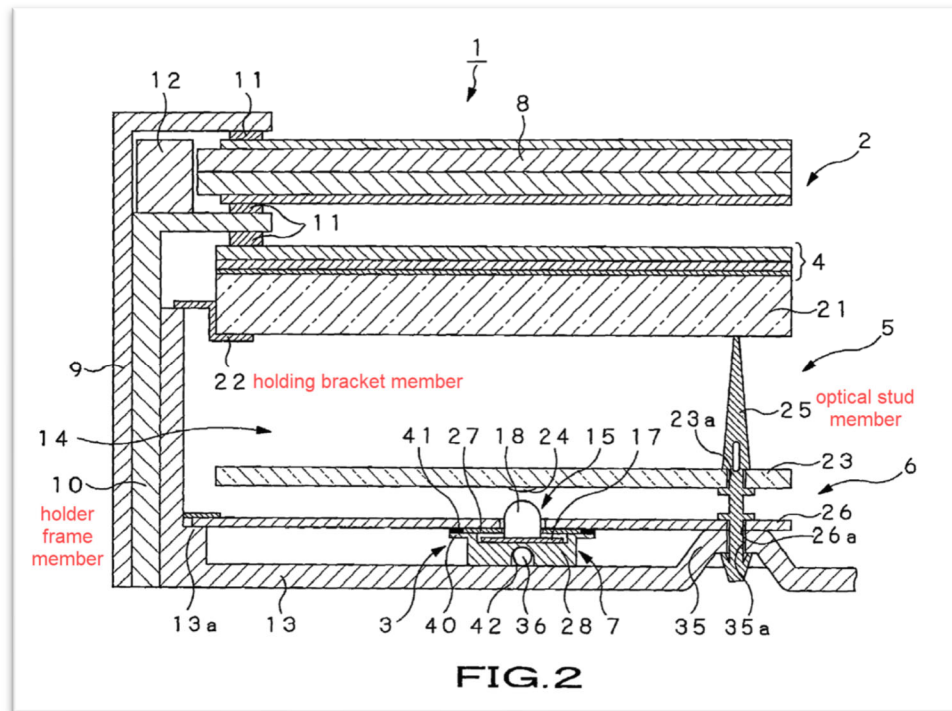
[16] The method of claim 13, wherein transmitting the first diffused light comprises transmitting scattered diffusion light from a plate including a light filter color.

See claim 10. A POSITA would recognize that the light transmitted by Schiavoni's optical element 100 and diffuser 110 comprises scattered diffusion light because it has passed through a light diffuser. This light could then pass through Kirita's color filter. *See, e.g.*, Kirita, [0075]; Ex. 1003, ¶¶77; ¶126, Claim 16.

J. Ground 10 – Claims 4 and 17 are Obvious Under 35 U.S.C. § 103 Over Schiavoni, Lim, and Tabito in view of the Knowledge of a POSITA.

1. Motivation to Combine Tabito to the Schiavoni-Lim Combination.

The Schiavoni-Lim combination discloses light emitting elements and a diffuser structure but does not expressly disclose the mounting for that diffuser structure. Like 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 is supported by optical stud members 25, holder frame member 10, and holding bracket member 22. *See* Tabito, [0081].



Tabito, Fig. 2 (annotated); Ex. 1003, ¶128. Tabito's method of supporting diffusing plates would also be suitable for use in supporting Schiavoni's diffuser plates. *Id.*

A POSITA would have been motivated to apply Tabito's supports to the Schiavoni-Lim combination to provide a more rigid mounting and support for the backlighting elements described in the Schiavoni-Lim combination. *Id.*

Schiavoni, Lim, and Tabito are in the same field of backlight assembly units for display devices, and Schiavoni, Lim, and Tabito aim to improve brightness inconsistencies in backlit display devices using similar structures. Ex. 1003, ¶129. 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. This combination is within the skillset of POSITA. Ex. 1003, ¶129.

2. Dependent Claim 4.

[4A] The device of claim 2, comprising a plurality of diffuser supports, wherein the diffuser supports comprise:

Schiavoni describes “[a]n optical structure 20 is attached to the open upper part 12 and ... kept in place by means of mutual engagement, not shown, such as a groove provided on the periphery of the surface of the structure cooperating with a peripheral rib of the enclosure.” Schiavoni, p. 15. Schiavoni does not expressly disclose the mounting for that diffuser structure. Tabito discloses a light transmitting LCD with a reflecting plate 26, diffusing plate 23, light diffusing conducting plate 21, and optical converting section 4 being supported by optical stud members 25, holder frame member 10, and holding bracket member 22. *See supra* Ground 4, Claim 4A.

[4B] a proximal end that is configured to be positioned proximate the plurality of solid state light emitters; and a distal end that is configured to support the diffuser sheet.

See supra Ground 4, Claim 4B addressing Tabito.

6. Dependent Claim 5.

[5] The device of claim 4, wherein the diffuser plate comprises a plurality of diffuser plate holes that are configured to receive the plurality of diffuser supports.

See supra Ground 4, Claim 5 addressing Tabito.

7. Dependent Claim 6.

[6] The device of claim 4, wherein the plurality of diffuser supports comprise steps for supporting, at the first distance from the plurality of solid state light emitters, the diffuser plate via the plurality of holes.

See supra Ground 4, Claim 6 addressing Tabito.

3. Independent Claim 17.

[17 Preamble] A display comprising:

Schiavoni describes “an optical system (100) for a lighting device having one or more sources (11) ... which consist of light-emitting diodes, especially for backlighting a liquid-crystal display screen[.]” Schiavoni, Abstract; Ex. 1003, ¶45.

[17A] a backlighting panel comprising

See claim 17[preamble].

[17B] a plurality of solid state light emitters arranged in a substantially planar configuration including a third distance between adjacent ones of the plurality of solid state light emitters,

See Claim 1[A] and 1[E].

[17C] a first diffusion plane that is configured to receive light from the plurality of solid state light emitters and to transmit first diffused light, the first diffusion plane including a diffuser plate that is positioned a first distance from the plurality of solid state light;

See claims 1[B] and 11.

[17D] a second diffusion plane that is configured to receive the first diffused light and to transmit second diffused light

See claims 1[B] and 1[C].

[17E] 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; and

See claims 1[C], 4, and 8. Schiavoni describes light emitting elements and a diffuser structure, but does not expressly disclose the mounting for that diffuser structure. Tabito discloses the claimed mounting structure. *See supra* Ground 4, Claim 17E.

[17F] a LCD display panel that is configured to receive the second diffused light and selectively transmit received light as display content,

See claims 10, 13[C], 13[D]. Schiavoni discloses an LCD Panel was known in the art. Schiavoni, p. 1 (“On direct lighting screens, the light sources, placed inside the lighting device, illuminate in a direction substantially perpendicular to the LCD screen”). An LCD display is configured to receive the second diffused light and selectively transmit received light as display content, and that such a use of Schiavoni’s backlight would have been obvious to a POSITA. *See, e.g.*, Tabito, Abstract; Ex. 1003, ¶¶82-83; ¶130, Claim 17F.

[17G] wherein the first distance is a function of the third distance.

See claim 1[E].

K. Ground 11 – Claims 18 and 20 are Obvious Under 35 U.S.C. § 103 Over Schiavoni, Lim, Tabito, and Onishi in view of the Knowledge of a POSITA.

1. Motivation to Combine Onishi to the Schiavoni-Lim-Tabito combination.

A POSITA would be motivated to combine Onishi to the Schiavoni-Lim-Tabito combination. Each of Schiavoni, Lim, and Tabito describes backlight assemblies for displays. Ex. 1003, ¶132. However, the Schiavoni-Lim-Tabito combination does not expressly disclose that its diffuser plate comprises a plurality of extrusion peaks that are divided by a plurality of extrusion grooves or that the extrusion peaks include a peak angle in a range of about 120 degrees to 170 degrees. Onishi describes convexoconcave extrusion structures that will produce a diffusion plate with extrusion peaks that are divided by a plurality of extrusion grooves (Onishi, [0057]) including “a convexoconcave portion formed of prism having an apex angle 140 degrees.” *Id.*, [0221]; Ex. 1003, ¶132.

A POSITA would have been motivated to combine Onishi’s extruded prismatic structures to Schiavoni’s optical element 100. Schiavoni describes that its diffusing areas “are ... preferentially associated with elongated patterns of the prism, lenticule, or Fresnel lens type.” Schiavoni, 9; Ex. 1003, ¶133. Onishi describes additional extruded prismatic structures in connection with a diffuser plate. *See* Onishi, [0057]. A POSITA would be motivated to modify Schiavoni to include these prismatic structures to improve the total light transmittance of the

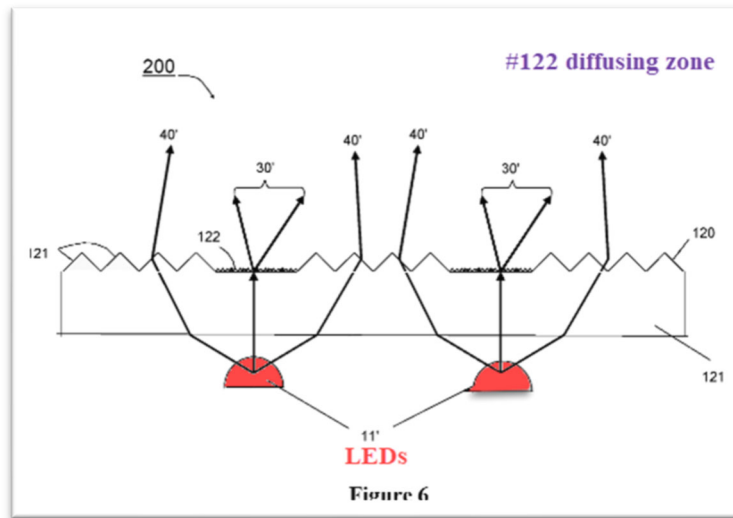
light diffusion plane. *See id.*; Ex. 1003, ¶133.

Further, this combination is nothing more than combining a known improvement in display backlighting as disclosed by Onishi and applying that improvement to the backlight disclosed by Schiavoni. A POSITA would be motivated to make this combination, and this combination would be within the skillset of a POSITA. Ex. 1003, ¶134-135.

2. Dependent Claim 18.

[18] The device of claim 1, wherein the diffuser plate comprises a structured refractive diffuser that includes a plurality of extrusion peaks that are divided by a plurality of extrusion grooves.

In discussing optical element 100,200, Schiavoni notes that the planar and structured sections could have different refractive indexes, indicating optical element 100,200 is refractive. Schiavoni, p. 7 (“[i]f two elements are used, the second element may preferentially be a refractive index material[.]”). Additionally, Schiavoni discloses a structured diffuser in with both “an elongated pattern (two-dimensional, ‘2D’) in particular a prism” and “a three-dimensional pattern (‘3D’) hollow or in relief, in particular of the pyramidal type,” *id.* at 7, where the “repeated pattern can be over the entire associated main face or only in areas preferably offset with respect to the sources. In the area or areas, the elongated elements can be essentially contiguous.” *Id.* at 9; Ex. 1003, ¶85-86.



Id., Fig. 6 (annotated).

Onishi discloses extrusion molding structures on the diffuser plate. *See supra* Ground 5, Claim 18. A POSITA would be motivated to apply these structures to Schiavoni's optical element.

3. Dependent Claim 20.

[20] The device of claim 18, wherein ones of the plurality of extrusion peaks include a peak angle in a range of about 120 degrees to 170 degrees.

See claim 18. Onishi discloses convexoconcave extrusion structures with apex angles of 140°. Onishi, [0221]; Ex. 1003, ¶87; ¶136, Claim 20.

L. Ground 12 – Claim 19 is Obvious Under 35 U.S.C. § 103 Over Schiavoni, Lim, Tabito, Onishi, and Epstein in view of the Knowledge of a POSITA.

1. Motivation to Combine Epstein to the Schiavoni-Lim-Tabito-Onishi combination.

A POSITA would be motivated to combine Epstein to the Schiavoni-Lim-

Tabito-Onishi combination. Schiavoni discloses a display for backlight assemblies. Schiavoni does not expressly disclose that the structured refractive diffuser comprises a plurality of crossed linear prismatic lenselets. However, Epstein is similarly in the field of LCD displays. Ex. 1003, ¶138; *See* Epstein, Abstract. Epstein discloses “symmetrical, four sided prisms having curved or arced faces in both the XZ and YZ planes” for use in LCD displays. *See* Epstein, [0214].

A POSITA would be motivated to apply these structures to Schiavoni’s optical system 100. This combination is nothing more than combining a known improvement in the same field (display technology) to Schiavoni’s device in the same technical area. Ex. 1003, ¶139. Further, a POSITA would be motivated to make this combination to provide improved lighting characteristics and viewing angles. As Epstein describes its “disclosed structures also have the advantage of reducing the effects of glare, since they enable the image to be viewed from positions outside of the areas receiving unwanted specularly reflected light from the various surfaces and interfaces of the display.” Epstein, [0005]; Ex. 1003, ¶139-140. A POSITA would be motivated to apply Epstein’s structures to Schiavoni’s diffusing plate 4 to take advantage of these improvements. *Id.*

2. Dependent Claim 19.

[19] The device of claim 18, wherein the structured refractive diffuser comprises a plurality of crossed linear prismatic lenselets.

Schiavoni describes that its system include a structured refractive diffuser,

explaining “The system 100 consists of a plastic or preferably a glass substrate, 3 mm thick. Its upper face 120 is texturized, for example by printing a laminated glass, to obtain the grooves 121 of the prism type with a triangular section, with an apex angle of preferably 90°, of height h1 equal to 1 mm for example.” Schiavoni, p. 16. Ex. 1003, ¶90. Schiavoni does not expressly disclose that the refractive diffuser comprises a plurality of crossed linear prismatic lenselets, but such a shape is disclosed in Epstein. *See supra* Ground 6, Claim 19.

VIII. Any Secondary Considerations Cannot Overcome the Clear Evidence of Obviousness.

Evidence of secondary considerations presented by the Patent Owner should be addressed in a trial where the parties may develop, and the Board may consider, a full record. *See, e.g., Tristar Products, Inc. v. Choon’s Design, LLC*, IPR2015-01883, Paper No. 6 at 26 (PTAB Mar. 9, 2016).

IX. Discretionary Denial is Inappropriate.

The Underlying Litigation does not warrant discretionary denial under 35 U.S.C. § 314(a). The *Fintiv* framework favors institution of this proceeding. *See Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (PTAB Mar. 20, 2020). As explained below, each of the *Fintiv* factors weighs against discretionary denial or is, at worst, neutral. The Board should institute IPR.

Factor 1 - Whether the Court Granted a Stay or Evidence Exists that One May be Granted if a Proceeding is Instituted. This factor favors institution or is,

at worst, neutral. There has been little investment by the parties. The early stage of the litigation and potential simplification (resulting from the Board invalidating all asserted claims of the '382 Patent) weighs against the exercise of discretion.

Factor 2 - Proximity of the Court's Trial Date to the Board's Projected Statutory Deadline for a Final Written Decision. This factor weighs against discretionary denial. This case is at its early stages, the counterclaim asserting the '382 Patent was filed in September 2022. *See* Ex. 1014 Further, Patent Owner only identified asserted claims and served infringement contentions on January 30, 2023, and Patent Owner supplemented these contentions on June 21, 2023. Ex. 1018. The schedule in the Underlying Litigation does not yet include a date for a *Markman* hearing, much less a trial date. *See* Ex. 1015. Further, the current case schedule does not include a date for the close of fact discovery, the beginning of expert discovery, or dispositive motions. Put simply, much more of the Underlying Litigation lies ahead than behind.

Further, according to the latest court management statistics, the average time from complaint to trial in the Northern District of Georgia—where the Underlying Litigation is Pending—is approximately 36 months. *See* Ex. 1016. Thus, conservatively, a jury trial would not occur in the underlying litigation until late 2025. Thus, a Final Written Decision is likely to be issued well before the date of any scheduled trial.

Factor 3 - Investment in the Parallel Proceeding by the Court and the Parties. This factor weighs against discretionary denial. The parties have made only minimal investment in this litigation to date. Plaintiff's infringement contentions identifying the asserted claims were served on January 30, 2023. *See* Ex. 1017. These contentions first identified the asserted claims, and Patent Owner supplemented these contentions on June 21, 2023. Ex. 1018. This fact weighs against the exercise of discretion, as the Board explained in *Fintiv*, where "the petitioner filed the petition expeditiously, such as promptly after becoming aware of the claims being asserted, this fact has weighed against exercising the authority to deny institution under *NHK*." *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 1 (PTAB Mar. 20, 2020) (precedential). Further, no substantive orders have been entered. Under these facts discretionary denial is improper. *See, e.g., Nokia of America Corp and Ericsson Inc. v. IPCOM, GMBH & Co. KG*, IPR2021-00533, Paper 10 at (PTAB Aug. 12, 2021).

Factor 4 - Overlap Between Issues Raised in the Petition and in the Parallel Proceeding. Petitioner challenges several claims of the '382 Patent that are not asserted in the Underlying Litigation. Exs. 1017-1018. Thus, there is no overlap with respect to some of the challenged claims.

Factor 5 - Whether the Petitioner and the Defendant in the Parallel Proceeding are the Same Party. This factor is neutral. The parties are the same,

but this is common in nearly every Petition filed where there is a co-pending litigation.

Factor 6 - Other Circumstances that Impact the Board's Exercise of Discretion, Including the Merits. Every element of the challenged claims is either expressly shown in the prior art or is obvious in view of well-known art. The strong merits of the grounds presented in this Petition further support institution. *Fintiv*, Paper 11 at 14-15.

X. Denial Under Section 325(d) is Inappropriate.

This Petition does not present “the same or substantially the same prior art or arguments previously were presented to the Office.” 35 U.S.C. §325(d). None of the prior art references used herein were cited in a substantive rejection during prosecution.

XI. Conclusion

In view of the foregoing, there is a reasonable likelihood that Petitioner will prevail with respect to claims 1-20 of the '382 Patent.

Respectfully submitted,

By: /s/ Matias Ferrario
Matias Ferrario
Registration No. 51,082

CERTIFICATE OF WORD COUNT

The undersigned certifies pursuant to 37 C.F.R. § 42.24(d) that the foregoing **Petition for Inter Partes Review** excluding any table of contents, mandatory notices, certificates of service or word count, or appendix of exhibits or claim listing, contains 13,773 words according to the word-processing program used to prepare this paper (Microsoft Word). Petitioner certifies that this **Petition for Inter Partes Review** does not exceed the applicable type-volume limit of 37 C.F.R. § 42.24(a).

Dated: August 11, 2023

By: /s/ Matias Ferrario
Matias Ferrario
Registration No. 51,082

CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the date below a copy of this **Petition for *Inter Partes* Review** has been served by Priority Mail Express® upon the following:

MYERS BIGEL, P.A.
P.O. BOX 37428
Raleigh, NC 27627

With a courtesy copy sent via email to litigation counsel in *Hisense USA Corporation v. Brightplus Ventures LLC*, No. 1:22-cv-02774 (N.D. Ga.).

Dated: August 11, 2023

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