

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. 9,605,835
Filing Date: February 2, 2015
Issue Date: March 28, 2017
Title: SOLID-STATE LUMINAIRES FOR GENERAL ILLUMINATION

Inter Partes Review No. IPR2023-01168

**PETITIONER'S CORRECTED OPPOSITION TO PATENT OWNER'S
CONTINGENT MOTION TO AMEND UNDER 37 C.F.R. § 42.121**

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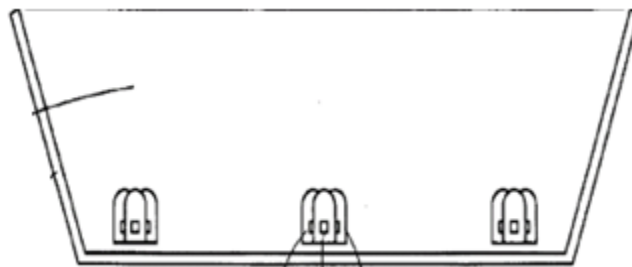
EXHIBIT	DESCRIPTION
1001	U.S. Patent No. 9,605,835 (“the ’835 Patent”)
1002	Prosecution History of U.S. Patent No. 9,605,835
1003	Declaration of Morgan Pattison, Ph.D.
1004	Curriculum Vitae of Morgan Pattison, Ph.D.
1005	US 2006/0227545 to Mok <i>et al.</i> (“Mok”)
1006	WO 03/056876 to Holman <i>et al.</i> (“Holman”)
1007	US 2005/0135115 to Lamb <i>et al.</i> (“Lamb”)
1008	US 2005/0265029 to Epstein <i>et al.</i> (“Epstein”)
1009	US 2006/0082698 to Ko <i>et al.</i> (“Ko”)
1010	US 2003/0118805 to Kretman <i>et al.</i> (“Kretman”)
1011	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)
1012	Scheduling Order in <i>Hisense USA Corp. v. Brightplus Ventures LLC</i> , No. 1:22-cv-02774, Dkt. 35 (N.D. Ga.)
1013	Judicial Caseload Profile for the Northern District of Georgia
1014	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.)
1015	Han-Ping D. Shieh, et al., <i>Micro-Optics for Liquid Cristal Displays Applications</i> , IEEE/OSA Journal of Display Tech., Vol. 1, No. 10, Sep. 2005.
1016	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
1017	US 2006/0083023 to Ayabe <i>et al.</i> (“Ayabe”)
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1019	US 2007/0188425 to Saccomanno (“Saccomanno”)
1020	Taiwanese Patent Application No. 93218806, entitled DIRECT TYPE BACKLIGHT MODULE/ DIRECT TYPE BACKLIGHT MODULE to Chang

1021	Certified Translation of Exhibit 1020, Taiwanese Patent Application No. 93218806, entitled DIRECT TYPE BACKLIGHT MODULE/ DIRECT TYPE BACKLIGHT MODULE to Chang (“Chang”)
1022	Declaration of P. Morgan Pattison, Ph.D. in Response to Patent Owner’s Contingent Motion to Amend
1023	US 2006/0186425A1 to Yano <i>et al.</i> (“Yano”)
1024	Rough Transcript of July 12, 2024 Deposition of William Bohannon
1025	Exhibit 8 to Deposition of William Bohannon, 3M United States, Prism Films
1026	Exhibit 9 to Deposition of William Bohannon, Vikuiti™ Brightness Enhancement Film (BEF) II
1027	Excerpts of Prosecution History of Application No. 13/657,141, entitled Solid State Luminaires for General Illumination, and to which the ’835 Patent Claims Priority

I. Introduction

Patent Owner failed to meet the requirements for amendment. The substitute claims enlarge the scope of the claims, inject new matter, fail to address the grounds of unpatentability, lack written description, and are indefinite.

Patent Owner's substitute claims also cover a well-known panel design that employs an angled reflector with angled side walls. This design is described in the prior art, including the prior art of record in this proceeding. A practically ubiquitous and common design for lighting panels employs a large reflective surface with angled side walls to form a light mixing chamber. LEDs sit within this chamber on the reflective surface. The perimeter of the reflector has angled side walls, upon which sit a diffuser, BEF, or other light management films. It looks like this:



Patent Owner now attempts to capture through substitute claims such well-known designs. This is improper. The '835 patent describes nothing of the sort. In fact, the '835 patent teaches away from such designs by distinguishing the need for light mixing chambers. Further, such designs are already disclosed in the prior art.

Patent Owner's substitute claims eliminate the aperture requirement, borrow angled sidewall disclosures from the now-eliminated aperture, and graft that onto the reflector, while at the same time broadening the substitute claims to recite that more than one LED that can be contained in the mixing chamber.

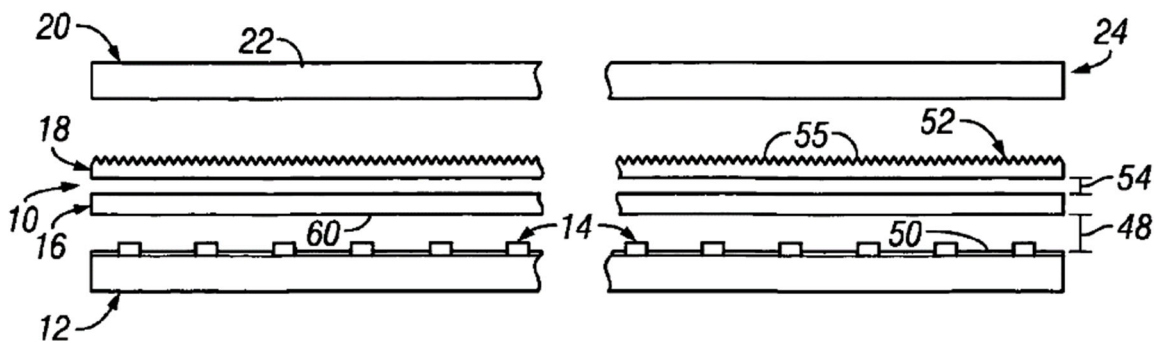
II. The Motion Fails to Comply with Section 316(d) Or Rule 42.121.

A. Patent Owner's Number of Substitute Claims Is Not Reasonable

Patent Owner's number of substitute claims is not reasonable. First, in the Appendix listing claims, proposed substitute claims 22, 23, and 25 depend from claim 1, not new substitute claim 21. Thus, claim 1 continues to be part of the contingent motion to amend and one could interpret Patent Owner's motion as containing ten claims (1-5 and 21-25) or six claims (1 and 21-25), neither of which is reasonable. Second, to the extent Appendix A contains typographical errors and Patent Owner meant to recite substitute claim 21 as the independent claim from which claims 22, 23, and 25 depend, the number of substitute claims is still unreasonable because (a) dependent claim 6 recites an element that has been eliminated in substitute claim 25 and (b) dependent claims 9, 10, 11, and 13 recite features (such as collimating light, diffusing light, recycling light) that have been eliminated or impacted by the cancellation of claims 2, 3, and 4. These deficiencies necessitate further amendments, which would necessarily multiply the claims.

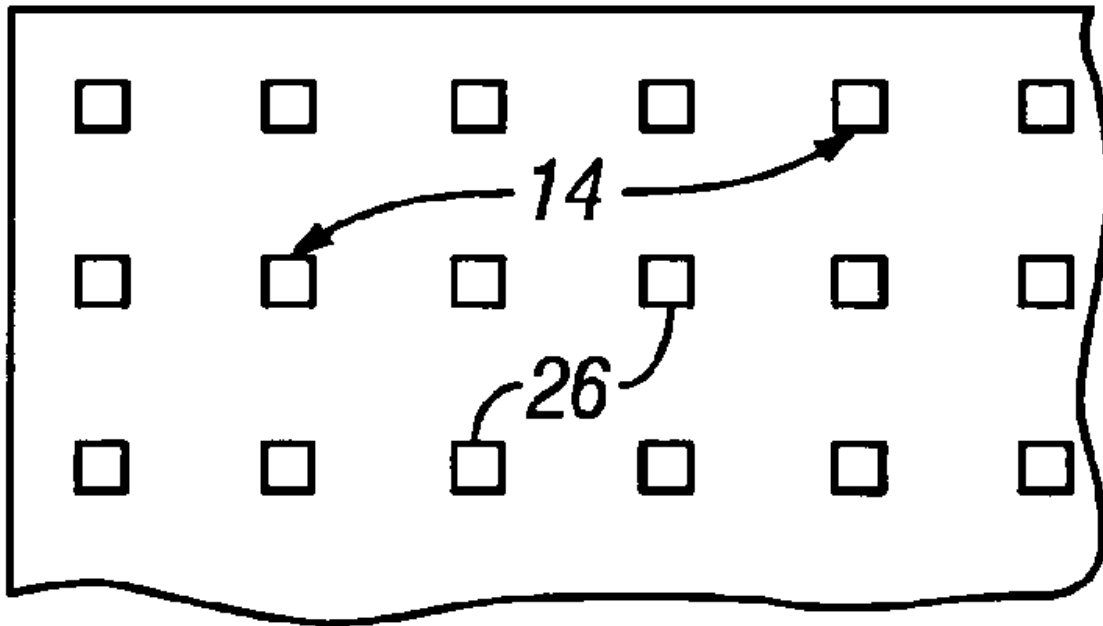
B. Patent Owner's Substitute Claims Do Not Respond to Grounds of Unpatentability Involved in the Proceeding

The Motion ignores the Board's construction of "on" that allows air gaps as intervening elements, which was also put forward in the Petition. Similarly, Patent Owner's expert failed to consider the Board's construction. Ex. 1024 at 137.¹ By ignoring this construction, Patent Owner has necessarily failed to respond to the grounds of unpatentability set forth in the Petition. Further, the substitute claims simply recite an angled reflector relative to the substrate, without limitation. A reflector may have an angle of 0° relative to the substrate. Such a configuration has already been shown to be invalid under the original grounds. *See Mok*, Figure 1 (reflector 50 lies along substrate 12). Thus, the substitute claims fail to respond to a ground of unpatentability.



¹ Patent Owner's expert opinion is not credible. He failed to analyze the Institution Decision in connection with his declaration. Ex. 1024 at 33-35. He failed to review the responsive claim construction briefs in the parallel litigation. *Id.* He failed to review other prior art or Patent Owner's related patents. *Id.* In all, he only reviewed what he was given by Patent Owner. *Id.* at p. 49-50 ("I work for the client. If they want me to review something, I review it.").

The Motion also fails to address Mok's reflective surface 50 that forms optical cavities for LEDs 14. As shown in the excerpt of Mok's Figure 2 below, the sidewall of the optical cavity is angled relative to the substrate (i.e., at a 90° angle) at the location of these optical cavities:



Thus Mok's reflective surface with angled sidewalls discloses Patent Owner's new claimed angled reflectors. The Motion should be denied.

C. The Substitute Claims Enlarge the Scope of the Original Claims.

It is improper to broaden the scope of challenged claims or remove features from a claim that result in a broader scope. *See Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 6 (PTAB Feb. 25, 2019) (precedential).

(1) Patent Owner Enlarged the Scope of Substitute Claims 21, 23, and 25 by Eliminating the “Aperture” Element and Including “At Least One” Lighting Device

Patent Owner improperly broadens its claims in several ways. For example, substitute claim 25 eliminates the aperture claim element previously present in claim 5. The specification describes (and the original claims claimed) that a reflector sheet contains apertures, with each aperture housing a “solid state lighting device[]” (e.g. LED). Ex. 1001, 3:42-51; 11:35-37, 11:48-51; Figs. 5A, 7.

By eliminating the concept of “apertures” around each LED, Patent Owner has expanded the claim scope. For example, Patent Owner now attempts to claim that the reflector “forms” an optical cavity. *See*, substitute claims 23 and 25. But the specification is clear – it is the sidewalls of *the aperture* that form an optical cavity, not the reflector. ’835 Patent 3:46-51 (“Respective ones of the apertures may include angled sidewalls to thereby form reflective optical cavities around the corresponding ones of the plurality of solid state lighting devices”); *see also*, 11:48-51 (“[T]he apertures 42 may be circular apertures, and may have a sidewall 42A that is angled with respect to the surface of the tiles 10, thereby forming reflective optical cavities around the lighting elements 12.”). Eliminating the term “aperture” enlarges the scope of the claim as now the reflector can “form” an optical cavity without the need for an aperture in the reflector.

Substitute claims 23 and 25 enlarge the claims in other ways. For example, the amendments recite that the reflector forms optical cavities around “at least one” solid state lighting device (e.g. LED). But by including the term “at least one,” Patent Owner has expanded the scope of substitute claims 23 and 25 because the reflector may now have angled sidewalls at the outer perimeter of the lighting panel and include multiple LEDs. Such a design finds no support in the specification whatsoever and enlarges the scope of the claim by eliminating the one-to-one correspondence between each aperture and solid state lighting device. In a similar way, substitute claim 21 has been expanded by now reciting that the reflector may be angled. As described in the specification and required by the original claims, only the apertures had angled side-walls with respect to the surface of substrate.

(2) Patent Owner Enlarged the Scope of Substitute Claims 21, 22, and 24 by Removing the Requirement that the Reflector Be Parallel to the Substrate and Only “Contact” the Diffuser.

The amendments further broaden substitute claims 21, 22, and 24. For example, original claim 1 recites a substrate “parallel to the principal plane of the lighting panel,” but, as written, the claimed reflector of substitute claim 21 is not parallel to the principal plane of the lighting panel. Original claim 1 also recited a reflector “on the first side of the [] substrate.” Accordingly, the reflector on the first side of the parallel substrate would also have to be parallel to the principal plane of the lighting panel, just as the substrate is required to by the claim. Substitute claim

21, expands the claim to read on an angled reflector, which removes the requirement that the reflector be on the parallel-to-the-principal-plane substrate. In other words, the reflector can now both extend (and be parallel with the substrate) and be angled (and not parallel with the substrate).

Further, original claim 1 required that the diffuser be “on” a reflector that was extended and parallel to the principal plane of the lighting panel. And “on” meant directly on, or on with intervening elements present. Thus, the diffuser of claim 2 and 4 would be on a reflector and in direct contact along the entire length of the reflector/diffuser interface. Substitute claims 22 and 24 simply require “contact” at *some point* between the interface of the reflector and the diffuser. And by amending the claims to recite an angled reflector, substitute claims 22 and 24 are broadened to encompass a design where a reflector, with angled sidewalls at the perimeter of the lighting panel, can “contact” the diffuser at discrete points along the perimeter edge.

D. The Substitute Claims Add New Matter and Violate the Written Description and Definiteness Requirements

The fundamental failures of the substitute claims fall into two categories. First, the substitute claims eliminate the aperture requirement and broaden the previously claimed extended, parallel reflector to a reflector with angled side-walls. Second, the substitute claims introduce the term “contact” to describe a positional relationship between elements of the lighting panel in a way that allows a new and undescribed physical connection between the diffuser and reflector.

As to an angled reflector, there is simply no support in the specification for angled reflectors. Rather, angled sidewalls are only described in the specification as pertaining to apertures in the reflector. Ex. 1001, 3:42-51; 11:35-37, 11:48-51; Figs. 5A, and 7. In fact, the entire specification is directed to a stacked arrangement of substrate, reflector, diffuser, and BEFs. Further, during prosecution of related patents the Patent Owner distinguished this very concept. *See, e.g.*, Ex. 1027 at 11 (“In contrast [to Saccomanno’s light mixing chamber], Applicants have discovered that no such mixing chamber may be necessary, and the reflector sheet can be placed parallel to the principal plane of the lighting panel.”); *see also id.* at 25 (same). These light mixing chambers—which Patent Owner distinguished from the claimed invention—contain reflectors with angled sidewalls.

Additionally, there is no written description support for any metes or bounds of the term “angled” as recited in substitute claim 21. Thus, an angle could be 0° (i.e., parallel), 90° (i.e., perpendicular), or anything in between. There is no support in the specification for any particular range of angles, and no guidance as to what constitutes an appropriate angle.

Moreover, the fact that “the reflector is *extended and angled*” is similarly unbound. It could mean that the reflector is perpendicular to the substrate and extends upward from the substrate. Or it could mean that some portion of the reflector is parallel to the substrate and some portion is angled (at some unspecified

angle) to the reflector. Such broad and imprecise claim language is indefinite, especially when measured against the lack of disclosure in the specification. Even Patent Owner's expert explained, when discussing the prior art, that one of skill in the art would need more information before understanding if or how a sidewall is angled. Ex. 1024 at 145:7-9 ("if somebody is describing an angle or for whatever reason they show it as an angle, they do a – they do an angular diagram and give it a name and call it out and say this angle is such and such..."). Finally, depending on how the limitation is interpreted, the substitute claims now require the reflector to be angled relative to the surface of the substrate. Yet, the claim also requires that the substrate be a plane that is parallel to the reflector. A reflector cannot be both angled and parallel to a plane defined by the substrate.

As to the Patent Owner's use of the term "contact", such term finds no *ipsis verbis* support in the specification when discussing lighting films or reflectors. *Nuvo Pharm v. Dr. Ready's Lab.*, 923 F.3d 1368 (Fed. Cir. 2019) (holding that even where language appears in *ipsis verbis* Section 112 may not be met). More importantly, no embodiment, figure, or text describes or explains the scope or bounds of what it means for an element of the display to be in contact with another. As opposed to the term "on," which the specification defines in detail, the specification provides no guidance, for example, as to whether contact means to directly contact something or whether contact can be indirect, such as through an intervening element. Finally, as

described *infra*, given the other changes to the claims, the use of the term contact may cover a design or embodiment that was previously in the prior art and was disclaimed and criticized by Patent Owner in related prosecution.

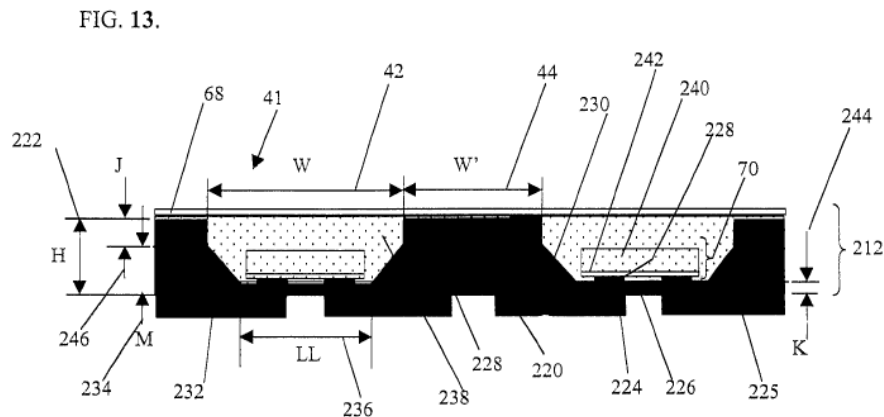
III. The Proposed Substitute Claims 21-25 Are Not Patentable in View of the Prior Art Used in the Original Grounds.

A. Substitute Claim 21: Prior Art Involved in the Original Grounds Discloses Extended and Angled Reflectors

Patent Owner is wrong that Mok is silent about an angled reflector. Mok discloses a reflective surface 50 on base panel 12 (e.g. PCB) with mounted light emitting elements 14. *See, e.g.*, Ex. 1005 at Fig. 1; [0021]. Mok also discloses that the light emitting elements 14 comprise a reflector cup 32 that may be formed the base portion. *See, e.g., id.* at Fig. 3; [0027]-[0028]; Ex. 1022 at ¶12. Further, Mok disclose a reflective coating 58 provided within the reflector cup. Ex. 1022 at ¶12. To the extent Mok's reflective coating 58 is not deemed a reflector, it would have been obvious to modify Mok's reflector to cover the angle sidewalls of reflector cup 32. Ex. 1022 at ¶13. For example, Mok discloses that "the reflective surface 50 may be deposited directly on the base panel 12 by any of a wide range of processes...." Ex. 1005 at [0021]. And it would have been obvious to deposit reflective surface 50 directly on all surfaces, including the sidewalls of reflector cup 32. Ex. 1022 at ¶13. Even Patent Owner's expert recognized that Mok disclosed that reflective surface and surface of the reflector cup 32 can be made or plated with the same reflective

material. Ex. 1024 at 147:1-23. Thus, Mok discloses reflective surfaces 50 and 58 that are both extended and angled with respect to the substrate. Ex. 1022 at ¶¶12-13.

Patent Owner is also wrong that Holman is limited to a flat reflecting layer 76. For example, Holman's sloped sidewalls 230 are angled and reflecting. *See* Ex. 1006, FIG. 13-15; *See also*, Ex. 1024 at 162:9-18 (Patent Owner's expert agreeing). Holman also discloses LEDs 70 mounted on composite reflective base layer 220 (reflected cavity structure layer laminated to insulating layer 225). Ex. 1022 at ¶¶14-15. Sloped sidewalls 230, with angle α , can be the same material as the base layer or a deposited material. *See* Ex. 1006 at Figure 13-15 and pp. 38-40. Holman's disclosures and teachings relative to Figures 7 and 8 are explicitly linked by Holman to its teachings relative to Figures. 13-15. *See* Ex. 1006 at 40.



Id. at Fig. 13; Ex. 1022 at ¶¶15-16.

Patent Owner is also wrong that Lamb's shaped reflector 17 is not angled and extended with respect to the substrate.

Lamb discloses that it was known in the prior art to shape a reflector that is both angled and extended. Ex. 1007, at Fig.

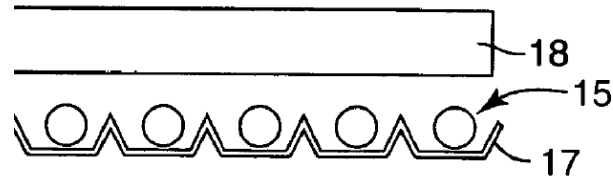


FIG. 1
PRIOR ART

1; [0304]-[0035]. To the extent Patent Owner argues that Lamb does not disclose a substrate or base layer, such would have been obvious to one of skill in the art. Ex. 1022 at ¶¶17-18.

Patent Owner is also wrong that Epstein is silent about a reflector angled and extended with respect to the base panel. Epstein discloses a reflective surface that may be “parabolic, elliptical or have some other shape.” Ex. 1008 at [0107], Fig. 18A and B; Ex. 1022 at ¶¶19-20

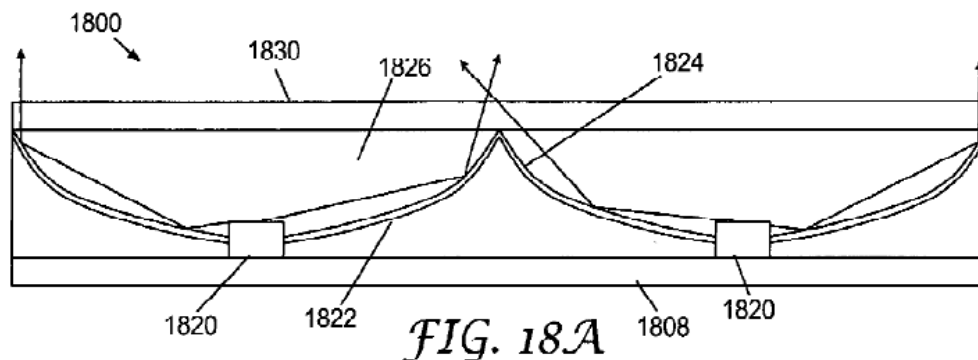


FIG. 18A

A curved shape, including a parabolic shape is both angled and extended at different points along its surface. Ex. 1022 at ¶¶19-20. Epstein's disclosure of “other shapes” would also encompass extended and angled reflective surfaces in view of such

disclosures in other prior art of record, including but not limited to, Mok and Holman. Epstein's Figure 20B also discloses a reflective surface that is extended and angled relative to a base layer 608 as shown below. *Id.* at Fig. 20B; *see also* [0096].

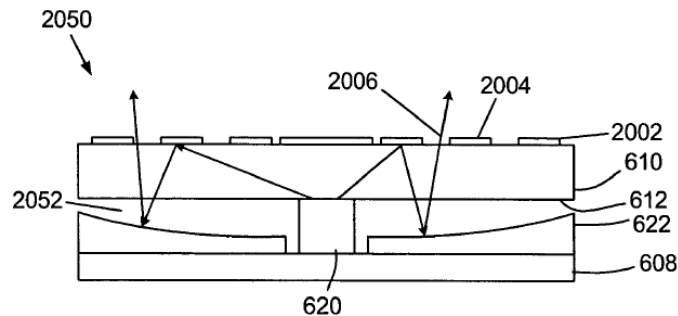


FIG. 20B

Additionally, as set forth in the Petition, Epstein's reflector with apertures 423 also disclosed extended and angled reflectors. *See* Paper 1 at 46, Ex. 1003 at [0048].

In short, Patent Owner has focused only on specific embodiments or figures in the prior art, and myopically misconstrued those disclosures. Patent Owner has failed to identify or distinguish the other, and in some cases broader, disclosures of the prior art. Such teachings, disclose or render obvious the new features of the substitute claims.

B. Substitute Claims 22 and 24: Prior Art Involved in the Original Grounds Discloses a Diffuser Sheet that Contacts the Reflector.

Patent Owner argues that the prior art that forms the grounds fail to disclose a diffuser sheet that contacts the reflector. Patent Owner is wrong.

For example, Mok discloses that the diffuser may be mounted separated from a base panel by a distance 48. Ex. 1005 at [0023]. However, Mok also teaches that

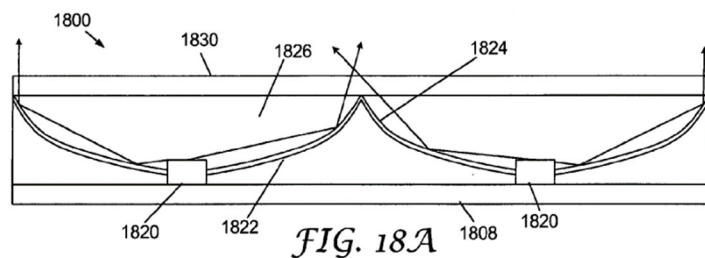
distance 48 may be 50 mm “or less”. *Id.* Zero is less than 50 mm. Moreover, Mok also teaches the benefit of having light conditioning layers, such as brightness enhancers and diffuser in contact with each other. *Id.* at [0025] (noting that it is preferable that the layers be in contact); Ex. 1022 at ¶¶23-24. This was a fact Patent Owner’s expert ignored when forming his opinions. Ex. 1024 at 139:6-16. Finally, Mok claims a diffuser “positioned adjacent said base panel”. Ex. 1005 at claims 13 and 17. As Dr. Pattison explains, Mok discloses or at a minimum renders obvious a diffuser in contact with the reflector. Ex. 1022 at ¶¶22-26.

Holman also teaches diffuser layers that contact the reflector. For example, Section 4.1.5 of Holman discloses a “fully integrated” LED panel. Ex. 1006 at 40-41; Ex. 1022 at ¶¶27-28. In Holman’s discussion regarding Figures 7, 8, 13, 14, 15, Holman teaches the variety of configurations that may be used in conjunction with the LEDs and the various considerations when determining the spacing between various components of the panel. Such teaching includes the disclosure that “[m]aking all media boundaries between the LED chips 70 and lower prism sheet layer 58 optically coupled increases the amount of output light 2019 emitted in higher angles, generally widening the beams angular extent.” *Id.* at 40. Holman further teaches that in some embodiments it is preferable to “couple” layers to the emitting cavities. *Id.* at 41; FIG. 15. Finally, Holman discloses that reflective base layer 220, which is reflected cavity structure layer laminated to insulating layer 225,

has angled sidewalls 230, which can be the same material as the base layer or a deposited reflective material. *See id.* at FIG. 13. Moreover, Figure 13 of Holman discloses that diffuse layer 68 contacts reflective base layer 220 and 225. *Id.* at pp. 39-41; *see also*, Ex. 1024 at 167:11-20 (Patent Owner’s expert agreeing diffuser 68 is in contact with reflective base layer 225); Ex. 1022 at ¶¶28-30.

Lamb also discloses a diffuser in contact with a reflector. For example, Lamb specifically provides that “the first recycling enhancement structure is attached to a surface of the first lightguide.” Ex. 1007 at [0015]. And in Lamb, the lightguide is the reflector, whereas the recycling enhancement structure includes a diffuser. *Id.* at [0036] (lightguide reflects light “from the surfaces 130a and 130b, e.g., by total internal reflection”) and [0013] (“[T]he first recycling enhancement structure may include ...a reflective polarizer and a diffuser...”); *see also, id.* at claim 30.

Epstein also discloses a diffuser in contact with the reflector. Ex. 1022 at ¶¶31-32. For example, in reference to FIG. 18A, Epstein discloses a reflector 1822 in contact with diffuser 1830.



In short, the prior art that forms the basis of one or more grounds is replete with description, figures, and explanations as to the specific configuration claimed

in substitute claims 22 and 24, and the reasons why one of skill in the art would so arrange those elements. The Motion fails to address these disclosures in any way.

C. Substitute Claims 23 and 25: Prior Art Involved in the Original Grounds Discloses Optical Cavities Around a Solid State Lighting Device.

As discussed *infra*, prior art that are part of the Grounds already disclose extended and angled reflectors. These disclosures also disclose the formation of optical cavities around LEDs by the extended and angled reflectors. Examples of such disclosures, completely ignored by PO, include:

- Mok’s disclosure of a reflective cup 32 that form an optical cavity around the LED. Ex. 1005 at [0021], [0027]-[0028]; Figures 1, 3; Ex. 1022 at ¶34.
- Holman’s disclosures in Figures 13, 14, and 15 regarding the use of two-dimensional light source panels combining LED back planes with interior walls that are reflective and create a cavity. Ex. 1006 at p. 39-41; Ex. 1022 at ¶35.
- Lamb’s disclosure that for direct-backlit systems, it was well-known for the reflector to form optical cavities around each lighting source using “shaped reflectors.” EX. 1007 at FIG. 1 and [0034]-[0035]; Ex. 1022 at ¶36.
- Epstein’s disclosure that reflective sheet 1822 forms apertures that create an optical cavity around each LED 1820 disposed on substrate 1808. Ex. 1008 at [0106]-[0107] and Figs. 18A and 18B; Ex. 1022 at ¶37.

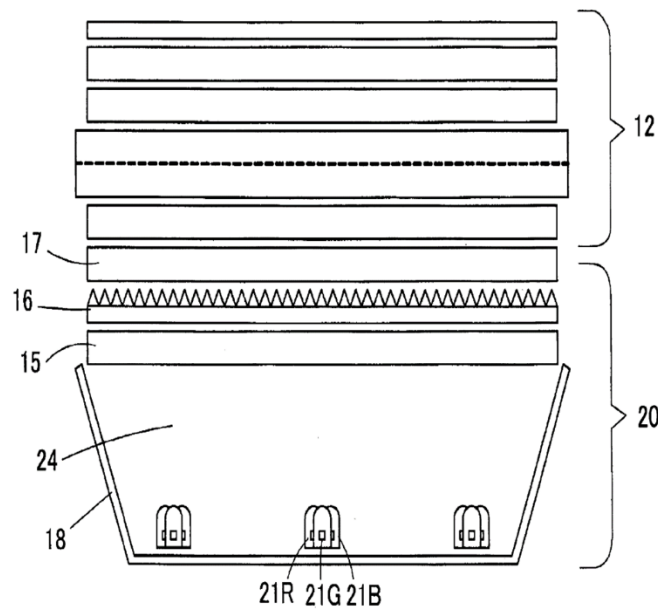
Each of these references, alone or in combination, teach and disclose the use of a reflector or reflective surfaces to form an optical cavity around one or more solid state lighting devices. Patent Owner's proposed substitute claims should be rejected.

IV. The Proposed Substitute Claims 21-25 Are Not Patentable in View of Other Prior Art, Including Prior Art of Record

A. The Prior Art Discloses Extended and Angled Reflectors that Form Optical Cavities

Substitute claims 21, 23 and 25 attempt to cover a design that was conventional and well-known in lighting panel design. In fact, such prior art was known to Patent Owner because it formed part of the prior art cited on the face of the '835 patent itself. Tellingly, Patent Owner fails to address even this prior art in its Motion, which reflects a lack of fidelity to its duty of candor before the Patent Office. Other prior art also disclose this feature.

For example, Ayabe (Ex. 1017) is cited on the face of the '835 patent and describes as "conventional" its configuration shown in Figure 2 that lighting panels used reflectors that are extended and angled and house more than one solid state lighting device. Ex. 1022 at ¶¶39-40.

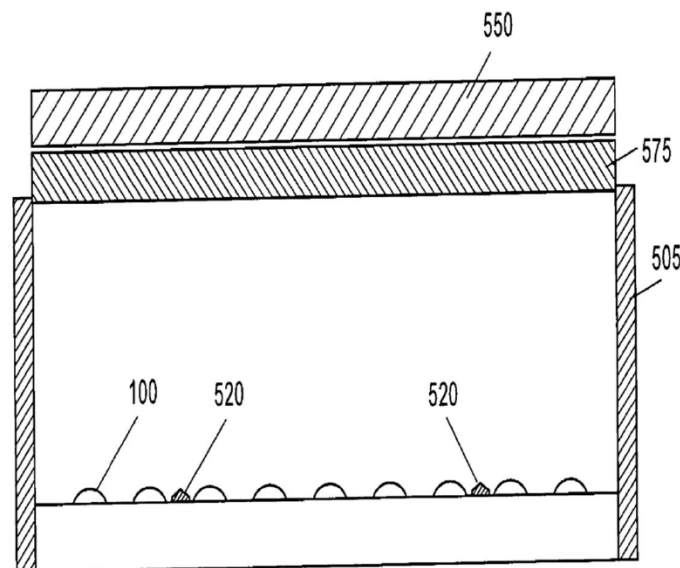


The conventional design in FIG. 2 is described by Ayabe as having a “reflective film 18”, “diffusing film 15”, and “brightness enhancing film 17”. Ex. 1017, Fig. 2, [0005] – [0008]. Ayabe further discloses that the reflector is both extended and angled, and that the reflector forms an optical cavity that houses more than one optical lighting device, e.g. LEDs. *Id.* at [0007] Ayabe’s other disclosures include extended and angled reflectors that form optical cavities via backward sloped surfaces of reflecting members that house solid state lighting sources. *See, e.g., Id.* at [0021]-[0024]; Figs. 32, 34-35; Claims 1-4, 6-7; Ex. 1022 at ¶41.

Roth (Ex. 1018), is also cited on the face of the ’835 patent and discloses the claimed features of substitute claims 21, 23, and 25. Ex. 1022 at ¶¶45-46. Roth shows a light emitting device structure 50 in which an LED is mounted on substrate 1. Ex. 1018 at [0024]. Roth discloses an angled reflector 31 on substrate 1 creating

an optical cavity. *Id.* at Fig. 2, [0028]. Roth also discloses that the substrate may be a metal substrate, which one of skill in the art would understand is reflective. *Id.* at [0030]. Thus, Roth discloses extended and angled reflectors that form an optical cavity around an LED. Ex. 1022 at ¶¶45-46.

Saccomanno (Ex. 1019), is also cited on the face of the '835 patent and discloses extended and angled reflectors that form optical cavities to house at least one LED. Ex. 1022 at ¶47. For example, Figures 4 and 5 of Saccomanno, and their accompanying description, disclose a lighting panel in which a reflector is extended and angled. *See, e.g.*, Ex. 1019, Figs. 4 and 5; [0038]-[0040]. Reflector 505 is angled at 90° relative to the substrate and also extends upwards, all of which forms an optical cavity around at least one LED. *Id.*

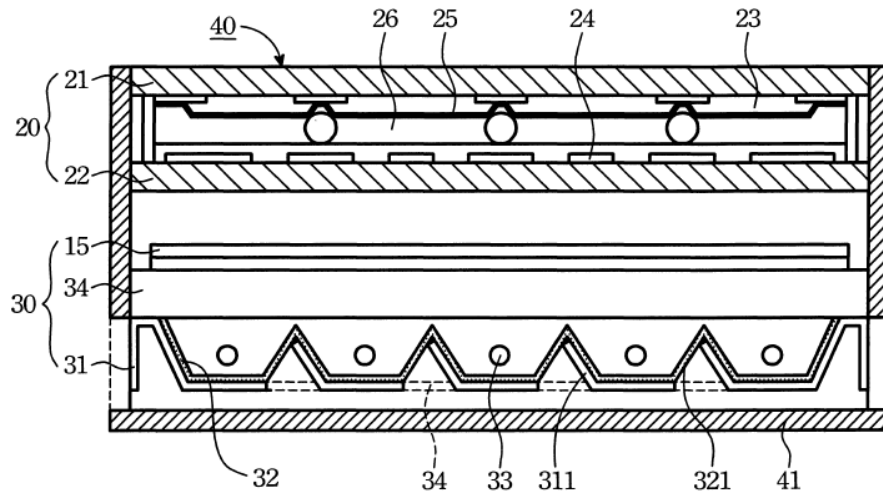


All of this was admitted by Patent Owner in the prosecution of the parent patent to the '835 patent. Ex. 1027 at 25 (“That is, Saccomanno uses the reflector

sheets 505, which are perpendicular to the panel and the BEF 575, to form a light mixing chamber in a direct backlighting arrangement.”).

Finally, Chang (Ex. 1021) also discloses this element in a backlight display.

Ex. 1022 at ¶¶50-51.



Chang relates to a direct backlight panel design that involves a base plate, reflector, lighting element, diffusion sheet, and optical film to enhance brightness. As shown in FIG. 6 of Chang, reflector 32 is angled and extended forming optical cavities around light emitting components 33, which can be LEDs.

B. The Prior Art Discloses Diffusers that Contact the Reflector

Substitute claims 22 and 24, which recite a diffuser in contact with the reflector, are also disclosed in the prior art

For example, Fig. 39 and accompanying text of Ayabe discloses backlight illumination system that uses a light emitting source array 77. Ex. 1022 at ¶¶43-44. As described by Ayabe, the illumination system describes a reflector sheet “affixed

to the inner surface of the casing 78.” Ex. 1017 at [0155]. Ayabe further discloses that optical components 80 and 81 can be, among other things, a “diffusing plate”. *Id.* As shown and described by Ayabe, the diffusing plate can be “installed in the interior or top surface of the casing 78.” *Id.* In either of these configurations, the diffuser would contact the reflector,² as annotated below.

Fig. 39

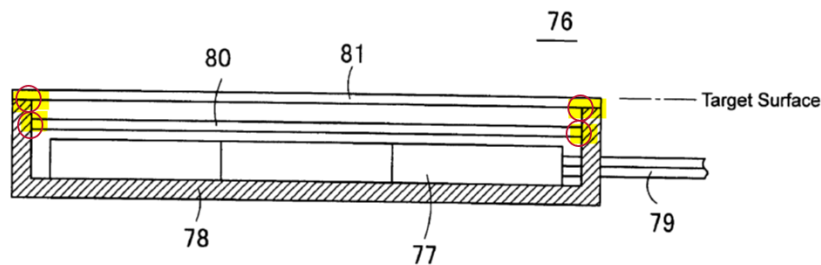


Figure 9 of Ayabe and accompanying text also discloses a reflector that contacts the diffuser. For example, light emitting source 49 is made with reflecting member 57. *Id.* at Fig. 32 and [0092]. Ayabe also discloses that “diffusing film 51” is “positioned on the front of light emitting source array 50 on which a plurality of light emitting sources 49 are arranged.” And although Fig. 9 shows the components in an exploded view, one of skill in the art would understand that the various components of the lighting array could be placed in direct contact with one another given Ayabe’s explicit disclosure that the diffuser is “positioned on” the light emitting source. Ex. 1022 at ¶¶43-44.

² This specific configuration of Ayabe also discloses a reflector that is extended and angled at 90° with respect to the surface of the substrate.

Saccomanno also discloses a reflector in contact with light management films, including light management films. Ex. 1019 at Fig. 5; [0039]-[0040] (describing and showing reflective surface 505 in contact with light management film 575). One of skill in the art would know that in addition to brightness enhancement films, diffusers are light managing films. Ex. 1022 at ¶49.

Finally, Chang discloses a reflector in contact with light films, including diffusers and brightness enhancement films. Ex. 1022 at ¶52 For example, Fig. 6 of Chang shows a diffusion sheet 34 directly on and in contact with reflector 32. Additionally, optical film 15, which can be a brightness enhancement film, is directly on diffusion sheet 34, which is directly on reflector 32.

V. One of Skill in The Art Would Have Been Motivated to Combine the Features of the Prior Art with Either Ground I or Ground II

To the extent Patent Owner argues that the features disclosed by the existing art or new art would not be combined with the current grounds, Patent Owner is wrong.

First, as to existing art, such as the disclosures of Holman and Epstein, those features are found explicitly in the art already of record. For the same reasons articulated in the Petition, such features would have been combined or used with the existing disclosures. More specifically, Holman's disclosures related to Figs. 13-15 are explicitly taught by Holman as relevant to FIG. 7. *See* Ex. 1006 at 41 ("The same type of integration applies to the arrangements of FIG. 14 and FIG. 7, and also to the

light sources of either FIG. 13 or FIG. 14 and the system of FIG. 8.”). Similarly, Epstein’s disclosures in Figures 19 and 20 simply provide additional details related to light extraction features that are part of, and consistent with, Epstein’s disclosures in Figs. 7 and 11. Accordingly, such teachings are readily combinable with the prior art in the Grounds as set forth in the Petition.

Second, as to new art, such disclosures are readily combinable with the existing grounds. For example, Ayabe was cited during prosecution of the ’835 patent. It relates to the same field of the invention, discusses common and well-known architectures for creating light mixing chambers, and is consistent with the overall aim of the ’835 patent, which is to improve the nature and quality of the light for lighting panel designs. Ex. 1022 at ¶55. Similarly, Roth was cited on the face of the patent and relates to improving the color of light, which would be of interest to anyone designing lighting panels. Saccomanno relates to, among other things, improving “diffusely illuminated LCD panels and with a collimated backlight comprising a plurality of LEDs.” Saccomanno. Finally, Chang relates to a backlight system with an arrangement of layers of optical films that are positioned “to increase the light uniformity of the entire display product and brightness.” Ex. 1021. at 6.

These disclosures would be highly relevant to one of skill in the art designing panels and attempting to improve lighting panel designs. As Dr. Pattison explains, the designs offered by these references would improve efficiency as well as the

quality and uniformity of light output by the backlight system. Ex. 1022 at ¶¶53-63. Thus, a person of ordinary skill in the art would be motivated to modify the art presented in the original grounds to include the additional disclosures of Ayabe, Roth, Saccamanno, or Chang to provide increased efficiency and more on-axis light. Ex. 1022 at ¶¶53-63.

VI. Conclusion

Patent Owner's substitute claims reflect a complete lack of fidelity to the rules governing motions to amend. The Board should use its inherent power to bar Patent Owner from further amending claims in this proceeding, or related proceedings.

Respectfully submitted,

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 **PETITIONER'S CORRECTED OPPOSITION TO PATENT OWNER'S CONTINGENT MOTION TO AMEND** has been served via email on the following:

hni@nilawfirm.com
twang@nilawfirm.com
nmassand@nilawfirm.com

Dated: July 19, 2024

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