

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 SUR-REPLY TO REPLY TO OPPOSITION TO PATENT
OWNER'S REVISED MOTION TO AMEND**

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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 PO 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 PO’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 PO’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”)
1018	US 2005/0274972 to Roth <i>et al.</i> (“Roth”)
1019	US 2007/0188425 to Saccomanno (“Saccomanno”)
1020	Taiwanese Patent Application No. 93218806, entitled DIRECT TYPE BACKLIGHT MODULE/ DIRECT TYPE BACKLIGHT MODULE to Chang

EXHIBIT	DESCRIPTION
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
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1024	Rough Transcript of July 12, 2024 Deposition of William Bohannon
1025	Exhibit 8 to Deposition of William Bohannon, 3M United States, Prism Films
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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
1028	Final Transcript of July 12, 2024 Deposition of William Bohannon
1029	US 2005/0231943A1 to Sloan <i>et al.</i> (“Sloan”)
1030	Korean Patent Application No. KR20050012372A, entitled “Luminescent diode package and method for manufacturing led package” to Park (“Park”)
1031	Certified Translation of Exhibit 1030, Korean Patent Application No. KR20050012372A, entitled “Luminescent diode package and method for manufacturing led package” to Park (“Park”)
1032	Chinese Patent Application No. CN1693962A, entitled “LED backlight system of packing LED using three primary colors (RGB)” to Li <i>et al.</i> (“Li”)
1033	Certified Translation of Exhibit 1032, Chinese Patent Application No. CN1693962A, entitled “LED backlight system of packing LED using three primary colors (RGB)” to Li <i>et al.</i> (“Li”)
1034	US 2005/0047134A1 to Mueller <i>et al.</i> (“Mueller”)

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1035	US 2007/0046485A1 to Grootes <i>et al.</i> (“Grootes”)
1036	Declaration of P. Morgan Pattison, Ph.D. in Response to Patent Owner’s Revised Contingent Motion to Amend

I. Introduction

PO's proposed substitute claims are aimed at panel designs with components that were well-known in the art as of the priority date of the '835 Patent. PO's Reply merely reiterates the same arguments in PO's Revised Motion to Amend. The substitute claims are unpatentable.

II. The Substitute Claims Violate the Written Description Requirement

As set forth in the Opposition, the substitute claims lack written description support. The Reply points to Figure 1 as support for substitute claim 21's metal core printed circuit board (MCPCB) that is "mounted on a lighting tile." But PO never identified Figure 1 as written description support for substitute claim 21 in its revised Motion to Amend, and Figure 1 does not provide support. In fact, the support PO pointed to says only that "solid state lighting tile 10 ... may include a metal core PCB (MCPCB)." Ex. 1001, 8:20-33. It makes no mention of a MCPCB "*mounted on* the lighting tile" as recited in claim 21. PO's argument that "Fig. 1 further demonstrates a lighting tile that includes multiple components and elements, and all such elements, and the substrate to which the elements are mounted, can be mounted on the lighting tile" is unsupported attorney argument without any citation to the specification or any other evidence. Reply at 1. Indeed, neither the Specification nor Figure 1 shows any "*substrate* to which the elements are mounted" separate from

the “lighting tile 10,” let alone that the substrate “*can be mounted on the lighting tile.*” *Id.*

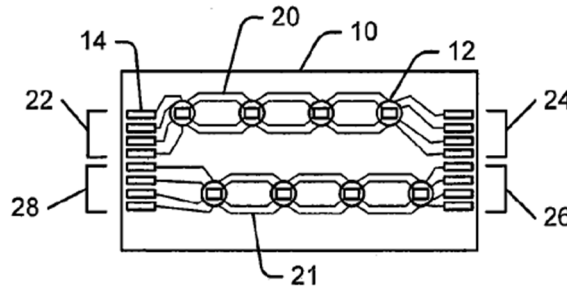


FIGURE 1

Ex. 1001, Fig. 1.

Similarly, neither Figure 1 nor its corresponding description describes a separate MCPCB that is mounted on the lighting tile. Rather, the Specification makes it clear that a MCPCB is a part of the lighting tile itself. Ex. 1001, 8:27-33. The '835 Patent never describes a MCPCB “mounted on” a lighting tile.

More importantly, the '835 Patent never describes “a *separate* lighting tile” from a substrate, which PO repeatedly relies upon in attempting to distinguish the prior art. Reply at 2-7. To the extent such a separation between the lighting tile and the substrate is the linchpin to patentability of the revised claims, the '835 Patent does not describe it in sufficient detail that one skilled in the art can reasonably conclude that the inventor had possession of the claimed invention. *See, e.g., Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1319 (Fed. Cir. 2003). Further, the only support PO provides for substitute claim 21 is based on the issued patent—

not the original disclosure, which is also improper. 37 C.F.R. § 42.121(b)(1) and (2); *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 (PTAB Feb. 25, 2019) (precedential).

Claim 21 and all its dependents are unpatentable at least for failure to meet written description requirement and statutory and regulatory requirements for amending claims in an IPR.

III. The Substitute Claims Are Not Patentable in View of the Prior Art

PO's Reply presented arguments only with respect to the claim elements discussed below. As the Opposition sets forth, all substitute claims, including those not addressed herein, are unpatentable in view of the prior art.

At the outset, PO's denial of prior art disclosures of each element of independent claim 21 (i.e., claim elements 21[a]-[c], [g], and [h]) is premised on importing a nonexistent limitation into the claim—namely a PCB mounted to a “separate” lighting tile. PO Reply at 2-7. But the claim language reads “at least one substrate comprising a metal core printed circuit board having traces formed thereon mounted on a lighting tile.” There is no requirement that the lighting tile be separate from the PCB as PO urges. PO's attempt to include unstated limitations should be rejected. *See, e.g., N. Telecom Ltd. v. Samsung Elecs. Co.*, 215 F.3d 1281, 1290 (Fed. Cir. 2000) (“This court has repeatedly and clearly held that it will not read unstated limitations into claim language.”).

A. The Prior Art Discloses Substitute Claim 21[a]

To the extent substitute claim element 21[a] has sufficient support in the '835 Patent, this claim element is disclosed by the prior art. Indeed, Mok's disclosure mirrors the disclosure of the '835 Patent. Mok teaches a base panel, a PCB, and LEDs that may be mounted to the base panel. *See* Ex. 1005, [0019]; Ex. 1036, ¶13-15. Mok also states, for example, that "it will be convenient in most applications for the base panel 12 to comprise a printed circuit board." Ex. 1005, [0019]. Similarly, the '835 Patent's description of the tile and MCPCB is "a tile 10 may include a metal core PCB." Ex. 1001, 8:30-31; *see also*, Reply at 1 ("comprise' ... 'includes' the presence of the stated features.").

Epstein also discloses substitute claim 21[a], describing a tile 304 and a separate substrate 308/408. Ex. 1008, [0039]; Figs. 3B-C. The substrate 308/408 may be a MCPCB. *Id.*, [0039], [0046], [0051]; Ex. 1036, ¶16-17.

Contrary to PO's assertion, the prior art, including at least Mok and Epstein, discloses "a substrate having a first side parallel to a principal plane of a lighting panel" as well. Reply at 2-3. Figure 5A of '835 Patent shows the principal plane 76 of lighting panel as a horizontal plane parallel to the substrate (tile; panel) 10. *See, e.g.*, Ex. 1001, 11:20-34, Fig. 5. Each of the cited prior art references shows a similar horizontal principal plane of the lighting panel and a corresponding side parallel to the horizontal principal plane of the lighting panel. *See, e.g.*, Ex. 1005, [0019], Fig.

1; Ex. 1008, [0039], [0046], [0051], Fig. 4A; Ex. 1031, p. 3 (“LEDs are made in the form of a surface mount device (SMD) in order to be directly mounted on a printed circuit board (PCB)”); Ex. 1033, 8, Fig. 4.

B. The Prior Art Discloses Substitute Claims 21[b] and 21[c]

PO does not dispute that the Mok-based grounds satisfy these claim elements. Reply at 3. As to Epstein-based grounds, PO misunderstands and mischaracterizes Epstein’s mapping. As set forth above with respect to substitute claim 21[a], Epstein discloses a tile 304 with a number of layers, including, for example, a substrate 308 and light emitting elements 306. Ex. 1008, [0039]. These separate layers, such as the LEDs 306 and substrate 308, are shown in Figure 3B and 3C. *Id.* Despite Epstein’s use of different reference numbers and the explicit disclosure, as well as Petitioner’s explanation, PO incorrectly reads that “the lighting elements 306 *are* the tile” and denies Epstein’s disclosure of these elements based on the misreading. *Id.*; Reply at 3 (emphasis added); Opposition to rMTA at 5-6. Rather, as shown in Figure 3B-3C, the lighting elements 306 are arranged on the first side of the substrate 308 and mounted on the tile 304, as required by substitute claim elements 21[b] and 21[c]. *See id.*, Fig. 3B; Ex. 1036, ¶16-17.

C. The Prior Art Discloses Substitute Claim 21[g]

Contrary to PO’s conclusory allegation, each of Mok, Epstein, and Li discloses a reflector mounted to a lighting tile and on a substrate. *See*, Opposition at

11-13. PO also acknowledges that each of these references discloses a reflector on a substrate, stating “Mok demonstrates a reflective surface 50 affixed to base panel 12. Epstein discloses an intermediate layer 422/522/622 mounted on substrate 408. Li discloses a reflector on a PCB.” Reply at 4.

PO appears to dispute that the reflector in these references is also mounted to a lighting tile. PO bases this incorrect conclusion on its argument that Mok, Epstein, and Li do not teach a MCPCB on a tile, which, as set forth above, is simply wrong. *See* § III.A-B *supra*. Li similarly discloses LEDs mounted to a MCPCB. Ex. 1033, 8; Ex. 1036, ¶18. To the extent that Li does not disclose that this MCPCB is also mounted to a separate lighting tile, such a modification would be obvious to a POSITA in light of the disclosures of Mok and Epstein. Indeed, Epstein states that LED arrays are “commonly formed as a tile.” Ex. 1008, [0002]. The use of a common, well-known lighting tile, as shown in Mok or Epstein, in combination with Li is a simple modification. *See* Ex. 1036, ¶80-83, 85, 89, 92. Such a modification would also have the benefit of better heat dissipation and durability than Li’s MCPCB would provide. *Id.*, ¶14-15.

Further, substitute claim 21[g] simply recites a reflector mounted to a lighting tile and “on” a substrate. The claim does not require that the reflector be ***directly on*** the lighting tile and substrate. As stated in the ’835 Patent, “when an element such as a layer, region or substrate is referred to as being ‘on’ or extending ‘onto’ another

element, it can be directly on or extend directly onto the other element or intervening elements may also be present. In contrast, when an element is referred to as being ‘directly on’ or extending ‘directly onto’ another element, there are no intervening elements present.” Ex. 1001, 6:66-7:5. In Mok, Epstein, and Li, regardless of intervening layers the reflector is still both on the tile and the substrate within the meaning of the ’835 Patent.

Moreover, PO does not dispute that Mok, Epstein, and Li also all disclose a “reflector being outside of the packaged solid state lighting devices.” *See* Opposition at 11-12.

D. The Prior Art Discloses Substitute Claim 21[h]

PO first argues that substitute claim 21[h] is not met by the prior art because “none of the prior art references disclose the claimed lighting tile requirement.” Reply at 5. For the same reasons set forth above with respect to substitute claims 21[a] and 21[b], the prior art discloses a lighting tile and PO’s allegation fails. *See* § III.A-B *supra*.

The prior art also discloses a reflector that extends to cover the lighting tile and includes sidewalls outside of the packaged solid state lighting devices that are angled with respect to the principal plane of the lighting panel. For example, with respect to sidewalls of the reflector (intermediate layer 422/522/622) “that are angled with respect to the principal plane of the lighting panel,” PO appears to conflate the

actual claim term “the principal plane of the lighting panel” with the LED and incorrectly concludes that Epstein does not meet this claim element because Epstein’s “apertures are completely parallel to LEDs.” Reply at 6. Regardless, as set forth in the Opposition, Epstein clearly shows in Figures 5 and 6 that “the aperture in the intermediate layer 522/622, which is a reflector ... would have sidewalls that ... necessarily would be angled, rather than in parallel with, the principal plane of the lightning panel to form the aperture and create the space to accommodate the LED.” Opposition at 13; Ex. 1036, ¶50-51.

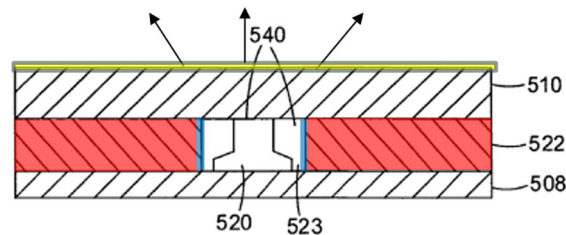


FIG. 5D

Ex. 1008, Fig. 5D (annotated).¹

Also, Epstein’s reflector 622 is angled with respect to the principal plane of the lighting panel in other figures. *See, e.g.*, Ex. 1008, Fig. 20B. That Epstein discloses a reflector that is angled with respect to the principal plane of the lighting

¹ Epstein explains that Figures 5A-5D all show cross-sections demonstrating “principles of the present invention.” Ex. 1008, [0016]. Epstein makes clear that all such embodiments are readily combinable. *Id.*, [0123] (“Various modifications, equivalent processes, as well as numerous structures to which the present invention may be applicable will be readily apparent to those of skill in the art to which the present invention is directed upon review of the present specification.”)

panel is also supported by the testimony of Dr. Pattison. *See* Ex. 1036, ¶51. PO's argument, however, is devoid of evidentiary support either from PO's purported expert or otherwise.

Because substitute claim 21[h] is disclosed by Epstein, PO's arguments with respect to Holman, Li, Lamb, Ayabe, and Saccomanno are all futile. But each of these references disclose substitute claim 21[h] as well. Similarly, with respect to Holman, PO argues only that the sidewalls of the reflector are not outside of the LED package. However, Holman describes and shows in Figure 14 LED chips 70 that are packaged in transparent LED substrates 240—a component which is entirely separate from the reflective sloped sidewalls 230. *See, e.g.*, Ex. 1006, 38, 88. Next, Li discloses a reflector that is formed as a “box,” and thus has sidewalls with a 90-degree angle. *See, e.g.*, Ex. 1003, 8. And each of Lamb, Ayabe, and Saccomanno disclose a reflector that is angled with respect to the principal plane of the lighting panel, as defined by the LEDs and the direction of light. *See, e.g.*, Ex. 1006, [0039], Fig. 1; Ex. 1017, [0091]-[0092], Figs. 1, 15; Ex. 1019, [0038]-[0039], Fig. 5.

E. The Prior Art Discloses Substitute Claim 22

Substitute claim 22 is disclosed by the prior art because it merely recites a conventional LED design well-known in the art, as evidenced by the various disclosures of Mok, Holman, Li, and Park. For example, Mok describes a lens that is “formed over” each LED and reflector cup. *See* Ex. 1005, [0029], Fig. 3. PO

argues, however, that claim 22 requires a “separate lens component” that must be outside of the LED package. Reply at 8. But that requirement is nowhere in the language of substitute claim 22, which requires only “the lens surrounds each of the packaged solid state lighting devices.” Thus, whether the lens component is separate from, or outside of, the LED package is not relevant to whether substitute claim 22 is disclosed by the prior art. *See, e.g., N. Telecom*, 215 F.3d at 1290.

In any event, even if substitute claim 22 did require a “separate lens component,” this was well-known in the prior art and disclosed by Mok. As shown in Figure 3 of Mok, “[t]he lens 36 ... may be formed in accordance with any of a ***wide range*** of processes known in the art for ***providing lenses to LED packages***,” is entirely separate from the LED package. Ex. 1005, [0029] (emphasis added), Fig. 3.

PO’s unsupported attorney argument that a lens “surrounding” the LED must entirely cover the LED package from all sides also fails. Reply at 8. Such a requirement would render the claims inoperable when read in conjunction with the limitations of substitute claim 21, which instead requires that the LED packages be mounted on a MCPCB and tile, with angled sidewalls of a reflector on the outside of the LED packages. Mok and Li disclose lenses with the same function as the lens in the ’835 Patent. *See* Ex. 1005, [0029], Fig. 3; Ex. 1033, 10; Ex. 1036, ¶¶63-64, 80-85. Moreover, as Dr. Pattison explains, lenses are used to allow for greater amounts of light to be captured by the lens, leading to uniform light output. Ex. 1036, ¶¶64.

Thus, a POSA would recognize that surrounding packaged LEDs with a lens would be an obvious implementation of well-understood optical design principles.

F. The Prior Art Discloses Substitute Claim 23

A generally planar diffuser that contacts the sidewalls of the reflector with no intervening elements is disclosed by the prior art.

PO argues that the reflector sheet of Epstein (intermediate layer 622) does not have sidewalls, and thus does not disclose sidewalls that are in contact with the planar diffuser (guiding layer 610). However, the LED 620 in Epstein is placed in the middle of the intermediate layer 622. Ex. 1008, [0074]-[0075], Fig. 11. Thus, the intermediate layer must have sidewalls to accommodate for LED 620 that is placed in the center of the layer 622. *Id.* Those sidewalls are in contact with guiding layer 610 as shown in Fig. 11. *Id.*; Ex. 1036, ¶65.

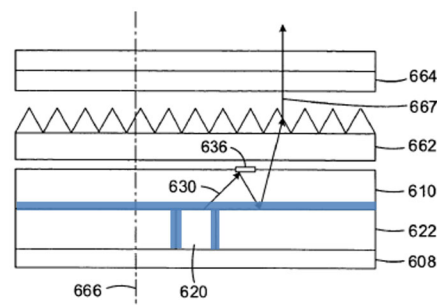


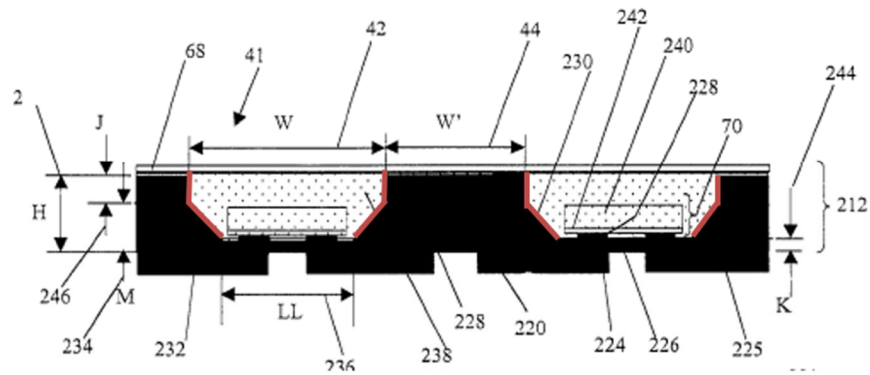
FIG. 11

Ex. 1008, Fig. 11 (annotated).

Holman discloses substitute claim 23 as well. PO argues, based solely on Figure 13 of Holman, that the reflector 230 does not contact the diffuser 68. But PO does not dispute that Holman's Figures 14-15 cited in the Opposition disclose this

feature. Opposition at 18. Moreover, Figure 13 (annotated below) of Holman also shows sidewalls of the reflector that contacts the diffuser 68 with no intervening elements.

FIG. 13.



Ex. 1006, Fig. 13 (annotated).

IV. Conclusion

Patent Owner's substitute claims are not patentable.

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 SUR-REPLY TO REPLY TO OPPOSITION TO PATENT
OWNER'S REVISED MOTION TO AMEND** has been served via email on the
following:

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

Dated: November 26, 2024

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