

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. 8,294,075
Filing Date: August 5, 2010
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Title: SOLID-STATE LUMINAIRES FOR GENERAL ILLUMINATION

Inter Partes Review No. IPR2023-01410

PETITIONER'S REPLY TO PATENT OWNERS' RESPONSE

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1001	U.S. Patent No. 8,294,075 (“the ’075 Patent”)
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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	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)
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1011	Judicial Caseload Profile for the Northern District of Georgia
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1014	US 2006/0082698 to Ko <i>et al.</i> (“Ko”)
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	Declaration of P. Morgan Pattison, Ph.D. in Response to Patent Owner’s Contingent Motion to Amend
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

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1021	Certified Translation of Exhibit 1020, Taiwanese Patent Application No. 93218806, entitled DIRECT TYPE BACKLIGHT MODULE/ DIRECT TYPE BACKLIGHT MODULE to Chang (“Chang”)
1022	US 2006/0186425A1 to Yano <i>et al.</i> (“Yano”)
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1027	Certified Translation of Exhibit 1026, Korean Patent Application No. 2002/009578, entitled Electronic Display Board for indication equipment to Lee <i>et al.</i> (“Lee”)
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1031	Exhibit 8 to Deposition of William Bohannon in Related Case No. IPR2023-01168, 3M United States, Prism Films
1032	Exhibit 9 to Deposition of William Bohannon in Related Case No. IPR2023-01168, Vikuiti™ Brightness Enhancement Film (BEF) II
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1035	LUXEON® Power Light Sources

I. Introduction

The challenged claims are unpatentable. The independent claim recites little more than a plurality of Light Emitting Diodes (“LEDs”) on a panel including a reflector, a diffuser sheet and a Brightness Enhancement Film (“BEF”). All of these components, and their claimed arrangement, were known in the art. The PO Response (“Response”) ignores the actual disclosure of the prior art detailed in the Petition. Instead, PO misdirects the Board to non-relevant disclosures or attempts to limit the prior art to single embodiments. Further, PO submits no credible expert testimony, instead relying on a declaration that largely parrots the Response, which confirms the futility of PO’s flawed arguments.

The challenged claims should all be cancelled as obvious.

II. The Response Parrots Arguments from the Preliminary Response, which the Board Already Rejected.

Large swaths of the Response are nearly a word-for-word copy of the Preliminary Response.

For example, with respect to the construction of “on” *Compare* Response at § III.D *with* Paper 6 at § III.D. Similarly, with respect to Ground I, *Compare* Response at § V.A *with* Paper 6 at § V.A; Response at § V.B *with* Paper 6 at § V.B; Response at § V.C *with* Paper 6 at § V.C; Response at § V.D *with* Paper 6 at § V.D; V.E *with* Paper 6 at § V.E; and Response at § V.F *with* Paper 6 at § V.F.

And with respect to Ground II, *Compare* Response at § VI.A with Paper 6 at § VI.A; Response at § VI.B with Paper 6 at § VI.B; Response at § VI.C with Paper 6 at § VI.C; Response at § VI.E with Paper 6 at § VI.D; Response at § VI.F with Paper 6 at § VI.E; and Response at § VI.G with Paper 6 at § VI.F. The Board rejected these arguments and should not reconsider them, especially where PO’s expert “testimony” is largely a word-for-word copy of the Response. *See infra* § V.

III. Ground 1 - Claims 1-7 and 9-12 are Obvious Over the Combination of Mok, Holman, and Lamb in view of the Knowledge of a POSITA.

A. Mok Alone Or in Combination with Holman Discloses “A Brightness Enhancement Film On the Reflector.”

PO first argues that Mok fails to disclose a BEF “on” a reflector. Response at 10-12. PO ignores Mok’s explicit teachings and common sense.

As the ’075 Patent plainly explains, “on” means directly on or with intervening elements in between. *See* ’075 Patent, 6:47-60. For this reason, the Institution Decision (“ID”) explained that air gaps can be intervening elements. *See* Paper 7 at 12-13; *see also* Ex. 1016, ¶59.

Despite the Board’s considered view, PO ignores it and analyzes Mok as if the term “on” requires direct contact. Response, 10-11. Even under PO’s narrow construction defying ’075 Patent’s express description, Mok is explicit that “the brightness enhancer 18 is *preferably stacked directly on (or applied to) the diffuser* 16, thereby minimizing or eliminating the distance 54.” Ex. 1005, [0025] (emphasis

added). Similarly, Mok discloses that the diffuser can be spaced apart from the reflector or not. Ex. 1005, [0032] (“diffuser 16 is about 50 mm *or less*”) (emphasis added). Thus, Mok discloses its BEF directly “on” the reflector without air gaps.

Further, PO never disputes that Mok satisfies this limitation under the ID’s construction of “on,” in which an air gap is an intervening element. Under this construction, Mok’s BEF is “on” the reflector and, even where there is an air gap, the optical layers are supported by supports, which further shows the layers as being “on” one another. Because PO fails to address this argument it has waived its right to contest it under this understanding of the term.

PO also attacks the Petition’s combination of Mok and Holman. Response, 11-12. This argument fails. First, PO attacks Holman’s disclosure of a BEF arguing that “the prism sheets 58 and 60 are not BEFs as used in the ’075 Patent.” Response at 11. PO never explains this reasoning, instead pointing to a statement in Holman that “prism sheets 58 and 60 ... do not have to exhibit the extreme standards in cosmetic perfection that have been associated with 3M’s BEF....” *Id.* (quoting Ex. 1006 at 121). This does not distinguish Holman, which discloses BEFs. *First*, the statement PO quotes is non-limiting. Rather, it simply explains that the prism sheets “do not have to” have the same high-quality level in cosmetic perfection associated with 3M’s BEF because “[c]osmetic defects in prism sheets 58 and 60 cannot be directly viewed, and are therefore much less critical to function.” Ex. 1006 at 121.

Holman by no means excludes a BEF from its prism sheet. In fact, to the contrary Holman states that its prism sheet may be 3M's "BEF, as in brightness enhancement film." Ex. 1006 at 8-9, 10-11. Even PO's own expert admits that Holman states that 3M's BEFs were one of the "[t]he most common prism sheets used to enhance backlighting brightness." Ex. 1023 at 119:2-6.

Second, PO attacks the Mok-Holman combination arguing that they discuss different and allegedly contradictory goals. However, as the ID explains, "[t]he fact that [a] motivating benefit comes at the expense of another benefit...should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another." Paper 7 at 28 (citing *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000)). Thus, simply because there may be tradeoffs, *i.e.*, that not every aspect of a combination is beneficial, does not mean there is a teaching away. *Dome Patent L.P. v. Lee*, 799 F.3d 1372, 1381 (Fed. Cir. 2015) (concluding no teaching away even where a prior art reference "disclose[d] potential disadvantages"); *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (similar).

With respect to these design tradeoffs, PO points to a statement in Mok that "larger spaced-distances 48 will improve the uniformity of the light produced by the panel, but at the expense of panel thickness and some loss of efficiency." Response at 12 (quoting Ex. 1005, [0023]). This simply teaches that there is a tradeoff between

spacing and light uniformity. Even assuming this is correct, the spacing Mok suggests is only “a distance 48 of about 50 millimeters (mm) or less.” Ex. 1005, [0023]. Thus, Mok does not disclose a significant separation, and in fact, “or less” includes zero (*i.e.*, direct contact), given that Mok’s explicit disclosure that “the brightness enhancer 18 is ***preferably stacked directly on (or applied to) the diffuser*** 16, thereby minimizing ***or eliminating*** the distance 54.” Ex. 1005, [0025] (emphasis added). Ex. 1003, ¶¶98-99. Critically, the proposed motivations provided by the Petition included other bases, including providing better light diffusion and thus a better display quality and efficiency, which would also provide motivation to make the combination. Ex. 1003, ¶112. PO ignores these improvements, and improperly concludes that there is no motivation to combine because of a design tradeoff. *See* Paper 7 at 12-13.

Also, PO’s criticism of Mok is premised on a faulty claim construction, which as the Board already found, is not supported by the evidence. *See* Paper 7 at 12-13. PO’s arguments on Claim 1D are unavailing. Claim 1D is rendered obvious by Mok alone or in combination with Holman.

B. Mok Discloses a BEF that Recycles Light in Claim 1F.¹

PO next argues that Mok’s Brightness Enhancer 18 is not a BEF because it does not recycle light. Response at 12-14. To reach this conclusion, PO inserts new language into claim 1, suggesting that a BEF must, by itself, recycle light. And although the term “recycling” is not in claim 1, even if it were present in the claim language, Mok still meets this limitation because recycling is exactly what is performed by Mok’s BEF. Ex. 1003, ¶63. Mok explains that “[t]he brightness enhancer 18 collects diffused light from the diffuser 16 and directs it out of a front surface 52 of the brightness enhancer 18 to maximize the on-axis brightness of the light emitting panel 10.” Ex. 1005, [0015]. Further, Dr. Pattison’s unrebutted testimony confirms, that BEFs *in general*, including 3M’s BEFs, are known films whose basic function is to “encourage light recycling and diffusion of light outside of the desired emission angle.” Ex. 1003, ¶63, 84; *see also* Ex. 1005, [0024] (explicitly disclosing 3M’s BEF). Thus, although Mok does not explicitly describe recycling light, its BEF unquestionably emits light of a first angle (*i.e.*, light directed out the front surface) and reflects light of a second angle (*i.e.*, light outside of the desired angle). Ex. 1003, ¶63. As such, Mok alone meets Claim 1F.

1. Although Section V.B is entitled “The Combination of Mok and Lamb fails to disclose [Claim 1F],” PO only addressed Mok in this section. Response at 12-14.

C. A POSITA Would Be Motivated to Combine Lamb with Mok and Holman.

In addition to Mok, Lamb also teaches element 1F and PO does not dispute it, as the Board already observed. Paper 7 at 31. PO resorts to arguing that a POSITA would not combine Lamb with Mok or Holman because Lamb relates to edge-lit displays. PO's analysis is flawed.

Lamb explicitly describes a known property of 3M's BEFs, namely light recycling. Ex. 1007, [0035] ("The enhancement film 14 ["Vikuiti™ Brightness Enhancement Film BEF, available from 3M Company"] refracts light within a certain angle toward the viewer. Light outside that angle is 'recycled,' *i.e.*, reflected back into the backlight 10, where it travels within the system until reaching the proper angle for exiting the system."). Lamb describes the same 3M BEF as Mok and Holman—all describe a BEF sold by 3M under the Trademark Vikuiti®. *See* Ex. 1006, [0024] ("(BEF) available from 3M and sold under the registered trademark Vikuiti®."); Ex. 1007, [0035] ("Vikuiti™ Brightness Enhancement Film BEF, available from 3M Company."). Thus, to the extent that PO's argument is that Lamb's 3M BEF is different from Mok's 3M BEF, that is simply wrong. *See* Ex. 1016, ¶¶60-64; Ex. 1003, ¶65.

PO also attempts to distinguish Lamb by arguing that Lamb is limited to edge-lit displays using CCFL light sources. This is also incorrect. First, PO ignores that

Lamb explicitly describes direct-lit backlight systems. *See, e.g.*, Ex. 1007, Fig. 1, [0034]. Second, Lamb explicitly describes using 3M's BEF in both "traditional direct-lit backlight" displays (Fig. 1) and an edge-lit display (Fig. 2). *Id.*, [0034]-[0035]. Third, with respect to lighting sources, Lamb repeatedly describes using LEDs instead of CCFLs. *See id.*, [0039].

PO also highlights its misreading of Lamb by next suggesting that the combination would require mounting Mok's LED substrate on top of Lamb's light guide and that doing so would render the device inoperable. Response at 16. To reach this conclusion PO distorts the combination to bodily incorporate Lamb's entire structure and sandwich it between Mok's structure. PO's argument entirely misses the point, *i.e.*, that one of skill in the art would know that the BEFs described in Mok, Lamb, and Holman, all function similarly. Ex. 1003, ¶¶65, 67, 112. Further, as the Board also found, and contrary to PO's erroneous suggestion, the test for obviousness is not bodily incorporation. Paper 7 at 33-34 citing *Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Keller*, 642 F.2d 413, 425 (C.C.P.A. 1981)).

Finally, to the extent PO argues that Lamb's or Holman's BEFs are different from the same brightness enhancement films generically disclosed in the '075 Patent, PO is wrong. Lamb specifically discusses emitting light of a first orientation, *i.e.* first angle, and reflecting light of a second orientation, *i.e.* second angle. Holman

also explicitly teaches that its prism sheets, which include 3M's BEF films, are optical layers that recycle light. In fact, Holman explicitly describes that the "hallmark" of 3M's BEFs is recycling light. Ex. 1006 at 125. And that such films are the "most common" films used in displays. *Id.* at 118. PO's attempt to distance itself from these common, well-known optical films and their well characterized and understood uses should fail.

D. The Combination of Mok, Holman, and Lamb Discloses "a heatsink panel on a second side of the at least one substrate."

PO argues that Mok does not disclose a heat sink because its printed circuit board is "not designed, intended or functional to draw heat away from the LEDs without substantially more than being simply a printed circuit board." Response at 17. However, a POSITA would know that a printed circuit board includes a heat sink, as heat is dissipated through electrical connections and the metal base of the printed circuit board in pertinent LED applications which involve enhanced thermal requirements. Ex. 1003, ¶106-108. Indeed, as a POSITA would know, the metal base of the printed circuit board, typically in the form of a layer or a plane (i.e., a panel), would allow for far greater heat dissipation than conventional non-metal base materials. Ex. 1016, ¶65-67. Additionally, even Mr. Bohannon, PO's expert, confirms that the heat sink disclosed in the '075 patent is a simple metal layer that draws heat in a direction opposite of the direction light is emitted. *See* Ex. 1024,

pages 55-60; Ex. 1001, 12:29-57. And as Dr. Pattison explains, element 80 (with or without optional fins 82) operates similar to the metallic layer of a PCB and thus Mok's disclosure of a PCB renders obvious the heat sink element of the claims.

Regardless of whether Mok itself discloses a heat-sink, heat sinks were well known in the art, as demonstrated by Holman. *See* Ex. 1003, ¶107. Holman, like Mok, recognizes the need for heat extraction from LEDs which emit light. Ex. 1006 at 8, 33, and 39. To solve this issue, Holman mentions a need for "adequate heat sinking." *Id.* at 31. Holman describes a base layer 220 that functions as part of a heat sink. *Id.* at 40. In Holman, the LEDs 70 are mounted to the base layer 220. *Id.*, Figs. 7 and 13. Light is emitted from the LEDs 70 in a direction away from the base layer 220 and the base layer draws heat away from the LEDs 70 in the direction opposite the direction of light emission. *Id.*

Further, to the extent it is argued that Mok's printed circuit board is not a heat sink, heat sinks were notoriously well known prior to the '075 patent and it would have been obvious to modify Mok's printed circuit board to include a heat sink layer, i.e., panel, to further improve heat dissipation away from Mok's heat producing LEDs. Ex. 1016, ¶68-71; Ex. 1003, ¶106-108. An obvious modification includes adding a layer of heat sink material to the bottom of Mok's base panel 12/printed circuit board to perform the heat sink function advocated by Holman and its base layer 220 (which itself is a panel) and further improve heat dissipation consistent

with both Mok's and Holman's goals. Ex. 1005, [0004], [0006]; Ex. 1006, 39-40; Ex. 1016, ¶68-71. Indeed, Holman describes its base layer material not only must be "thermally stable" but also "must be counted on to service as part of the collective heat sink" and include a metallic layer to implement its heat sinking function. Ex. 1006, 39; Ex. 1003, ¶107-108. Moreover, Holman explicitly discloses "heat sink tabs 264," i.e., a heat sink panel, can be combined with and add to the bottom surface of its base layer. Ex. 1006, Fig. 14, 40-41. Consistent with Mok's layered construction, such a heat sink layer would be, or a POSITA would find it obvious for it to be, a flat panel. Ex. 1016, ¶68-71. Modifying Mok to include a heat sink panel would have been well within the skills of a POSITA and would have led to a predictable result – a lighting panel with better heat dissipation properties. Ex. 1016, ¶68-71.

To combat this express disclosure, PO suggests that "Holman does not teach or suggest that the base layer is considered by itself a heatsink panel...." Response at 17. But this is not required by the claim. Rather, the claim requires "a heatsink panel on [the substrate] to draw heat away from [the substrate]." Such a heat-sink panel is either expressly disclosed or obvious in view of the combined disclosure of Mok and Holman. Ex. 1016, ¶68-71; Ex. 1003, ¶126 and 139, Claim 14.

E. Mok Discloses a Diffuser Sheet “in direct contact with the reflector sheet” In Claim 7

PO next argues that Mok does not disclose a diffuser sheet in direct contact with the reflector sheet because “spacing between the reflective surface and diffuser is a necessary and unavoidable part of the design described therein.” Response at 19.

However, as explained in the Petition, Mok further teaches that larger spaces between the diffuser and base panel are “at the expense of panel thickness and some loss of efficiency, and thus a POSITA would recognize that the distance between the reflective surface 50 in Mok and the diffuser 16 could be reduced so that the diffuser 16 directly contacts the reflective surface 50. Ex. 1005, [0023]; Ex. 1003, ¶98.

In support of this argument, PO relies on Mok’s statement that “[g]enerally speaking, larger spaced distances 48 will improve the uniformity of the light produced by the panel, but at the expense of panel thickness and some loss of efficiency.” Ex. 1005, [0023]. PO focuses on Mok’s recognition that larger spaced distance can improve light uniformity. But PO again improperly equates recognizing tradeoffs in selecting different embodiments of an invention to teaching away from those embodiments. However, the very same statement that PO relies on also shows that to create a thinner and more efficient display, a POSITA would be motivated to reduce or eliminate the distance between the reflector and diffuser such that there is direct contact. Ex. 1003, ¶98. That there may be tradeoffs in adopting this

configuration does not mean there is a teaching away. *See Dome Patent L.P.*, 799 F.3d at 1381 (concluding no teaching away even where a prior art “disclose[d] potential disadvantages”); *Medichem, S.A.*, 437 F.3d at 1165 (similar).

Further, the ID notes that “Petitioner does not address the height of light emitting elements 14.” ID at 42. The height of light emitting elements 14 is not discussed within Mok, and the height of those elements as shown in Figure 1 may be negligible in practice because figures “do not evidence actual dimensions.” *Plantronics, Inc. v. Aliph, Inc.*, 724 F.3d 1343, 1351 (Fed. Cir. 2013).

Moreover, Mok teaches the use of different LEDs and different configurations of LEDs on the base panel 12 depending on the needs of the particular light emitting panel. *See, e.g.*, Ex. 1005, [0019]-[0020]; [0033]; Ex. 1016, ¶72-79. A POSITA would also know, or find it obvious, that, depending on the desired spectral output and other characteristics of the light emitting panel, the light emitting elements may be, for example, larger or smaller and in a configuration where they are arranged in an array such that they extend the same distance from the base panel 12 as the reflective surface 50 or even lower than the reflective surface 50. Ex. 1016, ¶72-79.

Such an arrangement would have been obvious and advantageous because it creates a thinner display. *Id.* In these cases, the reflector and diffuser would be in direct contact. *Id.*

F. The Combination of References Discloses Claim 10.

PO next urges again that “Mok does not describe a BEF that preferentially emits light having a certain incident angle.” Response at 20. *First*, this is wrong. As discussed above, Mok explains that its brightness enhancer collects light and directs it out of its front surface. Ex. 1005, [0015]. Second, these are standard functions of a BEF, as Dr. Pattison explains. Ex. 1003, ¶¶84-85, 120. Third, and more critically, the Response ignores that the Petition also relies on Lamb, which expressly discloses recycling enhancement structures 112 and 114, which are BEFs. Lamb, [0042] and [0044]. As Lamb describes its prismatic structure both reflects and refracts light. *Id.*, [0045]. Thus, even if Mok alone did not disclose this claim element, the Mok-Lamb combination does.

IV. Ground 2 – Claims 1-7 and 9-12 are Obvious Over the Combination of Epstein, Holman, and Lamb in view of the Knowledge of a POSITA.

A. Lamb Is Not Limited to Edge Lighting.

PO argues Lamb is limited to edge-lit backlight displays using Cold Cathode Florescent Lighting (CCFL), and thus would not be combined with LED based backlights described in Epstein and Holman. Response at 21. This is simply wrong. As explained above, Lamb describes a backlighting system, including direct-lit backlighting systems. Ex. 1007, Fig. 1, [0034]. Similarly, Lamb describes using LEDs instead of CCFLs. *Id.* [0039].

Further, the Petition relies on Lamb as a secondary reference, to the extent Epstein does not explicitly describe the property of light recycling in its BEF, which Lamb expressly discloses for both edge-lit and direct-lit backlight systems. Ex. 1007 at [0035].

B. The Combination of References Discloses “a Brightness Enhancement Film on the Reflector.”

PO argues the BEF 662 disclosed by Epstein is not “on” the guiding layer 610, but instead there is an “empty space” between the layers. Response at 21-22. Similar to PO’s misguided argument pertaining to Ground 1, PO ignores that the ID found “that the term ‘on’ does not exclude air gaps.” Paper 7 at 11-12. Under the Board’s construction of “on,” this element is met by Epstein. The Response ignores this finding, with PO merely stating that “Petitioner concedes that this element is not met as there is an airgap between the layers.” Response at 22. This is false. Petitioner does not take a position on whether empty space is an intervening layer. Petitioner’s position is that under either construction, the prior art discloses the “on” limitation.

PO further ignores that Holman, which is used in this combination, expressly discloses a stacked arrangement as described above. *See* Ex. 1006, at 8-11, 37-38; Figures 7, 8, 13, 14, and 15 and accompanying disclosures. Further, Holman discloses the claimed BEF, again contrary to PO’s assertion. *Id.* at 8-9 (disclosing 3M’s BEF).

C. Epstein Discloses a BEF Configured to “preferentially reflect light having a second orientation, different from the first orientation, back into the lighting panel.”

PO next argues that if Epstein discloses a BEF it refracts light and does not reflect light back into the lighting panel. Response at 23. This is again incorrect. Epstein expressly discloses how optical films may be used to reflect light back into the lighting panel. Ex. 1008, [0075] (describing recycling in polarizing BEFs). However, Epstein also explicitly discloses regular BEFs, including 3M’s BEF. Ex. 1008, [0074]. And although Epstein focuses on the emitting properties of the BEF, as discussed above and by Dr. Pattison, BEFs, including 3M’s BEF, reflect light. Ex. 1003, ¶¶60, 63-65, 84-85. And in Epstein’s system, as described in relation to Figure 10B, Epstein’s BEF reflects light back into diffuser/guiding layer 610. *Id.* PO’s myopic focus on whether Epstein explicitly describes reflection is misplaced, and irrelevant to the standard for obviousness. A POSITA would readily understand Epstein’s disclosed BEF as one that reflects light back into the diffuser. *Id.*

That Epstein’s BEF, which includes 3M’s BEF, reflects light back into the diffuser is further supported by Lamb’s description of the very same 3M BEF. *See* Ex. 1008, [0074]; Ex. 1007, [0035]. As set forth in the Petition, a POSITA would have found it obvious to combine Epstein and Lamb. Petition, 34-36.

D. Epstein Discloses a Diffuser Sheet “in direct contact with the reflector sheet and the brightness enhancement film” In Claim 7.

First, PO urges that “Epstein does not disclose a diffuser as described by the ’075 Patent” suggesting that guiding layer 610 is not a diffuser. This ignores that Epstein is explicit that there may be “diffusely reflecting material 636 on the surface 611 of the guiding layer 610 may be selected so as to direct light to the intermediate layer 622 while also permitting light to pass through the upper surface 612 towards the viewer.” Ex. 1008, [0069]. Epstein is further explicit that the guiding layer 610 may include its own diffuser 1902. *See id.*, [0084] (“the diffuser 1902 is a volume diffuser.... The diffuser 1902 is used to reduce the amount of light that passes directly through the guiding layer 610 from the LED, and thus to uniformize the output from the light emitting element.”). Thus, guiding layer 610 is either a diffuser or includes a diffuser. Ex. 1003, ¶100-101.

Second, PO argues that Epstein does not disclose a diffuser sheet in direct contact with the reflector sheet because of the reflecting material 636 shown in FIG. 11. Response at 26-27. PO provides pure attorney arguments and is wrong. *Id.* First, the reflecting material 636 is only one optional implementation of the light extraction features, and there are various designs of light extraction features that would not interfere with the direct contact between the diffuser sheet and the reflector sheet. *See e.g.*, Ex. 1008, [0067] (disclosing “the light extraction features 624 may

comprise areas that include diffractive structures or diffusely reflecting material 636 provided.”) For example, Epstein discloses various other implementations of the light extraction features such those that penetrate the upper surface (FIG. 9 Ex. 1008, [0067]; Ex. 1016, ¶80-85) or those provided on the lower surface (Ex. 1008, [0080]-[0082]). Moreover, Epstein discloses that “the light extraction features may be placed or adapted to extract less light at a position close to the LED itself, to increase the amount of light extraction from the positions of the light extracting element further away from the LED.” Ex. 1008, [0088]; Fig. 16A-D. Such designs would not interfere with the direct contact between the diffuser sheet and the reflector sheet and also achieve “a more uniform intensity profile in the light emitted from the light emitting element” as Epstein advocates. Ex. 1008, [0088]; Ex. 1016, ¶80-85. Thus, to the extent that Figure 11 shows any intervening space between the BEF 662 and diffuser sheet (guiding layer 610 with the reflecting material 636), it would have been obvious to a POSITA to modify the arrangement of the layers such that there was no such space, especially given the fact that Epstein recognizes a challenge with prior art systems that were “thick and bulky.” Ex. 1008, [0003]; Ex. 1003, ¶104; Ex. 1016, ¶80-85. PO’s argument that this statement applies only to edge lit displays is inapposite—the invention in Epstein “relates to lighting or display assemblies,” including backlighting units for LCD displays. Ex. 1008, [0001], [0119]. Moreover, as the Board observes, Holman provides evidentiary

support for such a modification. ID at 59. Indeed, Holman seeks to provide the “thinnest overall multilayer system thickness, T, possible” and describes one advantage of its claimed invention as creating a display device that is “significantly thinner.” Ex. 1006, 2, 15.

Further, Epstein clearly states that “[t]he present invention should not be considered limited to the particular examples described above, but rather should be understood to cover all aspects of the invention as fairly set out in the attached claims.” Ex. 1008, [0123]. Thus, it is improper to limit Epstein to only a single drawn embodiment. *See, e.g., Polaris Innovations Ltd. v. Brent*, 48 F.4th 1365, 1375-78 (Fed. Cir. 2022) (finding not proper to limit claim scope to only cover “multiple unpackaged dies within a single package” simply because two figures of the patent showed that embodiment).

PO also presents the unsupported argument that modifying the arrangement of the BEF 662 and the diffuser sheet (guiding layer 610) such that there is no intervening space between the two would “negatively impact the light uniformity or display quality so much so that it would not offer any substantial benefit” because of the reflecting material 636 on the guiding layer 610. Response at 26-27. Indeed, PO’s expert does not even mention this point in his declaration. *See* Ex. 2003. And even if it were the case that there was a potential disadvantage to such a modification, weighing this with the advantage of thinner, less bulky system, as sought by Epstein,

would be within the skill set of a POSITA. Ex. 1003, ¶104; Ex. 1016, ¶80-85; *see also Dome Patent L.P.*, 799 F.3d at 1381; *Medichem, S.A.*, 437 F.3d at 1165.

PO further argues that “[t]here is no disclosure of the diffuser in Epstein as directly contacting the intermediate layer 622.” Response at 26. The guiding layer 610 of Epstein spreads light, and thus functions as a diffuser. Ex. 1008, [0066], [0084]; Ex. 1003, ¶100. Thus, PO’s argument is directly contradicted by the very same embodiment of Epstein that PO has pointed to with respect to this claim element, Figure 11, which clearly shows the diffuser sheet (guiding layer 610) is in direct contact with intermediate layer 622. Ex. 1008, Fig. 11.

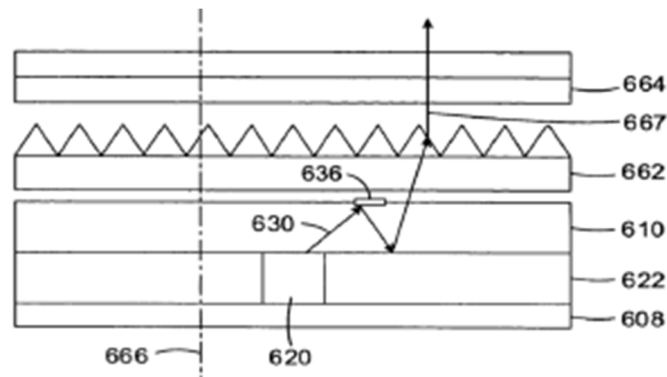


FIG. 11

E. Epstein Discloses “the light extraction features are random features” of Claim 9.

With respect to claim 9, PO argues that there is no description in Epstein of randomizing light, and that a POSITA would not modify the Epstein design because doing so would be inefficient. Response at 27. PO provides no support for its position that modifying Epstein would be inefficient. PO’s only cite is to its expert

who adds no explanation or citation to the references and instead merely repeats the same conclusion as the Response. Ex. 2006, ¶65. Second, Dr. Pattison provides a detailed explanation of how randomization reduces Moire patterns, which neither PO nor its expert address. *See* Ex. 1003, ¶80. Third, Lamb, describes the “randomization” of the polarization and direction of light. Ex. 1007, [0042]. Neither PO nor its expert address this disclosure.

F. Epstein Discloses the BEF is “configured to limit direct emission...to thereby encourage light recycling/diffusion in the lighting panel” of Claim 10.

PO argues that the polarization layer of Epstein is not a BEF and its only purpose is to re-orient light. Response at 27-28. However, Epstein expressly discloses BEFs, including 3M BEFs. Ex. 1008, [0074]. As discussed above, to the extent Epstein does not explicitly discuss recycling in connection with the BEF (vs. Epstein’s explicit discussion of recycling in connection with DBEF), one of skill in the art would understand recycling is a “hallmark” property of BEF films. Ex. 1003, ¶60, 63-65, 84-85. Second, as discussed above, PO’s efforts to limit Lamb to edge-lit embodiments are wrong. Lamb’s disclosures apply to direct-lit backlighting systems similar to the ones discussed in Epstein. *See, e.g.* Ex. 1006, at 6-7; Ex. 1007, [0009]-[0011]. And again, PO relies on a specific embodiment (*i.e.*, Lamb’s edge-lit embodiment) and bodily incorporates Lamb’s FIG. 2 into Fig. 5E of Epstein in its illustration in arguing that Lamb’s BEF is not combinable with Epstein’s direct-lit

backlight display, which is exactly what the Court has cautioned against. Response at 28-29; *see In re Keller*, 642 F.2d 413, 425 (CCPA 1981). As the Board pointed out, PO ignores Lamb’s explicit teachings that BEFs improve light output, including in direct-lit backlight displays, which is one of Epstein’s goals. *See, e.g.* Ex. 1006, at 1; Ex. 1007, [0057]; Paper 7 at 33. A POSITA would have been motivated to combine Epstein and Lamb, and the resulting combination renders claim 10 obvious.

V. PO’s Purported Expert is Entitled to No Weight.

PO submits a declaration from its expert, Mr. Bohannon. *See* Ex. 2006, (the “Bohannon Declaration”). The Bohannon Declaration is fundamentally suspect because Mr. Bohannon simply parrots the Response and does not provide any insightful analysis.

The Board has consistently recognized that a declaration that repeats a Paper *verbatim* “is conclusory and unsupported, adds little to the conclusory assertion for which it is offered to support, and is entitled to little weight.” *Xerox Corp. v. Bytemark, Inc.*, IPR2022-00624, Paper 9, at 15 (P.T.A.B. Aug. 24, 2022) (precedential) (listing cases); *see also, MarkForged Inc. v. Continuous Composites, Inc.*, IPR2022-01431, Paper 7, at 14 (P.T.A.B. Jan. 18, 2023); *LG Elecs. Inc. v. Jawbone Innovations, LLC*, IPR2023-01111, Paper 10, at 15 (P.T.A.B. Jan. 9, 2024); *Content Square SAS v. Medallia Inc.*, IPR2022-00316, Paper, at 38 (P.T.A.B. July

14, 2022); *Man Wah Holdings Ltd. v. Rafeel Sys., LLC*, IPR2019-00616, Paper 7, at 15–16 (P.T.A.B. Aug. 21, 2019).

For example, compare Paragraph 48 of the Bohannon declaration to pages 14–15 of the PO response, purporting to provide “expert opinion.” *Compare* Response 14–15 *with* Ex. 2006, ¶47. Mr. Bohannon merely “repeats ... the conclusory assertion for which it is offered to support,” and thus “adds little to the conclusory assertion for which it is offered to support, and is entitled to little weight.” *Xerox*, IPR2022-00624, Paper 9, at 15. Indeed, a purported expert parroting the PO cannot give any insight into what a POSITA may understand and/or be motivated to do. *See LG Elecs.*, IPR2023-01111, Paper 10, at 15; *Content Square*, IPR2022-00316, Paper, at 38.

There are numerous other instances where the Bohannon Declaration is a near exact copy of the Response, and the Response purports to rely on those conclusory arguments to give the mindset of a POSITA. *Compare* Response at 16 *with* Ex 2006, ¶48; *Compare* Response at 15–16 *with* Ex 2006, ¶51. Indeed, the last eight paragraphs of the declaration are nearly an identical copy of pages 21–29 of the Response. *Compare* Response at 20–29 *with* Ex 2006, ¶59–67

Mr. Bohannon’s unhelpful declaration should be given no weight.

VI. Conclusion

Claims 1–7 and 9–12 of the ’075 Patent are invalid.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT

The undersigned certifies pursuant to 37 C.F.R. § 42.24(d) that the foregoing **PETITIONER’S REPLY TO PATENT OWNER’S RESPONSE** excluding any table of contents, mandatory notices, certificates of service or word count, or appendix of exhibits or claim listing, contains 5,569 words according to the word-processing program used to prepare this paper (Microsoft Word). The foregoing word count complies with the 5,600 word type-volume limit specified by 37 C.F.R. § 42.24(c)(1).

Dated: September 30, 2024

By: /s/ *Matias Ferrario*
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CERTIFICATE OF SERVICE

The undersigned hereby certifies that on the date below a copy of this
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