

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Hisense USA Corporation
Petitioner

v.

Brightplus Ventures LLC
Patent Owner

Patent No. 8,177,382
Filing Date: March 11, 2008
Issue Date: May 15, 2012
Title: APPARATUS AND METHODS FOR MULTIPLANAR OPTICAL
DIFFUSERS AND DISPLAY PANELS FOR USING THE SAME

Inter Partes Review No. IPR2023-01311

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

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1020	Rough Transcript of the September 6, 2024 Deposition of William K. Bohannon ¹
1021	Oliver Dross, William Parkyn, Julio Chaves, Waqidi Falicoff, Juan Miñano, Pablo Benitez, & Roberto Alvarez, <u>A superior architecture of brightness enhancement for display backlighting</u> , 6338 Proc. of SPIE 63380G-1 (2006).

¹ Petitioner will submit the final transcript when received.

EXHIBIT	DESCRIPTION
1022	Chao-Heng Chien & Zhi-Peng Chen, <u>Fabrication of concentric light guiding plate with SiO₂ reflective film</u> , 6376 Proc. of SPIE 63760E-1 (2006).
1023	Ji-Young Lee, Kie-Bong Nahm, Jae-Hyeon Ko, & Joong Hyun Kim, <u>Effects of Reshaping Micro-pyramids and Prisms on the Optical Performances of Light Collimating Films in the Field of LCD Backlight</u> (2006).
1024	US 7,072,096 to Holman (“Holman ’096”)
1025	Ching-Cherng Sun, Ivan Moreno, Shih-Hsun Chung, Wei-Ting Chien, Chih-To Hsieh, Tsung-Hsun Yang, <u>Brightness Management in a Direct LED Backlight for LCD TVs</u> (2007)
1026	Intentionally Omitted
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I. Introduction

Patent Owner (PO) failed to meet the requirements for amending claims in an IPR. The amended claims fail to address the grounds of unpatentability and lack written description. Substitute claim 21 is unpatentable as Kobayashi discloses a second distance that is greater than the third distance and less than 1.5 times the third distance. This limitation is also disclosed by Lim. Substitute claim 22 is likewise unpatentable in view of Kobayashi. More importantly, merely specifying a reference point in defining distances is not a patentable feature, particularly considering that the prior art discloses the claimed distances defined by the newly added reference point. Finally, PO's Motion to Amend does not cite any evidence in support of the proposed amendments. *Icon Health & Fitness, Inc. v. Strava, Inc.*, 849 F.3d 1034, 1043 (Fed. Cir. 2017) ("Attorney argument is not evidence").

II. PO Has Not Complied With 35 U.S.C. § 316(d) Or 37 C.F.R. § 42.121.

Petitioner notes that the Appendix to the claims contains the non-sensical phrase "wherein the second distance comprises a distance *in* greater than the third distance." The recitation of the word "in" is grammatically incorrect and prevents an understanding of the claim. A non-sensical claim is not a reasonable substitution.

A. Patent Owner's Amendments Do Not Respond to Grounds of Unpatentability Involved in the Proceeding

The proposed substitute claims do not respond to the grounds for a number of reasons.

First, proposed substitute claim 21 merely carves out an end-point (i.e., 1) of a distance ratio range of 1 to 1.5 recited in original claim 9. However, PO's motion fails to address that Kobayashi, a prior art reference part of the original grounds, already discloses ratios greater than 1. Moreover, one of skill in the art would have found it obvious and advantageous for the ratio between the second and third distance to be greater than 1, even if infinitesimally greater than 1, for the reasons also explained below. PO's motion also fails to explain why one of skill in the art would not have understood this ratio could be greater than 1 especially since such a ratio is disclosed within the prior art, and there are multiple compelling design and engineering reasons why one would want to configure the ratio to be so, and doing so is within the ordinary skill of a person of skill in the art. PO's motion presents nothing more than attorney argument, unsupported by credible testimony. *Icon*, 849 F.3d at 1043 (Fed. Cir. 2017).

Second, proposed substitute claim 22 recites a limitation that is also already disclosed in Kobayashi and Holman '096 as described below.

Third, as Dr. Pattison explains, the placement and positioning of the various display components, including LEDs and diffusers involves a multi-factor optimization approach based on desired display characteristics, including brightness, uniformity, and cost. Ex. 1019, ¶26-32. The multi-variate approach takes into account a number of factors including the number of LEDs, LED power, LED

brightness and directionality, spacing constraints, optical film characteristics, and other engineering factors. *Id.* Modest adjustments to these various factors are routine engineering decisions. There are not fundamentally optimal spacings, thicknesses, or distances since each depends on numerous underlying factors including optical, brightness enhancing, and diffusion performance parameters of the films. Configurations will also depend on the light output, optical distribution, efficiency, and cost of the LEDs (in LED lit backlight systems). *Id.* As the prior art already recognized, these factors all impact how and why one of skill in the art would design and vary distances between components of the system to balance the display characteristics of the panel. For example, the prior art already recognizes that the ratio of LED spacing to the LED to diffuser distance is about 1 and that the ratio can be modified around that range to fine tune or adjust the display properties of the system. Moreover, LEDs have many configurations, such as power output, output angle and other configurations that impact their behavior in the system. If, for example, one selected an LED with lower power, the distance between the LEDs can be made smaller to increase light output, which results in increase of the ratio when keeping the LED to diffuser distance unchanged. PO's motion never addresses these well-known design principals and fails to explain how or why one of skill in the art would not recognize that the ratio of the LED spacing to the LED and diffuser distance is not already taught in the prior art.

B. Patent Owner's Amendments Lack Written Description and are Indefinite

1. Substitute claim 21 lacks written description for “greater than”

Proposed substitute claim 21 fails to comply with 35 U.S.C. § 112. PO attempts to exclude through its proposed amendment the lower end point of “1” from the original claimed ratio range of “the third distance and 1.5 times the third distance.” However, there is no support in the specification or prosecution history for such a distinction.²

The specification provides that “[i]n some embodiments, the solid state emitters include a third distance between adjacent ones of the solid state light emitters and the second distance includes a distance *in a range between* the third distance and 1.5 times the third distance.” Ex. 1001, 2:8-12 (emphasis added). Similarly, the specification provides that “[i]n some embodiments, the solid state light emitters include a third distance between adjacent ones of the solid state light emitters such that the first distance is about one half of the third distance, and the second distance includes a value *in a range between substantially* the third distance value and substantially 1.5 times the third distance value.” Ex. 1001, 2:53-58 (emphasis added). The specification later states that “[i]n some embodiments, the

² Tellingly, PO's Motion to Amend does not identify any part of the '382 patent specification that supports its amended claims, reciting in conclusory fashion “the claim limitations recited in proposed substitute claims 21 and 22 find support in the specification of the '382 Patent.” Motion at 8.

second distance 148 may be *in a range including* and [sic] the third distance 149 and 1.5 times the third distance 149.” Ex. 1001, 6:28-30 (emphasis added). And again, the specification provides: “[i]n some embodiments, the second distance may be *in a range including approximately* 1.0 to 1.5 times the third distance value.” Ex. 1001, 8:41-43 (emphasis added).

Thus, the specification consistently and repeatedly provides that the relationship between the second and third distance is “in a range between” or “in a range between substantially” or “in a range approximately.” None of the figures in the ’382 patent, nor the prosecution history, provide any other support, description, depiction, or differing information. Wholly lacking from PO’s motion to amend is any explanation, or indeed citation to evidence (expert or otherwise), as to how or why “greater than” provides a meaningfully distinct limitation. The ’382 patent contains no data, empirical or theoretical, that would explain or provide support for the precise range the amended claims purport to recite. If anything, the specification reveals the opposite—the specification’s use of the terms “approximately” and “substantially” show that the specific numerical value, whether 0.9, 1.0, 1.1, do not impart any meaningful limitations on the claimed range.

2. Substitute claim 22 lacks written description for measuring from the bottom of the LED, or in the alternative, is indefinite

The new element a first and second distance from the bottom of the plurality of the solid state emitters finds no support in the specification. The ’382 specification

describes a distance “from the solid state emitters” or “from a surface defined by the solid state emitters.” For example, the ’382 patent provides that “[i]n some embodiments, the multiplane light diffuser includes a diffuser plate that includes the first side of the multiplane light diffuser and is positioned a first distance from the solid state light emitters. The diffuser plate is configured to define the first diffusion plane. The diffuser further includes a diffuser sheet that includes the second side of the multiplane light diffuser and is positioned a second distance from the solid state light emitters.” Ex. 1001, 1:42-49. Similarly, the ’382 patent provides that “[i]n some embodiments, the multiplane light diffuser includes a first diffuser plate positioned at a first distance from the plurality of solid state emitters, a second diffuser plate positioned at a second distance from the plurality of solid state emitters, and a diffuser sheet supported by the second diffuser plate such that the first distance is less than the second distance.” Ex. 1001, 2:18-24. Thus, the ’382 Patent specification only ever describes the distance from the emitters *generally*, without ever describing a particular part of the emitter.

If anything, the specification confusingly discloses distances from an LED “surface.” *See, e.g.*, Ex. 1001, 5:62-64 (“The diffuser plate 140 may be positioned a first distance 147 from a surface defined by the solid state light emitters 113.”); 6:16-19 (“the diffuser sheet 142 may be positioned a second distance 148 from the surface defined by the solid state light emitters 113, such that the second distance 148 is

greater than the first distance 147.”). But the specification never defines which “surface” the measurement is being taken from. And although PO may point to figure 3 and the depiction of distance 148 as defining a point or surface, this too should fail. The “surface” of the solid state emitter is shown as element 113, which points to a surface location of the solid state emitter that is different than the point from which the distance 148 is shown. Thus, the depiction in the patent is different and inconsistent with the ambiguous words in the patent. And the elements in the figure are internally contradictory as the surface of the solid state emitter shown at 113 is different than the point shown by 148.

Moreover, relying on a figure for support in this instance would be completely inappropriate. In fact, even PO argued during prosecution that relying on figures for written description support is not appropriate. Ex. 1002 at 74 (“[P]atent drawings do not define the precise proportions of the elements and may not be relied upon to show particular sizes if the specification is completely silent on the issue.”).

In light of the specification’s conflicting description, the lack of textual support in the specification for “bottom of,” and the lack of any explanation as to how or why such a precise point is meaningful, PO’s proposed amendment lacks written description support or, in the alternative, is indefinite.

3. Substitute Claim 22 is indefinite because it does not define what the “bottom” of the solid state light emitter is

Solid state light emitters can take many forms and be comprised of numerous parts. For example, the LED light emitter in the '382 Patent can be a packaged light emitting device including one or more LEDs. And the light emitters can also be implemented as one or more LED emitter chips. Ex. 1001, 4:50-54. Thus, without more disclosure or explanation, one of skill in the art would not understand the point within these display panels from which one would define the distance – the bottom of a packaged light emitting device or the bottom of the LED emitter chips. In fact, all the specification describes is that the distances are “from a surface defined by the solid state light emitters.” *Id.*, 5:63-64.

Although PO may again try to point to Figure 3 as support, that fails. Figure 3 is not a technical description of these systems. In fact, PO itself emphasized that the '382 Patent is very specific about how the disclosed distances, stating, for example, that “the '382 Patent is specific in its implementation of a first distance and a second distance as a function of a third distance.” Paper 12 at 11. Thus, given that the '382 Patent is specific in its implementation of distances, the “bottom of the solid state light emitters” is indefinite because a POSITA would not know exactly what point of the solid state light emitter is the bottom for the purposes of defining the distances. Accordingly, substitute claim 22 is indefinite for this reason as well.

III. The Proposed Substitute Claims 21-22 Are Not Patentable in View of the Prior Art that is Already Part of the Grounds

A. Substitute Claim 21: Prior Art Involved in the Grounds Already Discloses and Renders Obvious a Second Distance Greater than a Third Distance and Less Than 1.5 the Third Distance

1. Kobayashi discloses and renders obvious, a second distance greater than a third distance and less than 1.5 the third distance.

In the Petition, Petitioner took the most conservative approach in analyzing Kobayashi and selected the bottom surface of the diffuser from which to measure the second distance (this is Kobayashi's distance "a" minus the thickness of the diffuser 5). Petition at 19. Nothing in the claim language requires such a narrow interpretation and one of skill in the art would understand that Kobayashi's distance "a" is the claimed second distance. This is so because the claim language recites that the second distance is to the "second diffusion plane." '382 Patent, Element 1B; *see also id.* at 6:14-16 (reciting second diffusion plane as a diffuser sheet that includes a second side); *see also* Ex. 1020, 44:16-25; 46:5-23; 53:12-16; 55:18-56:1. Thus, the '382 patent defines a second distance to the diffusion plane and the claimed distance is not limited to being defined by a particular side or point of the second diffusion plane. *Id.* Original dependent claim 2 supports this interpretation as it recites a diffuser sheet, which includes a second side, that is "configured to define the second diffusion plane." *Id.*

Kobayashi discloses distance “a”, which is disclosed as being measured to “the light emitting surface of the diffusing plate at the most exiting side.” Ex. 1006 at [0019]. Accordingly, Kobayashi’s distance “a” is defined by the same point as that included or recited by the ’382 patent (i.e., the “second side” that is “configured to transmit diffused light.”). *Id.*

Kobayashi also discloses distance “c” that is the “distance between the center of two adjacent LEDs”. Ex. 1006 at [0020]. This distance “c” satisfies the distance claimed by the ’382 patent’s “third distance,” which is defined as the “distance between adjacent ones of the plurality of solid state light emitters.” Ex. 1006 at claim 21; *see also* fig. 3 and Ex. 1001, 6:23-26. Thus, Kobayashi discloses both the claimed second distance, “a”, and the claimed third distance, “c.”

As to the specific distances and ratios, Kobayashi explicitly discloses potential values of “a” to be “10 mm or more” and “b” to be “10 to 100 mm.” Ex. 1006 at [0019]-[0020]. Thus, Kobayashi explicitly discloses a range of values for “a” (second distance) and “b” (third distance) that would result in a ratio (a/b) greater than 1 and less than 1.5.

This is obvious, for example, when “a” is 22 mm and “b” is 16 mm as the ratio would be 1.375, which is greater than 1 and less than 1.5. But Kobayashi explicitly discloses other values that fall within the claimed range. For example, when a is 24 mm and b is 17 mm (resulting in a ratio of ~1.41); or when a is 25 mm and b is 18

mm (resulting in a ratio of ~ 1.39); or when a is 26 mm and b is 19 mm (resulting in a ratio of ~ 1.37). And there could be fractional values that lead to hundreds if not thousands of valid measurements disclosed by Kobayashi that all lead to a ratio of greater than 1 to less than 1.5 times the third distance. Thus, Kobayashi explicitly discloses numerous values for a second distance that is greater than the third distance and also less than 1.5 times the third distance.

To the extent that PO argues that Kobayashi should be limited to its preferred ratio of 0.2 to 1, PO's argument should fail. First, prior art disclosures are not limited to their preferred embodiments. *Galderma Lab'sys., L.P. v. Tolmar, Inc.*, 737 F.3d 731 (Fed. Cir. 2013) ("A teaching that a composition may be optimal or standard does not criticize, discredit, or otherwise discourage investigation into other compositions."). Second, PO never provides an explanation as to why or how one of skill in the art would read Kobayashi as not teaching the claimed range. In fact, PO's motion is devoid of any citation to evidence, whether intrinsic or extrinsic, as to why one of skill in the art would understand Kobayashi in such a limited way.

More critically, Kobayashi itself recognizes that the ratio of 1 is only preferable because at greater ratios it may be "difficult to demonstrate the superiority of the units of the present invention." Kobayashi, [0020]. But this teaching in Kobayashi, rather than teaching away from ratios greater than 1, actually suggests that a ratio larger than 1 may be preferable to one of skill in the art for various

reasons, not limited to the easiness of “demonstrat[ing] the superiority of the units of the present invention.” *Id.*; Ex. 1019, ¶33-36.

For example, Kobayashi discloses its “superiority” includes reducing “the eye-catching lamp image” and minimizing “the brightness irregularity” to achieve “a display device with excellent display characteristics.” Ex. 1006, [0015]. Kobayashi additionally recognizes that a smaller third distance b between the LED is desirable because “if the distance between the LEDs 1 is widened, the highly directional light is emphasized, and even when viewed as a surface, it looks like an eye-catching lamp image which is disliked by an increasing number of users.” Ex. 1006, [0008]. However, Kobayashi also explains that for the market concerned with the “energy consumption and cost” associated with using a large number of LEDs, the third distance b cannot be made arbitrarily small. Ex. 1006, [0008]. Accordingly, Kobayashi teaches that one of skill in the art should balance these considerations, including the benefit of spacing LEDs closer together (to reduce lamp image) with energy consumption and cost.

In light of these considerations, a POSITA in view of Kobayashi would have readily appreciated that there would scenarios where a slight increase of energy consumption and cost, for example, by adding a few LEDs would be outweighed by the benefits of better brightness (due to more LEDs) and better brightness uniformity and less lamp image (due to smaller LED spacing). Ex. 1019, ¶32-33. In those

scenarios, the ratio of a/b of Kobayashi would be slightly larger than 1. Ex. 1019, ¶34-36.

Additionally, there are several well-known design principles that would guide a POSITA to make small changes to Kobayashi's system that would result in a ratio greater than one. For example, Dr. Pattison explains that it would have been obvious to modify Kobayashi's system to include slightly smaller LED spacing (making b smaller) and increase the distance between the LEDs and the diffuser (a). Ex. 1019, ¶34-35. This change would be obvious because although it would increase the cost of LEDs, it would not only increase brightness but also create better light mixing (e.g. more light uniformity) due to the larger mixing chamber.

Other obvious modifications of Kobayashi would also lead to ratios slightly greater than one. As another example, one might increase the number of LEDs (to reduce lamp image), keep the distance " a " the same, but use a slightly less diffusive, more transmissive diffuser. Ex. 1019, ¶32-33. Such a modification would trade a slightly higher cost for a brighter display that also resulted in a relatively thin form factor. *Id.*

In fact, when the LEDs are spaced a little closer together than described in Kobayashi, which is beneficial as it reduces lamp image, one of skill in the art can tune the light output using a variety of different off-the-shelf diffusers well known in the art. Ex. 1019, ¶40. This would allow a designer to use diffusers with lower

cost or less stringent diffusing characteristics. *Id.* Even Kobayashi's data itself teaches such modifications. For example, when comparing examples 2 and 3 of Kobayashi in Table 1, Kobayashi's data reveals that leaving all things equal (light transmittance, diffusivity, lenses, etc.) when increasing the distance *b*, the light conditions improve. Ex. 1006 at Table 1 and 2 (showing improvement from example 2 (less luminosity and good condition) to example 3 (good condition that glows evenly as a surface – less luminosity and good condition). Kobayashi's data also reveals that tuning the thickness of diffuser plate 5 (i.e., the second diffuser) impacts the light conditions in Kobayashi's system. *Id.* at Examples 22-24. Ex. 1019, ¶40.

Thus, based on these teachings one of skill in the art would understand that starting with Kobayashi's system, small design changes can be made that create trade-offs between the various costs and benefits relevant to the overall system. In light of these teachings, modifying Kobayashi's system to include ratio's slightly greater than its preferred ratio of 1 would have been obvious to one of ordinary skill in the art. Ex. 1019, ¶38.

Finally, even if PO articulates some reason why Kobayashi's "preference" would dissuade someone from using a range greater than 1, something PO has not provided evidence of at all, that too should fail. As explained by Dr. Pattison, one of skill would recognize that the ratio of 1, about 1, greater than 1, substantially 1, or approximately 1 does not alter functionality. Ex. 1019, ¶39-40. As discussed above

the '382 specification already describes these distances with words of degree, including “substantially” and “approximately.” And the patent provides no explanation or description as to how these distances matter in any precise way. A POSITA would have found it obvious to deviate from a strict ratio of 1, because small deviations make little practical difference. Ex. 1019, ¶39-40.

2. Kobayashi’s Preferred Embodiment Discloses a Second Distance Greater than a Third Distance and Less than 1.5 the Third Distance When LED Height is Taken into Account.

Under PO’s amended claims, which now recite a second distance from the bottom of the LED, even Kobayashi’s preferred embodiment discloses the claimed distance. This is so because Kobayashi’s $(a + H)$ becomes the claimed second distance, with H being the height of the LED.

PO’s proposed substitute claim recites a second distance that is from the diffuser to the bottom of the LED. Accordingly, one would have to add the height of the LED, H , to Kobayashi’s distance “ a .” The '382 Patent and Kobayashi both disclose using LEDs as the solid state emitters. Ex. 1001 at 4:47-63; Ex. 1006 at [0002]-[0003]. As explained by Dr. Pattison, conventional LEDs used in displays at the relevant time would typically have heights of around 1 mm. Ex. 1019, ¶44. Thus, adding height H of conventional LEDs in use at the time of both Kobayashi and the '382 patent to Kobayashi’s preferred embodiment means that even Kobayashi’s preferred ratio a/b of 0.2 to 1 discloses a ratio of $0.2+H/b$ to $1+H/b$. And $1+H/b$ is

greater than 1 and less than 1.5, especially given the typically values of H being 1 mm and b being 10 to 100 mm. *See* Ex. 1006, [0020]; Ex. 1019, ¶41-44.

Finally, although figures ought not be relied on for precise measuring points, Kobayashi's proportional representation of its LEDs and the thickness of the second diffuser in its figures 1 and 2 reveal both components to be substantially the same thickness. Thus, even if the LED height is not precisely known or disclosed, since the second distance can be defined to any point of the diffusion plane, the height of the LED will not materially impact the disclosed ratios of Kobayashi since it has a similar height or thickness as the second diffuser. And the second distance can be measured with or without the thickness of the diffuser (i.e. to the lower or upper side of the second diffuser). Ex. 1006, [0020]; Ex. 1019, ¶45-46.

3. Even under the most conservative interpretation of Kobayashi, it discloses, and renders obvious, a second distance greater than a third distance and less than 1.5 the third distance.

Finally, even under the more conservative interpretation of Kobayashi where the second distance is defined by the distance between the lower surface of the second diffuser and the bottom of the LED, (i.e., Kobayashi's distance "a" minus the thickness of the second diffuser, plus the height of the LED), Kobayashi still explicitly discloses a second distance that is greater than the third distance and less than 1.5 the third distance.

As discussed in Section III.A.1, Kobayashi explicitly discloses a number of valid values for its second distance, “a”, and third distance “b.” To the extent that PO attempts to limit the interpretation of the second distance as being defined by the distance between the bottom face of the second diffuser, Kobayashi still explicitly discloses a second distance that is greater than the third distance and less than 1.5 times the third distance.

For example, Kobayashi discloses that the second diffuser may be comprised of a diffuser sheet that has a thickness of 1-5 mm, preferably 1.5 to 3 mm. Ex. 1006 at [0039]. Using the largest value for the thickness of the diffuser sheet, here 5 mm, each of the previously discussed examples—which all fall within the ranges contemplated by Kobayashi—still result in the claimed ratio.

- Example 1: when “a” is 22 mm and “b” is 16 mm, the ratio is $22 \text{ mm} - 5 \text{ mm} / 16 \text{ mm} = \sim 1.06$
- Example 2: when “a” is 24 mm and “b” is 17 mm, the ratio is $24 \text{ mm} - 5 \text{ mm} / 17 \text{ mm} = \sim 1.12$
- Example 3: when “a” is 25 mm and “b” is 18 mm, the ratio is $25 \text{ mm} - 5 \text{ mm} / 18 \text{ mm} = \sim 1.11$
- Example 4: when “a” is 26 mm and “b” is 19 mm, the ratio is $26 \text{ mm} - 5 \text{ mm} / 19 \text{ mm} = \sim 1.1$

Each of these ratios fall directly in the claimed range. Moreover, each of these are just examples using explicitly disclosed values from Kobayashi's ranges. There are multiple additional examples, indeed likely thousands, that would result in the claimed range.

Finally, the above examples do not account for the height of the LED. However, as discussed above in Section III.A.2, when such height is added back into the equation, regardless of whether one subtracts the thickness of the diffuser, the result is the same – Kobayashi discloses hundreds if not thousands of values and combinations of values that would result in the claimed range.^{3,4}

B. Substitute Claim 22: Prior Art Involved in the Grounds Discloses the First and Second Distances Defined from the Bottom of the Solid State Emitters.

Kobayashi's embodiments and descriptions already disclose substitute claim 22's limitation of the first distance being a function of the third distance when the first distance is measured from the bottom of the LED.

First, none of the amendments change the fact that the first distance is a function of the third distance. Indeed, PO does not make any arguments that amending the claim affects this aspect of the claim limitation. Nor could it.

³ Without subtracting thickness, Example 1: $22 \text{ mm (a)} + 1 \text{ mm (h)} / 16 \text{ mm (b)} = \sim 1.43$; Example 2: $24 \text{ mm (a)} + 1 \text{ mm (h)} / 17 \text{ mm (b)} = \sim 1.47$; etc.

⁴ Subtracting thickness, Example 1: $22 \text{ mm (a)} + 1 \text{ mm (h)} - 5 \text{ mm} / 16 \text{ mm (b)} = \sim 1.12$; Example 2: $24 \text{ mm (a)} + 1 \text{ mm (h)} / 17 \text{ mm (b)} = \sim 1.17$; etc.

Kobayashi discloses that b and c are related and thus no matter the specific location from which a measurement is defined, the functional relationship exists.

Second, changing or amending one of the two end-points that define the first and second distances does not change the fact that Kobayashi also discloses that same end point. Kobayashi, like the amended claim, also discloses an LED that has a bottom. Just as the '382 discloses that distance, so too does Kobayashi.

To the extent that PO argues that Kobayashi does not show distance “a” or “c” as “measured from” the bottom of the LED, that argument is a red herring. The claim simply claims a distance from “X” to “Y” and says nothing about measuring. Kobayashi objectively discloses and explicitly shows such distances (e.g., in Figures 1 and 2) as one of skill in the art would readily appreciate. Ex. 1019, ¶¶41-42.

IV. Substitute Claims 21 and 22 Are Not Patentable in View of Other Prior Art

A. The Prior Art Discloses a Second Distance that is greater than the third distance and less than 1.5 the third distance

Lim in combination also Kobayashi discloses the claimed ratio. As discussed above, Kobayashi explains the use of a multiplane light diffuser. And Kobayashi teaches the trade-off between closer LED spacing and the use of different diffusers and their respective spacing. Due to one of many design considerations including “energy consumption and cost,” Kobayashi discloses a preference for maintaining the ratio at 1 and a spacing between LEDs at 10~100 mm because “if b is less than 10 mm, the number of LEDs 1 becomes excessive.” Ex. 1006 at [0008], [0020].

Lim is directed to backlight display units that are relatively thin and have a good brightness. Ex. 1013 at [0024], [0048]. Lim explains that it is desirable to maintain the LED spacing to below 10 mm. Ex. 1013 at [0047]. And Lim explains that when such LED spacing is below 10 mm, the display can maintain “a high brightness over 2000 nit and provide a thin backlight unit.” Ex. 1013 at [0048]. Moreover, as discussed in Lim, it had been known to one of skill in the art that a sufficient distance “a” between the LED and the diffuser helps ensure uniform brightness. Ex. 1019, ¶49.

Thus, one of skill in the art would have found it obvious to modify Kobayashi’s specific embodiment in light of Lim’s teachings to reduce the LED spacing to be less than 10mm, which might result in more LEDs but would also achieve higher brightness due to the additional light sources and the narrower spacing between the LEDs. Ex. 1019, ¶50. The resulting combination would exhibit the specifically claimed ratio of 1 to 1.5, for example, when the LED spacing b is 9 mm and a is 10 mm. Ex. 1019, ¶51. This is particularly true in light of Dr. Pattison’s explanation that the interaction between the different components of a display panel, including the properties of the optical film, the type and power rating of the LEDs, and the spacing between these components, were well known design choices available to those of ordinary skill in the field. Ex. 1019, ¶31.

B. Prior Art Discloses First and Second Distances from The Bottom of the Solid State Emitter

The prior art is full of examples where those of skill in the art consider the height of the LED in designing a lighting system, and where the distance to the first or second diffuser includes consideration of or identification of the height of the LED. To be clear, the substitute claim does not require “measuring from” a point of the LED – only that the display have a distance defined by a point of the LED, which in the case of the amended claims is the “bottom of the solid state emitter.”

To the extent the prior art must explicitly identify or disclose the height of the LED, which Petitioner contends is not necessary, Holman '096 discloses this. Holman '096 is directed to “thin and compact multilayered optical system and method for generating well-organized output illumination from a spatially discontinuous one or two-dimensional array of discrete emitters....” Ex. 1024 at 1:12-17. And Holman '096 is directly related to optimizing the precise location of the optical layers to “even-out the light source array’s brightness uniformity.” *Id.* at 1:30-35. Holman '096 further explains that “the total system 10 thickness 56, T, in FIG. 1 ... is made the smallest possible commensurate with suppressing visibility of the discontinuous nature of the light source 1.” *Id.* at 15:55-58. In considering the total system height T, Holman '096 specifically discloses measuring the height of the LED, “H,” and taking into consideration that measurement point when designing

the system. *See, e.g., id.* and reference to “H” in Figs. 7, 8A, 13A, 14, 15A-15D (and corresponding description).

Holman '096 also discusses the impact of spacing between the components of a system, how those distances, and specifically how distances between the light source and the optical layers, impact light uniformity and brightness. *See, e.g., id.* at 28:4-31; 28:35-46. Moreover, Holman '096 provides a significant amount of teaching related to the factors that go into determining optical layer spacing and their relation to all the components of the system, including LED height. *See, e.g., id.* at 90:18-98:14. And Holman '096 contains numerous embodiments and teachings of including (and thus measuring from the bottom) height “H” when designing the spacing between the components of the lighting panel.

Thus, even if the claims require “measuring from” the bottom, Holman '096 shows it would have been obvious to include consideration of the bottom of the LED when designing a lighting system according to the teachings of Kobayashi.

V. One of Skill In The Art Would Have Been Motivated To Combine The Features of the Prior Art With Ground I

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

First, as to existing art no additional motivation or modifications are necessary as Kobayashi discloses the elements. To the extent that PO tries to argue that

Kobayashi teaches away from using its less preferred distances and ranges, PO's argument fails for the reasons explained above.

Kobayashi's statement that at a ratio above 1 the superiority of the invention is more difficult to show is not a teaching away. At most it suggests that the benefit in Kobayashi's system, that is, using the specific diffusers described by Kobayashi, are difficult to show at higher ratios. But something being difficult to show does not mean it does not exist or cannot be shown. And such a brief mention by Kobayashi falls far short of the criticizing, discrediting, or otherwise discouraging required to establish a teaching away. *Merck & Co. v. Biocraft Lab'ys, Inc.*, 874 F.2d 804, 807 (Fed. Cir. 1989) (“[T]he fact that a specific [embodiment] is taught to be preferred is not controlling, since all disclosures of the prior art, including unpreferred embodiments, must be considered.” (second alteration in original) (citation omitted)), *cert. denied*, 493 U.S. 975 (1989).

Dr. Pattison explains how and why one of skill in the art would understand and be motivated to use Kobayashi's ratios, including ratios greater than 1 and less than 1.5; whereas, PO cites no evidence whatsoever and simply relies on attorney argument. Dr. Pattison also explains how one of skill in the art would have been motivated to modify Kobayashi when considering the costs and benefits of the various factors that go into a panel design. Ex. 1019, ¶30; *see also Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (explaining that “a given

course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine”); *Winner Int’l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) (“The fact that the 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. Instead, the benefits, both lost and gained, should be weighed against one another.”); *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1197-98 (Fed. Cir. 2014); *In re Fulton*, 391 F.3d 1195, 1200 (Fed. Cir. 2004).

Second, as to new art, Lim’s disclosures are readily combinable with Kobayashi. *See* Petition at 48-49, 65-66. For example, Kobayashi is directed to a backlighting system using either edge lit or direct backlighting light sources, including LEDs, but focuses on the use of direct back light displays. Ex. 1006 at [0003]. Lim is similarly directed to a backlighting system using edge lit or direct backlighting light sources, and similarly focuses on direct back light displays. Ex. 1013 at [0046], [0068]; *see also id.* at Fig. 2, 3A, 3B, 4A, 4B, 6. Kobayashi is directed to managing optical films in relation to their distance to LEDs (Ex. 1006 at [abstract]); as is Lim (Ex. 1013 at [0057-0058], [0069]); Ex. 1019, ¶¶57-58. Both references are concerned with optimizing brightness and light uniformity by configurations of the light sources and optical films/sheets in the backlight module/unit. Ex. 1006 at [0010]-[0011]; Ex. 1013 at [0069]-[0070]. Thus, both

references are readily combinable and their combination would have been predictable, well within the skills of a skilled person in the art.

Additionally, one of skill in the art would have immediately recognized Holman '096's teachings as relevant to Kobayashi. Holman '096 is a virtual treatise on optimizing brightness and uniformity in lighting displays using the same types of optical films in a multi-layer arrangement. Moreover, both Holman '096 and Kobayashi use commercially available LEDs and optical films. Ex. 1019, ¶59. Thus, Holman '096's teachings are directly relevant to Kobayashi (and Lim) and one of skill would have found it obvious that the teachings of Holman '096 are predictably combinable with Kobayashi, especially regarding a well-known reference point in measuring a distance in the similar lighting displays disclosed by both Kobayashi, Holman '096, and Lim.

VI. Conclusion

The proposed substitute claims are improper and should not be entered.

Respectfully submitted,

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

The undersigned hereby certifies that on the date below a copy of this
**PETITIONER’S OPPOSITION TO PATENT OWNER’S CONTINGENT
MOTION TO AMEND** has been served via email on the following:

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Dated: September 13, 2024

By: /s/ Matias Ferrario
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