

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Hisense USA Corporation

Petitioner,

v.

Brightplus Ventures LLC,

Patent Owner

Case No. IPR2023-01168

U.S. Patent No. 9,605,835

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

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I. INTRODUCTION

Pursuant to 35 U.S.C. § 326(d) and 37 C.F.R. § 42.121, Patent Owner Brightplus Ventures, LLC (“Brighplus”) respectfully moves to amend U.S. Patent No. 9,605,835 (“the ‘835 Patent”), contingent on the outcome of this trial. In the event the Board finds any of the challenged claims unpatentable, Patent Owner requests that the Board grant this revised motion to amend and issue the proposed substitute claims.

II. STATEMENT OF RELIEF REQUESTED

If the Board finds any original claim unpatentable in this proceeding, Brightplus requests that the Board grant this revised motion to amend with respect to each corresponding substitute claim presented here. The Board should not consider this motion for each original claim it finds patentable.

III. THIS MOTION PROPOSES A REASONABLE NUMBER OF SUBSTITUTE CLAIMS

In this Revised Motion to Amend, Patent Owner proposes no more than 1 substitute claim for each challenged claim 1-5, 7, 9-10, and 13. (*see*, Paper 21 at pg. 6) Hence, patent Owner proposes a reasonable number of substitute claims. *See* Prelim. Guidance at 6-7. Patent Owner has also corrected any typographical errors that were identified by Petitioner and the Board in the proposed substitute claims.

IV. THE SUBSTITUTE CLAIMS DO NOT EXPAND THE SCOPE OF THE CLAIMS OF THE ‘835 PATENT

While Proposed Claims 21-29 include new limitations not previously presented, patent Owner submits the commentary provided in the Board’s Preliminary Guidance is still applicable to this Revised Motion to Amend. For example, proposed substitute independent claim 21 retains all limitations of corresponding original independent claim 1 and further includes additional limitations as compared to claim 1. As the Board stated in its Preliminary Guidance, the additional limitations narrow the original claim and do not enlarge the scope of the claims of the challenged patent. (see, Paper 21 at pg. 9). Consequently, even though proposed dependent claims 22-29 may have certain limitations removed, because these proposed claims depend from narrowed proposed substitute claim 21, proposed dependent claims 22-29 do not enlarge the scope of the challenged patent. *See Lectrosonics v. Zaxcom*, IPR2018-01129, Paper 15 at 6–7 (PTAB, Feb. 25, 2019) (“A substitute claim will meet the requirements of § 42.121(a)(2)(i) and (ii) *if it narrows the scope of at least one claim of the patent*, for example, the challenged claim it replaces, in a way that is responsive to a ground of unpatentability involved in the trial.” (emphasis added)). (see, Paper 21 pg. 10)

V. THE PROPOSED SUBSTITUTE CLAIMS DO NOT ADD NEW MATTER AND HAVE WRITTEN DESCRIPTION SUPPORT IN THE SPECIFICATION OF THE '835 PATENT

According to 37 C.F.R. § 42.121(b), a motion to amend must set forth both (1) the support in the original disclosure of the patent for each claim that is added or amended; and (2) the support in an earlier-filed disclosure for each claim for which benefit of the filing date of the earlier-filed disclosure is sought. Written description support for each proposed substitute claim is identified below:

- Proposed Claim 21: EX1001 at 8:30-33; 4:15-18; 14:8-11; Fig. 2; 9:62-10:8; 9:43-46; Fig. 11; 14:45-57; 14:63-15:6; 9:10-15; 11:49-51; Fig. 5A; Fig. 5B and Fig. 7
- Proposed Claim 22: EX1001 at 9:43-46
- Proposed Claim 23: EX1001 at Fig. 5A
- Proposed Claim 24: EX1001 at Fig. 5A
- Proposed Claim 25: EX1001 at Fig. 11 and accompanying description
- Proposed Claim 26: EX1001 at Fig. 11 and accompanying description
- Proposed Claim 27: EX 1001 at 14:45-57
- Proposed Claim 28: EX 1001 at 14:16-20; 16:1-4; 20:9-12
- Proposed Claim 29: EX1001 at Fig. 5a; Fig. 5B; and Fig. 7

VI. THE PROPOSED SUBSTITUTE CLAIMS ARE RESPONSIVE TO AND OVERCOME THE ASSERTED GROUNDS OF UNPATENTABILITY

While Patent Owner submits new and additional limitations in Claims 21-25, as well as additional amendments 26-29, the Board's Preliminary Guidance is still applicable to this Revised Motion to Amend. For example, the Board recognized that "Patent Owner's Motion presents good faith arguments as to why Patent believes the art cited in the Petition's original grounds (e.g., Mok, Lamb, Ko, Kretman, and some of the Petition's cited figures from Holman and Epstein) do not teach the limitation added in proposed substitute claim 21." (see, Paper 21 pgs. 6-7). Similarly, Patent Owner has incorporated into this Revised Motion to Amend arguments as to why the art cited in Petitioner's original grounds¹ and the additional art cited in Petitioner Opposition to Patent Owner Contingent Motion to Amend does not teach the limitations in proposed substitute claims 21-29. Additionally, all of the proposed substitute claims are to modify the claims included in Petitioner's original grounds, namely claims 1-5, 7, 9-10, and 13.

¹ As stated by the Board, "Petitioner *does not expressly refer to Ground III of the Petition or its asserted references (i.e., Ko and Kretman)*, we understand Petitioner's Opposition *not to be asserting original Ground III* against proposed substitute claims 21-25." (see, Prelim. Guidance at 16). Patent Owner, therefore does not explicitly address Ko and Kretman in its Revised MTA.

VII. GROUND 1: THE COMBINATION OF MOK, HOLMAN AND LAMB DOES NOT RENDER THE SUBSTITUTE CLAIMS OBVIOUS

Regarding Ground I, which is based upon the combination of Mok, Holman and Lamb, proposed claim 21 addresses deficiencies in Patent Owner's original Motion to Amend described by the Board in its Preliminary Guidance such that the combination does not render the proposed substitute claim obvious.

As recognized by the Board, Mok does "not appear to show a reasonable likelihood that Mok teaches or renders obvious a reflector that is extended and angled with respect to the surface of the substrate." (Paper 21 at 18) Proposed claim 21 adds similar and further limitations to the recited reflector. Specifically, the reflector is "outside of the solid state lighting device packages" and "extends to cover the lighting tile and includes a plurality of sidewalls that are angled with respect to the principal plane of the lighting panel." The Board also noted that it did not find "the reflector cups 32 (and attached reflective coatings 58) embedded in each of Mok's light emitting devices 14 to be teaching 'a reflector on the first side of the at least one substrate, wherein the reflector is extended and angled with respect to the surface of the substrate'...Rather, each reflector cup 32 (and attached reflective coating 58) is part of a solid state lighting device." (*Id.* at 20).

The same explanation of Mok's deficiency as a reference as to previously proposed claim 21 applies to the newly proposed claim 21. The reflector of newly

proposed claim 21 is not part of the solid state lighting devices as it is “outside of the solid state lighting device packages.” The Reflective Surface 50 of Mok is not angled with respect to Base Panel 12 and therefore it does not include a plurality of sidewalls which are angled with respect to the principal plane of the lighting panel. Moreover, diffuser 16 of Mok does not contact “the sidewalls of the reflector with no intervening elements” as required by proposed claim 23. If anything, diffuser 16 would contact the light emitting elements 14.

Further, while Mok does disclose a lens that forms part of a light emitting element, the lens is mounted to the reflector cup over a bare LED die. Mok, [EX1005 at 0016], Fig. 3. The lenses of proposed claim 21, on the other hand, are mounted over each of the *packaged* solid state lighting devices.

The Board noted that “Holman’s Figure 13 therefore appears to teach a reflector...that is extended and angled with respect to the surface of a substrate...as required by proposed substitute claim 21. Holman’s Figures 13 and 15 also appear to teach that the reflector forms a reflective optical cavity around at least one solid state lighting device...as recited in proposed substitute claims 23 and 25.” (Paper 21at 24)

Presently proposed claim 21 addresses these arguments. First, Figure 13 of Holman illustrates a cross-sectional side view of the parallel layers for “a two-dimensional array of light emitting diode chips having...separate diffusely reflecting

compartments surrounding each diode chip . . .” (EX1006 at 151:23-29). Figures 3, 7, 13 and 14 of Holman all refer to an LED chip 70 which is located inside of package element 161 (EX1006 at 29:31-33). The description of Figures 13 and 14 of Holman are each described as illustrations of the packaging elements for light emitting diodes (see e.g. EX1006 at 7:40-55). Figure 14 of Holman shows the same LED chip 70 as Fig. 7; this is an individual die. The sidewall reflector of Figure 14 is a “packaging element”; it is not outside the package as required by presently proposed claim 21. The “packaged solid state lighting devices” of proposed claim 21 could be described as SMD packages e.g. “may include a packaged discrete electronic component including a carrier substrate 13 on which a plurality of LED chips 16A-16D are mounted.” (‘835 Patent at 9:11-15) Thus, the reflector described in newly amended claim 21 being “outside of the solid state lighting device packages” means that the reflector is not a part of the package as described in Holman but rather a separate element. Further the reflector of newly amended claim 21 “extends to cover the principal plane of the lighting panel” which is distinct from the structures described in Figure 13 of Holman which shows individual reflectors that are positioned around each light emitting diode.

Further, the control system of Holman does not disclose modulation of the pulse width of the emission of the LEDs (i.e. the packaged solid state lighting devices of proposed claim 21). While Holman does discuss the modulation of light

emission from the backlighting device vis-a-vis an LCD panel and/or a light diffusing panel acting as a spatial light modulator (*see e.g.* EX1006 Sect. 5.1, pp. 47 et seq.), there is no discussion of pulse width modulation of a signal from a current supply circuit to the backlighting device. In the '835 patent, "the controller 230...may be programmed to provide pulse width modulation (PWM) control of separate current supply blocks within the driver 220 for the LED strings 23." This allows the backlighting system to vary the intensity and brightness of the individual LED strings so as to achieve appropriate brightness in the viewing field based on information received from the controller. Such modulation of a current signal is not disclosed in Holman. Moreover, the controller of Holman does not "transmit pulse width modulated signals to one or more of the plurality of strings" of light emitters as required by proposed claim 26.

The Board stated that Lamb, "does not appear to show a reasonable likelihood that Lamb's Figure 1 teaches or renders obvious a reflector that 'is extended and angled with respect to the surface of the substrate'". (Paper 21 at 26). In fact, Lamb does not describe a substrate with solid state lighting devices disposed thereon, does not include a reflector that is extended and angled with respect to a substrate, does not disclose a substrate and Petitioner has not advanced an argument that the addition of a substrate would be desirable. (*Id.* at 26 and 27).

Further Lamb does not disclose strings of packaged solid state lighting devices connected in series to a metal core printed circuit board, it does not disclose a control system for individually controlling those strings, nor does it disclose a PWM system as discussed above and as recited in proposed claim 21.

By the same logic as applied by the Board in the Prelim Guidance, Mok and Lamb do not disclose a reflector that “extends to cover the lighting tile and includes a plurality of sidewalls that are angled with respect to the principal plane of the lighting panel” as recited in proposed claim 21. While Holman shows in Figure 13 a light emitting diode that has angled sidewall reflectors, those angled sidewall reflectors do not extend over the principal plane of a lighting panel, nor are those sidewall reflectors outside of the solid state lighting device packages, as required in proposed claim 21.

Further, Holman does not disclose a control system that is operable to modulate the pulse width of the current supplied to the lighting devices. Thus, the combination does not render proposed claim 21 obvious as there is no disclosure in either Mok or Lamb which a POSITA would combine with Holman to arrive at the lighting panel recited in the proposed substitute claim. Neither Mok nor Lamb disclose a control system of any kind. Finally, neither Mok, nor Holman, nor Lamb, nor their combination, disclose a lighting tile that is a separate element from a substrate disposed thereon.

VIII. GROUND 2: THE COMBINATION OF EPSTEIN, HOLMAN AND LAMB DOES NOT RENDER THE SUBSTITUTE CLAIMS OBVIOUS

Regarding Ground II, which relies on the combination of Epstein, Holman and Lamb, proposed claim 21 addresses the deficiencies described by the Board in its Preliminary Guidance. Patent Owner realleges its arguments made with respect Ground I above as to Holman and Lamb and incorporates them by reference as if fully set forth herein.

With respect to Epstein, the Board stated, “Epstein’s reflecting sheet or surface (1822 or 1824) appears to form a reflector that is extended and angled with respect to the surface of a substrate (e.g., substrate 1808) as required by proposed claim 21, because reflecting sheet 1822 (or reflecting surface 1824 if deposited thereon) forms sidewalls around diodes 1820, on substrate 1808, as shown in Figures 18A–18B...Epstein’s Figure 20B illustrates an ‘intermediate layer 622 [that] is reflective’ and ‘may be curved, for example as shown in FIG. 20B.’ *See id.* ¶¶ 95–96, Fig. 20B. Epstein’s layer 622 appears to form a reflector that is extended and angled with respect to the surface of a substrate (e.g., substrate 608) as required by claim 21.” (Paper 21 at 30 and 31).

Presently proposed claim 21 addresses these issues as it includes a “substrate...mounted on a lighting tile and having a first side parallel to a principal plane of the lighting panel” and a reflector that is “mounted to the lighting tile and

on the first side of the at least one substrate.” The substrate and lighting tile of the lighting panel of proposed claim 21 are separate elements, and while intermediate layer 622 of Epstein is on substrate 608 as disclosed in Figures 18A-B and 20B, Epstein does not include, nor does it suggest the need for, a separate element constituting a lighting tile and thus the intermediate layer 622 of Epstein is not mounted on such a separate element. Further, proposed claims 21 and 22 include lenses “mounted over each one of the packaged solid state lighting devices...[and] surrounds each of the packaged solid state lighting devices” which are not disclosed in Epstein. Epstein does not disclose a plurality of strings of packaged solid state lighting devices as required by proposed claim 21, rather the LEDs 420 of Epstein are individually connected via wire bond 426 to conductors 421 and 425.

Epstein does not disclose pulse width modulation of the current signals from a plurality of current supply circuits as required by newly amended claim 21. The system disclosed in Epstein does make passive reference to controlling the backlighting panel in order to increase or decrease the brightness in specific areas (*see e.g.* “In addition, a backlight as described may be controlled so that different areas of the display are illuminated at different levels of intensity.” (EX1008 at 0122)), but it does not propose a means for doing so or account for how its individually wired light emitters could be controlled in such a fashion. As discussed above, the current control system disclosed in the ‘835 Patent and claimed in newly

amended claim 21 advances a practical means for achieving control of individual strings of light emitters in a backlighting system as opposed to a prophetic example as discussed in Epstein.

The combination of Epstein, Holman and Lamb does not disclose the features of proposed claim 21. As noted above, the angled reflector walls of Holman are a feature of the packages proposed therein; that is, they are not outside the packages, as recited in proposed claim 21. Further, the reflective sidewalls of Holman do not cover the principal plane of the lighting device as they are structured around individual diodes, hence, there is no reflector extending to cover the principal plane of a lighting panel which is a separate and distinct element from the substrate on which the packaged solid state lighting devices are mounted. While the intermediate layer 622 of Epstein covers the substrate, Epstein does not disclose, as a separate element, a lighting tile on which the substrate is mounted. Any combination of Holman and Epstein would either have the reflective sidewalls disposed as part of the packaging elements for the light emitters as per Holman; that is, the reflective sidewalls would not be disposed outside the packaged solid state lighting devices. On the other hand, such a combination would have a substrate with no separate tile as per Epstein.

Further, neither Epstein nor Holman disclose lenses which are mounted above each of the packaged solid state lighting devices or surrounding each of the packaged

solid state lighting devices. Finally, neither Epstein, Holman nor Lamb disclose a plurality of current supply circuits operable to control the pulse width of the current supplied their light emitters as claimed in proposed claim 21.

IX. GROUNDS 3 AND 4: THE COMBINATION OF ABAYE, MOK, EPSTEIN, HOLMAN AND LAMB DOES NOT RENDER THE SUBSTUTE CLAIMS OBVIOUS

Grounds 3 and 4, which are based on the combination of Ayabe, Mok, Epstein, Holman, and Lamb as well as the Board's comments in its Preliminary Guidance are addressed below. Patent Owner realleges its arguments made with respect to Ground 1 above as to Mok, Holman, and Lamb, and Ground 2 above as to Epstein, Holman and Lamb and incorporates them by reference as if fully set forth herein.

With respect to Abaye as discussed in the Preliminary Guidance, Fig. 2 of Ayabe does not teach or suggest a reflector that that is angled with respect to the principal plane of another surface or substrate. Proposed claim 21, recites that the reflector is mounted to the lighting tile and that the reflector is angled with respect to the principal plane of the lighting panel. First, Ayabe does not disclose a lighting tile or another substrate that the reflector is mounted to. Second, Ayabe does not define a principal plane that the reflective film is angled with respect to. Thus, neither Ayabe's disclosure, nor Fig. 2, anticipate proposed claim 21.

Ayabe's Figs. 9, 32, 34, and 35 all show a similar design, wherein an LED chip is mounted to a wiring board 55 and encapsulated in a molded unit 54. All the

embodiments above demonstrate that the reflector is within the LED package. Proposed claim 21 specifies the reflector is “outside of the solid state lighting device packages” and “extends to cover the principal plane of the lighting panel and includes a plurality of sidewalls which are angled with respect to the principal plane of the lighting panel.” These requirements are not disclosed by Ayabe, as the reflector is a part of the LED packaging. To the extent that the reflector is not found to be a part of the LED packaging, Ayabe is still lacking disclosure of the reflector recited in proposed claim 21 inasmuch as Ayabe only discloses a single wiring board 55 to which the reflecting member 57 is mounted to and does not disclose two separate elements—specifically a lighting tile and a substrate—that the reflecting member 57 is mounted to. Additionally, Ayabe requires multiple reflectors, one for each LED grouping. Proposed claim 21, however, recites a single reflector that extends to cover the lighting tile.

Ayabe further does not disclose a controller operable to deliver a control signal to a plurality of current supply circuit. Ayabe only states that, “Direct current is supplied to the light emitting source array 77 through wiring parts 79 such as a lead, a connector or wiring board.” (EX1017 at 0155). There is no further disclosure about multiple current supply circuits or the method of controlling the current.

Ayabe does not disclose a lens mounted over each one of the packaged solid state lighting devices. Ayabe discloses a molding unit, which is either part of the

LED package or is a lens encapsulating the LED chip 56R, 56G, and 56B. That is, the lens element is part of the packaged lighting element and not mounted over it.

Lastly, as stated by the Board, Ayabe does not disclose that the diffuser contacts the reflector. Neither Figs. 9, 32, 34, 35, 39 or the textual description disclose a reflector contacting the diffuser. For example, Fig. 39 shows optical component contacting the top of casing 78, but not contacting the inner surface of casing 78. Additionally, Fig. 9 does not show the reflecting member 57 on top of molded unit 54, and therefore there would be no contact between the reflecting member and the lighting diffusing film 51 (See Paper 21, pgs. 35-37). Further, Ayabe does not present any other embodiment or disclosure wherein the reflector 57 directly contacts the light diffusing film 51.

With respect to Ground 3, Ayabe does not make up for the deficiencies with respect to Mok, Holman or Lamb (see Ground 1), as Ayabe does not describe the “control system”, a “lighting tile” that is separate from a “substrate, or a reflector that is mounted to a lighting tile and “extends to cover the principal plane of [a] lighting panel [that] includes a plurality of sidewalls which are angled with respect to the principal plane of the lighting panel”. Additionally, the Board stated, “the cathode tube arrangement of layers shown in Ayabe’s Figure 2 appears to be significantly different from the arrangement of layers in Mok and Holman that Petitioner relied upon with respect to the claimed arrangement of layers in original

claim 1.” (See Paper 21, pg. 33). The Board’s finding suggests that the combination of Ayabe with Holman and Mok would not resemble the lighting panel recited in proposed Claim 21 since Ayabe does not disclose the additional limitations included in proposed Claim 21.

With respect to Ground 4, Ayabe does not make up for the deficiencies with respect to Epstein, Holman and Lamb (see Ground 2), as Ayabe does not disclose a reflector that is mounted to a lighting tile and “extends to cover the principal plane of [a] lighting panel [that] includes a plurality of sidewalls which are angled with respect to the principal plane of the lighting panel,” lenses which are mounted above each of the packaged solid state lighting devices, or a plurality of current supply circuits operable to control the pulse width of the current supplied their light emitters as claimed in proposed claim 21.

X. GROUNDS 5 AND 6: THE COMBINATION OF ROTH, MOK, EPSTEIN, HOLMAN AND LAMB DOES NOT RENDER THE SUBSTITUTE CLAIMS OBVIOUS

Grounds 5 and 6, which rely on the combination of Roth, Mok, Epstein, Holman, and Lamb, do not render proposed substitute claim 21 obvious. Regarding Grounds 5 and 6, newly amended claim 21 as proposed herein addresses the arguments raised by the Board in its Preliminary Guidance. Patent Owner realleges its arguments made with respect to Ground 1 above as to Mok, Holman, and Lamb,

and Ground 2 above as to Epstein, Holman, and Lamb and incorporates them by reference as if set forth herein.

With respect to Roth, the Board stated, “Roth’s Figure 2 appears to teach a reflector (reflector 31) that is ‘extended and angled’ with respect to the surface of a substrate (substrate 1)” (see, Paper 21 pg. 38). Even if true, Roth fails to disclose a reflector that is “outside of the solid state lighting device packages,” as recited in proposed claim 21. In Roth, it is apparent that reflector 31 is included within the package of light emitting device 50. See Roth Fig. 2 and [0028] (“[A] top-type package light emitting device may have a reflector 31. . .”). Moreover, Fig. 2 of Roth shows one reflector positioned around a single light emitting diode, and this is not a reflector that “extends to cover the principal plane of the lighting panel,” as recited in proposed claim 21. Lastly, in Roth substrate 1 is contained within the package and so is not a substrate on which a plurality of strings of packaged solid state lighting devices is arranged, as required by proposed claim 21. Further, Roth does not include the controller, current supply circuits, diffuser, reflector, or lighting tile limitations required by proposed claim 21.

As to Ground 5, Roth does not make up for the deficiencies with respect to Mok, Holman, or Lamb (see Ground 1), as Roth does not describe the “control system”, a “lighting tile” that is separate from a “substrate, or a reflector that extends to cover the principal plane of [a] lighting panel [that] includes a plurality of

sidewalls which are angled with respect to the principal plane of the lighting panel,” and is “outside of the packaged solid state lighting devices”.

As to Ground 6, Roth does not make up for the deficiencies with respect to Epstein, Holman, or Lamb (see Ground 2), as Roth does not describe the “control system”, a “lighting tile” that is separate from a “substrate, or a reflector that extends to cover the principal plane of [a] lighting panel [that] includes a plurality of sidewalls which are angled with respect to the principal plane of the lighting panel,” and is “outside of the packaged solid state lighting devices”.

XI. GROUND VII: THE COMBINATION OF SACCOMANO, MOK, HOLMAN AND LAMB DOES NOT RENDER THE SUBSTUTE CLAIMS OBVIOUS

Regarding Ground VII, which relies on the combination of Saccomanno, Mok, Holman and Lamb, proposed claim 21 addresses the art as described by the Board in its Preliminary Guidance. Patent Owner realleges its arguments made with respect to Ground 1 above as to Mok, Holman, and Lamb and incorporates them by reference as if fully set forth herein.

While the Board, in its preliminary guidance, was unpersuaded by Petitioner’s arguments that Saccomanno discloses a diffuser sheet in contact with a reflector as required by newly amended claim 21, it is important to note other deficiencies with respect to this reference. First, Saccomanno does not disclose a lens as recited in proposed claim 21, that is one that is mounted over each one of the packaged solid

state lighting devices or that, as recited in proposed claim 22, surrounds a packaged solid state lighting device. Saccomanno does not disclose a plurality of current sources operable to modify the pulse width modulation of the packed solid state light emitters. Saccomanno makes one reference to pulse width modulation (i.e. “In particular, control system 150 may be implemented as an integrated circuit that receives feedback from photosensors...to adjust the pulse width modulated drivers for banks of red, green, and blue LEDs in order to maintain color and brightness settings over time-and-temperature.” (EX1019 at 0033). However, the controller recited in proposed claim 21 requires current supply circuits operable to control the pulse width of the current supplied to the light emitters that are separate from the controller. This distinction is meaningful as it distributes the control of the light emitters to multiple elements allowing for greater flexibility of control over the system. In a system such as the one recited in proposed claim 21, multiple current supply circuits can interpret addressed signals over a single channel, thus increasing the number of possible individually controlled strings of light emitters. On the other hand, the system as disclosed in Saccomanno would be limited to the number of channels available on the controller. Therefore, the system as recited in proposed claim 21 represents a significant advancement over that of Saccomanno.

Patent owner realleges its arguments with respect Ground I above as to the combination of Mok, Holman and Lamb. The addition of Saccomanno to the

combination of Ground I is not supported in the art for a number of reasons. Similar to Mok, Holman and Lamb, Saccomanno does not disclose a lighting tile that is a separate element from a substrate disposed thereon. Saccomanno does not disclose lenses mounted over and surrounding the packaged solid state lighting devices as in proposed claims 21 and 22. Saccomanno relies on optical conduits (110, 210, 310) to transmit light to photosensors in order to inform its controller of variances in lighting intensity. While Saccomanno does discuss varying the brightness of individual LEDs “to compensate for any small-area and/or large-area non-uniformities (Saccomanno at 0034) and for testing purposes (Saccomanno at 0042), Saccomanno does not propose individually controlling the pulse width modulation of the current delivered to a string of packaged solid state lighting devices based for example on user input as required in new claims 26, 27 and 28.

XII. GROUND 8: THE COMBINATION OF SACCOMANNO, EPSTEIN, HOLMAN AND LAMB DOES NOT RENDER THE SUBSTITUTE CLAIMS OBVIOUS

Regarding Ground 8, which relies on the combination of Saccomanno, Epstein, Holman, and Lamb, proposed claim 21 addresses the deficiencies described by the Board in its Preliminary Guidance. Patent Owner realleges its arguments made with respect to Ground II above as to Epstein, Holman, and Lamb and with respect to Ground VII above as to Saccomanno and incorporates them by reference as if fully set forth herein.

The combination of Saccomanno with Epstein, Holman and Lamb suffers from the same difficulties as described above with regard to the combination of Epstein and Holman discussed above vis a vis Ground II. The addition of Saccomanno, which includes reflective surface 505 depicted as vertical would not include a reflective surface that covers the lighting tile and includes angled sidewalls. Thus, a combination of Epstein, Holman and Saccomanno would have either the angled reflective sidewalls incorporated as a package element as per Holman, would not include a substrate separate from a lighting tile as per Epstein or would have a vertical reflective sidewall that does not extend to cover the substrate on which the lighting elements are mounted. No combination of these elements results in a reflector that is mounted to a lighting tile, covers a substrate on which packaged solid state lighting devices are mounted and has angled side walls as required by proposed claim 21.

XIII. GROUND 9: THE COMBINATION OF CHANG, MOK, HOLMAN AND LAMB DOES NOT RENDER THE SUBSTUTE CLAIMS OBVIOUS

Regarding Ground 9, which relies on the combination of Chang, Mok, Holman and Lamb, proposed claim 21 addresses the deficiencies described by the Board in its Preliminary Guidance. Patent Owner realleges its arguments made with respect to Ground 1 above as to Mok, Holman, and Lamb and incorporates them by reference as if fully set forth herein.

The Board stated, “Chang’s reflector 32 appears to be extended and angled with respect to base plate 31... Chang’s Figure 6 appears to teach a reflector that forms a ‘reflective optical cavity’ around at least one lighting device, as recited in proposed substitute claims 23 and 25.” (Paper 21 at 42-43) Proposed claim 21 addresses these deficiencies and recites a “plurality of strings of packaged solid state lighting devices” arranged on a substrate which is mounted on a lighting tile. Additionally, proposed claim 21 recites that a reflector is “mounted to the lighting tile and on the first side” of the substrate. That is, the reflector of proposed claim 21 is attached to the lighting tile and covers the substrate such that it is on the substrate. Further, proposed claim 30 recites that the reflector is “substantially planar to the surface of the lighting tile” in the area in which it is in contact with the substrate. All the figures of Chang which show the light emitting components depict them as being mounted above the reflector. There is no description in Chang which depicts a light emitting component mounted to a substrate disposed beneath the reflector. Further, there is no description within Chang which describes a substrate mounted to a lighting tile.

Chang also does not describe a controller in communication with a plurality of current supply circuits which transmit pulse width modulated signals to the plurality of strings of packaged solid state lighting devices as required by proposed claim 21 and proposed claims 25, 26, and 27. Chang also does not describe lenses

mounted above its light emitted components wherein those lenses are mounted to the substrate as required by proposed claim 21 and proposed claim 22.

The combination of Chang with Mok, Holman and Lamb suffers from the same difficulties as described above with regard to the combination of Mok and Holman discussed above vis a vis Ground I. Neither Holman nor Chang discloses a control system that is operable to modulate the pulse width of the current supplied to the lighting devices. Thus, the combination of Holman and Chang does not anticipate proposed claim 21 and there is no disclosure in either Mok or Lamb which a POSITA would combine with Holman to arrive at the lighting panel recited thereby. Neither Mok nor Lamb disclose a control system of any kind. Finally, neither Chang, Mok, Holman, Lamb, nor their combination, disclose a lighting tile that is a separate element from a substrate on which are disposed packed solid state lighting devices wherein the substrate is disposed on the lighting tile as per proposed claim 21.

XIV. GROUND 10: THE COMBINATION OF CHANG, EPSTEIN, HOLMAN AND LAMB DOES NOT RENDER THE SUBSTUTE CLAIMS OBVIOUS

The comments made by the Board with respect to the combination of Chang, Epstein, Holman, and Lamb are addressed below. Patent Owner realleges its arguments made with respect to Ground II above as to Epstein, Holman, and Lamb

and with respect to Ground XI above as to Chang and incorporates them by reference as if fully set forth herein.

For the same reasons as described above with respect to Ground XI as to the combination of Chang with Mok and Holman, the combination of Chang with Epstein, Holman and Lamb would not anticipate the limitations of proposed claim 21. The combination of Chang with Epstein, Holman and Lamb suffers from the same difficulties as described above with regard to the combination of Epstein and Holman discussed above vis a vis Ground II. Neither Epstein, Holman nor Chang discloses a control system that is operable to modulate the pulse width of the current supplied to the lighting devices. Thus, the combination of Epstein, Holman and Chang does not anticipate proposed claim 21. Finally, neither Chang, Epstein, Holman, Lamb, nor their combination, disclose a lighting tile that is a separate element from a substrate on which are disposed packed solid state lighting devices wherein the substrate is disposed on the lighting tile as per proposed claim 21. Any combination of Chang with Holman and Epstein would have one of:

- 1) the reflective sidewalls disposed as part of the packaging elements for the light emitters as per Holman;
- 2) A substrate with no separate tile as per Epstein; or
- 3) No substrate on which light emitters are mounted as per Chang.

None of the references of this combination disclose a lighting tile as a separate element from a substrate on which lighting elements are mounted.

XV. CONCLUSION

For the reasons set forth herein, Patent Owner submits that proposed substitute claims 21, 22, 23, 24, and 25 satisfy all of the statutory requirements for a motion to amend set forth in paragraphs (1) and (3) of 35 U.S.C. § 316(d) and paragraphs (a)(1), (a)(2), (a)(3), (b)(1) and (b)(2) of 37 C.F.R. § 42.121 and respectfully requests the Motion be granted contingent upon a finding that the challenged claims 1-5 are unpatentable.

Respectfully Submitted,

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CERTIFICATE OF SERVICE

Pursuant to 37 C.F.R. § 42.6(e), the undersigned certifies that the above-captioned Mandatory Notice was served on counsel of record for the Petitioner by filing this document through the Patent Review Processing System as well as by delivering a copy via electronic mail to:

MFerrario@kilpatricktownsend.com (Lead Counsel)
MMorlock@kilpatricktownsend.com (Back-Up Counsel)

Dated April 23, 2024

/Neal Massand/

Neal Massand (Reg. No. 54,296)

APPENDIX A

(Proposed Amendments)

21. (proposed substitute for Claim 1) A lighting panel, comprising:

at least one substrate comprising a metal core printed circuit board having traces formed thereon mounted on a lighting tile and having a first side parallel to a principal plane of the lighting panel;

a plurality of strings of packaged solid state lighting devices arranged on the first side of the at least one substrate and configured to emit light;

wherein the plurality of strings of packaged solid state lighting devices is mounted on the lighting tile;

wherein a lens is mounted over each one of the packaged solid state lighting devices;

a controller configured to control the plurality of strings of packaged solid state lighting devices;

wherein the controller is operable to deliver a control signal to a plurality of current supply circuits that are operable to control the pulse width of the current supplied to each one of the plurality of strings of packaged solid state lighting devices using information transmitted to the controller over a communication link;

a reflector mounted to the lighting tile and on the first side of the at least one substrate, the reflector being outside of the packaged solid state lighting devices;

wherein the reflector extends to cover the lighting tile and includes a plurality of sidewalls outside of the packaged solid state lighting devices that are angled with respect to the principal plane of the lighting panel;

a brightness enhancement film on the reflector, wherein the reflector is arranged between the at least one substrate and the brightness enhancement film and the brightness enhancement film is configured to preferentially emit light having a first orientation from the lighting panel and to preferentially reflect light having a second orientation, different from the first orientation, back into the lighting panel, and

a generally planar diffuser sheet between the reflector and the brightness enhancement film, wherein the generally planar diffuser contacts the reflector, and wherein the light having the second orientation that is reflected back into the lighting panel is recycled within at least the diffuser sheet.

22. (proposed substitute for Claim 2) The lighting panel of claim 1 21, wherein the reflector comprises a coating on the substrate that is configured to reflect and scatter light incident thereon wherein the lens surrounds each of the packaged solid state lighting devices

23. (proposed substitute for Claim 3) The lighting panel of claim 1 21, wherein the reflector comprises a reflector sheet that is configured to reflect and scatter light incident thereon wherein the generally planar diffuser contacts the sidewalls of the reflector with no intervening elements.

24. (proposed substitute for Claim 4) The lighting panel of claim 1 23, further comprising at least one additional layer on the brightness enhancement film configured to diffuse, polarize, collimate and/or reflect light wherein the generally planar diffuser is offset from the packaged solid state lighting devices.

25. (proposed substitute for Claim 5) The lighting panel of claim 1 21, wherein respective ones of the apertures include angled sidewalls to thereby form reflective optical cavities around the corresponding ones of the plurality of solid state lighting devices wherein the controller transmits control signals to a plurality of current supply circuits.

26. (proposed substitute for Claim 7) The lighting panel of claim 3 25, wherein the reflector sheet comprises a plastic foam wherein at least one of the current supply circuits transmit pulse width modulated signals to one or more of the plurality of strings of packaged solid state lighting devices.

27. (proposed substitute for Claim 9) The lighting panel of claim 1 26, wherein the brightness enhancement film comprises a plurality of three dimensional light extraction features configured to bend at least some light rays passing through the brightness enhancement film toward the direction normal to the principal plane of the lighting panel wherein the current supply circuits are operable to individually control the current to each of the strings of packaged solid state lighting devices.

28. (proposed substitute for Claim 10) The lighting panel of claim 9 27, wherein the light extraction features are random features wherein the pulse width modulation of the current delivered to each of the strings of packaged solid state

lighting devices is based on one or more of: user input, ambient light information or other input.

29. (proposed substitute for Claim 13) ~~The lighting panel of claim 9 21, wherein the brightness enhancement film is configured to substantially collimate light emitted by the lighting panel~~ wherein the reflector is substantially planar to the surface of the lighting tile where the reflector is on the at least one substrate.