

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Hisense USA Corporation

Petitioner

v.

Brightplus Ventures LLC

Patent Owner

Case IPR2023-01412

U.S. Patent No. 8,330,710

PATENT OWNER'S SUR-REPLY

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Exhibit List

Exhibit	Description
2003	Declaration of William K. Bohannon (“Bohannon Decl.”)
2004	Curriculum vitae of William K. Bohannon

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USE OF EMPHASIS IN QUOTATIONS

All emphases in quotations and exhibit citations have been added, unless otherwise indicated.

APPLICABLE STATUTES

References to 35 U.S.C. §§ 102 and 103 are to the pre-AIA versions applicable to the '710 Patent.

I. INTRODUCTION

Brightplus Ventures LLC (“Patent Owner” or “Brightplus”) submits this Sur-Reply showing that each of the 6 grounds set forth by Hisense USA Corporation (“Petitioner” or “Hisense”) fails to render obvious challenged claims 1-2, 5, 11-13, 16-17, and 47-48. of U.S. Patent No. 8,330,710 (“the ‘710 Patent” or “EX2001”). A number of the claim elements are missing from the prior art and the missing elements would not be obvious to a POSITA. Further, a POSITA would not be motivated to combine the references. Accordingly, Patent Owner respectfully requests that the Board maintain the validity of the challenged claims.

II. PETITIONER’S CLAIM CONSTRUCTION ARGUMENTS ARE UNAVAILING

The term “plurality of on-state drive currents” should be construed as “at least two different on-state drive currents.” For each of the plurality of on-state drive currents to be “selectively controlled” as described in ’710 Patent, the currents must be different to allow for “controlling the amount and/or duty cycle of current supplied to each string.” Petitioner’s proposed construction essentially reads the purpose of the invention out of the claim. It is, therefore, not the correct construction.

With respect to the term “display performance information” the specification of the ’710 Patent supports the construction that “display performance” is directed to an “LCD display.” The only figures in the ’710 Patent which discloses a display

specifically discloses an LCD panel utilizing an LCD controller. *See* '710 patent, Figs. 14-15. The '710 Patent makes no references that its invention is operable with any displays other than LCD displays. *See Id.*, 12:37-50; 15:22-33. Indeed, the '710 Patent is specifically entitled “Systems and Methods for Controlling a ***Solid State Lighting*** Panel.” (emphasis added). The invention would not operate with any non LCD or solid state based displays and Petitioner has not provided any compelling argument to the contrary.

III. GROUND 1 – CLAIMS 1-2, 5, 12 AND 16-17 ARE NOT RENDERED OBVIOUS OVER THE COMBINATION OF SHTEYNBERG, ARAI AND ZHANG IN VIEW OF THE KNOWLEDGE OF A POSITA

A. A POSITA would not be motivated to combine Shteynberg, Arai and Zhang

Shteynberg describes blending the emissions of red, green and blue LEDs to achieve light that is perceived by a viewer as “white” neither Arai nor Zhang describe that process. These references are not in the same field of endeavor as suggested by Petitioner. Also, Shteynberg relates to providing ambient lighting for a building, not providing backlighting for an LCD panel as in Arai or Zhang. The idea that the invention of Shteynberg could be adapted to work with the other references would require inventive modifications—far more than can be permitted in an obviousness contention. Also, Arai already discloses a method of brightness uniformity, namely “corner reflection plates... in which the bottom surface reflection plate (16a) and the side surface reflection plates (16b) to (16e) ... serves

to permit rays of light incident onto a display panel (1) to be **uniform to realize uniformity of brightness of the entire surface thereof.**" (EX1008 at Abstract).

Arai intends for all the backlights to be illuminated, which allows the optical layers to distribute light uniformly. Zhang would not improve the brightness uniformity when combined with Arai. Indeed, Arai's invention would lose uniformity if the LED strings were cycled on and off as described in Zhang, since the optical layers in Arai would become unevenly distributed and the resulting image would be non-uniform. (*Id.* at 53) Zhang would not be a suitable option for combination with Arai as the combination would lead to an unevenly distributed optical layers.

In addition, Zhang is focused on CCFL Lamps. Arai explicitly states the problem with CCFL backlighting and offers LEDs as an improved invention. (EX1008 at 0004-0006) Arai is also unsuitable for combination with Zhang as they pertain to completely different types of lighting systems. Therefore, a POSITA would not combine Arai and Zhang.

Shteynberg and Zheng in combination would not be functional. The modifications necessary to make the combination are not obvious and would require an entirely new invention. Zhang would, therefore, not be suitable for combination with Shteynberg in the eyes of a POSITA. Given the gap in technology, a POSITA would not look to a completely different and largely incompatible system of backlighting an LCD panel to combine with an LED based system.

B. The combination of Shtenyberg and Arai Fails to Disclose or Render Obvious Claim 1A: “A plurality of strings of solid state lighting devices... positioned at intervals in at least one second direction”

Shtenyberg does not disclose the physical orientation of the LED strings. Indeed, Shtenyberg is explicit that Fig. 3 is a circuit/block diagram (EX1007 at 0030) and 0043). A circuit/block diagram is not an exact physical representation of the device it is representing (EX2003 at 56). It would not be obvious to a POSITA how to orient and design a lighting panel simply based on the diagram in Fig. 3. (*Id.*) Shteynberg does not disclose the specific arrangement of the strings of LEDs relative to one another. Further, when deploying ambient lighting, a designer would take into account a number of factors such as the shape of rooms, the height of ceilings, the color of the walls, ceiling and floors, the use of the space etc. which would not be part of the decision for designing a backlighting unit for an LCD panel. (EX2003 at 57). Also, Arai does not describe the lighting strings being positioned at “intervals” in a second direction. Arai only discloses that “LEDs of light three primary colors are two-dimensionally arranged in the state positioned at the rear face side of the diffusion film.” (EX1008 at 0006). Petitioner incorrectly assumes that Fig. 5 displays LED strings being positioned at intervals, nowhere does Arai disclose such an implementation.

C. Shtenyberg fails to disclose or Render Obvious Claim 1B: “current supply circuit configured to selectively supply a

plurality of on-state drive currents to the plurality of strings responsive to a control signals.”

The system in Shteynberg, namely the controller 125, power converter 120, and multiplexer 150 does not “selectively drive the plurality of strings” as described in the ‘710 Patent. For example, the power converter 120 only supplies one current to all the LED strings. Further, the multiplexer 150 doesn’t “drive” the strings but allows current to flow through the strings for a certain amount of time. (EX2003 at 59-62). To clarify, the multiplexer 150 is best described as a switch, which activates each string for a selected duration. (*Id.*) The power converter of Shteynberg supplies an averaged current (as opposed to an individually determined current for each string) to the LEDs based on the required energizing time provided by the controller. Thus, the power converter supplies a single current to all of the LED strings. (*Id.*) In Arai, the multiplexer and controller only act as time duration switches, that either turn an LED string on or off. (*Id.*) Unlike the ‘710 Patent and claim 1B which uses **different** on-state drive currents, Shteynberg does not provide “a plurality of on state drive currents to [a] plurality of strings” as per the ‘710 Patent, rather Shteynberg discloses providing the **same** drive current (110_N in Shteynberg) to any or all of its strings. (*Id.*)

D. Shteynberg fails to disclose or render obvious Claim 1C: a “control system configured to receive a user input and to selectively provide control signals to the current supply

circuit responsive to the user input to selectively drive the plurality of strings.”

It is important to note again that Shteynberg relates to providing ambient lighting for a building, not backlighting an LCD panel. The system disclosed in Shteynberg receives input from “open or closed-loop feedback of various signals and measurements,” these signals may be transmitted over “a wide variety of data transmission protocols.” (*Id.*) However, nothing in the limited disclosure describes *user* input or feedback. Shteynberg, being a system for providing lighting to a building, does not include reference to a user controlled switch or a system that tracked occupancy in a room. In fact, Shteynberg discloses a list of sensors, but it does not propose in any of its rather long disclosure on the topic of sensors a sensor that interacts *with a user*. Thus, Shteynberg does not disclose user input as per the ‘710 patent as being an element of the control system of the current supply circuit. (EX2003 at 63-64). The “input” described in Shteynberg is described primarily as measurements within the “LED array driver circuit.” Shteynberg [0049], and “potentially the larger lighting system environment” *Id.* [0079]. In Shteynberg, the sensors measure and send signals related to the panel and not the environment, there is no mention of “user input” used in lieu of or in tandem with the sensor input.

**E. Shteynberg and Zhang fail to disclose or render obvious
Claim 1D: “control system further including firing logic**

configured to determine a firing order of the plurality of strings.”

The multiplexer of Shteynberg does not supply current, nor does the multiplexer determine the current level as Petitioner argues. Shteynberg uses the switching period to determine the current through each string (See discussion of element B of claim 1 above). Shown in Fig. 4 of Shteynberg, the multiplexer either turns on or off each LED string, for a time period T_{qn} . The length of this on/off cycle is a function of the current supplied to the multiplexer as described above, not of firing logic interpreted by the controller. (EX2003 at 65-67) Thus, there are not a plurality of currents being supplied to strings. (*Id.*) These energizing time periods are not equivalent to the firing logic as described in the '710 Patent. Fig. 8 of the '710 Patent illustrates that the firing logic is passed to the current driver 808 which supplies current signals to panel 810 according to the firing logic. (*Id.*) As described above, a multiplexer is not a current driver. (*Id.*) As implemented in Shteynberg, the multiplexer functions as a rapid on/off switch, it does not supply or modulate the power provided to the LED strings. Therefore, Shteynberg does not disclose a control system including firing logic configured to determine a firing order of the plurality of strings. (*Id.*)

Similar to Shteynberg, Zhang discloses lights that are either in an on or off state. Zhang discloses lights being activated one after another. In other terms, only one “backlight module” is being supplied current at a time according to Zhang.

Thus, Zhang's method of only activating one lighting module at a time is not the same as the firing logic or firing order contemplated by the '710 Patent. (*Id.*) As shown neither Shteynberg nor Zhang disclose or render obvious the firing logic or firing order as described in Claim 1D.

F. Shteynberg and Zhang fail to disclose or render obvious Claim 2: "The system of claim 1, wherein the firing logic comprises rule-based logic operative to generate a non-spatially sequentially firing order."

For the reasons described above regarding element D of Claim 1, the elements of this claim are not disclosed or rendered obvious by Shteynberg in view of Zhang.

G. Arai fails to disclose or render obvious Claim 5: "The system of claim 1, wherein ones of the plurality of strings are arranged corresponding to a plurality of bars that include portions of the plurality of strings, wherein the plurality of bars extend in the first direction and are positioned adjacent one another in a substantially parallel arrangement."

As stated above, a POSITA would not be motivated to combine Shteynberg and Arai. The combination suggested by Petitioner with regard to claim 5 does not disclose a system that would be functional as a backlight for those reasons. (EX2003 at 69)

Claim 5 requires that "ones of the plurality of strings are arranged corresponding to a plurality of bars that include that include portions of the plurality of strings." Arai, however, discloses "laterally elongated rectangular wiring board

12a on which these LEDs 12 are mounted in a predetermined order.... Red LEDs, green LEDs and blue LEDs are combined are mounted on the wiring board 12a." (Arai at 0029). Arai does not disclose that the wiring board 12a include portions of the plurality of strings. That is, Arai only discloses that the wiring board 12a combined the LEDs thereon and makes no mention of the boards 12a containing a plurality of strings or portions of the plurality of strings. Shteynberg does not disclose the orientation of the LED strings or that portions of those strings can be mounted on different bars. Thus, the combination does not render obvious claim 5.

**H. Shteynberg fails to disclose or render obvious Claim 12:
“The system of claim 1, further comprising a means for
generating a feedback signal configured to provide display
performance information to the control system.”**

Shteynberg discloses a system for providing ambient lighting to a building, it does not disclose a display. Indeed, Petitioner equates display performance to the performance/functioning of the LED array not an LCD display as in claim 12. Since, Shteynberg does not include a display within the meaning of the LCD display of the '710 Patent, therefore, it cannot disclose a means for generating a feedback signal configured to provide display performance information to the control system.

**I. Shteynberg and Arai fail to disclose or render obvious
Claim 16: “The system of claim 1, wherein the second
direction is substantially orthogonal to the first direction.”**

For the same reasons discussed above regarding element A of claim 1, Shteynberg in view of Arai does not disclose or render obvious the elements of this claim.

**J. Shteynberg and Arai fail to disclose or render obvious the
preamble of Claim 17: “A method for controlling a
plurality of strings of solid state lighting devices configured
to extend in a first direction and to be arranged in
substantially adjacent positions relative to one another in a
second direction that is different from the first direction,
the method comprising.”**

For the same reasons discussed above regarding element A of claim 1, Shteynberg in view of Arai does not disclose or render obvious this element.

**K. Shteynberg fails to disclose Claim 17A: “receiving an input
from a user; and”**

For the same reasons discussed above regarding element C of claim 1, Shteynberg does not disclose or render obvious this element.

**L. Shteynberg and Zhang, alone or in combination, fail to
disclose or render obvious Claim 17B: “supplying, based in
part on the input from user, a plurality of pulsed driver
currents to the plurality of strings in a non-spatially-
sequential firing order.”**

For the same reasons discussed above regarding elements B, C and D of claim 1 and claim 2, Shteynberg does not disclose this element.

Furthermore, the multiplexer of Shteynberg is a simple on/of switch, the length of its cycle is a function of the current supplied to it, not user input. (EX2003 at 74-75) Further, the currents supplied to the strings of LEDs in Shteynberg are constant, not pulsed drive currents. The power supply of Shteynberg supplies an averaged current (as opposed to an individually determined current for each string) to the LEDs 110 based on the required energizing time provided by the controller. (EX2003 at 74-75) Thus, the power converter supplies a single current to all of the LED strings. (*Id.*) In addition, Zhang does not disclose a non-spatially firing order. Zhang does not disclose any method of supplying a plurality of currents to a plurality of strings. Zhang only discloses turning on one backlight module at a time. The non-sequential firing order in the '710 Patent is not the same as activating one LED string at a time in a non-sequential order, which is the method disclosed in Zhang. (*Id.*)

IV. GROUND 2 – CLAIM 11 IS NOT OBVIOUS OVER THE COMBINATION OF SHTEYNBERG, ARAI, ZHANG AND KOBORI

A. A POSITA would not be motivated to combine Shteynberg, Arai, Zhang and Kobori

For the same reasons stated above regarding the combination of Shteynberg, Arai and Zhang, a POSITA would not be motivated to combine Shteynberg, Arai, Zhang and Kobori because Kobori is directed to a display panel and Shteynberg is directed to ambient lighting for a building. (EX2003 at 76) Also, for reasons

similar to those stated above regarding the combination of Zhang and Arai, a POSITA would not be motivated to combine Kobori with Zhang because different LEDs being turned on or off in a display would not lead to better light uniformity. (*Id.* at 77) A POSITA would also not combine Kobori with Zhang because Zhang is directed to CCFLs and Kobori is directed to LEDs. (*Id.*) Accordingly, a POSITA would not consider Kobori suitable for combination with Zhang. (*Id.*)

V. GROUND 3 – CLAIMS 47 AND 48 ARE NOT OBVIOUS OVER THE COMBINATION OF SHTEYNBERG, ARAI AND LEE

A. A POSITA would not be motivated to combine Shteynberg, Arai and Lee

As stated above, Shteynberg describes blending the emissions of red, green and blue LEDs to achieve light that is perceived by a viewer as “white” and Arai does not describe that process. A POSITA would not combine Arai and Shteynberg. (EX2003 at 78) Shteynberg clarifies that “The various embodiments of the invention provide innumerable advantages for energizing a plurality of series of LEDs, using a **single power converter and controller for an entire LED array, and does not utilize multiple, separate power converters and controllers for each LED string.**” (EX 1007 at 0011) Lee illustrates three separate LED driving circuits each driving a particular color LED string(s), “the identical color LEDs are interconnected in series between a terminal for the connection to the driving circuit 221, 222 or 223” (EX1007 at 0034) (emphasis added) Also, Petitioner argues that

Lee's solution to "the problems of conventional LED connection" structures, which require "an excessive driving voltage or current" should be combined with Shteynberg to improve the driving voltage and currents disclosed by Shteynberg. (Petition at 54) However, as stated above, Shteynberg discloses an improvement to Lee. Shteynberg specifically has improved LED driver efficiency, which is assumed to include driving voltage and current. (EX2003 at 80) A POSITA would recognize Shteynberg already teaches a better functioning system that has less likelihood of driving excessive voltage or current. (*Id.*) Also, a POSITA would recognize that implementing more driving circuits (as disclosed in Lee) would require additional power converters 120, controllers 125 and multiplexers 150 (as disclosed in Shteynberg), which would cause the combined system to perform worse than when separate. (*Id.*) Therefore, a POSITA would not be motivated to combine Shteynberg and Lee (and Lee and Shteynberg are unsuitable for combination) as the inventions are incompatible and any combination would result in a system worse than what Shteynberg and Lee disclose individually.

B. Shteynberg and Arai fail to disclose or render obvious the preamble of Claim 47: "A method for controlling a plurality of strings of solid state lighting devices configured to extend in a first direction and arranged substantially adjacent to one another."

For the reasons set forth above regarding the preamble of claim 17, Shteynberg in view of Arai fails to render this element obvious.

**C. Shteynberg, Arai, and Lee fail to disclose or render obvious
Claim 47A: “the method comprising supplying a plurality of
pulsed drive current to a plurality of groups of the plurality of
strings.”**

For the reasons set forth above regarding element A of claim 17, Shteynberg in view of Arai and Lee fail to render this element obvious. Shteynberg does not supply a plurality of pulse currents to a plurality of strings; the power converter supplies a single current, and the multiplexer does not supply a current. (EX2003 at 83-86) Since Shteynberg only supplies one current and does not disclose any grouping of the plurality of strings, Shteynberg does not disclose or render obvious the requirements of Claim 47A. (*Id.*) Lee teaches three separate LED driving circuits that each drive a red, green, or blue LED string, respectively. (*Id.*) Lee does not contemplate the operation of each driving circuit, nor how that circuit supplies current. (*Id.*) Lee only states that excessive driving current can be solved by “interconnecting the proper number of LEDs, which can be driven by a proper voltage, in series and by interconnecting the proper number of series connections, that can be driven by a proper current, in parallel.” (EX1013 at 0050) There is no mention that each driver circuit (221, 222, and 223) supplies a plurality of pulsed drive currents as required by the ‘710 Patent. Even more concerning is that each driver circuit is only connected to one group (i.e., one color of LED strings) of the plurality of strings. (*Id.*) Lee, therefore, does not disclose supplying a plurality of pulsed currents to a plurality of groups of the plurality of strings. (*Id.*)

**D. Shteynberg, Arai, and Lee fail to disclose or render obvious
Claim 48: “The method of claim 47, further comprising
receiving a user input, wherein supplying the plurality of
pulsed drive currents is based on user input.”**

For the reasons set forth above regarding elements B and C of claim 1, elements A and C of claim 17, and the preamble and element A of claim 47, the combination of Shteynberg, Arai and Lee fails to disclose or render obvious the elements of this claim.

**VI. GROUND 4—CLAIMS 1-2, 5, 12 AND 16-17 ARE NOT OBVIOUS OVER
THE COMBINATION OF SHTEYNBERG, ARAI AND KAWABATA IN
VIEW OF THE KNOWLEDGE OF A POSITA**

**A. A POSITA would not be motivated to combine Shteynberg,
Arai and Kawabata**

While Shteynberg describes blending the emissions of red, green and blue LEDs to achieve light that is perceived by a viewer as “white” neither Arai nor Kawabata describe that process. (EX2003 at 88) Thus, Shteynberg, Arai and Kawabata are not in the same field of endeavor. Shteynberg relates to providing ambient lighting for a building and the like, not providing backlighting for an LCD panel as in Arai or Kawabata. Petitioner does not substantiate how such a system would be adapted to a backlight for an LCD panel as the power, switching and output demands for the two applications are very different. (EX2003 at 88-90) Also, Petitioner proposes modifying the “Shteynberg-Arai” combination “to include the non-spatially-sequential firing order” of Kawabata. (*Id.*) In examining

the preferred embodiments of Shteynberg and Kawabata, such a combination would not be functional. The light emitting elements of Kawabata are cold cathode tubes. A POSITA would not look to a completely different, wholly unsuitable and largely incompatible system of backlighting an LCD panel to combine with an LED based system.

B. The combination of Shteynberg and Arai fails to disclose or render obvious the elements of Claim 1A: “a plurality of strings of solid state lighting devices...positioned at intervals in at least one second direction.”

For the reasons stated above regarding element A of Claim 1, the combination of Shteynberg and Arai fails to render this element obvious.

C. Shteynberg fails to disclose or render obvious Claim 1B: “a current supply circuit configured to selectively supply a plurality of on state drive currents to the plurality of strings responsive to a plurality of control signals.”

For the reasons stated above regarding element B of Claim 1, Shteynberg fails to render this element obvious.

D. Shteynberg fails to disclose or render obvious Claim 1C: “a control system configured to receive a user input and to selectively provide control signals to the current supply circuit responsive to the user input to selectively drive the plurality of strings.”

For the reasons stated above regarding element C of Claim 1, Shteynberg fails to render this element obvious.

E. Shteynberg and Kawabata alone or in combination fail to disclose or render obvious Claim 1D: “a control system

further including firing logic configured to determine the firing order of the plurality of strings.”

As discussed above regarding element B of Claim 1, the multiplexer of Shteynberg does not supply current, nor does the multiplexer determine the current level as Petitioner argues. Shteynberg uses the switching period to determine the current through each string (see discussion of element B of claim 1 above). (EX2003 at 94) Thus, there are not a plurality of currents being supplied to strings. (*Id.*) These energizing time periods are not equivalent to the firing logic as described in the ‘710 Patent. Further, Fig. 8 of the ‘710 Patent illustrates that the firing logic is passed to the current driver 808 which supplies current signals to panel 810 according to the firing logic. As described above, a multiplexer is not a current driver. As implemented in Shteynberg, the multiplexer functions as a rapid on/off switch, it does not supply or modulate the power provided to the LED strings. Only the power converter 120 supplies current. (EX2003 at 95) The power converter 120 supplies one current to all strings. (*Id.*) It does not selectively supply current based on a timing signal from the multiplexer or determine the order in which to supply current to the LED strings. (*Id.*)

Similar to Shteynberg, Kawabata discloses lights that are either in an on or off state. The on signal corresponds to a first signal intensity, which is the maximum voltage or current value and the off signal corresponds to a second signal intensity, which is a zero voltage or current value. (EX1012 at 0070) Kawabata only supplies

a single current to each light emitting element. (EX2003 at 96) Therefore, Kawabata does not supply a plurality of on-state drive currents in a certain firing order. (*Id.*)

Further, as noted above in the arguments against the motivation to combine Kawabata and Shteynberg, a POSITA would not find a CCFL based system suitable to combine with a building ambient lighting system in order to produce a backlight for an LCD panel. (EX2003 at 97).

Also, Kawabata describes, similar to Shteynberg, a simple on/off pre-programmed system for lighting a panel. (*Id.* at 98-101) Thus, Kawabata discloses a system for lighting its elements in a sequential manner so as to provide adequate display brightness while reducing power consumption. (EX2003 at 98-101) Petitioner improperly views the “firing logic” of the ‘710 Patent by stating that “the firing logic 802 can include rule based logic...rule-based logic is viewed as firing logic. Therefore, Kawabata discloses firing logic.” (Petition at 66) Kawabata does not use the words “rule” or “logic” anywhere in its specification. The “timing rule” that Petitioner describes not disclosed in the references at all.

**F. Kawabata fails to disclose or render obvious Claim 2”
“wherein the firing logic comprises rule-based logic
operative to generate a non-spatially sequential firing
order.”**

For the reasons stated above regarding element D of Claim 1, Kawabata fails to render this element obvious.

G. Arai fails to disclose or render obvious Claim 5: “The system of Claim 1, wherein ones of the plurality of strings are arranged corresponding to a plurality of bars that include portions of the plurality of strings, wherein the plurality of bars extend in the first direction and are positioned adjacent one another in a substantially parallel arrangement.”

For the reasons set forth above regarding claim 5, Arai fails to disclose or render the elements of this claim obvious.

H. Shteynberg fails to disclose or render obvious Claim 12: “The system of Claim 1 further comprising a means for generating a feedback signal configured to provide display performance information to the control system.”

For the reasons set forth above regarding claim 12, Shteynberg fails to disclose or render the elements of this claim obvious.

I. Shteynberg and Arai, individually or in combination, fail to disclose or render obvious Claim 16: “The system of claim 1, wherein the second direction is substantially orthogonal to the first direction.”

For the reasons set forth above regarding claim 16, Shteynberg and Arai, individually or in combination, do not disclose or render obvious the elements of this claim.

J. The combination of Shteynberg and Arai fails to disclose or render obvious the preamble of Claim 17: “A method for controlling a plurality of strings of solid state lighting devices configured to extend in a first direction and to be arranged in substantially adjacent positions relative to one

another in a second direction that is different from the first direction.”

For the reasons set forth above regarding the preamble of claim 17, Shteynberg in view of Arai fails to disclose or render this element of the claim obvious.

**K. Shteynberg fails to disclose or render obvious Claim 17A:
“receiving an input from a user.”**

For the reasons set forth above regarding element A of claim 17, Shteynberg in view of Arai fails to disclose or render this element of the claim obvious.

L. Shteynberg and Kawabata, alone or in combination, fail to disclose or render obvious Claim 17B: “supplying, based in part on the input from the user, a plurality of pulsed drive currents to the plurality of strings in a non-spatially sequential firing order.”

For the reasons set forth above regarding elements B and D of claim 1, this element of the claim is not rendered obvious.

VII. GROUND 5—CLAIM 11 IS NOT OBVIOUS OVER THE COMBINATION OF SHTEYNBERG, ARAI, KAWABATA AND KOBORI AND IN VIEW OF THE KNOWLEDGE OF A POSITA.

A. A POSITA would not be motivated to combine Shteynberg, Arai, Kawabata and Kobori

The arguments against the combination of Shteynberg, Arai and Kawabata are set forth above. Furthermore, a POSITA would not be motivated to combine Kobori and Kawabata since Kawabata is directed to a CCFL lighting system. (EX2003 at 108) The electrical requirements of a CCFL differ from an LED system. (*Id.*) Further, LEDs and CCFLs have different luminiferous levels and lighting

characteristics. (*Id.*) Accordingly, the combination would not lead to better lighting uniformity and a POSITA would not be motivated to combine the references. (*Id.*)

VIII. GROUND 6—CLAIM 13 IS NOT OBVIOUS OVER THE COMBINATION OF SHTEYNBERG, ARAI, KAWABATA AND LEE IN VIEW OF THE KNOWLEDGE OF A POSITA

A. A POSITA would not be motivated to combine Shteynberg, Arai, Kawabata and Lee

As shown above, Shteynberg, Arai and Kawabata are not suitable for combination. Petitioner also argues that “the Shteynberg-Arai-Kawabata combination and Lee are in the same field of endeavor i.e. achieving the emission of light perceived as white light.” (Petition at 75) As stated above regarding Ground I, Shteynberg describes blending the emissions of red, green and blue LEDs to achieve light that is perceived by a viewer as “white” and Arai does not describe that process. A POSITA would, therefore, not be motivated to combine Arai and Shteynberg. Further, Lee clearly demonstrates that each LED driving circuit is separate and intended to control a specific string of LEDs. Petitioner offers no example of how Lee would improve excessive driving voltage or current in Shteynberg. The sequence of Kawabata is spatially sequential within the meaning of the ‘710 patent. Therefore, Kawabata does not disclose a “rule-based logic operative to generate a non-spatially sequential firing order” within the meaning of claim 2 of the ‘710 patent. Therefore, a POSITA would not be motivated to combine Shteynberg and Lee as the inventions are incompatible and any combination would result in a system

worse than what Shteynberg and Lee disclose individually. (*Id.*) Kawabata is no more likely to be combined with Lee by a POSITA than Shteynberg or Arai. Kawabata discloses a backlighting system employing CCFLs and a sequential “sweep” of the on/off cycle of each light source. A POSITA would not seek to combine an LED based system such as Lee with a CCFL system such as Kawabata. (EX2003 at 113)

B. Lee and Kawabata alone or in combination fail to disclose or render obvious Claim 13A: “wherein the current supply circuit comprises a plurality of phase drivers configured to supply a plurality of on-state drive currents at a plurality of times.”

Kawabata in describing “phase shifting” is describing turning one light on and then turning on another in a pre-programmed sequence. The ‘710 Patent, on the other hand, is describing a dynamic system that can adapt via feedback sensors to the inputs of the display via the color management unit. The phase drivers are part of the current drivers, which receive instruction from the control system (as per Figure 10). (EX2001 at 114-115) The control system receives information from the performance feedback sensors, the color management unit and user input to determine the appropriate behavior of the phase drivers within the current drivers. Rather than a dumb system that seeks to keep the display at a uniform level of brightness as in Kawabata employing “phase shifting”, the phase drivers of the ‘710 patent allow for a dynamic response to the behavior of the display on the part of the lighting panel. *Id.*

C. Lee and Kawabata, alone or in combination, fail to disclose Claim 13B and Claim 13C: “wherein the plurality of strings of solid state lighting devices comprise a plurality of string groups, each configured to receive current from one of the plurality of phase drivers” and “wherein the control system is further configured to determine the plurality of times that each of the plurality of phase drivers begin to supply current to the plurality of string groups.”

As set forth above regarding the combination of Lee and Kawabata do not disclose a plurality of phase drivers. Accordingly, the combination does not render these elements obvious.

IX. PETITIONER'S ARGUMENT REGARDING EXPERT DECLARATIONS IS UNAVAILING

For Petitioner to call into question the weight of an expert declaration because the expert's statement is similar to the papers is laughable. Petitioner's papers and expert declarations are littered with parroting the response. Patent Owner understands that Petitioner concedes that Petitioner's argument is that own expert declaration should be given no weight in any instance where the declaration matches the argument on the Paper. Likewise, taken this into account, many elements which Petitioner contends is obvious or where its expert merely invents a motivation to combine with conclusory arguments should be given no weight.

X. CONCLUSION

Accordingly, Patent Owner respectfully requests the Board find the Challenged Claims not obvious under Grounds 1-6.

Patent Owner's Sur-Reply

IPR2023-01412

Patent No. 8,330,710

Respectfully submitted,

/Neal Massand/

Neal Massand

Counsel for Petitioner

CERTIFICATE OF COMPLIANCE

Per 37 C.F.R. §42.24(a) and (d), the undersigned hereby certifies that the Petition complies with the type-volume limitation of 37 C.F.R. §42.24(a)(i) because, exclusive of exempted portions, it contains 5674 words as counted by the word-processing program used to prepare it.

Dated: July 25, 2024,

Respectfully submitted,

/Neal Massand/

Hao Ni (Reg. No. 53,858)

hni@nilawfirm.com

Timothy Wang (Reg. No. 61,554)

twang@nilawfirm.com

[Neal Massand](mailto:nmassand@nilawfirm.com)

nmassand@nilawfirm.com

Ni, Wang & Massand, PLLC

8140 Walnut Hill Lane, Suite 500

Dallas, Texas 75231

(t) (972) 705-4600

(f) (972) 314-0900

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: November 21, 2024

/s/ Neal Massand
Neal Massand (Reg. No. 54,296)