

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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Videndum Production Solutions, Inc.  
Petitioner,

v.

Rotolight Limited,  
Patent Owner.

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Case: To Be Assigned  
U.S. Patent No. 10,197,257

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**PETITION FOR *INTER PARTES* REVIEW OF  
U.S. PATENT NO. 10,197,257**

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| 1002           | File History for U.S. Patent No. 10,197,257                                 |
| 1003           | Declaration of Woody Smith (“Smith Decl.”)                                  |
| 1004           | Astera AX10 Spotmax User Manual (“Asteria”)                                 |
| 1005           | Declaration of Simon Canins (“Canins Decl.”)                                |
| 1006           | U.S. Patent Application Publication No. 2012/0044374 to Pohlert (“Pohlert”) |
| 1007           | Institution Decision in IPR2021-01496 challenging the ’257 Patent           |
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**CLAIM APPENDIX**

**Asserted Claims of U.S. Patent No. 10,197,257**

| <b>Identifier</b>   | <b>Claim Language</b>                                                                                                                                                                                                                                                                                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Claim 1[pre]</b> | A method for controlling a lighting device to produce a user customisable lighting effect, the method comprising:                                                                                                                                                                                                            |
| <b>Claim 1[a]</b>   | calculating, using an effect simulator, a time varying lighting value based on at least one simulation parameter;                                                                                                                                                                                                            |
| <b>Claim 1[b]</b>   | wherein said at least one simulation parameter characterises a user customisable lighting effect selected from a range of different user customizable lighting effects for at least one of: videography, broadcasting, cinematography, studio filming, and location filming;                                                 |
| <b>Claim 1[c]</b>   | wherein said at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;                                                                                                                                                                                            |
| <b>Claim 1[d]</b>   | said simulation parameter depending on the user customisable lighting effect being simulated;                                                                                                                                                                                                                                |
| <b>Claim 1[e]</b>   | outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customisable lighting effect.                                                                                                                                                                                          |
| <b>Claim 2</b>      | The method according to claim 1 wherein the random brightness comprises a random peak brightness.                                                                                                                                                                                                                            |
| <b>Claim 3</b>      | The method according to claim 1 wherein the random interval comprises at least one of a random interval between flashes, a random interval between groups of flashes, and a random frequency.                                                                                                                                |
| <b>Claim 4</b>      | The method according to any claim 1 wherein the random duration comprises at least one of a random ramp-up time to peak brightness, a random fade-down time from peak brightness, and a random number of pulses.                                                                                                             |
| <b>Claim 5</b>      | The method according to claim 1 wherein said at least one simulation parameter is random within predefined boundaries and wherein the predefined boundaries comprise at least one of an upper and lower duration; a number of flashes in a burst; an interval between bursts; an amplitude; and a ramp-up or fade-down time. |

| Identifier      | Claim Language                                                                                                                                                                                                                                                                                                                                             |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Claim 6</b>  | The method according to claim 1 wherein the at least one of: a random brightness; a random duration; and a random interval is determined in dependence on one or more user-selectable simulation parameters.                                                                                                                                               |
| <b>Claim 7</b>  | The method according to claim 1, wherein the simulation parameter is related to one or more of: a rate of increase of brightness; a rate of decrease of brightness; a rate of change of colour; a brightness; a local maximal brightness; a local minimal brightness; a brightness fluctuation period; and a colour fluctuation period.                    |
| <b>Claim 8</b>  | The method according to claim 1 further comprising receiving a user input of one or more user-selectable simulation parameters and adapting the simulation in dependence on the one or more user-selectable simulation parameters.                                                                                                                         |
| <b>Claim 9</b>  | The method according to claim 1 wherein the simulation parameter comprises at least one of: a maximum brightness; a minimum brightness; a colour; and a trigger.                                                                                                                                                                                           |
| <b>Claim 10</b> | The method according to claim 1 wherein the simulation iterates through repeated cycles of calculating a time varying lighting value based on at least one random simulation parameter and simulating the user customisable lighting effect.                                                                                                               |
| <b>Claim 11</b> | The method according to claim 1 wherein the user customisable lighting effect is designed to mimic at least one of fire flickering; police light; television; lightning flashing; electrical sparking; fireworks; a neon flickering sign; a gunshot; welding; a scan; a propeller; a (nuclear) explosion; a wormhole; paparazzi flashes; flashes (strobe). |
| <b>Claim 12</b> | The method according to claim 1, further comprising selecting a definition of a trigger event, said trigger event initiating said output of the time varying lighting value thereby to simulate the user customisable lighting effect.                                                                                                                     |
| <b>Claim 13</b> | The method according to claim 1, further comprising storing the at least one simulation parameter corresponding to said user customisable lighting effect.                                                                                                                                                                                                 |
| <b>Claim 14</b> | The method according to claim 1 comprising controlling a plurality of lights in dependence on the output.                                                                                                                                                                                                                                                  |

| Identifier           | Claim Language                                                                                                                                                                                                                                                               |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Claim 15[pre]</b> | A controller adapted to control at least one lighting device to produce a user customisable lighting effect, the controller comprising:                                                                                                                                      |
| <b>Claim 15[a]</b>   | an effect simulator adapted to calculate a time varying lighting value based on at least one simulation parameter;                                                                                                                                                           |
| <b>Claim 15[b]</b>   | wherein said at least one simulation parameter characterises a user customisable lighting effect selected from a range of different user customisable lighting effects for at least one of: videography, broadcasting, cinematography, studio filming, and location filming; |
| <b>Claim 15[c]</b>   | wherein the at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;                                                                                                                                             |
| <b>Claim 15[d]</b>   | said simulation parameter depending on the user customisable lighting effect being simulated; and                                                                                                                                                                            |
| <b>Claim 15[e]</b>   | wherein an output of the effect simulator is adapted to control a lighting device according to the calculated variation of lighting over time.                                                                                                                               |
| <b>Claim 16</b>      | The controller according to claim 15, wherein the controller comprises a wired or wireless communication interface adapted for communication with one or more lighting devices.                                                                                              |
| <b>Claim 17</b>      | The controller according to claim 15, wherein the controller comprises an input interface adapted to receive a user input.                                                                                                                                                   |
| <b>Claim 18</b>      | A lighting system comprising the controller according to claim 15 and at least one lighting device; said lighting device comprising at least one light emitting diode.                                                                                                       |
| <b>Claim 19</b>      | The lighting system according to claim 15 wherein said controller and said lighting device are integrated in a combined unit.                                                                                                                                                |
| <b>Claim 20[pre]</b> | A computer program comprising software code for controlling a lighting device to produce a user customisable lighting effect, the computer program adapted to perform, when executed, the steps of:                                                                          |
| <b>Claim 20[a]</b>   | calculating using an effect simulator a time varying lighting value based on at least one simulation parameter;                                                                                                                                                              |

| Identifier         | Claim Language                                                                                                                                                                                                                                                                   |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Claim 20[b]</b> | wherein said at least one simulation parameter for characterises a user customisable lighting effect selected from a range of different user customisable lighting effects for at least one of: videography, broadcasting, cinematography, studio filming, and location filming; |
| <b>Claim 20[c]</b> | wherein the at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;                                                                                                                                                 |
| <b>Claim 20[d]</b> | said simulation parameter depending on the user customisable lighting effect being simulated; and                                                                                                                                                                                |
| <b>Claim 20[e]</b> | outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customisable lighting effect.                                                                                                                                              |
| <b>Claim 21</b>    | The method according to claim 13, further comprising recalling said stored at least one simulation parameter from a memory.                                                                                                                                                      |

## I. INTRODUCTION

Petitioner Videndum Production Solutions, Inc. (“Videndum”) challenges Claims 1–21 (“Challenged Claims”) of U.S. Patent No. 10,197,257 (“the ’257 Patent”). The Challenged Claims are directed to a well-known lighting system allowing users to select, customize, and produce a light effect having at least one of a random “brightness,” “duration,” or “interval.” These claims—whether directed to a method, controller, or program—address two basic things: (1) calculating a “time varying lighting value,” based on a parameter that characterizes the desired effect (*e.g.*, fire) and has either a random brightness, duration, or interval, and (2) outputting that value to a light to generate the effect.

The ’257 Patent does not disclose anything new or non-obvious. All of the features of the Challenged Claims were well known in the film/television industry long before the earliest effective filing date of the ’257 Patent. This fact is evidenced by the two references discussed in this Petition.

The first reference is a user manual for the Astera AX10 Spotmax (“Astera”) (Ex. 1004). The lighting system described in Astera allowed users to generate customizable lighting effects, including effects having random brightness, duration, and intervals through an interface on the light or an app. These include a “fire effect,” with a random flicker and a “stroboscope” effect that produces random strobe flashes.

The second reference—U.S. Patent Application Publication No. 2012/0044374 (“Pohlert,” Ex. 1006)—discloses a “lighting and effects generation system,” with an integrated “power controller” that allows a user to select and customize lighting effects.

These references anticipate and/or render obvious the Challenged Claims. Indeed, the Board has already found that there was a likelihood that at least one of the Challenged Claims was unpatentable based on these exact prior-art references and Grounds. Ex. 1007. The Board instituted an IPR filed by Arnold & Richter Cine Technik GmbH & Co. Betriebs KG (“ARRI”) based on *the same prior art presented in this Petition. Id.*

The ARRI IPR was terminated before a Final Written Decision following a settlement between ARRI and Rotolight Limited (“Patent Owner”). At the time of termination, Videndum informed the Board that it too was being accused of infringement, and requested that, in the interest of ridding the public of invalid patents, the Board issue a Final Written Decision as to the ’257 Patent despite the ARRI and Patent Owner settlement. Ex. 1010. The Board declined to do so, but noted that Videndum was not time-barred from filing its own Petition challenging the ’257 Patent using the same prior art. Ex. 1011.

To advance the goal of the USPTO in “revisit[ing] and revis[ing] earlier patent grants...to improve patent quality and restore confidence in the presumption of

validity that comes with issued patents,” Videndum requests that the Board institute IPR and find the Challenged Claims unpatentable. *See Code200, UAB, et al. v. Bright Data Ltd.*, IPR2022-00861, IPR2022-00862, Paper 18 at 5 (Aug. 23, 2022) (precedential).

## **II. IDENTIFICATION OF CHALLENGED CLAIMS**

Petitioner requests IPR of Claims 1–21 of the ’257 Patent on the following grounds, and requests that each claim be found unpatentable as set forth below. Additional evidence is set forth in the Smith Declaration (Ex. 1003).

| <b>Ground</b> | <b>Claims</b> | <b>Basis</b> | <b>Prior Art</b> |
|---------------|---------------|--------------|------------------|
| <b>I</b>      | 1–21          | § 102        | Astera           |
| <b>II</b>     | 1–21          | § 103        | Astera           |
| <b>III</b>    | 1–21          | § 102        | Pohlert          |
| <b>IV</b>     | 1–21          | § 103        | Pohlert          |

## **III. SUMMARY OF THE ’257 PATENT**

### **A. File History**

The ’257 Patent was filed on November 22, 2017, and issued on February 5, 2019. Ex. 1001 at Cover Page. The ’257 Patent claims priority to U.S. Provisional No. 62/319,809, filed April 8, 2016. *Id.* The earliest effective filing date of the ’257 Patent is April 8, 2016, and the AIA applies.

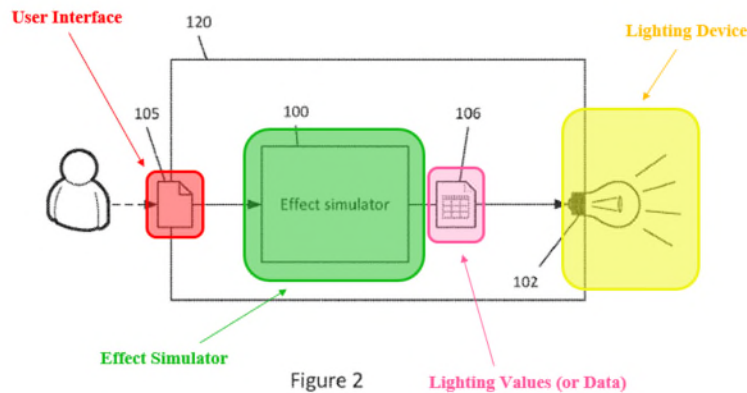
During examination, the claims of the ’257 Patent were rejected as anticipated by US2008/0129226 (“Dewitt”). Ex. 1002 at 428-432. The examiner found Dewitt discloses a lighting device for producing a range of user-customizable lighting effects

for videography, adapted to (1) calculate a “time varying lighting value,” based on a simulation parameter having at least one of random brightness, duration, or interval, and (2) output that value to a light, to simulate the effect. *Id.*

Applicant amended its claims and argued Dewitt does not disclose the claims as amended. *Id.* at 457. The ’257 Patent was thereafter allowed. *Id.* at 605.

**B. Purported Invention in the ’257 Patent**

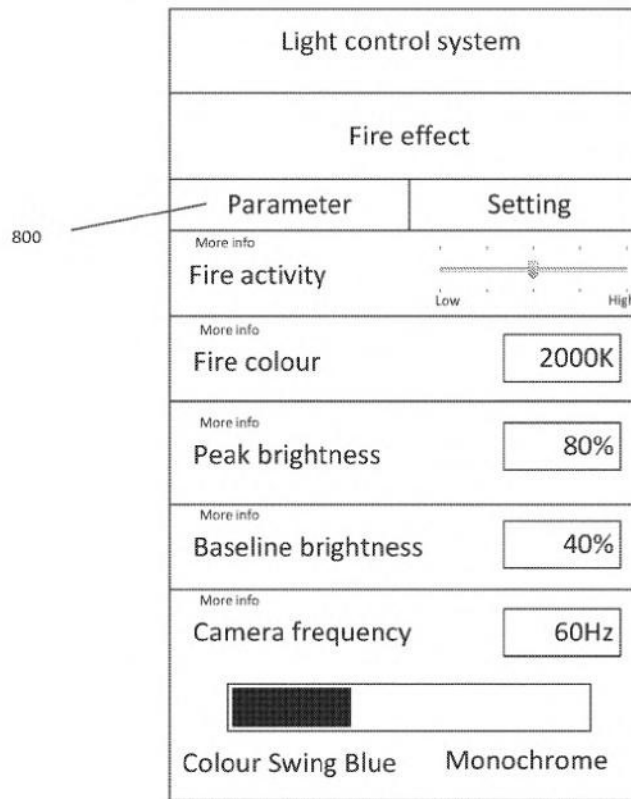
Independent Claims 1, 15, and 20 of the ’257 Patent recite a method, controller, and computer program for “producing a user customizable lighting effect” having at least one of a random “brightness,” “duration,” or “interval.” Ex. 1001. The claims recite two basic elements: (1) calculate a “time varying lighting value” based on a simulation parameter that: (a) characterizes a user customizable lighting effect for use in videography, broadcasting, cinematography, studio filming, and location filming and (b) includes a parameter related to at least one of a random brightness, duration, or interval; and (2) output the “time varying lighting value” to a lighting device, so as to generate the user-selected lighting effect.



Ex. 1001 at Fig. 2 (annotated).

Users can make selections of desired lighting effects on user interface 105. *Id.* at 6:1-8, 6:43-7:44. Depending on the desired effect, “simulation parameters,” such as “brightness,” “duration,” “colour,” and “frequency,” can be adjusted to customize the effect. *Id.* at 3:47-62, 6:44-7:12, 8:8-21, Fig. 6. These simulation parameters may be random or user-selected, and are used by the “effect simulator” to calculate the data, or “time varying lighting values,” that characterize the lighting effect. *Id.* at 7:25-44, 8:14-48.

The '257 Patent provides “fire” as an example of a randomized effect. *Id.* at 6:43-63, 8:14-25, 9:51-65. Parameters, like color, maximum/minimum brightness, and fire activity, can be used to modify the effect. *Id.* The effect will produce randomized sparks, or flicker, based on these parameters. *Id.*



*Id.* at Fig. 6.

#### IV. OVERVIEW OF THE PRIOR ART

##### A. Astera

Astera is a user manual for the AX10, a controllable lighting device used in studio filming and entertainment lighting. Ex. 1004; Ex. 1005, ¶¶ 2, 5. Astera is prior art under at least 35 U.S.C. §102(a)(1). The AX10 was sold to customers beginning in 2014 in Germany, and orders in the U.S. started in March 2015. Ex. 1005, ¶¶ 4-8. Astera is dated May 7, 2015, and was made publicly available, including to distributors and purchasers of the AX10, at least in June of 2015 in the

U.S., including via a Quick Start guide that was included with the product and on Astera’s website. *Id.*; Ex. 1003, ¶ 41-45.

Astera Manual was publicly accessible. Ex. 1005, ¶¶ 1-15. Public accessibility is “the touchstone in determining whether a reference constitutes a printed publication.” *In re Lister*, 583 F.3d 1307, 1311 (Fed. Cir. 2009). To be “publicly accessible,” a reference must be “disseminated or otherwise made available to the extent that persons interested and ordinarily skilled in the subject matter or art, exercising reasonable diligence, can locate it.” *Id.* Public accessibility includes availability through commercial websites and avenues. *Id.* at 1316; *Centripetal Networks, Inc. v. Cisco Sys., Inc.*, 847 F. App’x 869, 878 (Fed. Cir. 2021).

POSITAs would have been aware of the AX10 and could have easily located Astera. The company was well-known in the entertainment lighting business and regularly attended trade shows including the 2014 Prolight and Sound Exhibition, which showcased the AX10. Ex. 1005, ¶ 5. Astera was provided to AX10 distributors and purchasers via a Quick Start Guide from at least June 2015. Ex. 1005, ¶¶ 5-6.<sup>1</sup> Astera was also published on Astera’s website since at least June

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<sup>1</sup> The “16/06/15” date on the Quick Start Guide is June 16, 2015. Ex. 1005, ¶ 6.

2015, allowing anyone to access it. Ex. 1005, ¶¶ 5-8, 11. Over 750 AX10s were sold in 2015. Ex. 1005, ¶ 5.

Astera describes a controllable lighting fixture with an array of nine “RGBAW” (red, green, blue, amber, white) LEDs:

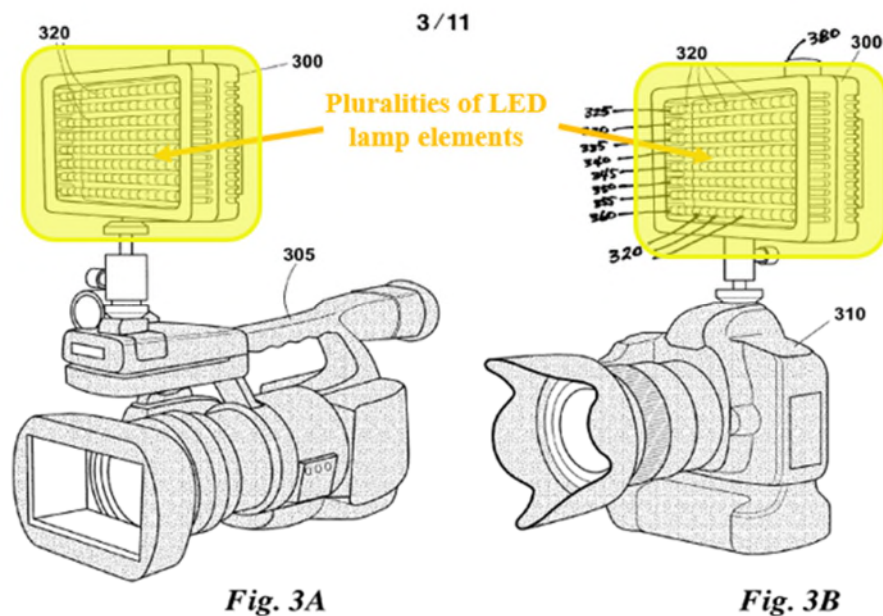


Ex. 1004 at Cover, 7. The AX10 can be controlled by various controllers, including (a) LCD Control Panel (a “standalone engine”) on the AX10 (“Control Panel”), (b) remote control, (c) “AsterApp”, and (d) CRMX wireless DMX. *Id.* at 9-11, 23.

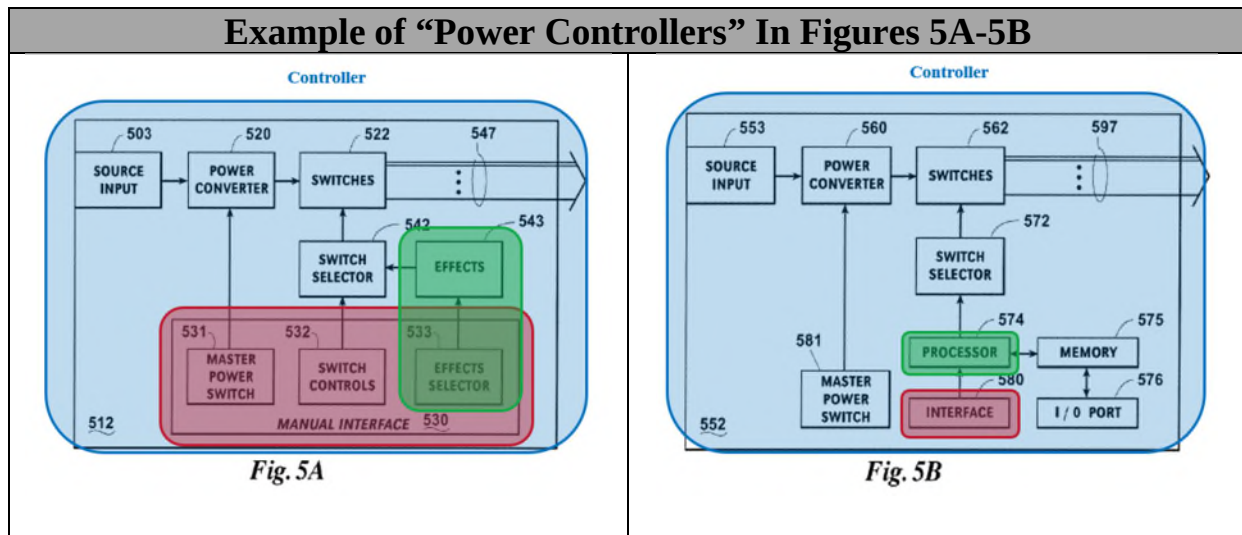
The AX10 produces customized lighting effects (*id.* at 23-24, 27-28, 32) through the Control Panel, infrared remote, AsterApp, and DMX control. *Id.* at 21, 28, 17. The effects include fire with a “random” flickering; “random” fast, medium, and slow strobes; random color chaser effects; color fades; spiral colors; and rainbow. *Id.* at 17, 21. Users can customize effects by adjusting parameters including speed, crossfade, stroboscope, and brightness. *Id.* at 27, *see id.* at 20, 24-29; Ex. 1003, ¶¶ 46-49.

## B. Pohlert

Pohlert was published on February 23, 2012, and is prior art under at least 35 U.S.C. § 102(a)(1). Ex. 1006 at Cover Page. Pohlert discloses a “lighting and effects generation system” (Figs. 3A and 3B) that includes LED lamps in a lighting frame, with a connected and dedicated “power controller.” *Id.* at Cover, [0051]-[0057]; Ex. 1003, ¶ 189. The power controller includes (1) a user interface to select and customize lighting effects, (2) an “effects generator” that generates the selected effects, and (3) switches that convert the generated effects into power control signals output to the LEDs.



Ex. 1006 at Figs. 3A, 3B (annotated).



## V. LEVEL OF ORDINARY SKILL IN THE ART

As of the earliest effective filing date claimed in the '257 Patent, a person of ordinary skill in the art (“POSITA”) would have had at least a Bachelor of Science degree in electrical engineering, or a closely related field, along with at least two years of experience in the design of entertaining lighting systems, and the design and use of LED lights. Ex. 1003, ¶ 38-39.

## VI. CLAIM CONSTRUCTION

In an IPR, claims are interpreted under *Phillips*. 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). Claim terms are given their plain meaning as understood by a POSITA. 415 F.3d at 1312–13. Unless indicated otherwise in the arguments below, claim terms are given such ordinary and customary meaning.

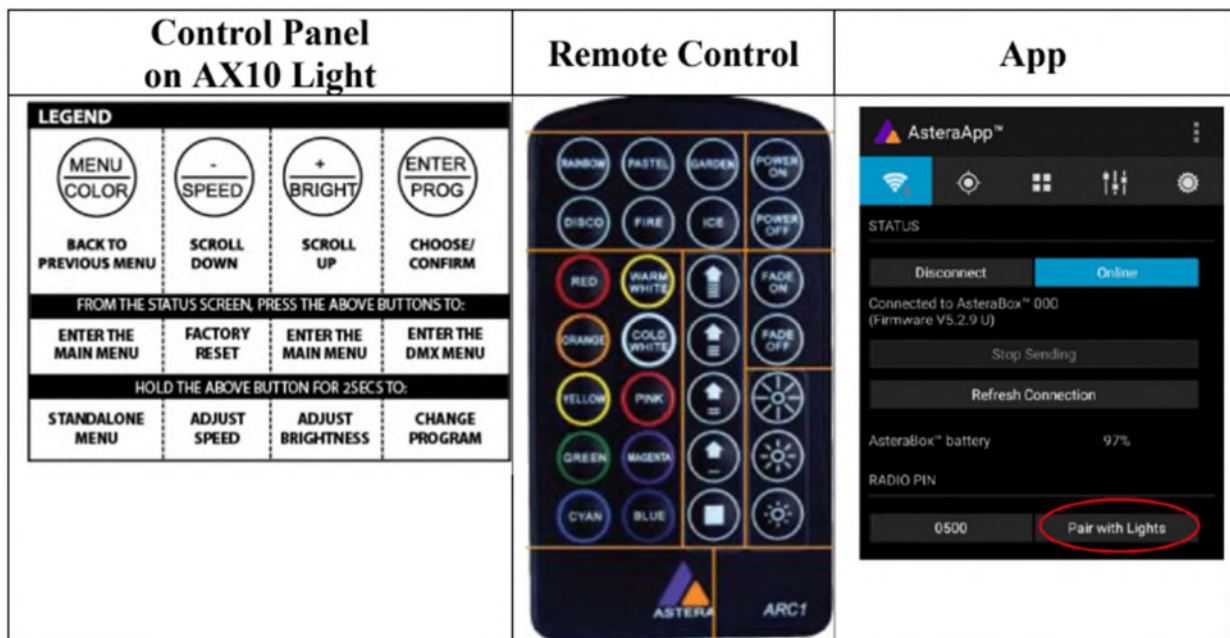
## VII. GROUND I: ASTERA ANTICIPATES CLAIMS 1-21

### A. Claim 1

Astera discloses each and every limitation of Claim 1.

#### Claim 1[pre]

Astera discloses a controllable lighting fixture with an array of nine “RGBAW” LEDs. Ex. 1004 at 7; Ex. 1003, ¶¶ 51-53. The AX10 can be controlled via various controllers, including Control Panel, remote, and AsteraApp. Ex. 1004 at 9-11.



*Id.* at 9, 11, 23.

The AX10 can produce “user customizable lighting effects.” Ex. 1003, ¶¶ 53-58. “Effect modes” offer “a comprehensive control of the built in standalone

engine,” to implement “predefined programs” for effects including fire, strobe, static colors, color fades, rainbow, spiral colors. Ex. 1004 at 17, 21.

Users can customize these effects. *Id.* at 8, 11, 13, 20, 24-29. The Control Panel allows users to “select” one of the effects and then modify it by adjusting: (i) intensity to set a dimmer level; (ii) speed to change the time to complete one cycle of the program; (iii) fade time between program steps; and (iv) color. *Id.* at 11, 20.

Users can select and customize effects including “running lights,” “fire,” “rainbow,” “chaser effects” and “stroboscope” through AsteraApp. *Id.* at 27-28. Selected effects can be customized by adjusting parameters including: (i) “speed” of “how long it will take for the effect to complete one cycle,” (ii) “crossfade” between steps, (iii) “speed” of a “stroboscope” effect, and (iv) “brightness.” *Id.* at 27; Ex. 1003, ¶¶ 53-58.

**Claim 1[a]**

This limitation requires “calculating, using an effect simulator.” The ’257 Patent does not provide *any* detail as to how the “calculation” is purportedly performed, or disclose a specific algorithm for performing the “calculation.” Nor does the ’257 Patent disclose a particular way in which “calculating” is performed.

Instead, it broadly describes “calculating” as **creating** brightness or color information for a lighting effect. The ’257 Patent discloses the “effect simulator” as a black-box (element 100 in Figures 2, 4) that “creates data 106 characterising a

lighting effect.” Ex. 1001 at 7:51-52, 8:41-50. The data is the claimed “time varying lighting values,” and represent “brightness and/or color values that vary over time” that, when displayed by a lighting device, provide the desired lighting effect. *Id.* at 8:36-50; Ex. 1003, ¶ 60.

Figure 3 discloses that the “calculation” is performed merely by adjusting parameters and generating an effect:

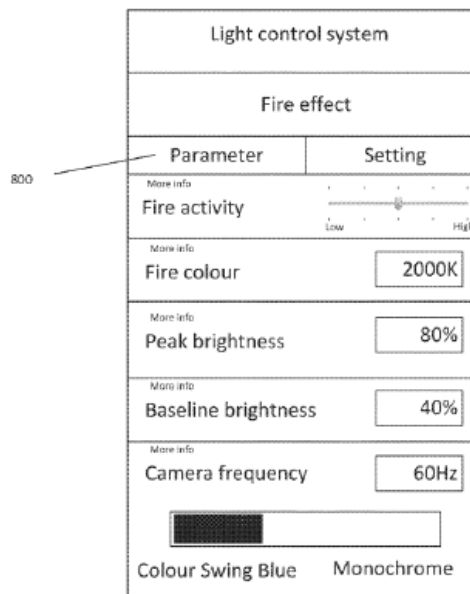


Figure 6

Ex. 1001 at Figs. 3, 6, 7:29-47. Instead of teaching *how* the lighting values are “calculated,” the ’257 Patent discloses that a user adjusts parameters and the lighting effect is created or generated by adjusting parameters. Patent Owner’s previous expert, Dr. Bretschneider, agreed that the ’257 Patent does not disclose an algorithm or how “calculations” are performed. Ex. 1008 at 149:11-153:9, 153:19-154:18,

155:4-6, 165:9-11, 176:16-19. Dr. Bretschneider testified that no algorithm needs to be disclosed in the patent because the “calculating” limitation—the heart of what Rotolight says it invented—is just something “routine” that would “be within the knowledge” of a POSITA. *Id.* at 149:11-153:9, 185:7-188:13.

Astera teaches to calculate time varying lighting values for generating special effects based on user-input simulation parameters. Ex. 1004 at 9-11, 13, 17, 21; Ex. 1003, ¶¶ 60-64. The Control Panel allows users to “select” from predefined effects, and adjust parameters including intensity (to set a dimmer level), speed (to change the time to complete one cycle), fade time, and color. Ex. 1004 at 20. Based on these selections input using the Control Panel, the AX10 creates data characterizing the adjusted lighting effect, in the form of values and settings for the LEDs to “display these effects properly with [the] light.” *Id.* at 17, 20-21; Ex. 1003, ¶¶ 60-64.

The AsteraApp also allows users to select from a variety of lighting effects, such as “fire,” “chasers,” “rainbow” and “stroboscope.” Ex. 1004 at 23-24, 27-28; *see supra* Claim 1[pre]. Selected effects can “be highly customized” by adjusting parameters including: (i) “speed” of how long it will to complete one cycle, (ii) “crossfade” between steps, (iii) random “stroboscope” speed, and (iv) “brightness.” Ex. 1004 at 27. Users can select and customize the colors for effects “with a customizable color palette,” and certain effects, like the “fire effect,” allow a user to “adjust” the colors making up the effect. *Id.* at 24, 27, 28.

The parameters that are input using the AsteraApp are calculated, using a processor, and the calculated time varying lighting values, including brightness and color information user-customized effects are output by the AX10. *Id.* at 23-29; Ex. 1003, ¶¶ 63-64. Using the AsteraApp, a user can “send complex effects” to the lights, and be “used to adjust the lights remotely” by sending control signals (lighting values). Ex. 1004 at 23; Ex. 1003, ¶¶ 63-64. Based on user selections, “effects can be created and can be sent to the light by the built in UHF receiver,” where the effects are “triggered” and played at each light. Ex. 1004 at 23.

If Rotolight argues that Astera does not disclose the “calculate” limitation, this would contradict its own infringement allegations. In parallel litigation, Patent Owner asserted that the “calculating” limitation is easily satisfied by citing a user manual depicting the following functionality: inputting of “parameters” into a lighting device via a user interface, which in turn causes the lights to display a lighting effect based on recalled pre-set parameters. Ex. 1009 at 24-25. Patent Owner should not be permitted to assert the opposite here by arguing that Astera fails to satisfy the “calculating” limitation. The near-identical disclosure in Astera teaches adjusting parameters through an interface associated with the lighting device, which in turn produces a lighting effect based on those parameters. Ex. 1004 at 11, 20, 27.

The lighting effects in Astera can be modified by the user. The “predefined programs” in Astera are “highly customized” by adjusting parameters including color, intensity, speed, fade, and strobe. Ex. 1004 at 21, 27-28. When parameters for a selected effect are changed, a “calculation” (the creation of data) is required to create new values to generate an effect reflecting the adjusted parameters. Ex. 1003, ¶¶ 61-64.

**Claim 1[b]**

Users can select a range of lighting effects (“fire effect,” “rainbow effect,” “chaser effects”) and customize these by adjusting parameters, including brightness (intensity), speed, fade, and color. *See supra* Claim 1[a]; Ex. 1003, ¶¶ 65-66. These parameters characterize the selected effect, in that, as in the ’257 Patent, the selected, customized effect is dependent on these parameters. Ex. 1003, ¶¶ 65-66; Ex. 1004 at 17, 20-21, 24-28.

The effects can be used for “videography, broadcasting, cinematography, studio filming, and location filming.” Ex. 1003, ¶¶ 67-72. Astera manufactures luminaires for film, TV, and theatrical use. Ex. 1005, ¶ 5.

Astera teaches the AX10 can produce effects captured by video cameras. Ex. 1003, ¶¶ 70-71. The AX10 has an “Anti-Flicker” adjustment, so the settings will “fit different camera’s frame rates.” Ex. 1004 at 32. Fitting lights to camera frame

rates indicates the lighting effects are intended to be captured on video. Ex. 1003, ¶¶ 70-72.

A POSITA would understand references to DMX control in Astera (Ex. 1004 at 9-10) indicate the disclosed method was developed for TV, cinematography, and filming, as DMX is a common communication standard for these industries. *Id.*, ¶ 72.

**Claim 1[c]**

The effects in Astera can include simulation parameters of at least a random brightness, duration, or interval. Ex. 1003, ¶¶ 73-79. Astera discloses a “fire effect” comprising a “random flicker between two colors, background and flickering color.” Ex. 1004 at 21, 28. As the fire is described as having a “flicker” characteristic, it includes simulation parameters of random brightness levels between the background and flickering colors—rather than consistent brightness levels, which would create an unrealistic strobe rather than flicker effect. *Id.*

Astera discloses a “chaser effect,” where “colors are randomly chosen.” *Id.* at 28. Different colors have different brightness (yellow created by illuminating both the red and green LED emitters to full is brighter than a red light consisting of the red LED emitter alone), and thus the random color parameter has random brightness. Ex. 1003, ¶ 76.

With respect to random duration and interval, the “random flicker” in the “fire” effect indicates that the (total) duration of time the background and flicker colors are each activated is random, as is the interval of time between activations. Ex. 1003, ¶¶ 75-77. Absent such random duration and intervals, the effect would not be a “random flicker,” and would instead be consistent strobing between background and flickering colors. *Id.*

The “stroboscope” effect also includes “random” settings options. Ex. 1004 at 17, 21, 27. For a “stroboscope” to be random, the duration and interval of flashes *must* be random. Ex. 1003, ¶ 78. Absent such random duration and interval, strobing would be consistent and uniform, rather than “random.” *Id.*; see Ex. 1004 at 17, 21, 27. “Slow” random strobe would have a different duration and interval than “fast,” with “fast” including more random flashes per interval. Ex. 1004 at 27; Ex. 1003, ¶¶ 78-79.

**Claim 1[d]**

The simulation parameters in Astera depend on the user-selected pre-programmed light effect (fire, rainbow, chaser), as customized by any desired random strobing, speed, brightness, or color parameters. *See supra* Claims 1[b]-[c]; Ex. 1003, ¶¶ 80-81. The speed, fade, color, stroboscope, and brightness selectable menu options are based on the user-selected effect and are presented as parameters for adjusting the effect. Ex. 1004 at 20-21, 24-28. When “rainbow” is selected a “speed” parameter can

be generated, and when “fire” is selected parameters to generate the “random flicker” and set the background and flickering effect colors are generated. *Id.* at 28.

**Claim 1[e]**

The AX10 can output time-varying lighting values based on the input parameters a user inputs using the Control Panel and AsteraApp. The AX10 then can “display these [selected] effects properly with [its] light.” Ex. 1004 at 21; Ex. 1003, ¶¶ 82-87. The “Main Menu” status screen allows users to select “STANDALONE” mode, where the Control Panel will “set [the] parameters of the standalone engine” in the AX10. Ex. 1004 at 12, 17. In “STANDALONE,” the Control Panel allows users to select a desired lighting effect program, and adjust simulation parameters of intensity, speed, fade, and color. *Id.* at 20-21; *see also supra* Claim 1[a]. In doing so, the Control Panel is used to create data characterizing the adjusted lighting effect, in the form of values and settings for the LEDs that change over time, which set “the parameters of the standalone engine.” Ex. 1004 at 12, 17. This “standalone engine” then causes the LEDs to “display static colors or replay a number of predefined effect patterns with a customizable color palette.” *Id.* at 10, 17, 24. For effect patterns, the values vary with time to change the output of the LEDs, creating the effect. *Id.*; Ex. 1003, ¶¶ 86-87.

With the AsteraApp, users can select from different lighting effects (fire, chasers, rainbow) and customize them (adjust speed, crossfade, stroboscope,

brightness). *See* Claim 1[a]. Based on these user-selected, customized effects, a processor calculates time varying lighting values including brightness and color information for the desired effects. Ex. 1004 at 23-29; Ex. 1003, ¶¶ 86-87. “With the AsteraApp these effects can be created and be sent to the light by the built in UHF receiver,” where they are received by the standalone engine in the AX10. *Id.* at 10, 24. The AX10 then outputs the lighting values representing the adjusted effect created in AsteraApp and the light outputs the effect. Ex. 1004 at 24; Ex. 1003, ¶¶ 86-87.

**B. Independent Claims 15 and 20**

There are no substantive differences between Claim 1 and Claims 15 and 20, and Astera anticipates Claims 15 and 20 for the same reasons as Claim 1. *See supra* Claim 1; Ex. 1003, ¶¶ 88-89. A comparison of limitations in Claim 1 to the corresponding limitation in Claims 15 and 20 follows, with differences in **bold**:

| <b>Claim 1</b>                                                                                                                  | <b>Claim 15</b>                                                                                                                                              | <b>Claim 20</b>                                                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A method for</b> controlling a lighting device to produce a user customisable lighting effect, <b>the method comprising:</b> | <b>A controller adapted to</b> control <b>at least one</b> lighting device to produce a user customisable lighting effect, <b>the controller comprising:</b> | <b>A computer program comprising software code for</b> controlling a lighting device to produce a user customisable lighting effect, <b>the computer program adapted to perform, when executed, the steps</b> |

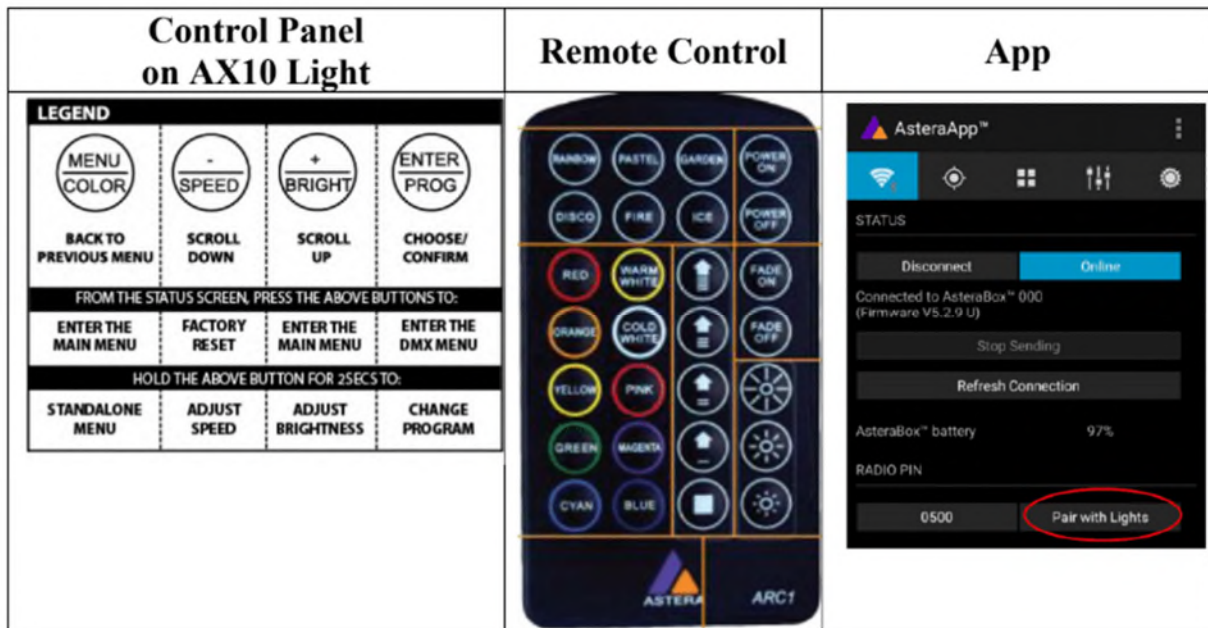
| <b>Claim 1</b>                                                                                                                                                                                                                                                               | <b>Claim 15</b>                                                                                                                                 | <b>Claim 20</b>                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|
| calculating, <b>using</b> an effect simulator, a time varying lighting value based on at least one simulation parameter;                                                                                                                                                     | an effect simulator <b>adapted to</b> calculate a time varying lighting value based on at least one simulation parameter;                       | calculating <b>using</b> an effect simulator a time varying lighting value based on at least one simulation parameter; |
| wherein said at least one simulation parameter characterises a user customisable lighting effect selected from a range of different user customisable lighting effects for at least one of: videography, broadcasting, cinematography, studio filming, and location filming; | wherein said at least one simulation parameter... <i>[no differences in rest of limitation]</i> ;                                               | wherein said at least one simulation parameter... <i>[no differences in rest of limitation]</i> ;                      |
| wherein <b>said</b> at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;                                                                                                                                     | <i>[no substantive differences in limitation]</i>                                                                                               | <i>[no substantive differences in limitation]</i>                                                                      |
| said simulation parameter depending on the user customisable lighting effect being simulated; and                                                                                                                                                                            | <i>[no differences in limitation]</i>                                                                                                           | <i>[no differences in limitation]</i>                                                                                  |
| outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customisable lighting effect.                                                                                                                                          | <b>wherein an output of the effect simulator is adapted to control a lighting device according to the calculated variation of lighting over</b> | <i>[no differences in limitation]</i>                                                                                  |

While Claim 1 is directed to a “method” for controlling a lighting device, Claim 15 is directed to a “controller” implementing this same method and Claim 20 is directed to a “computer program” performing the same method.<sup>2</sup> Astera discloses each limitation in Claims 15 and 20 for the same reasons discussed above with respect to the corresponding limitation in Claim 1. Astera discloses the method can be performed on a “controller” or a “software program.” Ex. 1004 at 9.

With respect to Claim 15, Astera discloses various controllers with an effect simulator that controls the AX10, including the Control Panel, remote, and AsteraApp. Ex. 1004 at 8-9, 11-13, 17, 20-29; see Claim 1; Ex. 1003, ¶¶ 90-94.

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<sup>2</sup> Claim 15’s recitation of the effect simulator controlling a lighting device based on the calculated variation of lighting over time is the same as outputting the calculated time varying lighting values to control a lighting device recited in Claim 1.



*Id.* at 9.

As to Claim 20, the Control Panel and AsteraApp and the processor or engine in the AX10 perform functions based on computer software program code. Ex. 1003, ¶ 95. AsteraApp is a mobile application (*i.e.*, software code) that is downloaded and run on a user's device. *Id.*; Ex. 1004 at 2, 9, 24-36. The Control Panel is implemented through software-based programming. *Id.* The AX10 includes "firmware version 5.2.20," and the information menu displays "the firmware version and hardware version of the light." Ex. 1004 at 2, 12, 22. A POSITA would understand that firmware is software programmed into a read-only memory, and that this firmware implements the programming and control of the AX10. Ex. 1003, ¶ 95.

**C. Claim 2**

Astera discloses “fire” and “chaser” effects that include a random brightness parameters. *See supra* Claim 1[c]. Each of these include a random peak brightness. Ex. 1003, ¶¶ 96-101.

With respect to “fire,” the “random flicker” is achieved through alternating between the background and flickering colors at random brightness levels. Ex. 1004 at 21, 28; Ex. 1003, ¶¶ 97-98. This “flicker” characteristic indicates it includes random brightness levels for the background and flickering colors—rather than consistent brightness levels, which would create a strobe rather than flicker effect. *Id.* Whichever brightness level is the highest would be the “random peak brightness.” *Id.*

Astera states users can select the maximum, or peak, for these random brightness levels by customizing the “brightness.” Ex. 1004 at 20-21, 27, 31. Adjusting the overall brightness controls what the “peak,” or maximum possible brightness, can be for each flicker in the fire effect. *Id.* at 20-21, 27-28, 31; Ex. 1003, ¶¶ 99-100.



Each effect can be adjusted in brightness as well.

Ex. 1004 at 27.

As to “chaser” effects, Astera discloses “colors are randomly chosen,” and each color has a different brightness level, resulting in a random peak brightness as the effect cycles through random colors. *Id.* at 28; Ex. 1003, ¶ 100. Users can set the maximum brightness level for “chaser” effects, controlling the potential peak brightness as the effect cycles randomly through colors. Ex. 1004 at 17, 20, 27-29, 31; Ex. 1003, ¶¶ 100-101.

#### **D. Claim 3**

The “fire effect” and “stroboscope” effects in Astera have at least a random interval between flashes and a random frequency. *See supra* Claim 1[c]; Ex. 1003, ¶¶ 102-106. As for “fire,” the random “flickering” between a background and flickering colors indicates a “random interval” of time between each flash of the background and flickering colors (*e.g.*, each flicker of the fire). Ex. 1004 at 21, 28; Ex. 1003, ¶ 104. Absent such random interval, the effect would not be considered a “random flicker,” but would be consistent strobing between background and flickering colors. Ex. 1004 at 21, 28. In implementing the random flicker, AX10 outputs light at a “random frequency” (rather than a consistent one), as the interval between flashes randomly changes. Ex. 1003, ¶¶ 104-105.

As to “random stroboscope,” for the slow, medium, or fast “stroboscope” effect to be “random,” the interval between strobe flashes must be random. Ex. 1004 at 17, 27; Ex. 1003, ¶ 106. Absent such a random interval, the strobing would be

consistent and uniform, rather than “random.” *Id.*; Ex. 1004 at 17, 27. A “slow” random strobe would have a longer random interval between flashes than a “fast” random strobe, with a “fast” one including shorter random intervals between random flashes, to produce more flashes in the same time. Ex. 1003, ¶ 106. With a random interval between flashes, the frequency of the flashes is also random. *Id.*

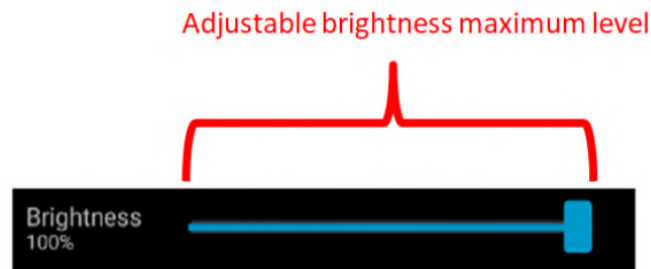
**E. Claim 4**

The “fire effect” and “stroboscope” simulation parameters have at least a random number of pulses. *See supra* Claim 1[c]; Ex. 1003, ¶¶ 107-110. With respect to “fire,” randomly changing between background and flickering color involves a random number of pulses of background and flickering color to create the fire effect. Ex. 1004 at 21, 28; Ex. 1003, ¶¶ 108-109. If the number of pulses of background and flickering colors were consistent, rather than random, then the effect would appear as a consistent strobe rather than a flickering fire. Ex. 1004 at 21, 28; Ex. 1004 at 21, 28.

With respect to “stroboscope,” choosing any of the “slow, medium, or fast” random options includes a random number of pulses. Ex. 1004 at 17, 27. With the strobe being random, rather than consistent or uniform, the number of pulses output during the strobe effect changes randomly. Ex. 1003, ¶ 110. In “slow,” there would be fewer random pulses in the effect than in “fast.” *Id.*; *see* Ex. 1004 at 17, 27.

**F. Claim 5**

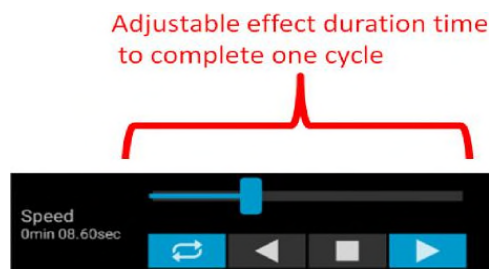
The simulation parameters for “fire,” “chaser,” and random “stroboscope” in Astera are random within “predefined boundaries.” Ex. 1003, ¶¶ 111-115. Specifically, with these AX10 effects, users can set a simulation parameter specifying the maximum “brightness” level, thereby setting an upper boundary for the maximum “amplitude” (or brightness) of the effect. Ex. 1004 at 20, 27; see Claims 1[c], 2.



Each effect can be adjusted in brightness as well.

Ex. 1004 at 27.

By setting and adjusting the “speed” of “how long it will take for the effect to complete one cycle,” users set boundaries for the duration, as the effect must be completed within the time of one cycle. *Id.*



The speed tells how long it will take for the effect to complete one cycle.

*Id.* at 27.

Users can select boundaries of an interval between bursts for the “stroboscope” effect. Ex. 1004 at 17, 27. Boundaries can address whether the duration and interval between the bursts making up the strobe effect will be “slow, medium, [or] fast.” *Id.* at 17, 27; *see also supra* Claim 1[c]; Ex. 1003, ¶¶ 112-115.

#### **G. Claim 6**

The effects in Astera such as fire, chaser, and strobe are based on parameters including random brightness, duration, and interval. *See supra* Claim 1[c]; Ex. 1003, ¶¶ 116-118. These random parameters are determined based on user selections through an interface. Ex. 1004 at 17, 20-21, 23-24, 28. A “random brightness” is determined in dependence on the user’s selection of any “brightness” customization for the effect. Ex. 1004 at 20, 27, 31; *see* Claims 1[c], 2. A “random brightness,” “random duration,” and “random interval” of the fire effect are based on user customizations. *See* Claim 1[c]. Similarly, “random duration” and “random interval” for the “stroboscope” effect are determined at least based on user-selectable parameters of whether the random stroboscope will be “slow, medium, [or] fast.” Ex. 1004 at 17, 27; *see* Claims 1[c], 3, 4; Ex. 1003, ¶¶ 116-118.

#### **H. Claim 7**

Users can select from various lighting effects from the Control Panel or AsteraApp. Ex. 1004 at 17, 20-24, 27-28; Ex. 1003, ¶¶ 119-124. Users can adjust

the “intensity” or “brightness” parameters of each effect. Ex. 1004 at 17, 20, 27, 31. Astera discloses parameters related to “a brightness,” as the brightness may be adjusted. Ex. 1003, ¶¶ 120-121.

The simulation parameters are related to a rate of increase or decrease of brightness, and the brightness fluctuation period, as the time for an effect to complete a cycle is adjusted through the speed parameter. Ex. 1004 at 20, 27, 31. Completing the same effect in a shorter time cycle changes how quickly the brightness or color fluctuates to complete the effect. *See* Claims 2, 4; Ex. 1003, ¶ 121.

In addition, “stroboscope” can be adjusted in speed, changing the brightness fluctuation period of the flashes in the effect. Ex. 1004 at 27. Rate of color change and color fluctuation period parameters can be adjusted in the “chaser effect” and “rainbow effect” that change colors, as the “speed” of both can be adjusted. *Id.* at 27-32. Changing the speed changes the rate of color change and color fluctuation period. Ex. 1003, ¶ 124.

## **I. Claim 8**

Users can select from various desired effects and parameters through interfaces on the Control Panel or AsteraApp. Ex. 1004 at 9-11, 13, 20, 23-29; Ex. 1003, ¶¶ 125-129.

The Control Panel includes an LCD menu allowing users to “select” a lighting pattern (*e.g.*, those listed on page 21) and adjust: (i) intensity; (ii) speed of a cycle of

the program; (iii) fade time between steps of the program; and (iv) color selections. Ex. 1004 at 11, 20. The Control Panel adjusts the desired effect based on the selected parameters. Ex. 1003, ¶¶ 127-128; *see* Claim 1[e].

With AsteraApp, lighting effects may be selected and “highly customized” using user interfaces. Ex. 1004 at 27. Based on user selections of effects and parameters, Astera creates new signals sent to the light to provide the desired output. *Id.* at 23-24, 27; *see* Claim 1[e]; Ex. 1003, ¶ 129.

#### **J. Claim 9**

Once a user selects a lighting effect in Astera, users can customize the lighting effect to change the brightness, change the colour, or set a trigger. Ex. 1004 at 24, 27, 31-32; Ex. 1003, ¶¶ 130-134. For maximum brightness, Astera has a slider such that “[e]ach effect can be adjusted in brightness.” Ex. 1004 at 27; *see* Claim 2. The user-selected simulation parameter can be a maximum brightness, with the slider setting possible brightness percentage. Ex. 1004 at 27; Ex. 1003, ¶¶ 130-133.

The Control Panel allows for the same brightness adjustment. *Id.* at 11. Because a “background” color can be set, there is minimum brightness that is at least the background color brightness. *Id.* at 21, 27-28.

For “color,” Astera discloses that for “fire” effect, “the background color and the color of the flickering effect can be adjusted.” *Id.* at 28. Users can set colors for lighting effects, which can be customized to include random “stroboscope” effect.

*Id.* at 24, 27-28. Thus, users can set a color for an effect, and then add a stroboscope effect to randomly strobe the color. *Id.* at 24-27; Ex. 1003, ¶ 133

With respect to a “trigger,” users can manually select a time delay (or a trigger) to start the user customized lighting effect show. *Id.* at 10, 24, 34. The “standby is intended to be used between setup and event.... [A]ll lights may be switched to standby mode and woken up later when the event starts.” *Id.* at 34; *see* Claim 12; Ex. 1003, ¶ 134.

**K. Claim 10**

Once users select a lighting effect, users can change how long it will take to complete one cycle. Ex. 1004 at 17, 20, 27; Ex. 1003, ¶¶ 135-137. As a POSTA would understand, at the start each of cycle, the standalone engine in the AX10 would calculate the lighting values for the desired effect, based on any user customizations. Ex. 1003, ¶¶ 135-137. Where any desired effect includes a “random” color or speed parameter, the values for this effect must be continuously calculated each cycle to keep the effect “random.” *Id.*; *see* Ex. 1004 at 17, 27.

Light effects calculated by Astera are “triggered and then each light replays them autonomously until a new effect is sent.” *Id.* at 23, 24. Astera repeatedly calculates lighting values to allow the LEDs to continue autonomously playing the effect. Ex. 1003, ¶ 137.

**L. Claim 11**

The AX10 in Astera can produce lighting effects, including a “fire effect” which mimics a fire flickering. Ex. 1004, 28, 21; Ex. 1003, ¶¶ 138-142. A “stroboscope effect” (strobe of flashes) can be added to selected effects. Ex. 1004 at 17, 27. A POSITA would understand Astera can produce other claimed effects (lightning, welding, sparking, paparazzi flashes, fireworks), based on the effects it offers and its ability to generate various colors, alternate between colors, and add strobing/flashing. *Id.* at 17, 21, 27-28; Ex. 1003, ¶¶ 141-142.

**M. Claim 12**

Users can select a time delay to start the user customized lighting effect, resulting in outputs of control signals to vary the lighting values and simulate the desired effects later. Ex. 1004 at 34; Ex. 1003, ¶¶ 143-147. The “standby is intended to be used between setup and event” and “all lights may be switched to standby mode and woken up later when the event starts.” Ex. 1004 at 34; Ex. 1003, ¶¶ 143-147.

Users can enter the standby menu by selecting the “Enter Standby Before Event” option, and then select whether to leave or enter standby either “Now” or “Later.” *Id.* With “Later,” a separate menu allows the user to select the specific time when the lights will leave standby and begin operating and outputting the pre-programmed light show. *Id.* “Now” immediately triggers the effect. *Id.*

Using the Control Panel, users can “power the light on/off,” which triggers the output of time varying lighting values to the LEDs, so they turn on with the appropriate characteristics. Ex. 1004 at 9. Users can “select” predefined program patterns, initiating a trigger to the LEDs to display that program. *Id.* at 20-21. In Astera, the effects are just triggered and then each light replays it autonomously until it receives a new effect.” *Id.* at 10, 23-24; Ex. 1003, ¶¶ 143-147.

**N. Claims 13 and 21**

The user-selectable lighting effects in Astera, and adjustments made to those effects, may be “saved back to the main screen by pressing the save button.” Ex. 1004 at 27; Ex. 1003, ¶¶ 148-151. Users may select an effect (like “fire”) and modify it by changing simulation parameters (like “speed,” “stroboscope,” “brightness”). *Id.*; see Ex. 1004 at 27. When the user is done, he can click the disk icon, saving the modified effect. *Id.*

Once saved, these stored effects (with modified parameters) can be recalled and played later. *Id.* at 10, 24, 30. Saving and recalling within the AsteraApp saves and recalls to a “memory” that contains the computer readable instructions that can be recalled and implemented through the app. Ex. 1003, ¶¶ 148-151.

**O. Claim 14**

Astera discloses nine “RGBAW” LEDs. Ex. 1004 at 7; Ex. 1003, ¶¶ 152-156. The Control Panel and AsteraApp control the nine LEDs. See Claims 1[a]-[e]; Ex.

1003, ¶ 153. The “[l]ights can be grouped into sets,” so a user-created effect “can stretch over up to 32 lights.” Ex. 1004 at 10, 23. Lights can be grouped together such that all lights in the same “Sync-Set” play the same effect simultaneously, based on control signals from AsteraApp. *Id.* at 25. Alternatively, lights can be grouped into a “Flow-Set,” where each light can be assigned to “positions” within the Flow-Set, and the lights will play the same lighting effect but offset to each other, in order of their positions. *Id.* at 26; Ex. 1003, ¶¶ 154-156.

**P. Claim 16**

The AX10 includes both “wired” and “wireless” communication interfaces to communicate with LEDs. Ex. 1004 at 5, 10, 26; Ex. 1003, ¶¶ 157-161. The Control Panel includes a “wired” interface for communicating with the LEDs. Ex. 1004 at 8-9, 11; Ex. 1003, ¶ 161. The Control Panel communicates with the LEDs through wires to “power the light on/off, set a static color or change its settings.” Ex. 1004 at 9. The Control Panel communicates directly with the LED driver circuitry within the AX10. Ex. 1003, ¶ 160.

AsteraApp communicates with AX10 lights by Bluetooth and controls the lights by UHF (forms of “wireless” communication). Ex. 1004 at 9-10, 22-24; *id.* at 23; Ex. 1003, ¶ 161.

**Q. Claim 17**

Astera discloses multiple controller interface systems through which users can provide inputs, including the Control Panel and AsteraApp. Ex. 1004 at 9-11; Ex. 1003, ¶¶ 162-163; *see* Claim 8.

**R. Claim 18**

Astera discloses the controller according to Claim 15 (*see* Claim 15), as well as “9 x 15 RGBAW” LEDs, and includes at least one LED lighting device. Ex. 1004 at 7; Ex. 1003, ¶¶ 164-165.

**S. Claim 19**

The LEDs can be controlled through the Control Panel on the AX10 itself. Ex. 1004 at 9-11; Ex. 1003, ¶¶ 166-167. The AX10 has a built-in standalone engine controlled through the Control Panel to select programs, and adjust speed, intensity, fade, and color of the program effect. Ex. 1004 at 9-10, 13 (“standalone” mode”), 20-21. The Control Panel and light (*e.g.*, the LEDs) are integrated into a combined device. Ex. 1003, ¶¶ 166-167.

**VIII. GROUND II: ASTERA RENDERS OBVIOUS CLAIMS 1–21**

Claims 1–21 would have been obvious to a POSITA based on Astera. A patent claim is unpatentable where “the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious” to a POSITA. 35 U.S.C. § 103.

The prior art is extremely close, if not identical, to the '257 Patent. If an alleged silence in a reference (*e.g.*, that a reference does not explicitly use the word “calculate” or describe a “calculation” in detail—much like the '257 Patent itself) is a purported “difference” between the reference and the claims in the context of anticipation, such “difference” would have been obvious to a POSITA based on the same evidence that supports anticipation. Ex. 1003, ¶¶ 168-187 (a POSITA would understand Astera to disclose the “calculating” limitation). It is axiomatic that evidence capable of establishing anticipation may also provide the underlying factual bases for obviousness. *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1373 (Fed. Cir. 2019) (“[I]t is well settled that ‘a disclosure that anticipates under § 102 also renders the claim invalid under § 103, for ‘anticipation is the epitome of obviousness.’”) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)).

A patent can “be obvious in light of a single prior art reference if it would have been obvious to modify that reference to arrive at the patented invention.” *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361 (Fed. Cir. 2016); *see also Takeda Chem. Indus., Ltd. v. Alphapharm Pty. Ltd.*, 492 F.3d 1350, 1357 (Fed. Cir. 2007). Reference to common knowledge of a POSITA is appropriate in a single reference obviousness analysis when explained with sufficient reasoning. *See*

*Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1337 (Fed. Cir. 2020) (affirming PTAB’s finding of obviousness based on single prior art reference).

**A. Claims 1-21 Are Disclosed By, and Rendered Obvious by, Astera**

As explained in Sections VII.A-VII.S, Claims 1-21 are expressly disclosed in Astera. For this reason, these claims would have been obvious to a POSITA.

**B. Claim Limitations 1[a], 15[a], and 20[a] Would Have Been Obvious to a POSITA Based on Astera**

If the Board finds that Claims 1[a], 15[a], and 20[a] are not expressly disclosed in Astera, they would have been obvious. As explained in Section VII.A, the ’257 Patent does not provide **any** specifics regarding how the “calculation” is purportedly performed. A POSITA would understand that the effect simulator’s use of user input parameters to generate/create lighting effects is done by a calculation (*i.e.*, taking the parameter values and, through a processor or DMX controller, generating a lighting effect matching those numeric parameters). Ex. 1003, ¶¶ 172-181.

This is not new or unique. In Astera, for example, a fire effect creates a random flickering between two colors, and based on parameter adjustments a POSITA would understand that different visual effects **will be generated each time, randomly**, based on a calculation using the input numerical values. Ex. 1003, ¶¶ 178-

181. If no new values for an effect are calculated and sent to the LEDs based on parameter adjustments, then those adjustments would be meaningless. *Id.*

A POSITA would not understand from Astera that the AX10 pre-stores in tables sequences of brightness and color values for every possible combination of effects and parameters, and then recalls the specific relevant sequence and replays it (like an MP3) when a user “selects” the precise combination in question. Ex. 1003, ¶¶ 177-178. Instead, a POSITA would understand that the specific data (*i.e.*, brightness and color values) for an effect—whether a random fire flicker, strobe, or color—is created **after** the user selects the effect and customizes its parameters. *Id.*; Ex. 1008 at 149:11-153:9, 185:7-188:13.

The '257 Patent requires (1) a parameter related to an effect is received, (2) “calculation” (or creation of data) is performed to generate lighting value data to change the light output accordingly, and (3) the data is sent to the LEDs to output the light. This is exactly what is described in Astera—parameters such as color, intensity, and fade for different steps of an effect are input through the Control Panel or AsteraApp, data values reflecting these parameters are created (*i.e.*, calculated) using a processor, and the values are sent to the LEDs to generate/produce the effect. Ex. 1004 at 20-21, 27-28; Ex. 1003, ¶¶ 178-181.

Astera thus discloses the “calculating” limitation of independent Claims 1, 15, and 20, or, at a minimum, it would have been obvious to a POSITA to utilize a DMX

controller or processor (such as the Control Panel or AsteraApp) of the AX10 to mathematically calculate the effect on the fly, dynamically, based on user parameters. A POSITA would have been motivated to utilize the known (and disclosed in Astera) controllers, processors, and software to perform the calculation as it would have created a robust and dynamic lighting effect system that can utilize real-time adjustments. Ex. 1003, ¶¶ 178-181.

### C. “Random” Limitations

Astera discloses simulation parameters such as random brightness, random duration, and random interval. If the Board finds that these “random” limitations are not disclosed in Astera, they would, at a minimum, have been obvious to a POSITA.

For instance, Astera describes multiple random effects that a POSITA would understand are *not* pre-recorded, such as “fire,” “strobe,” and “chaser.” Ex. 1003, ¶¶ 182-187. For one of these effects to appear random, a POSITA would understand that the effect must have different values every time. *Id.* If the same (non-random) strobe sequence were repeated every time, a user would not consider it random. *Id.* If the same flicker pattern for a fire were repeated in an endless loop, it would not appear random and would look artificial. *Id.*

Astera, like the ’257 Patent, teaches that a user may modify parameters for a “random” effect like flickering fire or a strobe effect so that the effect appears

random. Ex. 1004 at 21, 28. Astera does not say pre-recorded fire effect (or strobe), but rather calls it a “fire” with “random” flickering. *Id.* It would have been obvious to a POSITA that the “simulation parameter” is one of a “random brightness; a random duration; and a random interval.” Ex. 1003, ¶¶ 182-187. A POSITA would have been motivated to utilize the “random” parameters and effects to ensure that the effect looks realistic and not artificial. Ex. 1003, ¶¶ 186.

## **IX. GROUND III: POHLERT ANTICIPATES CLAIMS 1–21**

### **A. Claim 1**

Pohlert discloses each limitation of Claim 1. Ex. 1003, ¶¶ 190-220.

#### **Claim 1[pre]**

Pohlert discloses a method for controlling a lighting system having LED “light panels” controlled by a “power controller,” enabling users to select and modify lighting effects, like strobing, flashing, dimming, and brightening the lights. Ex. 1006 at Abstract, [0020], [0050], [0063], [0067], [103]; Ex. 1003, ¶¶ 191-192. Pohlert’s system can be used for “photography, film, television.” *Id.* at [0003], Figs. 1, 3A-3B; Ex. 1003, ¶¶ 191-192.

#### **Claim 1[a]**

Pohlert discloses an “effects selector” and “effects generator” (Figure 5A) or “processor” (Figure 5B) in the “power controller” calculates time varying lighting values, in the form of data signals characterizing the desired lighting effect, which

are converted to power control signals supplied to the LEDs to generate and create the desired effect. Ex. 1006 at [0059], [0061]-[0062], [0065]-[0067]; Ex. 1003, ¶¶ 193-202. These power control signals provide time-varying signals for “controlling the intensities” of the LEDs to generate the desired light patterns and effects. *Id.* at [0050]-[0051], [0059]-[0067]; Ex. 1003, ¶¶ 193-202.

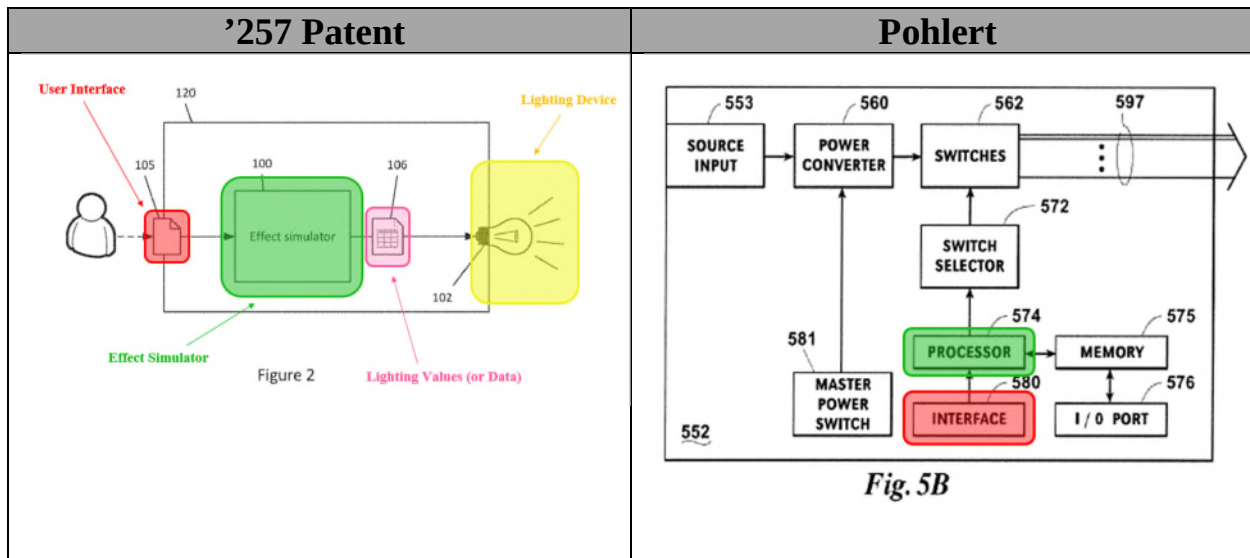
Power control signals are based on user-selected parameters for the desired effects, including brightness, dimming, duration, frequency, whether a sequence will be pseudo-random, and color. *Id.* at [0051], [0061]-[0063], [0066]-[0067], [0089]-0091]. Each of these controllers receives user inputs for desired effects, determines (*i.e.*, “calculates”) lighting values reflecting the user selections, and sends these lighting values to LEDs to produce the effects. Ex. 1003, ¶¶ 198.

A user may select a strobing effect, implemented by the controller generating an oscillating signal (a time varying signal) and applying it as a control signal to control the intensities of LEDs. Ex. 1003, ¶¶ 198-199; Ex. 1006 at [0062]. A user can adjust the frequency parameter of the strobing effect “via a manual knob, switch or other selection means” in the user interface. Ex. 1006 at [0062]; Ex. 1003, ¶¶ 198-199. Adjusting the oscillation frequency parameter causes the controller to calculate and create a new output signal, changing the frequency of the strobe effect. Ex. 1003, ¶¶ 199-202. The effects in Pohlert are generated *after* a user makes selections for the combinations of effects and sequences that will form the pattern. Ex. 1006 at [0063],

[0067]. To generate these patterns after user selections, a calculation is performed. Ex. 1003, ¶¶ 201-202.

To adjust the color or color temperature of the LEDs, users input “intensity control” and “ratio control” parameter adjustments through “manual control knobs, dials, switches, or other such means” on a user interface. Ex. 1006 at [0088]-[0092]. The “intensity control” and “ratio control” adjustments are received by “intensity control circuits” and “ratio control circuits”, which then calculates and generates signals to modify the power supply to the different LEDs to generate the desired color and color temperature. *Id.* at [0089]-[0091]. The pseudo-random sequences generated by the effect simulator (Ex. 1006 at [0063], [0067]) is a sequence of preset values and calculations performed to generate values for the “pseudo-random” sequence. Ex. 1003, ¶¶ 201; Ex. 1008 at 353:15-16, 357:1-22, 360:17-363:20 (testifying that “an algorithm is used” to generate pseudo-random numbers).

Pohlert’s generation and output of control signals, or time varying lighting values, representing the desired effect, is the same as the effect simulator and output lighting values disclosed in the ’257 Patent:



Ex. 1001 at Fig. 2 (annotated); Ex. 1006 at Fig. 5B (annotated), Fig. 5A.

**Claim 1[b]**

Users can select from a range of effects through an interface on the controller. Ex. 1006 at [0057]-[0059], [0061]-[0063], [0067], Figs. 2, 5A, 5B; Ex. 1003, ¶¶ 203-207. Users “customize” these effects by selecting and adjusting different simulation parameters. See Claim 1[a]. These parameters characterize the selected effect, in that the effect generated in Pohlert is dependent on and reflective of these parameters. Ex. 1003, ¶ 205; Ex. 1006 at [0057]-[0059], [0061]-[0063], [0067], [0089]-[0091].

These simulation parameters include selections for brightness, dimming, duration, frequency, pseudo-random, and color. *Id.* Users can customize the desired lighting pattern by choosing from, and adjusting, the combinations of parameters, including predetermined or pseudo-random strobing and flashing sequences, and dimming and brightening of different light elements. *Id.*; Ex. 1003, ¶¶ 205-206.

The lighting effects, based on these parameters, are used to provide lighting for “photography, film, television.” Ex. 1006 at [0003], [0005], [0052], Figs. 1, 3A-3B.

**Claim 1[c]**

The user-selected lighting effect patterns in Pohlert can be modified by selecting from a number of parameters that will make up the effect, including “[1] strobing or flashing different groups of light segments...in a predefined sequence (which may be a pseudo-random sequence, if desired), [2] strobing or flashing different light elements 320 of the light segments 325-360 in a predefined (or pseudo-random) sequence, [3] gradually dimming or brightening light segments 325-360 (individually, in groups, or collectively), or [4] various combinations of these effects.” Ex. 1006 at [0063], [0067]; Ex. 1003, ¶¶ 208-213. As acknowledged by the ’257 Patent, a “pseudo-random parameter” is considered “to be equivalent to a truly random parameter.” Ex. 1001 at 7:30-34; Ex. 1003, ¶ 210.

Selecting to strobe or flash different lights in a pseudo-random sequence includes “random brightness” (the intensity of the overall strobe/flash), “random duration” (how long a strobe/flash lasts), and “random intervals” (time between strobes/ashes). Ex. 1006 at [0063], [0067]; Ex. 1003, ¶ 211. Pseudo-random sequences are a series of random strobes and flashes, one after another, with the time between strobes or flashes, and the groups of light elements used, being random (as

opposed to flashing them with consistent duration and interval, which would be a fixed, rather than random, sequence). Ex. 1003, ¶ 211. A POSITA would understand that such a pseudo-random sequence would include random brightness, duration, and intervals. Ex. 1003, ¶¶ 211-214.

The brightness of the sequence, and each step of the sequence, will be random, as it depends on which LED elements and groups of elements are randomly selected to be activated at any time—the more elements activated, the greater the brightness. *Id.* A POSITA would recognize that such a pseudo-random sequence of flashes and strobes includes random durations and intervals for those flashes and strobes, as opposed to the gradual dimming and brightening that may also be selected as part of the combinations of parameters making up the desired light pattern, or consistently flashing or strobing the same elements in a consistent sequence. *Id.*; Ex. 1006 at [0063], [0067].

**Claim 1[d]**

The simulation parameters in Pohlert depend on the customizable lighting effects selected by the user. *See supra* Claims 1[b]-[c]; Ex. 1003, ¶¶ 215-218. Simulation parameters of dimming or brightening different lights, and selecting whether the pattern sequences will be pseudo-random (and thus have random brightness, duration, and intervals of strobing and flashing), depend on a user first selecting to generate a pattern effect on the user interface. Ex. 1006 at [0063], [0067].

The simulation parameter related to “frequency” of an oscillation signal depends on the user selecting to simulate a “strobing” effect. *Id.* at [0061]-[0063], [0066]-[0067]; Ex. 1003, ¶¶ 217-218.

**Claim 1[e]**

The “power controller” sends control signals through wires to light elements, causing the lights to simulate the selected effect. *See supra* Claims 1[a]-[d]; Ex. 1003, ¶¶ 219-220. The output from the “effects selector” and “effects generator” or “processor,” and switches, in Figures 5A-5B are provided to the LED lamps through a cable or wires. Ex. 1006 at [0058]-[0059], Figs. 2, 5A, 5B.

**B. Claims 15 and 20**

There are no substantive differences between Claim 1 and Claims 15 and 20 (*supra* Section VII.B), and Pohlert anticipates Claims 15 and 20 for the same reasons as Claim 1. *See* Claim 1; Ex. 1003, ¶¶ 221-222. As discussed with Claim 1, Pohlert discloses the method can be performed on a “controller” or a “software program.”

A controller performs the method for controlling the lighting elements. Ex. 1006 at Figs. 5A, 5B, [0057]-[0067]; *see supra* Claim 1[a].

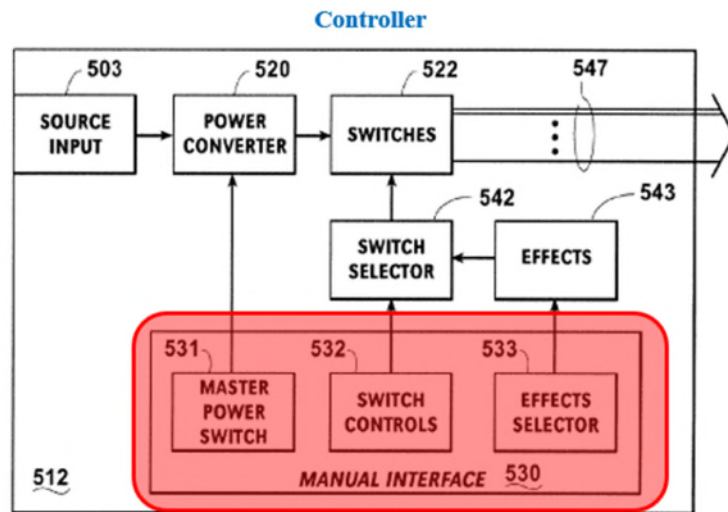


*Fig. 5A*

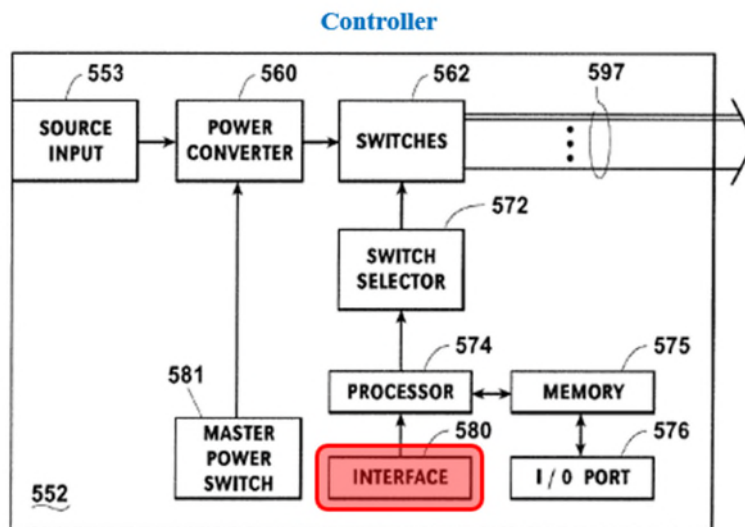


*Fig. 5B*

*Id.* at Figs. 5A, 5B (annotated). Fig. 5B controller implements a software program, in the form of “programming instructions,” read and implemented by the processor to customize and produce selected effects. *Id.* at [0066]-[0067]; Ex. 1003, ¶¶ 223-225.

Pohlert discloses the “controller” and “software program” for controlling “a lighting device to produce a user customisable lighting effect,” as in Claims 15 and 20. Ex. 1003, ¶¶ 223-225.

**C. Claim 2**

Pohlert discloses strobing or flashing all, or groups of, lights in a pseudo-random sequence. *See supra* Claim 1[c]; Ex. 1003, ¶¶ 226-230. As different groups of lights may contain differing numbers of light elements turning randomly on and off, each activated grouping has a different, random peak brightness. Ex. 1003, ¶ 229.

Different combinations of groups of lights may be selected, and the total light output would change depending on which groups are selected. Ex. 1006 at [0059]. In pseudo-random sequences, when all light segments are selected, there would be 100% total light output (*i.e.*, brightness). *Id.* This maximum light output decreases to 50% if every other light segment is randomly selected and to 25% if every fourth light segment is randomly selected. *Id.* at [0059], [0063], [0067]. Depending on how many light segments are activated in the pseudo-random sequence, the peak brightness generated randomly changes. Ex. 1003, ¶¶ 229-230.

**D. Claim 3**

Pohlert discloses intervals can be pseudo-random strobing or flashing sequences based on parameters. Ex. 1006 at [0063], [0067]; *see supra* Claim 1[c]; Ex. 1003, ¶¶ 231-235. A sequence of strobos or flashes is a series of strobos and

flashes following one after another. Ex. 1003, ¶ 232. When this sequence is pseudo-random, the interval, or time between strobes flashes, changes in a random manner (as opposed to a consistent, non-random sequence, where the interval would be uniform). *Id.*, ¶¶ 232-233. Pohlert implements the pseudo-random sequences by controlling “all or different groups” of lights, causing random intervals between flashes and groups of flashes, as different groups are randomly turned on and off. Ex. 1006 at [0063], [0067]. With a random interval between flashes or groups of flashes, the frequency of the flashes is random. Ex. 1003, ¶¶ 232-235.

**E. Claim 4**

The random sequences can be pseudo-random parameters relating to strobing or flashing sequences. Ex. 1006 at [0063], [0067]; *see supra* Claim 1[c]; Ex. 1003, ¶¶ 236-239. These are generated by controlling “all or different groups” of the light elements, causing a random number of pulses, depending on when each of the different groups is turned on and off. Ex. 1006 at [0063], [0067]. If the lighting elements are divided into four groups, then the number of pulses will randomly change, depending on when the groups are randomly turned on and off. Ex. 1003, ¶ 237.

Patterns may be generated using “combinations” of effects, including combinations of pseudo-random sequences of flashing/strobing the LEDs and gradually dimming or brightening the same LEDs. Ex. 1006 at [0063], [0067]; Ex.

1003, ¶ 238. A POSITA would recognize that gradually dimming and brightening LEDs, as they are flashed or strobed in a pseudo-random sequence, would cause the time when the peak brightness of the random sequence is reached to shift. The ramp up and down from peak brightness, would be random and would change with the dimming and brightening of the sequences. Ex. 1003, ¶¶ 238-239.

**F. Claim 5**

Pohlert's simulation parameters include pseudo-random sequences of flashes or strobing. Ex. 1006 at [0063], [0067]; Ex. 1003, ¶¶ 240-243. These sequences are applied within “predefined boundaries” of the patterns, and the boundaries of the lights. Ex. 1003, ¶ 243.

The predefined boundaries for the “amplitude” of the light produced in its pseudo-random sequences. Ex. 1006 at [0059], [0063], [0067]. The pseudo-random sequences can include flashing or strobing different combinations of LEDs. *Id.* at [0063], [0067]. The “amplitude” of light in a pattern will depend on the number of groups of LEDs activated at any given time. *Id.* at [0059]. The “amplitude” output in the pseudo-random sequences is random within the boundaries of how many LEDs or groups of LEDs are activated at any given time. Ex. 1003, ¶ 242.

As to “predefined boundaries” of the lighting elements, the upper and lower “duration” and the “interval” between flashes are linked and determined by the frequency of the oscillation used to generate the flashes or strobing. *Id.*, ¶ 243. This

frequency has predefined upper and lower boundaries determined by the LEDs and their circuitry. *Id.* The physical properties of the lighting device are related to the effect being simulated, and, here, the LEDs have a predefined minimum output of zero, when the LED is off, and a predefined maximum output when the LED is on, which is limited by the physical capabilities of the LED and power supply. *Id.*

**G. Claim 6**

The user selected simulation parameters in Pohlert can include random brightness, duration, and intervals in pseudorandom sequences of strobes and flashes. *See supra* Claim 1[a]-[d]; Ex. 1003, ¶¶ 244-247; Ex. 1006 at [0063], [0067]; *see infra* Claim 8. The “[p]attern generation may be accomplished by, e.g., manual selection from a number of predefined patterns, or else through an interface allowing different pattern sequencing.” Ex. 1006 at [0063]. Based on the user interface selections to implement random (instead of predefined) sequences, the controller generates patterns by “strobing or flashing different groups of light segments” in “pseudo-random sequences.” *Id.* Users can also select “combinations of effects” that include “pseudo-random” sequences, along with “gradually dimming or brightening light segments 325-360 (individually, in groups, or collectively).” *Id.*; Ex. 1003, ¶ 247.

## **H. Claim 7**

The random simulation parameter's in Pohlert relate to at least “a brightness.” Ex. 1006 at [0063]; Ex. 1003, ¶¶ 248-252. The parameter of using “pseudo-random” sequences of strobing and flashing light elements, either individually, in groups, or all together. Ex. 1006 at [0063], [0067]. Depending on how many of the elements are activated during the sequence, the brightness will vary. *Id.*; Ex. 1003, ¶ 249; *see supra* Claims 1[c], 2, 4.

The effects used to generate a pattern can include “combinations” of pseudo-random sequences *and* “gradually dimming or brightening.” Ex. 1006 at [0063], [0067]. This additional parameter of gradually dimming or brightening the light elements, in the overall light pattern effect, is related to at least brightness, rate of brightness increase/decrease, and brightness fluctuation period. Ex. 1003, ¶ 251; *see also supra* Claim 4.

The LEDs may be different colors, as selective combinations of RGB LEDs can be used to “generate virtually any desired color.” Ex. 1006 at [0084]. The simulation parameters used to generate patterns or sequences may be related to a color fluctuation period as light element groups may be of different colors in different steps in the sequences or patterns, generating different color fluctuation time. *Id.* at [0063], [0067]; Ex. 1003, ¶ 252.

### I. Claim 8

Pohlert's power controllers include an interface, which receives user inputs selections of parameters, in choosing and adjusting combinations of effects, including patterns, strobing, flashing, dimming, and brightening. Ex. 1006 at [0059], [0066]-[0067], Figs. 5A, 5B; Ex. 1003, ¶¶ 253-258.

Figure 5A discloses a controller with a “manual interface 530...to allow operation of the switches 522 according to manual selection.” *Id.* at [0059].

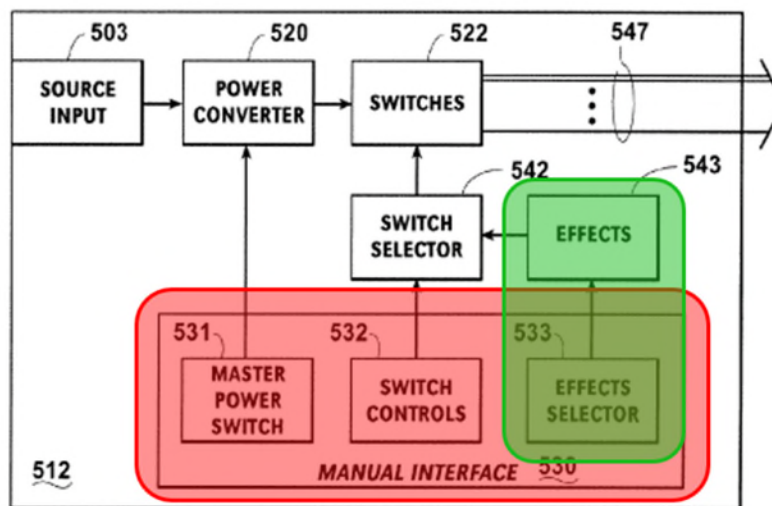


**Fig. 5A**

*Id.* at Fig. 5A (annotated).

Selections made by the user are sent to an “effects generator 543,” which provides “the ability to create various lighting effects, such as, e.g., dimming, strobing, pulsation, or pattern generation.” *Id.* at [0061]; Ex. 1003, ¶ 256. The controller can accomplish selected “pattern generation” by “manual selection from

a number of predefined patterns, or else through an interface allowing different pattern sequencing.” *Id.* at [0063]. The patterns users can select include “strobing or flashing different groups of light segments...in a predefined sequence (which may be a pseudo-random sequence, if desired), strobing or flashing different light elements 320 of the light segments 325-360 in a predefined (or pseudo-random) sequence, gradually dimming or brightening light segments 325-360 (individually, in groups, or collectively), or various combinations of these effects.” *Id.*

The Figure 5B controller includes “[a]n interface 580...for programming or otherwise interfacing with the processor 574, or manually selecting various lighting effects options through selectable knobs, switches or other selection means.” *Id.* at [0066], Fig. 5B.

Selections made through this interface are converted to instructions for the processor, which instructions “provide for various lighting effects, such as dimming, strobing, pulsation, or pattern generation, for example.” *Id.* at [0067]. The desired effect patterns are adapted based on the user-selected effects and parameters. Ex. 1003, ¶¶ 257-258.

## **J. Claim 9**

Pohlert discloses the effect parameters can include maximum and minimum brightness, color, and a trigger. Ex. 1006 at [0061]-[0067], [0084]-[0091]; Ex. 1003, ¶¶ 259-268. With respect to a “maximum brightness” and “minimum brightness,”

users can selectively dim or brighten the lights. *Id.* at [0061], [0063]-[0065], [0067]. The “effects generator 543 may provide the ability to create various lighting effects, such as, e.g., dimming, strobing, pulsation, or pattern generation. The effects selector 543 may affect all of the switches 522 simultaneously, or else may affect individual switches or groups of switches 522, depending upon the desired complexity of the lighting effects. Dimming may be accomplished...through a manual control knob or multi-position switch on the effects selector 533.” *Id.* at [0061]; Ex. 1003, ¶¶ 260-263. Pohlert discloses that a “dimmer switch” may allow users to “control light output.” *Id.* at [0064]. By adjusting the dimmer switch, users may select the maximum for the lighting elements producing the effect. Ex. 1003, ¶ 262. Selecting the number of switches that will be affected controls the minimum brightness, with the potential minimum brightness increasing as more switches (and thus groups of light elements) are selected. *Id.*

The pattern generation effects can include “gradually dimming or brightening” the light segments. Ex. 1006 at [0063], [0067]. Gradually dimming light elements involves adjusting the brightness level from a higher level to a lower level, with the ultimate lowest level of brightness produced by the dimming being a “minimum brightness.” Ex. 1003, ¶¶ 263-264. Brightening involves increasing the brightness to a “maximum brightness.” *Id.*

With respect to “a colour,” the user-selected effects can include a color parameter. Bi-color LEDs may be used, allowing users to adjust the output color and color temperature (degrees Kelvin) of the apparatus. Ex. 1006 at [0086], [0092], [0086]-[0091]; Ex. 1003, ¶¶ 264-265.

With respect to “a trigger,” the parameters can include “triggers” that activate switch controls, to send power signals to the light elements to start the pattern generation output from the light elements. Ex. 1006 at [0059], [0065]-[0067]. Pohlert specifies that the “power controller 552 includes a processor 574 which may be programmed to provide various lighting effects by manipulating the switch selector 572 (for example, by changing values in registers which control the on/off states of the switches 562).” *Id.*; *see infra* Claim 12. Pohlert discloses that “slave flashes” can be triggered by RF, infrared (IR), or optical signals (such as flashes generated by LEDs directly connected to the controller). Ex. 1006 at [0022]. Its system, which includes the power controllers, is “particularly well suited for use with such optical, IR or RF slave flash systems.” *Id.* at [0023]; Ex. 1003, ¶¶ 266-268.

#### **K. Claim 10**

The pattern generation in Pohlert may include implementation of “various combinations” of patterns and sequences that include pseudo-random sequences of strobing and flashing. Ex. 1006 at [0063], [0067]; *see supra* Claims 1[b]-[d]; Ex.

1003, ¶¶ 269-270;. These programming instructions, which provide control of the switches according to designated sequences, cycle through calculations of the time varying lighting values needed for each different pattern and the different sequences. Ex. 1006 at [0063], [0067]; Ex. 1003, ¶ 270.

**L. Claim 11**

Pohlert's effects and patterns include "strobing or flashing different groups of light segments...in a...pseudo-random sequence," "strobing or flashing different light elements" in a pseudo-random sequence, "gradually dimming or brightening light segments" individually, in groups, or collectively. Ex. 1006 at [0063], [0062], [0067]; Ex. 1003, ¶ 271-274. Pohlert discloses "flashes (strobe)." Ex. 1003, ¶ 272.

A POSITA would understand the pattern generation and sequences (Ex. 1006 at [0063], [0067], [0081]) can produce additional claimed effects, such as mimicking lightning, welding, and sparking. Ex. 1003, ¶¶ 273-274. The "pseudo-random sequences" of flashes or strobes result in irregularly-timed light, which a POSITA would understand can produce random flashes of light simulating lightning, welding, and sparking effects. *Id.*

**M. Claim 12**

The '257 Patent indicates a "trigger" is something "[t]o start the effect running" and can be a manual trigger or a remote signal. Ex. 1001 at 6:52-54, 9:43-45; Ex. 1003, ¶¶ 275-280. Pohlert discloses selecting, through a processor,

programming instructions that indicate the start and stop times for the selected patterns, sequences, and effects that result in outputs of control signals to vary the lighting values and simulate the desired effects. Ex. 1006 at [0066]-[0067]; Ex. 1003, ¶¶ 276-277.

The “processor 574 may make use of one or more electronic timers to provide timing between on and off events. The programming instructions may provide that the switches 562 are turned on and off according to designated sequences, thus allowing the capability of pattern generation via the processor 574.” *Id.* at [0067].

The manual interface 530 in the Figure 5A controller also provides for defined “trigger events” to start illumination of the lighting elements. *Id.* at [0059]. Users turning a knob or pressing a switch on the user interface (*e.g.*, via the effects generator or effects selector) implements switch controls to initiate and control illumination of the different groups of light elements. *Id.*; *see also id.* at [0067]; Ex. 1003, ¶ 279.

Pohlert discloses “slave flashes” that can be controlled by radio frequency, infrared, and optical signals (including flashes from the LEDs controlled by the power controller). Ex. 1006 at [0022]-[0023]. These may be “[o]ptical slave flashes” that are “triggered by light,” including light pulses from another device. *Id.* at [0023]. When an optical slave flash is used with the lighting system, the “power controller” in the lighting system would cause the LEDs to produce the light pulse that triggers the optical slave flashes. Ex. 1003, ¶ 280.

**N. Claims 13 and 21**

Pohlert discloses a memory for storing programming instructions, including the “simulation parameters” for the varying power control signals sent to the LED elements to implement the user-selected effects. Ex. 1006 at [0066]-[0067], Figs. 5B; Ex. 1003, ¶¶ 281-282.

**O. Claim 14**

Power controller in Pohlert can control a plurality of groups of LEDs, which may be included as lamp elements in an “arrangement” on a panel or frame, and the power controller controls “the intensities of the various lamp elements, either collectively, individually, or in designated groups, and, in some embodiments, through preprogrammed patterns.” Ex. 1006 at [0050], [0053], [0059], [0067], Figs. 1, 3A, 3B; Ex. 1003, ¶¶ 283-286.

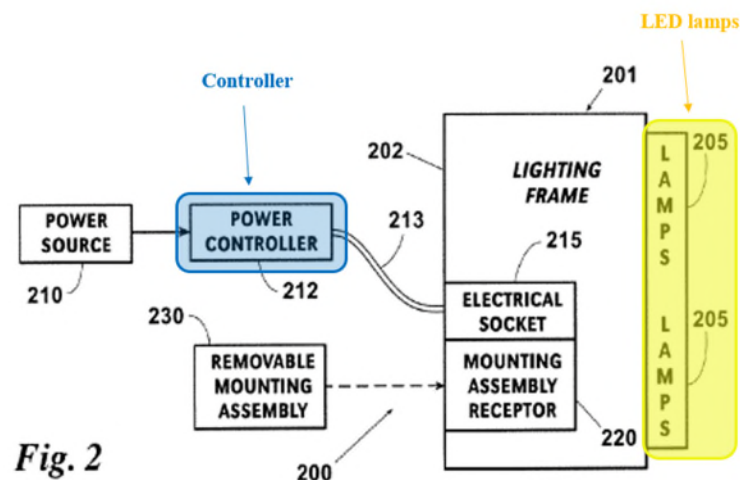
The system may include “multiple panel light sections 123, 124” (*id.* at [0053]), and the lighting arrangements are controlled by the controller to produce effects using multiple lights. Ex. 1006 at [0059], [0067].

Pohlert discloses “slave flashes” that can be controlled by radio frequency, infrared, and optical signals (including flashes from LEDs controlled by the controller). *Id.* at [0022]-[0023]. These may be “optical slave flashes” that are “triggered by light,” including light pulses from another device. *Id.* at [0023]. In such situation, the “power controller” in the system would cause the LEDs to

produce the light pulse that triggers the optical slave flashes, thereby controlling the slave flashes. Ex. 1003, ¶ 286.

**P. Claim 16**

Pohlert's controllers include a wired interface connecting to the lighting devices, wherein the wired connection communicates power control signals to the lighting devices. Ex. 1006 at [0058]; Ex. 1003, ¶ 288. In “the lighting assemblies shown in FIGS. 3A and 3B, the LEDs or other low power lamps 205...may be powered by a power source 210 controlled by a power controller 212 such as is generally shown in FIG. 2.” *Id.* at [0057]. Pohlert states that the power controller “outputs a plurality of power wires 547 preferably through a cable (e.g., cable 213 shown in FIG. 2) for connection to the lighting frame 202,” with the lighting frame including the light elements. *Id.*



*Id.* at Fig. 2 (annotated.)

The controller can be the controller shown in Figure 5A or Figure 5B. *Id.* at [0058]. In the Figure 5A controller, the output from the controller would “control power to the wires 547 supplying power to the light segments.” *Id.* at [0059].

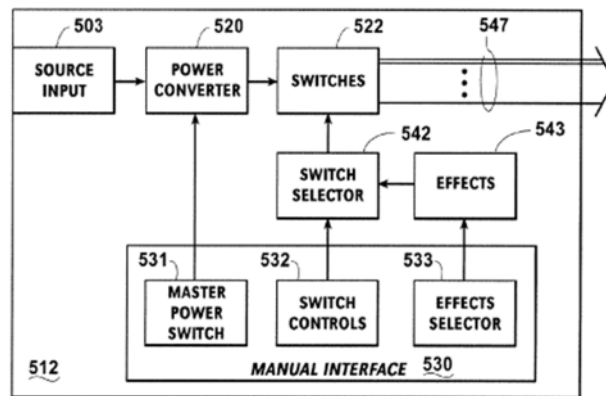


*Fig. 5A*

*Id.* at Fig. 5A.

The Figure 5B power controller similarly includes an output for “providing power to individual wires 597 which are conveyed, preferably by cable, to the lighting frame assembly 201 of the lighting effects system 200.” *Id.* at [0065].

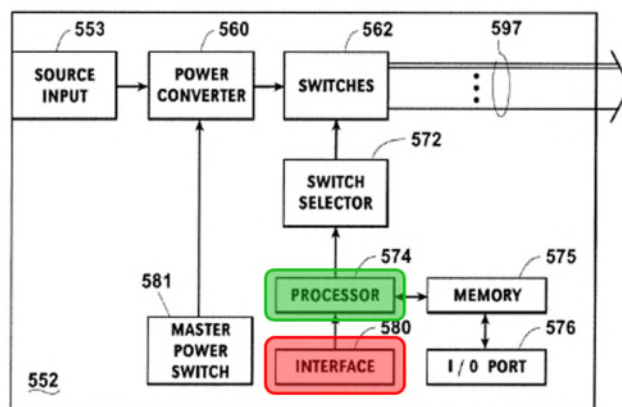


*Fig. 5B*

*Id.* at Fig. 5B (annotated).

Pohlert also discloses a **wireless communication** interface. Ex. 1003, ¶ 292. The Figure 5B controller includes an “I/O port” that may be wireless (*e.g.*, infrared) for obtaining digital information. Ex. 1006 at [0066]. The “slave flashes” can be controlled by RF, infrared (IR), or optical signals (such as flashes generated by LEDs directly connected to the controller). *Id.* at [0022]. Pohlert states its lighting system is “particularly well suited for use with such optical, IR or RF slave flash systems.” *Id.* at [0023].

A POSITA would have understood the Figure 5B power controller, having an IR “I/O port,” could generate the exact IR signals Pohlert mentions trigger the external slave flash units. Ex. 1003, ¶ 293. A POSITA would have understood that the I/O port could both receive (input) and generate (output) IR signals, and would have been motivated to use the wireless IR I/O port in the power controller to communicate with the slave flashes, so that she could coordinate and control all lights being used from one controller. *Id.*

**Q. Claim 17**

Pohlert’s Figure 5A-5B controllers include an input user interface to receive user inputs. *See supra* Claim 8; Ex. 1003, ¶¶ 294-295.

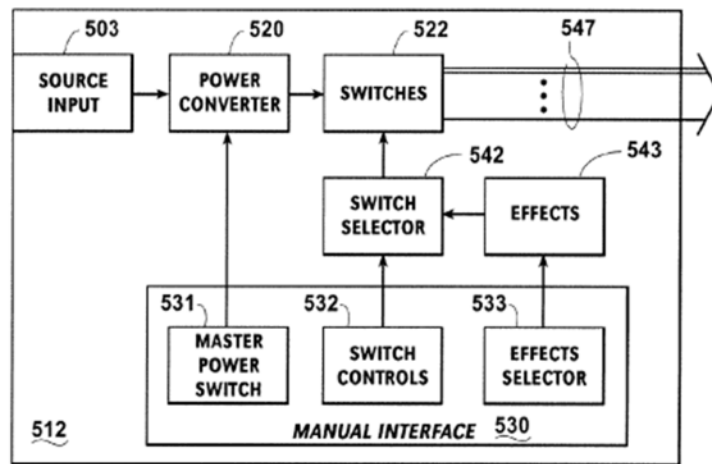


Fig. 5A

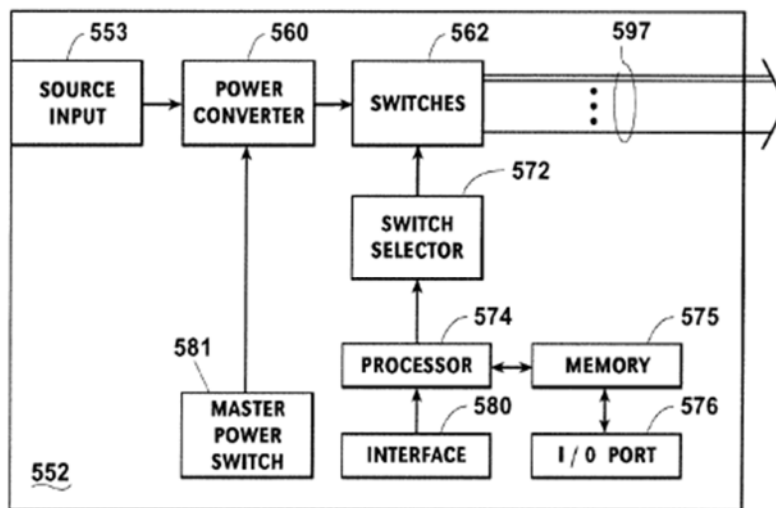


Fig. 5B

*Id.* at Figs. 5A, 5B.

## R. Claim 18

A lighting system comprising the controller according to Claim 15 (*see supra* Claim 15), and lamp elements including multiple LEDs, such as the plurality of lamp segments 320 shown in Figures 3A and 3B, and that these can be RGB LEDs. Ex.

1006 at [0057], [0081], [0084]; Ex. 1003, ¶¶ 296-297. Pohlert discloses the lamp elements may comprise “high output LEDs” including green, blue, red, amber, and cyan. *Id.* at [0111], Figs. 3A, 3B (annotated).

**S. Claim 19**

Pohlert’s lighting system includes a power controller and LED lamps physically connected and combined into one device. Ex. 1006 at [0020], [0050]-[0051]; Ex. 1003, ¶¶ 298-302. The “power controller” can be physically connected by a cable to the lighting elements on the lighting frame, making them one combined unit. *Id.* at Fig. 2.

The “power source 210” in Figure 2 may be “a battery having sufficient current to drive the LEDs.” *Id.* at [0057]. Where a battery is used, “the light panel and self-contained battery unit function as an integrated lighting apparatus.” *Id.* at [0018]. The lighting system may be a stand-alone unit mounted to a video or photography camera. *Id.* at Figs. 3A, 4B, [0094]. The LEDs and controller may be mounted to a camera or a frame, and may be “provided in the form of a kit, with one or more of a light panel, self-contained battery unit, compact stand, connecting cable(s), adapter(s), lenses or color gels, and so on, being provided in a single package to allow flexibility and versatility to users in the field.” *Id.* at [0024], [0050]; Ex. 1003, ¶¶ 298-302.

**X. GROUND IV: POHLERT RENDERS OBVIOUS CLAIMS 1–21**

If Pohlert does not anticipate Claims 1–21, Claims 1–21 would have been obvious to a POSITA based on Pohlert, based on the disclosures in Sections IX.A-IX.S. *Realtime Data, LLC*, 912 F.3d at 1373.

**A. Claims 1-21 Are Disclosed By, and Rendered Obvious by, Pohlert**

As explained in Sections IX.A-IX.S, each of Claims 1-21 are disclosed in Pohlert. These claims would have been obvious to a POSITA.

**B. Claim Limitations 1[a], 15[a], and 20[a] Would Have Been Obvious to a POSITA Based on Pohlert**

If the Board finds that Claims 1[a], 15[a], and 20[a] are not expressly disclosed in Pohlert, it would have been obvious to a POSITA. As explained in Section IX.A, Pohlert teaches the “calculating” limitation. If Patent Owner argues that Pohlert generates lighting effects without performing a “calculation,” then, at a minimum, this limitation would have been obvious to a POSITA.

A POSITA would understand that Pohlert’s “effect generator 543” of Figure 5A or “processor 574” of Figure 5B must generate effects by doing “calculations” (or data creation). Ex. 1003, ¶¶ 303-310. Just like the ’257 Patent, inputs received through manual or digital interfaces in Pohlert are used by either the effects generator 534 or processor 574 to calculate time varying data signals representing the desired effect. Ex. 1006 at [0059]-[0067].

A POSITA would understand that a “calculation” is being done for, at least, Pohlert’s “strobing” effect. Ex. 1003, ¶¶ 307-310. Users can adjust oscillator frequency for the strobing effect by, for example, adjusting a knob or switch. When these adjustments are made, the controllers calculate new oscillating signals changing the frequency of the strobing. Ex. 1003, ¶ 309. Whether “conventional electronic components” or a “conventional” computer program implements changes to oscillation frequency does not negate that some calculation was performed to arrive at the adjusted oscillating frequency. Ex. 1003, ¶¶ 308-309.

### **C. “Random” Limitations**

Pohlert discloses simulation parameters such as random brightness, random duration, and random interval, as explained above. If the Board finds that these “random” limitations are not disclosed in Pohlert, they would, at a minimum, have been obvious to a POSITA.

The “pseudo-random” input parameter disclosed in Pohlert would be understood by a POSITA to be a random simulation parameter relating to at least one of “random brightness; a random duration; and a random interval.” Ex. 1003, ¶¶ 312-315. The ’257 Patent itself acknowledges that “pseudo random” is the same as “random.” Ex. 1001 at 7:30-34. A POSITA would understand that to have an effect, such as fire or strobe, that looks random, the user must be able to input random parameters or else the effect will look static, non-variable, and artificial. Ex. 1003,

¶¶ 312-315. A POSITA would have been motivated, based on the teachings of Pohlert, to permit a user to include a random parameter, using the controller and processor, to output a random effect. Ex. 1003, ¶¶ 312-315.

## **XI. DISCRETIONARY DENIAL WOULD BE INAPPROPRIATE**

Denial under 35 U.S.C. §§ 325(d) or 314(a) is not warranted because the invalidity positions presented in this Petition are neither cumulative nor redundant of the grounds set forth during the prosecution of the '257 Patent.

The Examiner did not consider the prior art combinations relied on in this Petition, nor did the Examiner consider the invalidity positions presented in this Petition. The Examiner also did not have the benefit of the expert declaration presented in this Petition. *Group III International, Inc. v. Targus Group International, Inc.*, IPR2021–00371, No. 21 at 33 (P.T.A.B. Jul. 9, 2021); *Intel Corporation v. Koninklijke Philips N.V.*, IPR2021–00370, No. 10, at 9 (P.T.A.B. Jul. 6, 2021).

While the same invalidity positions were previously presented to the Board by ARRI in IPR2021-01496, ***the Board instituted review based on these positions finding a likelihood of success on the merits***. Ex. 1007 at 15-16. There is no basis for discretionary denial as the Board has not previously found these arguments unpersuasive.

There is also no basis for discretionary denial under *Fintiv*. While there is a co-pending litigation (*Rotolight Limited v. Videndum PLC, et al.*, Case No. 22-928-MN-JLH) that proceeding is at a very early stage. The six *Fintiv* factors weigh against denial. The litigation is not stayed and there is no scheduling order or trial date set. Neither the parties nor Court have invested significant resources, and no discovery has taken place. Additionally, the merits of this Petition are very strong and counsel against a *Fintiv* denial.

Regardless, Petitioner has agreed to a *Sotera*-type stipulation. See Exhibit 1012.

## **XII. MANDATORY NOTICES**

Videndum hereby submits these Mandatory Notices in accordance with 37 C.F.R. § 42.8 *et seq.*

### **A. Real Party-in-Interest (37 C.F.R. § 42.8(b)(1))**

The real parties-in-interest are Petitioner Videndum Production Solutions, Inc., located at 14 Progress Dr., Shelton, Connecticut 06484; and Videndum PLC, located at Bridge House, Heron Square, Richmond TW9 1EN, United Kingdom.

### **B. Notice of Related Matters (37 C.F.R. § 42.8(b)(2))**

ARRI previously filed *inter partes* review petitions against the '257 Patent in IPR2021-01496. This IPR was instituted based on the same prior art presented in this Petition. ARRI and Patent Owner reached a confidential settlement agreement,

and the Board terminated the IPR proceeding shortly before issuing a Final Written Decision.

Pending before the United States District Court for the District of Delaware is the case *Rotolight Limited v. Videndum PLC and Videndum Product Solutions, Inc.*, Case No. 22-928-MN-JLH, in which Rotolight has asserted infringement of the '257 Patent against Petitioner.

**C. Designation of Lead and Back-Up Counsel and Service Information (37 C.F.R. § 42.8(b)(3) and (4))**

Petitioner hereby identifies lead counsel as David M. Magee (Reg. No. 51,982), who can be reached at Armstrong Teasdale LLP, 800 Boylston St., 30th Floor, Boston, Massachusetts 02199, via e-mail at [dmagee@atllp.com](mailto:dmagee@atllp.com), telephone at 617.824.5131, and via fax at 617.830.8490. Backup counsel are: (1) Marc Vander Tuig (Reg. No. 57,964), who can be reached at Armstrong Teasdale LLP, 7700 Forsyth Blvd., Suite 1800, St. Louis, Missouri 63105, via email at [mvandertuig@atllp.com](mailto:mvandertuig@atllp.com), via telephone at 314.621.5070, and via fax at 314.621.5065; and (2) Kyle G. Gottuso (*pro hac vice* forthcoming), Armstrong Teasdale LLP, 7700 Forsyth Blvd., Suite 1800, St. Louis, Missouri 63105, [kgottuso@atllp.com](mailto:kgottuso@atllp.com), via telephone at 314-342-4131, and via fax at 314.621.5065. A Power of Attorney is filed concurrently herewith.

Petitioner consents to electronic service to lead and backup counsel, using the email addresses above.

### **XIII. REQUIREMENTS FOR PETITION FOR *INTER PARTES* REVIEW**

#### **A. Grounds for Standing (37 C.F.R. § 42.104(a))**

Petitioner certifies the '257 Patent is available for *inter partes* review, and that Petitioner is not barred or estopped from requesting an IPR of Claims 1–21 of the '257 patent on the grounds identified herein.

#### **B. Payment of Fees (37 C.F.R. § 42.15(a))**

The required fees are submitted herewith. If additional fees are due, the Office is authorized to charge Deposit Account No. 012384.

#### **C. Proof of Service (37 C.F.R. § 42.105)**

Proof of service of this Petition on Patent Owner at the correspondence address of record for the '257 Patent is attached.

### **XIV. CONCLUSION**

The prior art demonstrates that the Challenged Claims are directed to a well-known LED lighting systems, methods, and lighting effect generators. There is a reasonable likelihood that these claims are unpatentable based on the grounds presented in this Petition. Petitioner requests that the Board institute trial and find Claims 1–21 of the '257 Patent unpatentable.

Dated: July 17, 2023

Respectfully submitted,

/David M. Magee/

David M. Magee (Reg. No. 51,982)  
Armstrong Teasdale LLP  
800 Boylston St., 30th Floor  
Boston, MA 02199  
Telephone: 617.824.5150  
Facsimile: 617.830.8490

*Counsel for Petitioner*

**CERTIFICATE OF SERVICE**

Under 37 C.F.R. § 42.6(e), the undersigned certifies that on July 17, 2023, a copy of the foregoing PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,197,257, Petitioner's Power of Attorney, and all associated exhibits were served in their entirety on the following counsel of record for Patent Owner via UPS Next Day Air:

Darrell Hollis  
Martin Moynihan  
PRTSI Inc.  
232 NW 42nd Ter  
Plantation, FL 33317

*Litigation Counsel:*

Bradley D. Liddle  
bliddle@carterarnett.com  
CARTER ARNETT PLLC  
8150 N. Central Expy, 5th Floor  
Dallas, Texas 75206

Dated: July 17, 2023

Respectfully submitted,

/David M. Magee/

David M. Magee (Reg. No. 51,982)  
Armstrong Teasdale LLP  
800 Boylston St., 30th Floor  
Boston, MA 02199  
Telephone: 617.824.5150  
Facsimile: 617.830.8490

*Counsel for Petitioner*

**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME  
REQUIREMENTS UNDER 37 C.F.R. § 42.24**

Under 37 C.F.R. § 42.24(d), the undersigned certifies that the PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,197,257 complies with the type-volume requirements of 37 C.F.R. § 42.24(a)(1)(i) because it contains 13,414 words, excluding the parts of the Petition exempted by 37 C.F.R. § 42.24(a).

This Petition also complies with the typeface requirements of 37 C.F.R. § 42.6(a)(2)(ii) and the type style requirements of 37 C.F.R. § 42.6(a)(2)(iii) and (iv).

Dated: July 17, 2023

Respectfully submitted,

/David M. Magee/

David M. Magee (Reg. No. 51,982)  
Armstrong Teasdale LLP  
800 Boylston St., 30th Floor  
Boston, MA 02199  
Telephone: 617.824.5150  
Facsimile: 617.830.8490

*Counsel for Petitioner*