

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Arnold & Richter Cine Technik GmbH & Co. Betriebs KG,
Petitioner,

v.

Rotolight Limited,
Patent Owner.

Case (to be assigned)
Patent 10,197,257

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 10,197,257
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 42.100 *et seq.***

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I. INTRODUCTION

Petitioner Arnold & Richter Cine Technik GmbH & Co. Betriebs KG (“**ARRI**”) challenges Claims 1-21 of U.S. Patent No. 10,197,257 (“**’257**”). The **’257** claims nothing more than 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.” The system—whether claimed as a method, controller, or program—does two basic things: (1) calculates 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) outputs that value to a light to generate the effect.

None of this was new at the time of the alleged invention. Myriad prior art references disclose a lighting system that (a) accepts input commands from users to select and customize a special effect, (b) converts those commands into values to produce the special effect, and (c) produces the effect on the light. Nor was the notion that such an effect could have random brightness, duration, or interval new.

The two primary references discussed herein, together with the Declaration of lighting expert Mike Wood,¹ underscore this. The first is a User Manual for the Astera AX10 Spotmax (“**Astera**”) (Ex. 1004). Astera discloses how the AX10 can, through an interface on the light or an app, generate customizable lighting effects,

¹ The Declaration of Mike Wood (the “**Wood Decl.**”) is Exhibit 1006.

including effects having random brightness, duration, and intervals. These include a “fire effect,” with a random flicker, and a “stroboscope” effect that produces random strobe flashes. The second reference, Pohlert,² is a published patent application disclosing a “lighting and effects generation system,” with a dedicated “power controller” allowing users to select and customize effects, including strobing and flashing different groups of LEDs in “pseudo-random” sequences to produce lighting patterns.

Neither reference was considered during prosecution of the ’257. Both invalidate the ’257.

II. MANDATORY NOTICES

A. Real Parties-in-Interest

The real party-in-interest in this proceeding is Arnold & Richter Cine Technik GmbH & Co. Betriebs KG.

B. Related Matters

The ’257 is not the subject of any other proceedings. ARRI is filing other *inter partes* review petitions against U.S. Patent Nos. 10,197,258 and 10,203,101 contemporaneously with this petition. These related patents claim priority to the same parent application as the ’257.

C. Counsel and Service Information

² “**Pohlert**” is U.S. Patent Application Publication No. 2012/0044374 (Ex. 1003).

Lead counsel is Joe Raffetto (Reg. 66,218). Backup counsel are Celine Crowson (Reg. 40,357) and Scott Hughes (Reg. 68,385). Service information is as follows:

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III. NOTICE OF FEES PAID

Fees are submitted herewith. If additional fees are due during the proceeding, the undersigned authorizes the Office to charge them to Deposit Account No. 50-1349.

IV. CERTIFICATION OF GROUNDS FOR STANDING

ARRI certifies the '257 is available for *inter partes* review, and that ARRI is not barred or estopped from requesting this review.

V. PRECISE RELIEF REQUESTED

The relief requested is cancellation of the challenged claims, as follows:

Ground	References	Claims³	Basis
1	Astera	1-14, 15-19,	102 / 103

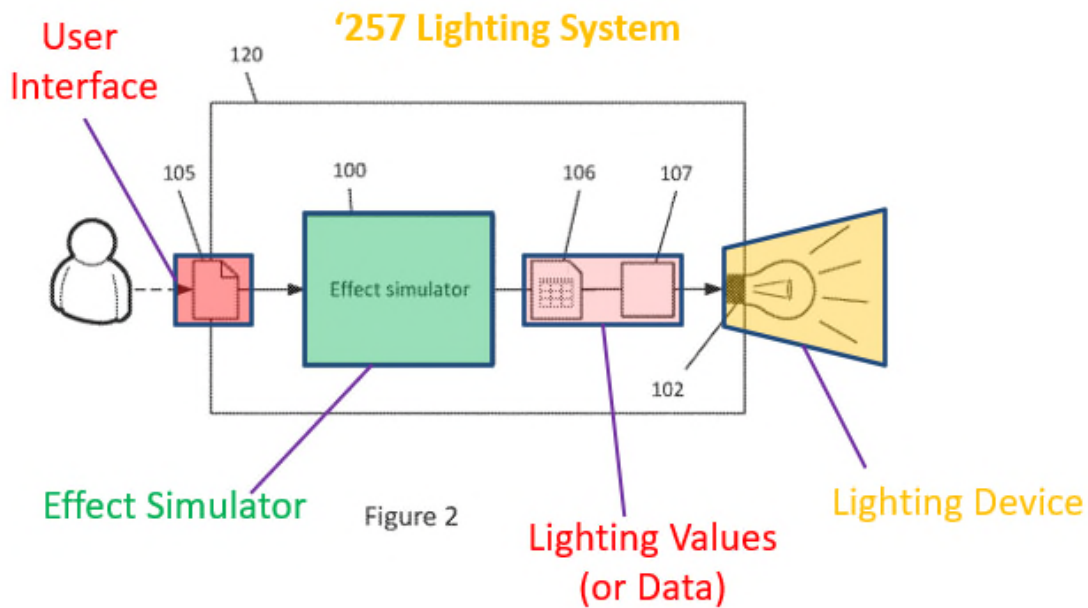
³ Independent claims in **bold**.

Ground	References	Claims ³	Basis
		20, 21	
2	Pohlert	1-14, 15-19, 20, 21	102 / 103

VI. THE '257

A. '257 Overview

Independent Claims 1, 15, and 20 of the '257 recite a method, controller, and computer program, respectively, for “producing a user customizable lighting effect” having at least one of a random “brightness,” “duration,” or “interval.” The independent claims recite two basic elements. **One, 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. **Two, output** the “time varying lighting value” to a lighting device, so as to generate the user-selected lighting effect.



(’257, Fig. 2 (annotated).)

With reference to annotated Figure 2 above, the ’257 describes how users can make selections of desired lighting effects on user interface 105. (*Id.*, 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.*, 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 106, or “time varying lighting values,” that characterize the lighting effect and are used to produce it on the LEDs. (*Id.*, 7:25-44, 8:14-48.)

The ’257 provides “fire” as an example of a randomized effect that can be produced. (*Id.*, 6:43-63; 8:14-25; 9:51-65.) Parameters, like color (“fire colour”), maximum/minimum brightness (“peak brightness”/“baseline brightness”), and fire

activity, can be used to modify the effect. (*Id.*) Following this, the effect will produce randomized sparks, or flicker, based on these parameters. (*Id.*)

Light control system	
Fire effect	
Parameter	Setting
More info Fire activity	
More info Fire colour	2000K
More info Peak brightness	80%
More info Baseline brightness	40%
More info Camera frequency	60Hz

(*Id.*, Figure 6.)

B. '257 File History

The '257 was filed November 22, 2017 and issued February 5, 2019. The '257 is a continuation of U.S. Application No. 15/481,460, and claims priority to U.S. Provisional No. 62/319,809, filed April 8, 2016. During examination, the claims of the '257 were rejected as anticipated by US2008/0129226, published June 5, 2008 (“**Dewitt**”). 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.

In response, Applicant amended the independent claims and argued DeWitt teaches a simulated “tea light” candle, but that this does not teach “simulation parameter(s) characteri[zing] 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,” as recited in the amended claims. (’257 File History, July 10, 2018 Response at 12.) The ’257 was thereafter allowed.

VII. CLAIM CONSTRUCTION AND POSITA DEFINITION

A. Claim Construction

Claims in an *inter partes* review “shall be construed using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. 282(b), including construing the claim in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” 37 C.F.R. § 42.100(b). Unless indicated otherwise, all claim terms are given such ordinary and customary meaning.

B. Definition of a Person of Ordinary Skill in the Art

A person of ordinary skill in the art (“**POSITA**”) in the field of the ’257 would have had a good working knowledge of electrical engineering and entertainment lighting systems, controls, and effects. (Wood Decl., ¶ 39.) She would have gained this through an undergraduate Bachelor’s degree in electrical engineering, or a comparable field as well as some experience in the field (*e.g.*, in entertainment lighting systems). (*Id.*) The more education one has, the less experience needed to attain an ordinary level of skill. (*Id.*) Similarly, more experience in the field may serve as a substitute for formal education. (*Id.*)

VIII. ANALYSIS OF GROUNDS FOR UNPATENTABILITY

A. Grounds Based on Astera

Astera is a user manual for the AX10, a controllable lighting device used in studio filming and entertainment lighting. (Wood Decl., ¶¶ 42; Canins Decl.⁴, ¶¶ 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 the first orders from customers in the United States were in March 2015. (Canins Decl., ¶¶ 4-8.) Astera bears a date of May 7, 2015, and was made publicly available, including to distributors and purchasers of the AX10, beginning at least in June of 2015 in the U.S., including via a Quick Start guide included in the product packaging and via Astera’s website. (*Id.*)

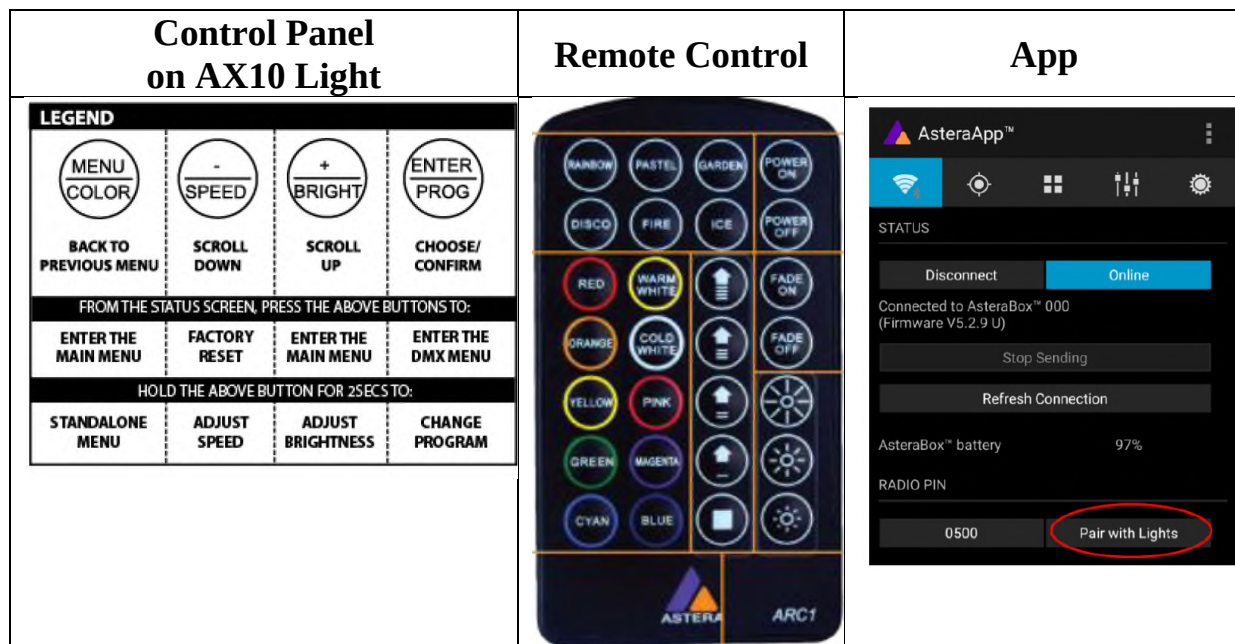
⁴ The Declaration of Simon Canins (the “**Canins Decl.**”) is Exhibit 1008.

Astera describes the operation and use of the AX10, a controllable lighting fixture with an array of nine “RGBAW” (*i.e.*, red, green, blue, amber, and white) LEDs:



(Astera, cover (annotated); *see also id.*, 7.)

The AX10 can be controlled by various controllers, including (a) LCD Control Panel (with a “standalone engine”) on the AX10 (“**Control Panel**”), (b) remote control, (c) “AsteraApp” (an app for mobile devices), and (d) CRMX wireless DMX. (*Id.*, 9.)



(*Id.*, 9, 11, 23.)

The AX10 produces customized lighting effects (*id.*, 23-24, 27-28, 32) run through the Control Panel, infrared remote, AsteraApp, and DMX control. (*Id.*, 21, 28; *see also id.*, 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.*, 17, 21.) Users can customize these effects by adjusting parameters including speed, crossfade, stroboscope, and brightness:

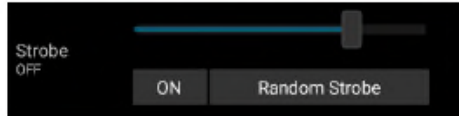
AN EFFECT CAN BE HIGHLY CUSTOMIZED:



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



The crossfade tells if the light will fade from step to step. If it is set to 0% an immediate change is visible. If set to 100% the changes will be soft.



Stroboscope effect can be enabled and seamlessly adjusted in speed. Additionally, three random stroboscope options are available: slow, medium and fast.



Each effect can be adjusted in brightness as well.

(*Id.*, 27; see also *id.* 20, 24-29.)

1. Ground 1 – Astera Anticipates or Renders Obvious Claims 1-21

a. Independent Claim 1

Astera anticipates Claim 1.

Claim 1p: *A method for controlling a lighting device to produce a user customisable lighting effect, the method comprising:*

Astera discloses Claim 1p. (Wood Decl., ¶¶ 52-57.) Astera discloses the features and functionality of the AX10, a controllable lighting fixture with an array of nine “RGBAW” (*i.e.*, red, green, blue, amber, and white) LEDs. (Astera, 7.)

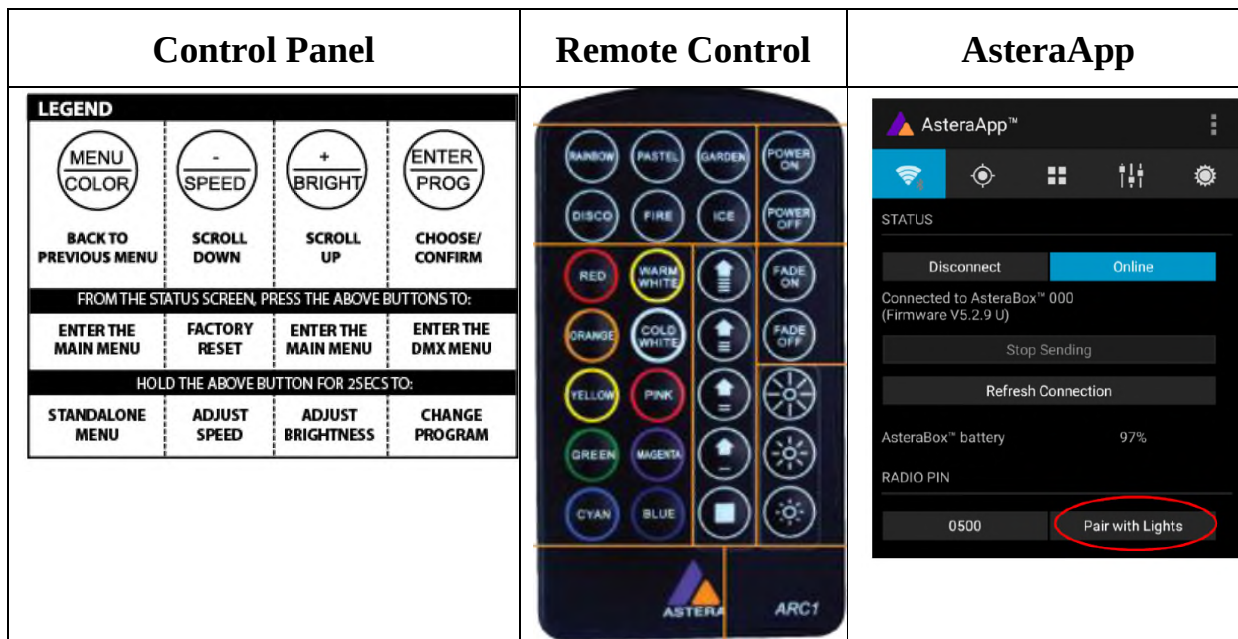


4 SPECIFICATION

LED power:	135W
Illuminants:	9 x 15W RGBAW Philips LEDs
Luminous Flux*:	3,350lm (at White 4000K)
Emittance*:	10,350lx (at 2m; White 4000K)
CRI*:	up to 92

(*Id.*, cover (annotated), 7 (annotated).)

The AX10 can be controlled via various controllers, including the Control Panel and AsteraApp. (*Id.*, 9.)



(*Id.*, 9, 11, 23.)

The AX10 can produce “user customizable lighting effects.” (Wood Decl., ¶ 54.) “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. (Astera, 17, 21.)

Name	Pattern
ONE COLOR STATIC	A static color is displayed on the whole virtual light.
TWO COLOR STATIC	The virtual light is split into two halves and two colors are displayed.
THREE COLOR STATIC	The virtual light is split into three parts and three colors are displayed.
FOUR COLOR STATIC	The virtual light is split into four parts and four colors are displayed.
ONE COLOR FADE	For all FADE programs, the whole color palette of four colors is used. Those colors are faded in and out one by one. Here, the whole virtual light shows the same color.
TWO COLOR FADE	The virtual light is split and shows two colors at a time.
THREE COLOR FADE	The virtual light is split and shows three colors at a time.
FOUR COLOR FADE	The virtual light is split and shows four colors at a time.
SIMPLE RUNNING	A running light; the background and the running pixels color can be set.
DOUBLE RUNNING	Two pixels are running in opposite direction.
TWO COL RUNNING	The two pixels are of different color even.
FLAG RUNNING	A three color flag is running over the background color.
DOUBLE FLAG RUNNING	Two flags are running over background in opposite direction.
SPIRAL 4 COLORS	The color is changed pixel by pixel. All four colors are used one after the other.
SPIRAL 2 COLORS	The color changes between color 1 and 2 from the outside to the inside, pixel by pixel.
RAINBOW	A rainbow effect is displayed.
FIRE	The fire effect is a random flicker between two colors, background and flickering color.

(*Id.*, 21.)

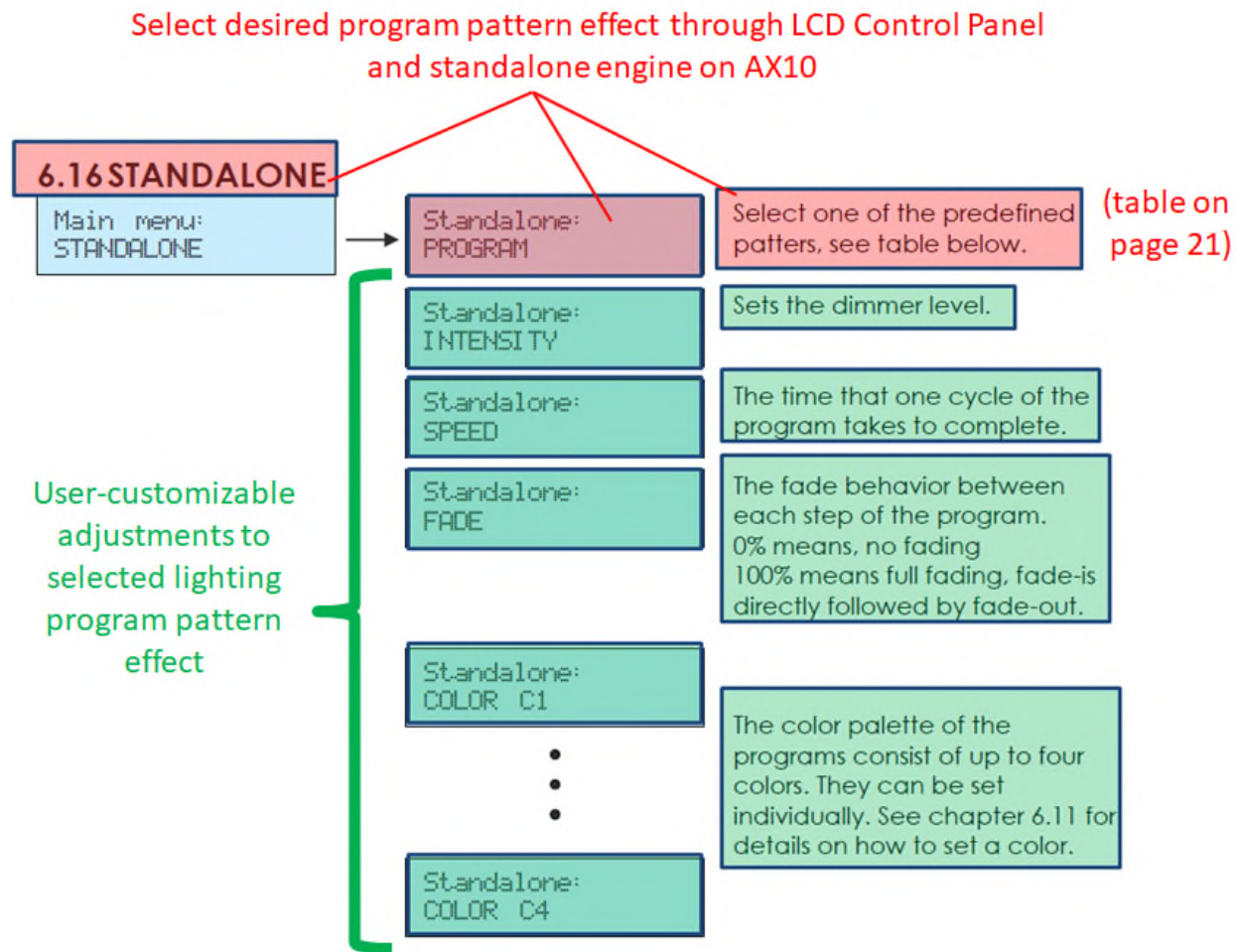
Users can customize these effects. (*Id.*, 8,11, 13, 20, 24-29.) The Control Panel allows users to “select” one of the effects and then modify it by adjusting: (i) intensity to set a dimmer level; (ii) speed to change the time to complete one cycle of the program; (iii) fade time between program steps;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

6.6 CONTROL PANEL

User-customizable
adjustments to
selected lighting
program pattern
effect

LEGEND			
 BACK TO PREVIOUS MENU	 SCROLL DOWN	 SCROLL UP	 CHOOSE/ CONFIRM
FROM THE STATUS SCREEN, PRESS THE ABOVE BUTTONS TO:			
ENTER THE MAIN MENU	FACTORY RESET	ENTER THE MAIN MENU	ENTER THE DMX MENU
HOLD THE ABOVE BUTTON FOR 2SECS TO:			
STANDALONE MENU	ADJUST SPEED	ADJUST BRIGHTNESS	CHANGE PROGRAM

Select desired
program pattern



(*Id.*, 11, 20 (annotated).)

Similarly, users can select and customize effects including “running lights,” “fire,” “rainbow,” “chaser effects” and “stroboscope” through AsteraApp. (*Id.*, 27-28.)

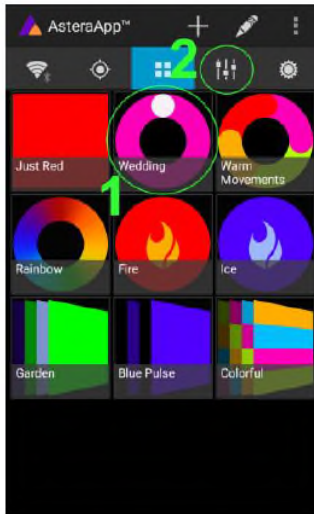
7.7 LIST OF EFFECTS

The effects' patterns are pre-defined and cannot be modified by the user. They are pre-programmed inside of each light. Still they can be parameterized. These effects are:

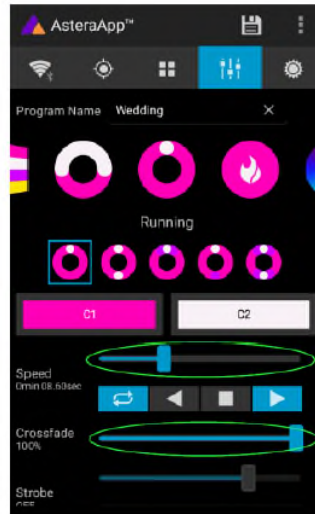
	Several variations of running lights are available.
	The Fire effect shows a random flickering effect. The background color and the color of the flickering effect can be adjusted.
	The rainbow effect shows a color change through all colors. Only its speed can be adjusted.
	Chaser effects provide an efficient means to create dancefloor lighting. The static chaser exchanges the color of the lights according to the tapped-in beat. The colors are randomly chosen. The effect can be adjusted to show up to 4 different colors at a time.
	The Moving Chasers overlay the static chaser by a second movement of the four displayed colors over the available positions of a Flow-Set. This gets mostly interesting if the Moving Strobe is chosen. Then, only some of the positions strobe and they are moving. So the strobe effect moves over the Flow-Set.

(Id., 28 (annotated).) 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”:

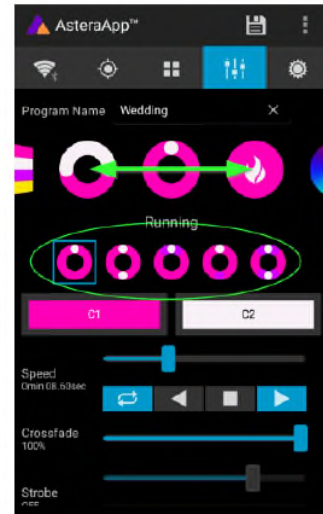
7.6 CHANGING THE EFFECT



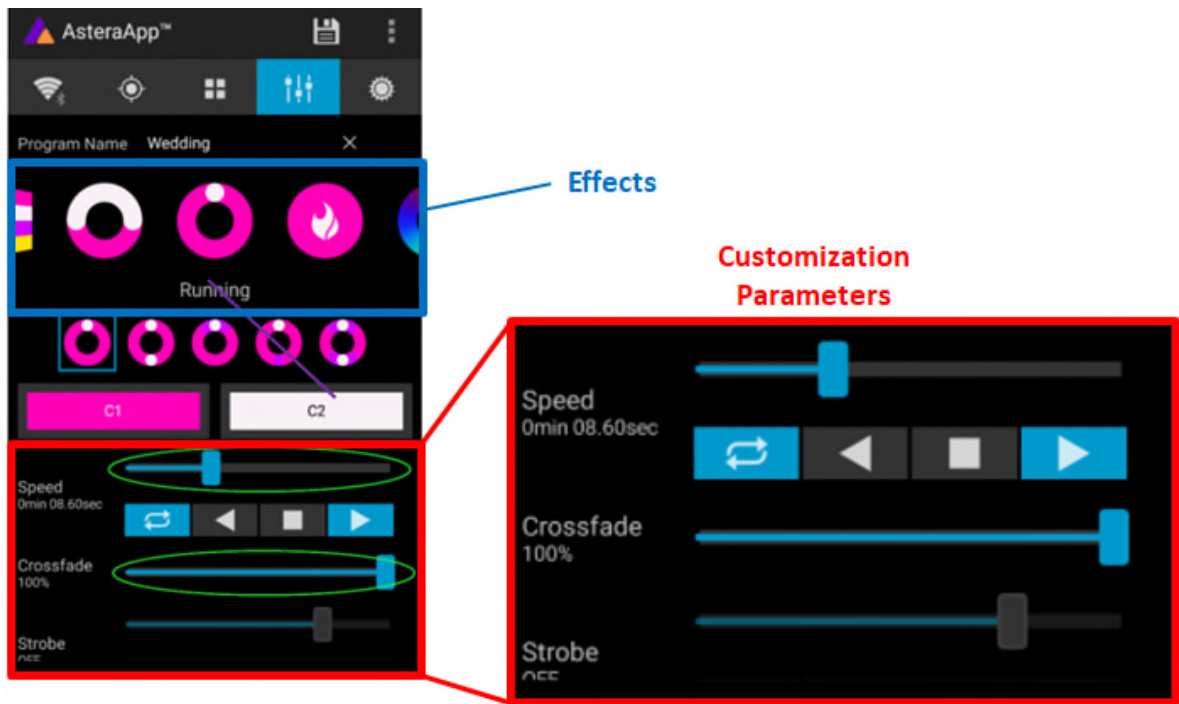
On the AsteraApp™ main screen, press “Wedding” (1), then enter the editor (2).



Set “Crossfade” to 0% and “Speed” to around 2 seconds. You should see a clean running light now. The White light will run over a pink background.



The effect can be changed by sliding the effect picker and choosing a sub-effect below it. Again the colors can be adjusted, too.



Set 'Crossfade' to 0% and 'Speed' to around 2 seconds. You should see a clean running light now. The White light will run over a pink background.

(Id., 27 (annotated).)

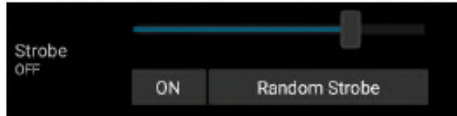
AN EFFECT CAN BE HIGHLY CUSTOMIZED:



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



The crossfade tells if the light will fade from step to step. If it is set to 0% an immediate change is visible. If set to 100% the changes will be soft.



Stroboscope effect can be enabled and seamlessly adjusted in speed. Additionally, three random stroboscope options are available: slow, medium and fast.



Each effect can be adjusted in brightness as well.

(*Id.*, 27.)

Claim 1a: *calculating, using an effect simulator, a time varying lighting value based on at least one simulation parameter;*

Astera discloses Claim 1a. (Wood Decl., ¶¶ 58-62.) The Control Panel and AsteraApp controllers calculate time varying lighting values for generating special effects based on user-input simulation parameters. (Astera, 9-11, 13, 17, 21.)

The Control Panel allows users to “select” from predefined effects, and then adjust parameters including intensity (to set a dimmer level), speed (to change the time to complete one cycle), fade time, and color. (*Id.*, 20.) Based on these selections, the Control Panel creates data characterizing the adjusted lighting

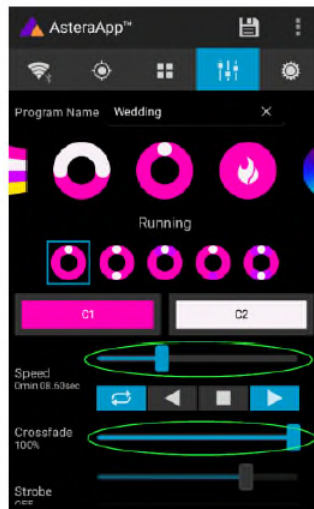
effect, in the form of values and settings for the LEDs to “display these effects properly with [the] light.” (*Id.*, 17, 20-21; *see also* Wood Decl., ¶¶ 58-59.)

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

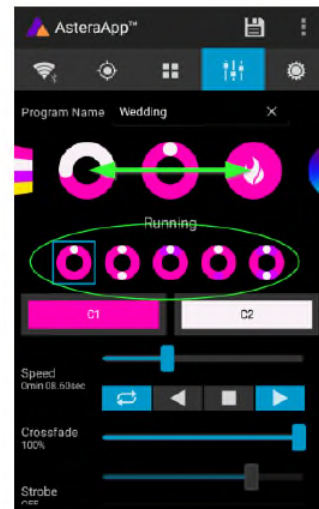
7.6 CHANGING THE EFFECT



On the AsteraApp™ main screen, press “Wedding” (1), then enter the editor (2).



Set “Crossfade” to 0% and “Speed” to around 2 seconds. You should see a clean running light now. The White light will run over a pink background.



The effect can be changed by sliding the effect picker and choosing a sub-effect below it. Again the colors can be adjusted, too.

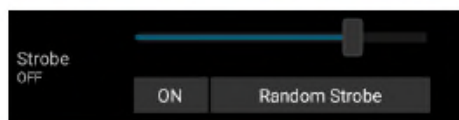
AN EFFECT CAN BE HIGHLY CUSTOMIZED:



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



The crossfade tells if the light will fade from step to step. If it is set to 0% an immediate change is visible. If set to 100% the changes will be soft.



Stroboscope effect can be enabled and seamlessly adjusted in speed. Additionally, three random stroboscope options are available: slow, medium and fast.



Each effect can be adjusted in brightness as well.

(*Id.*, 27.)

AsteraApp calculates time varying lighting values, including brightness and color information, for the user-customized effects. (*Id.*, 23-29; *see also* Wood Decl., ¶¶ 61, 76.) AsteraApp can “send complex effects” to the lights, and can be “used to adjust the lights remotely” by sending controls (which are lighting values). (*Id.*, 23; *see also* Wood Decl., ¶ 61.) 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 replayed at each light. (Astera, 23.)

Claim 1b: *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;*

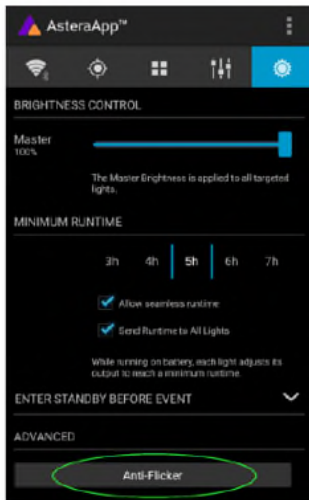
Astera discloses Claim 1b. (Wood Decl., ¶¶ 63-67.) Users can select a range of lighting effects (such as “fire effect,” “rainbow effect,” and “chaser effects”) and customize these by adjusting parameters, including brightness (intensity), speed, fade, and color. *See supra* Claim 1a. These parameters characterize the selected effect, in that, as in the ’257, the selected, customized effect is dependent on these parameters. (Wood Decl., ¶ 63; *see also* Astera, 17, 20-21, 24-28.)

Further, the effects available can be used for “videography, broadcasting, cinematography, studio filming, and location filming.” (Wood Decl., ¶ 64.) As was well-known to a POSITA, Astera manufactures luminaires for film, TV, and theatrical use. (Canins Decl. ¶¶ 2, 5 (noting the AX10 is one of Astera’s “production lighting products,” and was shown at a “Prolight and Sound Exhibition”); Wood Decl., ¶ 64.) Further, the AX10 was designed and sold for such uses. (Canins Decl. ¶¶ 2-5; Wood Decl., ¶ 64.)

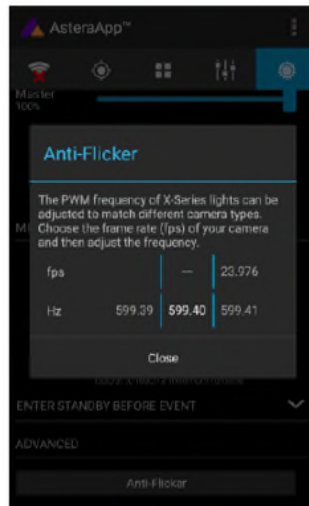
Moreover, Astera ***expressly*** teaches the AX10 can produce effects captured by video cameras (used in videography, broadcasting, cinematography, and studio/location filming). (Wood Decl., ¶ 65.) The AX10 has an “Anti-Flicker” adjustment, so the light settings will “fit different ***camera’s frame rates.***” (Astera, 32.)

7.12 ANTI-FLICKER

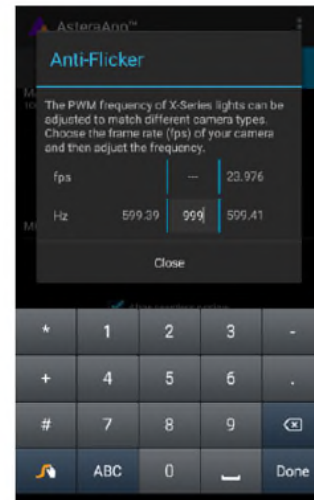
The PWM refresh rate of this light is 599.4 Hz by default. This frequency can be freely adjusted between 200 Hz and 1205 Hz to fit different camera's frame rates.



Make sure you have targeted the lights you wish to adjust (chapter 7.5). Then press the "Anti-Flicker".



Slide the "fps" to adjust to default values for a framerate. Slide the "Hz" to fine-adjust.



Press the highlighted frequency to enter a custom value between 200 and 1205 Hz.

(*Id.*, 32 (annotated).) Fitting lights to camera frame rates indicates the lighting effects are intended to be captured on video, as the "flicker" avoided is an unwanted artefact that would otherwise appear on captured video. (Wood Decl., ¶ 66.)

Further, a POSITA would understand references to DMX control in Astera (see, e.g., Astera, 9-10) indicate the AX10 was developed for TV, cinematography, and studio filming, as DMX is a common communication standard created by and for the entertainment lighting industry. (Wood Decl., ¶ 67.)

Claim 1c: *wherein said at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;*

Astera discloses Claim 1c. (Wood Decl., ¶¶ 68-72.) The effects can include simulation parameters of “at least one of” a random brightness, duration, and interval. (*Id.*)

With respect to **random brightness**, Astera, like the '257, discloses a “fire effect” comprising a “random flicker between two colors, background and flickering color.” (Astera, 17; *see also id.*, 28.) As the fire is described as having a “flicker” characteristic, it includes random brightness levels between the background and flickering colors—rather than consistent brightness levels, which would create a strobe rather than flicker effect. (*Id.*)

Astera also discloses a “chaser effect,” where “colors are randomly chosen.” (*Id.*, 28.) Different colors have different brightness (*e.g.*, a 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. (Wood Decl., ¶ 70.)

With respect to **random duration and random 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. (Wood Decl., ¶ 71.) 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.*)

In addition, the “stroboscope” effect includes “random” settings options. (Astera, 17, 21, 27.) For a “stroboscope” to be random, the duration and interval of flashes must be random. (Wood Decl., ¶¶ 72, 90.) Absent such random duration and interval, strobing would be consistent and uniform, rather than “random.” (*Id.*) Further, “slow” random strobe would have a different duration and interval than “fast,” with “fast” including more random flashes per interval. (Wood Decl., ¶ 72.)



Stroboscope effect can be enabled and seamlessly adjusted in speed. Additionally, three random stroboscope options are available: slow, medium and fast.

(*Id.*, 27 (annotated).)

Claim 1d: said simulation parameter depending on the user customisable lighting effect being simulated;

Astera discloses Claim 1d. (Wood Decl., ¶ 73.) The simulation parameter depends on the user-selected pre-programmed light effect (*e.g.*, fire, rainbow, chaser), as customized by any desired random strobing, speed, brightness, or color parameters. *See supra* Claims 1b-1c. 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 particular selected effect . (Astera, 20-21, 24-28.) For example, 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.*, 28.)

Claim 1e: *outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customisable lighting effect.*

Astera discloses Claim 1e. (Wood Decl., ¶¶ 74-77.) Both the Control Panel and AsteraApp output time-varying lighting values for the AX10 to “display these [selected] effects properly with [its] light.” (Astera, 21.)

The Control Panel “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. (*Id.*, 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.*, 20-21.) *See also supra* Claim 1a. In doing so, the Control Panel creates 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.” (Astera, 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.*, 24; *see also id.*, 10, 17.) For effect patterns, the values vary with time to change the output of the LEDs, creating the effect. (*Id.*, *see also* Wood Decl., ¶ 75.)

With respect to AsteraApp, users can select from different lighting effects (*e.g.*, fire, chasers, rainbow) and customize them (*e.g.*, adjust speed, crossfade,

stroboscope, brightness). *See supra* Claim 1a. Based on these user-selected, customized effects, AsteraApp calculates time varying lighting values including brightness and color information for the desired effects. (Astera, 23-29; *see also* Wood Decl., ¶ 76.) “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.*, 24 (emphasis added); *see also id.*, 10, 17.) That is, AsteraApp outputs the lighting values representing the adjusted effect created in AsteraApp to the AX10. (Wood Decl., ¶ 76.) When the lighting values are received by the standalone engine, the AX10 “replays [the effect] autonomously until a new effect is received.” (Astera, 24.)

b. Independent Claims 15 and 20

For this Petition, 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. (*See also* Wood Decl., ¶¶ 78-83.)

A matching of each limitation in Claim 1 to the corresponding limitation in Claims 15 and 20 is as follows, with differences shown in red:

Claim 1	Claim 15	Claim 20
A method for controlling a lighting device to produce a user customisable lighting effect, the method comprising:	A controller adapted to control at least one lighting device to produce a user customisable lighting effect, the controller comprising:	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:
calculating, using an effect simulator, a time varying lighting value based on at least one simulation parameter;	an effect simulator adapted to calculate a time varying lighting value based on at least one simulation parameter;	calculating using 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 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 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;
wherein said at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;	wherein the at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;	wherein the at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;
said simulation parameter depending on the user customisable lighting effect being simulated; and	said simulation parameter depending on the user customisable lighting effect being simulated; and	said simulation parameter depending on the user customisable lighting effect being simulated; and

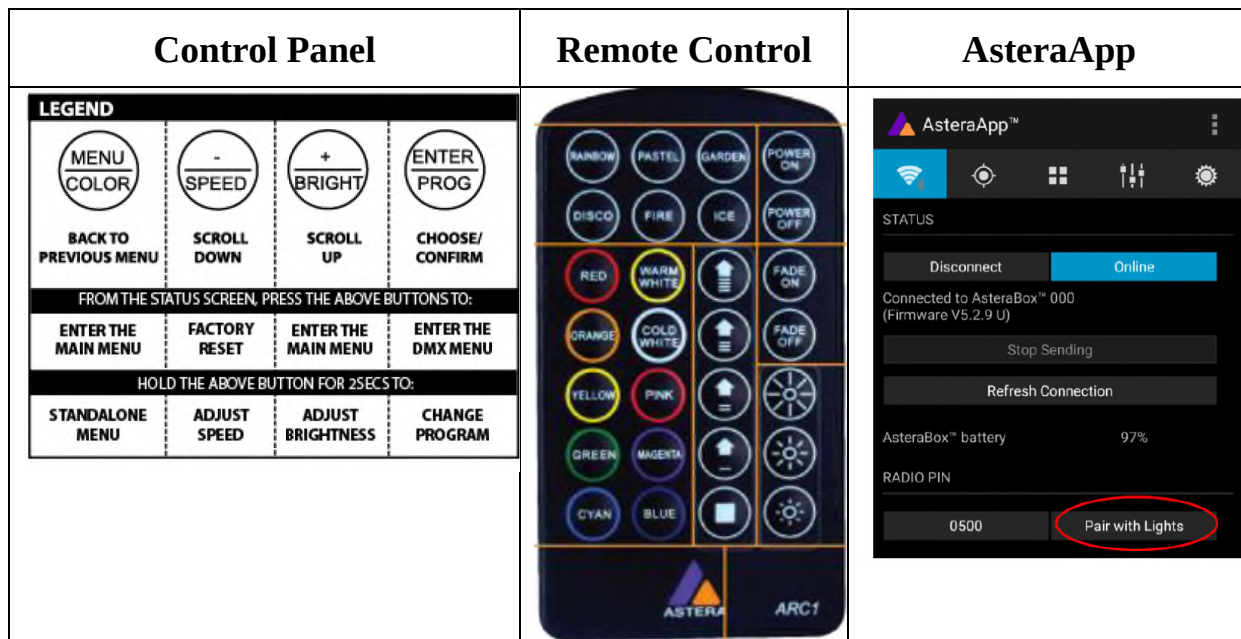
Claim 1	Claim 15	Claim 20
outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customisable lighting effect.	wherein an output of the effect simulator is adapted to control a lighting device according to the calculated variation of lighting over time.	outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customisable lighting effect.

The only differences are that 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.⁵ Thus, Astera discloses each limitation in claims 15 and 20 for the same reasons discussed above with respect to the corresponding limitation in Claim 1.

Moreover, as discussed above in Claim 1, Astera expressly discloses the method can be performed on a “controller” or a “software program.”

With respect to Claim 15, Astera discloses various controllers with an effect simulator that control the AX10, including the Control Panel and AsteraApp. (*Id.*, 8-9, 11-13, 17, 20-29.) *See supra* Claim 1.

⁵ 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. (Wood Decl. ¶ 80.)



(Id., 9.)

With respect to Claim 20, the Control Panel and AsteraApp perform the functions based on computer software program code. (Wood Decl., ¶ 83.) AsteraApp is a mobile application, in the form of software code, that is downloaded and run on a user’s mobile device. (Id.) The Control Panel is implemented through software-based programming in the AX10 itself. (Id.) The AX10 includes “firmware version 5.2.20,” and the information menu displays “the firmware version and hardware version of the light.” (Astera, 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. (Wood Decl., ¶ 83.)

c. Dependent Claim 2

Claim 2: The method according to claim 1 wherein the random brightness comprises a random peak brightness.

Astera anticipates Claim 2. (Wood Decl., ¶¶ 84-87.) The “fire” and “chaser” effects include a random brightness. *See supra* Claim 1c. Each of these further include a random peak brightness. (Wood Decl., ¶¶ 84-87.)

With respect to “fire,” the “random flicker” is achieved through alternating between the background and flickering colors at random brightness levels. (Astera, 21, 28; *see also* Wood Decl., ¶ 85.) 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.*)

Further, Astera indicates users can select the maximum, or “peak,” for these random brightness levels by customizing the “brightness.” (Astera., 20-21, 27.) Adjusting the overall brightness controls what the “peak,” or maximum possible brightness, can be for each flicker in the fire effect. (*Id.*, 20-21, 27-28; *see also* Wood Decl., ¶ 86.)



Each effect can be adjusted in brightness as well.

(Astera, 27.)

With respect to “chaser” effects, Astera discloses “colors are randomly chosen,” and each color has a different brightness level—thus resulting in a random peak brightness as the effect cycles through random colors. (*Id.*, 28; *see also* Wood Decl., ¶ 87.) Further, users can set the maximum brightness level for “chaser” effects, controlling the potential peak brightness as the effect cycles randomly through colors. (*Id.*, 17, 20, 27-28; *see also* Wood Decl., ¶ 87.)

d. Dependent Claim 3

Claim 3: *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.*

Astera anticipates Claim 3. (Wood Decl., ¶¶ 88-90.) The “fire effect” and “stroboscope” parameters have at least a random interval between flashes and a random frequency. *See supra* Claim 1c.

With respect to “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). (Astera, 21, 28; *see also* Wood Decl., ¶ 89.) Absent such random interval, the effect would not be considered a “random flicker,” but would instead be consistent strobing between background and flickering colors. (*Id.*) Moreover, in implementing the random flicker, AX10 outputs light at a “random frequency” (rather than a consistent one), as the interval between flashes randomly changes. (Wood Decl., ¶ 89.)

With respect to “random stroboscope,” for the slow, medium, or fast “stroboscope” effect to be “random,” the interval between strobe flashes must be random. (Astera, 17, 27; Wood Decl., ¶ 90.) Absent such a random interval, the strobing would be consistent and uniform, rather than “random.” (*Id.*) Moreover, 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 period. (Wood Decl., ¶ 90.) With a random interval between flashes, the frequency of the flashes is also random. (*Id.*)

e. Dependent Claim 4

Claim 4: *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.*

Astera anticipates Claim 4. (Wood Decl., ¶¶ 91-93.) The “fire effect” and “stroboscope” simulation parameters have at least a random number of pulses. See *supra* Claim 1c.

With respect to “fire,” randomly changing between background and flickering color involves a random number of pulses of background and flickering color, respectively, so as to create the fire effect. (Astera, 21, 28; Wood Decl., ¶ 92.) 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. (*Id.*)

With respect to “stroboscope,” choosing any of the “slow, medium, or fast” random options includes a random number of pulses. (*Id.*, 17, 27.) With the strobe being random, rather than consistent or uniform, the number of pulses output during the strobe effect changes randomly. (Wood Decl., ¶ 93.) In “slow,” there would be fewer random pulses in the effect than in “fast.” (*Id.*)

f. Dependent Claim 5

Claim 5: *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.*

Astera anticipates Claim 5. (Wood Decl., ¶¶ 94-97.) The simulation parameters for “fire,” “chaser,” and random “stroboscope” are random within “predefined boundaries.”

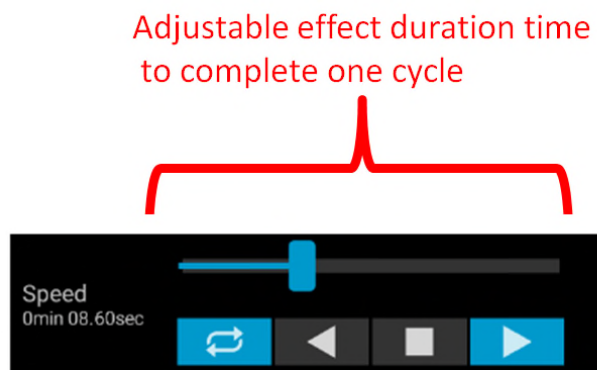
Specifically, with these AX10 effects (*i.e.*, fire, chaser, and stroboscope), users can set a simulation parameter specifying the maximum “brightness” level, thereby setting an upper boundary for the maximum “amplitude” (or brightness) of the effect. (*Id.*, 20, 27.) *See also supra* Claims 1c, 2.



Each effect can be adjusted in brightness as well.

(Astera, 27 (annotated).)

Similarly, by setting and adjusting the “speed” of “how long it takes effect to complete one cycle,” users set boundaries for the duration, as the effect must be completed within the time of one cycle. (*Id.*, 27.)

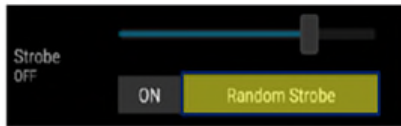


The speed tells how long it will take for the effect to complete one cycle.

(*Id.*, 27 (annotated).)

Users can also select predefined boundaries of an “interval between bursts” for the “stroboscope” effect. (Astera. 17, 27.) Users can set boundaries for whether the duration and interval between the bursts making up the strobe effect will be “slow, medium, or fast.” (*Id.*, 17, 27.) *See also supra* Claim 1c.

AN EFFECT CAN BE HIGHLY CUSTOMIZED:



Stroboscope effect can be enabled and seamlessly adjusted in speed. Additionally, three random stroboscope options are available: slow, medium and fast.

(Astera, 27 (annotated).)

g. Dependent Claim 6

Claim 6: *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.*

Astera anticipates Claim 6. (Wood Decl., ¶ 98.) The effects such as fire, chaser, and strobe are based on parameters including random brightness, duration, and interval. *See supra* Claim 1c. These random parameters are determined based on user selections through a user interface. (Astera, 17, 20-21, 23-24, 28.) For example, “random brightness” is determined in dependence on the user’s selection of any “brightness” customization for the effect. (Astera, 20, 27.) *See also supra* Claims 1c, 2. Further, “random brightness,” “random duration,” and “random interval” of the fire effect are determined based on user customizations. *See supra* Claim 1c. 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.” (Astera, 17, 27.) *See also supra* Claims 1c, 3, 4.

h. Dependent Claim 7

Claim 7: *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.*

Astera anticipates Claim 7. (Wood Decl., ¶¶ 99-102.) Users can select from various lighting effects from the Control Panel or AsteraApp. (Astera, 17, 20-21, 23-24, 27-28.) Users can adjust the “intensity” or “brightness” parameters of each effect. (*Id.*, 20, 27.) Accordingly, Astera expressly discloses parameters related to “a brightness,” as the brightness may be adjusted. (Wood Decl., ¶ 93.)

Moreover, Astera discloses 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. (*Id.*, 20, 27.) Completing the same effect in a shorter time cycle changes how quickly the brightness or color fluctuates to complete the effect. *See supra* Claims 2, 4. (See also Wood Decl., ¶ 100.)

In addition, “stroboscope” can be adjusted in speed, thereby changing the brightness fluctuation period of the flashes in the effect. (*Id.*, 27.) And, 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.*, 27-28.) Changing the speed changes the rate of color change and color fluctuation period. (Wood Decl., ¶ 102.)

i. Dependent Claim 8

Claim 8: *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.*

Astera anticipates Claim 8. (Wood Decl., ¶¶ 103-105.) The AX10 has multiple user interfaces:



(Astera, 9, 11, 23.) Users can select from various desired effects and parameters through interfaces on the Control Panel or AsteraApp. (*Id.*, 8, 11, 13, 20, 24-29.)

The Control Panel includes an LCD menu interface allowing users to “select” a lighting pattern (*e.g.*, those listed on page 21 of Astera) and then adjust: (i) intensity; (ii) speed of a cycle of the program; (iii) fade time between steps of the program; and (iv) color selections. (*Id.*, 20.)

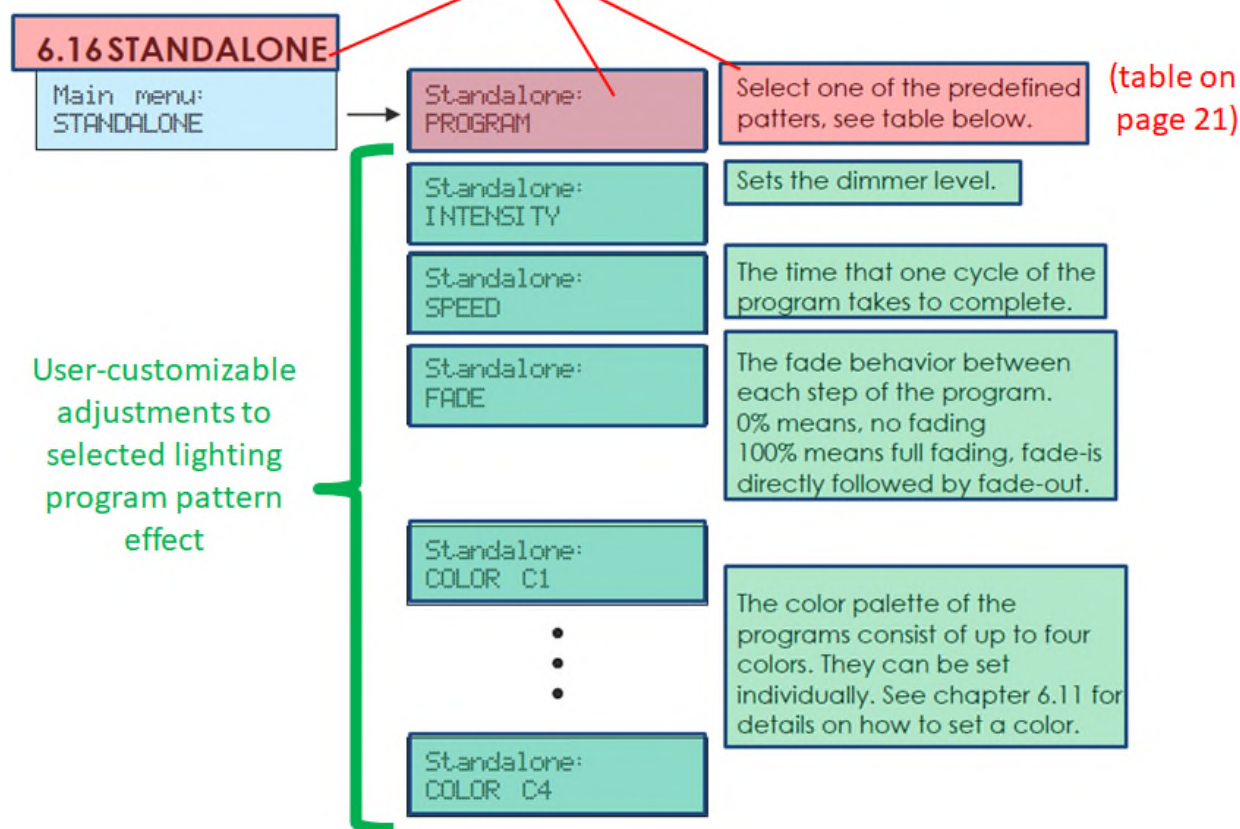
6.6 CONTROL PANEL

User-customizable
adjustments to
selected lighting
program pattern
effect

LEGEND			
 BACK TO PREVIOUS MENU	 SCROLL DOWN	 SCROLL UP	 CHOOSE/ CONFIRM
FROM THE STATUS SCREEN, PRESS THE ABOVE BUTTONS TO:			
ENTER THE MAIN MENU	FACTORY RESET	ENTER THE MAIN MENU	ENTER THE DMX MENU
HOLD THE ABOVE BUTTON FOR 2SECS TO:			
STANDALONE MENU	ADJUST SPEED	ADJUST BRIGHTNESS	CHANGE PROGRAM

Select desired
program pattern

Select desired program pattern effect through LCD Control Panel
and standalone engine on AX10



(*Id.*, 11, 20 (annotated).) The Control Panel then adjusts the desired effect accordingly based on the selected parameters. (Wood Decl., ¶¶ 104.) *See also supra* Claim 1e.

Similarly, with AsteraApp, lighting effects may be selected and “highly customized” in user interfaces. (*Id.*, 27.) Based on user selections of effects and parameters, AsteraApp creates new signals sent to the light to provide the desired output. (*Id.*, 23-24, 27.)

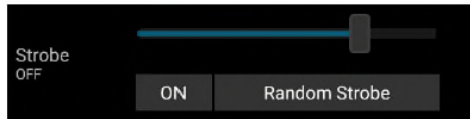
AN EFFECT CAN BE HIGHLY CUSTOMIZED:



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



The crossfade tells if the light will fade from step to step. If it is set to 0% an immediate change is visible. If set to 100% the changes will be soft.



Stroboscope effect can be enabled and seamlessly adjusted in speed. Additionally, three random stroboscope options are available: slow, medium and fast.



Each effect can be adjusted in brightness as well.

(*Id.*, 27.) *See also supra* Claim 1e.

j. Dependent Claim 9

Claim 9: *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.*

Astera anticipates Claim 9. (Wood Decl., ¶¶ 106-109.) Once a user selects a lighting effect, users can customize the lighting effect to change the brightness, change the colour, or set a trigger. (Astera, 24, 27, 32).

With respect to “**maximum brightness**,” AsteraApp has a slider such that “[e]ach effect can be adjusted in brightness.” (*Id.*, 27.) *See also supra* Claim 2.

Accordingly, the user-selected simulation parameter can be a maximum brightness, with the slider setting possible maximum brightness percentage.

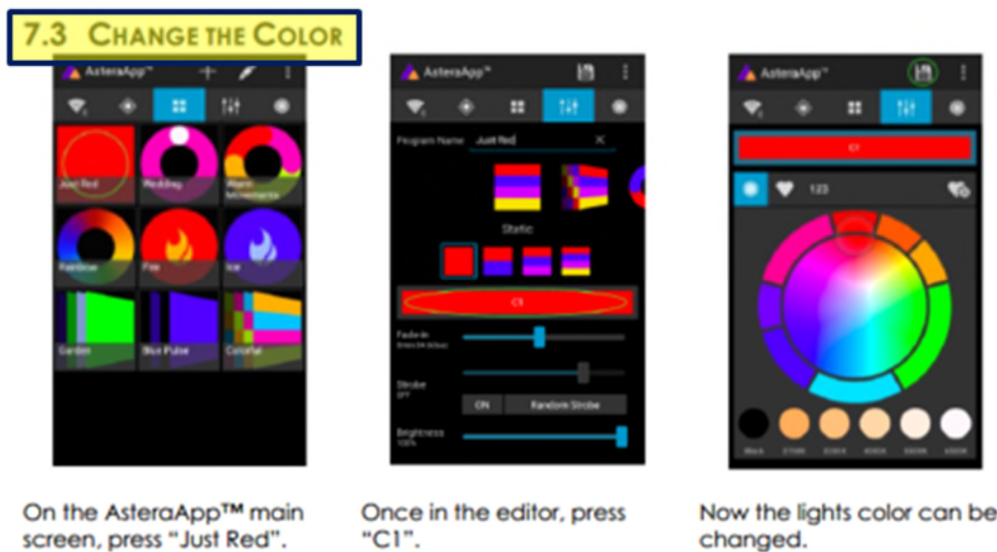


Each effect can be adjusted in brightness as well.

(*Id.*, 27.) The Control Panel allows for the same brightness adjustment. (*Id.*, 11.)

Because a “background” color can be set, there is “**minimum brightness**” that is at least the background color brightness. (*Id.*, 21, 27-28.)

With respect to “**color**,” Astera discloses, for example, that for “fire” effect, “the background color and the color of the flickering effect can be adjusted.” (*Id.*, 28.) Moreover, users can set colors for lighting effects, which can be customized to include random “stroboscope” effect. (*Id.*, 24, 27-28.)



(*Id.*, 24 (annotated).) Thus, users can set a color for an effect, and then add a

stroboscope effect to randomly strobe the color . (Id., 24-27.)

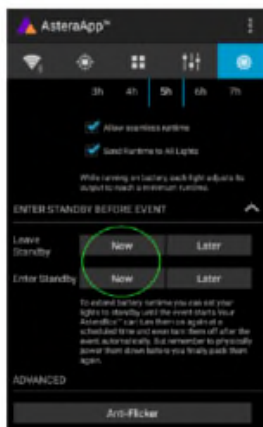
With respect to a “**trigger**,” users can manually select a time delay (or a trigger) to start the user customized lighting effect show. (Id., 34.) The “standby is intended to be used between setup and event... [A]ll lights may be switched to standby mode and woken up later when the event starts.” (Id.)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

7.14 ENTER AND LEAVE STANDBY

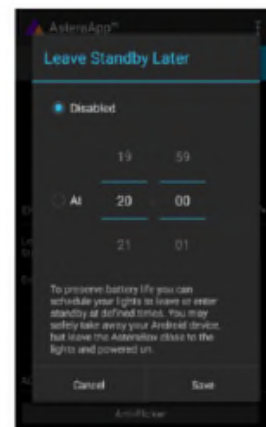
The standby is intended to be used between setup and event (see chapter 3.2.1 **Error! Reference source not found.**). After setup is completed, all lights may be switched to standby mode and woken up later when the event starts. This ensures that no battery runtime is wasted. This can be either done manually or automated.



Press the small arrow to open the standby menu.



By pressing the “Now” buttons, standby can be switched on or off for all currently targeted lights.



Any of the “Later” buttons will require a time to be set. The standby will be scheduled to the specified time.

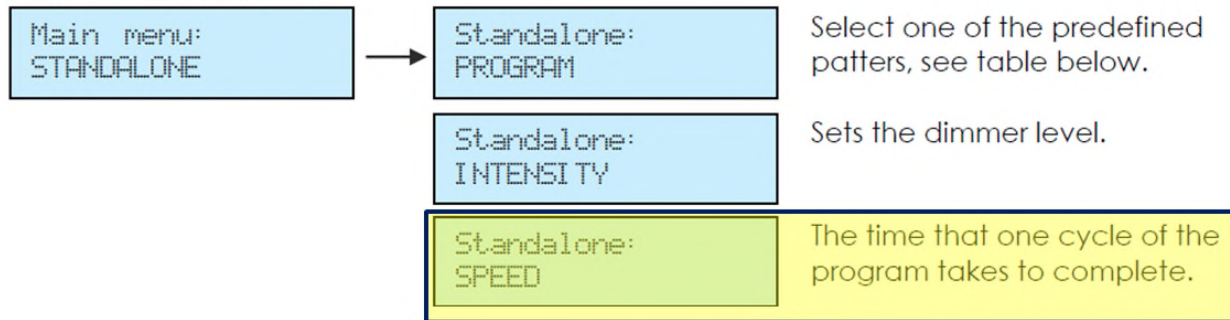
(Id., 34.)

k. Dependent Claim 10

Claim 10: *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.*

Astera anticipates Claim 10. (Wood Decl., ¶¶ 110-111.) Once users select a lighting effect, from the Control Panel or AsteraApp, users can change how long it will take to complete one cycle. (Astera, 20, 27.)

6.16 STANDALONE



(*Id.*, 20 (annotated),

AN EFFECT CAN BE HIGHLY CUSTOMIZED:



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

(*Id.*, 27 (annotated); *see also id.* 17.) 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. (Wood Decl., ¶ 110.) And, 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.*)

Moreover, light effects calculated by AsteraApp and sent to the light are “just triggered and then each light replays them autonomously until a new effect is sent.” (*Id.*, 24.)

7.2 POWERFUL LIGHT CONTROL

Your light has a built in standalone engine. It can display static colors or replay a number of predefined effect patterns with a customizable color palette.

With the AsteraApp™ these effects can be created and be sent to the light by the built in UHF receiver. The effects are just triggered and then each light replays them autonomously until a new effect is sent.

(*Id.*, 23 (annotated).) This again indicates the AX10 repeatedly calculates lighting values, and sends them to LEDs to continue autonomously playing the effect.

(Wood Decl., ¶ 111.)

I. Dependent Claim 11

Claim 11: *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).*

Astera anticipates Claim 11. (Wood Decl., ¶¶ 112-14.) The AX10 can produce many lighting effects, including a “fire effect” which mimics a fire flickering:

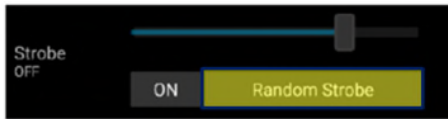


The Fire effect shows a random flickering effect. The background color and the color of the flickering effect can be adjusted.

(*Id.*, 28; see also *id.*, 21.)

Moreover, a “stroboscope effect” (producing a strobe of flashes) can be added to selected effects:

AN EFFECT CAN BE HIGHLY CUSTOMIZED:



Stroboscope effect can be enabled and seamlessly adjusted in speed. Additionally, three random stroboscope options are available: slow, medium and fast.

(*Id.*, 27 (annotated); *see also id.*, 17.)

Further, a POSITA would understand from Astera that the AX10 would produce other claimed effects (such as a candle, lightning, welding, sparking, paparazzi flashes, fireworks, a flickering neon sign, a scan, and a police light), based on the effects it offers and its ability to generate various colors, alternate between colors, and add strobing/flashing. (*Id.*, 17, 21, 27-28; *see also* Wood Decl., ¶ 114.) For example, flashing blue and red lights simulates police lights, and irregularly-timed stroboscope flash effects create the impression of lightning, paparazzi flashes, welding, and spark/short circuit effects. (*Id.*)

m. Dependent Claim 12

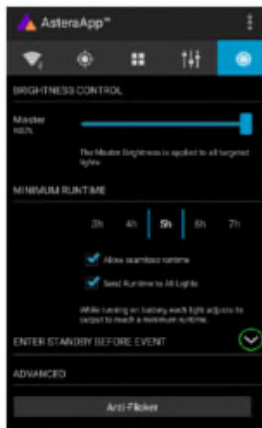
Claim 12: *The method according to claim 1, further comprising selecting a definition of a trigger event, said trigger event initiating said output of the time varying lighting value thereby to simulate the user customisable lighting effect.*

Astera anticipates Claim 12. (Wood Decl., ¶¶ 115-118.) Users can select a time delay to start the user customized lighting effect show, resulting in outputs of

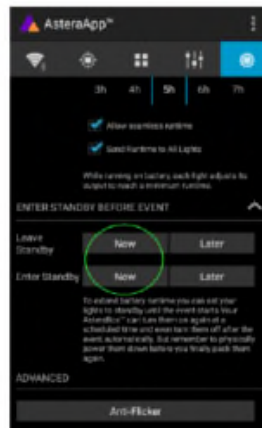
control signals to vary the lighting values and simulate the desired effects at a later time. (Astera, 34.) The “standby is intended to be used between setup and event... [A]ll lights may be switched to standby mode and woken up later when the event starts.” (Id.)

7.14 ENTER AND LEAVE STANDBY

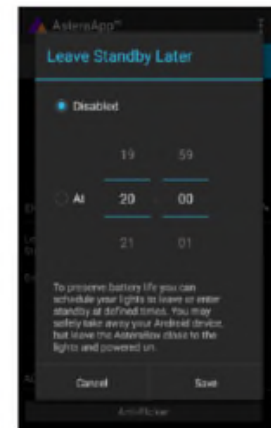
The standby is intended to be used between setup and event (see chapter 3.2.1 **Error! Reference source not found.**). After setup is completed, all lights may be switched to standby mode and woken up later when the event starts. This ensures that no battery runtime is wasted. This can be either done manually or automated.



Press the small arrow to open the standby menu.



By pressing the “Now” buttons, standby can be switched on or off for all currently targeted lights.



Any of the “Later” buttons will require a time to be set. The standby will be scheduled to the specified time.

(Id., 34.)

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.)

Moreover, users can select options, from the Control Panel or AsteraApp, to begin a programmed light effect. 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. (*Id.*, 9.) Control Panel also allows users to “select” predefined program patterns, initiating a trigger to the LEDs to display that program. (*Id.*, 20-21.) Similarly, in AsteraApp, the “effects can be created and be sent to the light by the built in UHF receiver. The effects are just **triggered** and then each light replays it autonomously until it receives a new effect.” (*Id.*, 10 (emphasis added); see also *id.*, 23-24.)

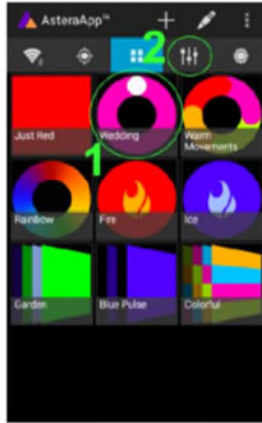
n. Dependent Claims 13 and 21

Claim 13: *The method according to claim 1, further comprising storing the at least one simulation parameter corresponding to said user customisable lighting effect.*

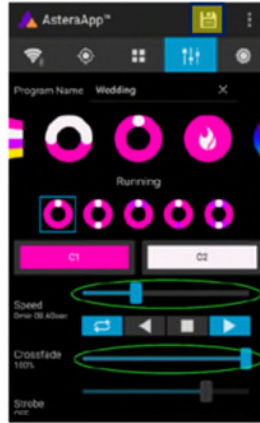
Claim 21: *The method according to claim 13, further comprising recalling said stored at least one simulation parameter from a memory.*

Astera anticipates Claims 13 and 21. (Wood Decl., ¶¶ 119-121.) The user-selectable lighting effects, and user adjustments made to those effects, may be “saved back to the main screen by pressing the save button.” (Astera, 27.) Users may select an effect (like “fire” or “wedding”) and modify it by changing simulation parameters (like “speed,” “stroboscope,” and “brightness”). (*Id.*) When the user is done, she can click the disk icon in AsteraApp, saving the modified effect. (*Id.*, 27.)

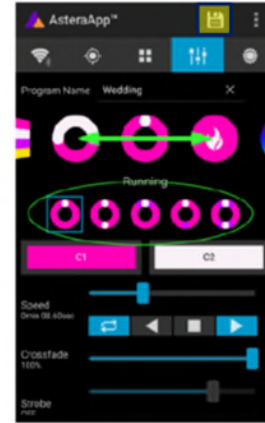
7.6 CHANGING THE EFFECT



On the AsteraApp™ main screen, press "Wedding" (1), then enter the editor (2).



Set "Crossfade" to 0% and "Speed" to around 2 seconds. You should see a clean running light now. The White light will run over a pink background.



The effect can be changed by sliding the effect picker and choosing a sub-effect below it. Again the colors can be adjusted, too.

After the effect is adjusted, it may be saved back to the main screen by pressing the save button.

(*Id.*, 27 (annotated).)

Once saved to the main screen, these stored effects (with their modified parameters) can be recalled and played later. (*Id.*, 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. (Wood Decl., ¶ 121.)

o. Dependent Claim 14

Claim 14: *The method according to claim 1 comprising controlling a plurality of lights in dependence on the output.*

Astera anticipates Claim 14. (Wood Decl., ¶¶ 122-125.) The AX10 comprises nine “RGBAW” LEDs. (Astera, 7.) The Control Panel and AsteraApp control this plurality of nine LED “lights” in the AX10. *See supra* Claims 1a-e.

In addition, when AX10 lights are controlled by AsteraApp, the “[l]ights can be grouped into sets,” so that a user-created effect “can stretch over up to 32 lights.” (Astera, 10; *see also id.*, 23.)

6.4 CONTROL BY THE ASTERAAPP™

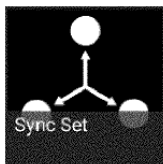
Your light has a built in standalone engine. It can display static colors or replay a number of predefined effect patterns with a customizable color palette.

With the AsteraApp™ these effects can be created and be sent to the light by the built in UHF receiver. The effects are just triggered and then each light replays it autonomously until it receives a new effect.

Lights can be grouped into sets. This way they can be controlled separately and also effects can stretch over up to 32 lights.

(*Id.*, 10 (annotated).) 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:

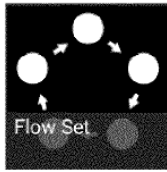
7.4.1 SYNC SET



All lights that are assigned to a Sync-Set can be controlled together. They will do exactly the same.

(*Id.*, 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:

7.4.2 FLOW SET



By using a Flow-Set, lights can also be controlled together. But additionally, they are assigned to positions inside the Flow-Set and so form a virtual light with several pixels. All effects, like a running light, are stretched over this virtual light.

(*Id.*, 26.)

p. Dependent Claim 16

Claim 16: *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.*

Astera anticipates Claim 16. (Wood Decl., ¶¶ 126-128.) The AX10 includes both “wired” and “wireless” communication interfaces to communicate with its LEDs. (*Id.*)

The AX10’s Control Panel includes a “wired” interface for communicating with the LED lights. (Astera, 9.) As the Control Panel is included on the AX10, it communicates with the LEDs through wires to, for example, “power the light on/off, set a static color or change its settings.” (*Id.*) The Control Panel communicates directly with the LED driver circuitry within the AX10 to control the LEDs. (Wood Decl., ¶ 127.)

Further, AsteraApp communicates with AX10 lights by Bluetooth and controls the lights by UHF (forms of “wireless” communication):

7 USING THE LIGHT WITH THE ASTERAAPP™

The buttons of the AX10 only allow a basic operation of the light. To gain full control over all features, the AsteraApp™ should be used.

The AsteraApp™ is an efficient way to quickly create a customized light show. It can group several lights together, address individual lights or groups of lights, and send complex effects with a user defined color palette to all lights in range.

Additionally, it can be used to adjust the lights settings remotely.

The AsteraBox™ is needed to interface your Android device with the lights. It communicates to the Android device by Bluetooth and controls the lights by UHF.

(Aster, 23; *see also* Aster, 10, 22, 24.) Through the wireless UHF interface, AsteraApp “pairs” with the one or more AX10 lights, creating a “connection,” so the “lights are controllable.” (*Id.*, 23.)

q. Dependent Claim 17

Claim 17: *The controller according to claim 15, wherein the controller comprises an input interface adapted to receive a user input.*

Aster anticipates Claim 17. (Wood Decl., ¶ 129.) The AX10 has multiple controller interface systems through which users can provide inputs, including the Control Panel and AsteraApp. (Aster, 9.) *See supra* Claim 8.

r. Dependent Claim 18

Claim 18: *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.*

Aster anticipates Claim 18. (Wood Decl., ¶ 130.) The AX10 includes the controller according to claim 15 (*see Supra* Claim 15), as well as “9 x 15 RGBAW Philips LEDs,” and thus includes at least one LED lighting device. (Aster, 7.)

4 SPECIFICATION

LED power:	135W
Illuminants:	9 x 15W RGBAW Philips LEDs
Luminous Flux*:	3,350lm (at White 4000K)
Emittance*:	10,350lx (at 2m; White 4000K)

(*Id.*, 7 (annotated).)

s. Dependent Claim 19

Claim 19: *The lighting system according to claim 15 wherein said controller and said lighting device are integrated in a combined unit.*

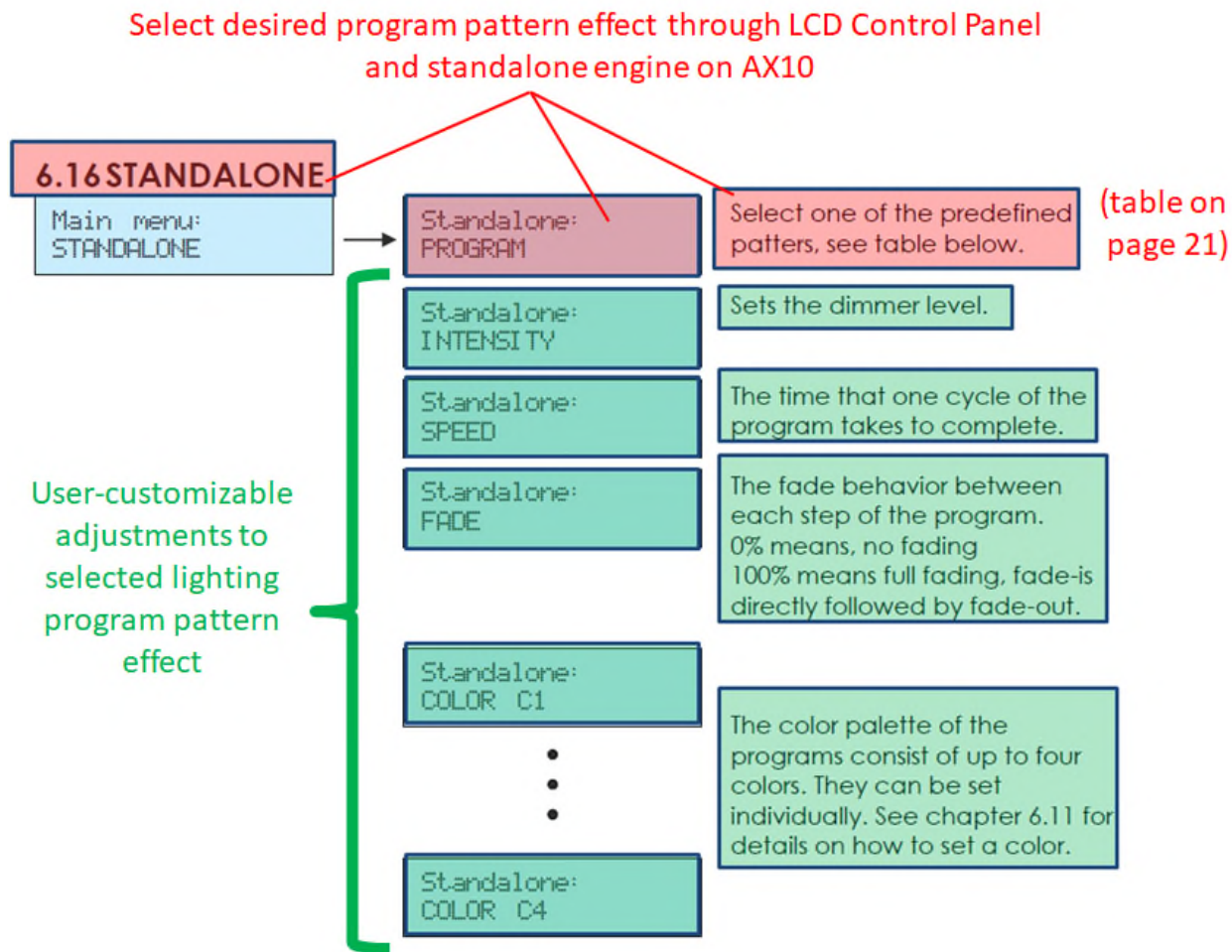
Astera anticipates Claim 19. (Wood Decl., ¶ 131.) The AX10 LEDs can be controlled through the Control Panel on the AX10 itself. (Astera, 9.) The AX10 has a built-in standalone engine controlled through the Control Panel to select programs, and adjust speed, intensity, fade, and color of the program effect. (*Id.*, 9-10, 20-21; *see also id.*, 13 (“standalone” mode”).)

6.6 CONTROL PANEL

User-customizable
adjustments to
selected lighting
program pattern
effect

LEGEND			
 BACK TO PREVIOUS MENU	 SCROLL DOWN	 SCROLL UP	 CHOOSE/ CONFIRM
FROM THE STATUS SCREEN, PRESS THE ABOVE BUTTONS TO:			
ENTER THE MAIN MENU	FACTORY RESET	ENTER THE MAIN MENU	ENTER THE DMX MENU
HOLD THE ABOVE BUTTON FOR 2SECS TO:			
STANDALONE MENU	ADJUST SPEED	ADJUST BRIGHTNESS	CHANGE PROGRAM

Select desired
program pattern



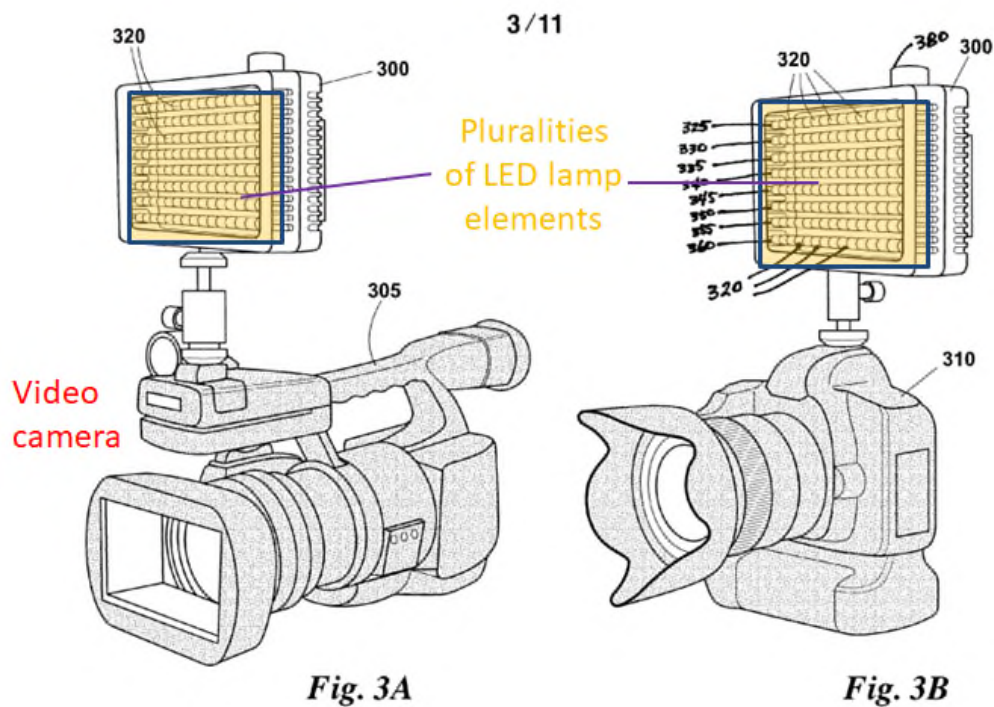
(*Id.*, 11, 20 (annotated).) Thus, the Control Panel and light (*e.g.*, the LEDs) are integrated into a combined device.

B. Grounds Based on Pohlert

Pohlert is a U.S. patent application that published on February 23, 2012, and is prior art under at least 35 U.S.C. § 102(a)(1).

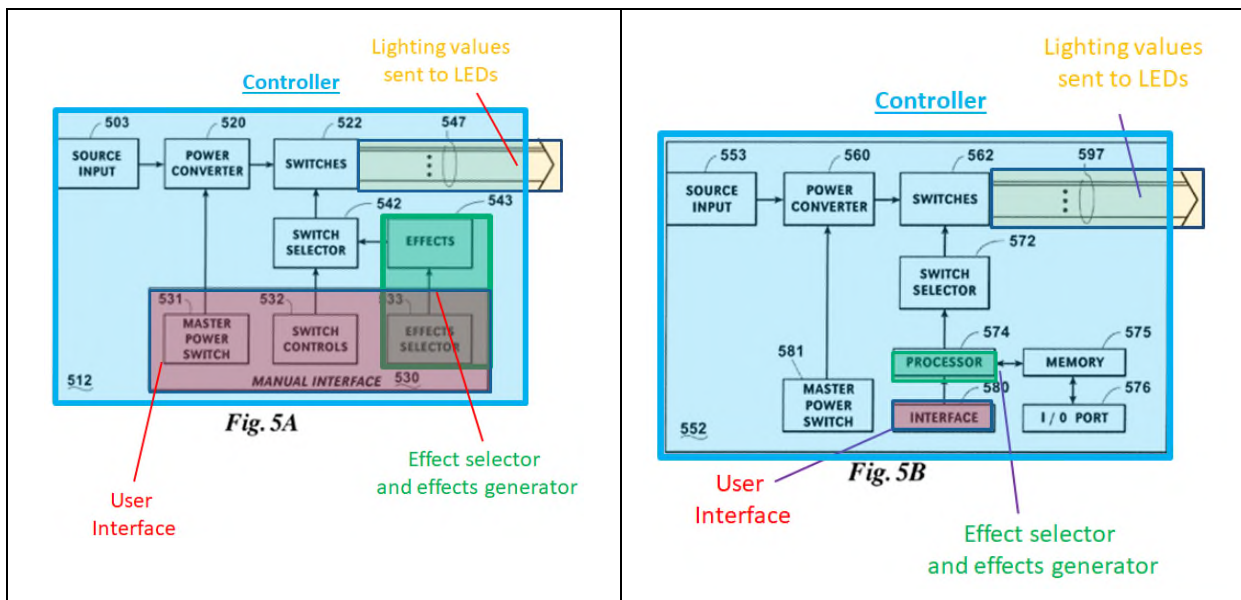
Pohlert discloses a “lighting and effects generation system” (such as shown in Figs. 3A and 3B below) that includes LED lamps in a lighting frame, with a connected and dedicated “power controller.” (Pohlert, Abstract, [0051], [0057]; *see*

also Wood Decl., ¶ 133.) The power controller includes (1) a user interface to select and customize lighting effects, including lighting patterns based on “pseudo-random” sequences of strobing and flashing groups of LEDs, (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.



(Pohlert, Figures 3A-3B (annotated).)

Example “Power Controllers” Used in Figs. 3A-3B



(*Id.*, Figures 5A-5B (annotated).))

1. **Ground 2 – Pohlert Anticipates or Renders Obvious Claims 1-21**

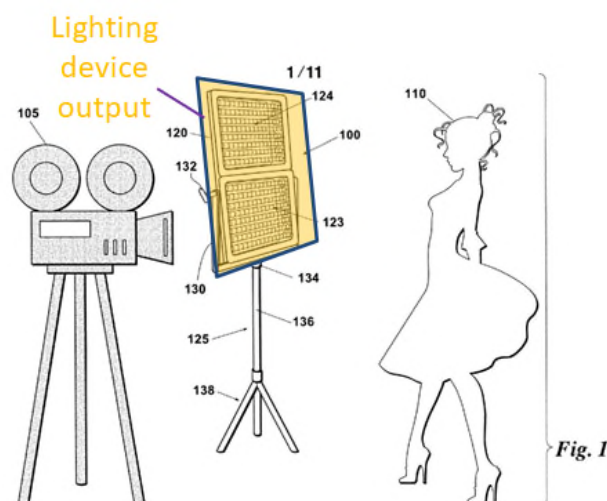
a. **Independent Claim 1**

Pohlert anticipates Claim 1.

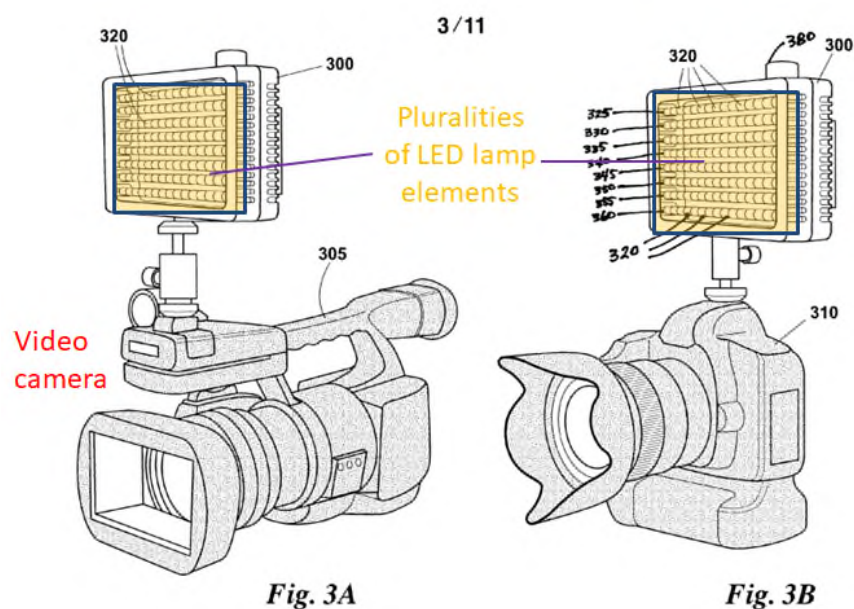
Claim 1p: *A method for controlling a lighting device to produce a user customisable lighting effect, the method comprising:*

Pohlert discloses Claim 1p. (Wood Decl., ¶ 136.) 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 special effects, such as patterns of strobing, flashing, and dimming and brightening the lights. (Pohlert, Abstract, [0020], [0050], [0063], [0067], [103].) This can be used for “photography, film, television, and other applications.” (*Id.*, [0003].) Figure 1

illustrates use of the lighting system with a video camera that may be “a motion picture-type camera.” (*Id.*, [0052].)



(*Id.*, Figure 1 (annotated).)



(*Id.*, Figures 3A-3B (annotated).)

Claim 1a: *calculating, using an effect simulator, a time varying lighting value based on at least one simulation parameter;*

Pohlert discloses Claim 1a. (Wood Decl., ¶¶ 137-145.) In Pohlert, 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 desired light output. (*Id.*, [0059], [0061]-[0062], [0065]-[0067]; *see also* Wood Decl., ¶ 139.) These power control signals provide time-varying signals for “controlling the intensities” of the LEDs to generate the desired light output patterns and effects. (*Id.*, *see also id.*, [0050]-[0051].) Moreover, these power controls signals are based on user-selected parameters for desired lighting effects, including brightness (or dimming), duration, frequency, whether a sequence will be pseudo-random, and color. (*Id.*, [0051], [0061]-[0067], [0089]-[0091].)

Users may select a strobing effect, for example, implemented by the controller generating an oscillating signal (which is a time varying signal) and applying it as a control signal to control intensities of the LEDs. (Wood Decl., ¶¶ 139-140; *see also* Pohlert, [0062].) Users can adjust the oscillator frequency parameter of the strobing effect “via a manual knob, switch, or other selection means as part of the effects selector 533” in the user interface. (*Id.*, [0062].)

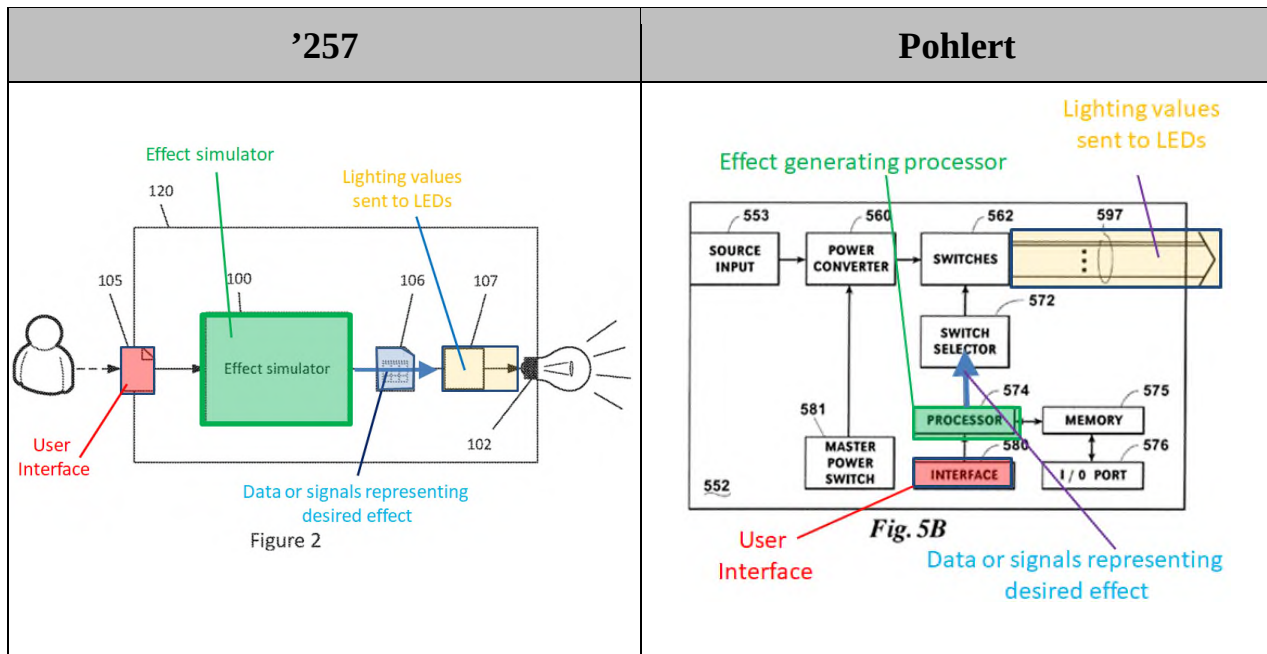
Adjusting the oscillation frequency causes the controller to calculate and create a

new output time varying power control signal, changing frequency of the strobing. (Wood Decl., ¶ 140.)

Pohlert also discloses generating light effect patterns where light segments are strobed, flashed, or dimmed in sequences, requiring the controller to calculate signals that are time varying, as some lights are on and some off at different times to generate patterns. (Wood Decl., ¶ 141; *see also* Pohlert, [0063], [0067].) The brightness and frequency of these patterns are customized by user-selected parameters, including the brightness and dimming of different groups of light elements during the pattern and whether the sequences will be pseudo-random. (*Id.*, Pohlert, [0063], [0067].)

And, to adjust the color or color temperature of the LEDs, users input “intensity control” and “ratio control” adjustments through “manual control knobs, dials, switches, or other such means, or alternatively ... a digital keypad, a set of digital buttons, or the like” on an interface. (*Id.*, [0088]; *see also id.*, [0089]-[0092].) The “intensity control” and “ratio control” adjustments are received by “intensity control circuits” and “ratio control circuits” in the controller, which then calculates and generates signals to modify the power supply to the LEDs to generate desired colors and color temperature. (*Id.*, [0089]; *see also id.* [0090]-[0091]; Wood Decl., ¶ 142.)

The effect simulator and output of lighting values disclosed in Pohlert is also strikingly similar to that disclosed in the '257:



(Compare, e.g., '257, Figure 2 (annotated) with Pohlert, Figure 5B (annotated); see also Pohlert, Figure 5A.)

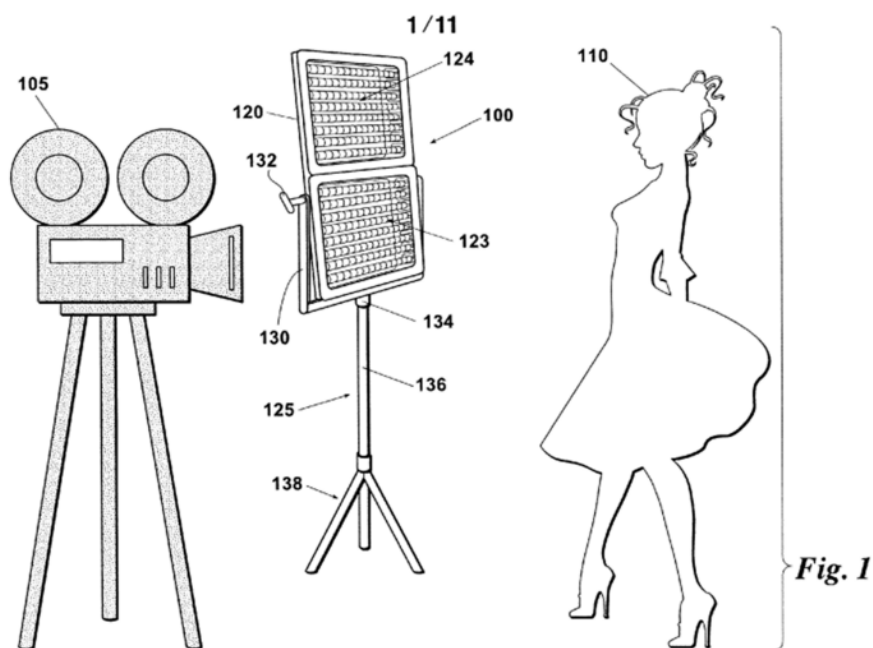
Claim 1b: wherein said at least one simulation parameter characterises a user customisable lighting effect selected from a range of different user customisable lighting effects for at least one of: videography, broadcasting, cinematography, studio filming, and location filming;

Pohlert discloses Claim 1b. (Wood Decl., ¶¶ 146-149.) Users can select from a range of effects through an interface on the controller, such effects including patterns and pattern sequences, strobing, flashing, and dimming and brightening. (Pohlert, [0057]-[0059], [0061], [0063], [0067]; Figures 2, 5A, 5B.) Users can “customize” these effects by selecting and adjusting different simulation

parameters. *See supra* Claim 1a. These parameters characterize the selected effect, in that, as in the '257, the effect generated in Pohlert is dependent on and reflective of these parameters. (Wood Decl., ¶ 146; *see also* Pohlert, [0057]-[0059], [0061], [0063], [0067].)

Further, these simulation parameters include selections for brightness (or dimming), duration, frequency, whether a sequence will be pseudo-random, and color. (*Id.*, [0051], [0061]-[0063], [0066]-[0067], [0089]-0091].) Users can customize the desired lighting pattern by choosing from, and adjusting, the combinations of parameters that make up the pattern, including predetermined strobing and flashing sequences, pseudo-random strobing and flashing sequences, and dimming and brightening of different light elements. (*Id.*; *see also* Wood Decl., ¶ 147.)

The lighting effects, created based on these parameters, are used to provide lighting for “photography, film, television, and other applications.” (*Id.*, [0003], [0005].) Figure 1 illustrates using the lighting system with a video camera that may be “a motion picture-type camera.” (*Id.*, [0052].)



(Id., Figure 1.)

Claim 1c: *wherein said at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;*

Pohlert discloses Claim 1c. (Wood Decl., ¶¶ 150-153.) The user-selected lighting effect patterns 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 325, 330, 335, 340, 345, 350, 355, and 360 (given the example of FIG. 3B) 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.**” (Pohlert, [0063])

(emphasis added); *see also id.* [0067].) As acknowledged by the '257, a “pseudo-random parameter” is considered “to be equivalent to a truly random parameter.” ('257, 7:30-34; *see also* Wood Decl., ¶ 150.)

Selecting to strobe or flash different light elements, or groups of light elements, in a pseudo-random sequence includes “random brightness” (the intensity of the overall strobe or flash), “random duration” (how long a strobe or flash lasts), and “random intervals” (time between strobes or flashes). (Pohlert, [0063, [0067]; *see also* Wood Decl., ¶ 151.) 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). (Wood Decl., ¶ 151.) A POSITA would thus understand that such a pseudo-random sequence would include random brightness, duration, and intervals. (Wood Decl., ¶¶ 151-152.)

For example, the brightness of the sequence, and each step of the sequence, will be random, as it will depend 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.*) In addition, 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 or groups of elements in a consistent sequence of set interval and duration. (*Id.*; *see also* Pohlert, [0063], [0067].)

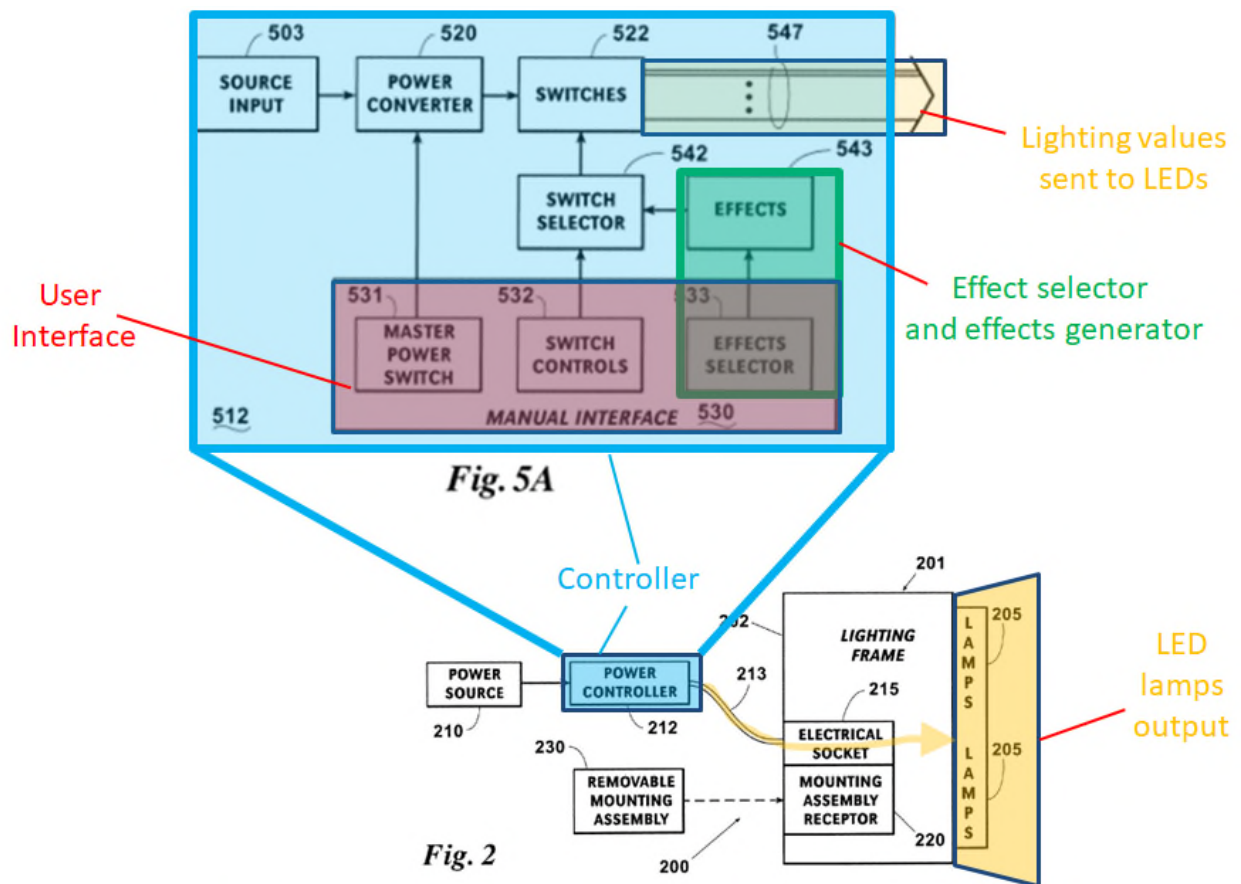
Claim 1d: *said simulation parameter depending on the user customisable lighting effect being simulated;*

Pohlert discloses Claim 1d. (Wood Decl., ¶¶ 154-156.) The simulation parameters depend on the customizable lighting effects selected by the user through the interface. *See supra* Claims 1b-1c. Simulation parameters of dimming or brightening different groups of light elements, 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. (Pohlert, [0063], [0067].) Similarly, the simulation parameter related to “frequency” of an oscillation signal depends on the user selecting to simulate a “strobing” effect. (*Id.*, [0061]-[0063], [0066]-[0067].) That is, the adjustment parameter for the “frequency” of strobing is directly related to users selecting to produce a strobing effect. (Wood Decl., ¶ 156.)

Claim 1e: *outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customisable lighting effect.*

Pohlert discloses Claim 1e. (Wood Decl., ¶ 157.) The “power controller” sends control signals through wires supplying power to light elements, causing the

light elements to simulate the selected effect. *See supra* Claims 1a-1d. The output from the “effects selector” and “effects generator” or “processor,” and switches, in the controllers shown in Figures 5A-5B are provided to the LED lamps through a cable or wires. (Pohlert, [0058]-[0059] (“The power converter 520 is preferably connected to a plurality of switches 522 ... each switch controlling power delivered by the power converter 520 to one of the wires 547 output by the power controller 512. ... The switch selector 542 would then convert each knob setting to a set of control signals to the appropriate switches 522, which in turn would control power to the wires 547 supplying power to the light segments.”).)



Combined LED lighting device and dedicated, connected controller

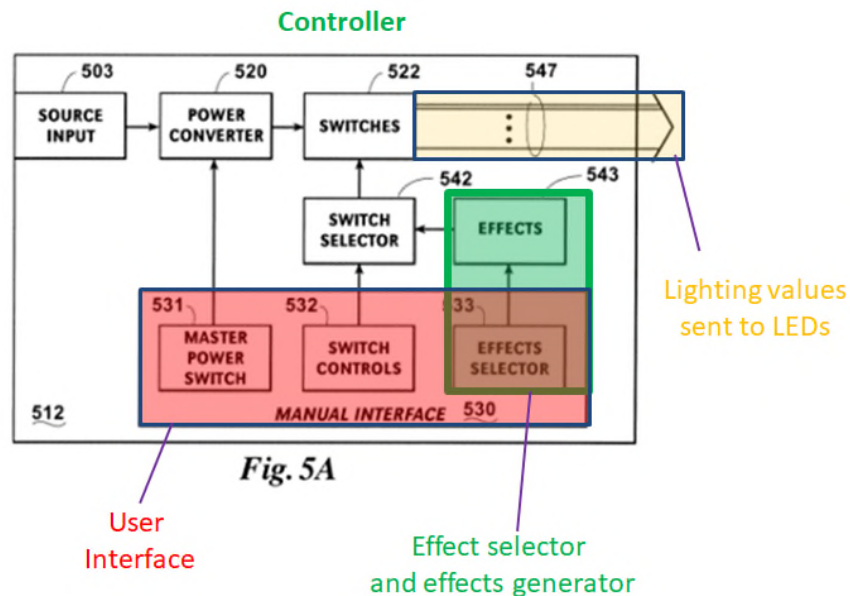
(Id., Figures 2, 5A (annotated); see also Figure 5B.)

b. Independent Claims 15 and 20

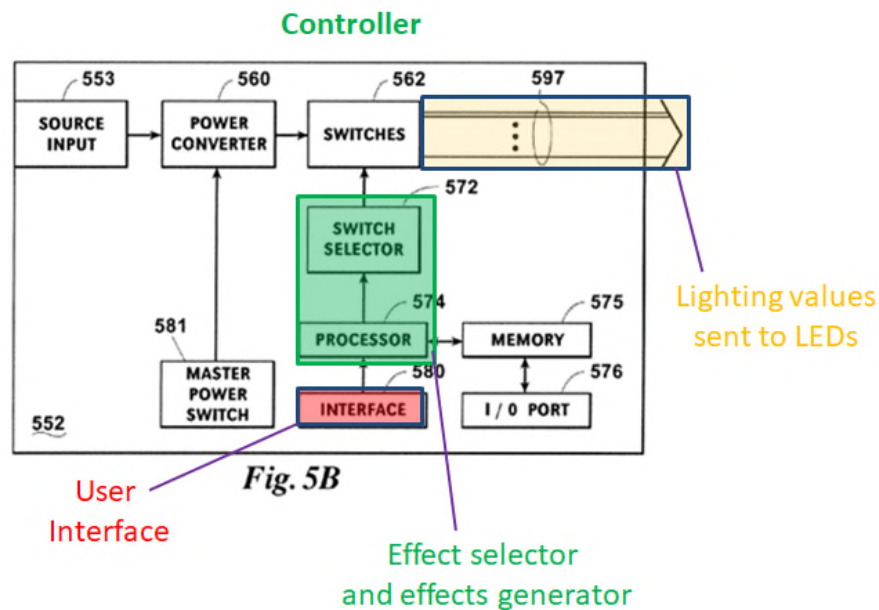
For this Petition, there are no substantive differences between Claim 1 and Claims 15 and 20 (see *supra* Astera, Claims 15 and 20), and Pohlert anticipates Claims 15 and 20 for the same reasons as Claim 1. See *supra* Claim 1. (See also Wood Decl., ¶¶ 158-162.) Moreover, as discussed above in Claim 1, Pohlert expressly discloses the method can be performed on a “controller” or a “software program.”

A controller performs the method for controlling the lighting elements.

(Pohlert, Figures 5A, 5B, [0057]-[0067].) *See also supra* Claim 1a.



(*Id.*, Figure 5A (annotated).)



(*Id.*, Figure 5B (annotated).) The Figure 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.*, [0066]-[0067].)

Thus, 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.

c. Dependent Claim 2

Claim 2: *The method according to claim 1 wherein the random brightness comprises a random peak brightness.*

Pohlert anticipates Claim 2. (Wood Decl., ¶¶ 163-164.) Pohlert discloses strobing or flashing all, or different groups of, light elements in a pseudo-random sequence. *See supra* Claim 1c. As different groups of light elements may contain differing numbers of light elements turning randomly on and off, each activated light grouping has a different, random peak brightness. (Wood Decl., ¶ 163.)

Different combinations of groups of light elements may be selected, and the total light output would change depending on which groups are selected. (*Id.*, [0059] (“The switch controls 532 could have a first setting to select all of the light segments ... thereby illuminating all 320 light elements, a second setting to select every other light segments 325, 335, 345 and 355, and a third setting to select every fourth of light segment 325, 340, 360, thus providing options of 100%, 50% and 25% total light output.”).) Thus, 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.*, [0059], [0063], [0067].) Depending on how many light segments are activated at any given time in the pseudo-random sequence, the peak brightness generated randomly changes. (Wood Decl., ¶¶ 164.)

d. Dependent Claim 3

Claim 3: *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.*

Pohlert anticipates Claim 3. (Wood Decl., ¶¶ 165-166.) The random interval can be a pseudo-random strobing or flashing sequence. (Pohlert, [0063], [0067].) *See also supra* Claim 1c. A sequence of strobes or flashes is a series of strobes and flashes following one after another. (Wood Decl., ¶ 165.) When this sequence is pseudo-random, the interval, or time between strobes or flashes and groups thereof, changes in a random manner (as opposed to a consistent, non-random sequence, where the interval would be uniform). (*Id.*, ¶¶ 165-166.) Pohlert implements the pseudo-random sequences by controlling “all or different groups” of the light elements, causing random intervals between flashes and groups of flashes, as different groups of elements are randomly turned on and off. (Pohlert, [0063], [0067]) With a random interval between flashes or groups of flashes, the frequency of the flashes is also random. (Wood Decl., ¶ 166.)

e. Dependent Claim 4

Claim 4: *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.*

Pohlert anticipates Claim 4. (Wood Decl., ¶¶ 167-168.) The random sequences can be pseudo-random strobing or flashing sequences. (Pohlert, [0063], [0067].) *See also supra* Claim 1c. 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. (Pohlert, [0063], [0067].) For example, 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 with respect to each other. (Wood Decl., ¶ 167.) Pohlert’s random sequence of flashes thus includes a random number of pulses making up the sequence. (*Id.*)

Further, patterns may be generated using “combinations” of effects, including combinations of pseudo-random sequences of flashing and strobing the LEDs and gradually dimming or brightening the same LEDs. (Pohlert, [0063], [0067].) A POSITA would recognize that gradually dimming and brightening the 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. Thus, the ramp up to the peak brightness, and ramp down from the peak brightness,

would be random and would also change randomly with the dimming and brightening of the random sequences. (Wood Decl., ¶ 168.)

f. Dependent Claim 5

Claim 5: *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.*

Pohlert anticipates Claim 5. (Wood Decl., ¶¶ 169-171.) Pohlert simulation parameters include pseudo-random sequences of flashes or strobing. ([Pohlert, [0063], [0067].) These sequences are applied within “predefined boundaries” of the patterns, and within “predefined boundaries” of the capabilities of the lighting elements. (Wood Decl., ¶ 169.)

Pohlert discloses predefined boundaries for the “amplitude” of the light produced in its pseudo-random sequences. (*Id.* [0059], [0063], [0067].) The pseudo-random sequences can include flashing or strobing different combinations of groups of LEDs. (*Id.*, [0063], [0067].) And, the “amplitude” of light in a pattern will depend on the number of groups of LEDs activated at any given time. (*Id.*, [0059] (indicating a 100% total light output (or amplitude) when all groups of LEDs are activated at the same time, a 50% total light output when every other group is activated, and a 25% total light output when every fourth group is activated).) Thus, 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. (Wood Decl., ¶ 170.)

With respect 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.*, ¶ 171.) This frequency has predefined upper and lower boundaries determined by the LEDs and their circuitry. (*Id.*) Further, 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 specific LED and power supply. (*Id.*, ¶¶ 171.)

g. Dependent Claim 6

Claim 6: *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.*

Pohlert anticipates Claim 6. (Wood Decl., ¶¶ 172-173.) The simulation parameters can include random brightness, duration, and intervals in pseudo-random sequences of strobes and flashes. *See supra* Claim 1a-1d. These random parameters are determined based on user selections through an interface. (Pohlert, [0063], [0067].) *See also infra* Claim 8.

More specifically, 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.**” (Pohlert, [0063] (emphasis added).) Based on the user interface selections to implement random (as opposed to 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.*) These combinations, including random sequences, thus depend on the user selections of such combinations of effects. (Wood Decl., ¶ 173.)

h. Dependent Claim 7

Claim 7: *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.*

Pohlert anticipates Claim 7. (Wood Decl., ¶¶ 174-176.) The simulation parameter is related to at least “a brightness.” (*Id.*) Pohlert discloses the parameter of using “pseudo-random” sequences of strobing and flashing light elements, either individually, in groups, or all together. (Pohlert, [0063], [0067].) Depending on how many of the elements are activated at any given time during the sequence, the

brightness levels will vary. (*Id.*) Thus, Pohlert teaches the simulation parameter is related to at least brightness. (Wood Decl., ¶ 174.) *See also supra* Claims 1c, 2, 4.

Moreover, the effects used to generate a pattern can include “combinations” of pseudo-random sequences *and* “gradually dimming and brightening.” (Pohlert, [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. (Wood Decl., ¶ 175.) *See also supra* Claim 4.

Further, the LEDs may be of differing colors, as selective combinations of red, green, and blue (RGB) LEDs can be used to “generate virtually any desired color.” (Pohlert, [0084].) Thus, the simulation parameters used to generate patterns or sequences may be related to “color fluctuation periods,” as light element groups may be of different colors in different steps in the sequences or patterns, generating different color fluctuation time. (*Id.*, [0063], [0067].)

i. Dependent Claim 8

Claim 8: *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.*

Pohlert anticipates Claim 8. (Wood Decl., ¶¶ 177-182.) 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, and dimming and brightening. (Pohlert, [0059], [0066]-[0067], Figures 5A, 5B.)

In the **Figure 5A controller**, a “**manual interface 530** is provided to allow operation of the switches 522 according to manual selection. The manual interface 530 may include a master power switch 531, switch controls 532, and, optionally, an effects selector 533. The switch controls 532 may include an individual manual switch, button or other selection means for each individual switch provided in the set of switches 522, or else may comprise a control mechanism (such as knob or reduced number of manual switches, buttons or other selection means) for selecting groups of switches 522 according to predesignated arrangements.” (*Id.*, [0059].)

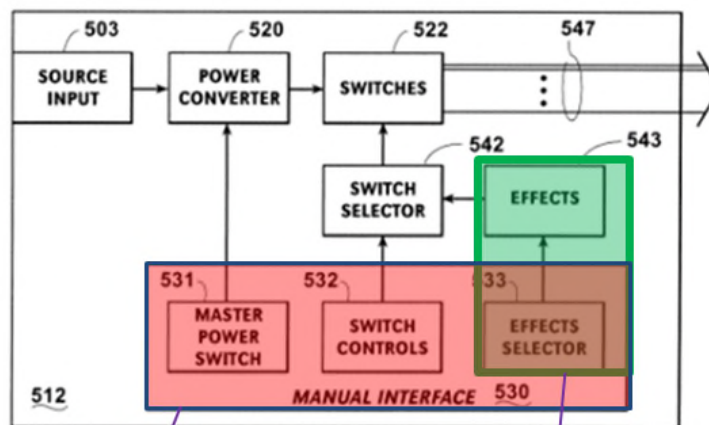


Fig. 5A

User
Interface

Effect selector
and effects generator

(*Id.*, Figure 5A (annotated).)

Through this Figure 5A interface, 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.*, [0061].) Moreover, 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.*, [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.*)

Similarly, the **Figure 5B** controller includes “**an 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, as generally explained previously with respect to FIG. 5A.” (*Id.*, [0066].)

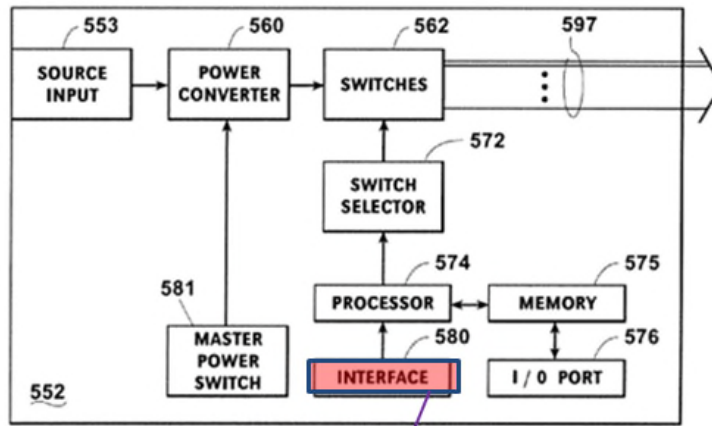


Fig. 5B

User
Interface

(*Id.*, Figure 5B (annotated).)

Selections made through the Figure 5B 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.*, [0067].) 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. Patterns may include, for example, strobing or flashing all or different groups of light segments ... in a predefined (or pseudo-random) sequence, strobing or flashing different low power lamps 320 of the light segments 325-360 in a predefined (or pseudo-random) sequence, gradually dimming or brightening the light segments 325-360 (individually, in groups, or collectively), or various combinations of these effects is contemplated.” (*Id.*)

The desired effect patterns are therefore adapted based on the user-selected effects and parameters. (Wood Decl., ¶ 182.)

j. Dependent Claim 9

Claim 9: *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.*

Pohlert anticipates Claim 9. (Wood Decl., ¶¶ 183-190.) Pohlert discloses the effect parameters can include maximum and minimum brightness, colour, and a trigger. (Pohlert, [0061]-[0067], [0084]-[0091].)

With respect to a “**maximum brightness**” and “**minimum brightness**,” Pohlert discloses users can selectively dim or brighten the light elements. (*Id.*, [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, for example, through a manual control knob or multi-position switch on the effects selector 533.” (*Id.*, [0061].) Pohlert further discloses that a “dimmer switch” may be provided to allow users to “control the light output.” (*Id.*, [0064].) By adjusting the dimmer switch, users may select the maximum for the lighting elements producing the effect. (Wood Decl., ¶ 184.) Similarly, 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.*)

Additionally, the pattern generation effects can include “gradually dimming or brightening” the light segments. (*Id.*, [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.” (Wood Decl., ¶ 185.) Similarly, brightening involves increasing the brightness to a “maximum brightness.” (*Id.*)

With respect to “**a colour**,” the user-selected effects can include a color parameter. For example, bi-color LEDs may be used, allowing users to adjust the output color and color temperature (degrees Kelvin) of the apparatus. (Pohlert, [0086].) Pohlert explains that “[b]ecause the two different colors of LEDs (e.g., daylight and tungsten) can be controlled separately ... and because these particular LEDs, or other similar complementary colors, do not have significant color shifts when dimmed, it would be relatively straightforward to adjust (e.g., cross-fade, cross-dim) between the two colors and, for example, provide a variety of natural light illumination effects for various types of common film stock.” (*Id.*, [0092]; *see also id.*, [0086]-[0091].)

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. (*Id.*, [0059], [0065]-[0067].) Pohlert discloses selecting, through the processor in the Figure 5B controller, “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. (*Id.*, [0066]-[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 also infra* Claim 12. Pohlert also 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). (*Id.*, [0022].) Pohlert states its system, which includes the power controllers, is “particularly well suited for use with such optical, IR or RF slave flash systems.” (*Id.*, [0023].)

k. Dependent Claim 10

Claim 10: *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.*

Pohlert anticipates Claim 10. (Wood Decl., ¶ 191.) The pattern generation may include implementation of “various combinations” of patterns and sequences

that include pseudo-random sequences of strobing and flashing. (Pohlert, [0063], [0067].) *See also supra* Claims 1b-1d. In particular, “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.” (Pohlert, [0067].) These programming instructions, which provide for 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 within a pattern. (*Id.*, *see also* Wood Decl., ¶ 191.)

I. Dependent Claim 11

Claim 11: *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).*

Pohlert anticipates and renders obvious Claim 11. (Wood Decl., ¶¶ 192-193.) Pohlert’s effects and patterns 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.*, [0063]; *see also id.*,

[0062], [0067].) Thus, Pohlert explicitly discloses “flashes (strobe).” (Wood Decl., ¶ 192.)

Moreover, a POSITA would understand the pattern generation and sequences (*id.*, [0063], [0067], [0081]) can produce additional claimed effects, such as mimicking lightning, welding, and sparking. (Wood Decl., ¶ 193.) For example, 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. Dependent Claim 12

Claim 12: *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.*

Pohlert anticipates Claim 12. (Wood Decl., ¶¶ 194-198.) The '257 indicates a “trigger” is simply something “to start the effect running” and can be a manual trigger or a remote signal. ('257, 6:52-54, 9:43-45.) Pohlert discloses selecting, through the Figure 5B controller 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. (Pohlert, [0066]-[0067].) 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.*)

Further, Pohlert discloses 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.*, [0067].)

The manual interface 530 in the Figure 5A controller also provides for defined “trigger events” to start illumination of the lighting elements. (*Id.*, [0059].) For example, 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.*)

Pohlert discloses additional “trigger events.” For example, “[t]o accomplish dimming, the processor 574 may be programmed select binary-encoded values to load into registers of the switch selector 572, which in turn select a variable resistance value which controls the output from each individual or group of switches 562.” (*Id.*, [0067].) Similarly, “[t]o accomplish strobing, the processor 574 may be programmed to turn the switches 562 on and off according to a predesignated pattern dictated by the programming instructions.” (*Id.*, [0067].) The instructions to select resistance values, or turn on and off the switches, to

accomplish dimming and strobing are triggers that initiate the generation of those desired effects. (Wood Decl., ¶ 197.)

Moreover, 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). (*Id.*, [0022]-[0023].) These may be “optical slave flashes” that are “**triggered** by light,” including light pulses from another device. (*Id.*, [0023] (emphasis added).) The lighting and effect generation system is “particularly suited for use with such” optical slave flashes. (*Id.*) 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. (Wood Decl., ¶ 204.)

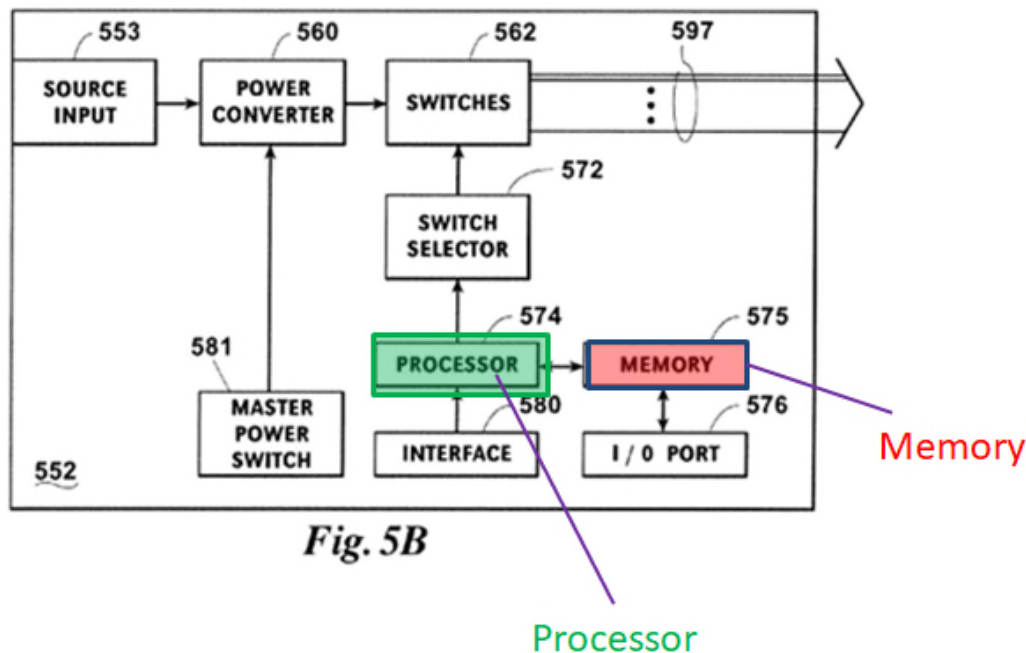
n. Dependent Claims 13 and 21

Claim 13: *The method according to claim 1, further comprising storing the at least one simulation parameter corresponding to said user customisable lighting effect.*

Claim 21: *The method according to claim 13, further comprising recalling said stored at least one simulation parameter from a memory.*

Pohlert anticipates Claims 13 and 21. (Wood Decl., ¶ 199.) Pohlert discloses a memory storing programming instructions, including the “simulation parameters” for the varying power control signals sent to the LED elements to implement the user-selected effects. (Pohlert, [0066]-[0067].) The Figure 5B controller processor interfaces with a memory, and “reads instructions from the memory 575 and

executes them in a conventional manner. The instructions will generally cause the processor 574 to control the switch selector by, e.g., setting various digital values in registers whose outputs control the switches 562. The programming instructions may also provide for various lighting effects, such as dimming, strobing, pulsation, or pattern generation, for example.” (*Id.*, [0067].)



(*Id.*, Figure 5B (annotated).)

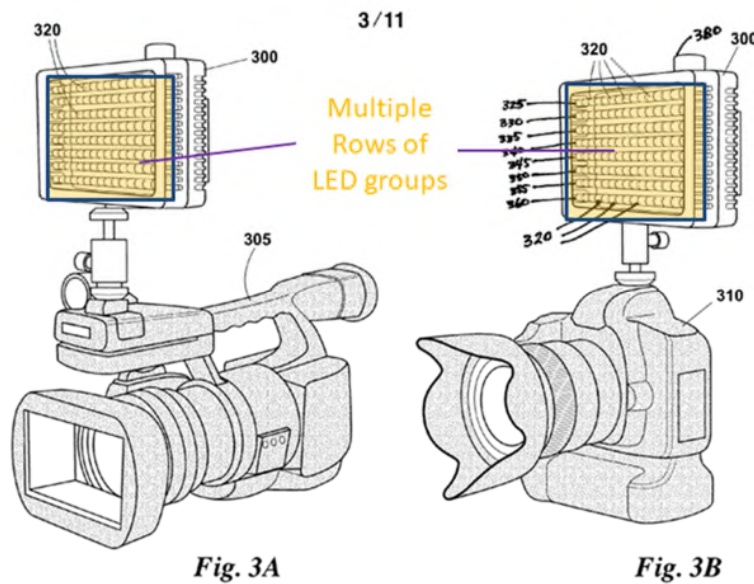
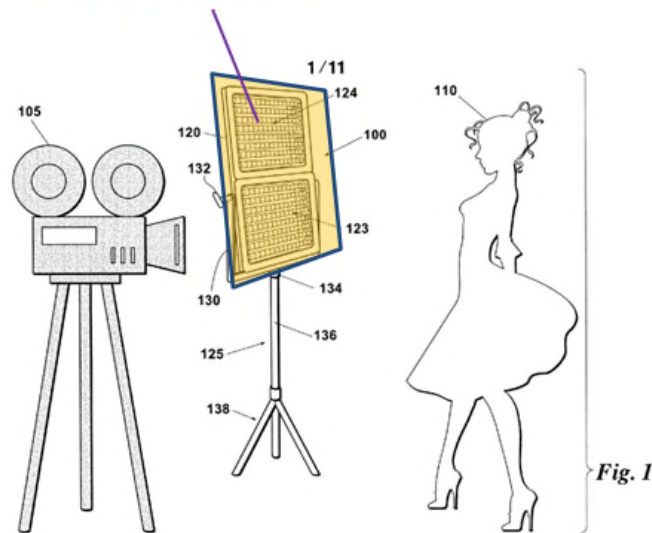
o. Dependent Claim 14

Claim 14: *The method according to claim 1 comprising controlling a plurality of lights in dependence on the output.*

Pohlert anticipates Claim 14. (Wood Decl., ¶¶ 200-204.) Pohlert’s power controller 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 pre-programmed patterns.” (Pohlert, [0050]; *see also id.* [0053], [0059], [0067].)

Multiple lighting
elements in
multiple panels



(*Id.*, Figures 1, 3A, 3B (annotated).)

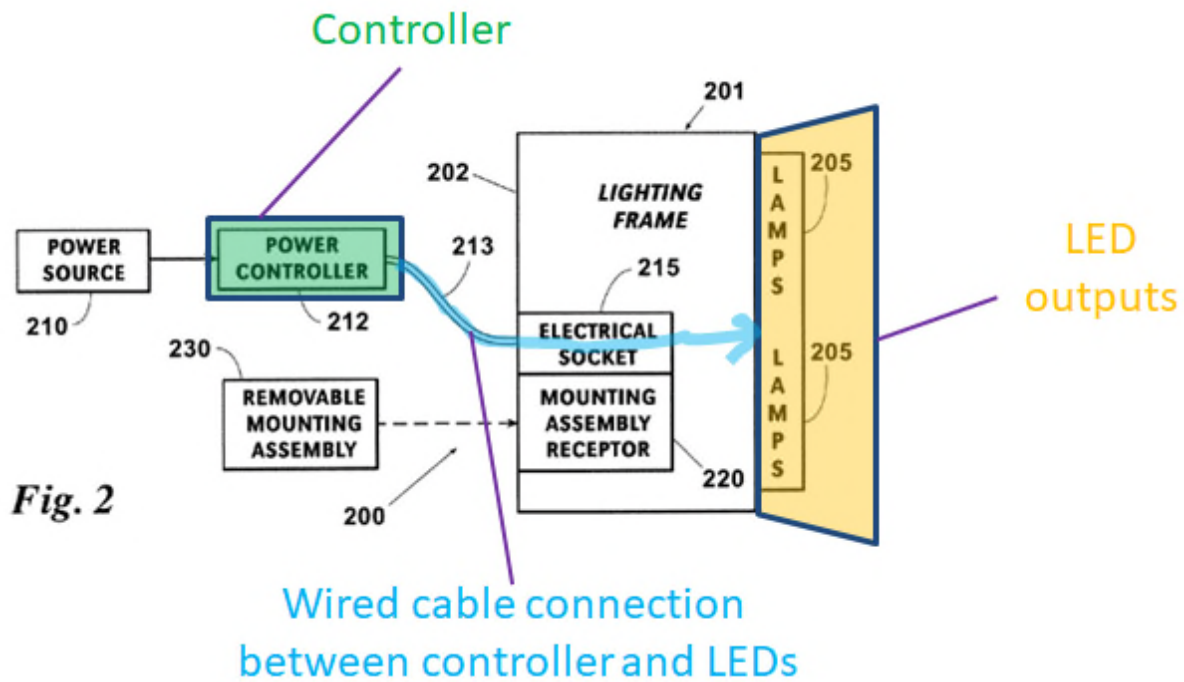
The system may include “multiple panel light sections 123, 124” (*id.*, [0053]), and the lighting arrangements are controlled by the controller to produce effects using multiple light segments. (*Id.*, [0059].) For example, the Figure 5B controller “may be programmed to turn the switches 562 on and off according to a predesignated pattern dictated by the programming instructions... As mentioned before, patterns may include, for example, strobing or flashing all or different groups of light segments 325-360 (given the example of FIG. 3) in a predefined (or pseudo-random) sequence, strobing or flashing different low power lamps 320 of the light segments 325-360 in a predefined (or pseudo-random) sequence, gradually dimming or brightening the light segments 325-360 (individually, in groups, or collectively), or various combinations of these effects is contemplated.” (*Id.*, [0067].)

Moreover, Pohlert discloses “slave flashes” that can be controlled by radio frequency, infrared, and optical signals (including flashes from LEDs controlled by the controller). (*Id.*, [0022]-[0023].) These may be “optical slave flashes” that are “triggered by light,” including light pulses from another device. (*Id.*, [0023].) Pohlert notes that its lighting system is “particularly suited for use with such” optical slave flashes. (*Id.*) 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. (Wood Decl., ¶ 204.)

p. Dependent Claim 16

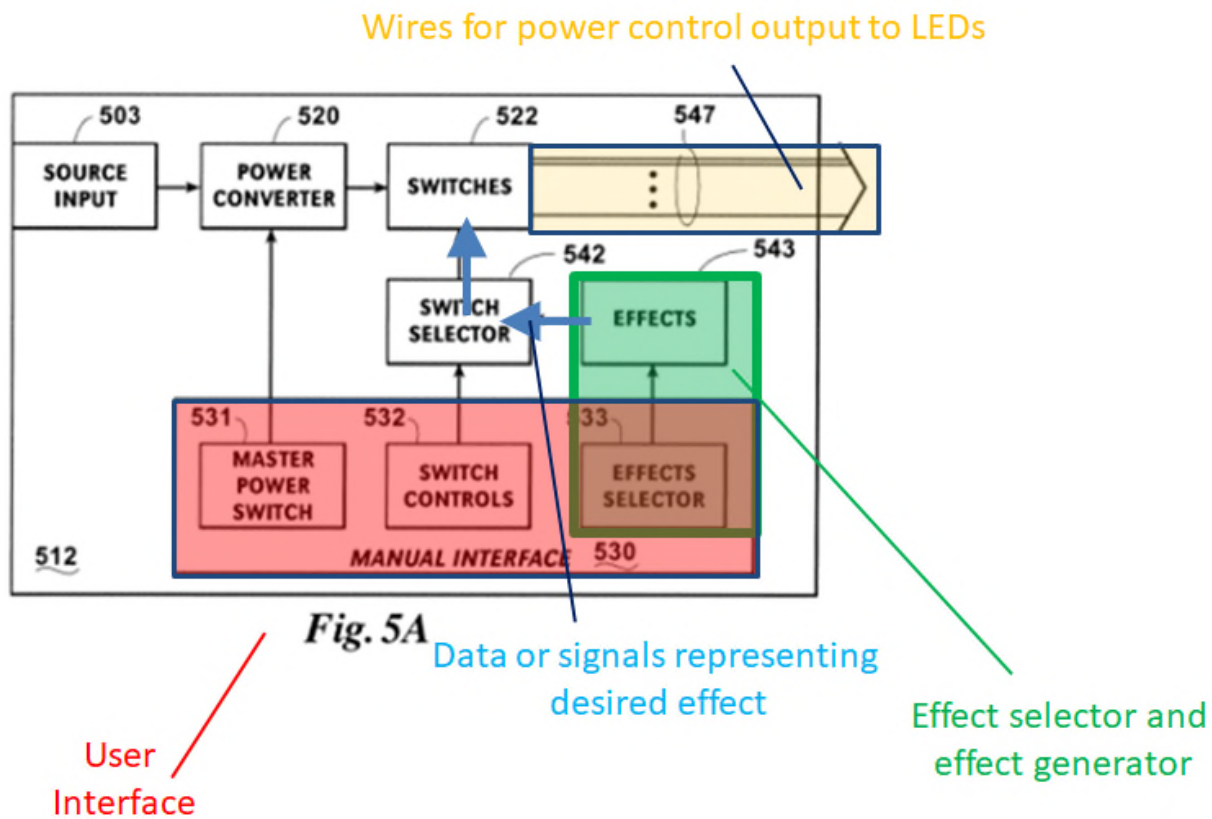
Claim 16: *The controller according to claim 15, wherein the controller comprises a wired or wireless communication interface adapted for communication with one or more lighting devices.*

Pohlert anticipates and renders obvious Claim 16. (Wood Decl., ¶¶ 205-209.) The controllers include a **wired interface** connecting to the lighting devices, wherein the wired connection communicates power control signals to the lighting devices. (Pohlert, [0058].) 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.” (Pohlert, [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.*)



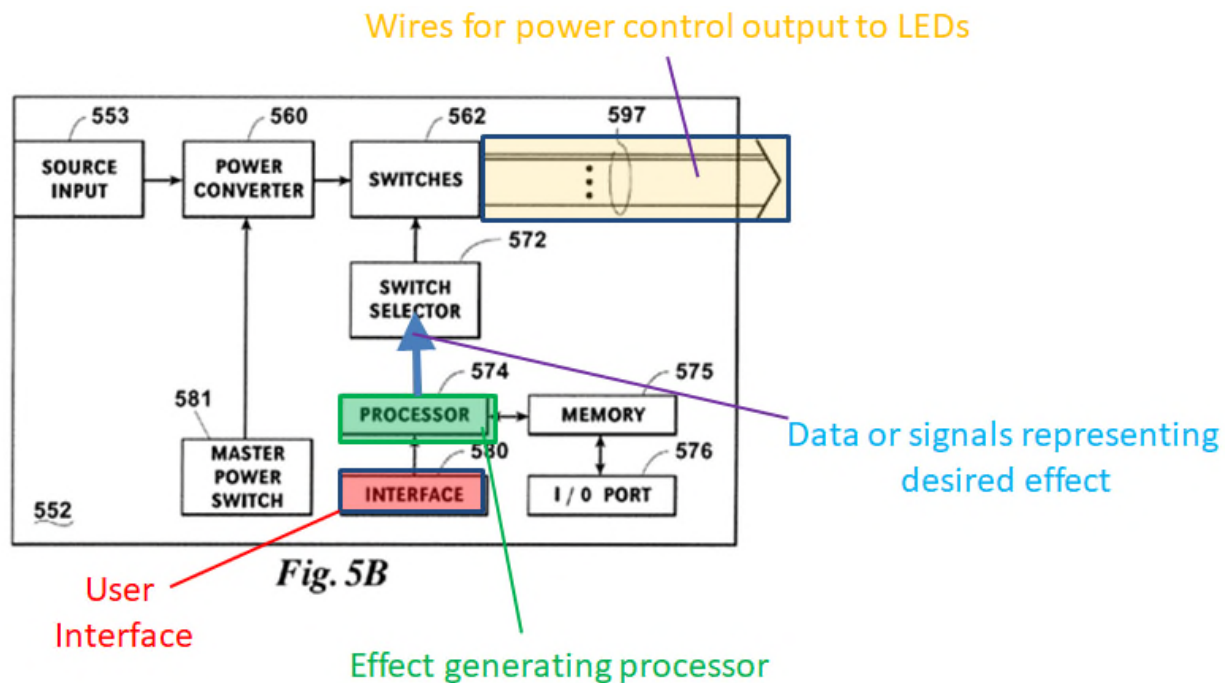
(*Id.*, Figure 2 (annotated).)

The controller shown in Figure 2 can be either the controller shown in Figure 5A or Figure 5B. (*Id.*, [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.*, [0059].)



(*Id.*, Figure 5A (annotated).)

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.*, [0065].)



(*Id.*, Figure 5B (annotated).)

Pohlert also discloses a **wireless communication** interface. (Wood Decl., ¶ 208.) The Figure 5B controller includes an “I/O port” that may be wireless (*e.g.*, infrared) for obtaining digital information. (Pohlert, [0066].) Moreover, 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.*, [0022].) Pohlert states its lighting system is “particularly well suited for use with such optical, IR or RF slave flash systems.” (*Id.*, [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. (Wood Decl., ¶¶ 190, 209.) 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.*)

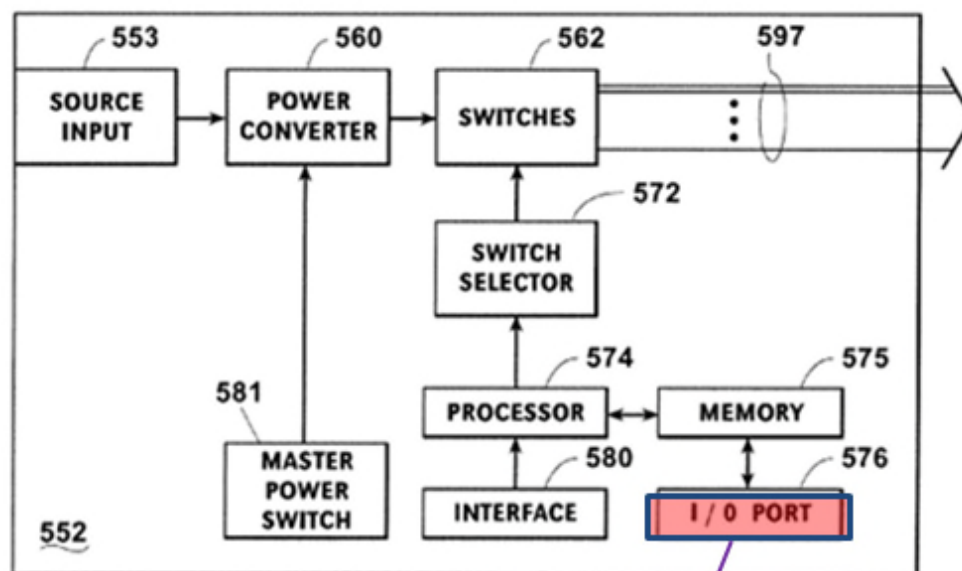


Fig. 5B

Input/output
port

(Pohlert, Figure 5B (annotated).)

q. Dependent Claim 17

Claim 17: *The controller according to claim 15, wherein the controller comprises an input interface adapted to receive a user input.*

Pohlert anticipates Claim 17. (Wood Decl., ¶ 210.) The Figure 5A-5B controllers include an input user interface to receive user inputs. *See supra* Claim 8.

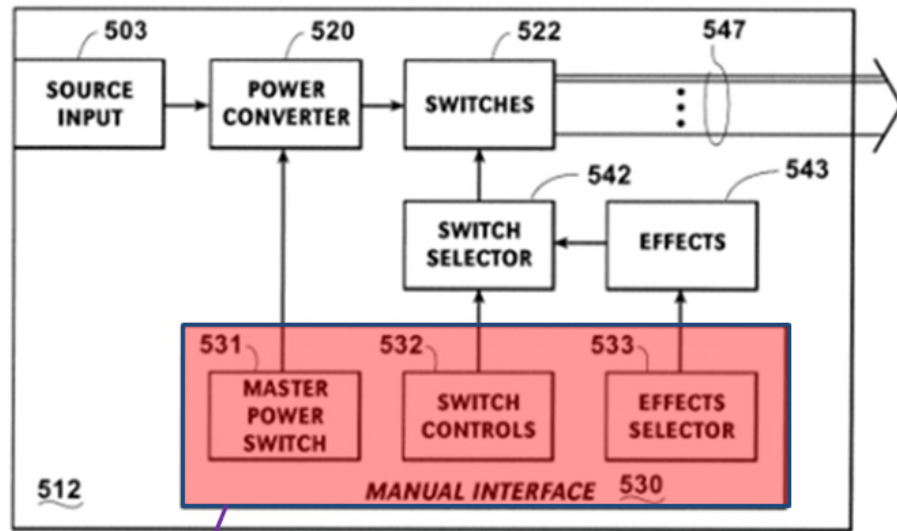


Fig. 5A

User
Interface

(*Id.*, Figure 5A (annotated).)

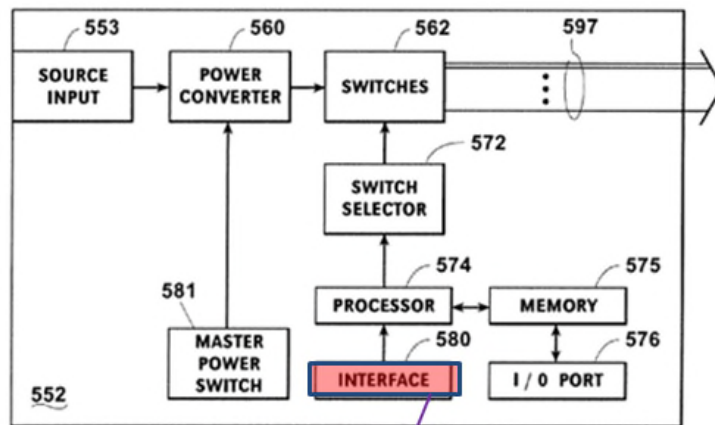


Fig. 5B

User
Interface

(*Id.*, Figure 5B (annotated).)

r. Dependent Claim 18

Claim 18: 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.

Pohlert anticipates Claim 18. (Wood Decl., ¶ 211.) Pohlert discloses a lighting system comprising the controller according to claim 15 (*see Supra* Claim 15), and lamp elements including multiple light emitting diodes (LEDs), such as the plurality of lamp segments 320 shown in Figures 3A and 3B, and that these can be “red, green, and blue LEDs” (*i.e.*, RGB LEDs). (Pohlert, [0057], [0081], [0084].) Pohlert also discloses the lamp elements may comprise “high output LEDs” that “are available in white as well as colors such as green, blue, red, amber, and cyan.” (*Id.*, [0111].)

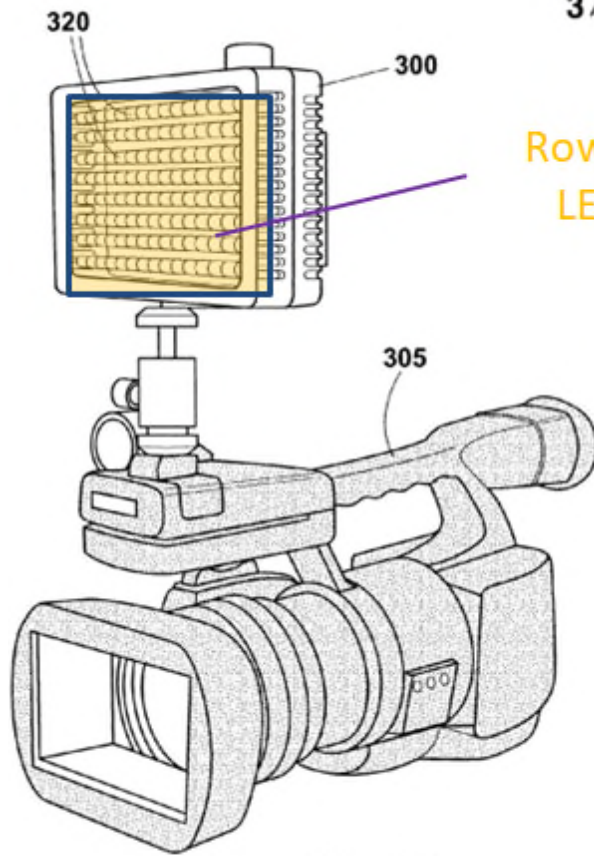


Fig. 3A

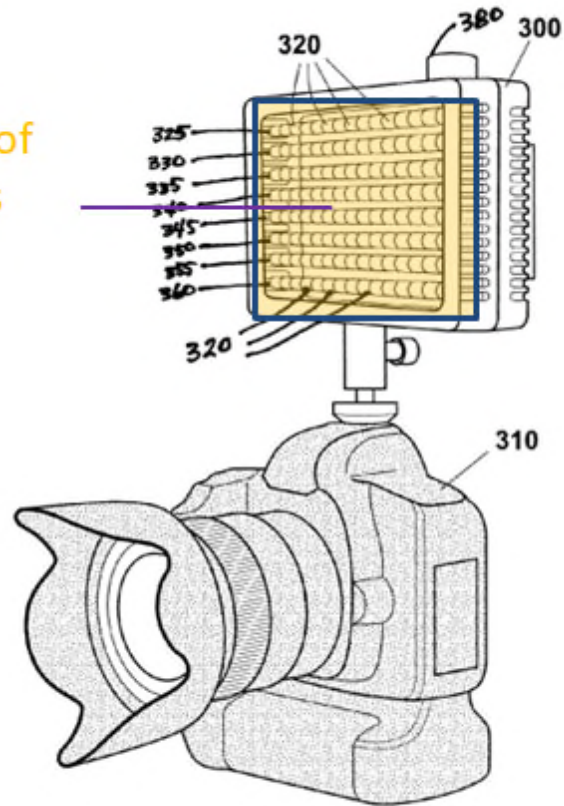


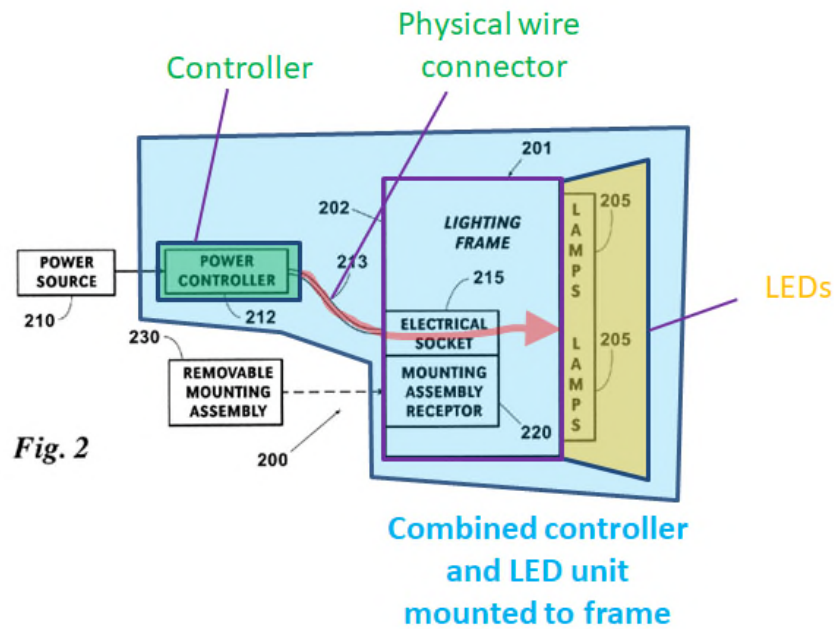
Fig. 3B

(Id., Figures 3A, 3B (annotated).)

s. **Dependent Claim 19**

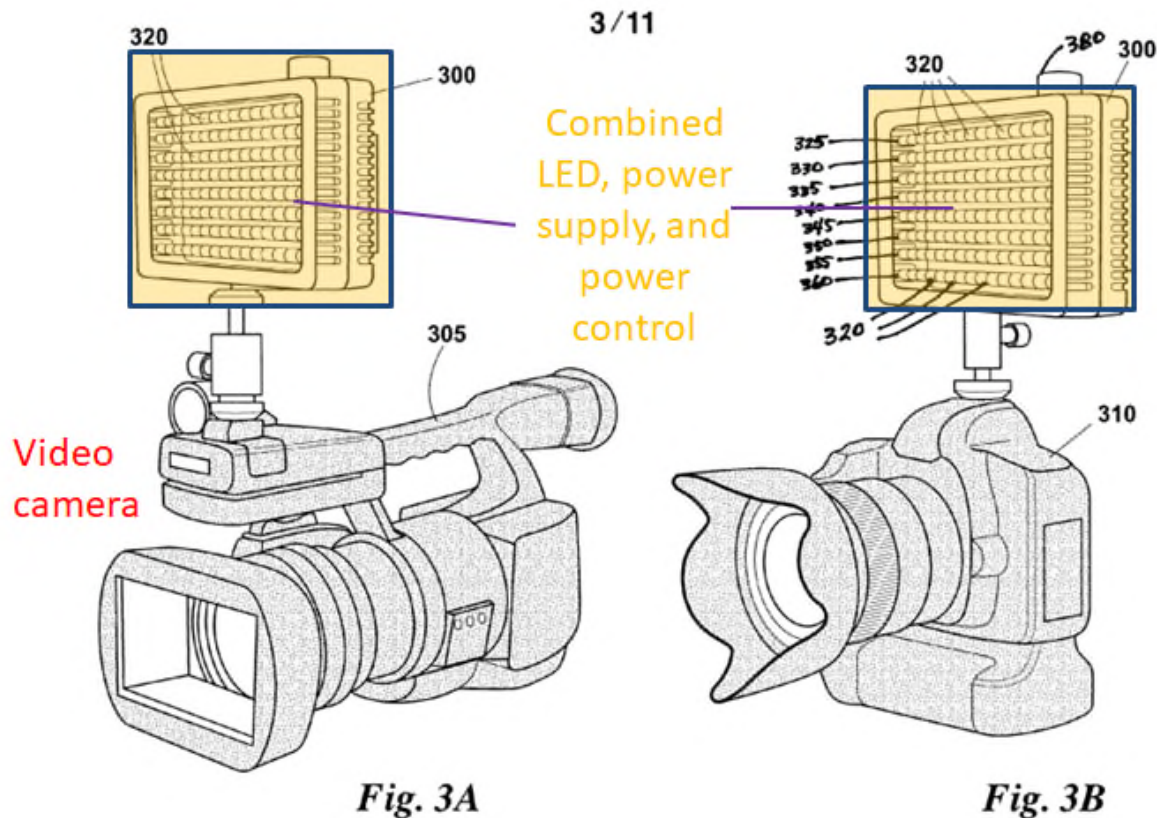
Claim 19: *The lighting system according to claim 15 wherein said controller and said lighting device are integrated in a combined unit.*

Pohlert anticipates Claim 19. (Wood Decl., ¶¶ 213-216.) The lighting system includes a power controller and LED lamps physically connected and combined into one device. (Pohlert, [0020], [0050]-[0051].) The “power controller” can be physically connected by a cable to the lighting elements on the lighting frame, making them one combined unit:



(*Id.*, Figure 2 (annotated).)

The “power source 210” in Figure 2 (above) may be “a battery having sufficient current to drive the LEDs.” (*Id.*, [0057] (emphasis added).) Where a battery is used, “the light panel and self-contained battery unit function as an integrated lighting apparatus.” (*Id.*, [0018].) Similarly, as shown in Figures 3A-3B below, the lighting system may be a stand-alone unit mounted to a video or photography camera:



(*Id.*, Figures 3A, 4B (annotated); *see also id.*, [0094].) Also, 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.*, [0024], [0050].)

IX. CONCLUSION

ARRI respectfully requests that a Trial be instituted. Claims 1-21 should be cancelled. ARRI respectfully submits that each of the presented Grounds are separate and distinct.

Dated: September 3, 2021

Respectfully submitted,

/s/ Joseph J. Raffetto

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APPENDIX A

Table of Exhibits

Exhibit No.	Description
1001	U.S. Patent No. 10,197,257 (<i>Challenged Patent</i>)
1002	File History for the '257 Patent
1003	U.S. Patent Application Publication No. 2012/0044374 (Pohlert)
1004	The Astera Manual
1005	American National Standard E1.11 – 2008 (2013), Entertainment Technology USITT DMX512-A, Asynchronous Serial Digital Data Transmission Standard for Controlling Lighting Equipment and Accessories, ANSI (2017)
1006	Declaration of Mr. Michael Wood
1007	Curriculum Vitae of Mr. Michael Wood
1008	Declaration of Mr. Simon Canins

APPENDIX B

Certificate of Word Count

I certify that, in accordance with 37 C.F.R. § 42.24(d), the word count for the foregoing Petition totals 13,993. This is less than the permitted total under the 37 C.F.R. 42.24(a)(1)(i).

/s/ Joseph J. Raffetto
Joseph J. Raffetto (Reg. No. 66,218)
*One of the attorneys for Petitioner Arnold &
Richter Cine Technik GmbH & Co. Betriebs KG*

APPENDIX C

Certificate of Service

I certify that on September 3, 2021, a copy of this Petition and supporting document were served on Patent Owner via Federal Express at the following address:

PRTSI Inc.
232 NW 42nd Ter
Plantation FL 33317

/s/ Joseph J. Raffetto
Joseph J. Raffetto (Reg. No. 66,218)
One of the attorneys for Petitioner
Arnold & Richter Cine Technik GmbH & Co.
Betriebs KG