UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

APUTURE IMAGING INDUSTRIES CO., LTD.,

Petitioner,

v.

ROTOLIGHT LIMITED,

Patent Owner.

Case No.: IPR2024-01424
U.S. Patent No. 10,197,257

PETITION FOR INTER PARTES REVIEW

OF U.S. PATENT NO. 10,197,257

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I. MANDATORY NOTICES UNDER 37 C.F.R. § 42.8

A. Real Party-in-Interest.

Aputure Imaging Industries Co., Ltd. is the Petitioner and a real party-in-interest.

B. Related Matters.

U.S. Patent No. 10,197,257 (the "'257 Patent") is one of multiple patents asserted in *Rotolight Limited v. Aputure Imaging Industries Co., Ltd.*, No. 4:23-00508-ALM (E.D. Tex.), filed June 5, 2023. The '257 Patent has also been asserted or challenged in the following litigations and *inter partes* review proceedings:

- *Videndum Production Solutions, Inc. v. Rotolight Limited*, No. IPR2023-01220 (P.T.A.B.), filed July 17, 2023;
- *Rotolight Limited v. Chauvet & Sons, LLC f/k/a Chauvet & Sons, Inc.*, No. 1:23-cv-00364 (D. Del.), filed March 30, 2023;
- *Rotolight Limited v. ARRI Inc.*, No. 1:22-cv-00983 (D. Del.), filed July 27, 2022;
- *Rotolight Limited v. Videndum PLC*, No. 1:22-cv-00928 (D. Del.), filed July 12, 2022;
- *Vitec Production Solutions, Inc. v. Rotolight Limited*, No. IPR2022-00261 (P.T.A.B.), filed December 3, 2021; and
- *Arnold & Richter Cine Technik GmBH & Co. Betriebs KG v. Rotolight Limited*, No. IPR2021-01496 (P.T.A.B.), filed September 3, 2021.

C. Lead and Back-up Counsel and Service Information.

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II. GROUNDS FOR STANDING

Petitioner certifies that the ’257 Patent is available for *inter partes* review and Petitioner is not barred or estopped from requesting IPR challenging the patent claims on the grounds identified herein.

III. REQUESTED RELIEF

Petitioner asks that the Board review the accompanying prior art and analysis, institute a trial for an IPR of claims 1-21 of the ’257 Patent (the “Challenged Claims”) and cancel those claims as unpatentable.

IV. REASONS FOR THE REQUESTED RELIEF

The Challenged Claims of the ’257 Patent were anticipated by the prior art or would have been obvious to a person of ordinary skill in the art (“POSITA”) and are therefore unpatentable. The ’257 Patent claims recite a known and obvious combination of lighting systems, lighting system components, and processes for the use of such systems that had been used by POSITAs prior to the filing of the ’257 Patent.

This Petition’s showing that the cited art renders the Challenged Claims unpatentable is supported by the Declaration of P. Morgan Pattison, PhD. (EX1003). Dr. Pattison is familiar with the state of the relevant arts before the ’257 Patent was filed and fully agrees with and supports the showing herein that the claims at issue merely recite long-known aspects of such lighting systems.

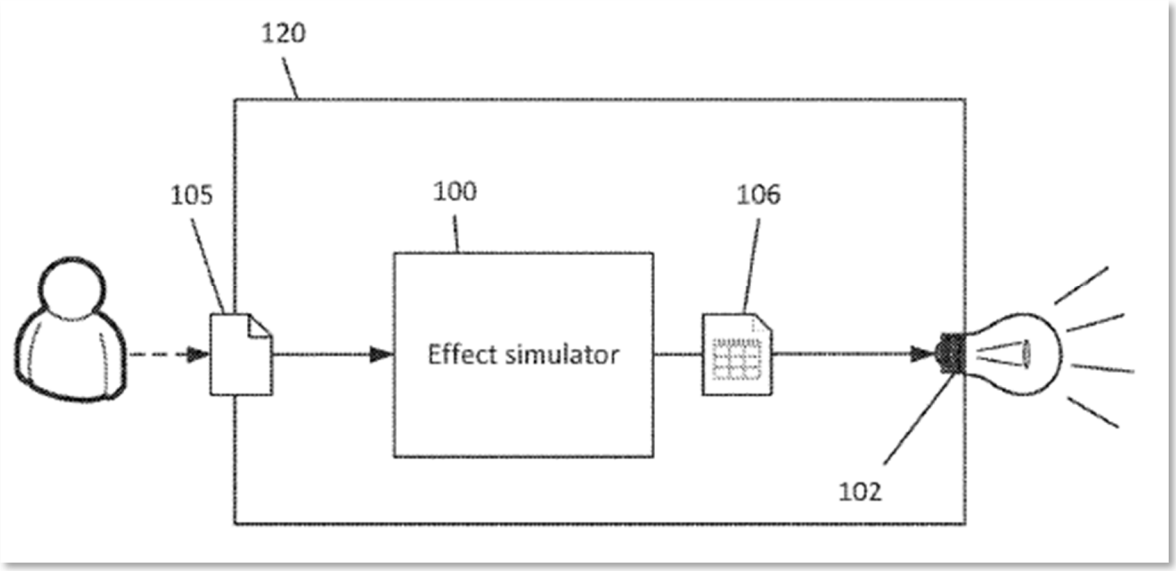
Accordingly, the Board should institute trial and cancel the Challenged Claims.

A. Summary of the ’257 Patent.

Claims 1, 15, and 20 of the ’257 Patent recite a method, controller, and computer program for “produc[ing] a user customisable lighting effect” having at least one of a random “brightness,” “duration,” or “interval.” These claims recite two basic elements: (1) calculate a “time varying lighting value” based on a simulation parameter that (a) characterizes a user customizable lighting effect for

use in videography, broadcasting, cinematography, studio filming, and location filming and (b) includes a parameter related to at least one of a random brightness, duration, or interval; and (2) output the "time varying lighting value" to a lighting device to generate the user-selected lighting effect.

Figure 2 is a diagram of a lighting system:



EX1001, Figure 2.

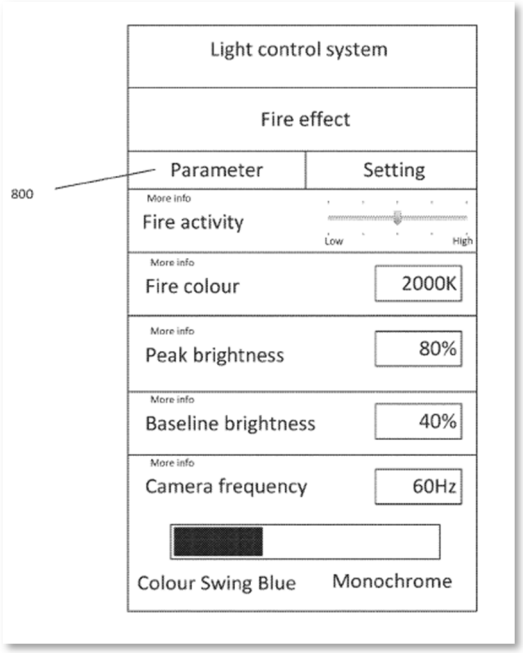
Figure 2 depicts a studio lamp device (120) with an effect simulator (100) and a light (102) integrated therein. *Id.*, 5:58-60. Figure 2 also depicts

- an input interface (105), including a control panel for user input of parameters for simulating a lighting effect; and
- data (106) used to modulate light 102 so the desired effect is produced.

Id., 5:54-55, 6:1-5. Though not depicted in Figure 2, the '257 Patent also discloses, "[a] microcontroller or other computing unit [that] is integrated in the lamp device 120 for performing calculations." *Id.*, 5:65-67.

Users can make selections of lighting effects on user interface 105. *Id.*, 6:1-8, 6:43-7:44. Depending on the 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 parameters may be random or user-selected and are used by the "effect simulator" to calculate the data 106, or "time varying lighting values," characterizing the effect and are used to produce it on lighting device 102. *Id.*, 7:25-44, 8:14-48.

One example of a randomized effect is "fire." *Id.*, 6:43-63, 8:14-25, 9:51-65. Parameters like color, minimum/maximum brightness, and fire activity, can modify the effect. *Id.* Following these parameters, the effect will produce randomized sparks, or flicker. *Id.*



Id., Figure 6.

B. The Prosecution History of the '257 Patent.

The '257 Patent issued on February 5, 2019, from U.S. Application No. 15/820,469, which is a continuation of U.S. Application No. 15/481,460, and claims priority to U.S. Provisional Application No. 62/319,809, filed April 8, 2016. In an Office Action dated April 10, 2018, the Examiner, in addition to rejecting the original claims as indefinite, rejected original claims 1-20 as anticipated by US2008/0129226, published June 5, 2008 ("Dewitt"). EX1002, 282-286. The Examiner found Dewitt discloses a lighting device for producing a range of user-customizable light effects for videography, adapted to (1) calculate a "time varying light value," based on a simulation parameter having at least one of random

brightness, duration, or interval, and (2) output the value to a light to simulate the effect. *Id.*, 282-283.

The Applicant amended the independent claims, arguing Dewitt teaches only a simulated "tea light" candle but does not teach simulation parameters characterizing a user customizable light effect selected from a range of different user customizable lighting effects for at least one of: videography, broadcasting, cinematography, studio filming, and location filming as recited in the amended claims. *Id.*, 254. The '257 Patent subsequently issued.

C. Priority Date.

The '257 Patent claims a priority date of April 8, 2016. EX1001, Cover. That date is the assumed priority date for purposes of this Petition. The references cited herein qualify as prior art based on that date.

E. Discretionary Denial under § 325(d) or § 314(a) Is Not Warranted.

Aputure has not been involved in any previous review of the '257 Patent. Additionally, the Office has not considered the combinations of references forming the grounds for this Petition, which are not redundant to any combination of references considered during prosecution. Additionally, the instant Petition provides the analysis of Dr. Pattison, which has not been presented to the Office before. As the same or similar arguments have not been previously considered by the Office, discretionary denial under § 325(d) is not warranted here.

1. Institution should not be denied under the *General Plastic* Factors

The factors articulated by the Board in *General Plastic Industrial Co., Ltd v. Canon Kabushiki Kaisha*, IPR2016-01357, Paper 19 (P.T.A.B 2017), do not support denial of institution. Though prior Petitions for IPR challenging the '257 have been filed by third parties, Petitioner has not previously such a petition, nor does Petitioner have a significant relationship with any prior petitioner. "[W]here, as here, the first and second petitioners are neither the same party, nor possess a significant relationship under *Valve* [*Corp. v. Electronic Scripting Products, Inc.*, IPR2019-0062, Paper 11 (P.T.A.B. Apr. 2, 2019)], *General Plastic* factor one necessarily outweighs the other *General Plastic* factors." *Videndum Production Solutions, Inc. v. Rotolight Ltd.*, IPR2023-01218, Paper 12 at 6 (P.T.A.B. Apr. 19, 2024) (Director Vidal vacating Board decision denying institution). The fact that Petitioner has not previously sought IPR of the '257 Patent and does not have a significant relationship with any previous petitioner is thus dispositive on this issue.

Even if the Board considers the additional *General Plastic* factors, such consideration would not warrant denying institution. There has been no time between the filing of a prior Petition from Petitioner and the present Petition (Factor 5). Moreover, Petitioner was not aware of the prior art asserted in this Petition prior

to the filing third party ARRI's 2021 petition filed against the '257 Patent (Factor 2). Each of these factors weighs against denying institution based on *General Plastic.*

The remaining factors are either neutral or, given that Petitioner has not previously challenged any claims of the '257 Patent, not applicable to the present Petition. Though Petitioner learned of the prior art asserted in the ARRI petition shortly after it was sued by Patent Owner in the district court on June 5, 2023 (EX1007) (Factor 4), there is no evidence on which Patent Owner could rely that Petitioner has improperly delayed in filing the present Petition, the district court litigation remains in its early stages, and this Petition is brought within the one-year time limit set forth in 35 U.S.C. § 315(b).[1] And because Patent Owner waived its Patent Owner's Preliminary Response to ARRI's petition, no time has elapsed since Petitioner's receipt of such a response (Factor 3). There is no evidence the Board's finite resources (Factor 6) will prevent the Board from issuing a final determination within the timing requirements of 35 U.S.C. § 316(a)(11) (Factor 7). Institution should not be denied.

2. Institution should not be denied under the *Finitiv Factors*

The Petition should also not be denied under the discretionary factors set out in *Apple v. Finitiv, Inc.*, IPR2020-00019, Paper 11, at 6 (PTAB Mar. 20, 2020

[1] Patent Owner did not serve the Complaint in the district court litigation until October 17, 2023. EX1007.

("*Finitiv I*") and reinforced in the June 21, 2022 Interim Procedure for Discretionary Denials in AIA Post-Grant Proceeding with Parallel District Court litigation Memorandum.

Regarding Factor 1, no stay of the district court litigation has been requested, though a stay would be appropriate under the applicable standard. *See, e.g.*, *Vill. Green Techs., LLC v. Samsung Elecs. Co.*, No. 2:22-CV-00099-JRG, 2023 US. Dist. LEXIS 12794, at *9-10 (E.D. Tex. Jan 25, 2023). Patent Owner waited years after the '257 Patent issued before filing its Complaint on June 5, 2023, EX1005, and the litigation is in its early stages, and a stay pending IPR would be appropriate. Given that a motion to stay has not been filed, however, the Board should not infer the outcome of that motion. *Intel Corp. v. VLSI Tech. LLC*, IPR2020-00158, Paper 16, at 7 (PTAB May 20, 2020). This factor is neutral.

Regarding Factor 2, trial in the litigation is not scheduled. EX1007. In the Eastern District of Texas, average time to trial is 24-27 months. EX1008. In the Central District of California, to which Petitioner seeks transfer, average time to trial is 29-32 months. EX1009. That the case remains in its early stage means it is unlikely the litigation will be ready for trial before the Board enters a final written decision. This factor weighs against discretionary denial.

Regarding Factor 3, investment in the litigation has been minimal. Patent Owner has filed its Complaint, which it has amended. This Factor weighs against discretionary denial.

Regarding Factor 4, no deadline requiring Petitioner to articulate its invalidity positions in the litigation is imminent. Instituting a proceeding will allow the Board to address the art, and the issues will be narrowed in the litigation due to the estoppel provisions of 35 U.S.C. § 315(e)(2). To reduce potential overlap, if the Board institutes trial, Petitioner will decline to assert in the related litigation the prior art combinations on which trial is instituted while trial is instituted. The most efficient course is for the Board to address the issues before it. This factor weighs against discretionary denial.

Regarding Factor 5, Petitioner is a defendant in the litigation. EX1007. That is true of many Petitioners in IPR proceedings and is consistent with one purpose of IPRs as a process available to defendants. This factor is not a basis for denying institution.

Regarding Factor 6, the prior art discussed herein demonstrates Claims 1-21 are unpatentable as anticipated or obvious. The merits of Petitioner's argument are strong, and this factor weighs against discretionary denial.

This Petition should not be denied on discretionary factors.

V. CLAIM CONSTRUCTION

In IPR, claims are "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)." 37 C.F.R. § 42.100(b). Claims must be given their ordinary and customary meaning as understood by a POSITA at the time of the invention in light of the specification and the prosecution history. *Id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2015) (*en banc*).

Petitioner believes the '257 Patent's claim terms do not require construction for the purpose of evaluating the prior art in this Petition. Petitioner, however, may pursue constructions of additional claim terms, including that certain terms are indefinite in the related litigation concerning the '257 Patent to help the jury understand the relevant technical terms.

VI. STATUTORY GROUNDS FOR CHALLENGES AND REFERENCES USED

Ground #1: Claims 1-21 of the '257 Patent were anticipated by Pohlert under 35 U.S.C. § 102 and/or would have been obvious under 35 U.S.C. § 103 over Pohlert.

Ground #2: Claims 1-21 of the '257 Patent would have been obvious under 35 U.S.C. § 103 over Mueller in view of Reichow.

VII. LEVEL OF ORDINARY SKILL IN THE ART

A POSITA in the field of the '257 Patent, as of April 8, 2016, would have had a good working knowledge of electrical engineering and entertainment lighting

systems, controls, and effects. EX1003, ¶38. She would have gained this through an undergraduate degree in electrical engineering or a comparable field as well as some experience in the field of 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. CLAIMS 1-21 ARE UNPATENTABLE

When the Examiner allowed the Challenged Claims to issue, the Examiner was not aware of Pohlert, Mueller, or Reichow. The cited art discloses or teaches every limitation of the Challenged Claims. Had the Examiner been aware of this art, the Examiner would have found the Challenged Claims unpatentable. EX1003, ¶¶39-436.

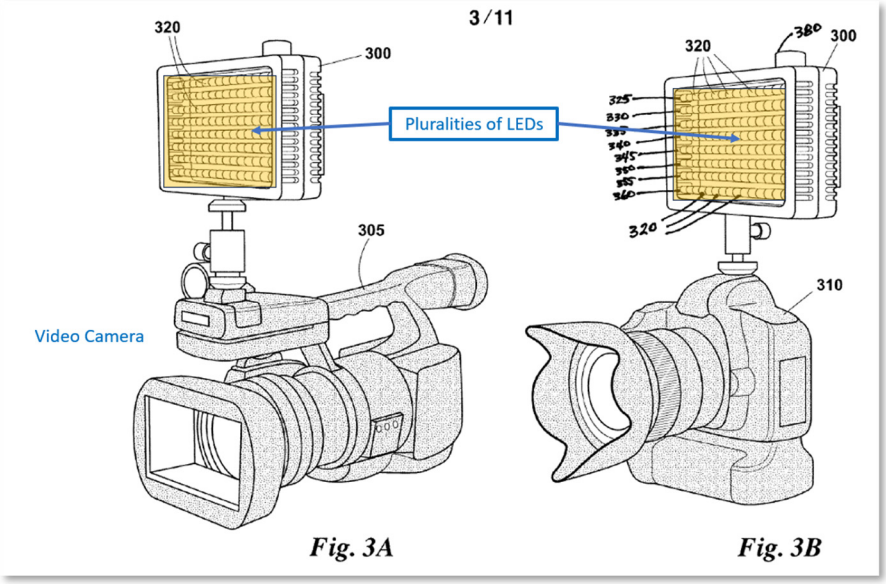
This Petition's showing that the cited art renders the challenged claims unpatentable is supported by the Declaration of Dr. Pattison (EX1003), an expert in the field of lighting systems. Dr. Pattison is familiar with the state of lighting methods and system art before the '257 Patent was filed, EX1003, ¶¶5-9, and fully supports the showing herein that the claims at issue merely recite methods and systems that have long been known. *Id.*, ¶¶39-436.

A. Ground 1 – Pohlert anticipates or renders obvious Claims 1-21.

1. Overview of Pohlert

Pohlert is a U.S. 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" that includes LED lamps in a frame with a connected and dedicated "power controller." EX1011, [0051], [0057]; *see also* EX1003, ¶42. 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 effects; and (3) switches that convert the effects into power control signals output to the LEDs.



EX1011, Figures 3A-3B (annotated). Pohlert also depicts and describes the components power controllers described therein:

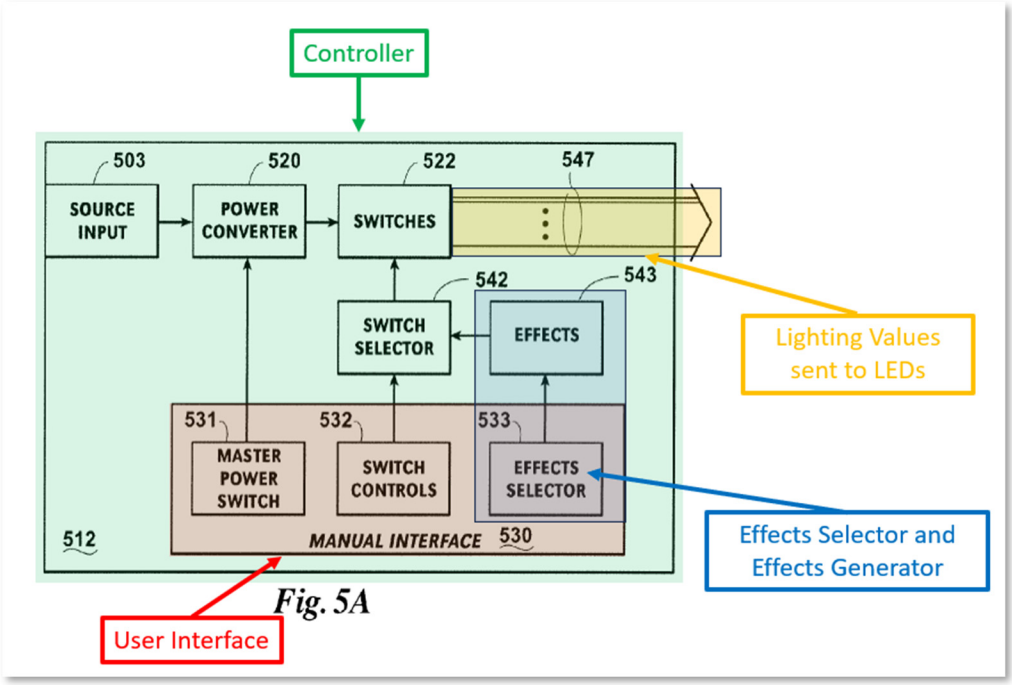


Fig. 5A

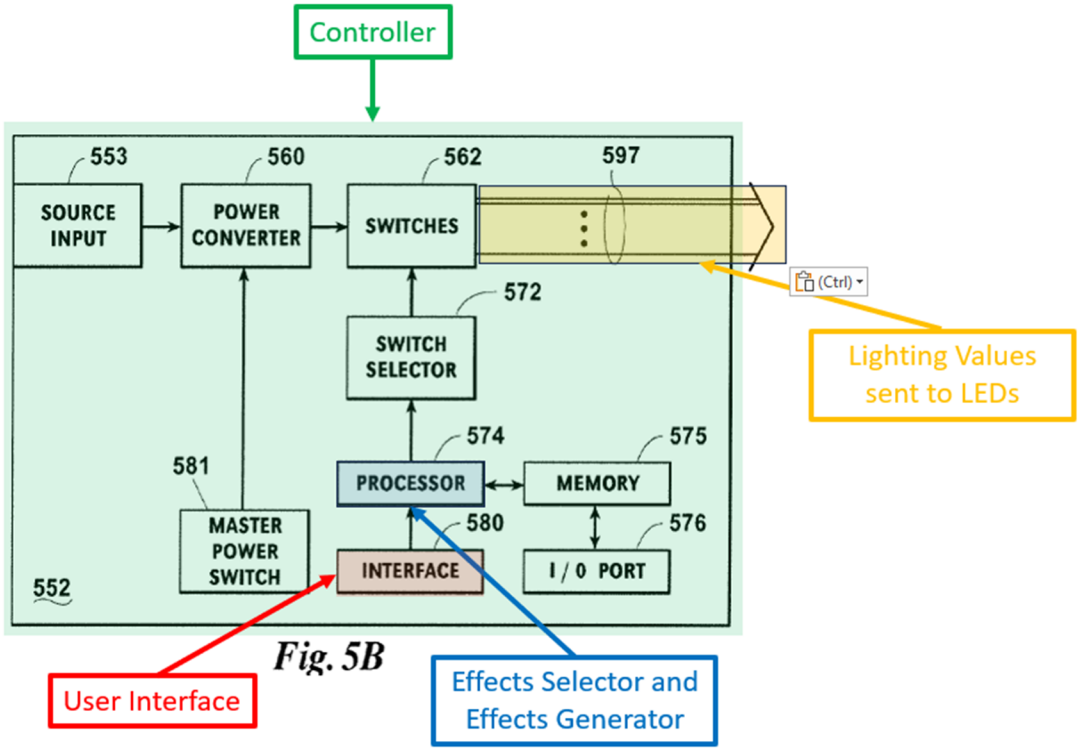


Fig. 5B

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

2. Claim 1

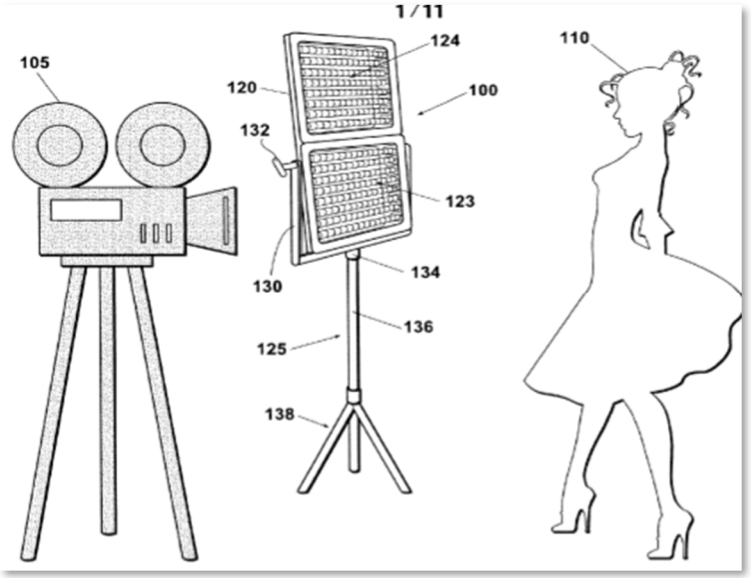
Pohlert anticipates or renders obvious Claim 1. EX1003, ¶¶41-78

a. Claim Element 1p

A method for controlling a lighting device to produce a user customizable lighting effect, the method comprising:

It is Petitioner's position that the preamble to Claim 1 is not limiting and need not be analyzed for purposes of determining validity. Should the Board determine the preamble is limiting, Pohlert discloses Claim Element 1p. EX1003, ¶¶43-47.

Pohlert discloses a method for controlling a lighting system with LED "light panels" controlled by a power controller permitting users to select and modify lighting effects, such as patterns of strobing, flashing, and dimming and brightening the lights. EX1011, Abstract, [0020], [[0050], [0063], [0067], [0103]. The method 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.

b. Claim Element 1a

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

Pohlert discloses Claim Element 1a. EX1003, ¶¶48-55.

Pohlert discloses an "effects selector" and "effects generator" (Figure 5A) or "processor" (Figure 5B) in the power controller that calculates time varying lighting values in the form of data signals characterizing the desired effect based on user input, which are converted to power control signals supplied to LEDs to generate output. EX1011, [0059]-[0067]; EX1003, ¶51. These power control signals provide time-varying signals for "controlling the intensities" of the LEDs to generate the desired light output effects. EX1011, [50]-[51], [0059], [0061]-[0062], [0065]-[0067]. These power control signals are also based on user-selected parameters for

desired lighting effects, including brightness, duration, frequency, whether a sequence will be pseudo-random, and color. *Id.*, [0051], [0061]-[0067], [0089]-[0091]. Just like the process disclosed in connection with Figure 3a the '257 Patent (reproduced below), each of Pohlert's controllers receives user inputs for desired effects, determines (*i.e.*, "calculates") lighting values reflecting these inputs, and sends these values to LEDs to produce the effects. EX1003, ¶¶51-54; *compare* EX1001, Figure 3a, 7:21-44 (describing calculations performed in the '257 Patents method for simulating a light effect) *with* EX1011, [0059]-[0067] (describing creating data signals representing user combinations of dimming, strobing, pre-defined sequences, and pseudo-random sequences to create an effect).

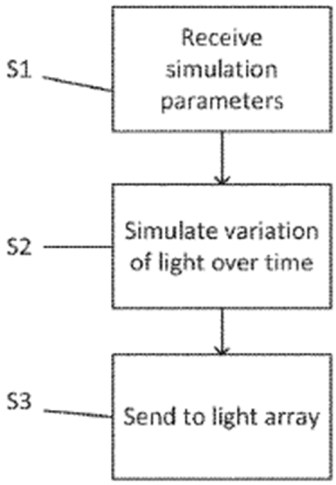


Figure 3a

EX1001, Figure 3a.

A user may select a strobing effect implemented by the controller generating a time-varying oscillating signal and applying the signal to control intensities of the LEDs. EX1003, ¶52; *see also* EX1011, [0062]. That user can adjust the oscillator frequency parameter of the strobing effect "via a knob, switch, or other selection means as part of the effect selector" in the user interface. EX1011, [0062]; *see also* EX1001, 6:1-11, 7:25-44. Adjusting the oscillation frequency in this way causes the controller to calculate and create a new output time-varying power control signal, changing frequency of the strobing. EX1003, ¶52.

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. *Id.*, ¶53; EX1011, [0063], [0067]. The brightness and frequency of these patterns are customized by user-selected parameters, including the brightness of different groups of light elements during the pattern and whether the sequences are pseudo-random. EX1003, ¶53; EX1011, [0063], [0067].

c. Claim Element 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 Element 1b. EX1003, ¶¶56-61.

Users can select from a range of effects through an interface on the controller, including patterns and pattern sequences, strobing, flashing, and dimming and brightening. EX1011, [0057]-[0059], [0061], [0063], [0067], Figures 2, 5A, 5B. Users can customize these effects by selecting and adjusting different simulation parameters. *See supra* Claim Element 1a. These parameters characterize the selected effect in that the effect generated in Pohlert is dependent on and reflective of these parameters. EX1003, ¶58; EX1011, [0057]-[0059], [0061], [0063], [0067].

Moreover, these simulation parameters include brightness, duration, frequency, whether a sequence will be pseudo-random, and color. EX1011, [0051], [0061]-[0063], [0066]-[0067], [0089]-0091]. A user 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 lights. *Id.*; *see also* EX1003, ¶59.

The lighting effects based on these parameters are used to provide lighting for photography, film, television, and other applications. EX1011, [0003], [0005].

d. Claim Element 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 Element 1c. EX1003, ¶¶62-68.

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 . . . in a pre-defined sequence (which may be a pseudo-random sequence, if desired), [2] strobing or flashing different light elements . . . of the light segments . . . in a predefined (or pseudo-random) sequence, [3] gradually dimming or brightening light segments . . . (individually, in groups, or collectively), or [4] various combinations of these effects.

EX1011, [0063]. As acknowledged by the '257 Patent, a "pseudo-random parameter" is considered "to be equivalent to a truly random parameter." EX1001, 7:30-34; *see also* EX1003, ¶64. Moreover, these pseudo-random outputs of light correspond to inputs to create that randomness. EX1003, ¶64; *see also* EX1011, [0063], [0067].

Selecting to strobe or flash different lights, or groups of lights, 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). EX1011, [0063], [0067]; EX1003, ¶65.

Pseudo-random sequences are a series of random strobes and flashes, one after another, with the time between strobes or flashes, and the group of light elements used, being random. EX1003, ¶65. A POSITA would thus understand such a pseudo-random sequence could include random brightness, duration, and intervals. *Id.*

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.*, ¶66. Additionally, a POSITA would recognize 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 patterns, or consistently flashing or strobing the same elements or groups of elements in a consistent sequence of set interval and duration. *Id.*, ¶66; *see also* EX1011, [0063], [0067].

e. Claim Element 1d

said simulation parameter depending on the user customisable lighting effect being simulated; and

Pohlert discloses Claim Element 1d. EX1003, ¶¶69-73.

The simulation parameters of Pohlert depend on the customizable lighting effects selected by the user. *See supra* Claim Elements 1b, 1c. Parameters of

dimming or brightening different groups of light elements, and selecting whether the pattern will be pseudo-random, depend on a user first selecting to generate a pattern effect on the user interface. EX1011, [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 frequency of strobing is directly related to a user selecting to produce a strobing effect. EX1003, ¶71.

f. Claim Element 1e

outputting, from said effect simulator, said time varying lighting value thereby to stimulate the user customisable lighting effect.

Pohlert discloses Claim Element 1e. EX1003, ¶¶74-78

Pohlert's power controller sends control signals through wires supplying power to light elements, causing the light elements to simulate the selected effect. *See supra* Claim Elements 1a-1d. The output from the effects selector and effects generator or processor and switches in the controllers shown in Figures 5A and 5B of Pohlert are provided to the LED lamps through a cable or wires:

> 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.

EX1011, [0058]-[0059].

3. Claims 15 and 20

For purpose of this Petition, there are no substantive differences between Claim 1 and Claims 15 and 20, and Pohlert anticipates or renders obvious Claims 15 and 20 for the same reasons as Claim 1. *See supra* Claim 1; *see also* EX1003, ¶¶43-78, 145-181, 201-239.

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 and underlined:

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 customizable 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:	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:	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:

Claim 1	Claim 15	Claim 20
videography, broadcasting, cinematography, studio filming, and location filming;	videography, broadcasting, cinematography, studio filming, and location filming;	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 customizable lighting effect being simulated; and
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 method and Claim 20 is directed to a "computer program" performing the method. Thus, Pohlert discloses or teaches each limitation in Claims 15 and 20 for the same reasons discussed above with respect to the corresponding limitations in Claim 1.

Moreover, Pohlert expressly discloses the method can be performed on a "controller" of "software program." A controller performs the method for controlling the lighting elements. EX1011, Figures 5A, 5B [0057]-[0067]; *see also supra* Claim Element 1a. 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. EX1011, [0066]-[0067].

Pohlert thus discloses the "controller" and "software program" for controlling "a lighting device to produce a user customisable lighting effect," as in Claims 15 and 20.

4. Claim 2

[2] The method according to claim 1 wherein the random brightness comprises a random peak brightness.

Pohlert anticipates Claim 2. EX1003, ¶¶79-83.

Pohlert discloses strobing and flashing all, different groups of, or individual light elements in a pseudo-random sequence. *See supra* Claim Element 1c. As different groups of lights may contain differing numbers of lights turning randomly on and off, each activated light grouping has a different, random peak brightness. EX1003, ¶81.

Different combinations of groups of light elements may be selected, and the total light output would change depending on which groups are selected:

> 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.

EX1011, [0059]. 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 beak brightness generated randomly changes. EX1003, ¶83.

5. Claim 3

[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. EX1003, ¶¶84-87.

The random interval can be a pseudo-random strobing or flashing sequence. EX1011, [0063], [0067]; *see also supra* Claim Element 1c. When a sequence of strobes and flashes is pseudo-random, the interval, or time between strobes or flashes and groups thereof changes in a random manner. EX1003, ¶86. 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. EX1011, [0063], [0067]. With a random interval between flashes or groups of flashes, the frequency is also random. EX1003, ¶86.

6. Claim 4

[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. EX1003, ¶¶88-91

The random sequences can be pseudo-random strobing or flashing sequences. EX1011, [0063], [0067]; *see supra* Claim Element 1c. These sequences are generated by controlling all or different groups of light elements, causing a random number of pulses, depending on when each of the different groups is turned on and off. EX1011, [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. EX1003, ¶90. Pohlert's random sequence of flashes thus includes a random number of pulses making up the sequence. *Id.*

Pohlert also discloses 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. EX1011, [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 peak brightness would be random and would also change randomly with the dimming and brightening of the random sequences. EX1003, ¶91.

7. Claim 5

[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. EX1003, ¶¶92-96.

Pohlert's simulation parameters include pseudo-random sequences of flashes or strobing. EX1011, [0063], [0067]. These sequences are applied within "predefined boundaries" of the patterns and within predefined boundaries of the capabilities of the lighting elements. EX1003, ¶94.

Pohlert discloses predefined boundaries for the "amplitude" of the light produced in its pseudo-random sequences. EX1011, [0059], [0063], [0067]. The

pseudo-random sequences can include flashing or strobing different combinations of groups of LEDs. *Id.*, [0063], [0067]. The amplitude of the light in a pattern will depend on the number of groups of LEDs activated at any given time. *Id.*, [0059]. 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. EX1003, ¶95.

With respect to predefined boundaries of the lighting elements, the upper and lower "duration" and the "interval" between flashes are linked to and determined by the frequency of the oscillation used to generate the flashes or strobing. *Id.*, ¶96. This frequency has predefined upper and lower boundaries determined by the LEDs and the power supply driving circuitry as well as practical limitations where very high frequency operation is unperceived and very low frequency is too slow to be of interest. *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.*

8. Claim 6

[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. EX1003, ¶¶97-100.

The simulation parameters can include random brightness, duration, and intervals in pseudo-random sequences of strobes and flashes. *See supra* Claim Elements 1a-1d. These random parameters are determined based on user selections through an interface. EX1011, [0063], [0067]; *see also infra* Claim 8.

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." EX1011, [0063]. Based on the user interface selections to implement random 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 individually, in groups, or collectively. *Id.* These combinations, including random sequences, thus depend on the user selections of such combinations of effects. EX1003, ¶100.

9. Claim 7

[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. EX1003, ¶¶101-105.

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 collectively. EX1011, [0063], [0067]. Depending on how many elements are activated at any given time during the sequence, the brightness levels will vary. *Id.* Thus, Pohlert discloses the simulation parameter is related to at least brightness. EX1003, ¶103; *see also supra* Claim Element 1c, Claims 2, 4.

Further, the effects used to generate a pattern can include "combinations" of pseudo-random sequences and gradually dimming and brightening. EX1011, [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. EX1003, ¶104; *see also supra* Claim 4.

Moreover, the LEDs may be of differing colors, as selective combinations of red, green, and blue LEDs can be used to "generate virtually any desired color." EX1011, [0084]. Thus, the simulation parameters used to generate patterns or sequences may be related to "color fluctuation periods," as light element groups may be different colors in different steps in the sequences or patterns, generating different color fluctuation in time. *Id.*, [0063], [0067].

10. Claim 8

[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. EX1003, ¶¶106-112

The power controllers of Pohlert include an interface, which receives user input selections of parameters, in choosing and adjusting combinations of effects, including patterns, strobing, flashing, and dimming and brightening. EX1011, [0059], [0066]-[0067], Figures 5A, 5B.

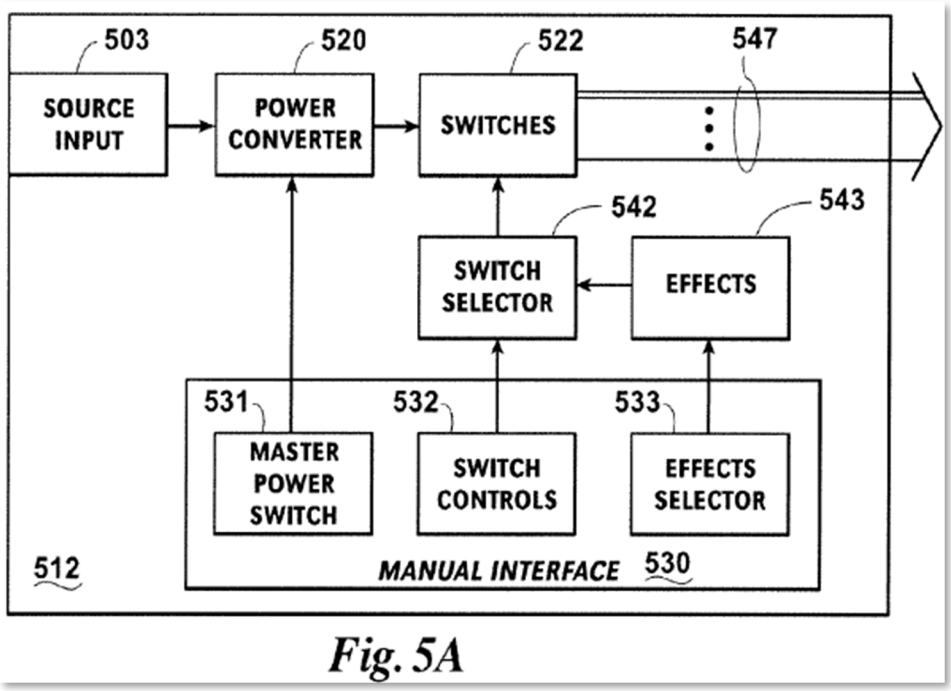


Fig. 5A

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]. Through this Figure 5A interface, selections made by the user are sent to an effects generator, which provides "the ability to create various lighting effects, such as, e.g., dimming, strobing pulsation, or pattern generation." *Id.*, [0061]. 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 interface 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].

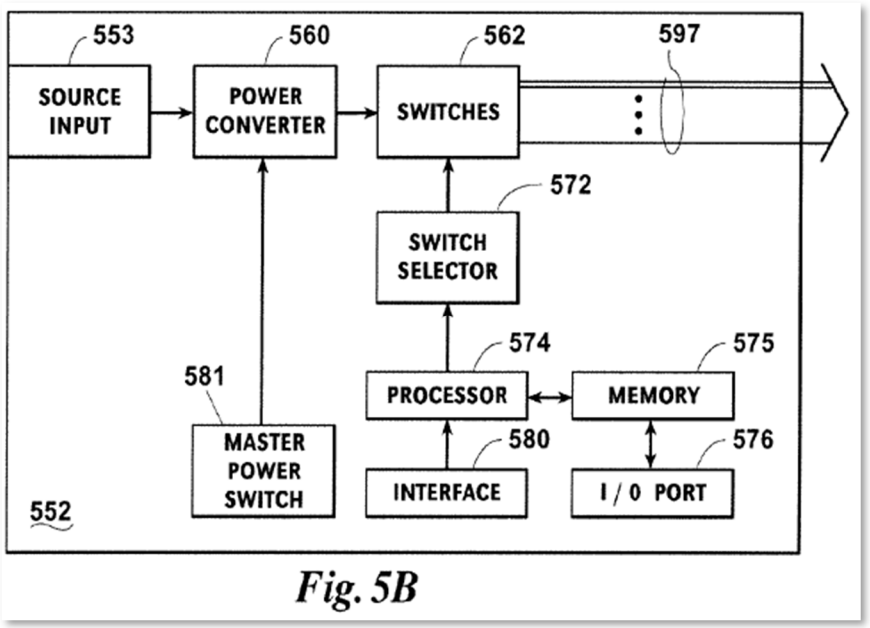


Fig. 5B

Id., Figure 5B.

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. EX1003, ¶112.

11. Claim 9

[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. EX1003, ¶¶113-121.

Pohlert discloses the effect parameters can include maximum and minimum brightness, color, and a trigger. EX1011, [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 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. EX1003, ¶117. 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.*

Moreover, 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." EX1003, ¶118. 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 of the apparatus. EX1011, [0086]. Pohlert explains:

> Because 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].

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, or optical signals such as flashes generated by LEDs directly connected to the controller. EX1011, [0022]. Pohlert states its system, which include the power controllers, is "particularly well suited for use with such optical, IR, or RF slave flash systems." *Id.*, [0023].

12. Claim 10

[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. EX1003, ¶¶122-124.

The pattern generation may include implementation of various combinations of patterns and sequences that include pseudo-random sequences of strobing and flashing. EX1011, [0063], [0067]; *see also supra* Claim Elements 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." EX1011, [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* EX1003, ¶124.

13. Claim 11

[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 Claim 11. EX1003, ¶¶125-129

Pohlert's effects and patterns include

> strobing or flashing different groups of light segments . . . in 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.

EX1011, [0063]. Thus, Pohlert explicitly discloses "flashes (strobe)." EX1003, ¶128.

Moreover, a POSITA would understand the pattern generation and sequences, EX1011, [0063], [0067], [0081], can produce additional claimed effects, such as mimicking lightning, welding, and sparking. EX1003, ¶129. 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.*

14. Claim 12

[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. EX1003, ¶¶130-136.

The '257 Patent indicates a "trigger" is simply something "to start the effect running" and can be a manual trigger or a remote signal. EX1001, 6:52-54, 9:43-45. Pohlert discloses selecting, through the Figure 5B controller processor, programming instructions that indicate the start and stop time of selected patterns, sequences, and effects that result in outputs of control signals to vary the lighting values and simulate the desired effects. EX1011, [0066]-[0067]. The "power controller 522 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.*

Pohlert also 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 also discloses additional trigger events. For example, "[t]o accomplish dimming, the processor 574 may be programmed [to] 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.* 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. EX1003, ¶135.

Further, 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). EX1011, [0022]-[0023]. These may be "optical slave flashes" that are "triggered by light," including light pulses from another device. *Id.*, [0023]. 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. EX1003, ¶136.

15. Claims 13 and 21

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

[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. EX1003, ¶¶137-139, 240-242.

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. EX1011, [0066]-[0067].

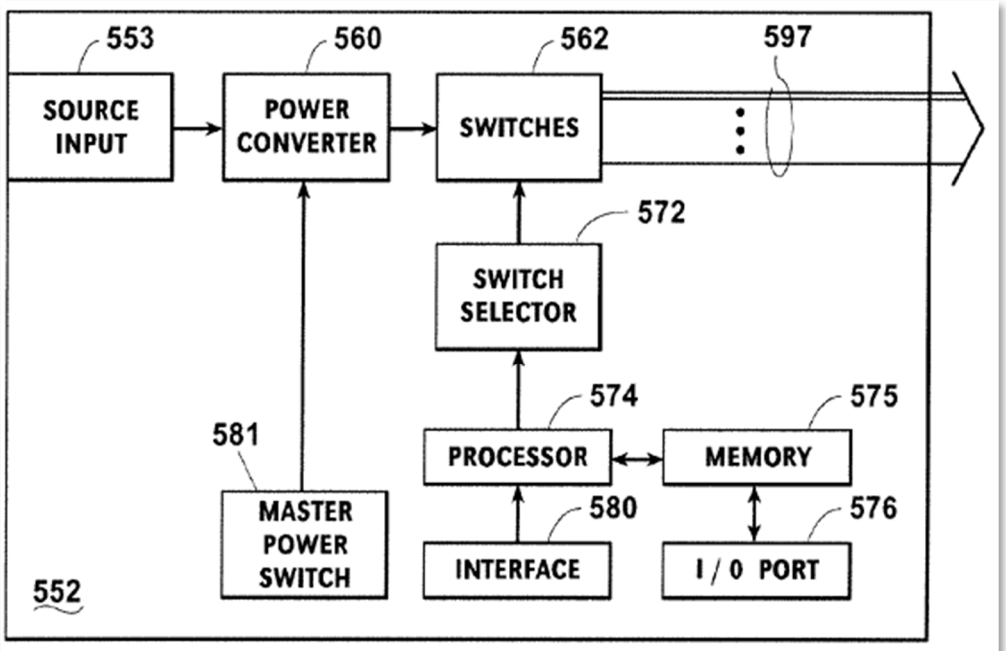


Fig. 5B

Id., Figure 5B. 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 to control the switch selector by, e.g., setting various digital values in registers whose output control the switches 562. The programming instructions may also provide for various lighting effects, such as dimming, strobing, pulsation, or pattern generation, for example.

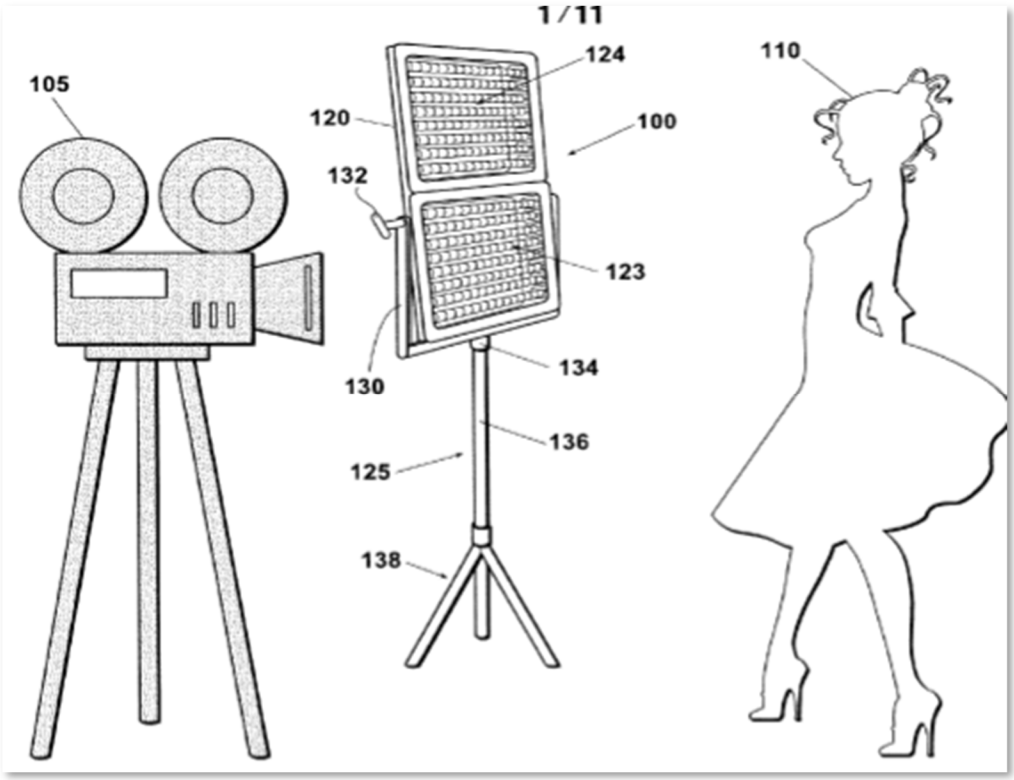
Id., [0067].

16. Claim 14

[14] The method according to claim 1 comprising controlling a plurality of lights in dependence on the output.

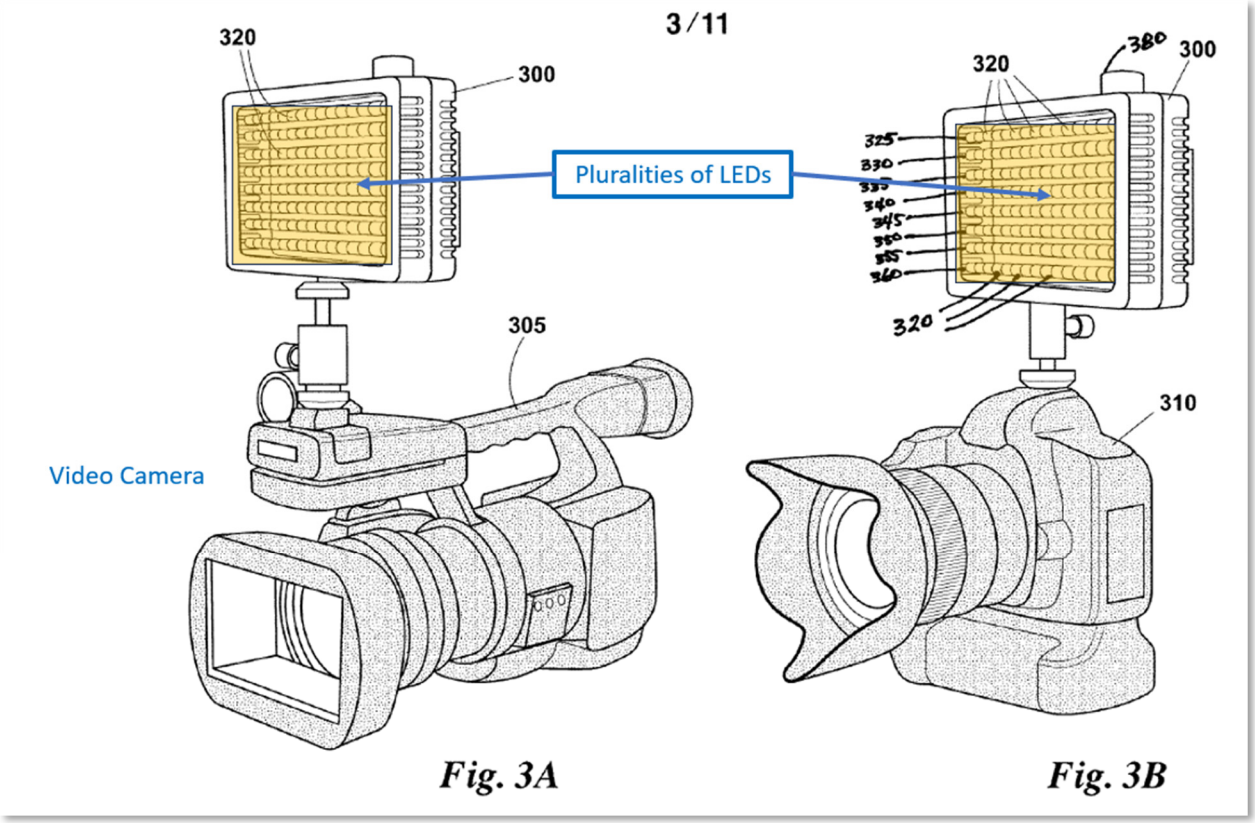
Pohlert anticipates Claim 14. EX1003, ¶¶140-144

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 various lamp elements, either collectively, individually, or in designated groups, and, in some embodiments, through pre-programmed patterns. EX1011, [0050].



Id., Figure 1.

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].



Id., Figures 3A, 3B (annotated). 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 325-260 (individually, in groups, or collectively), or various combinations of these effects is contemplated.

Id., [0067].

Pohlert further 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. EX1003, ¶144.

17. Claim 16

[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 Claim 16. EX1003, ¶¶182-187.

The controllers include a wired interface connecting to the lighting devices, wherein the wired connection communicates power control signals to the lighting devices. EX1011, [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." *Id.*, [0057]. Pohlert states that the power controller "outputs a plurality of power wires 541 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.*

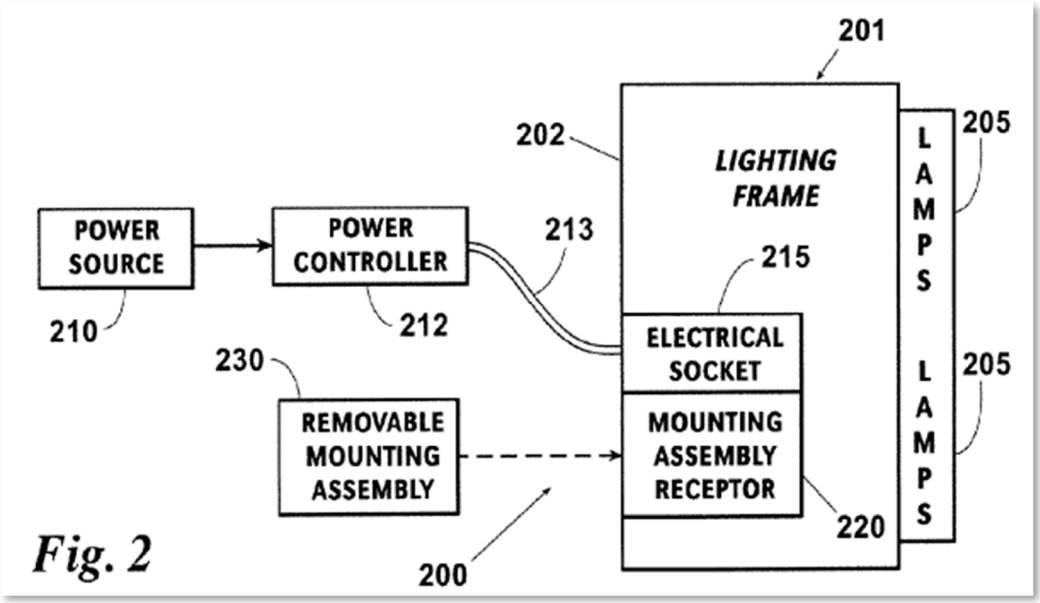


Fig. 2

Id., Figure 2.

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].

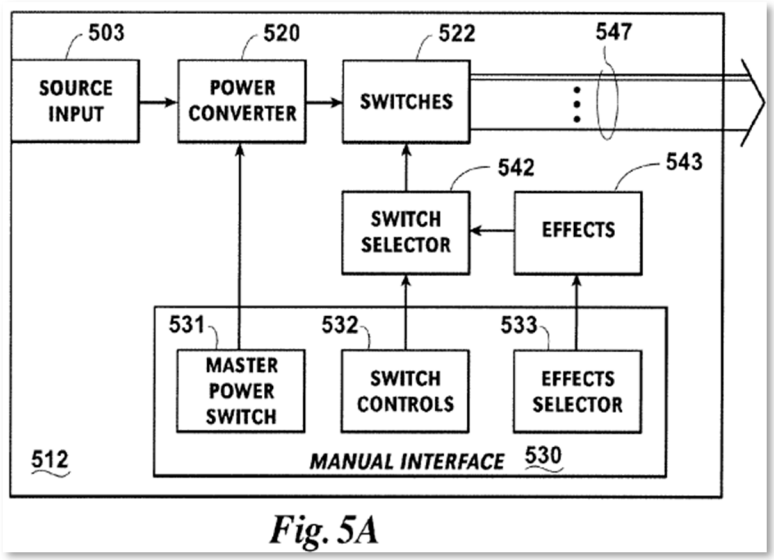


Fig. 5A

Id., Figure 5A.

The Figure 5B power controller similarly included 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].

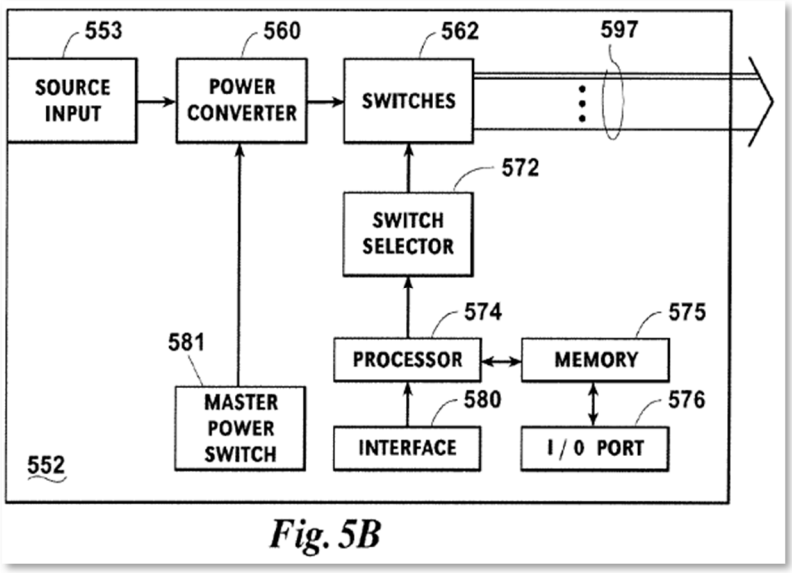


Fig. 5B

Id., Figure 5B.

Pohlert also discloses a wireless communication interface. EX1003, ¶186. The Figure 5B controller includes an "I/O port" that may be wireless (*e.g.*, infrared) for obtaining digital information. EX1011, [0066]. Moreover, the slave flashes can be controlled by RF, infrared, 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 slave flash systems. *Id.*, [0023].

A POSITA would have understood the Figure 5B power controller, having an infrared I/O port, could generate the exact infrared signals Pohlert mentions trigger the external slave flash units. EX1003, ¶187. A POSITA would have understood that the I/O port could receive (input) and generate (output) infrared 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 or he could coordinate and control all lights being used from one controller. *Id.*

18. Claim 17

[17] The controller according to claim 15, wherein the controller comprises an input interface adapted to receive a user input.

Pohlert anticipates Claim 17. EX1003, ¶¶188-191

The Figure 5A-5B controllers include an input user interface to receive user inputs. *See supra* Claim 8.

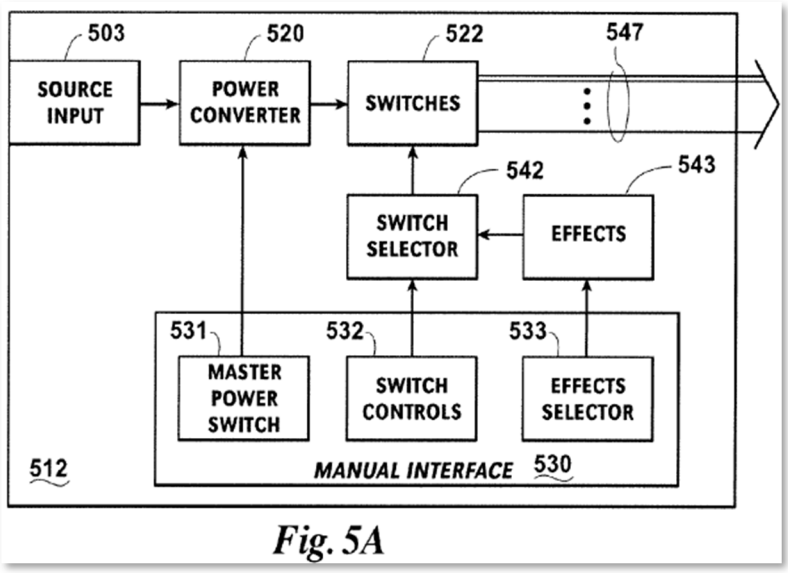


Fig. 5A

EX1011, Figure 5A.

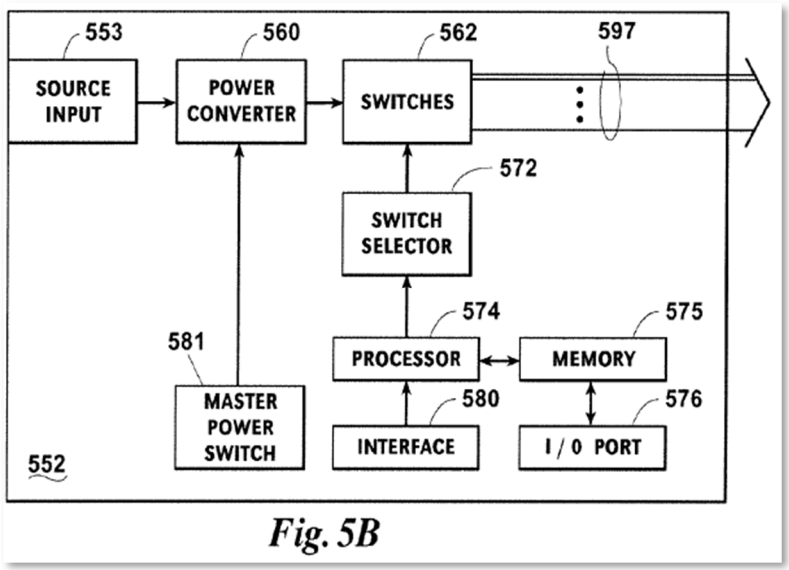


Fig. 5B

Id., Figure 5B.

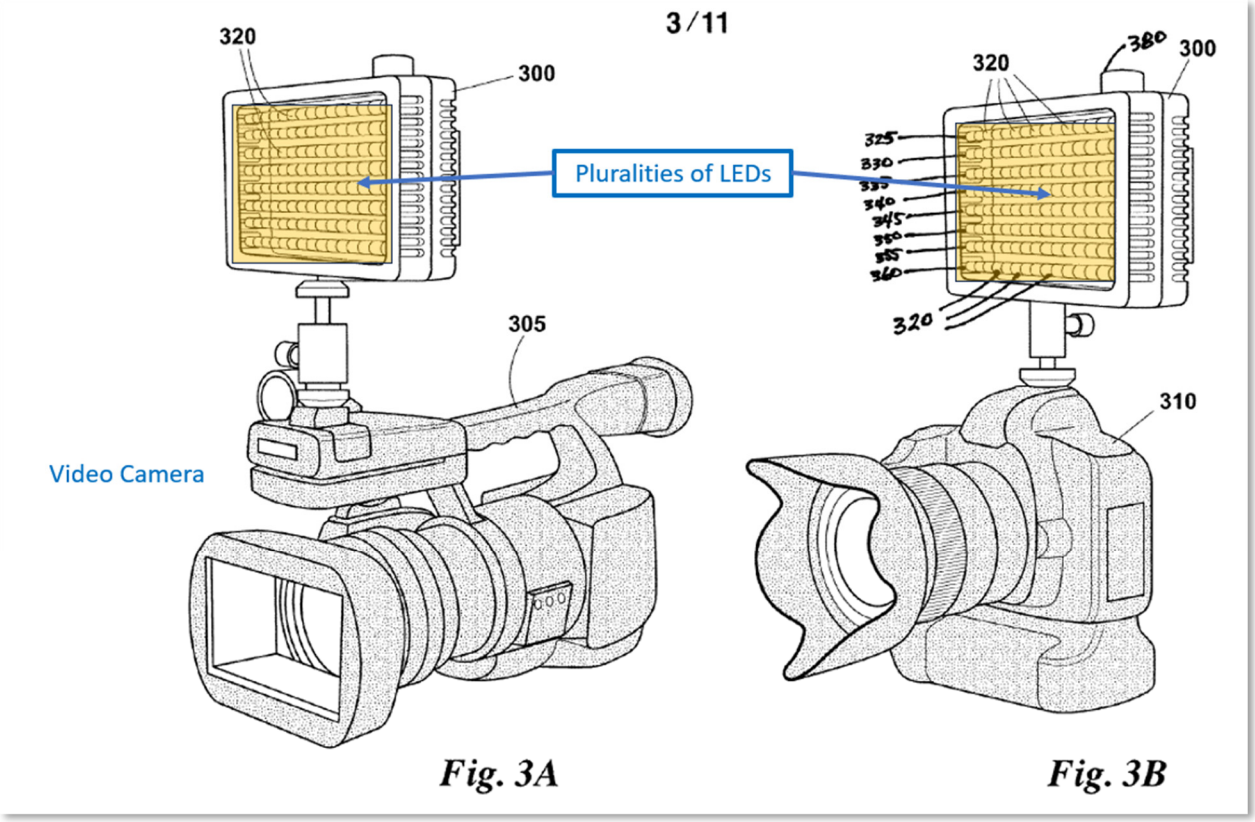
19. Claim 18

[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. EX1003, ¶¶192-194.

Pohlert discloses a lighting system comprising the controller according to Claim 15, *see supra* Claims 15 and 20, and lamp elements including multiple light emitting diodes (LEDs), such as the plurality of lamp segments 320 shown in Figures 3A and 3B (and shown in yellow below), and that these can be "red, green, and blue LEDs." EX1011, [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].



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

20. Claim 19

[19] The lighting system according to claim 18 wherein said controller and said lighting device are integrated in a combined unit.

Pohlert anticipates Claim 19. EX1003, ¶¶195-200.

The lighting system includes a power controller and LED lamps physically connected and combined into one device. EX1011, [0020], [0050]-[0051]; *see also* EX1001, 11:39-42 (the '257 Patent explaining that "it should be appreciated that the

effect simulator 100 or the computing device 130 may be ***separate*** from any light 102, and ***connectable to*** lights 102, ***by either a wired or wireless connection***.") The power controller (green below) can be physically connected by a cable to the lighting elements on the lighting frame, making them one combined unit.

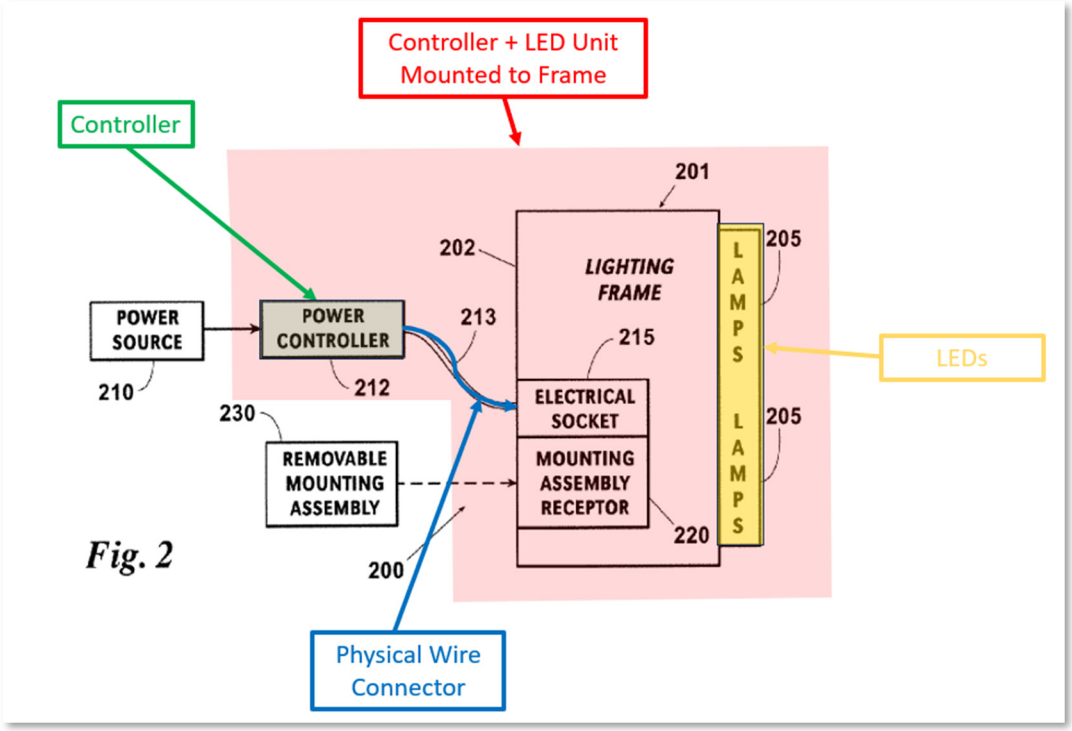
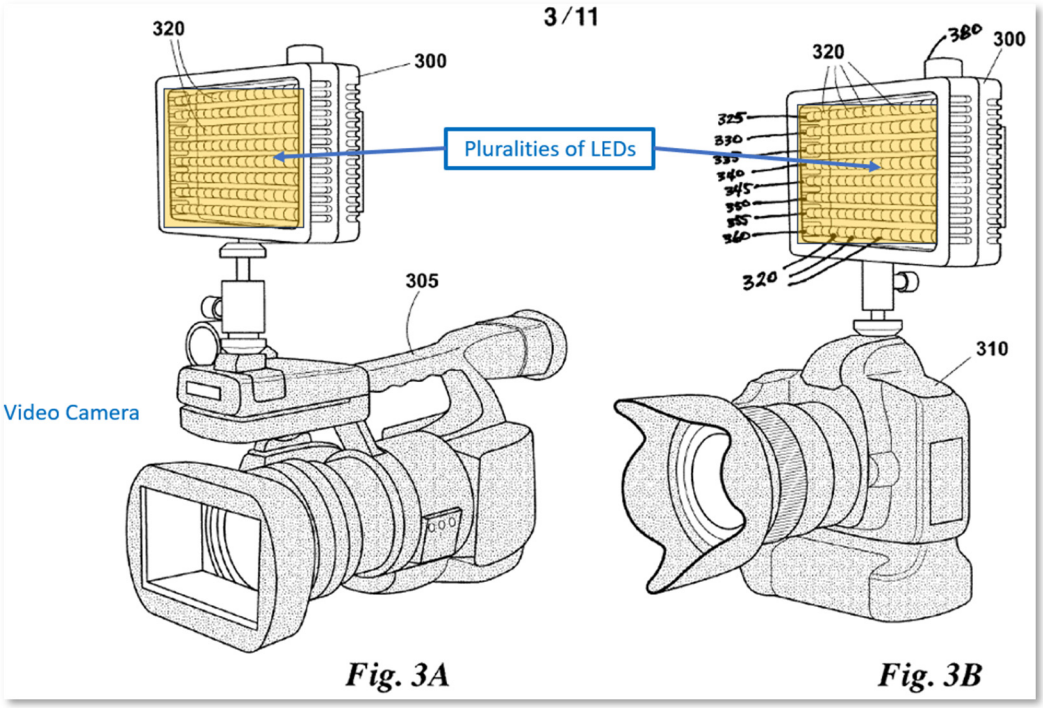


Fig. 2

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]. Where a battery is used, "the light panel and self-contained battery unit functions 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-B (annotated). The LEDs and controller may also be mounted to a camera frame and may be "provided in the form of a kit, with one or more light panel, self-contained batter 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 use in the field." *Id.*, [0024], [0050].

B. Ground 2 – Mueller in view of Reichow renders Claims 1-21 obvious.

1. Overview of Mueller

U.S. Patent Publication 2005/0275626 to Mueller *et al.*, titled "Entertainment Lighting System" was filed on March 2, 2005, and published on December 15, 2005. Mueller is prior art to the '257 Patent under at least 35 U.S.C. §102(a).

Mueller describes creation and modification of coordinated lighting effects. Specifically, a processor 102 is configured to output control signals to drive light sources 104 to generate various intensities of light from each light source 104. EX1004, [0168]. Processor 102 may be configured (*e.g.*, programmed) to provide control signals to light sources 104 to generate a variety of static or time-varying (dynamic) multi-color (or multi-color temperature) lighting effects. *Id.*, [0170]. The processor's control of light sources 104 could be based, at least in part, on user signals provided through interface 118. *Id.*, [0183]. Such user signals could be user-selectable settings or functions, including, but not limited to changing and/or selecting various pre-programmed lighting effects to be generated by the lighting unit, and changing and/or selecting various parameters of selected lighting effects. *Id.*, [0182].

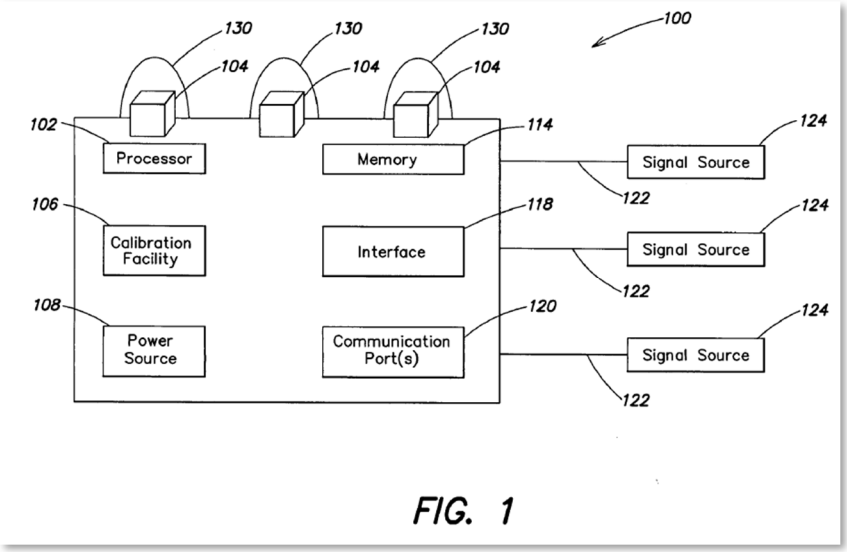


FIG. 1

Id., Figure 1.

Mueller discloses alternative embodiments utilizing the general concepts disclosed therein in a variety of specific devices and settings. EX1003, ¶245. A POSITA would understand that the concepts discussed in the context of each of these embodiments are applicable to Mueller's other embodiments. *Id.* Generally, employing these concepts across Mueller's embodiments would require only the alteration or addition of software code, a concept with which a POSITA would be familiar. *Id.* A POSITA would thus be motivated, where required, to combine the teachings of Mueller's various embodiments with those of other embodiments. *Id.*

2. Overview of Reichow

U.S. Patent No. 7,686,471 to Reichow ("Reichow") titled "Standalone Flame Simulator" was filed on Nov. 10, 2006, published on May 15, 2008, and issued on March 30, 2010. Reichow is prior art to the '257 Patent at least under 35 U.S.C. § 102(a).

Reichow describes an apparatus for simulating flames including first and second light sources, such as high-powered light emitting diodes (LEDs), provided to produce light beams having two differing colors such as an amber beam and an orange/red beam. Each of the LEDs has a brightness level that can be tuned or adjusted by a controller, which may be manual or may be automated to modify the brightness level of at least one of the LEDs and typically both LEDs during the operation of the flame simulator.

3. Motivation to Combine

Mueller describes the control of an entertainment lighting system using an interface, controller, and effect simulator. Mueller also describes how a user might select and customize a particular effect to be simulated, how the systems described therein receives data relating to the customized effect and converts the received data into lighting signals that are then sent to light sources to produce the customized effect. Mueller provides less detail regarding the combinations of particular colors, timing, and brightness of each effect that the systems described therein are capable of generating. For instance, Mueller discloses that the systems described therein can simulate the light from a fire. EX1004, [0215], [0221]. But Mueller does not disclose the particular colors, intensities, and timings associated with simulating such an effect.

But Reichow does describe how one might use lighting effects to simulate the light of a flame in greater detail. A POSITA seeking to program such an effect into the systems of Mueller, would look to other art, like Reichow, to determine the manner in which such effects are generated, particularly effects that require flickering or strobing of lighting elements. EX1003, ¶248.

4. Claim 1

Mueller in view of Reichow renders Claim 1 obvious. EX1003, ¶¶249-283.

a. Claim Element 1p

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

It is Petitioner's position that the preamble to Claim 1 is not limiting and need not be analyzed for purposes of determining Claim 1's validity. Should the Board determine the preamble is limiting, Mueller teaches Claim Element 1p. EX1003, ¶¶250-258.

Mueller describes "methods and systems for managing control instructions for a plurality of light systems." EX1004, [0025]. Specifically, lightning unit 100 is controlled by a processor 102 that "may be particularly configured (e.g., programmed) to provide control signals to one or more of the light sources so as to generate a variety of static or time-varying (dynamic) multi-color (or multi-color temperature) lighting effects." *Id.*, [0170].

Mueller explains that control of the lightning unit 100 includes producing user customizable lightning effects. For instance, Mueller describes "controlling the light output of lighting unit 100, changing and/or selecting various pre-programmed lighting effects to be generated by the lighting unit, [and] changing and/or selecting various parameters of selected lighting effects . . . ." *Id.*, [0182].

b. Claim Element 1a

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

Mueller teaches Claim Element 1a. EX1003, ¶¶259-265.

Mueller describes an effect simulator that performs calculations, namely processor 102. EX1004, [0168]. Processor 102 can calculate a time varying lighting value: "the processor 102 may be particularly configured (e.g., programmed) to provide control signals to one or more of the light sources so as to generate a variety of static or time-varying (dynamic) multi-color (or multi-color temperature) lighting effects." *Id.*, [0170]. This calculation is made in response to user input, including input relating to parameters on which the lighting value is based, received by processor 102, which determines (*i.e.*, "calculates") lighting values reflecting these inputs, and sends these values to light sources 104 to produce the desired effects. *Id.*, [0170], [0182]-[0183].

In connection with a number of additional embodiments, Mueller discloses the use of a processor as an effect simulator to calculate a time varying lighting value:

- "The program may be configured, for example to generate an array of lighting effects such as color-changing effects, stroboscopic effects, flashing effects, coordinated lighting effects, lighting effects

coordinated with other media such as video or audio, color wash where the color changes in hue, saturation or intensity over a period of time, ambient color generation, color fades, effects that simulate movement such as a color chasing rainbow, a flare streaking across a room, a sun rising, a plume from an explosion, other moving effects, and any other lighting effect consistent with the environment 602 and the lighting system 200." *Id.*, [0215];

- "By changing the coordinates in the configuration file, the real world lights can be mapped to the virtual world represented on the screen in a way that allows them to reflect what is happening in the virtual environment. The developer can thus create time-based effects, such as an explosion." *Id.*, [0242].

In connection with several embodiments, Mueller discusses the use of software, algorithms, and the like to calculate time varying lighting values. *See, e.g.*, *id.*, [0063], [0064], [0170], [0172], [0178], [0205]-[0207], [0211], [0220], [0302], [0303]. A POSITA would have understood that such software or algorithms would provide processor 102 with the ability to calculate these dynamic lighting values. EX1003, ¶263.

A POSITA would have understood that Mueller disclosed an effect simulator (processor 102) that could be programmed in a multitude of different

ways, including to calculate a time-varying lighting value based on a simulation parameter in the manner disclosed in multiple these multiple embodiments of Mueller. EX1003, ¶264.

c. Claim Element 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;

Mueller teaches Claim Element 1b. EX1003, ¶¶266-270.

Mueller discloses that the user customizable lighting effect based, at least in part, on a simulation parameter, can be selected from a range of pre-programmed, customizable lighting effects. EX1004, [0182] (describing "changing and/or selecting various pre-programmed lighting effects.").

The systems described in Mueller can be used in a variety of contexts and locations, including "a film studio, [and] a video studio." EX1004, [0034]. A POSITA would understand that the lighting systems and methods described in Mueller could be used in a number of entertainment settings, including videography, broadcast, cinematography, studio filming, and/or location filming. EX1003, ¶269.

d. Claim Element 1c

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

Mueller in view of Reichow teaches Claim Element 1c. EX1003, ¶¶271-276.

Reichow, which, like Mueller, uses lights in connection with simulating a flame effect, discloses simulation parameters of a random brightness, a random duration, and a random interval.

Regarding random brightness, Reichow uses a controller to "run a flame simulation routine that determines a cyclical pattern or random timing or random brightness levels." EX1010, 3:13-15. As the simulated fire of Reichow is described as appearing to flicker, *id.*, 9:9-12, 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. EX1003, ¶274.

Regarding random duration and random interval, that LEDs described in Reichow "are caused to flash or be turned on/off at regular ***or random intervals*** to illuminate flame elements[,]" and can be controlled "to alter the brightness of the two or more flame simulation routines to alter the brightness of the two or more LEDs on a regular ***or random time schedule*** . . . ." EX1010, 3:13-15, 4:59-62. Absent such random duration and intervals, the effect would not be a "random flicker," and would instead be a consistent strobing between background and

flickering colors. EX1003, ¶275.

e. Claim Element 1d

said simulation parameter depending on the user customisable lighting effect being simulated;

Mueller teaches Claim Element 1b. EX1003, ¶¶276-278.

Mueller discloses the selection of user customizable lighting effects to be simulated. *See supra* Claim Elements 1p, 1b. A user may customize those lighting effects by changing one or more simulation parameters. *See supra* Claim Element 1p. A POSITA would understand that the simulation parameter(s) for the pre-programmed lighting effects of Mueller, EX1004, [0182], are dependent on the specific pre-programmed lighting effects selected for simulation. EX1003, ¶278. A POSITA would understand that presenting simulation parameters unrelated to the lighting effect to be simulated would only create confusion and would limit the available parameters to be adjusted to only those relevant to the selected effect. *Id.* This is particularly true because Mueller specifically discloses contexts in which adjustable effect parameters are limited to those relevant to a selected effect. *See, e.g.*, *id.*, [0305].

f. Claim Element 1e

outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customisable lighting effect.

Mueller teaches Claim Element 1e. EX1003, ¶¶279-282.

The outputting a time varying lighting value to simulate a selected lighting effect, as it explains "processor 102 . . . is configured to output one or more control signals to drive the light sources 104 so as to generate various intensities of light from the light sources 104. EX1004, [0168]. "[T]he processor 102 may be particularly configured (e.g., programmed) to provide controls signals to one or more of the light sources so as to generate a variety of static or ***time-varying (dynamic) multi-color (or multi-color temperature) lighting effects***." *Id.*, [0170] (emphasis added).

5. Claims 15 and 20

There are no relevant, substantive differences between Claim 1 and Claims 15 and 20, *see supra* Ground 1, Claims 15 and 20, and Mueller in view of Reichow renders Claims 15 and 20 obvious for the same reasons as Claim 1. *See supra* Claim 1; *see also* EX1003, ¶¶249-282, 341-377, 392-429; *supra* Ground 1, Claims 15 and 20.

With respect to Claim 15, Mueller discloses that the method of Claim 1 is implemented on a system that includes the lighting unit 100 as controlled by processor 102. *See supra* Claim 1.

Moreover, Mueller discloses the method can be performed by a "software program" as in Claim 20: "[i]n some implementations [of the methods and systems

described therein], the storage media may be encoded with one or more programs that, when executed on one or more processors, perform at least some of the functions discussed herein." EX1004, [0064]. Mueller further provides that "[t]he terms 'program' and 'computer program' are used herein in a generic sense to refer to any type of computer code (e.g., high or low level software, microcode, and so on) that can be employed to control operation of a processor." (*Id.*) A POSITA would thus understand that the control of lighting systems and methods disclosed in Mueller is via the processor's execution of software code. EX1003, ¶¶396.

6. Claim 2

[2] The method according to claim 1 wherein the random brightness comprises a random peak brightness

Mueller in view of Reichow renders Claim 2 obvious. EX1003, ¶¶283-285.

Reichow teaches the simulation parameter of random brightness. *See supra* Claim Element 1c. Given that Reichow describes the generation of a flickering effect, 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. EX1003, ¶285. Whichever brightness level is the highest would be the "random peak brightness." *Id.*

7. Claim 3

[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.

Mueller in view of Reichow renders Claim 3 obvious. EX1003, ¶¶286-288.

Reichow discloses the simulation parameter of random interval. *See supra* Claim Element 1c. Given that the simulated flame of Reichow is described as appearing to flicker, such flickering indicates a "random interval" of time between each flash of light. EX1003, ¶288. Absent such random interval the effect would not be consistent strobing rather than a flicker effect. *Id.* Moreover, in implementing the random flickering, Reichow inherently discloses a random frequency, as the interval between flashes randomly changes. *Id.*

8. Claim 4

[4] The method according to 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.

Mueller in view of Reichow renders Claim 4 obvious. EX1003, ¶¶289-291.

Reichow's flame simulation effect has at least a random number of pulses. Reichow discloses random interval, random duration, and random frequency. *See supra* Claim Element 1c, Claim 3. Absent such random intervals, durations, and

frequencies, the effect of Reichow could not achieve a flicker effect but would instead result in consistent strobing. EX1003, ¶291. Achieving this flickering effect would necessarily also include a random number of pulses for any unit of time, as the interval between each pulse, and the length of each pulse, is random. *Id.*

9. Claim 5

[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 burst; an interval between bursts; an amplitude, and a ramp-up or fade-down time.

Mueller in view of Reichow renders Claim 5 obvious. EX1003, ¶¶292-297.

Reichow discloses an upper and lower bounds of brightness amplitude. Reichow describes that the controller adjusts LEDs by using a random number generator to randomly select among a number of wash up and down subroutines for one or both of the LEDs, with the wash up and down subroutines setting the upper and lower boundaries for brightness. EX1010, 8:3-7; *see also supra* Claim Element 1c and Claim 2.

Moreover, Reichow discloses that the simulation parameter of "a random brightness" is within predefined boundaries as it describes that the brightness level is within "a range of brightness levels." *Id.*, 3:13-17. Specifically, Reichow explains

"the controller may run a flame simulation routine that ***determines*** a cyclical pattern or random timing and ***brightness levels***, and the controller responds to ***move the brightness level*** of one or both the LEDs concurrently or separately ***through a range of brightness levels.***" *Id.* (emphasis added).

10. Claim 6

[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.

Mueller in view of Reichow renders Claim 6 obvious. EX1003, ¶¶298-302

Reichow's flame simulation effect is based on parameters including random brightness, duration, and interval. *See supra* Claim Element 1c.

The selection of random brightness is based on user selections. The simulation parameter of a random brightness is determined in dependence on user-selectable range of brightness level. EX1010, 3:10-17. For example,

> [t]he controller may be manual or it may be automated to modify the brightness level of at least one of the LEDs and typically both LEDs during the operation of flame simulation. For example, the controller may run a flame simulation routine that determines a cyclical pattern or random timing and ***brightness levels***, and the controller responds to ***move the brightness level*** of one or both the LEDs concurrently or separately ***through a range of brightness levels***.

Id., 3:10-17 (emphasis added).

The selection of random interval and duration, as opposed to regularly timed

intervals and durations, are also based on user selections, as the controller of Reichow "run[s] a flame simulation routine that determines a cyclical pattern ***or*** random timing . . . ." EX1010, 3:13-15.

11. Claim 7

[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 local fluctuation period; and a colour fluctuation period.

Mueller in view of Reichow renders Claim 7 obvious. EX1003, ¶¶303-307.

Reichow discloses a user-selected simulation parameter related to brightness: "Each of the LEDs may be manually tuned to have a particular brightness level or may be controlled by a programmable controller that acts to automatically wash or move the LEDs' brightness levels through a range of brightness levels." EX1010, 2:32-35.

Moreover, a POSITA would understand that Mueller describes that the simulation parameters relating to timing are related to a rate of increase of brightness, a rate of decrease of brightness, as it describes a "rate of decay". EX1004, [0305]; EX1003, ¶306. Specifically, Mueller explains that "a user can select a sparkle effect 5050 from the pull-down menu of the type field 4058, in which case the parameters pane 4074 shows parameters appropriate for a sparkle effect. The

parameters include ***timing parameters, such as the rate of decay***, set in a field 5052." EX1004, (emphasis added).

A POSITA would understand that Mueller describes that the simulation parameters concerning timing are related to a rate of change of color and a color fluctuation period, as it describes parameters such as "the time per color in a field", "the fade time in a field". *Id.*, [0303]; EX1003, ¶307.

12. Claim 8

[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.

Mueller in view of Reichow renders Claim 8 obvious. EX1003, ¶¶308-313.

Mueller makes clear that interface 118 of lighting unit 100 permits a user to select simulation parameters and adapt the simulation in dependence on those parameters:

> The lighting unit 100 may include one or more interfaces 118 that are provided to facilitate any of a number of user-selectable settings or functions (e.g., generally controlling the light out put of the lighting unit 100, changing and/or selecting various pre-programmed lighting effects to be generated by the lighting unit[and] changing and/or selecting various parameters of selected lighting effects . . . .)

EX1004, [0182].

Mueller also describes user input comprising the selection of many simulation parameters, as "the user can set various parameters, including those related to timing,

such as the time per color in a field, the fade time in a field, the number of colors that appear randomly before a cycle is created in a field, and the light-to-light offset in a field." EX1004, [0303]. In another example, a user selects simulation parameters for a sparkle effect, which is a lighting effect, i.e., selecting "from the pull-down menu of the type field, in which case the parameters pane shows parameters appropriate for a sparkle effect." *Id.*, at [0305].

The simulation is adapted depending on the user selectable simulation parameters, as simulation parameters for a sparkle effect is selected, the simulated lighting effect would be a sparkle effect. *Id.*, [0305].

13. Claim 9

[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.

Mueller in view of Reichow renders Claim 9 obvious. EX1003, ¶¶314-317.

Reichow discloses an upper and lower bounds of brightness amplitude as simulation parameters. For example, Reichow explains that the controller adjusts LEDs by using a random number generator to randomly select among a number of wash up and down subroutines for one or both of the LEDs, with the wash up and down subroutines setting "the ***upper and lower bounds for brightness***". EX1010, at 8:3-7 (emphasis added).

Reichow also discloses the simulation parameter of a color: "[T]he brightness and ***resulting color preferably should be tunable*** or settable to approximate a color and brightness of a flame being imitated . . . ." *Id.*, 5:61-63 (emphasis added).

14. Claim 10

[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 customizable lighting effect.

Mueller in view of Reichow renders Claim 10 obvious. EX1003, ¶¶318-321.

Mueller discloses repeated cycles of calculating information by a central controller. A central controller carrying out an algorithm "performed on information that is collected" and "accomplished every time the image is refreshed or every time this section of the image is refreshed or at other times." EX1004, [0218]. Here, the information received is the simulation parameter, time varying lighting value could be the calculated and selected "maximum information", "minimum information", "first quartile of the information", "third quartile of the information", "most used information", "integral of the information". *Id.* Mueller further explains that such calculation is to better simulate user customizable lighting effect, as "this step may be completed to ***level the effect of the lighting system in response to information received***. For example, the information in one refresh cycle may change the

information in the map several times and the effect may be viewed best when the projected light takes on one value in a given refresh cycle." *Id.*

15. Claim 11

[11] The method according to claim 1 wherein the user customizable lighting effect is designed to mimic at least one of fire flickering; police light; television; lighting flashing; electrical sparking; fireworks; a neon flickering sign; a gunshot; welding; a scan; a propeller; a (nuclear) explosion; a wormhole; paparazzi flashes; flashes (strobe).

Mueller in view of Reichow renders Claim 11 obvious. EX1003, ¶¶322-325.

Mueller discloses a user customizable lighting effect, such as an explosion effect: "designer can program the fire or explosion effect on a computer". EX1004, [0221]. In another example, "the program may be configured, for example to generate an array of lighting effects such as. . .flashing effects. . .a flare streaking across a room . . . a plume from an explosion". *Id.* [0215].

16. Claim 12

[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 customizable lighting effect.

Mueller in view of Reichow renders Claim 12 obvious. EX1003, ¶¶326-330.

Mueller discloses a button 6352 may be a trigger event, and a user may select a button 6352 to press on, thereby simulate the user customizable lighting effect. Specifically, "the user interface may be a keypad 6350, with one or more buttons 6352 for triggering shows. ***Each button 6352 might trigger a different show***, or a given sequence of buttons might trigger a particular show, so that a simple push-button interface can trigger many different shows". EX1004, [0322] (emphasis added).

Reichow also discloses trigger events, including detection of motion by a motion sensor and detection of predetermined light levels detected by a light sensor. EX1010, 8:28-34.

17. Claims 13 and 21

[13] The method according to claim 1, further comprising storing the at least one simulation parameter corresponding to said user customizable lighting effect.

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

Mueller in view of Reichow renders Claims 13 and 21 obvious. EX1003, ¶¶331-336, 430-435.

Mueller describes "one or more storage media generically referred to . . . as 'memory[.]'" EX1004, [0064]. "[T]he storage media may be encoded with one or more programs that, when executed on one or more processors, perform at least some

of the functions discussed herein." *Id.* Such functions as include, "generally controlling the light output of the lighting unit 100, changing and/or selecting various pre-programmed lighting effects to be generated by the lighting unit, [and] changing and/or selecting ***various parameters of selected lighting effects*** . . . ." *Id.*, [0182] (emphasis added).

Mueller further provides that

> [t]he lighting unit 100 also may include a ***memory*** 114 to ***store*** various information. For example, the memory 114 may be employed to ***store one or more lighting programs*** for execution by the processor 102 (e.g., to generate one or more control signals for the lights sources, as well as various types of data useful for generating variable color radiation . . . .

Id. (emphasis added).

A POSITA would understand that a lighting program stored in memory 114 could include a user input simulation parameter depending on a selected lighting effect to be simulated. EX1003, ¶¶335, 434. This is particularly true because, in connection with another embodiment, Mueller describes storing at least one simulation parameter in memory: "the lighting control interface allows for the storage and downloading of new functions and new parameter settings." EX1004, [0380]; *see also* EX1003, ¶¶335, 434.

In view of the disclosure by Mueller that the storage of lighting effects and the user-selected parameters associated therewith is carried out by memory,

EX1004, [0064], a POSITA would understand that such storage of user input simulation parameters must be in memory for fast execution by processor 102. EX1003, ¶¶336, 435. A POSITA would also understand that the purpose for storing in memory a lighting program, comprising lighting effects and their parameters, was to later recall the lighting program and run it. *Id.* This is particularly true given that Mueller, in the context of a separate embodiment describes that lighting functions and parameters can be stored for "user modification and implementation" of lighting effects. EX1004, [0380]; EX1003, ¶¶336, 435.

18. Claim 14

[17] The method according to claim 1 comprising controlling a plurality of lights in dependence on the output.

Mueller in view of Reichow renders Claim 14 obvious. EX1003, ¶¶337-340.

Mueller describes controlling a plurality of LEDs to produce a user desired output. EX1004, [0171]. "[T]he lighting unit 100 may include ***a wide variety of colors of LEDs*** in various combinations . . . . Such combinations of ***differently colored LEDs in the lighting unit 100*** can facilitate accurate reproduction of a ***host of desirable spectrums of lighting conditions.***" *Id.* (emphasis added).

19. Claim 16

[18] 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.

Mueller in view of Reichow renders Claim 16 obvious. EX1003, ¶¶378-380.

Mueller discloses "communication ports 120," which are interfaces for communication with other lighting devices through wired or wireless connections. EX1004, [0190].

20. Claim 17

[19] The controller according to claim 15, wherein the controller comprises an input interface adapted to receive a user input.

Mueller in view of Reichow renders Claim 17 obvious. EX1003, ¶¶381-383.

Mueller describes an input interface: "one or more interfaces 118" that are adapted to receive a user input facilitating "any of a number of user-selectable settings or functions." EX1004, [0182].

21. Claim 18

[19] 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.

Mueller in view of Reichow renders Claim 18 obvious. EX1003, ¶¶384-387.

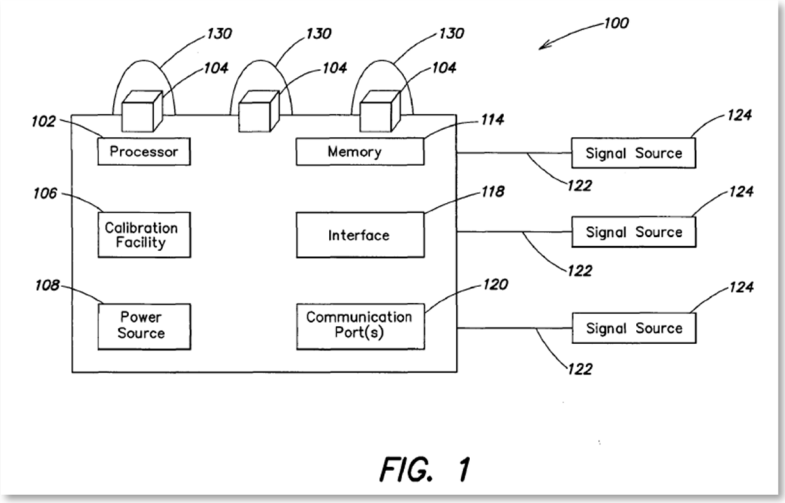
Mueller's lighting unit 100 comprises one or more light sources 104, and those light sources 104 may be light emitting diodes (LEDs). EX1004, [0167].

22. Claim 19

A lighting system according to claim 18 wherein said controller and said lighting device are integrated in a combined unit.

Mueller in view of Reichow renders Claim 19 obvious. EX1003, ¶¶388-391.

Mueller describes that the controller (i.e., processor 102), input interface 118, memory 114, and light sources 104 are integrated in a combined unit: lighting unit 100. EX1004, [0168], Figure 1.



Id., Figure 1.

IX. CONCLUSION

Aputure respectfully requests that a Trial be instituted. Claims 1-21 should be cancelled.

Dated: September 16, 2024

Respectfully submitted,

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APPENDIX A – CLAIM LISTING

U.S. Patent No. 10,197,257

Claim or Element #	Claim Language
Claim 1	
1p	A method for controlling a lighting device to produce a user customizable lighting effect, the method comprising:
1a	calculating, using an effect simulator, a time varying lighting value based on at least one simulation parameter;
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;
1c	wherein said at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;
1d	said simulation parameter depending on the user customisable lighting effect being simulated; and
1e	outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customisable lighting effect.

Claim 2	
[2]	The method according to claim 1 wherein the random brightness comprises a random peak brightness.
Claim 3	
[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.
Claim 4	
[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.
Claim 5	
[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.
Claim 6	

[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.
Claim 7	
[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.
Claim 8	
[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.
Claim 9	
[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.
Claim 10	

[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.
Claim 11	
[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).
Claim 12	
[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.
Claim 13	

[13]	The method according to claim 1, further comprising storing the at least one simulation parameter corresponding to said user customisable lighting effect.
Claim 14	
[14]	The method according to claim 1 comprising controlling a plurality of lights in dependence on the output.
Claim 15	
15p	A controller adapted to control at least one lighting device to produce a user customisable lighting effect, the controller comprising:
15a	an effect simulator adapted to calculate a time varying lighting value based on at least one simulation parameter;
15b	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;
15c	wherein the at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;
15d	said simulation parameter depending on the user customisable lighting effect being simulated; and

15e	wherein an output of the effect simulator is adapted to control a lighting device according to the calculated variation of lighting over time.
Claim 16	
[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.
Claim 17	
[17]	The controller according to claim 15, wherein the controller comprises an input interface adapted to receive a user input.
Claim 18	
[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.
Claim 19	
[19]	The lighting system according to claim 18 wherein said controller and said lighting device are integrated in a combined unit.
Claim 20	

20p	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:
20a	calculating using an effect simulator a time varying lighting value based on at least one simulation parameter;
20b	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;
20c	wherein the at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval;
20d	said simulation parameter depending on the user customisable lighting effect being simulated; and
20e	outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customisable lighting effect.
Claim 21	
[21]	The method according to claim 13, further comprising recalling said stored at least one simulation parameter from a memory.

APPENDIX B

Certificate of Word Count

I certify that, in accordance with 37 C.F.R. § 42.24(d), the total word count for the forgoing Petition 13,907. This is less than the permitted total under 37 C.F.R. 42.24(a)(1)(i).

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APPENDIX C

Certificate of Service

I certify that on September 16, 2024, a copy of this Petition for *Inter Partes Review* and supporting documents were served on Patent Owner via Federal Express at the following address:

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