UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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APUTURE IMAGING INDUSTRIES CO., LTD.,

Petitioner,

v.

ROTOLIGHT LIMITED,

Patent Owner.

_____

Case No.: IPR2024-01425
U.S. Patent No. 10,197,258

_____

PETITION FOR INTER PARTES REVIEW

OF U.S. PATENT NO. 10,197,258

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PETITIONER'S EXHIBIT LIST

EX1001	U.S. Patent No. 10,197,258 (the "'258 Patent")
EX1002	Prosecution History of the '258 Patent
EX1003	Declaration of P. Morgan Pattison, PhD, dated September 16, 2024 ("Pattison Decl.")
EX1004	U.S. Patent Application Publication No. 2005/0275626 to Mueller *et al.* ("Mueller")
EX1005	Installation & User's Manual for Showline SL PAR 155 ZOOM RGBW LED Luminaire ("Showline")
EX1006	Complaint for Patent Infringement, *Rotolight Limited v. Aputure Imaging Indust. Co., Ltd.*, No. 4:23-cv-00508-ALM (E.D. Tex.) (Dkt. 1, filed June 5, 2023)
EX1007	First Amended Complaint for Patent Infringement, *Rotolight Limited v. Aputure Imaging Indust. Co., Ltd.*, No. 4:23-cv-00508-ALM (E.D. Tex.) (Dkt. 25, filed April 29, 2024)
EX1008	Docket Report for *Rotolight Limited v. Aputure Imaging Indust. Co., Ltd.*, No. 4:23-cv-00508-ALM (E.D. Tex.)
EX1009	Time to Trial Report for the Eastern District of Texas from docketnavigator.com, captured June 13, 2024.
EX1010	Time to Trial Report for the Central District of California from docketnavigator.com, captured June 13, 2024.
EX1011	Declaration of Martin Palmer Regarding Showline SL PAR 155 Zoom RGBW LED Luminaire User's Manual, from *Arnold & Richter Cine Technik GmbH & Co. Betriebs KG v. Rotolight Limited*, No. IPR2021-01497 (P.T.A.B.)
EX1012	U.S. Patent No. 8,632,208 to Choong ("Choong")

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. 10,197,258 (the "'258 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 '258 Patent has also been asserted or challenged in the following litigations and *inter partes* review proceedings:

- *Videndum Production Solutions, Inc. v. Rotolight Limited*, No. IPR2023-01219 (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. IPR2022-00262 (P.T.A.B.), filed December 3, 2021; and
- *Arnold & Richter Cine Technik GmBH & Co. Betriebs KG v. Rotolight Limited*, No. IPR2021-01497 (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 ’258 Patent is available for *inter partes* review and Petitioner is not estopped from requesting *inter partes* review 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 *inter partes* review of claims 1-22 of the ’258 Patent and cancel those claims as unpatentable.

IV. REASONS FOR THE REQUESTED RELIEF

The challenged claims of the ’258 Patent would have been obvious to a person of ordinary skill in the art (“POSITA”) and are therefore unpatentable. The claims recite nothing more than previously disclosed subject matter or an obvious combination of lighting system components and processes for the use of lighting systems that had been used by POSITAs prior to the filing of the ’258 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). EX1003, ¶¶31-349. Dr. Pattison is familiar with the state of the cinematic and videographic lighting arts before the ’258 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.

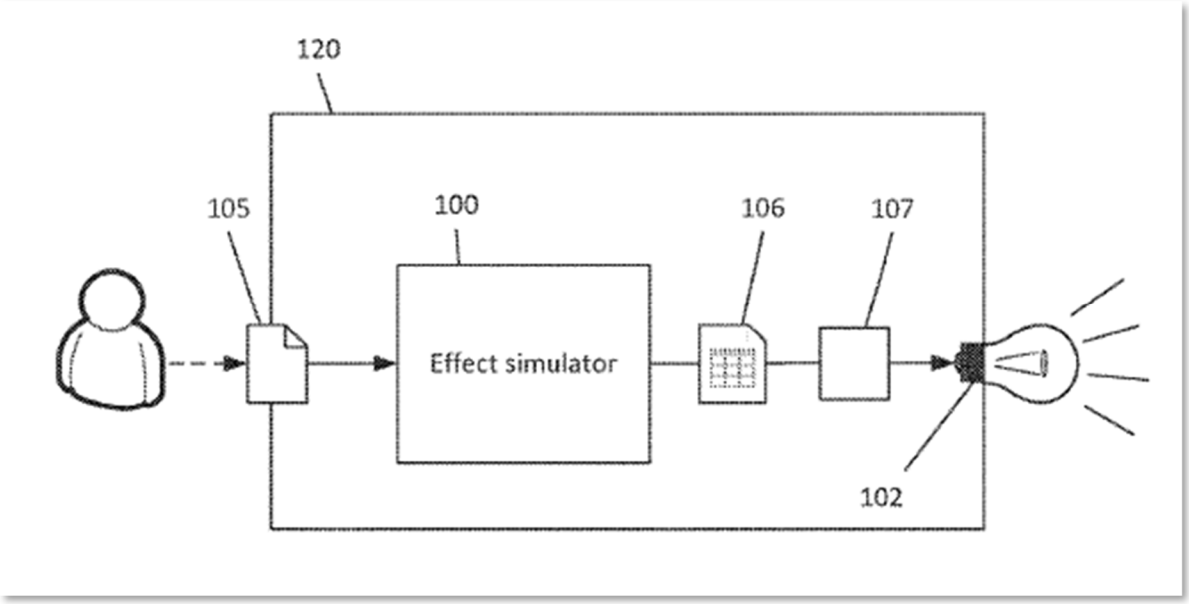
Accordingly, the Board should institute trial and cancel the challenged claims.

A. Summary of the ’258 Patent

Claim 1 recites a “lighting system” that includes a “lighting device” and “controller” integrated into a combined unit. The controller is “adapted to control the lighting device to produce a user customizable cinematic lighting special effect selected from a range of different user customizable cinematic lighting special effects.” The controller includes an “input interface,” which enables users to select an effect, and an “effect simulator,” which calculates a “time varying lighting value,”

based on at least one "simulation parameter" (e.g., brightness, color) depending on the selected effect, and outputs the value to a lighting device to simulate the selected effect."

Figure 2 is a schematic diagram of a lighting system:



EX1001, Figure 2.

Figure 2 depicts a single studio lamp device (120) with an effect simulator (100) and a light (102) integrated therein. EX1001, 5:61-63. Figure 2 also depicts

- an input interface (105);
- data (106) to modulate light 102 such that the desired lighting effect is produced; and
- a lighting data converter 107 to convert data 106 from the lighting effect simulator 100 into a suitable signal for a light 102.

Id., 5:57-58, 6:4-8, 8:41-46. The '258 Patent also discloses "[a] microcontroller or other computing unit [that] is integrated into the lamp device 120 for performing calculations." *Id.*, 6:1-3.

The effect simulator 100 is a component of the controller that "creates data 106 characterising a lighting effect." *Id.*, 5:54-58, 7:51-52, 8:41-50. The '258 Patent describes how before this data is sent to lighting device 102 to output the light simulating effect, it may be converted by lighting data converter 107. *Id.*, 8:41-53. The lighting device 102 then outputs light simulating the desired effect.

The '258 Patent also describes a number of variants that correspond to dependent claims 2-22.

B. The Prosecution History of the '258 Patent.

The '258 Patent issued on February 5, 2019, from U.S. Application No. 15/849,819, 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 a March 28, 2018 Office Action, the Examiner rejected the original claims under 35 U.S.C. § 112 but made no rejections relating to prior art. EX1002, 288-299. The claims were amended to overcome the Examiner's rejections, and a Notice of Allowance was sent on September 24, 2018. In the Notice, the Examiner indicated that the prior art fails to teach or suggest "an effect simulator adapted to calculate a time varying lighting value based on at least one simulation parameter, said at least

one simulation parameter depending on the selected user customisable cinematic lighting special effect being simulated, and adapted to output said time varying lighting value to said lighting device so as to simulate the selected user customisable cinematic lighting special effect." *Id.*, 114-115.

C. Priority Date.

The '258 Patent claims priority to a provisional application filed on April 8, 2016. EX1001, Cover. That date is the assumed priority date for purposes of this Petition. All references cited in the instant Petition qualify as prior art based on that priority date.

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

Aputure has not been involved in any previous review of the '258 Patent. Additionally, the Office has not considered the combinations of references forming the grounds for this Petition, and the combinations are not redundant to any combination of references considered during prosecution. Additionally, the instant Petition provides the analysis of Dr. Pattison, which has likewise 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, Pater 19 (P.T.A.B Sept. 6, 2017), do not

support denial of institution. Though prior Petitions for IPR challenging the '258 have been filed by third parties, Petitioner has not previously filed a petition directed to the '258 Patent, 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 '258 Patent and does not have a significant relationship with any previous petitioner is thus dispositive on the issue of whether the Board should exercise its discretion to deny institution under 35 U.S.C. § 314(a).

Even if the Board considers the additional *General Plastic* factors, however, such consideration would not warrant denying institution. For instance, 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 '258 Patent (Factor 2). Each of these factors weighs against denying institution based on *General Plastic.*

The remaining factors are, at most, either neutral or, in view of the fact that Petitioner has not previously challenged any claims of the '258 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 (EX1008) (Factor 4), there is no evidence on which Patent Owner could rely that Petition has improperly delayed in filing the present Petition, the district court litigation remains in its early stages, and this Petition is brought well 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). And there is no evidence that 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 based on *General Plastic*.

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

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

[1] Patent Owner did not serve the Complaint in the district court litigation until October 17, 2023. EX1008.

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 '258 Patent issued before filing its Complaint on June 5, 2023, EX1006, and the litigation is in its early stages, and a stay pending IPR would be appropriate. Given that a motion to stay has not yet 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 and the court has not entered a Scheduling Order. EX1008. In the Eastern District of Texas, average time to trial is 24-27 months. EX1009. In the Central District of California, to which Petitioner seeks transfer, average time to trial is 29-32 months. EX1010. That the case remains in its early stages 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. No scheduling order has been entered. EX1008. 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. EX1008. 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 that Claims 1-22 are unpatentable as anticipated or obvious. The merits of Petitioner's argument are strong, and this factor weighs against discretionary denial.

As such, this Petition should not be denied on discretionary factors.

V. Claim Construction

In *inter partes* review, 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). Claim 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 pertaining to the patent. *Id.*; *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312-13 (Fed. Cir. 2015) (*en banc*).

Petitioner believes the '258 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 '258 Patent to help the jury understand the relevant technical terms.

VI. STATUTORY GROUNDS FOR CHALLENGES AND REFERENCES USED

Ground #1: Claims 1-6 and 8-22 of the '258 Patent would have been obvious under 35 U.S.C. § 103 over Mueller.

Ground #1a: Claim 7 of the '258 Patent would have been obvious under 35 U.S.C. § 103 over Mueller in view of Choong.

Ground #2: Claims 1-6 and 8-22 of the '258 Patent would have been obvious under 35 U.S.C. § 103 over Showline in view of Mueller.

Ground #2a: Claim 7 of the '258 Patent would have been obvious under 35 U.S.C. § 103 over Showline in view of Mueller and further in view of Choong.

VII. LEVEL OF ORDINARY SKILL IN THE ART

A POSITA in the field of the '258 Patent, as of April 8, 2016, would have had a good working knowledge of electrical engineering and entertainment lighting systems, controls, and effects. EX1003, ¶30. He or 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 1-22 ARE UNPATENTABLE.

When the Examiner allowed the claims to issue, the Examiner was not aware of Mueller, Showline, or Choong. Mueller, Mueller in view of Choong, Showline in view of Mueller, and Showline in view of Mueller and Choong teach every limitation of the claims. Had the Examiner been aware of these references, the Examiner would have found the claims unpatentable. EX1003, ¶31.

This Petition's showing that the art cited herein renders the challenged claims unpatentable is fully 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 '258 Patent was filed, EX1003, ¶¶4-8, and fully supports the showing herein that the claims at issue merely recite methods and systems that have long been known. *Id.*, ¶¶31-346.

A. Ground 1 – Mueller renders Claims 1-6 and 8-22 obvious.

1. Overview of Mueller

U.S. Application 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 therefore prior art to the '258 Patent under 35 U.S.C. 102(a).

Mueller describes the creation and modification of lighting effects. Specifically, Mueller describes a processor 102 configured to output control signals to drive light sources 104 to generate various intensities of light from each light source 104. EX1004, [0168]. The processor 102 may also be configured to provide control signals to the light sources 104 to generate a variety of static or time-varying multi-color (or multi-color temperature) lighting effects. *Id.*, [0170]. Mueller further describes that the processor's control of light sources 104 could be based, at least in part, on user signals provided through an interface 118. *Id.*, [0183]. Such signals could be user-selectable settings or functions, including 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].

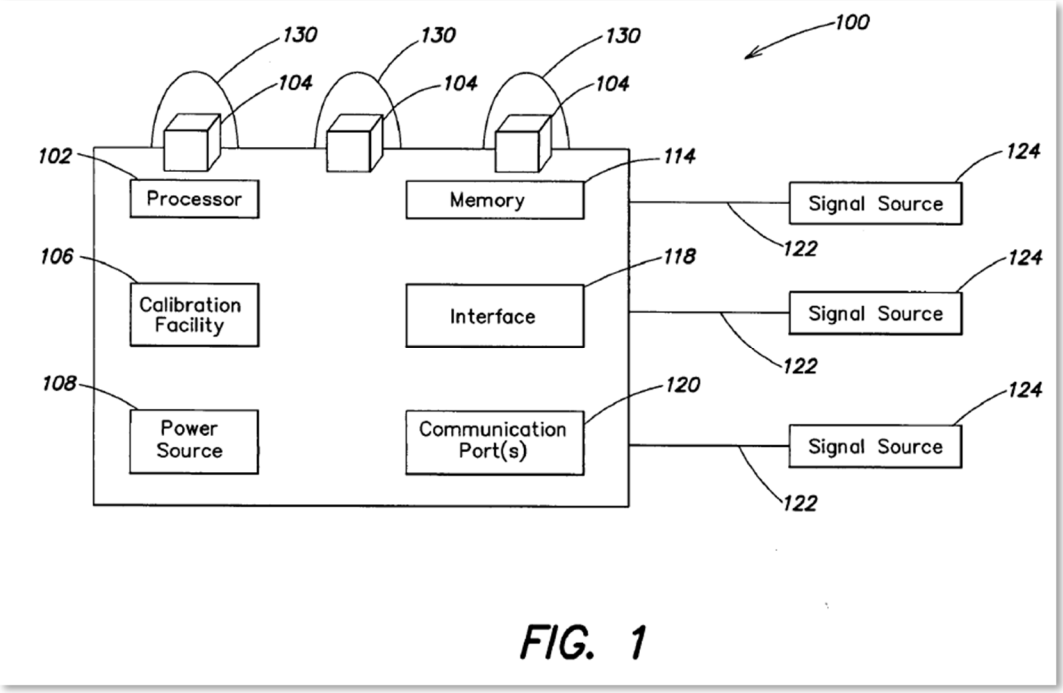


FIG. 1

Id., Figure 1.

Mueller discloses a number of alternative embodiments utilizing the general concepts disclosed therein in a variety of specific devices and settings. EX1003, ¶35. 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. Claim 1

Mueller renders Claim 1 obvious. EX1003, ¶¶36-90.

a. Claim Element 1p

A lighting system comprising:

It is Petitioner's position that the preamble of Claim 1 is not limiting and need not be considered for purposes of determining the invalidity of Claim 1. Regardless, Mueller teaches Claim Element 1p. EX1003, ¶¶37-42.

Mueller describes "a networked lighting system 200". EX1004, [0197].

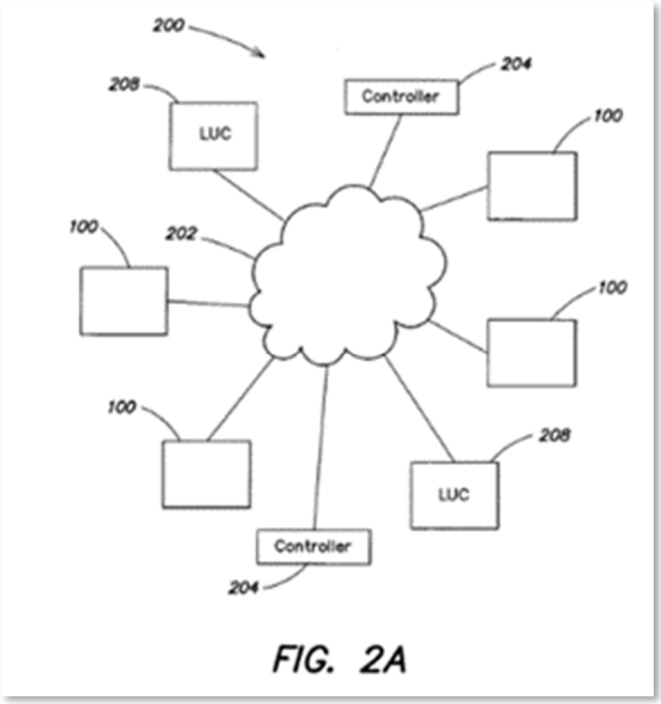


FIG. 2A

Id., Figure 2A.

b. Claim Element 1a

a lighting device; and

Mueller teaches Claim Element 1a. EX1003, ¶¶43-46.

Mueller describes that lighting system 200 comprises "a . . . lighting unit[] 100." EX1004, [0197].

c. Claim Element 1b

a controller adapted to control the lighting device to produce a user customisable cinematic lighting special effect selected from a range of different user customisable cinematic lighting special effects, the controller comprising:

Mueller teaches Claim Element 1b. EX1003, ¶¶47-56.

In one embodiment, Mueller describes a processor 102 of lighting unit 100. Processor 102, "controls one or more of the light sources 104". *Id.*, [0183].

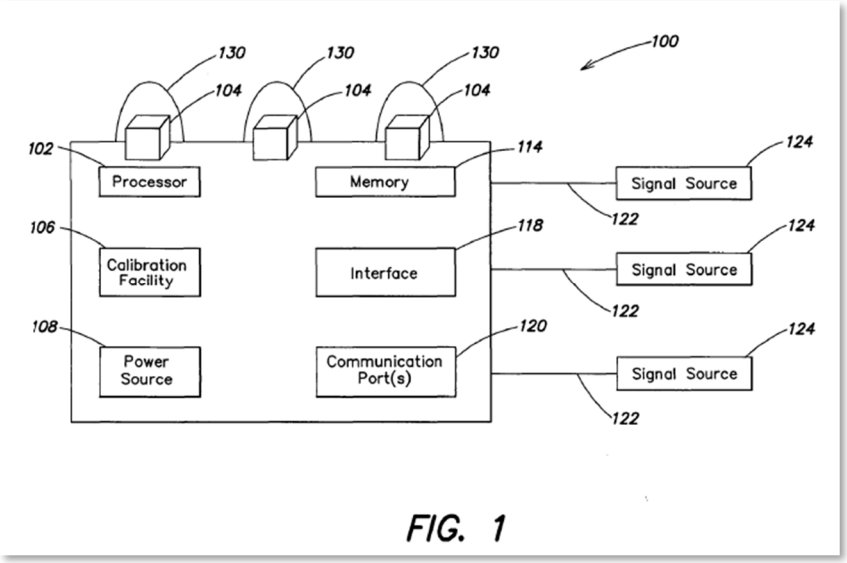


FIG. 1

Id., Figure 1. Mueller explains that this control is "based at least in part on signals, such as user signals, provided through [an] interface 118[,]" *id.*, [0183], and includes the ability to produce user customizable lightning special effects. Mueller describes this control as "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]; EX1003, ¶49.

In a second embodiment comprising a networked lighting system 200 made up of multiple lighting units 100, Mueller describes lighting unit controller (LUC) 208, which controls lighting unit(s) 100. EX1004, [0199]

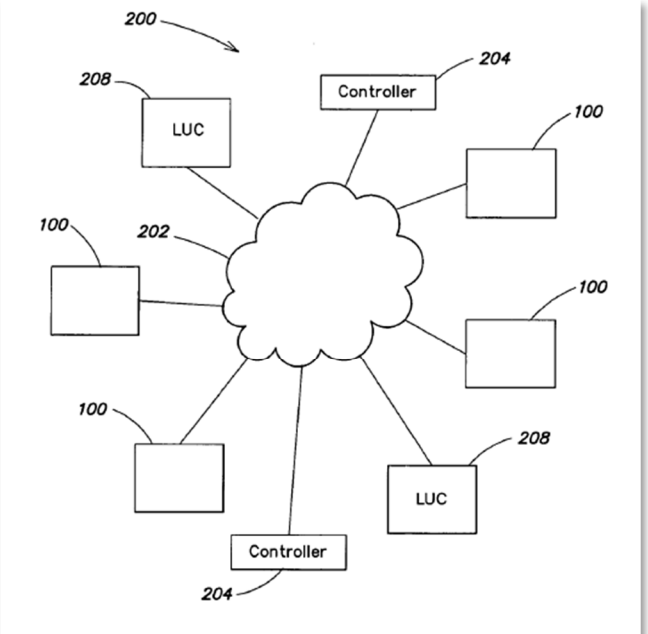


FIG. 2A

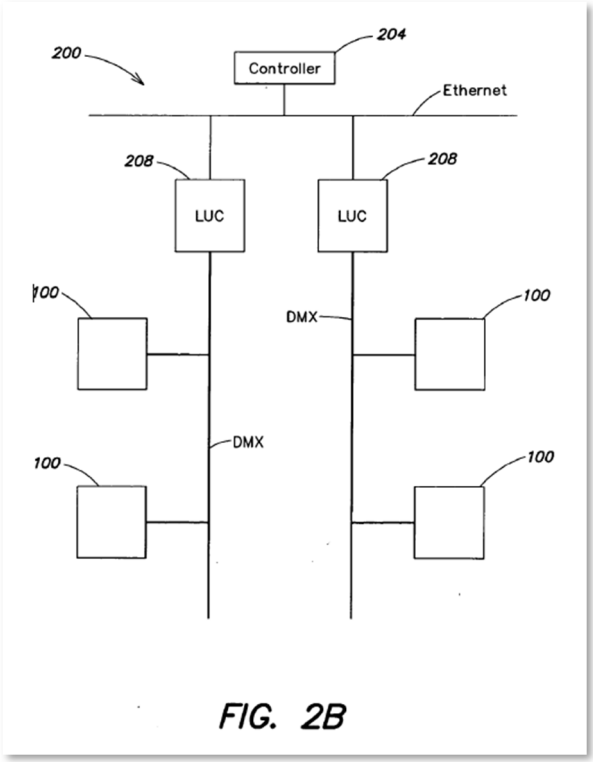


FIG. 2B

Id., Figures 2A, 2B.

Mueller explains that LUC 208's control includes enabling each lighting unit 100 to produce user customizable lightning effects. EX1003, ¶52. One example Mueller discloses is the generation a "rainbow chase": "The user may provide a simple instruction to the central controller 204 to accomplish this, and in turn the central controller 204 may communicate over the Ethernet network to one or more LUCs 208 and provide a high level command to generate a 'rainbow chase' (appearance of a propagating rainbow of colors)." *Id.*, [0202]. Other such effects include fires and explosions. *Id.*, [0221].

Mueller further explains that such lighting effects are user customizable. A user may select from a range of different lighting effects, *Id.*, [0215], and "[a]ny of the effects can be specified with parameters, such as frequencies, wavelengths, wave widths, peak-to-peak measurements, velocities, inertia, friction, speed, width, spin, vectors, and the like." *Id.*, [0225].

In the context of either embodiment, a POSITA would understand from Mueller that the lighting effects could include cinematic lighting special effects. EX1003, ¶54. Mueller discloses that the lighting systems described therein can be used in connection with an event taking place in an entertainment venue, including "a film studio" or "a video studio". EX1004, [0034]. Moreover, a POSITA would understand that lighting effects generated by the methods and systems of Mueller could be used in a variety of applications, including cinematography and filmmaking. EX1003, ¶54. For a POSITA, applying the lighting effects disclosed in Mueller to such uses would require little experimentation or adaptation. *Id.*

d. Claim Element 1c

an input interface for receiving user input to enable a user to select user customisable cinematic lighting special effect from said range of different user customisable cinematic lighting special effects; and

Mueller teaches Claim Element 1c. EX1003, ¶¶57-61.

Mueller explains that lighting unit 100, alone or within lighting system 200,

comprises one or more interfaces 118. EX1004 [0182]. Mueller further explains that "the network lighting system 200 may be configured flexibly to include any of the components discussed [in connection with lighting unit 100], such as the signal sources 124, ***interfaces 118***, communication ports 120 . . . either as stand alone components, integrated components or shared components." *Id.*, [0198] (emphasis added)). A POSITA would understand that lighting system 200 could include interface 118 as an integrated component of lighting unit 100 or as a standalone component. EX1003, ¶59. As explained above, interface 118 enables a user to select user-customizable cinematic lighting effects from a range of different effects. *See supra* Claim Element 1b.

Mueller also explains that interface 118 receives user input in the form of "any of a number of user-selectable settings or functions (e.g., . . . changing and/or selecting various pre-programmed lighting effects to be generated by the lighting unit . . . .)" *Id.*, [0182]. Mueller also discloses that the pre-programmed lighting effects can be customized by a user. *See supra* Claim Element 1b.

e. Claim Element 1d

an effect simulator adapted to calculate a time varying lighting value based on at least one simulation parameter,

Mueller teaches Claim Element 1d. EX1003, ¶¶62-71.

In the context of a lighting system comprising a single lighting unit 100, Mueller describes processor 102, which is an effect simulator. EX1004, [0168]-[0170]. Mueller explains that processor 102 is configured to output at least one control signal based on a simulation parameter for each light source 104 to independently control the intensity of light generated by each light source 104. *Id.*, [0168]. Mueller further explains that processor 102 calculates 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] (emphasis added).

In the context of networked lighting system 200, Mueller discloses LUC 208, which is an effect simulator. *Id.*, [0199]-[0202]. Specifically, Mueller explains that "when an intended LUC 208 receives . . . a command, it may then interpret the command so as to generate the appropriate lighting control signal." *Id.*, [0202]. A POSITA would understand that such interpretation of a received command to generate an appropriate lighting control signal comprises one or more calculations. EX1003, ¶65.

Mueller also explains that both processor 102 and LUC 208 can generate control signals for time-varying lighting effects. EX1004, [0170] ("***[P]rocessor 102*** may be particularly configured . . . 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***." (emphasis added)); [0215] ("The program may be configured . . . to generate an array of lighting effects . . . where ***the color changes in hue, saturation or intensity over a period of time*** . . . .") (emphasis added)).

Mueller further explains that the parameters of the lighting effects generated by the lighting devices 100, regardless of whether they are used alone or in a networked configuration, may be adjusted. *Id.*, [0182] (identifying as "user-selectable settings or functions" "changing and/or selecting various parameters of selected lighting effects.") A POSITA would understand this disclosure to indicate that the time-varying lighting effects of Mueller were based, at least in part, on simulation parameters that were either pre-programmed or specified by a user. EX1003, ¶67.

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 or LUC 208 with the ability to calculate these dynamic lighting values. EX1003, ¶69.

f. Claim Element 1e

said at least one simulation parameter depending on the selected user customisable cinematic lighting special effect being simulated,

Mueller teaches Claim Element 1e. EX1003, ¶¶72-77.

Mueller discloses the selection of user customizable cinematic lighting effects to be simulated. *See supra* Claim Elements 1a-1c. Mueller also teaches that a user of the systems described therein may customize those cinematic lighting effects by changing one or more simulation parameters. *See supra* Claim Element 1e. 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, ¶74. A POSITA would understand that presenting simulation parameters unrelated to the selected lighting effect would create confusion and would therefor limit the parameters to be adjusted to those relevant to the selected effect. *Id.*, ¶75. 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.*, EX1004, [0305] ("***a user can select a sparkle effect*** 5050 from the pull-down menu of the type filed 4058, in which case ***the parameters pane 4074 shows parameters appropriate for a sparkle effect***." (emphasis added).

g. Claim Element 1f

adapted to output said time varying lighting value to said lighting device so as to simulate the selected user customisable cinematic lighting special effect;

Mueller teaches Claim Element 1f. EX1003, ¶¶78-83.

Mueller discloses both processor 102 and LUC 208 outputting a time varying lighting value to lighting unit 100, whether lighting unit 100 is used alone or in a networked system, to simulate selected user-customizable cinematic lighting special effects. EX1004, [0170].

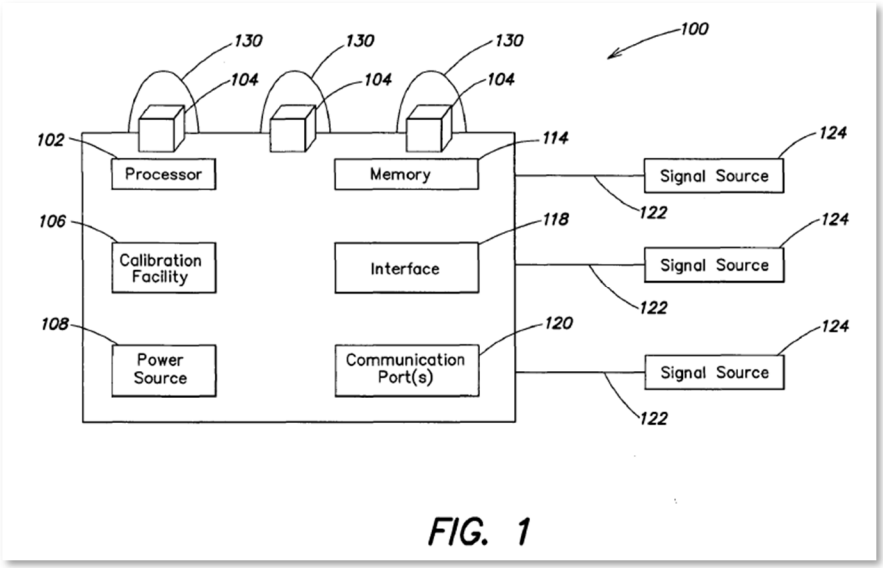
Mueller explains that processor 102 "provide[s] control signals to one or more of the light sources so as to generate a variety of static or ***time-varying (dynamic)*** multi-color (or multi-color temperature) lighting effects." EX1004, [0170] (emphasis added); *see also supra* Claim Element 1b. Mueller also explains that LUC 208 "is responsible for communicating with and generally controlling one or more lighting units 100[,]" *id.*, EX1004, [0199], by "generat[ing] the appropriate lighting control signals which it then communicates . . . to one or more lighting units 100." *Id.*, [0202].

h. Claim Element 1g

wherein said lighting device and said controller are integrated in a combined unit.

Mueller teaches Claim Element 1g. EX1003, ¶¶84-90.

In the context of a lighting system comprising a single lighting unit 100, Mueller describes that processor 102 and lighting unit 100 are integrated in a combined unit: lighting unit 100. EX1004, [0168].



Id., Figure 1.

In the context of a networked lighting system 200, though LUC is depicted as residing outside lighting unit 100, Mueller explains that the components described therein and depicted in Figure 2A, such as "lighting units 100 may be coupled to a given LUC 208 in a variety of different configurations including serial connections, parallel connections, networked connections, and combinations thereof." *Id.*, [0199].

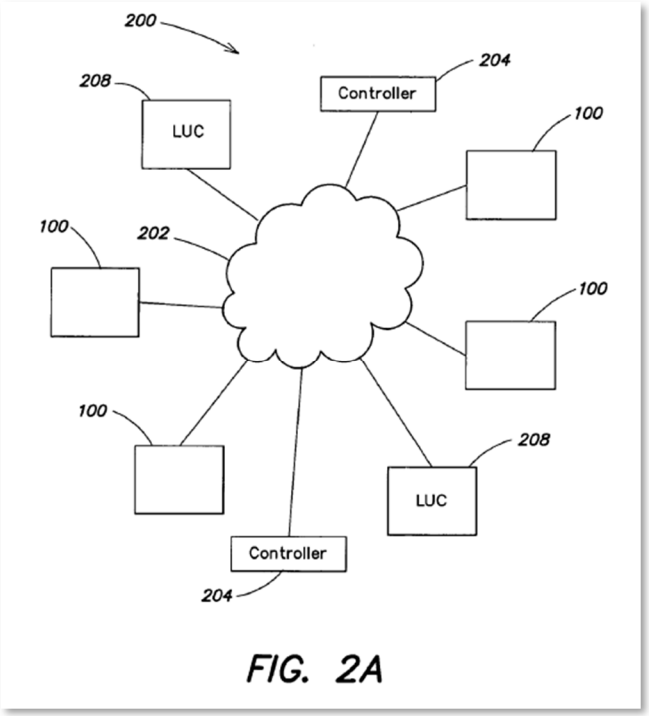


FIG. 2A

Id., Figure 2A. The '258 Patent contemplates a system comprising such connections as being a combined unit. *See, e.g.*, EX1001, 11:44-47 ("[I]t 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.")

Moreover, Mueller makes clear that such systems can be designed with flexibility regarding the placement of the various components disclosed therein: "the networked lighting system 200 may be configured flexibly to include any of the components discussed above, . . . either as standalone components, integrated components or shared components." *Id.*, [0198]. A POSITA would understand that LUC(s) 208 could be located in any of various components comprising a lighting system and could elect to include LUC(s) 208 within a combined unit with lighting

unit 100 for a variety of reasons, including but not limited to portability, cost savings, durability, and ease of use. EX1003, ¶89.

3. Claim 2

[2] The lighting system according to claim 1, wherein the input interface is adapted to receive user input to enable a user to customise said user customisable cinematic lighting special effect.

Mueller renders Claim 2 obvious. EX1003, ¶¶91-94.

Mueller explains that the interface 118 is "provided to facilitate any of a number of user-selectable settings or functions." EX1004, [0182]. Mueller further explains that interface 118 enables users to customize lighting special effects by "changing and/or selecting various parameters of selected lighting effects." *Id.*

4. Claims 3-5

[3] The lighting system according to claim 1, wherein the lighting device comprises at least one LED.

[4] The lighting system according to claim 3, wherein the lighting device comprises multiple different coloured LEDs.

[5] The lighting system according to claim 4, wherein the multiple different coloured LEDs comprise at least one of a RGB LED, and a RGB+W LED.

Mueller renders Claims 3-5 obvious. EX1003, ¶¶95-109.

Mueller explains that "the lighting unit 100 may include one or more light

sources 104, wherein one or more of the light sources may be an LED-based light source that includes one or more light emitting diodes (LEDs)." EX1004, [0167]. Mueller further explains that such LEDs can be different colors:

> [L]ighting unit 100 may include a wide variety of colors of LEDs in various combinations, including two or more of red, green, and blue LEDs to produce a color mix, as well as one or more other LEDs to create varying colors and color temperatures of white light. For example, red, green and blue can be mixed with amber, white, UV, orange, IR or other colors of LEDs.

Id., [0171].

A POSITA would have understood the benefits of incorporating RGB or RGB+W LEDs as light sources 104 to generate various temperatures of white light. EX1003, ¶99, 104, 109.

5. Claim 6

[6] The lighting system according to claim 3, wherein the controller is adapted to control the colour or colour temperature of said LEDs in dependence on a user input received via the input interface.

Mueller renders Claim 6 obvious. EX1003, ¶¶110-114.

Mueller discloses that the controller controls the colour or colour temperature of LEDs. *Id.*, [0170] ("the ***processor-controlled*** variable intensity light generated by two or more of the light sources 104 combines to ***produce a mixed colored light (including essentially white light having a variety of color temperatures)***" (emphasis added)).

Mueller further discloses that processor 102's controlling of color or color temperature depends on a user input via interface 118, as the production of mixed color/mixed color temperature of light is in response to selection of "desirable spectrums of lighting conditions." *Id.*, [0171].

6. Claim 8

[8] The lighting system according to claim 6, wherein the lighting device is operable to produce light at a colour temperature typically in the range of 2800-7000 Kelvin.

Mueller renders Claim 8 obvious. EX1003, ¶¶115-117.

Mueller discloses lighting unit 100 "may be constructed and arranged to produce a wide range of variable color radiation . . . including essentially white light having a variety of color temperatures." EX1004, [0170]. Mueller discloses multiple color temperatures within the range of 2800-7000 Kelvin. *Id.*, [0060].

7. Claim 9

[9] The lighting system according to claim 3, wherein the controller is adapted to control the brightness of said LEDs in dependence on a user input received via the input interface.

Mueller renders Claim 9 obvious. EX1003, ¶¶118-120.

Mueller discloses that processor 102 of lighting unit 100 controls the intensity (i.e., "brightness") of light generated by each light source 104 in lighting unit 100.

EX1004, [0168]. Mueller discloses that this control can be implemented via user input through interface 118. *See supra* Claim Element 1c.

8. Claim 10

[10] The lighting system according to claim 1, wherein the simulation parameter comprises at least one of a colour and a colour temperature.

Mueller renders Claim 10 obvious. EX1003, ¶¶121-124.

Mueller explains that one simulation parameter used with lighting unit 100 can comprises a color. Mueller discloses that processor 102 of lighting unit 100 "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 stator or time-varying (dynamic) multi-color (or multi-color temperature) lighting effects." EX1004, [0170].

In the context of a networked lighting system comprising multiple lighting units 100, Mueller describes the way a user can "generate a color changing effect that various colors from one lighting unit 100 to another lighting unit 100 and across a number of lighting units 100 in such a way as to generate the appearance of a propagating rainbow of colors ("rainbow chase") . . . ." *Id.*, [0202]. Mueller explains that commands may be sent to each lighting unit 100 that "contain timing, intensity, hue, saturation or other relevant information, for example." *Id.*

9. Claim 11

[11] The lighting system according to claim 1, wherein the selected user customisable cinematic lighting special effect is designed to mimic at least one of fire; lightning; police car light; television; a neon flickering sign; a candle; muzzle (gunshot); welding; spark/short circuit; a scan (e.g. fingerprint scanner); paparazzi flashes; fireworks; flashes (strobe); a propeller; a (nuclear) explosion; and a wormhole.

Mueller renders Claim 11 obvious. EX1003, ¶¶125-128.

Mueller discloses light unit(s) 100 can be programmed to simulate a number of different effects, including explosions, flashes, and the like. Mueller describes that "designer can program the fire or ***explosion effect*** on a computer." EX1004, [0221] (emphasis added). Mueller also explains that "the program may be configured, for example to generate an array of lighting effects such as. . .***flashing effects***. . .***a flare streaking across a room***. . .[and] ***a plume from an explosion***". *Id.*, [0215] (emphasis added).

10. Claims 12 and 21

[12] The lighting system according to claim 1, wherein the controller is adapted to store said at least one simulation parameter in memory.

[21] The lighting system according to claim 12, wherein the controller is adapted to recall said stored at least one simulation parameter from said memory.

Mueller renders Claims 12 and 21 obvious. EX1003, ¶¶129-135, 172-178.

Mueller describes, associated with processor 102, "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.* Mueller describes such functions as including, "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 user input simulation parameters depending on a selected lighting effect. EX1003, ¶¶133, 176. 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] (emphasis added); *see also* EX1003, ¶¶133, 176.

Mueller also discloses recalling the stored simulation parameter for execution: "[t]he 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 light sources." EX1004, [0172].

A POSITA would understand that the purpose for storing in memory a lighting program was to later recall the lighting program and run it. EX1003, ¶¶135, 178.

11. Claim 13

[13] The lighting system according to claim 1, wherein the controller is adapted to control a plurality of lighting devices in dependence on the selected user customisable cinematic lighting special effect.

Mueller renders Claim 13 obvious. EX1003, ¶¶136-141.

Mueller's LUC 208 is adapted to control one or more lighting device by outputting a time varying light value to those lighting devices to simulate a selected

user customizable cinematic lighting special effect. *See supra* Claim Element 1f. Mueller discloses that each LUC 208 "is responsible for communicating with and generally controlling ***one or more*** lighting units 100 coupled to it." EX1004, [0199].

12. Claim 14

[14] The lighting system according to claim 1, further comprising a further lighting device, said further lighting device being separate from said controller.

Mueller renders Claim 14 obvious. EX1003, ¶¶142-146.

Mueller teaches that the lighting systems disclosed therein, whether a single lighting unit 100 or a networked system of multiple lighting units 100, can be designed with flexibility regarding the placement of the various components disclosed therein. *See supra* Claim Element 1g. Mueller explains that the lighting system 200 comprises "a number of lighting units 100". EX1004, [0197].

As shown below in Figure 2A, additional lighting unit(s) 100 are separated from LUC 208 and processor 102 of the first lighting unit 100.

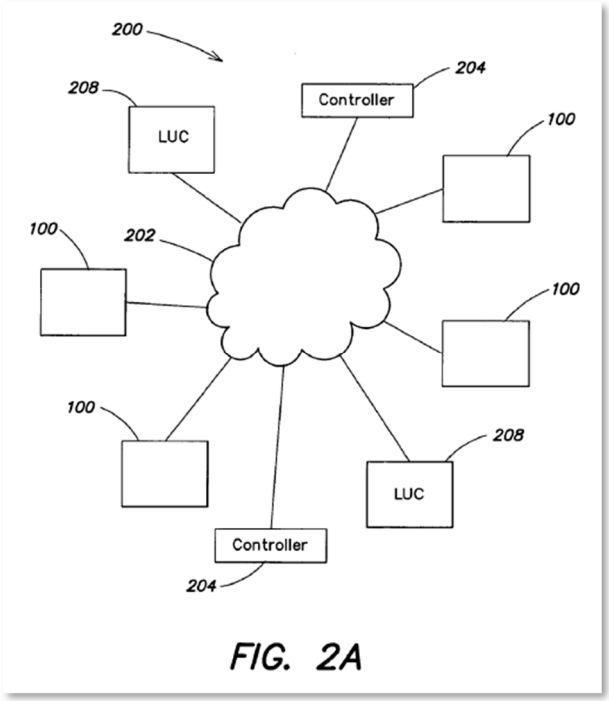


FIG. 2A

Id., Figure 2A.

13. Claim 15

[15] The lighting system according to claim 14, wherein the controller comprises a wireless communication interface adapted for wireless communication with said further lighting device.

Mueller renders Claim 15 obvious. EX1003, ¶¶147-150.

Mueller discloses "communication ports 120" as part of lighting unit 100, which are interfaces for communication with other lighting devices. EX1004, [0190] ("the lighting unit 100 may include one or more communication ports 120 to facilitate coupling of the lighting unit 100 to any of a variety of other devices . . . the

communication port 120 may include an interface for any suitable wireless communications").

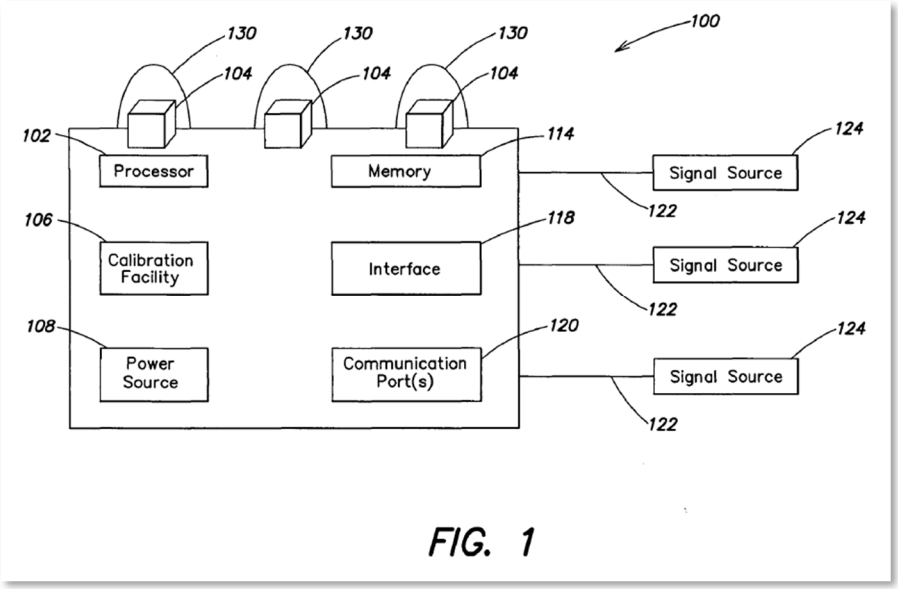


FIG. 1

Id., Figure 1.

Mueller teaches that the communication port 120 can be integrated into a controller (either processor 102 or LUC 208), as it explains that "any of the components discussed above, such as the signal sources 124, interfaces 118, communication ports 120, and other components . . . either as stand alone components, integrated components or shared components" can be flexibly configured to be included with processor 102. *Id.*, [0198]; EX1003, ¶150. A POSITA would have understood that the communication ports 120 could be integrated with any of the controllers disclosed by Mueller. EX1003, ¶150.

14. Claim 16

[16] The lighting system according to claim 13, wherein the controller is adapted to at least one of: offset and overlap the output of said plurality of lights with one-another so as to simulate a moving light source.

Mueller renders Claim 16 obvious. EX1004, ¶¶151-154.

Mueller discloses lighting effects that simulate a moving light source, including a "rainbow chase" effect involving "a color changing effect that various colors from one lighting unit 100 to another lighting unit 100, or across a number of the lighting units 100 in such a way as to generate the appearance of a propagating rainbow of colors, explosions, turbulence, fire, missiles, shape motion, tinkerbell-like shapes, lights moving in a room," "and many others." EX1004, [0202], [0225]. A POSITA would have understood how to generate these effects using multiple light sources by offsetting and/or overlapping the output of the various light sources. EX1003, ¶154. A POSITA would not have found this to be a surprising or difficult task to undertake. *Id.*

15. Claim 17

[17] The lighting system according to claim 1, wherein the controller is separable from the lighting device.

Mueller renders Claim 17 obvious. EX1003, ¶¶155-158.

Mueller explains that the lighting systems disclosed therein may be designed with flexibility in mind. *See supra* Claim Element 1g; *see also* EX1004, [0062], [0198]. Mueller identifies a variety of different configurations under which LUC 208 and the lighting device 100 are connected, for example, serial connections, parallel connections, networked connections and combinations thereof. *Id.*, at [0199]. Mueller further teaches that the connection between LUC 208 and the lighting device 100 could be via a variety of different communication media and protocols. *Id.* Mueller also contemplates that "one or more devices coupled to a network may serve as a controller for one or more other devices coupled to the network (e.g., in a master/slave relationship)." *Id.*, [0066].

A POSITA would be motivated to adopt flexible connections between either LUC 208 or processor 102 and lighting unit 100, so that they can be integrated as a combined unit, while being separable and connected together via a cable. EX1003, ¶158. A POSITA would understand that Mueller teaches such flexibility and that such a flexible arrangement might be desired for any of a number of reasons, including adaptability (for instance, having the controller integrated into lighting unit 100 for portability, but separable to permit use in situations where remote control of lighting unit 100 is desired), ease of use, and cost. *Id.*

16. Claim 18

[18] The lighting system according to claim 1, wherein the input interface comprises at least one of: a wireless communication interface; a dial; a slider; a control panel; a display and buttons; and a touch screen.

Mueller renders Claim 18 obvious. EX1003, ¶¶159-162.

Mueller discloses that "[t]he interface 118 may present external controls that are, for example, physical controls such as switches, dials, buttons, or the like, programmatic controls, such as an application programming interface, or a user interface such as a graphical user interface on a computer." EX1004, [00182].

17. Claim 19

[19] The lighting system according to claim 1, further comprising a converter adapted to convert at least one of brightness and colour data from the simulator into lighting signals for output by the output.

Mueller renders Claim 19 obvious. EX1003, ¶¶163-167.

A POSITA would understand that a converter in lighting system 200, such as processor 102 or LUC 208, would be required to convert lighting data, such as brightness or color data into a lighting signal. *Id.*, [0214] ("With all of the light systems 102 in predetermined positions, as identified in the configuration file 500," the representation of the lighting effect "can be played in the room by the light system and or another system such as a sound system".)

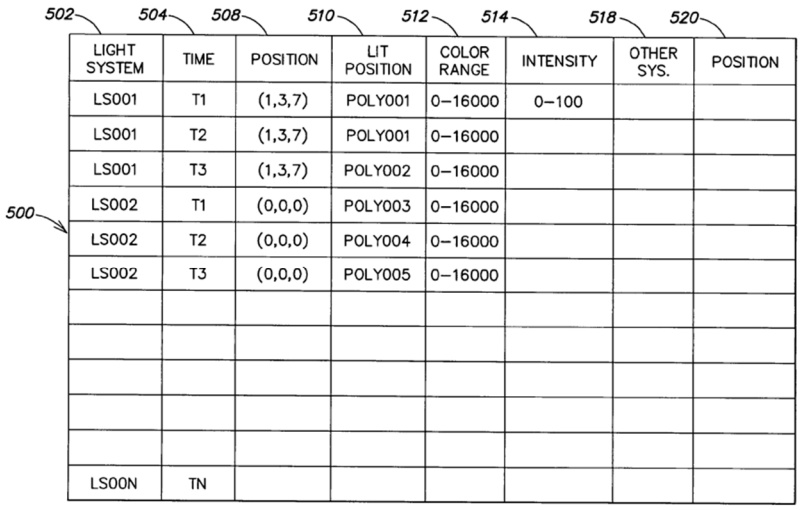


FIG. 5

Id., Figure 5; EX1003, ¶165. A POSITA would understand that such conversion would be necessary for lighting system 200 to operate by converting lighting data to control signals transmitted to each lighting unit 100. EX1003, ¶165. Measured brightness or color data would exist as an electrical signal, and perhaps, as stored computer memory data. *Id.*, ¶167. The measured electrical signal or computer data would be required to be translated back into a signal with specific electrical properties or LED drive condition (applied current) that is suitable to the specific color LED or LEDs that are putting out light. *Id.* LEDs have specific drive requirements and, typically, an LED driver chip or processor is used to convert desired intensity levels into usable drive signals or applied currents by the LEDs. *Id.*

18. Claim 20

[20] The lighting system according to claim 1, wherein the lighting system is a lighting system for at least one of: videography; broadcast; cinematography; studio filming; and location filming.

Mueller renders Claim 20 obvious. EX1003, ¶¶168-171.

Mueller explains that the systems described therein 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, ¶170.

19. Claim 22

[22] The lighting system according to claim 14, wherein said controller is adapted to control said further lighting device in dependence on the selected user customizable cinematic lighting special effect.

Mueller renders Claim 22 obvious. EX1003, ¶¶179-182.

Mueller explains that, in a networked lighting system 200, each lighting unit 100 can be controlled by a single input:

> In this example, the user may provide a simple instruction to the central controller 204 to accomplish [a rainbow chase effect], and in turn the central controller 204 may communicate over the Ethernet network to one or more LUCs 208 and provide a high level command to generate

> a "rainbow chase." The command may contain timing, intensity, hue, saturation or other relevant information, for example. When an intended LUC 208 receives such a command, it may then interpret the command so as to generate the appropriate lighting control signals which it then communicates . . . to one or more lighting units 100 that it controls . . . .

EX1004, [0202]. Thus, one input can control an original lighting unit 100 as well as further lighting units as required by Claim 22. EX1003, ¶181.

B. Ground 1a – Mueller in view of Choong renders Claim 7 obvious.

[7] The lighting system according to claim 3, wherein the lighting device comprises at least one "warm" white and at least one "cool" white LED.

Though Mueller teaches the use of multiple LEDs across a spectrum of colors and color temperatures, *see supra* Ground 1, Claims 3-5, it does not explicitly disclose a lighting device with at least one "warm" white LED and at least one "cool" white LED.

A POSITA would have understood the utility of an LED arrangement including a "warm" white LED and a "cool" white LED to enable the production of a broad spectrum of color temperatures of white light. EX1003, ¶184. It would thus have been obvious for a POSITA to employ such an arrangement within the lighting unit 100 of Mueller. *Id.*

That the benefits of such an arrangement were well known is demonstrated by Choong, which is within the same field of art as Mueller. *Id.* Specifically, Choong, which was based on a patent application filed in 2008, discloses a "methodology of

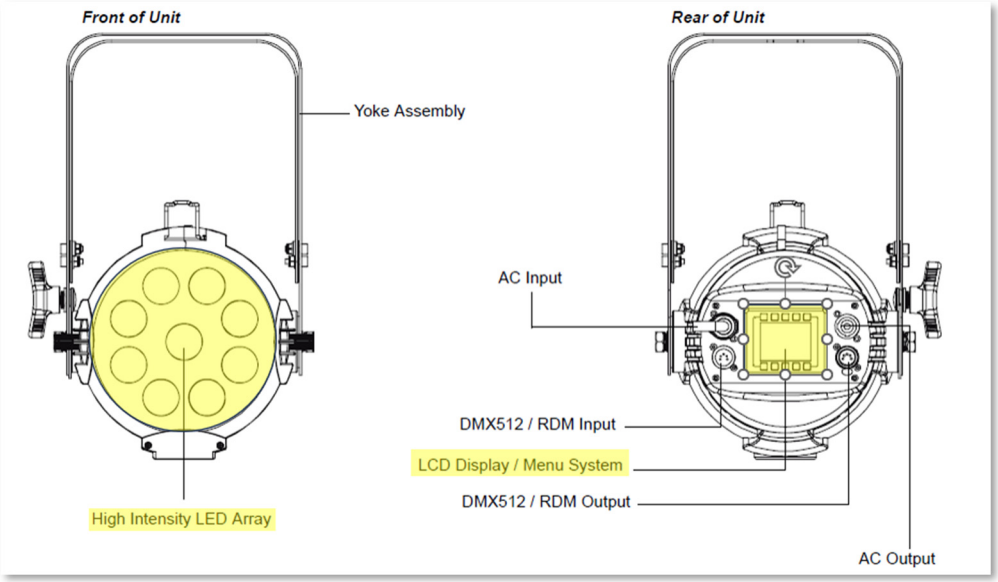
creating lighting of white colour with the intended [correlated colour temperature ('CCT')] to ease the user to control CCT of white lighting sources when the lighting source contains a plurality of cool white LEDs (not shown), white LEDs (108), warm white LEDs (102) and amber LEDs (100)." EX1012, 2:58-62; EX1003, ¶185. To incorporate this sort of LED arrangement, with a cool white LED and a warm white LED, would have been obvious to a POSITA seeking to provide a user with the ability to use the lighting unit 100 of Mueller to produce white light across a broad spectrum of color temperatures. *Id.*

C. Ground 2 – Showline in view of Mueller renders Claims 1-22 obvious.

1. Overview of Showline

Showline describes an LED luminaire called the SL PAR 155 ZOOM RGBW LED Luminaire ("SL PAR") used in entertainment, cinematography, and studio lighting systems. EX1011, ¶¶4-7; EX1003, ¶186. Showline bears a date of December 10, 2013, and was made publicly available, including to distributors and purchasers of the SL PAR, at least as of December 2013, via a Quick Start guide included in the product packaging and via Vari-Lite's (then Philips) website. EX1011, ¶¶7-10; EX1003, ¶186.

Showline describes the SL PAR, which has (a) a "high intensity LED array" on the front of the unit and (b) an integrated "LCD Display / Menu System" and various inputs and outputs on the unit's rear.



EX1005, Figure 2 (annotated).

The integrated LCD Display and Menu System "provides local control" for features and functionality of the LED array. *Id.*, 14. The LCD Display and Menu System includes a user interface, with buttons allowing a user to navigate, access, and select menu settings. *Id.*, 14-15.

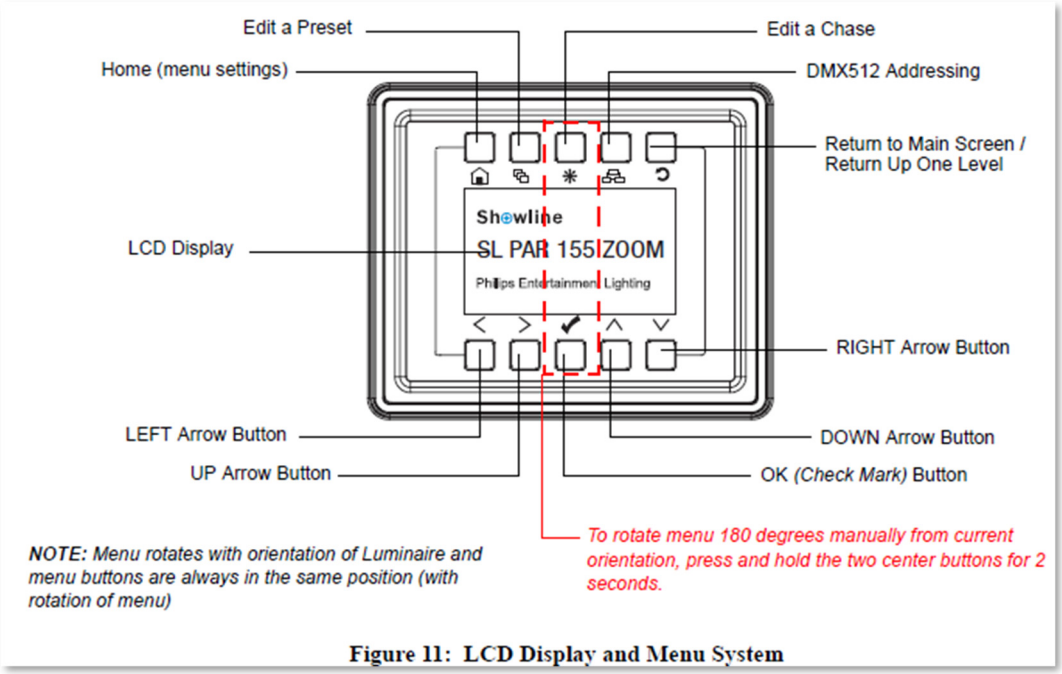


Figure 11: LCD Display and Menu System

EX1005, Figure 11. The LCD Display and Menu System allows users to select and customize desired lighting effects, such as "presets" and "chases." *Id.*, 15-17. Selected and customized presets and chases are then run on the luminaire. *Id.*

2. Motivation to Combine

A POSITA would be motivated to apply the teaching of Mueller into the system described by Showline, as both describe lighting systems comprising multiple LEDs controlled by a controller. Showline, which is an installation and user manual, provides a great deal of information concerning the operation of the SL PAR and instructions on how to use the luminaire to create a variety of effects. EX1005 *passim*; EX1003, ¶189. As an installation and user manual, however, Showline does not provide specific detail regarding the design or manufacture of the SL PAR itself

or the internal workings of the luminaire. EX1003, ¶189. A POSITA interested in designing equipment such as the SL PAR and systems employing such equipment would thus look to other references disclosing such technical information, including Mueller. *Id.*

A POSITA would therefore be motivated to apply the teaching of Mueller to those of Showline. *Id.*, ¶190.

3. Claim 1

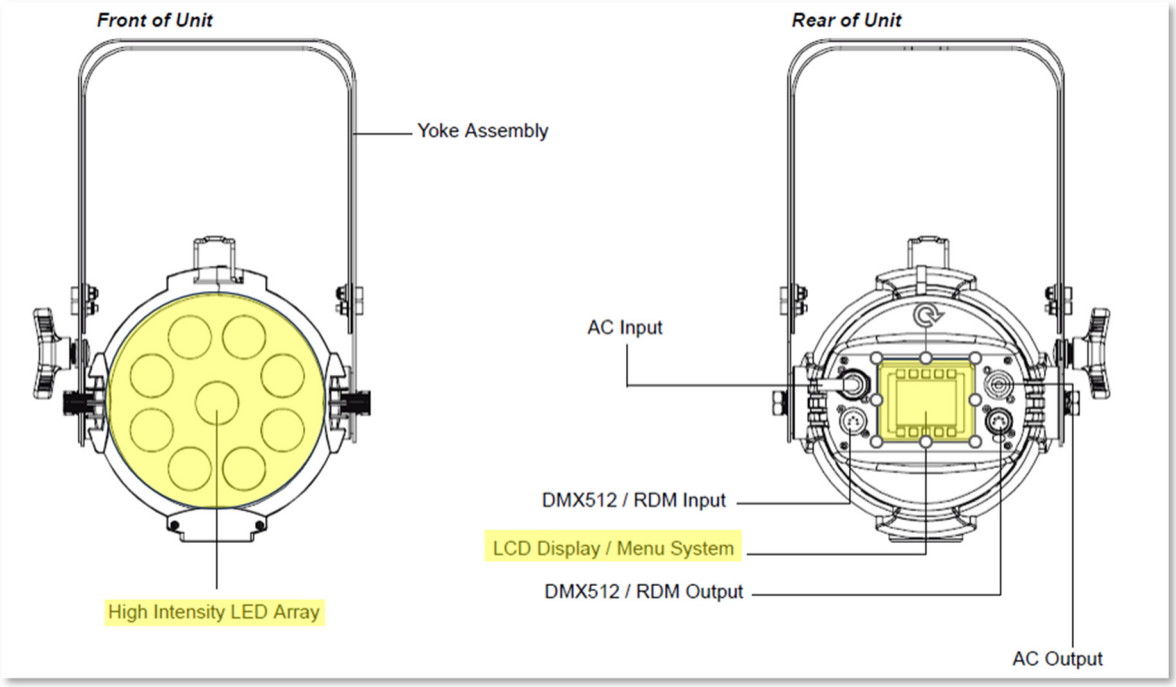
Showline in view of Mueller renders Claim 1 obvious. EX1003, ¶¶191-243.

a. Claim Element 1p

A lighting system comprising:

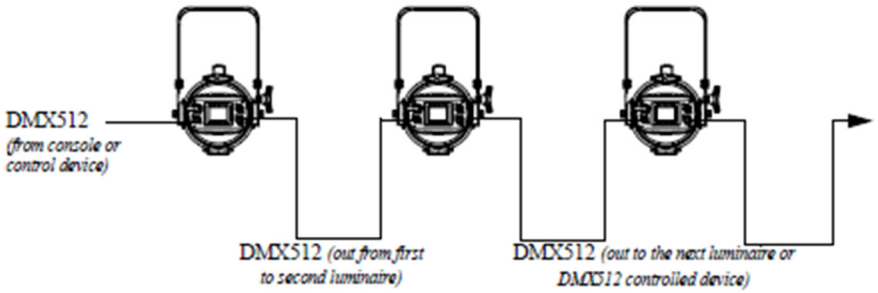
It is Petitioner's position that the preamble of Claim 1 is not limiting and need not be taken into account in determining the invalidity of Claim 1. Regardless, Showline teaches Claim Element 1p. EX1003, ¶¶192-197.

Showline discloses the SL PAR, a luminaire unit having a "high intensity LED array" on the front of the unit. EX1005, 6, 42. SL PAR offers a plurality of lighting effects, including presets, effects/chases, and strobe/timing, controlled through a "Display and Menu System" on the unit's back. *Id.*, 14. The SL PAR is thus a lighting system. EX1003, ¶195.



EX1005, Figure 2 (annotated).

Showline also teaches multiple embodiments in which multiple SL PARs can be connected in a networked lighting system, including by networking the multiple SL PAR units using DMX512 networking or through a "Master / Slave" operational mode. EX1005, 10, 23.



DMX512 Connections

DMX612 Signal	XLR Pin
Common (Drain)	1
DMX512 -	2
DMX512 +	3

Note: Remaining pins on each connector are not used.

Figure 6: SL PAR 155 ZOOM RGBW LED Luminaire - DMX512 Connections

Id., Figure 6.

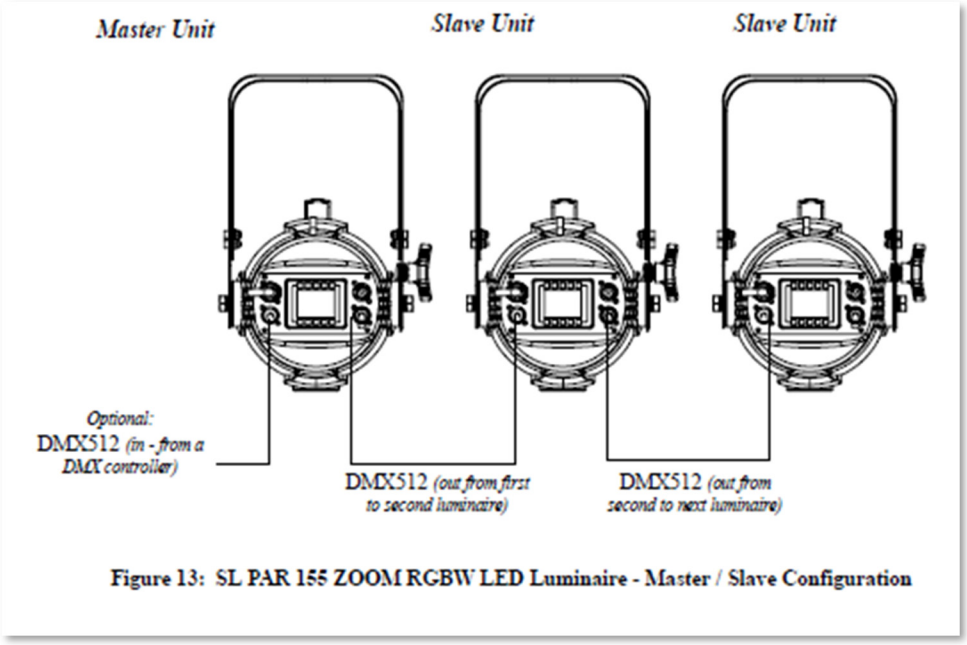


Figure 13: SL PAR 155 ZOOM RGBW LED Luminaire - Master / Slave Configuration

Id., Figure 13.

b. Claim Element 1a

a lighting device; and

Showline teaches Claim Element 1a. EX1003, ¶¶198-201.

The SL PAR includes a "high intensity LED array." EX1005, 6. The LED array in each SL PAR is a "Color RGBW LED Array (x9 – 15 Watt High Power LED Chipsets." *Id*, 42. These LEDs, individually and as an array, are "lighting devices" that provide illumination when running lighting effects, like presets or chases. *Id.*, 14-17.



Id., cover.

c. Claim Element 1b

a controller adapted to control the lighting device to produce a user customisable cinematic lighting special effect selected from a range of different user customisable cinematic lighting special effects, the controller comprising:

Mueller in view of Showline teaches Claim Element 1b. EX1003, ¶¶202-210.

The SL PAR includes an "LCD Display and Menu System" that provides "local control for accessing" fixture settings—that is, that controls the SL PAR and its LEDs. EX1005, 10, 14. The LCD Display and Menu System receives inputs from an interface and recalls the appropriate settings for the LED array to produce customizable cinematic effects, including editable presets and eight editable "chases." *Id.*, 15-16.

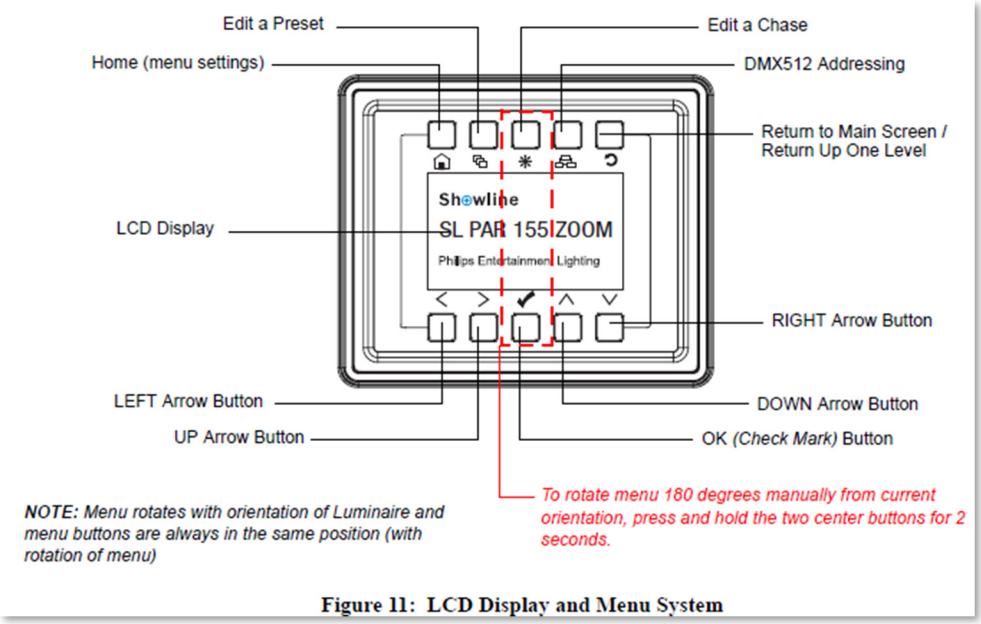
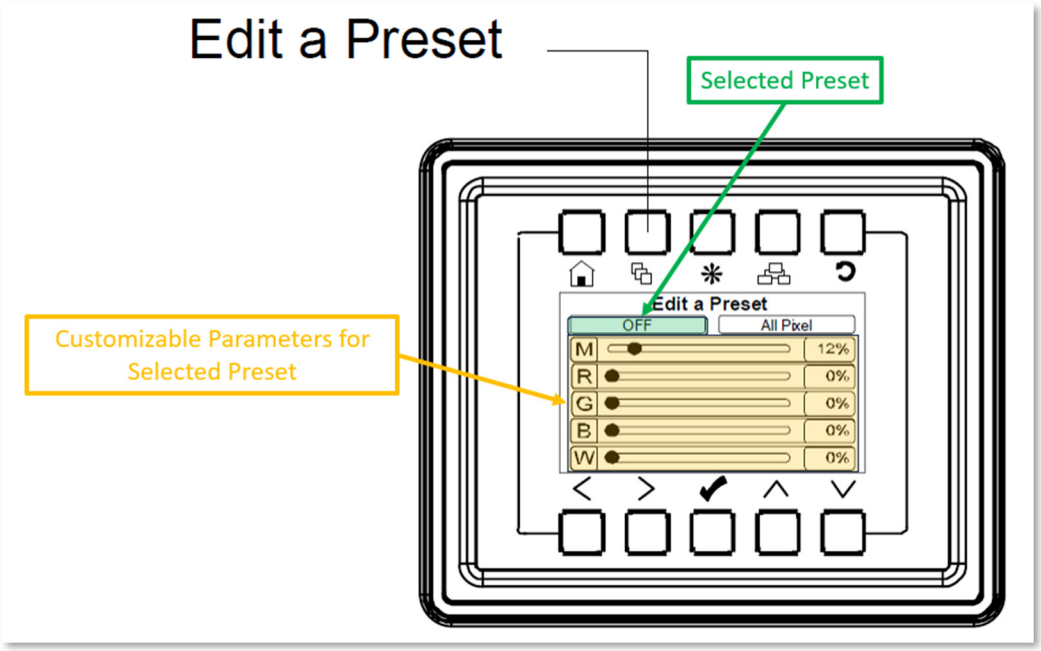


Figure 11: LCD Display and Menu System

Id., Figure 11.

Presets may be customized through an "Edit a Preset" menu that allows users to adjust the master intensity ("M"), as well as color values ("RGBW") for the particular preset. *Id.*, 15. The LCD Display and Menu System produces lighting value settings for the LEDs based on the selected preset and parameter adjustments. *Id.*, 15-16.



Id., 15 (annotated).

All chases may be customized through "adjustable parameters" that allow users to customize "the master intensity, speed, and fade values." *Id.*, 16. The chases may further be customized to create desired lighting effects by editing existing steps or adding new steps to a chase, with a user selecting parameters and using the buttons to make adjustments. *Id.* The LCD Display and Menu System produces lighting

value settings for the LEDs, based on these user selections and parameter adjustments. *Id.*, 16-17, Table 3; *see also* EX1003, ¶¶206-207.

Presets and chases can be further customized through a "Strobe / Timing Menu" in the LCD Display and Menu System. EX1005, 17. The "Strobe / Timing Menu" allows user to select from additional adjustable parameters, which are "instantly applied to any active Preset, Color Filter, or chase." *Id.*, 17. That is, if the luminaire is actively outputting lighting effects from the LED array, adjusting these parameters instantly causes the LCD Display and Menu System to adjust the light output to match the new parameter values. EX1003, ¶207. Table 4 summarizes these parameters:

Table 4: Strobe / Timing Parameters

Parameter	Description
Master Intensity	Overall fixture output intensity level.
Strobe: X	Strobe mode and rate value settings following DMX map (see SL PAR 155 ZOOM RGBW LED Luminaire DMX Mapping for details).
Duration	The time each strobe flash remains ON.
Intensity Timing	The time used to change intensity values when running a chase.
Color Timing	The time used to change color values when running a chase.

EX1004, Table 4.

While Showline provides significant detail regarding the operation of the SL PAR and detailed instructions on the SL PAR's use, it provides less detail regarding the internal components of the SL PAR and the relationships of those components that enable the LCD Display and Menu System to control the functioning of the SL PAR. EX1003, ¶208. A POSITA would understand that, to provide the functionality

described in Showline, the LCD Display and Menu System would necessarily comprise, or be in a functional relationship with, a processor or similar controller. *Id.* A POSITA interested in designing equipment such as the SL PAR and networked systems including such luminaires would thus look to other references disclosing such technical information, including Mueller. *Id.*

As explained above, Mueller discloses a number of controllers adapted to control a lighting device to produce a user-customizable cinematic lighting special effect selected from a range of different user-customizable cinematic lighting special effects, including processor 102 and LUC 208. *See supra* Ground 1, Claim Element 1b. A POSITA would recognize the benefits of incorporating Mueller's processor 102 or LUC 208 in connection with the design of a lighting system as disclosed by Showline. EX1003, ¶209.

d. Claim Element 1c

an input interface for receiving user input to enable a user to select user customisable cinematic lighting special effect from said range of different user customisable cinematic lighting special effects; and

Showline teaches Claim Element 1c. EX1003, ¶¶211-217.

The SL PAR's LCD Display and Menu System (or controller) includes a user interface that receives user inputs through selectable buttons allowing a user to navigate the menus and make selections. EX1005, 14-15. The LCD Display and

Menu System interface allows a user to select customizable lighting special effects, including "Presets" and "chases." *Id.*, 15-16. The selectable chases include "10 factory defined chases and eight user adjustable chases." *Id.*, 14-15.

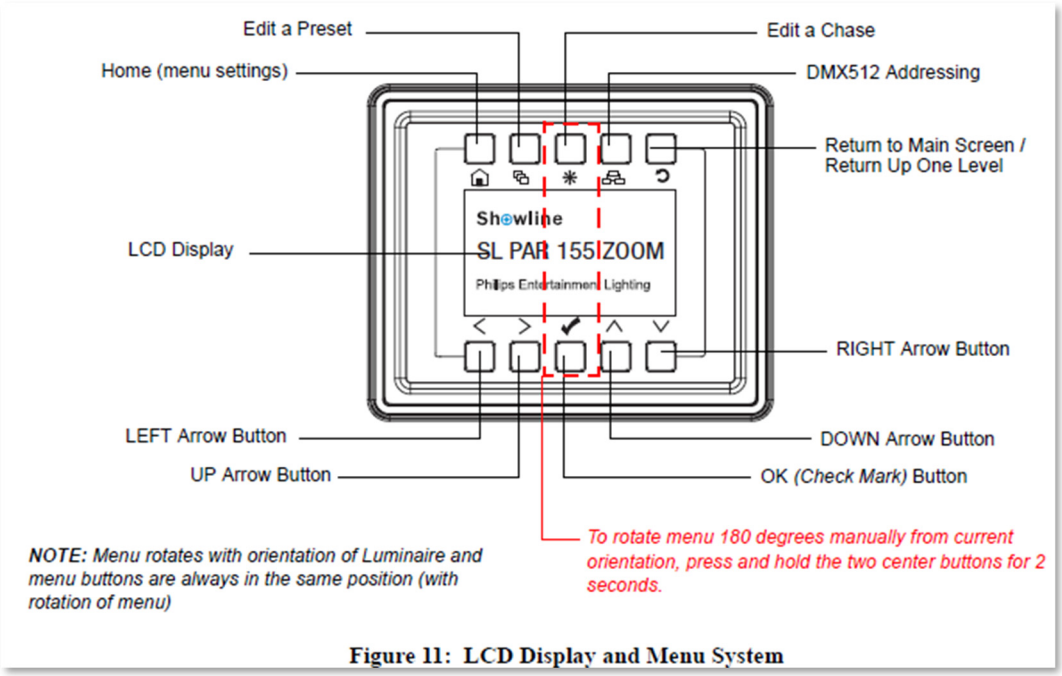


Figure 11: LCD Display and Menu System

Id., Figure 11.

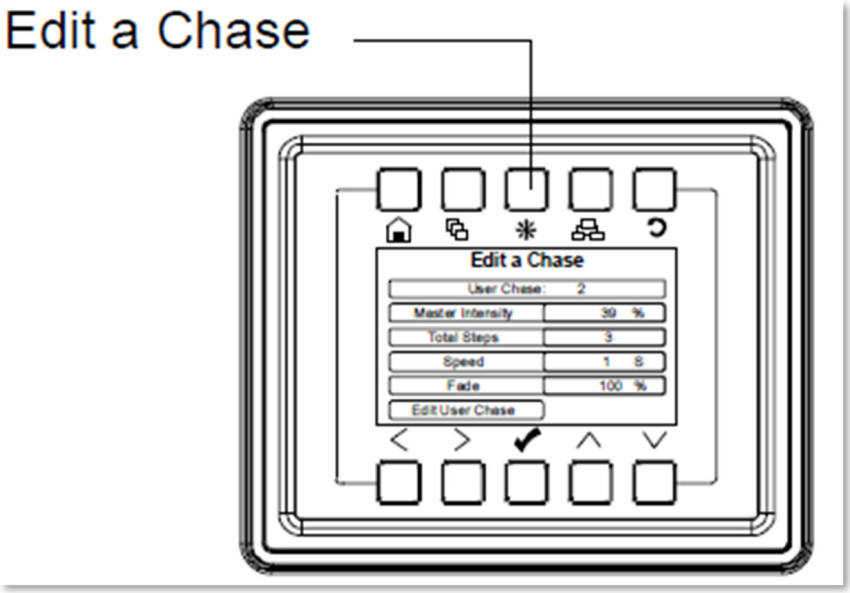
Further, the LCD Display and Menu System interface allows users to customize the available effects on the SL PAR. Selected presets can be customized in the "Edit a Preset" menu to customize the intensity and color values for those presets. *Id.*, 15-16. Selected chases can be customized by selecting adjustable parameters through the menus on the interface, as described in Table 3:

Table 3: Effects Parameters

Parameter	Description
User Chase / Built-in Chase	Select from the 18 different chases.
Master Intensity	Adjust the master intensity for ALL chases.
Total Steps	Displays the total steps used by the chase. This field is not editable.
Speed	The total time each step of the chase will be recalled.
Fade	The percentage of the time assigned by the speed that is crossfaded between steps.

Id., Table 3.

The "Eight User chases can be further customized to create different effects on the fixture." *Id.*, 17. When a user selects to "Edit a Chase" to further customize the chase, an "Edit a Chase" window will be displayed.



Id., 17.

Additionally, a "Strobe / Timing menu" provides an interface for users to make additional customizations to any selected lighting preset or chase. *Id.* Users may select and assign "strobe and timing values from the menu system" that are "instantly applied to any active Preset, Color filter, or chase." *Id.*, 17. These

adjustable strobing/timing parameters, selectable through the user interface menu, include (a) adjusting the overall intensity level of the SL PAR unit, (b) setting a strobe mode and strobe rate, (c) setting the duration of time each strobe flash remains on, (d) adjusting the time used to change intensity values when running a chase, and (e) adjusting the time used to change color values when running a chase. *Id.*, 17. These adjustable strobe/timing parameters are summarized in Table 4:

Table 4: Strobe / Timing Parameters

Parameter	Description
Master Intensity	Overall fixture output intensity level.
Strobe: X	Strobe mode and rate value settings following DMX map (see SL PAR 155 ZOOM RGBW LED Luminaire DMX Mapping for details).
Duration	The time each strobe flash remains ON.
Intensity Timing	The time used to change intensity values when running a chase.
Color Timing	The time used to change color values when running a chase.

Id., Table 4.

e. Claim Element 1d

an effect simulator adapted to calculate a time varying lighting value based on at least one simulation parameter,

Showline in view of Mueller teaches Claim Element 1d. EX1003, ¶¶218-227.

The SL PAR's LCD Display and Menu System includes an "effect simulator," as the interactive LCD Display and Menu System adjusts and stores data in the form of "values of the luminaire's LED settings" for the presets and chases. EX1005, 15-17; *see also supra* Claim Elements 1b-1c. These LED setting values are time-varying lighting values that characterize the desired effect and are provided to the LEDs to

produce the proper light output over time, e.g., the customized effect selected by the user. EX1003, ¶220.

When a user adjusts the parameters for a preset or chase, the LCD Display and Menu System calculates and stores new data values for the LED settings to match the adjustments. *Id.* In particular, the data values for the LED settings the LCD Display and Menu System sets (calculates) for each preset and chase are based on user-selected parameters, including:

Table 3: Effects Parameters

Parameter	Description
User Chase / Built-in Chase	Select from the 18 different chases.
Master Intensity	Adjust the master intensity for ALL chases.
Total Steps	Displays the total steps used by the chase. This field is not editable.
Speed	The total time each step of the chase will be recalled.
Fade	The percentage of the time assigned by the speed that is crossfaded between steps.

Table 4: Strobe / Timing Parameters

Parameter	Description
Master Intensity	Overall fixture output intensity level.
Strobe: X	Strobe mode and rate value settings following DMX map (see SL PAR 155 ZOOM RGBW LED Luminaire DMX Mapping for details).
Duration	The time each strobe flash remains ON.
Intensity Timing	The time used to change intensity values when running a chase.
Color Timing	The time used to change color values when running a chase.

EX1005, Tables 3-4 (annotated). The data values for the LED settings calculated and set by the LCD Display and Menu System are based on adjustable simulation parameters, including "intensity" (or brightness), "speed," "fade," "duration," "strobe rate," and "color timing." *Id.*

While Showline provides significant detail regarding the operation of the SL PAR and detailed instructions on the SL PAR's use, it provides less detail regarding the internal components of the SL PAR and the relationships of those components that enable to LCD Display and Menu system to calculate a time varying lighting value based on a simulation parameter. EX1003, ¶222. A POSITA would understand that, to provide the functionality described in Showline, the LCD Display and Menu system would necessarily comprise, or be in a functional relationship with, an effect simulator akin to processor 102 and LUC 208 of Mueller. *Id.* A POSITA interested in designing equipment such as the SL PAR and networked systems including such luminaires would thus look to other references disclosing such technical information, including Mueller. *Id.*

As explained above, Mueller discloses a number of effect simulators adapted to calculate a time-varying lighting value based on one or more simulation parameters. *See supra* Ground 1, Claim Element 1d. A POSITA would recognize the benefits of incorporating Mueller's processor 102 or LUC 208 in connection with the design of a lighting system as disclosed by Showline. EX1003, ¶223.

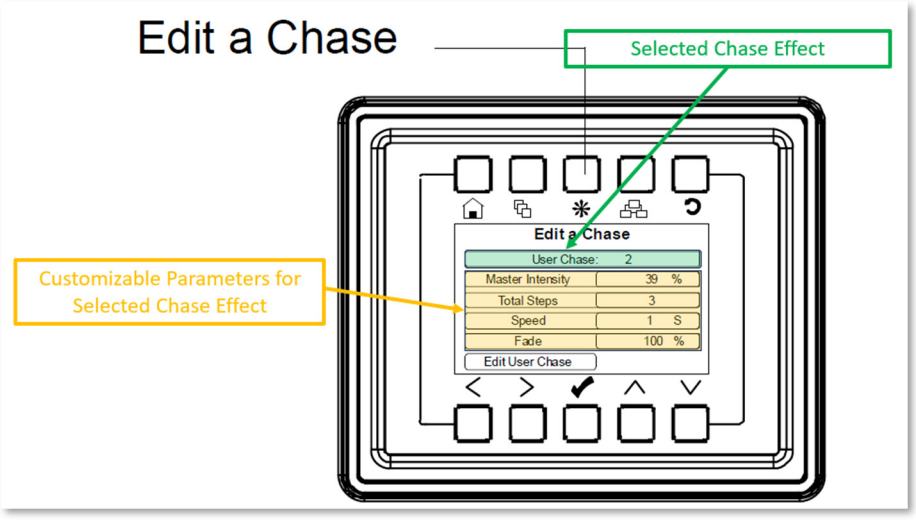
f. Claim Element 1e

said at least one simulation parameter depending on the selected user customisable cinematic lighting special effect being simulated,

Showline teaches Claim Element 1e. EX1003, ¶¶228-233.

Showline discloses that the "simulation parameters" a user may adjust depend on the selected preset or chase a user wants to edit and run on the SL PAR. *See supra* Claim Elements 1b-1d. Users are presented with options to adjust certain parameters of presets and chases after selecting a particular preset or chase. EX1005, 15-17. For example, with respect to presets, a user first selects a preset to edit by using buttons to "scroll through" available presets. *Id.*, 15. After selecting a preset to edit, a user may then "scroll through the parameters" for that preset, and use "left and right arrow buttons to make adjustments." *Id.* Thus, the parameters adjusted depend on the effect being edited. EX1003, ¶230.

As another example, with respect to editable chases, a user first selects a particular chase to edit and is provided a menu allowing a user to adjust parameters for that chase:



EX1005, 17 (annotated). Adjustments to the parameters for editable chases are made by selecting a chase to edit, using arrow keys to "scroll through" adjustable parameters, and using "left and right arrow buttons" to adjust selected parameters. *Id.* The adjusted parameters are particular to the chase being edited. EX1003, ¶231.

Finally, the "strobe/timing" parameters shown in Table 4 of Showline can be assigned to an "active Preset, Color filter, or chase." EX1005, 17. Thus, those parameters too depend on the preset, color filter, or chase that is active. EX1003, ¶232.

g. Claim Element 1f

and adapted to output said time varying lighting value to said lighting device so as to simulate the selected user customisable cinematic lighting special effect;

Showline in view of Mueller teaches Claim Element 1f. EX1003, ¶¶234-239.

The interactive LCD Display Menu System allows a user to "recall" (or play) an edited preset or chase from the main menu, with the corresponding "stored values of the luminaire's LED settings" for that preset or chase being sent to the LEDs so the effect can be "run" or implemented by the LED array. *See supra* Claim Elements 1b-1d. That is, when a preset or chase is recalled and run, the lighting values for that effect, which vary over time to change the light outputs to create the effect, are output from the LCD Display and Menu System to the LED array and the effect is implemented. EX1005, 15-17; *see also* EX1003, ¶236.

In addition, "strobe/timing" values are "instantly applied to any active Preset, Color filter, or chase." EX1005, 17. Thus, the LCD Display and Menu System instantly calculates and sends new LED setting values to implement particular strobe/timing adjustments with respect to the lighting effect being run. *Id.*; *see also* EX1003, ¶237. For example, adjustments to the "Color Timing" parameter are output to the LEDs to adjust "the time used to change color values when running a chase." EX1005, 17.

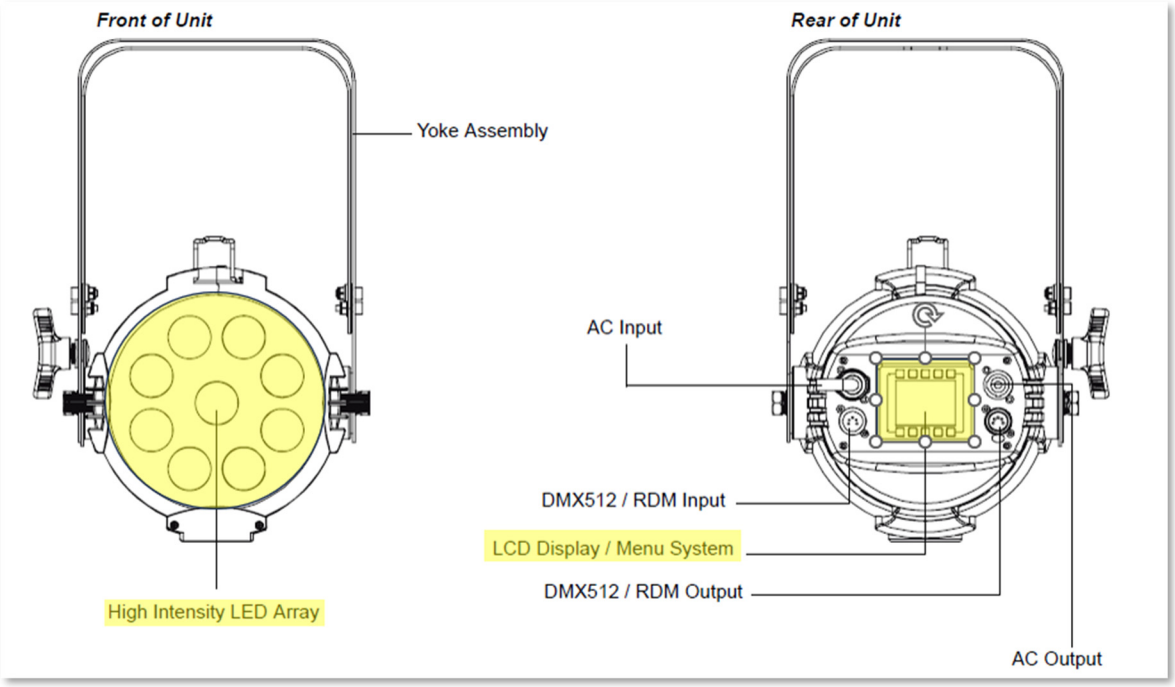
A POSITA would be motivated to incorporate Mueller's processor 102 or LUC 208 into the SL PAR's LCD Display and Menu System to enable the functionality disclosed by Showline. *See supra* Claim Element 1d. Mueller's processor 102 and LUC 208 are adapted to output time-varying lighting values to simulate a selected user-customizable cinematic lighting special effect. *See supra* Ground 1, Claim Element 1f.

h. Claim Element 1g

wherein said lighting device and said controller are integrated in a combined unit.

Showline teaches Claim Element 1g. EX1003, ¶¶240-243.

The LED array of SL PAR is located on the front of the unit, and the LCD Display and Menu System (which provides "local control" of the unit) is located on the rear of the same unit:



EX1005, Figure 2 (annotated). Thus, Showline teaches that the lighting device (*e.g.*, LEDs) and controller (*e.g.*, LCD Display and Menu System) are integrated into a single unit. EX1003, ¶242.

4. Claim 2

[2] The lighting system according to claim 1, wherein the input interface is adapted to receive user input to enable a user to customise said user customisable cinematic lighting special effect.

Showline in view of Mueller renders Claim 2 obvious. EX1003, ¶¶244-249.

The user interface of the LCD Display and Menu System enables a user to select and edit presets and chases, and to add strobe/timing adjustments to any preset or chase, to create desired effects. *See supra* Claim Element 1c. Menu options

allowing a user to edit presets and chases to customize the selected effects are shown in Figure 11:

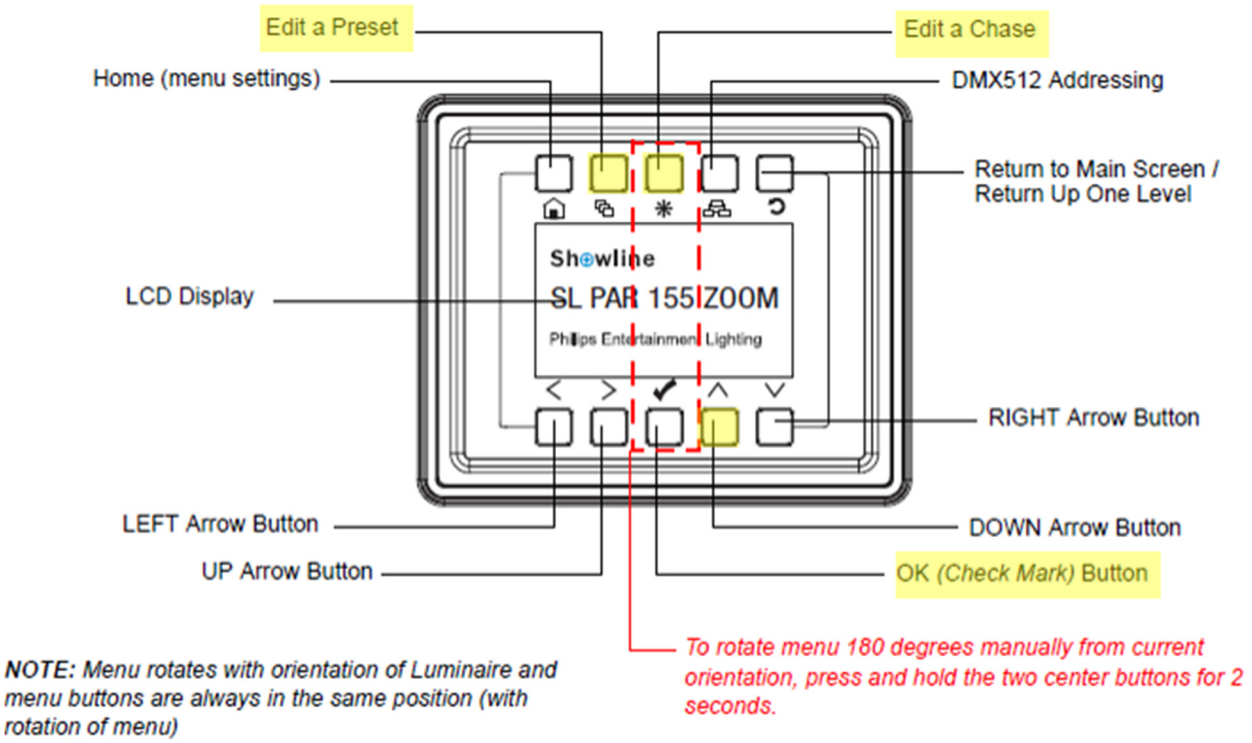
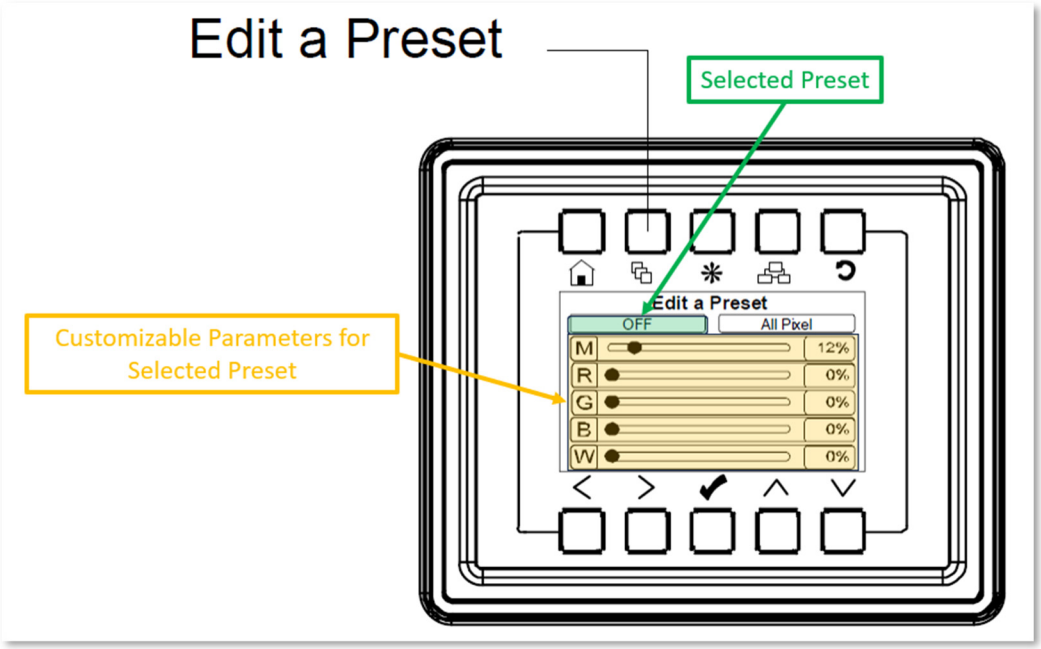


Figure 11: LCD Display and Menu System

EX1005, Figure 11 (annotated).

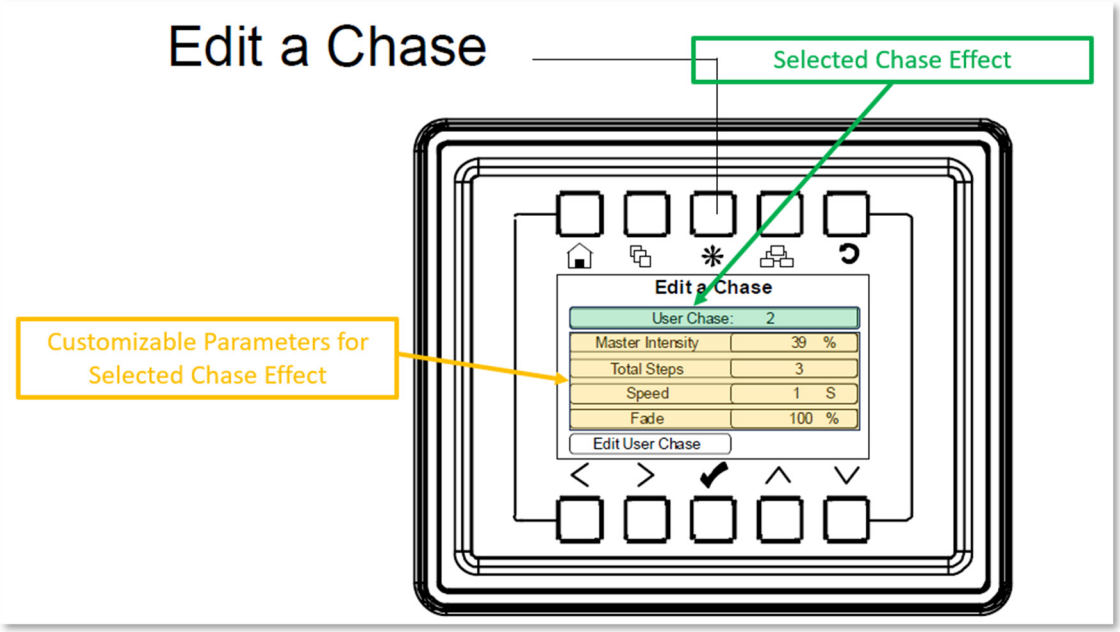
The LCD Display and Menu System buttons allows users to navigate and make selections to adjust parameters of lighting values for editable presets and chases, including intensity, duration, timing and colors. *Id.*, 15-17, Tables 3-4. By using the up, down, left, and right arrow buttons on the LCD Display and Menu System, users can edit presets to adjust selected parameters, edits chases to adjust selected parameters, and assign and adjust strobe and timing parameters to any preset or effect. *Id.*, 15- 17. For example, preset color parameters can be edited by changing

"RGBW" (*i.e.*, red, green, blue and white) or "HISC" (*i.e.*, hue intensity, saturation, and color) parameters. *Id.*, 15.



Id. (annotated).

Similarly, the LCD Display and Menu System provides user interface menus for a user to select and customize chase effects, including intensity, speed, fade, and colors. *Id.*, 16-17.



Id., 17 (annotated).

5. Claims 3-5

[3] The lighting system according to claim 1, wherein the lighting device comprises at least one LED.

[4] The lighting system according to claim 3, wherein the lighting device comprises multiple different coloured LEDs.

[5] The lighting system according to claim 4, wherein the multiple different coloured LEDs comprise at least one of a RGB LED, and a RGB+W LED.

Showline in view of Mueller renders Claims 3-5 obvious. EX1003, ¶¶250-258.

The SL PAR is an "RGBW LED" luminaire:



EX1005, cover. The SL PAR includes an array of nine RGBW (*i.e.*, multiple different colored) LEDs. *Id.*, 42; *see also id.*, 15, 17, 21, 28-29 (referencing control of red, green, blue, and white LEDs).

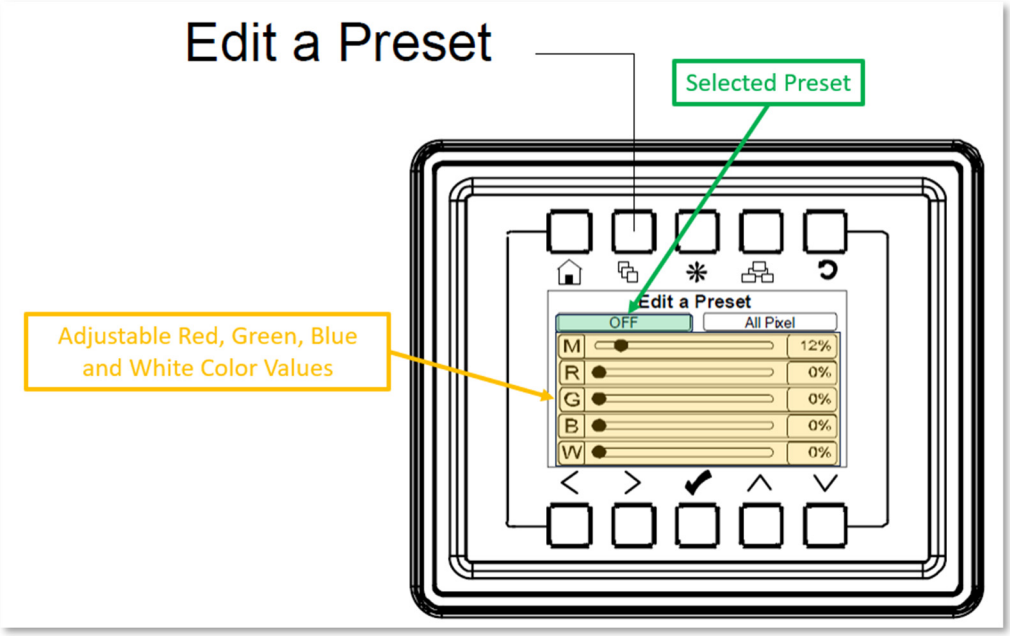
6. Claim 6

[6] The lighting system according to claim 3, wherein the controller is adapted to control the colour or colour temperature of said LEDs in dependence on a user input received via the input interface.

Showline in view of Mueller renders Claim 6 obvious. EX1003, ¶¶259-267.

Showline discloses that the color of the SL PAR's LEDs can be controlled based on user inputs in, for example, the "Edit a Preset," "Edit a Chase," and "Strobe / Timing" menus provided on the LCD Display and Menu System. EX1005, 15-17.

In the "Edit a Preset" menu, a user can adjust the "RGBW" (i.e., red, green, blue and white) or "HISC" (*i.e.*, hue intensity, saturation, and color) parameters to change the color that will be output by the LEDs for that particular preset. *Id.*, 15.



Id. (annotated).

In the "Edit a Chase" menu, users can select "presets or color filters" to apply to each step in the chase. *Id.*, 17. Assigning a preset or color filter to a step controls the color the LEDs will output for that particular step in the chase. EX1003, ¶263. Showline further discloses that the "Edit a Chase" menu allows adjustments to "RGBW" (*i.e.*, red, green, blue and white) or "HISC" (*i.e.*, hue intensity, saturation, and color) parameters to change the color. EX1005, 17.

In the "Strobe/Timing" menu, selected changes to "Color Timing" are implemented by the LCD Display and Menu System to control timing changes between different colors in a chase effect. *Id.* That is, when a chase effect includes multiple colors, the "Strobe/Timing" menu controls the timing of changes between these different colors. EX1003, ¶264.

Showline also discloses that, in addition to color adjustments discussed above, "color temperature" is also adjustable. *Id.*, ¶¶265-266. In particular, the "Color Temperature" is "user adjustable" between "2700 – 6500K." EX1005, 42.



1. Operational Specifications

Source:	Color RGBW LED Array (x9 - 15 Watt High Power LED Chipsets)
Beam Angle:	8 to 40 Degrees (hand adjustable)
Light Output:	> 3,200 lumens
Color Temperature:	2700 - 6,500K (user adjustable)

Id.; *see also id.*, 25 (describing color presets included "White" values at temperatures between 2700K and 10000K), 30 (describing correlated color temperature (CCT)

control through DMX settings when in the HSIC mode on the LCD Display and Menu System.) DMX is a common control protocol standard created by and for the entertainment lighting industry. EX1003, ¶¶265-266.

A POSITA would understand that user adjustment of color temperature would be done through the LCD Display and Menu System. *Id.*, ¶266. The LCD Display and Menu System is described as providing "local control" of the fixture settings. EX1005, 14. A POSITA would recognize that a user-adjustable color temperature would be one of these fixture settings. EX1003, ¶266. Moreover, the LCD Display and Menu System can access RGBW and HSIC parameters based on DMX maps. EX1005, 15, 17. Showline, in showing the DMX mapping for the HSIC parameters, indicates that one is "variable control of correlated color temperature (CCT)," which can be adjusted between "2700-6500K." *Id.*, 30. As Showline indicates that these DMX control settings can be made available to the user through the LCD Display and Menu System, a POSITA would understand that the LCD Display and Menu System can implement these color temperature adjustments. EX1003, ¶266.

7. Claim 8

[8] The lighting system according to claim 6, wherein the lighting device is operable to produce light at a colour temperature typically in the range of 2800-7000 Kelvin.

Showline in view of Mueller renders Claim 8 obvious. EX1003, ¶¶268-270.

Showline discloses the "color temperature" of the LED array is "user adjustable" in the range of 2700-6500K:



1. Operational Specifications

Source:	Color RGBW LED Array (x9 - 15 Watt High Power LED Chipsets)
Beam Angle:	8 to 40 Degrees (hand adjustable)
Light Output:	> 3,200 lumens
Color Temperature:	2700 - 6,500K (user adjustable)

EX1005, 42. Showline discloses that, in other modes, color presets which may be implemented by the SL PAR include "White 10000K," "White 8000K," "White 6500K," "White 5600K," "White 5000K," "White 4500K," "White 4000K," "White 3200K," "White 3000K," and "White 2700K." *Id.*, 25, 30. Thus, the SL PAR can produce light at a color temperature in the claimed range. EX1003, ¶270.

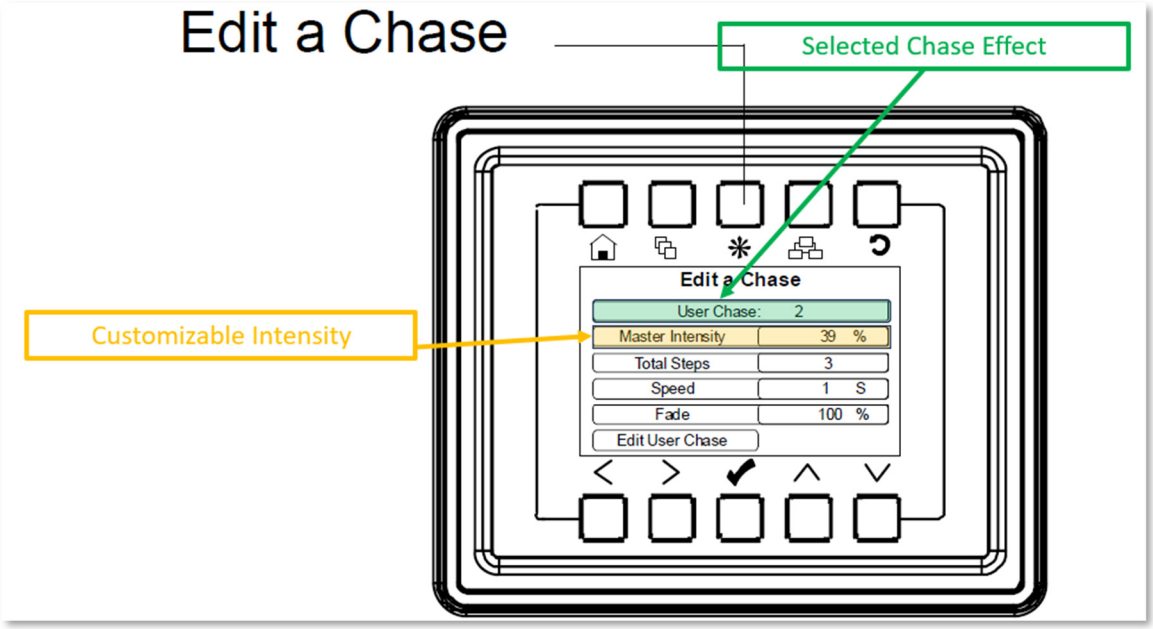
8. Claim 9

[9] The lighting system according to claim 3, wherein the controller is adapted to control the brightness of said LEDs in dependence on a user input received via the input interface.

Showline in view of Mueller renders Claim 9 obvious. EX1003, ¶¶271-273.

The LCD Display and Menu System controls the intensity (or brightness) of the LEDs based on user inputs in the "Edit a Preset," "Edit a Chase," and "Strobe/Timing" menus. *See supra* Claim elements 1b-1d. Showline indicates that "the master intensity" for any selected chase may be adjusted using "Up and Down" buttons and "Left and Right buttons" on the LCD Display and Menu System.

EX1005, 16, Table 3. Through the "Edit a Chase" and "Strobe/Timing" menus, users can adjust the "master intensity" of the LED output. *Id.*, 16-17.



Id., 17 (annotated).

9. Claim 10

[10] The lighting system according to claim 1, wherein the simulation parameter comprises at least one of a colour and a colour temperature.

Showline in view of Mueller renders Claim 10 obvious. EX1003, ¶¶274-277.

Showline discloses that the adjustable parameters include selections of color filters and user-adjustable color temperature. A user can change the color and color temperature of the LED elements by changing color and temperature control parameters, including for chases. *See supra* Claims 6, 8.

10. Claim 11

[11] The lighting system according to claim 1, wherein the selected user customisable cinematic lighting special effect is designed to mimic at least one of fire; lightning; police car light; television; a neon flickering sign; a candle; muzzle (gunshot); welding; spark/short circuit; a scan (e.g. fingerprint scanner); paparazzi flashes; fireworks; flashes (strobe); a propeller; a (nuclear) explosion; and a wormhole.

Showline in view of Mueller renders Claim 11 obvious. EX1003, ¶¶278-284.

Showline discloses that the user-selected, customizable effects can include at least "flashes (strobe)." EX1005, 16-17. Specifically, chase effects can include "strobe mode and rate settings," and "the time each strobe flash remains ON" in a chase can be adjusted based on user selections. *Id.*, 17, Table 4; *see also id.*, 28-29.

Further, a POSITA would understand that the editable chases, which can include various colors, flashing, and strobing, would produce other claimed effects, such as effects that mimic at least a police light, lightning, paparazzi flashes, welding, sparking, a fire or candle, and neon signs. EX1003, ¶281. For example, a chase with flashes or strobes of varying color, duration and intensity would produce light that simulates lightning, paparazzi flashes, and welding and spark/short circuit effects, and a chase flashing alternating blue and red lights would produce light that simulates a police car light. *Id.*

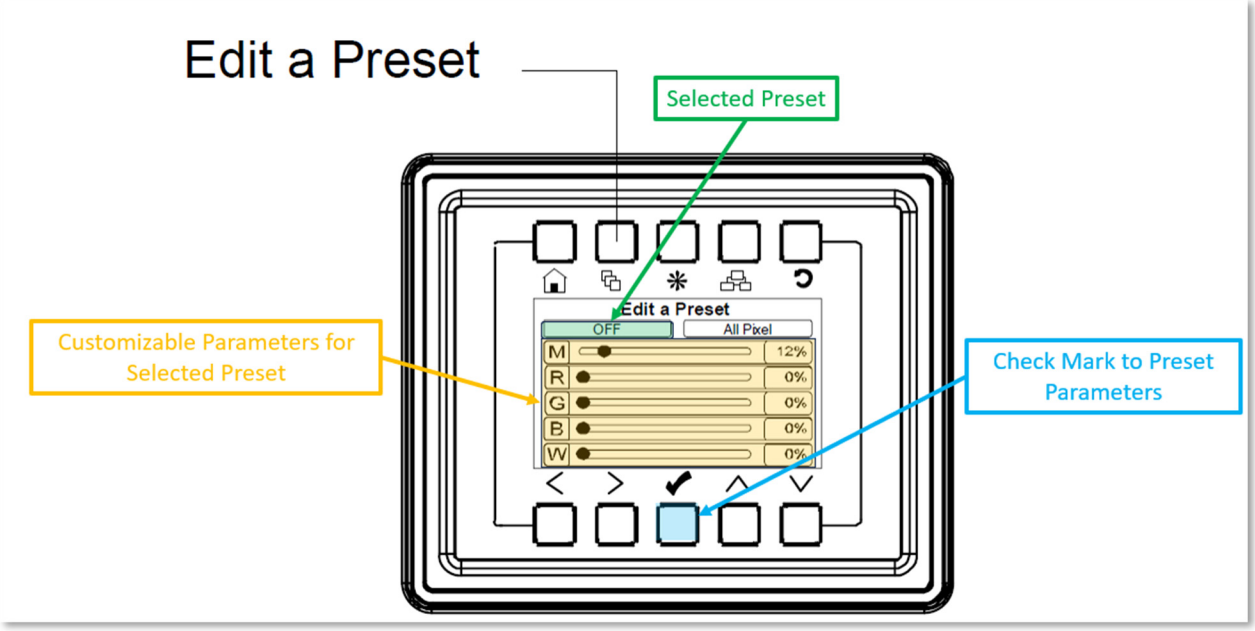
11. Claims 12 and 21

[12] The lighting system according to claim 1, wherein the controller is adapted to store said at least one simulation parameter in memory.

[21] The lighting system according to claim 12, wherein the controller is adapted to recall said stored at least one simulation parameter from said memory.

Showline in view of Mueller renders Claims 12 and 21 obvious. EX1003, ¶¶285-289, 333-337.

A user may edit presets using the SL PAR's LCD Display and Menu System, and once all values are adjusted as desired, pressing a "Check Mark" button saves the preset (with its parameters). EX1005, 15-16.



Id., 15 (annotated). When the "Check Mark" is selected, a "Save Preset Menu" option appears, and the user can "select the preset number to save to." *Id.*, 15-16. Saved presets can then be "recalled via the menu." *Id.*, 16.

Users can also adjust parameters for any chase, including the ten factory defined chases and the eight user-editable chases. *Id.*, 16. Users can use buttons on the LCD Display and Menu System to select parameters, and then press a "Check button" to save when done. *Id.* These parameterized chases can be "recalled" through the menu system. *Id.* Similarly, a user can "edit and save" the user-editable chases in the "Edit a Chase" menu, and when all editing steps are done, a user pushes a "Return to Main Menu" button and the "user chase is now saved and can be recalled." *Id.*, 17.

A POSITA would understand that the adjusted values and parameters selected by the user would be "saved" in and "recalled" from a memory in the SL PAR unit. EX1003, ¶¶289, 337.

12. Claim 13

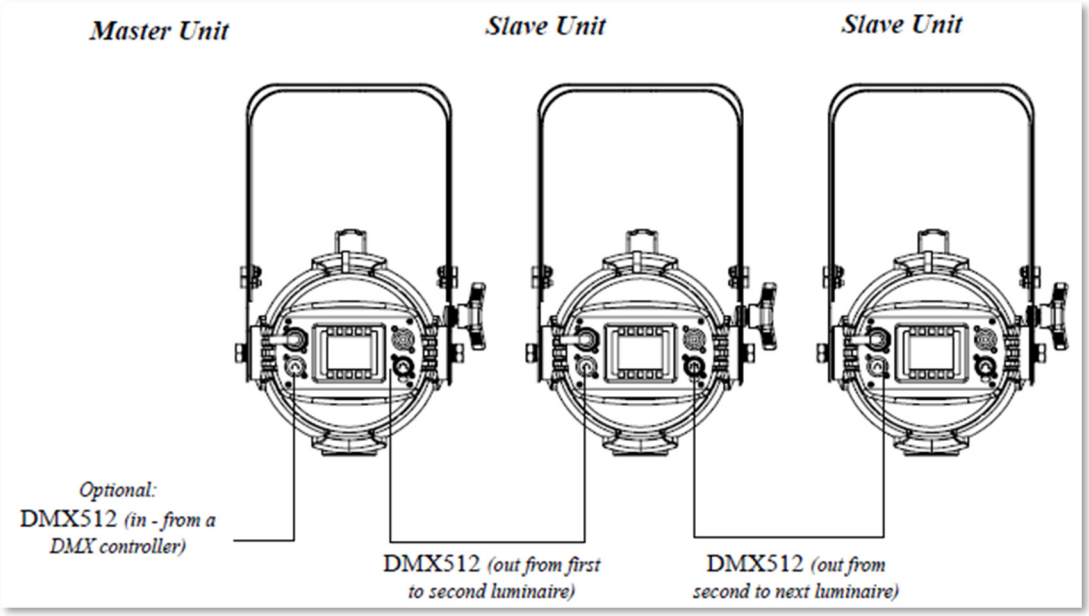
[13] The lighting system according to claim 1, wherein the controller is adapted to control a plurality of lighting devices in dependence on the selected user customisable cinematic lighting special effect.

Showline in view of Mueller renders Claim 13 obvious. EX1003, ¶¶290-294.

Each LED in the SL PAR array is itself a lighting device. *See supra* Claim element 1a. The LCD Display and Menu System controls these nine LED "lighting devices" in the SL PAR. *See supra* Claim elements 1b-1f.

The LCD Display and Menu System in one SL PAR can act as a "Master" controller, to control a plurality of "Slave" SL PARs. EX1005, 23. In particular, "[t]he Master / Slave Operational Mode allows one SL PAR 155 ZOOM RGBW LED Luminaire to act as the 'Master' unit and all other connected units are controlled by this unit. When a unit is set to 'Slave' mode, it will only listen to and follow any commands sent from a 'Master' unit. Only one 'Master' unit is allowed in this type of operation." *Id.*

In the "Master/Slave" mode, user-selected "presets and chases" made through the LCD Display and Menu System "recalled [i.e., played] on the master will automatically play on the slaves without having to program the slaves." *Id.* Thus, the plurality of "slave" units is controlled by the "master" unit, based on the user-selected, edited, and adjusted chases that are recalled to run on the master. EX1003, ¶294.



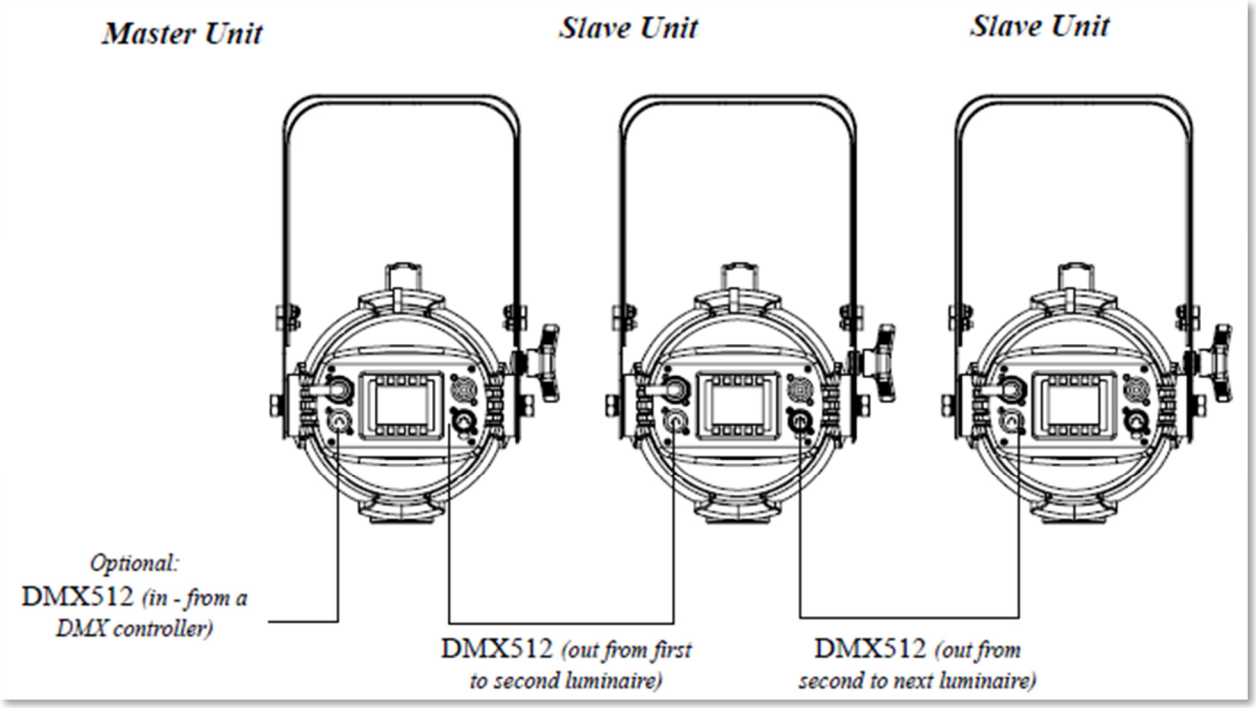
EX1005, Figure 13; *see also id.*, 10.

13. Claim 14

[14] The lighting system according to claim 1, further comprising a further lighting device, said further lighting device being separate from said controller.

Showline in view of Mueller renders Claim 14 obvious. EX1003, ¶¶295-300.

In the "Master/Slave" mode, the "slave unit" SL PARs, with their LED arrays, are controlled by and separate from the "master unit" SL PAR (and its LCD Display and Menu System). *See supra* Claim 13.



EX1005, Figure 13; *see also id.*, 10.

14. Claim 15

[15] The lighting system according to claim 14, wherein the controller comprises a wireless communication interface adapted for wireless communication with said further lighting device.

Showline in view of Mueller renders Claim 15 obvious. EX1003, ¶¶301-305.

As explained above, a POSITA would be motivated to incorporate a controller disclosed by Mueller, such as processor 102 or LUC 208, into the LCD Display and Menu System of the SL PAR or to associate such a controller with the LCD Display and Menu System of the SL PAR. *See supra* Claim Element 1b; *see also* EX1003, ¶305. Also as explained above, Mueller discloses that such controllers can comprise

a wireless communication interface adapted for wireless communication between a first lighting device and a further lighting device. *See supra* Ground 1, Claim 15.

15. Claim 16

[16] The lighting system according to claim 13, wherein the controller is adapted to at least one of: offset and overlap the output of said plurality of lights with one-another so as to simulate a moving light source.

Showline in view of Mueller renders Claim 16 obvious. EX1003, ¶¶306-312.

The LCD Display and Menu System controls the plurality of LEDs in the array of nine LEDs. *See supra* Claim Elements 1b-1e. The LCD Display and Menu System can offset or overlap the flashing of these LEDs to simulate a moving light source.

In creating and producing chase effects, the LCD Display and Menu can set, for example, a number of different steps in a chase, along with intensity and fade values for each step. EX1005, 16-17. Changing the intensity and fade values for the LEDs in implementing these chases simulates a moving light source, with the LED outputs overlapping to create the light with the appropriate fading. *Id.*; *see also* EX1003, ¶309. When the light produced by the LEDs in a step fades, it provides the appearance of a light moving farther away until it is no longer visible (such as a flare shot off into the distance). EX1003, ¶309.

In addition, in the "Master/Slave" mode, the slave units "mimic the master unit's operation in all cases." EX1005, 24. User-selected "presets and chases" made through the LCD Display and Menu System "recalled on the master will automatically play on the slaves without having to program the slaves." *Id.* Thus, the master unit's LCD Display and Menu System is adapted to at least overlap the output of the LED arrays in the master and slave units when running chase effects, simulating a moving light source when steps of the chase effect as implemented across the SL PAR units include, for example, all lights brightening at the same time to mimic an approaching train light. EX1003, ¶310.

16. Claim 17

[17] The lighting system according to claim 1, wherein the controller is separable from the lighting device.

Showline in view of Mueller renders Claim 17 obvious. EX1003, ¶¶313-317.

Showline explains that, in addition to being able to control the SL PAR via the LCD Display and Menu System, a separable DMX512 control source may be used to provide the same controls. EX1005, 9-10, 19-20; *see also* EX1003, ¶315. The manual states, for example, that "Presets are stored values of the luminaire's LED settings that can be recalled via the menu system ***or DMX***," color filters "can be recalled via the menu system ***or DMX***," and "Effects are chases stored values of the luminaire's LED settings that can be recalled via the menu system ***or DMX***."

EX1005, 15-17 (emphasis added).) The DMX512 control source is physically attached to the unit through a DMX "cable" connector, connecting the DMX512 control source and SL PAR unit. *Id.*, 10; *see also* EX1003, ¶315. This DMX512 controller can be disconnected from the SL PAR (including its LED array) and is therefore separable. EX1003, ¶315.

As explained above, Mueller makes clear that the lighting systems disclosed therein may be designed with flexibility in mind. *See supra* Claim Element 1g; *see also* EX1004, [0198], [0062]. Mueller further identifies a variety of different configurations under which LUC 208 and the lighting device 100 are connected, for example, serial connections, parallel connections, networked connections and combinations thereof. *Id.*, at [0199]. Mueller further teaches that the connection between LUC 208 and the lighting device 100 could be via a variety of different communication media and protocols. *Id.* Mueller also specifically contemplates that "one or more devices coupled to a network may serve as a controller for one or more other devices coupled to the network (e.g., in a master/slave relationship)." *Id.*, [0066].

A POSITA would understand that the separable DMX15 control source can include the processor 102 (controller) since Mueller is flexibly designed. EX1003, ¶317. The result of a separable controller would be predictable and allow the

controller to be stored separately, work with other units, or other benefits that would motivate a POSITA to include the processor 102 in a separable unit. *Id.*

17. Claim 18

[18] The lighting system according to claim 1, wherein the input interface comprises at least one of: a wireless communication interface; a dial; a slider; a control panel; a display and buttons; and a touch screen.

Showline in view of Mueller renders Claim 18 obvious. EX1003, ¶¶318-322.

The LCD Display and Menu System includes, for example, an LCD "display" with selectable menu "buttons." *See Supra* Claim element 1c.

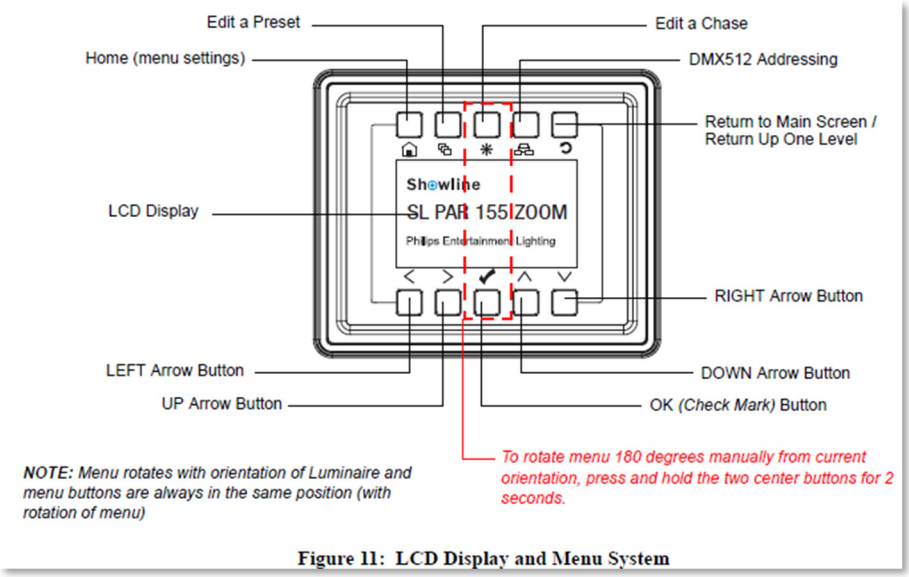


Figure 11: LCD Display and Menu System

EX1004, Figure 11.

18. Claim 19

[19] The lighting system according to claim 1, further comprising a converter adapted to convert at least one of brightness and colour data from the simulator into lighting signals for output by the output.

Showline in view of Mueller renders Claim 19 obvious. EX1003, ¶¶323-328.

As discussed above, the "converter" ensures the signals are of the proper type to be input into the LEDs or other light elements. A POSITA would understand from Showline that the SL PAR includes the claimed "converter." EX1003, ¶¶325-326. The LEDs in the SL PAR are "15 Watt High Power LED Chipsets." EX1005, 42. A POSITA would understand that the SL PAR includes a converter to change command signals reflecting the desired lighting effects and values into power signals that are provided to these chipsets, such that the LEDs can output the appropriate lighting colors and intensities over time to produce the desired light output EX1003, ¶¶325-326. In particular, the color and intensity (brightness) values for the presets and chases, *see supra* Claim element 1d and Claim 6, are converted by LED driver circuitry in the SL PAR to lighting signals sent to the LED chipsets to cause the LEDs thereon to output the appropriate light. EX1003, ¶¶325-326.

19. Claim 20

[20] The lighting system according to claim 1, wherein the lighting system is a lighting system for at least one of: videography; broadcast; cinematography; studio filming; and location filming.

Showline in view of Mueller renders Claim 20 obvious. EX1003, ¶¶329-332.

A POSITA would have known, and understood from Showline, that the SL PAR could be used for at least of videography, broadcast, cinematography, studio filming, and location filming. As was well known in the art to a POSITA, Showline is a brand name of Vari-Lite, a company that manufactured luminaires for film, TV, and theatrical use. EX1003, ¶331. Further, as was also well known, the SL PAR was designed and sold for such end uses. EX1011, ¶7 (noting that the SL PAR 155 is often used in "entertainment lighting and to provide special lighting effects in video and studio filming environments."); EX1003, ¶331.

Showline also discloses mounting SL PAR units to trusses or in hanging applications, such as would be done in studio filming applications, and further discloses that SL PAR units may be mounted to the floor. EX1005, 11-12.

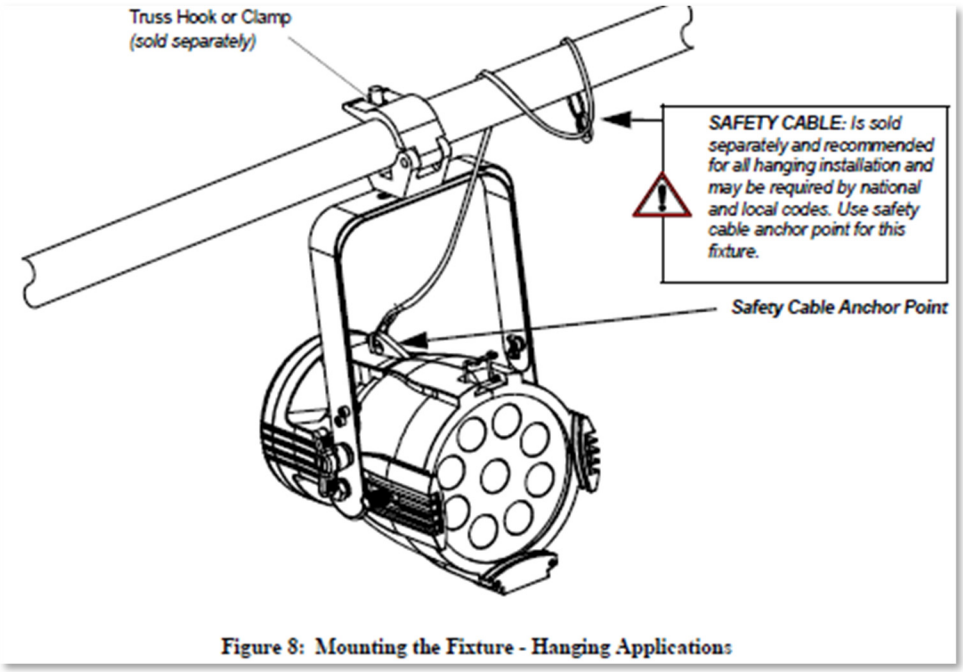


Figure 8: Mounting the Fixture - Hanging Applications

Id., Figure 8.

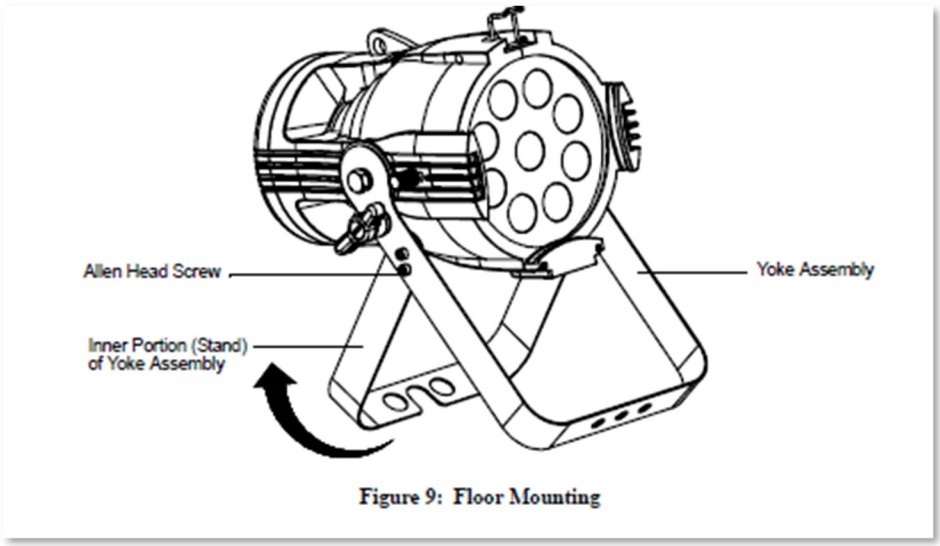


Figure 9: Floor Mounting

Id., Figure 9. A POSITA would recognize the truss and floor mounting configurations shown are typical configurations for mounting such luminaires in videography, broadcast, cinematography, studio filming, and location filming

settings. EX1003, ¶332. Indeed, these truss and floor mounting configuration are expected lighting set ups for studio filming applications, where a studio stage is illuminated with various luminaires mounted to trusses above the stage, and also from luminaires mounted to the floor that provide light illuminating scenes from below. *Id.* Further, a POSITA would understand the references to the DMX512 control protocol in Showline, *see, e.g.*, EX1005, 14, 24-39, indicate the SL PAR was for use in TV, cinematography, and studio filming, as this is a common communication standard created by and for the entertainment lighting industry. EX1003, ¶332.

20. Claim 22

[22] The lighting system according to claim 14, wherein said controller is adapted to control said further lighting device in dependence on the selected user customisable cinematic lighting special effect.

Showline in view of Mueller renders Claim 22 obvious. EX1003, ¶¶338-344.

Showline discloses that, in the "Master/Slave" mode, the LCD Display and Menu System in the "master unit" controls the LED arrays in the "slave" units, based on the user-selected effects recalled (or played) on the master unit. Stated differently, an effect selected on the "master unit" via its LCD Display and Menu System is run (or played) on the "slave" units. *See supra* Claim 14.

D. Ground 2a – Showline in view of Mueller and further in view of Choong renders Claim 7 obvious.

[7] The lighting system according to claim 3, wherein the lighting device comprises at least one 'warm' white and at least one 'cool' white LED.

Showline in view of Mueller and Choong renders Claim 7 obvious. EX1003, ¶¶345-34486.

Though Showline teaches the use of multiple LEDs across a spectrum of colors and color temperatures, *see supra* Ground 2, Claims 3-5, it does not explicitly disclose a lighting device with at least one "warm" white LED and at least one "cool" white LED. A POSITA would have understood the utility of an LED arrangement including a "warm" white LED and a "cool" white LED to enable the production of a broad spectrum of color temperatures of white light. EX1003, ¶347. It would thus have been obvious for a POSITA to employ such an arrangement within a device such as the SL PAR. *Id.*

That the benefits of such an arrangement were well known is demonstrated by Choong, which is within the same field of art as Showline and Mueller. *Id.* Specifically, Choong, which was based on a patent application filed in 2008, discloses a "methodology of creating lighting of white colour with the intended [correlated colour temperature ('CCT')] to ease the user to control CCT of white lighting sources when the lighting source contains a plurality of cool white LEDs

(not shown), white LEDs (108), warm white LEDs (102) and amber LEDs (100)." EX1012, 2:58-62; EX1003, ¶348. To incorporate this sort of LED arrangement, with a cool white LED and a warm white LED would have been obvious to a POSITA seeking to provide a user with the ability to use a lighting device like SL PAR to produce white light across a broad spectrum of color temperatures.

IX. CONCLUSION

Aputure respectfully requests that a Trial be instituted. Claims 1-22 should be cancelled.

Dated: September 16, 2024

Respectfully submitted,

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APPENDIX A – CLAIM LISTING

U.S. Patent No. 10,197,25

Claim or Element #	Claim Language
Claim 1	
[1(a)]	A lighting system comprising:
[1(b)]	a lighting device; and
[1(c)(1)]	a controller adapted to control the lighting device to produce a user customisable cinematic lighting special effect selected from a range of different user customisable cinematic lighting special effects, the controller comprising:
[1(c)(2)]	an input interface for receiving user input to enable a user to select user customisable cinematic lighting special effect from said range of different user customisable cinematic lighting special effects; and
[1(c)(3)(i)]	an effect simulator adapted to calculate a time varying lighting value based on at least one simulation parameter,
[(1)(c)(3)(ii)]	said at least one simulation parameter depending on the selected user customisable cinematic lighting special effect being simulated,

[1(c)(3)(iii)]	and adapted to output said time varying lighting value to said lighting device so as to simulate the selected user customisable cinematic lighting special effect;
[1(d)]	wherein said lighting device and said controller are integrated in a combined unit.
Claim 2	
[2]	The lighting system according to claim 1, wherein the input interface is adapted to receive user input to enable a user to customise said user customisable cinematic lighting special effect.
Claim 3	
[3]	The lighting system according to claim 1, wherein the lighting device comprises at least one LED.
Claim 4	
[4]	The lighting system according to claim 3, wherein the lighting device comprises multiple different coloured LEDs.
Claim 5	
[5]	The lighting system according to claim 4, wherein the multiple different coloured LEDs comprise at least one of a RGB LED, and a RGB+W LED.

Claim 6	
[6]	The lighting system according to claim 3, wherein the controller is adapted to control the colour or colour temperature of said LEDs in dependence on a user input received via the input interface.
Claim 7	
[7]	The lighting system according to claim 3, wherein the lighting device comprises at least one 'warm' white and at least one 'cool' white LED.
Claim 8	
[8]	The lighting system according to claim 6, wherein the lighting device is operable to produce light at a colour temperature typically in the range of 2800-7000 Kelvin.
Claim 9	
[9]	The lighting system according to claim 3, wherein the controller is adapted to control the brightness of said LEDs in dependence on a user input received via the input interface.
Claim 10	

[10]	The lighting system according to claim 1, wherein the simulation parameter comprises at least one of a colour and a colour temperature.
Claim 11	
[11]	The lighting system according to claim 1, wherein the selected user customisable cinematic lighting special effect is designed to mimic at least one of fire; lightning; police car light; television; a neon flickering sign; a candle; muzzle (gunshot); welding; spark/short circuit; a scan (e.g. fingerprint scanner); paparazzi flashes; fireworks; flashes (strobe); a propeller; a (nuclear) explosion; and a wormhole.
Claim 12	
[12]	The lighting system according to claim 1, wherein the controller is adapted to store said at least one simulation parameter in memory.
Claim 13	
[13]	The lighting system according to claim 1, wherein the controller is adapted to control a plurality of lighting devices in dependence on the selected user customisable cinematic lighting special effect.
Claim 14	

[14]	The lighting system according to claim 1, further comprising a further lighting device, said further lighting device being separate from said controller.
Claim 15	
[15]	The lighting system according to claim 14, wherein the controller comprises a wireless communication interface adapted for wireless communication with said further lighting device.
Claim 16	
[16]	The lighting system according to claim 13, wherein the controller is adapted to at least one of: offset and overlap the output of said plurality of lights with one-another so as to simulate a moving light source.
Claim 17	
[17]	The lighting system according to claim 1, wherein the controller is separable from the lighting device.
Claim 18	
[18]	The lighting system according to claim 1, wherein the input interface comprises at least one of: a wireless communication interface; a dial; a slider; a control panel; a display and buttons; and a touch screen.

Claim 19	
[19]	The lighting system according to claim 1, further comprising a converter adapted to convert at least one of brightness and colour data from the simulator into lighting signals for output by the output.
Claim 20	
[20]	The lighting system according to claim 1, wherein the lighting system is a lighting system for at least one of: videography; broadcast; cinematography; studio filming; and location filming.
Claim 21	
[21]	The lighting system according to claim 12, wherein the controller is adapted to recall said stored at least one simulation parameter from said memory.
Claim 22	
[22]	The lighting system according to claim 14, wherein said controller is adapted to control said further lighting device in dependence on the selected user customisable cinematic lighting special effect.

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 13,957. 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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