

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VITEC PRODUCTION SOLUTIONS, INC.
Petitioner,

v.

ROTOLIGHT LIMITED
Patent Owner.

Case: IPR2022-00262
U.S. Patent No. 10,197,258

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 10,197,258**

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P.O. Box 1450
Alexandria, VA 22313-1450

Filed on behalf of Petitioner:
David M. Magee (Reg. No. 51,982)
Marc Vander Tuig (Reg. No. 57,964)
Dhruv Kaushal, Ph. D. (Reg. No. 67,340)
Armstrong Teasdale LLP
800 Boylston St., 30th Floor
Boston, MA 02199
Telephone: 617.824.5150
Facsimile: 617.830.8490

TABLE OF CONTENTS

TABLE OF AUTHORITIES	III
LISTING OF EXHIBITS.....	IV
MANDATORY NOTICES.....	1
A. REAL PARTY-IN-INTEREST (37 C.F.R. § 42.8(B)(1)).....	1
B. NOTICE OF RELATED MATTERS (37 C.F.R. § 42.8(B)(2))	1
C. DESIGNATION OF LEAD AND BACK-UP COUNSEL AND SERVICE INFORMATION (37 C.F.R. § 42.8(B)(3))	1
D. DESIGNATION OF LEAD AND BACK-UP COUNSEL AND SERVICE INFORMATION (37 C.F.R. § 42.8(B)(4))	2
I. INTRODUCTION.....	1
II. REQUIREMENTS FOR PETITION FOR <i>INTER PARTES</i> REVIEW	1
A. GROUNDS FOR STANDING (37 C.F.R. § 42.104(A)).....	1
B. PAYMENT OF FEES (37 C.F.R. § 42.15(A)).....	1
C. PROOF OF SERVICE (37 C.F.R. § 42.105).....	1
III. IDENTIFICATION OF CHALLENGED CLAIMS (37 C.F.R. § 42.104(B))...	1
IV. SUMMARY OF THE '258 PATENT	2
V. LEVEL OF ORDINARY SKILL IN THE ART AS OF THE EARLIEST EFFECTIVE FILING DATE OF THE '258 PATENT	3
VI. CLAIM CONSTRUCTION.....	3
VII. DISCRETIONARY DENIAL WOULD BE INAPPROPRIATE.....	6
A. DISCRETIONARY DENIAL UNDER 35 U.S.C. § 325(D) IS NOT APPROPRIATE	6
VIII. THE CHALLENGED CLAIMS ARE UNPATENTABLE OVER MORGAN IN VIEW OF HINRICHS AND POHLERT	8
A. OVERVIEW OF MORGAN.....	8

B. OVERVIEW OF HINRICHS	9
C. OVERVIEW OF POHLERT.....	11
D. A SKILLED ARTISAN WOULD HAVE BEEN MOTIVATED TO COMBINE MORGAN WITH HINRICHS, AND POHLERT, AND WOULD HAVE HAD A REASONABLE EXPECTATION OF SUCCESS	12
E. GROUND 1: CLAIMS 1–22 ARE OBVIOUS OVER MORGAN IN VIEW OF HINRICHS AND POHLERT.	13
1. Independent Claim 1	13
2. Dependent Claim 2.....	25
3. Dependent Claims 3, 6, 7, 8 and 9	26
4. Dependent Claim 4.....	29
5. Dependent Claim 5.....	30
6. Dependent Claim 10.....	31
7. Dependent Claim 11.....	32
8. Dependent Claims 12 and 21	33
9. Dependent Claims 13 and 16	36
10. Dependent Claims 14, 15,and 22	38
11. Dependent Claim 17.....	40
12. Dependent Claim 18.....	40
13. Dependent Claim 19.....	41
14. Dependent Claim 20.....	42
IX. CONCLUSION	43

TABLE OF AUTHORITIES

	Page(s)
 Cases	
<i>Commscope Tech. 's LLC v. Dali Wireless Inc.</i> , IPR2020-014731 (P.T.A.B. Mar. 12, 2021)	24
<i>Group III International, Inc. v. Targus Group International, Inc.</i> , IPR2021-00371(P.T.A.B. Jul. 9, 2021)	7
<i>Honeywell Int'l, Inc. v. ITT Indus., Inc.</i> , 452 F.3d 1312 (Fed. Cir. 2006).....	4
<i>In re Larson</i> , 340 F.2d 965 (C.C.P.A. 1965)	25
<i>Intel Corporation v. Koninklijke Philips N.V.</i> , IPR2021-00370 (P.T.A.B. Jul. 6, 2021)	7
<i>KSR Int'l Co. v. Teleflex, Inc.</i> , 550 U.S. 398 (2007)	12
<i>Personalized Media Commc'ns, LLC v. Apple Inc.</i> , 952 F.3d 1336 (Fed. Cir. 2020).....	4
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005).....	3
<i>Realtime Data, LLC v. Iancu</i> , 912 F.3d 1368 (Fed. Cir. 2019).....	12
<i>Renishaw PLC v. Marposs Societa' per Azioni</i> , 158 F.3d 1243 (Fed. Cir. 1998).....	4
 Statutes	
35 U.S.C. § 102	8, 10, 11
35 U.S.C. § 103	2
35 U.S.C. § 325	6

LISTING OF EXHIBITS

Exhibit No.	Exhibit Description
1001	U.S. Patent No. 10,197,258 to Gammons <i>et al.</i> (“the ’258 Patent”)
1002	File History of the U.S. Patent No. 10,197,258 (“the File History”)
1003	Declaration of Fred Holmes (“Holmes Decl.”)
1004	Resume of Fred Holmes
1005	U.S. Patent No. 8,938,468 to Morgan <i>et al.</i> (“Morgan”)
1006	U.S. Patent No. 9,532,422 to Hinrichs (“Hinrichs”)
1007	U.S. Patent No. 7,874,701 to Pohlert <i>et al.</i> (“Pohlert”)

MANDATORY NOTICES

Vitec Production Solutions, Inc. (“Petitioner”) hereby submits these Mandatory Notices in accordance with 37 C.F.R. § 42.8 *et seq.*

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

The real party-in-interest is Petitioner Vitec Production Solutions, Inc., located at Shelton, Connecticut, and The Vitec Group plc, located in the United Kingdom.

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

The following currently pending matters relate to the challenged ’258 Patent: IPR2021–01496–01498. Vitec is filing another *inter partes* review petition against U.S. Patent No. 10,197,257 contemporaneously with this Petition.¹ This related patent claims priority to the same parent application as the ’258 Patent.

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

Petitioner hereby identifies lead counsel as David M. Magee (Reg. No. 51,982), who can be reached at Armstrong Teasdale LLP, 800 Boylston St., 30th Floor, Boston, Massachusetts 02199, via e-mail at dmagee@atllp.com, telephone at

¹ The following currently pending matters relate to the challenged ’257 Patent: IPR2021-01496.

617.824.5131, and via fax at 617.830.8490. Backup counsel are: (1) Marc Vander Tuig (Reg. No. 57,964), who can be reached at Armstrong Teasdale LLP, 7700 Forsyth Blvd., Suite 1800, St. Louis, Missouri 63105, via email at mvandertuig@atllp.com, via telephone at 314.621.5070, and via fax at 314.621.5065; and (2) Dhruv Kaushal, Ph. D. (Reg. No. 67,340), who can be reached at Armstrong Teasdale LLP, 800 Boylston St., 30th Floor, Boston, Massachusetts 02199, via email at dkaushal@atllp.com, via telephone at 617.824.5150, and via fax at 617.830.8490. A Power of Attorney is filed concurrently herewith.

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

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

I. INTRODUCTION

Pursuant to 35 U.S.C. §§ 311-319 and 37 C.F.R. § 42.100 *et seq.*, Petitioner hereby requests *inter partes* review (“IPR”) of Claims 1–21 (“the challenged claims”) of U.S. Patent No. 10,197,258 (“the ’258 Patent”) (Ex. 1001).

II. REQUIREMENTS FOR PETITION FOR *INTER PARTES* REVIEW

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

Petitioner certifies that the ’258 Patent is available for *inter partes* review, and that Petitioner is not barred or estopped from requesting *inter partes* review of the challenged claims of the ’258 Patent on ground identified herein.

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

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

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

Proof of service of this Petition on Rotolight Limited (“Patent Owner”) at the correspondence address of record for the ’258 Patent is attached hereto.

III. IDENTIFICATION OF CHALLENGED CLAIMS (37 C.F.R. § 42.104(b))

Petitioner respectfully requests *inter partes* review of Claims 1–22 of the ’258 Patent on the following ground, and requests that each of the challenged claims be found unpatentable as set forth in greater detail in Section VIII, which indicates where each element can be found in the prior art, and the relevance of

that prior art. Additional evidence is set forth in the Declaration of Fred Holmes (Exhibit 1003).

Ground 1: Claims 1–22 are obvious over Morgan in view of Hinrichs and Pohlert 35 U.S.C. § 103.

IV. SUMMARY OF THE '258 PATENT

The '258 Patent was filed on November 22, 2017 and issued on February 5, 2019. It is a continuation of U.S. Application No. 15/481,160 (subsequently granted on as U.S. Patent No. 10,845,044) and claims priority to U.S. Provisional No. 62/319,809, filed on April 8, 2016. Accordingly, the earliest effective filing date of the '258 Patent is April 8, 2016, and the provisions of the AIA apply.

The '258 Patent, titled “Lighting system and Control Thereof” is directed to a “controller” for a lighting system to produce user customizable lighting effects. Exhibit 1001, Abstract. This controller includes an “input interface” and an “effect simulator.” *Id.*, Abstract, 6:4–8. To produce a user customizable lighting effect, the '258 Patent discusses “calculating a time varying lighting value based on at least one simulation parameter which characterizes the user’s desired lighting effect. *Id.*; *see also id.*, 7:17–24, 38–43. For example, to produce a fire effect, [t]he user can select a fire activity . . . to set a frequency parameter” and other simulation parameters which determine additional aspects of the lighting effect (*i.e.*, color, brightness, duration). *Id.*, 8:21–25. The “frequency parameter,”

characterizes a fire effect by “set[ting] an average period between light peaks-e.g. a roaring fire may have a higher frequency than a single candle flame.” *Id.*, 6:59–62; *see also id.*, 8:26–29.

These simulation parameters are then used by the “effect simulator” to calculate an output—the “time varying lighting values”—for controlling the lighting system to produce the desired lighting effect. *Id.*, 7:29–7, 8:41–53; *see also* Fig. 2 and 3a.

V. Level of Ordinary Skill in the Art as of the Earliest Effective Filing Date of the '258 Patent

As of the earliest effective filing date claimed in the '258 Patent, a person of ordinary skill in the art with respect to the technology described in the '258 Patent (“POSA”) would have had at least a Bachelor of Science degree in electrical engineering, or a closely related field, along at least two years of experience in the design of entertaining lighting systems, controls and effects. Exhibit 1003 (Holmes Decl.). More education can supplement practical experience and vice versa. *Id.*

VI. CLAIM CONSTRUCTION

In an IPR, claims are interpreted under the *Phillips* standard. 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). Under this standard, claim terms are given their plain meaning as understood by a person of ordinary skill in the art. *Id.*, 415 F.3d at 1312–13. However, in cases where a given claim term may be amenable to more than one construction, “the

intrinsic evidence, including the claims themselves, the specification, and the prosecution history of the patent, [] is usually dispositive.” *Personalized Media Commc’ns, LLC v. Apple Inc.*, 952 F.3d 1336, 1340 (Fed. Cir. 2020). For example, “[w]here there are several common meanings for a claim term, the patent disclosure serves to point away from the improper meanings and toward the proper meanings.” *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250 (Fed. Cir. 1998). Further, where the patentee describes the invention in a particular way, as Patentee has done here, “[t]he public is entitled to take the patentee at his word.” *Honeywell Int’l, Inc. v. ITT Indus., Inc.*, 452 F.3d 1312, 1318 (Fed. Cir. 2006).

In the challenged claims, the terms “cinematic lighting special effect” and “effect simulator” are used to define the scope the alleged invention. Proposed constructions for these terms are presented below.

A. Cinematic Lighting Special Effect

The specification of the ’258 patent does not include an express definition of a “cinematic lighting special effect,” but it does describe a preferred embodiment for a lighting system that includes “rolling shutter compensation.” Ex. 1001, 4:21–26. Additionally, the specification describes “strobe” and “lightning” special effects produced by the subject lighting systems in which “[a] user may rotate a

knob on the device to adjust the ‘duty cycle’ (flash duration) to eliminate issues with rolling shutter cameras.” *Id.*, 9:16–21.

Viewed in light of this intrinsic evidence, the term “cinematic lighting special effect” is properly construed to refer to a lighting special effect that (a) does not cause a strobing effect when filmed with a rolling shutter camera and/or (b) is compatible with rolling shutter compensation, whereby a “minimum light pulse width [can] be adjusted to suit the shutter speed or frame rate of the user’s camera in order to prevent ‘strobing’ due to the light effect being out of phase/sync with the frame rate of the camera, ensuring that each frame captured by the camera is fully illuminated.” *Id.*, 4:21–26.

B. Effect Simulator

The terms “effect simulator” and “lighting effect simulator” are used interchangeably in the ’258 Patent. The ’258 Patent describes the “effect simulator” as follows: “lighting effect simulator 100 may be provided by way of a suitably adapted computing device such as a PC, tablet, or smart phone, with suitable software for user input of simulation parameters,” and the “computing device may be a suitably adapted light controller device with suitable controls for user input of simulation parameters.” *Id.*, 11:48–53. Therefore, the terms “effect simulator” and “lighting effect simulator” and are properly construed to refer to a

computing device programmed with software for calculating a lighting effect based on simulation parameter inputs.

Petitioner submits that any phrases in the challenged claims that are not addressed above may be properly construed under the *Phillips* standard.

Petitioner's positions herein are without prejudice to any other constructions

Petitioner may advance in this or another administrative proceeding or before a district court. Petitioner reserves the right to respond to any claim construction issues proposed by Patent Owner or raised by the Board.

VII. DISCRETIONARY DENIAL WOULD BE INAPPROPRIATE

A. Discretionary Denial Under 35 U.S.C. § 325(d) is not Appropriate

Denial under § 325(d) is not warranted because the challenges presented in this petition are neither cumulative nor redundant of the grounds set forth during the prosecution of the '258 Patent. The Examiner did not consider any of the references relied upon in this petition. Although a family member of the Morgan reference was cited on the face of the '258 Patent, it was not used in a rejection or substantively discussed by the examiner during prosecution. No other reference presented in this Petition was cited. The Board has found that where presented prior art references include references that were not before the examiner in combination with a reference that was not substantively considered by an examiner, such combinations are not the same or substantially the same art or

arguments previously presented to the Office. *Group III International, Inc. v. Targus Group International, Inc.*, IPR2021–00371, No. 21 at 33 (P.T.A.B. Jul. 9, 2021); *see also Intel Corporation v. Koninklijke Philips N.V.*, IPR2021–00370, No. 10, at 9 (P.T.A.B. Jul. 6, 2021) (finding that the first condition of *Advanced Bionics* was not satisfied where a single reference had been cited on the face of the Challenged Patent while the other references were not before the examiner and declining to consider the material error condition of *Advanced Bionics*).

Moreover, the Ground in this IPR is non-cumulative because it relies on prior art that teach the specific limitations the Examiner found lacking in the prior art of record used during prosecution. For example, during examination, the claims of the '258 Patent were rejected in just a single office action. The Examiner's only basis for rejection was under 35 U.S.C. § 112. The Examiner cited U.S. Patent No. 7,353,021 to Blackwell *et al.* ("Blackwell") as relevant prior art because it "disclose[d] an apparatus and a method for executing a lighting program to control a plurality of lights comprising a controller for controlling a lighting device in which a calculating device in the form of [a] processor calculates time-varying lighting values based on parameters input by a user via [an] interface to generate a lighting effect." Ex. 1002, March 28, 2018 Office Action, at 9–10.

Once Applicant amended the claims to overcome the 35 U.S.C. § 112 rejection, the claims of '258 Patent were subsequently allowed. More specifically,

in the Notice of Allowance, the Examiner indicated the claims were allowable because “[t]he prior [art] fails to teach or fairly suggest combination of elements recited in independent claims 1.” *Id.*, October 24, 2018 Notice of Allowance, at 3. Critically, however, the Examiner did not mention or rely on Morgan’s teachings of “methods and apparatus for facilitating the process of designing, selecting, and/or customizing lighting effects or lighting shows” (Ex. 1005, 2:48–51) that may be used for “theatrical or other entertainment-based/special effects lighting[.]” *Id.*, 10:51–52.

VIII. THE CHALLENGED CLAIMS ARE UNPATENTABLE OVER MORGAN IN VIEW OF HINRICHS AND POHLERT

As explained in greater detail below, Petitioner requests that Claims 1–22 be found unpatentable as being obvious over Hinrichs in view of Morgan.

A. Overview of Morgan

U.S. Patent No. 8,938,468 to Morgan *et al.* was filed on September 24, 2010, published on February 10, 2011, and issued as a patent on January 20, 2015. Accordingly, Morgan is available as prior art under 35 U.S.C. §§ 102(a)(1) and/or 102(a)(2).

Morgan is generally directed to “methods and apparatus for facilitating the process of designing, selecting, and/or customizing lighting effects or lighting shows.” Ex. 1005, 2:48–51. Morgan teaches a controller which includes a user interface. *Id.*, 24:24–40. This “controller” includes software that enables a user to

select a lighting effect from one or more predefined lighting effects and modify a selected lighting effect. *Id.*, 10:17–20, 26:8–17; *see also id.* 2:55–3:3, 9:36–57.

The predefined lighting effects of Morgan relate to, but are not limited by, attributes such as “color content,” “color distribution or color spatial frequency,” and/or “*at least one dynamic temporal characteristic.*” *Id.*, 3:57–67 (emphasis added); *see also id.*, 4:11–15.

Morgan further teaches that the light sources are controlled to generate the desired lighting effect based on control signals “(e.g. signals generated by executing a lighting program, one or more *outputs from a user interface*, etc.)[.]” *Id.*, 14:29–39 (emphasis added). Generation of the control signals may be accomplished through “simulating the lighting effect” and/or “determin[ing] one or more characteristics of the lighting effect” by “any other suitable analysis algorithm,” *Id.*, 32:15–30. These control signals can also be sent to “one or more lighting unit[s].” *Id.*, 2:19–22. This functionality is taught to facilitate “the process of designing, selecting, and/or customizing lighting effects or lighting shows.” *Id.*, 2:48–54.

B. Overview of Hinrichs

U.S. Patent No. 9,532,422 to Hinrichs (“Hinrichs”) was filed on March 25, 2014, published on September 11, 2014, and issued as a patent on December 27,

2016. Accordingly, Hinrichs is available as prior art under 35 U.S.C. §§ 102(a)(1) and/or 102(a)(2).

Hinrichs is directed to an illumination device for creating various lighting effects “in connection with live shows, TV shows, sports events,” and the like. Ex. 1006, 1:16–20. These lighting effects are characterized by various parameters such as “strobe frequenc[ies] [that] may define how fast the different [light] groups should strobe.” *Id.*, 9:28–29. The ability to define strobe frequencies in Hinrichs bears special relevance for cinematic lighting special effects characterized by or compatible with the tuning of lighting strobe frequencies for rolling shutter compensation. Ex. 1003, ¶49.

Hinrichs also teaches light fixture housing comprising “a main PCB,” having “switches and [a] display [that] act as a user interface to allow a user to communicate” with the lighting fixture. Ex. 1006, 3:63–67. The lighting fixture further includes “LED PCB[s],” which comprise a number of first and second LED types. *Id.*, 7:60–67; 8:12–21. Moreover, the lighting fixture includes a “controller unit 501 comprising a processor and a memory” wherein “[t]he processor acts as a controlling means and is adapted to control the” first and second light sources individually. *Id.*, 8:62–9:5. Hinrichs discloses that the illumination device comprises “a number of predetermined effect functions defining a number of visual effects which can be activated by a user through an input signal e.g. from a central

controller.” *Id.*, 5:51–55. For instance, the controller means may be “further adapted to control the groups of light sources based on an input signal 511 indicative of a number of control parameters” that are, for example, “indicative of color, intensity, strobe frequency related to the groups of light sources.” *Id.*, 9:16–21.

C. Overview of Pohlert

U.S. Patent No. 7,874,701 to Pohlert *et al.* (“Pohlert”) was filed on February 18, 2008, and issued as a patent on January 25, 2011. Accordingly, Pohlert is available as prior art under 35 U.S.C. §§ 102(a)(1) and/or 102(a)(2).

Pohlert discloses “lighting apparatus or lighting effects system[s] that [are] well suited for use in the film, commercial, and/or photographic industries, and/or with live stage performances[.]” Ex. 1007, 4:8–13. These devices and systems may include LEDs. *Id.*, 25:49–59. Pohlert teaches that these devices and systems may include “power controllers” that “provid[e] various lighting effect functions . . . such as, for example, dimming, strobing, selective activation, pulsation, and so on, or combinations thereof.” *Id.*, 9:28–31.

The power controller includes (1) a user interface to select and customize lighting effects, (2) an “effects generator” that generates the selected effects, and (3) switches that convert the generated effects into power control signals output to the LEDs. *See id.*, Fig. 10A; *see also id.*, 20:23–51; *see also*, Ex. 1003, ¶54.

D. A Skilled Artisan Would Have Been Motivated to Combine Morgan with Hinrichs, and Pohlert, and Would Have Had a Reasonable Expectation of Success

The Supreme Court held that a person of ordinary skill is “a person of creativity, not an automaton” and “in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” See *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415–18 (2007) (rejecting the Federal Circuit’s “rigid” application of the teaching, suggestion, or motivation to combine test, instead espousing an “expansive and flexible” approach). “A motivation to combine may be found explicitly or implicitly in market forces; design incentives; the interrelated teachings of multiple patents; any need or problem known in the field of endeavor at the time of invention and addressed by the patent; and the background knowledge, creativity, and common sense of the person of ordinary skill.” *Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1374 (Fed. Cir. 2019).

In the instant case, a POSA would have considered the teachings of Morgan, Hinrichs, and Pohlert since they are analogous art in the same field of endeavor as the ’258 Patent—namely, the field of lighting systems and methods for producing lighting special effects which utilize a plurality of LEDs to generate different types of effects and colors. Ex. 1003, ¶¶61–62. The POSA would have been motivated to combine the teachings of Morgan and Hinrichs insofar as they disclose related approaches for solving the problems that one of skill in the art would expect to

encounter in the design and implementation of lighting systems and methods for producing such special effects. *Id.*, ¶63. The POSA would also have had a reasonable expectation of successfully combining the elements of Morgan, Hinrichs, and Pohlert with one another because those elements comprised “controllers,” “LEDs” and like components that were familiar to a POSA at the time of the invention. *Id.*, ¶64. That is, the combinations of Morgan, Hinrichs and/or Pohlert proposed herein are combinations of known techniques and/or substitutions of art-known elements to yield predictable results. *Id.*

E. Ground 1: Claims 1–22 are obvious over Morgan in view of Hinrichs and Pohlert.

1. Independent Claim 1

The combination of Morgan, Hinrichs, and Pohlert satisfies each and every element of Claim 1. Ex. 1003, ¶58. A POSA would have been motivated to combine Morgan, Hinrichs, and Pohlert for at least the reasons discussed above and as set forth below. *See id.*, ¶¶58–103.

Claim 1[p]: A lighting system comprising:

Morgan and Hinrichs satisfy the preamble of Claim 1. Ex. 1003, ¶¶63–65.

Morgan teaches a “lighting system [that] may include a plurality of lighting units, and so the input information relates to a number of the lighting units, respective types of the lighting units, and/or a physical arrangement of the lighting

units in an environment in which the at least one lighting effect is to be generated.”

Ex. 1005, 3:37–44.

Hinrichs teaches an “illumination device” that includes “a number of light sources.” Ex. 1006, 1:7–9, 3:34–36, 4:59–62, 28:15–18.

Claim 1[a]: a lighting device; and

Morgan, Hinrichs, and Pohlert teach lighting systems comprising a lighting device. Ex. 1003, ¶68–70.

Morgan discloses that its subject lighting system “may include a plurality of lighting units.” Ex. 1005, 3:37–38. The term “lighting unit” as used in Morgan refers “to an apparatus including one or more light sources of same or different types.” *Id.*, 6:57–59.

Hinrichs focuses on “a moving head lighting fixture including a number of LEDs that generate a light beam,” but its teachings encompass “illumination devices using any kind of light source such as discharge lamps, OLEDs, plasma sources, halogen sources, fluorescent light sources.” Ex. 1006, 3:13–9.

Further, Pohlert teaches “a lighting effects system” having an “arrangement of lamp elements on a panel or frame” where the “lamp elements may be embodied as low power lights such as light emitting diodes (LEDs)[.]” Ex. 1007, 8:39–42.

Claim 1[b]: *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:*

Morgan, in view of Hinrichs and Pohlert, satisfies each of the structural and functional elements required by this clause of Claim 1. Ex. 1003, ¶¶70–79.

First, Morgan teaches a “controller” that produces user customisable lighting effects. For example, Morgan teaches that “one or more candidate lighting effects may . . . [be] processed by the central controller” to “control the lighting system accordingly.” Ex. 1005, 25:39–51. Wherein the “user may select one or more of the candidate lighting effects.” *Id.*, 25:31–39. The “lighting effects” of Morgan include, without limitation “theatrical or other entertainment-based/special effects lighting.” *Id.*, 10:46–58.

Morgan further discloses that the lighting effects are “user customisable.” For example, Morgan states that user functionality includes “changing and/or selecting various pre-programed lighting effects to be generated by the lighting unit [or] changing and/or selecting various parameters of selected lighting effects” *Id.*, 14:4–12.

Morgan also discloses that the lighting unit may include a controller “configured to output one or more control signals to drive the light sources.” *Id.*, 11:22–25, 13:15–21.

A POSA would understand the term “theatrical or entertainment-based/special effects lighting” includes, without limitation, lighting effects used for videography, broadcasting, cinematography, studio filming, or location filming. Ex. 1003, ¶78. More specifically, this term, with respect to cinematography, includes “cinematic lighting special effects.” *Id.*, ¶79.

Morgan expressly teaches that the frequency of control signals can be adjusted to avoid the perception of “discrete on-off cycles (commonly referred to as a ‘flicker effect’).” Ex. 1005, 12:14–28. A POSA would recognize an adjustment tool for reducing “flicker effect” satisfies the functionality of “rolling shutter compensation” in the field of cinematography, and, consequently, would understand that the “special effects” of Morgan satisfies the “cinematic lighting special effects” requirement of Claim 1 of the ’258 Patent. Ex. 1003, ¶81.

Importantly, Hinrichs also includes a parallel teaching of the structural and functional elements required by Claim 1[b], including a controller adapted to control the lighting device in the form of two groups of “light sources [that] are mounted on a PCB 207 (printed circuit board) [such that] the two groups of light sources can be controlled individually for instance by a controller (not shown) as known in the art of lighting.” Ex. 1006, 4:62–66.

Hinrichs “can further comprise a number of predetermined effect functions which can be activated by a user through an input signal e.g., from a central

controller as known in the art of entertainment lighting.” *Id.*, 5:51–55. The lighting special effect of Hinrichs is “user customizable,” as that term is properly construed insofar as it is adjustable:

“the input signal can also be indicative of an effect function adjustment parameter which relates the execution of respectively the effect function” by modifying “an execution speed of an effect function... [or] a number of other parameters related to the effect function. The effect functions make it easier for a light programmer and/or light designer to create different visual effects.”

Id., 9:42–57; Ex. 1003, ¶74. The lighting special effects of Hinrichs are also “user customizable” to the extent that multiple predetermined effects can be combined into other effects:

“[i]n order to provide the illumination device with further effects functions the controlling means is capable of activating at least two of the effect functions at the same time whereby the number of possible effects functions is increased as combination of at least two of the predetermined effect functions is possible. ... The priority schema and synchronizations schema makes it possible to provide an illumination device where conflicts between two effect functions automatically can be solved and where two functions easily can be combined into nice visual effects.”

Ex. 1005, 6:1–14; *see also id.*, 29:28–36.

In Pohlert, the power controller may include “[a]n effects generator 1043 . . . along with an effects selector 1033 which forms part of the manual interface 1030” where “[t]he effects generator 1043 may provide the ability to create various lighting effects.” Ex. 1007, 20:22–28. Pohlert further teaches that such effects can be used for “film.” *Id.*, 4:8–13.

Claim 1[c]: *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*

Morgan, Hinrichs, and Pohlert teach Claim 1[c]. Ex. 1003, ¶74–84. Morgan teaches a “user interface” (input interface) where “a user may select one or more of the [] lighting effects” that will be transmitted to the “controller to generate the lighting effect(s).” Ex. 1005, 25:39–51; *see also id.*, 11:22–25, 13:15–21. Along the same lines, the controller “may be configured to respond to [the] operation of the user interface.” *Id.*, 14:16–23.

It is through this user interface (“input interface”) that a “user may select one or of the candidate lighting effects” (*id.*, 25:28–39) and then “change one of the colors produced by the lighting effect/show, change a reproduction speed for the lighting effect, or change any other characteristic of the lighting effect.” *Id.*, 26:14–17; 14:4–12.

Morgan then teaches that the controller “may be configured to respond to [the] operation of the user interface.” *Id.*, 14:16–23. For example, the user-selected

lighting effects will be transmitted to the “controller to generate the lighting effect(s)[.]” *Id.*, 25:39–51; *see also id.*, 11:22–25, 13:15–21.

Hinrichs also teaches that its subject lighting systems may include “a main PCB [comprising] a number of switches (not shown) which extend through a number of holes in the head housing 111. Ex. 1006, 3:63–67. The switches and display act as a user interface allowing a user to communicate with the moving head lighting fixture.” *Id.*

Additionally, Pohlert teaches a “manual interface 1030” that “may include a master power switch 1031, switch controls 1032, and, optionally, an effect selector.” Ex. 1007, 19:64–20:1. Pohlert’s manual interface facilitates effect “generation . . . by, e.g., manual selection from a number of predefined patterns[.]” *Id.*, 20:57–61.

Claim 1[d]: *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;*

Morgan, Hinrichs, and Pohlert disclose Claim 1[d]. *See* Ex. 1003, ¶91–102. Morgan teaches that “one or more of the library of lighting effects/shows” and “one or more (or all) functional aspects of a user interface . . . and library searching may be performed by a controller that also controls the lighting system that generates the lighting effect(s)/show(s).” Ex. 1005, 10:16–21; *see also supra*

Claims 1[a]–[c]. The lighting effects controlled and generated by the controller of Morgan “may have one or more static and/or dynamic characteristics, and exemplary dynamic characteristics may relate to one or more of color, brightness, perceived transition speed, perceived motion, periodicity, and the like.” *Id.*, 1:50–55.

Morgan also teaches that a “component of the lighting system 200” may “generate the lighting effect using the executable lighting program,” or it may “simulate the lighting effect.” *Id.*, 32:15–22. The one or more characteristics of the lighting effect include, but are not limited to, “color content,” “color resolution,” “color distribution or color spatial frequency,” and/or “at least one dynamic temporal characteristic” of the selected lighting effect. *Id.*, 3:45–67. Moreover, Morgan discloses that a user can “chang[e] and/or select[] various *parameters* of selected lighting effects.” *Id.*, 14:4–12 (emphasis added).

Additionally, Morgan discloses that the controller is “particularly configured to provide control signals to one or more of the light sources so as to generate a variety of” lighting effects.” *Id.*, 13:10–15.

To the extent Morgan does not explicitly discuss “calculat[ing] a time varying lighting value,” Hinrichs teaches that its subject lighting system controller provides outputs based on “effect functions,” and thereby satisfies the “effect simulator” requirement of Claim 1. *Id.*, ¶94.

Hinrichs provides “effect functions” that are (i) defined by “input parameters” satisfying the “simulation parameters” requirement of Claim 1, and (ii) used by the system controller to generate an “output”:

“input parameters [are what] that effect function uses when generating the effect. The input parameters are indicated by the input signal and the controlling means uses the input parameters when generating the effect function; Output indicates the output [of] the effect function. The output is generated by the effect function based on the input parameters. Effect rules indicate[] what the controlling means does with other input parameters which normally are affected by the output of the effect function.”

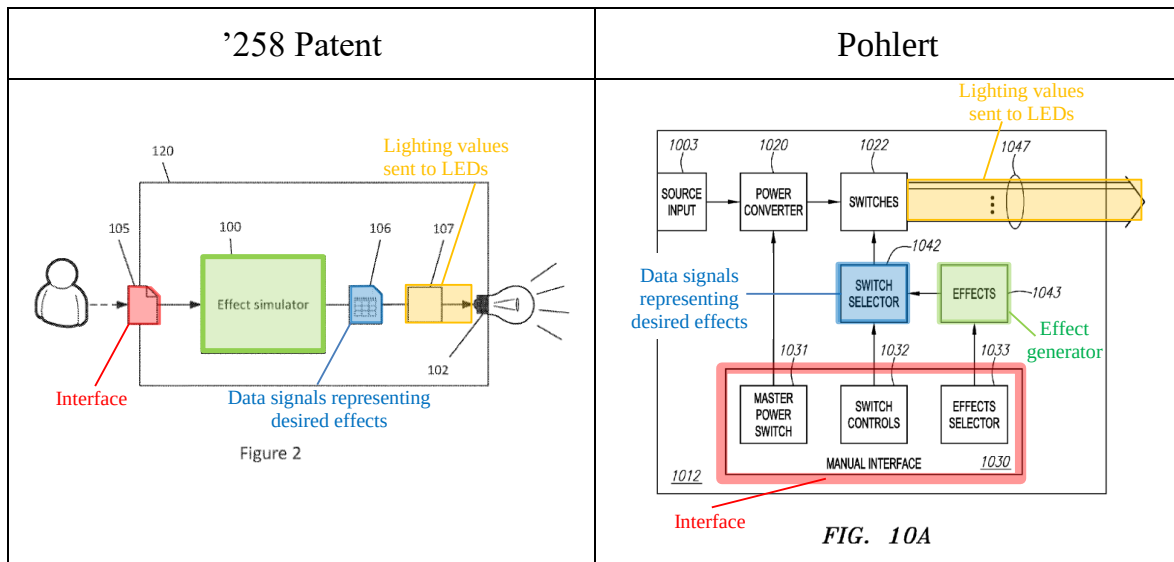
Ex. 1006, 9:60–64.

The “output” of the effect function is, in turn, “related to the controlling of the light sources ... based on a number of instructions stored in an effect function library EF and based on the other parameters indicated by the input signal and stored in the MEM. *Id.*, 28:49–55.

Finally, the output of the effect function of Hinrichs represents a “time varying lighting value.” Hinrichs teaches that “the controlling means must execute [effect functions] in relation to time and in relation to each other.” *Id.*, Abstract. In addition, Hinrichs teaches “control parameters” which are indicated by the input signal and which determine how lighting varies over time. For instance, “strobe frequency may define how fast the different groups of light should strobe.” *Id.*, 9:25–33.

It is important to note that Morgan teaches substantially the same structural elements but does not expressly teach an “effect simulator” that “calculates” the lighting effect onboard the lighting system. Ex. 1003, ¶98. This underscores the highly analogous nature of Morgan and Hinrichs and further supports the proposition that one of ordinary skill in the art would have a reasonable expectation of successfully combining the teachings of the two references. *Id.*

Specifically, Moreover, Pohlert’s disclosure of a controller and effect simulator outputting an effect is strikingly similar to the disclosure of the ’258 Patent:



Compare, e.g., ’258, Figure 2 (annotated) with Ex. 1007, Figure 10B (annotated); see also Ex. 1007, Figure 10A.

Pohlert, like the ’258 Patent, teaches that the power controller 112 may include a “manual interface 1030.” Ex. 1007, 19:64–67. Further, Pohlert teaches

that the “power controller 1012, along with an effects selector 1033, which forms part of the manual interface,” may communicate with an “effects generator 1043.” *Id.*, 20:23–25; *see also id.*, Figs. 10A, 10B. Where the “effects generator 1043 may provide the ability to create various lighting effects,” (*id.*, 20:25–28) that are “manual[ly] select[ed] from a number of predefined patterns[.]” *Id.*, 20:57–61. Pohlert then teaches that the “switch selector 1042 would then convert each [effect selector control mechanism setting] to a set of control signals to the appropriate switches 1022, which in turn would control power to the wires 1047 supplying power to the light segments 306.” *Id.*, 20:14–17.

More specifically, for example, Pohlert further teaches that a strobing effect from the effects generator “may be accomplished by generating an oscillating signal and applying it as a control signal either upstream or downstream from the switch selector 1042” where the “frequency of oscillation may be selectable via a manual knob, switch or other selection means as part of the effects selector 1033.” *Id.*, 20:52–56.

Moreover, Pohlert further teaches these processes may be carried out by a power controller that “includes a processor 1074 which may be programmed to provide various lighting effects” (*id.*, 21:20–25)—the effects generator—by “control[ling] the switch selector [through] setting various digital values.” *Id.*, 21:45–49. Further, “[t]he programming instructions may provide that the switches

1062 are turned on and off according to designated sequences, thus allowing the capability of pattern generation via the processor 1074.” *Id.*, 21:61–65.

Claim 1[e]: *wherein said lighting device and said controller are integrated in a combined unit.*

1. Morgan expressly indicates that the “lighting unit 100 also includes a controller.” Ex. 1005, 11:22–23 (citing Fig. 1). Morgan also teaches that a lighting unit “may be associated with (e.g., include, be coupled to and/or packaged together with) various other components (e.g., control circuitry) relating to the operation of the light source(s).” *Id.*, 19:63–67. Therefore, in view of Morgan’s teachings, combining similar combinations of known elements or components into an integrated whole have been an obvious design choice for a POSA, and doing so would not have posed any difficulties. Ex. 1003, ¶¶103–104.

Additionally, Hinrichs teaches that its subject lighting systems may include a head housing into which a “display 115 (visible from the rear side of the stack), main PCB 117 (Printed Circuit Board), a fan 119, a heat sink 121, an LED PCB 123, and lens assembly are stacked.” Ex. 1006, 3:41–45. Hinrichs also teaches that the “main PCB comprises controlling circuits and driving circuits.” *Id.*, 3:60–62. The POSA at the time of the invention might reasonably infer that these elements were “integrated” in a combined unit as required by Claim 1. Ex. 1003, ¶107.

Indeed, similar combinations of known elements or components into an integrated whole have been held to be obvious. *Commscope Tech.’s LLC v. Dali*

Wireless Inc., No. IPR2020–014731, 2021 WL 952424, at *14 (P.T.A.B. Mar. 12, 2021) (“[U]se of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice.” (quoting *In re Larson*, 340 F.2d 965, 968 (C.C.P.A. 1965))).

2. Dependent Claim 2

Claim 2 depends from Claim 1 and further recites that “the input interface is adapted to receive user input to enable a user to customise said user customisable cinematic lighting special effect.”

Morgan teaches Claim 2. Ex. 1003, ¶¶108–109. As noted above, Morgan discloses that the “user interface” functions in a manner to allow “information input . . . and effect/show selection and/or modification.” Ex. 1005, 10:16–21. Morgan similarly discloses that a user interface is used to facilitate “any of a number of user-selectable settings or functions (e.g., 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, changing and/or selecting various parameters of selected lighting effects, setting particular identifiers such as addresses or serial numbers for the lighting unit, etc.).” *Id.*, 14:4–12.

3. Dependent Claims 3, 6, 7, 8 and 9

Claim 3: *The lighting system according to claim 1, wherein the lighting device comprises at least one LED.*

Both Hinrichs and Morgan disclose a lighting device comprising at least one LED. Ex. 1003, ¶¶110–112. Morgan discloses a “lighting unit” which is “an apparatus *including one or more light sources* of same or different types.” Ex. 1005, 6:57–59 (emphasis added). Morgan also defines a “light source” to include, without limitation, “LED-based sources” that “include one or more LEDs.” *Id.*, 5:43–46.

In addition, Hinrichs teaches “a moving head lighting fixture including a number of LEDs that generate a light beam.” Ex. 1006, 3:13–16.

Claim 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.*

As noted above with respect to Claims 1 and 3, Morgan includes a controller that is controlled by user input received via the input interface. *See* Ex. 1005, 26:9–15 (stating the central controller can generate the lighting effect on the lighting system and/or “the lighting effect may be modified by the user [to] . . . change one of the colors produced by the lighting effect[.]”).

Morgan further discloses that “one or more LEDs [] are adapted to generate radiation having any of a variety of spectra (i.e., wavelengths or wavelength bands), including, but not limited to, *various visible colors* (including essentially

white light), *various color temperatures* of white light, ultraviolet, or infrared.”

Id., 12:57–63 (emphasis added), 21:35–39. Accordingly, Morgan discloses that a user—via a user interface—can instruct the controller “configured to provide control signals to one or more of the light sources,” to generate a variety of “multi-color (or multi-color temperature) lighting effects.” *Id.*, 13:10–15.

Accordingly, for at least the foregoing reasons, Morgan discloses the additional limitations identified in Claim 6. Ex. 1003, ¶¶113–116.

Claim 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.*

As noted above with respect to Claim 6, Morgan teaches that the color or color temperature of LEDs may be controlled. *See* discussion *supra* Claim 6. Morgan further discloses that “one or more LEDs [] are adapted to generate radiation having any of a variety of spectra (i.e., wavelengths or wavelength bands), including, but not limited to, . . . *various color temperatures* of white light, ultraviolet, or infrared.” *Id.*, 12:57–63 (emphasis added), 21:35–39.

With respect to “colour temperature,” Morgan teaches that color temperature is “characterized according to the temperature in degrees Kelvin (K),” where temperatures span 700 to 10,000 degrees K. *Id.*, 6:37–54.

Additionally, Morgan teaches that “[l]ower color temperatures generally indicate . . . a ‘warmer feel,’ while higher color temperatures generally indicate

white light having a . . . ‘cooler feel.’” *Id.*, 6:50–54. A POSA would understand that “warmer feel” color temperatures are generally associated with the range of 1500–3500 degrees K and “cooler feel” color temperatures span 4000–9000 degrees K. Ex. 1003, ¶121.

Claim 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.*

As noted above with respect to Claim 3, Morgan includes a lighting unit (a lighting device) that has one or more LEDs. *See* discussion *supra* Claim 3. Morgan also discloses a lighting unit having “multiple white LEDs having different color temperatures (e.g., one or more first white LEDs that generate a first spectrum corresponding to a first color temperature, and one or more second white LEDs that generate a second spectrum corresponding to a second color temperature different than the first color temperature). Ex. 1005, 13:28–37. Morgan further teaches that “[l]ower color temperatures generally indicate . . . a ‘warmer feel,’ while higher color temperatures generally indicate white light having a . . . ‘cooler feel.’” *Id.*, 6:50–54.

Claim 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.*

As noted above with respect to Claim 3, Morgan discusses a lighting unit (“lighting device”) having controller controlling at least one LED. *See* discussions *supra* Claims 1 and 3.

Morgan also discloses “a controller 105 configured to output one or more control signals to drive the light sources so as to generate various intensities of light from the light sources.” Ex. 1005, 11:22–25. Morgan further discloses that the controller “receive[s] instructions (e.g., “lighting commands”) from a variety of origins, such as a user interface 118, . . . that specify prescribed operating powers for one or more channels and, hence, corresponding radiant output powers for the light generated by the respective channels.” *Id.*, 12:40–46. In turn, Morgan discusses that “[b]y varying the prescribed operating powers for one or more channels (e.g., pursuant to different instructions or lighting commands), different perceived colors and *brightness levels of light may be generated by the lighting unit.*” *Id.*, 46–50.

4. Dependent Claim 4

Claim 4 depends from Claim 1 and further recites that “the lighting device comprises multiple different coloured LEDs.” As noted above with respect to claim element 1[a], Morgan discusses a lighting unit (“lighting device”) having one or more light sources that are LEDs of same or different type. Ex. 1005, 6:57–59; *see also* discussion *supra* Claim 3. Morgan further discloses that “[a]ny two or more of the light sources may be adapted to generate different colors (e.g. red, green, blue)[.]” *Id.*, 11:9–10; *see also id.*, 13:22–25 (“[T]he lighting unit 100 may include a variety of colors of LEDs in various combinations”).

5. Dependent Claim 5

Claim 5 depends from Claim 4 and further recites that “the multiple different coloured LEDs comprise at least one of a RGB LED, and a RGB+W LED.”

As noted above with respect to Claim 4, Morgan includes multiple different colored LEDs. *See* Ex. 1005, 13:22–25 (“[T]he lighting unit **100** may include a variety of colors of LEDs in various combinations[.]”). In discussing the lighting system, Morgan discloses “a lighting unit that includes at least two light sources configured to respectively generate different [colors].” Ex. 1005. 7:4–10.

Further with respect to LEDs, Morgan teaches red, green, and blue LEDs, as well as white LEDs. *Id.*, 5:9–11. Morgan also teaches that an “LED may refer to a single light emitting device having multiple dies that are configured to respectively emit different [colors].” *Id.*, 5:32–35.

In addition, Hinrichs teaches that the LEDs used in a lighting system can be “RGBW LEDs which comprises a red die, green, die, blue die and a white die.” Ex. 1006, 8:1–3. A POSA armed with these teachings would recognize that an LED lighting unit could be configured to include RGB and RGB+W LEDs, and such a combination of art-known RGB light sources would be expected to have predictable results. Ex. 1003, ¶134.

6. Dependent Claim 10

Claim 10 depends from Claim 1 and further recites that “the simulation parameter comprises at least one of a colour and a colour temperature.”

As noted in Claim 1[d], the “effect simulator” disclosed in Morgan is adapted to “simulate the lighting effect” and/or “determine one or more characteristics of the lighting effect,” to generate the selected lighting effect. *See* discussion *supra* Claim 1; *see also* Ex. 1005, 32:15–22. Where the one or more characteristics of the lighting effect include, but are not limited to, “color content,” and “color distribution or color spatial frequency.” *Id.*, 3:45–67. As set forth in Morgan, “color temperature,” or otherwise described as “color content,” “refers to a particular . . . shade (e.g., reddish, blueish) of white light.” *Id.*, 6:39–41. Morgan further sets forth that “color distribution or color spatial frequency” refers to “the range of colors generated.” *Id.*, 31:44–46.

Hinrichs similarly teaches that its disclosed “controller means” are adapted “to control the groups of light sources based on an input signal 511 indicative of a number of control parameters” that, in turn, are “indicative of *color*, intensity, strobe frequency related to the groups of light sources.” Ex. 1006, 9:15–22 (emphasis added). Where “[t]he color parameter can for instance define the color of the light that the different groups of light sources shall generate[.]” *Id.* 9:22–24. Further, as noted with respect to Claim 5, Hinrichs includes RGB+W LEDs. *See*

id., 8:1–3. A POSA, in light of Morgan’s teachings on color temperature, would have appreciated that a lighting system that makes use of RGB+W LEDs could be programmed to output specific color temperatures, and that lighting effects could be defined in terms of parameters defining a desired color temperature or color temperature range. Ex. 1003, ¶14.

7. Dependent Claim 11

Claim 11 depends from Claim 1 and further recites that “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.”

Morgan teaches that the user customizable lighting effects may mimic at least moving light sources (Ex. 1005, 4:11–15), fireworks effects (*Id.*, 31:1), and a strobe effect (*Id.*, 26:59–60). With Morgan’s teachings of fireworks, adjusted for brightness, a user could create an effect mimicking an explosion. Additionally, Morgan’s teachings of generating sequences and patterns that mimic a moving light source may also be used to generate scanning effects. Ex. 1003, ¶144.

Hinrichs discusses the illumination device having “a number of predetermined effects functions defining a number of visual effects which can be

activated by a user through an input signal [] from a central controller.” Ex. 1006, 5:51–55; Ex. 1003, ¶145. Hinrichs further teaches that these visual effects may include “strobe” effects (Ex. 1006, 10:25–26) and “fire and water effects.” *Id.*, 24:8–10.

Changing effects simply requires a change in color, intensity, and or frequency, which is well within the skillset of a POSA. Ex. 1003, ¶146. Therefore, the ability to generate one effect renders the ability to generate multiple effects trivial. *Id.*, ¶147. It would have been obvious to a POSA to combine the teachings of Morgan and Hinrichs to provide additional special effects for user selection to facilitate the production and customization of different lighting special effects. *Id.*, ¶148.

As such, Morgan, in view of Hinrichs, renders obvious Claim 11. *Id.*, ¶147.

8. Dependent Claims 12 and 21

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

As noted above with respect to claim element 1[d], Morgan teaches a controller that has an effect simulator adapted to calculate a time varying lighting value based on at least one simulation parameter. *See discussion supra* Claim 1. For example, Morgan discloses that “lighting effects . . . may be based on parameters that are . . . based at least in part on predefined (“pre-packaged”) lighting effects available for selection.” *Id.*, 1:61–67.

Morgan also discloses that the controller “may locally store lighting effects” and that those stored “lighting effects may be modified versions of existing effects retrieved from the library.” Ex. 1005, 24:4–9.

As a further example, Morgan discusses that user may “chang[e] . . . various parameters of the selected lighting effect[.]” *Id.*, 14:9–10. And “once an executable lighting program for a lighting effect has been received and/or modified by a user, then the central controller 202 may transmit the executable lighting program to a data store associated with the central controller 202 . . . [which] may be a part of the central controller[.]” *Id.*, 26:26–33.

With Morgan’s teachings of storing lighting effects, in view of a user’s ability to modify parameters of a lighting effect, Morgan teaches the controller storing at least one simulation parameter. Ex. 1003, ¶153.

In addition, Hinrichs teaches that “parameters relating to the controlling of the illumination device . . . are stored in memory MEM for later use.” Ex. 1006, 28:25–29. It would have been obvious to a POSA to combine the teachings of Morgan and Hinrichs to facilitate the production and customization of different lighting special effects by storing effects, and their respective parameters, in memory for later use. Ex. 1003, ¶155.

Claim 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.*

Morgan further discusses “processor 102 may be configured to respond by selecting one or more pre-programmed control signals stored in memory, modifying control signals generated by executing a lighting program.” Ex. 1005, 14:23–56.

In view of Morgan’s teachings of storing parameters in memory, Hinrichs, in discussing Fig. 6, teaches that “an output related to the controlling of the lighting sources is generated based on the identification of the first and second effect functions . . . [and] based on a number of instructions stored in an effect function library EF and based on the other *parameters indicated by the input signal and stored in MEM.*” Ex. 1006, 28:49–55 (emphasis added); *see also id.*, Fig. 6 (reproduced below).

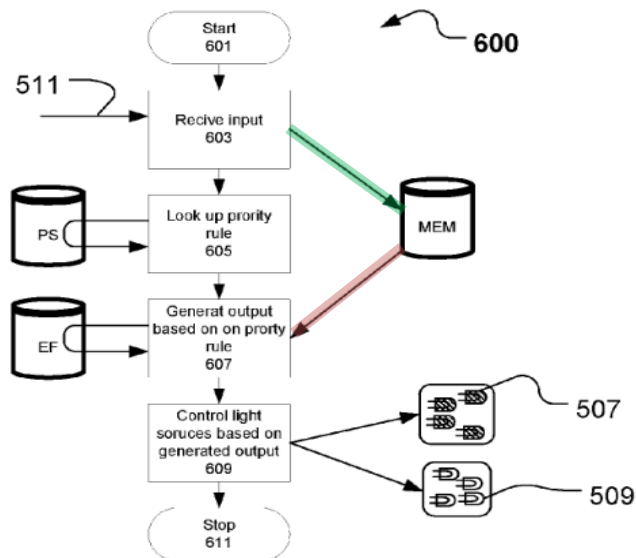


Fig. 6

9. Dependent Claims 13 and 16

Claim 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.*

As noted above with respect to claim element 1[b], Morgan includes a controller that is adapted to control a lighting unit (“lighting device”) in dependence on the selected user customizable cinematic lighting special effect. See discussion *supra* Claim 1.

Morgan further discloses that the controller “receive[s] instructions (e.g., “lighting commands”) from a variety of origins, such as a user interface 118.” Ex. 1005, 12:40–43. Morgan additionally discloses that the controller can also be

“configured to generate lighting commands for execution by one or more *lighting unit*.” *Id.*, 2:19–22 (emphasis added).

Moreover, Morgan discloses that “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, including one or more other lighting units.” *Id.*, 15:35–38; *see also id.*, 7:46–60 (explaining a controller associated with a lighting unit (“lighting device”) may “serve as a controller for one or more other [lighting] devices.”).

Claim 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.*

As noted above with respect to Claim 13, Morgan includes a controller for controlling a plurality of lights based on a user selected customizable cinematic lighting special effect. *See* discussion *supra* Section VIII.E.9. Further, the “lighting effects” as taught by Morgan may include “one or more states of light that are perceived . . . over some period of time” in some sequence that demonstrate “dynamic characteristics” such as “perceived motion.” *Ex.*, 1005, 1:47–55.

Moreover, Morgan additionally teaches that depending on the user-selected lighting effect, “the lighting controller in turn may be configured to generate lighting commands for execution by one or more lighting units[.]” *Id.*, 1:63–2:22. A POSA would have understood that “perceived motion” as taught by Morgan includes a

controller offsetting and/or overlapping the lighting commands to the one or more lighting units. Ex. 1003, ¶¶164–168.

10. Dependent Claims 14, 15, and 22

Claim 14: *The lighting system according to claim 1, further comprising a further lighting device, said further lighting device being separate from said controller.*

As noted above with respect to Claim 1, Morgan includes a lighting system having a lighting device and a controller. See discussion *supra* Section VIII.E.1.

Additionally, Morgan discloses that “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, including one or more other lighting units.” Ex. 1005, 15:35–38. In discussing multiple lighting units, Morgan states that “each lighting unit has an input communication port and an output communication port[,]” so that “[l]ighting instructions/data [can be] transmitted to the lighting units.” *Id.*, 17:36–42. Moreover, Morgan teaches that the communication ports “may also be adapted to receive and/or transmit data through wired or *wireless transmission.*” *Id.*, 15:44–46 (emphasis added).

Claim 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.*

As noted above with respect to Claim 14, Morgan includes a further lighting device being separate from the controller and where the controller controls the

further lighting device through a **communications port**. See discussion *supra* Claim 14; *see also* Ex. 1005, 2:19–22 (stating the controller can also be “configured to generate lighting commands for execution by one or more lighting unit.”). In addition, Morgan teaches that the **communication ports** “may also be adapted to receive and/or transmit data through wired or *wireless transmission*.” *Id.*, 15:44–46 (emphasis added).

Claim 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.*

As noted above with respect to Claim 14, Morgan includes a controller that is adapted to control a lighting unit (“lighting device”) in dependence on the selected user customizable cinematic lighting special effect. See discussions *supra* Claims 1 and 14. Further, Morgan additionally discloses that the controller can also be “configured to generate lighting commands for execution by one or more *lighting unit*.” Ex. 1005, 2:19–22. (emphasis added).

Moreover, Morgan discloses that “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, including one or more other lighting units.” *Id.*, 15:35–38; *see also id.*, 7:46–60 (explaining a controller associated with a lighting unit (“lighting device”) may “serve as a controller for one or more other [lighting] devices.”).

11. Dependent Claim 17

Claim 17 depends from Claim 1 and further recites that “the controller is separable from the lighting device.”

As noted with respect to Claim 1, Morgan discusses a “lighting unit” (lighting device) having a controller. *See* discussion *supra* Section VIII.E.1. Morgan discloses that the controller can be separable from the lighting device. Ex. 1005, 14:4–15 (user interface separable from lighting unit); 19:61–20:25, 25:40–44 (splitting the functions effects functions between a separate central controller 202 and lighting unit controllers 208A, 208B, 208C, and 208D); Ex. 1003, ¶¶179–180.

12. Dependent Claim 18

Claim 18 depends from Claim 1 and further recites that “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”

As noted above with respect to claim element 1[c], Morgan includes a user interface (“input interface”). *See* discussion *supra* Section VIII.E.1. In addition, Morgan further discloses that a user interface includes, but is not limited to, “switches, potentiometers, buttons, dials, sliders, a mouse, keyboard, keypad, various types of game controllers (e.g., joysticks), trackballs, display Screens, various types of graphical user interfaces (GUIs), touch screens, microphones and

other types of sensors that may receive some form of human-generated stimulus and generate a signal in response thereto.” Ex. 1005, 8:24–35.

13. Dependent Claim 19

Claim 19 depends from Claim 1 and further recites that “a converter adapted to convert at least one of brightness and colour data from the simulator into lighting signals for output by the output.”

Morgan, in view of Hinrichs and Pohlert renders obvious Claim 19. Ex. 1003, ¶¶183–188. Morgan teaches that a “component of the lighting system 200” may “generate the lighting effect using the executable lighting program,” or it may “simulate the lighting effect.” *Id.*, 32:15-22. Additionally, Morgan discloses that the controller is “particularly configured to provide control signals to one or more of the light sources so as to generate a variety of” lighting effects.” *Id.*, 13:10-15.

In discussing Fig. 6, Hinrichs states “*an output* relating to the controlling of the light sources is generated . . . based on a number of instructions stored in an effect function library EF and based on other parameter indication by the input signal and stored in the MEM.” Ex. 1006, 28:49–55. A POSA would have understood that to drive the LEDs of a light source to produce a lighting effect, the lighting effect parameters (data from the simulator) must be converted into signals for controlling the light source. Ex. 1003, ¶185.

For example, Pohlert discusses that the “effects generator 1043 may provide the ability to create various lighting effects.” *Id.*, 20:25-28. The “switch selector 1042 would then convert each [effect selector control mechanism setting] to a set of control signals to the appropriate switches 1022, which in turn would control power to the wires 1047 supplying power to the light segments 306.” *Id.*, 20:14–17.

Moreover, Pohlert further teaches these processes may be carried out by a power controller that “includes a processor 1074 which may be programmed to provide various lighting effects” (*id.*, 21:20–25)—the effects generator—by “control[ling] the switch selector [through] setting various digital values.” *Id.*, 21:45–49. Further, “[t]he programming instructions may provide that the switches 1062 are turned on and off according to designated sequences, thus allowing the capability of pattern generation via the processor 1074.” *Id.*, 21:61–65.

14. Dependent Claim 20

Claim 20 depends from Claim 1 and further recites that “the lighting system is a lighting system for at least one of: videography; broadcast; cinematography; studio filming; and location filming.”

Morgan teaches Claim 20. Ex. 1003, ¶¶189–192. As noted above with respect to Claim 1, Morgan teaches that lighting units “may be employed in a variety of applications including, but not limited to theatrical or other

entertainment-based/special effects lighting.” *Id.* at 10:46–58. The POSA would have understood these “theatrical or entertainment-based/special effects” to include the same applications contemplated by the ’258 Patent—namely, special effects for videography, broadcasting, cinematography, studio filming, or location filming. Ex. 1003, ¶¶190. The POSA would also recognize that Morgan’s disclosure encompasses cinematography, videography, and similar applications based on its discussion of pulse duration control. *Id.*; Ex. 1005, 12:18–28.

A POSA would recognize the need for rolling shutter compensation for preventing unwanted flicker, or other artifacts, and would have known that pulse duration control is commonly used to resolve this issue. Ex. 1003, ¶¶191.

IX. CONCLUSION

The prior art demonstrates that the challenged claims are directed to a well-known lighting systems capable of producing user customizable lighting effects that pre-date the ’258 Patent by years. Therefore, under 35 U.S.C. § 314(a), there is a reasonable likelihood that these claims are unpatentable based on the ground presented in this petition. Petitioner respectfully requests that the Board institute trial and cancel Claims 1–21 as unpatentable in light of the prior art.

Dated: December 3, 2021

Respectfully submitted,

/s/ David M. Magee

David M. Magee (Reg. No. 51,982)

Marc Vander Tuig (Reg. No. 57,964)

Dhruv Kaushal, Ph. D. (Reg. No. 67,340)

Armstrong Teasdale LLP

800 Boylston St., 30th Floor

Boston, MA 02199

Telephone: 617.824.5150

Facsimile: 617.830.8490

Counsel for Petitioner

Vitec Production Solutions, Inc.

CERTIFICATE OF SERVICE

Under 37 C.F.R. § 42.6(e), the undersigned certifies that on December 3, 2021, a copy of the foregoing PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,197,258, Petitioner's Power of Attorney, and all associated exhibits were served in their entireties on the following counsel of record for Patent Owner via Express Mail:

PRTSI Inc.
232 NW 42nd Ter
Plantation, FL 33317

/s/ David M. Magee
Lead Counsel for Petitioner
David M. Magee (Reg. No. 51,982)
Armstrong Teasdale LLP
800 Boylston St., 30th Floor
Boston, MA 02199
Telephone: 617.824.5131
Facsimile: 617.830.8490

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

Under 37 C.F.R. § 42.24(d), the undersigned certifies that the PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,197,258 complies with the type-volume requirements of 37 C.F.R. § 42.24(a)(1)(i) because it contains 9,494 words, excluding the parts of the Petition exempted by 37 C.F.R. § 42.24(a), but including words in images.

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

Dated: December 3, 2021

Respectfully submitted,

/s/ David M. Magee

Lead Counsel for Petitioner

David M. Magee (Reg. No. 51,982)

Armstrong Teasdale LLP

800 Boylston St., 30th Floor

Boston, MA 02199

Telephone: 617.824.5131

Facsimile: 617.830.8490