UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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VITEC PRODUCTION SOLUTIONS, INC.,
Petitioner,

v.

ROTOLIGHT LIMITED,
Patent Owner.

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IPR2022-00261
Patent 10,197,257 B2

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Before MICHELLE N. ANKENBRAND, GRACE KARAFFA OBERMANN,
and AVELYN M. ROSS, *Administrative Patent Judges.*

ROSS, *Administrative Patent Judge*.

DECISION
Denying Institution of *Inter Partes* Review
35 U.S.C. § 314, 37 C.F.R. § 42.4

I.   INTRODUCTION

Vitec Production Solutions, Inc. ("Petitioner") filed a Petition (Paper 1, "Pet.") requesting an *inter partes* review of claims 1–21 of U.S. Patent No. 10,197,257 B2 (Ex. 1001, "the '257 patent"). Rotolight Limited ("Patent Owner") filed a Preliminary Response to the Petition. Paper 7 ("Prelim. Resp.").

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314 (2020); 37 C.F.R. § 42.4(a). The standard for instituting an *inter partes* review is set forth in 35 U.S.C. § 314(a), which provides that an *inter partes* review may not be instituted "unless the Director determines . . . there is a reasonable likelihood that the petitioner would prevail with respect to at least [one] of the claims challenged in the petition."

For the reasons set forth below, and upon considering the Petition, the Preliminary Response, and the evidence of record, we determine that the information presented in the Petition does not establish a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim. Accordingly, we deny the Petition, and do not institute an *inter partes* review.

A. *Real Parties-in-Interest*

Petitioner states that "[t]he real party-in-interest is Petitioner Vitec Production Solutions, Inc." and "The Vitec Group plc." Pet. 1. Patent Owner identifies Rotolight Limited and Rotolight Group Ltd. as real parties-in-interest. Paper 5, 1 (Patent Owner's Mandatory Notices).

B. *Related Proceedings*

The parties identify the petitions for *inter partes* review challenging U.S. Patent Nos. 10,197,257 B2 (IPR2021-01496) and 10,197,258 B2 (IPR2022-00262) as related matters. Pet. 1; Paper 5, 1. Patent Owner also identifies the petitions for *inter partes* review challenging U.S. Patent Nos. 10,197,258 B2 (IPR2021-01497), 10,203,101 B2 (IPR2021-01498), and 10,845,044 B2 (IPR2022-00099) as related matters. Paper 5, 1.

C. *The '257 Patent*

The '257 patent, titled "Lighting System and Control Thereof," issued on February 5, 2019. Ex. 1001, codes (45), (54). The '257 patent "relates to a lighting system, and the control of a lighting system, and the simulation of lighting special effects, and in particular to a lighting system for videography, broadcasting and cinematography." Ex. 1001, 1:16–20.

According to the '257 patent, a typical "lighting controller called a 'flicker box' . . . is used to produce flickering light effects to mimic flickering light for example from a fire place, candle, electrical spark or lightning." *Id.* at 1:21–25. But flicker boxes are "complex, costly and time consuming" to set up, and the "connection and control of multiple pieces of hardware . . . requir[e] a physical wired connection to the 'hot' light source desired to be controlled." *Id.* at 1:30–35. Flicker boxes are also "incompatible with LED light sources" and "require the use of 'hot' incandescent light sources which are energy inefficient and also pose health and safety risks to those working on set." *Id.* at 1:39–42.

The "improved solution" the '257 patent offers includes methods, controllers, and computer programs "for controlling a lighting device to produce user customisable lighting effect" by, among other things,

"calculating a time varying lighting value based on at least one simulation parameter" and "outputting said time varying lighting value thereby to simulate a lighting effect." *Id.* at 1:45–51, 2:61–67, 3:37–43. Figure 2 is illustrative and reproduced below.
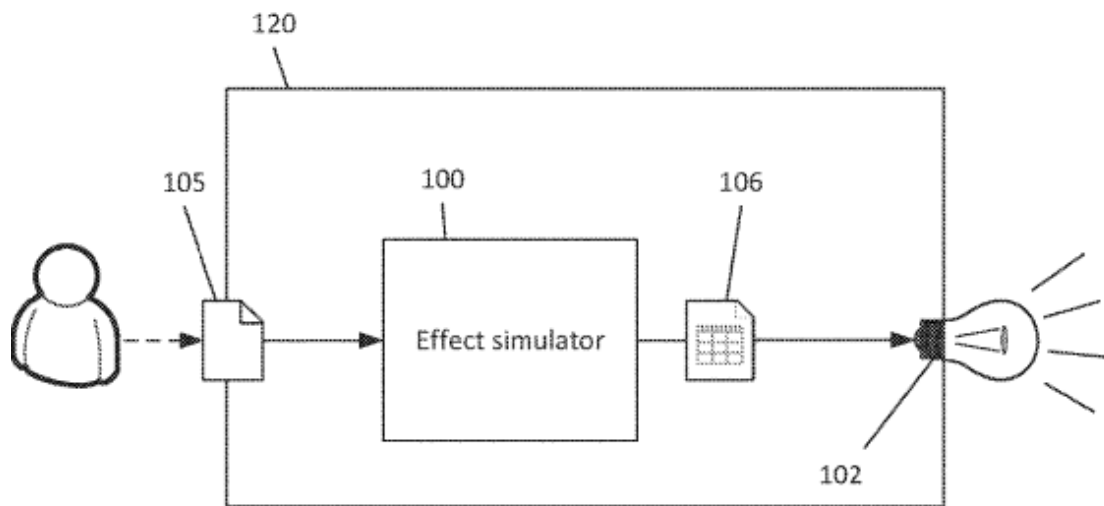

Figure 2

Figure 2 "is a schematic diagram of a further lighting system." *Id.* at 5:25. Figure 2 shows studio lamp device 120 that includes input interface 105 and lighting effect simulator 100 which produces data 106 used to modulate light 102. *Id.* at 5:51–6:14. "In one example, the light 102 is an array of LEDs, preferably of differing colours" and a "microcontroller or other computing unit is integrated in the lamp device 120 for performing calculations." *Id.* at 5:60–61, 5:65–67. The '257 patent explains that "[t]his arrangement does not require the DMX distribution hub 302, power elements 304, 306" required in a flicker box lighting system. *Id.* at 5:61–63.

Figure 6, reproduced below, illustrates a simulated lighting effect that employs an exemplary graphic user interface.
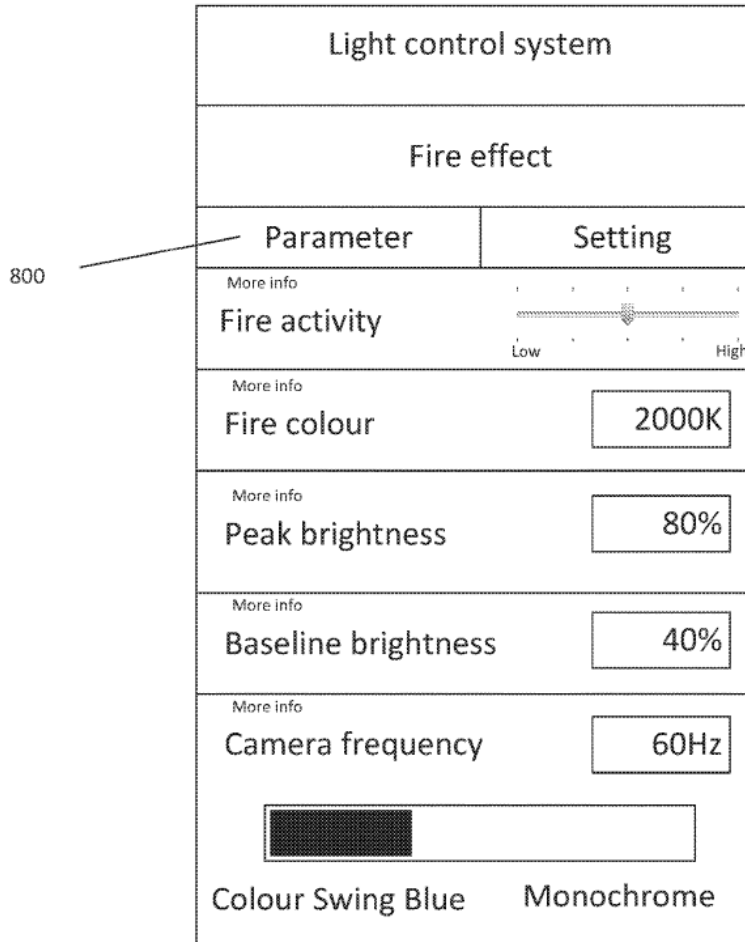
Figure 6

Figure 6 "is a graphic user interface [800] for user input of simulation parameters." *Id.* at 5:32–33. According to Figure 6, the simulated effect is a fire effect. *Id.* at 8:14–16. Interface 800 allows the user to select a "fire activity" by sliding the slider between low to high and set values for "fire colour," "peak brightness," "baseline brightness," and "camera frequency." *Id.* at 8:17–21.

D. *Illustrative Claim*

Petitioner challenges claims 1–21 of the '257 patent, with claims 1, 15 and 20 being the independent claims. Claim 1, reproduced below, is representative of the challenged claims.

> 1. A method for controlling a lighting device to produce a user customisable lighting effect, the method comprising:
>
> calculating, using an effect simulator, a time varying lighting value based on at least one simulation parameter; wherein said at least one simulation parameter characterises a user customisable lighting effect selected from a range of different user customisable lighting effects for at least one of: videography, broadcasting, cinematography, studio filming, and location filming; wherein said at least one simulation parameter is at least one of: a random brightness; a random duration; and a random interval; said simulation parameter depending on the user customisable lighting effect being simulated; and
>
> outputting, from said effect simulator, said time varying lighting value thereby to simulate the user customizable lighting effect.

Ex. 1001, 11:54–12:3.

E. *The Asserted Unpatentability Challenge*

Petitioner asserts that claims 1–21 would have been unpatentable on the following ground:

Claims Challenged	35 U.S.C. §	Reference(s)/Basis
1–21	103[1]	Morgan,[2] Julio[3]

Pet. 4. Petitioner also relies on declaration testimony of Fred Holmes
(Ex. 1003) to support its allegations.

II. ANALYSIS

A. Principles of Law

"In an IPR [(*inter partes* review)], the petitioner has the burden from
the onset to show with particularity why the patent it challenges is
unpatentable." *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed.
Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (2012) (requiring *inter partes*
review petitions to identify "with particularity . . . the evidence that supports
the grounds for the challenge to each claim")). This burden of persuasion
never shifts to the patent owner. *See Dynamic Drinkware, LLC v. Nat'l
Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden
of proof in *inter partes* review). Furthermore, a petitioner cannot satisfy its
burden of proving obviousness by employing "mere conclusory statements."
In re Magnum Oil Tools Int'l, Ltd., 829 F.3d 1364, 1380 (Fed. Cir. 2016).

Obviousness is a question of law based on underlying determinations
of fact. *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966); *Richardson-
Vicks, Inc. v. Upjohn Co.*, 122 F.3d 1476, 1479 (Fed. Cir. 1997). A claim is

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[1] The Leahy-Smith America Invents Act ("AIA"), Pub. L. No. 112-29, 125
Stat. 284 (2011), effective March 16, 2013. Given that the application from
which the '257 patent issued was filed after this date, the current version of
§ 103 applies.
[2] Morgan et al., US 8,938,468 B2, issued Jan. 20, 2015 (Ex. 1005,
"Morgan").
[3] Julio, US 2010/0264852 A1, published Oct. 21, 2010 (Ex. 1006).

unpatentable as obvious, under 35 U.S.C. § 103, if the differences between
the claimed subject matter and the prior art are such that the subject matter,
as a whole, would have been obvious at the time of the invention to a person
having ordinary skill in the art. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398,
406 (2007). The question of obviousness is resolved on the basis of
underlying factual determinations including (1) the scope and content of the
prior art; (2) any differences between the claimed subject matter and the
prior art; (3) the level of ordinary skill in the art; and (4) objective evidence
of nonobviousness.[4] *Graham*, 383 U.S. at 17–18.

At this preliminary stage, we determine whether the information
presented shows a reasonable likelihood that Petitioner would prevail in
establishing that at least one of the challenged claims would have been
obvious over the proposed prior art.

We analyze the challenges presented in the Petition in accordance
with the above-stated principles.

B.   *Level of Ordinary Skill in the Art*

We review the grounds of unpatentability in view of the
understanding of a person of ordinary skill in the art at the time of the
invention. *Graham*, 383 U.S. at 17.

Petitioner contends that a person of ordinary skill in the art "would
have had a Bachelor of Science degree in electrical engineering, or a closely
related field, along [with] at least two years of experience in the design of
entertaining lighting systems, controls and effects." Pet. 5 (citing Ex. 1003
¶¶ 33–34). Petitioner further states that "[m]ore education can supplement

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[4] At this stage of the proceeding, the parties have not asserted or otherwise
directed our attention to any objective evidence of nonobviousness.

practical experience and vice versa." *Id.* Patent Owner does not, at this time, dispute Petitioner's proposed definition. *See* Prelim. Resp. 20.

On this record, we determine that Petitioner's proposed definition is consistent with the prior art of record, and apply it for this Decision. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (explaining that specific findings on ordinary skill level are not required "where the prior art itself reflects an appropriate level and a need for testimony is not shown" (quoting *Litton Indus. Prods., Inc. v. Solid State Sys. Corp.*, 755 F.2d 158, 163 (Fed. Cir. 1985))).

C. *Claim Construction*

Petitioner addresses claim terms "cinematic lighting special effect," "effect simulator," and "random." *See* Pet. 6–8. Patent Owner states that it "requests that the Board adopt the ordinary and customary meaning of the claim terms as understood by one of ordinary skill in the art." Prelim. Resp. 19.

We need not expressly construe any claim terms because resolution of the issues presented in this Petition for *inter partes* review are not based on any particular claim construction the parties advance. *See Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (holding that "only those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy"); *see also Nidec Motor Corp. v. Zhongshan Broad Ocean Motor*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs.* in the context of an *inter partes* review).

D. *Alleged Obviousness Based on Morgan in view of Julio*

Petitioner alleges that the combination of Morgan and Julio renders obvious claims 1–21. Pet. 16–43. Petitioner also relies on the testimony of Mr. Holmes to support its arguments. *See id.*

1. *Overview of Morgan (Ex. 1005)*

Morgan is 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 explains that "a 'lighting effect' refers to one or more states of light that are perceived as an entity over some period of time" and "[a] lighting effect may have one or more static and/or dynamic characteristics" in which "exemplary dynamic characteristics may relate to one or more of color, brightness, perceived transition speed, perceived motion, periodicity, and the like." *Id.* at 1:47–55. Morgan discloses that in one of its embodiments, a user can query input information and search a plurality of indexed predefined lighting effects based at least in part on the input information, in which each lighting effect of the plurality of lighting effects has at least one searchable attribute associated therewith. *Id.* at 3:6–13. The at least one searchable attribute can relate to a color content of light to be generated, a color resolution, a color distribution or color spatial frequency, at least one dynamic temporal characteristic of the light, a viewing perspective of a viewer of the light, at least one preferred object to be illuminated by the light, and a geometric configuration of a plurality of lighting units. *Id.* at 3:57–4:10. Morgan further explains that a user interface allows an interface between a human user or operator and one or more devices that enables communication between the user and the devices. *Id.* at 8:24–27, 24:23–40.

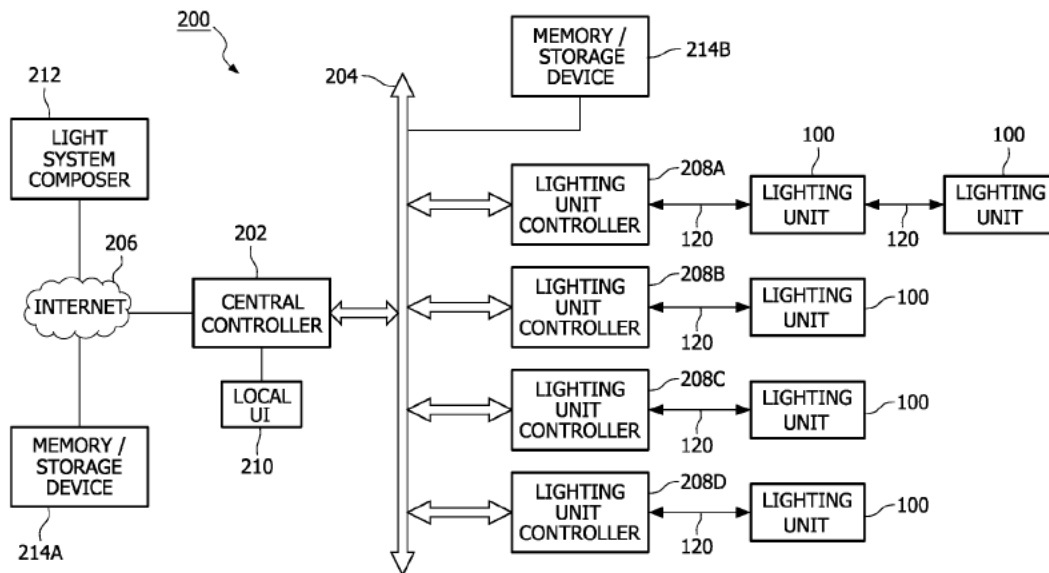One embodiment of Morgan's lighting apparatus is reproduced below.

FIG. 2

Ex. 1005, Figure 2. Figure 2 "is a generalized block diagram illustrating a networked system of lighting units." *Id.* at 8:47–49. Figure 2 shows networked lighting system 200 includes lighting units 100 and lighting unit controllers 208A–D. *Id.* at 19:32–33, 19:61–63. Each of lighting unit controllers 208A–D "is responsible for communicating with and generally controlling one or more lighting units 100 coupled to it." *Id.* at 19:63–65. Networked lighting system 200 also includes central controller 202 that may be associated with local user interface 210. *Id.* at 21:48–51. Each of lighting unit controllers 208A–D in turn may be coupled to central controller 202. *Id.* at 20:8–10. Another component is "light system composer [212 that] may encode an authored lighting effect . . . to provide a lighting program that may be executed by" central controller 202 to generate lighting commands for one or more lighting units 100 of lighting system 200. *Id.* at 22:12–18. Lighting unit 100 may be employed in a variety of applications

including "theatrical or other entertainment-based/special effects lighting." *Id.* at 10:46–52. Lighting unit 100 can also include controller 105 (shown in Figure 1) that is "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." *Id.* at 11:22–25. Lighting unit 100 may also include user interfaces 118 (also shown in Figure 1) "to facilitate any of a number of user-selectable settings or functions" such as "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.* at 14:4–10. Lighting system 200 includes a component or "storage facility 214A" that "may generate the lighting effect using the executable lighting program and may monitor the generated illumination to determine one or more characteristics of the lighting effect" such that "the component may simulate the lighting effect in any suitable manner and monitor illumination generated in the simulation." *Id.* at 32:15–22.

2. Overview of Julio (Ex. 1006)

Julio "relates to a method of using an algorithm to generate themed lighting selections." Ex. 1006 ¶ 2. Julio explains that there is a need for a lighting scheme that is "nonrepetitive" and "a scheme that will allow user selection of various light fixture scene involvement regarding parameters such as fixture installation or group, color/intensity range selection, fade timing delay selection, and dwell delay selection." *Id.* ¶ 9. Julio thus provides a "user range selection of lighting parameters within a selected theme." *Id.* ¶ 11. To provide a "color selection method using a biased, pseudo-random algorithm[]," Julio employs an algorithm that "applies random numbers to selecting values for a color-capable lighting system to

generate animated scenes that fit a particular envisioned theme" in which "the algorithm will select colors and fades from a predefined list that fit the criteria defining the theme." *Id.* ¶¶ 26, 41. Julio discloses "[b]ecause it uses random numbers the color changes will appear to be ever-changing with no repetition." *Id.* ¶ 41.

Julio further discloses that "[a] particular theme is defined by many parameters itself," that "[e]ach parameter defining a theme may have a range," and that "[t]he algorithm selects randomly within each range to generate the values for the lighting system." *Id.* ¶ 50. Selected parameters for the algorithm include light fixture selection, color selection, intensity selection, fade delay selection, and dwell delay selection. *Id.* ¶¶ 51–56.

3. Analysis of Claims 1, 15, and 20

Petitioner alleges that Morgan in view of Julio renders claims 1, 15, and 20 of the '257 patent invalid as obvious. Pet. 16, 22–24.

a) Petitioner's allegations

Petitioner asserts that, to the extent the preamble is limiting, Morgan describes a "method and apparatus for facilitating the process of designing, selecting, and/or customizing lighting effects of lighting shows," as claimed. *Id.* at 16 (citing Ex. 1005, 2:48–51; Ex. 1003 ¶¶ 69–70). Specifically, Petitioner alleges that Morgan teaches "[o]ne or more lighting effects, or an entire lighting show, may be based on parameters that are definable by a designer/programmer, or based at least in part on predefined ('pre-packaged') lighting effects available for selection." *Id.* (quoting Ex. 1005, 1:63–2:6). Petitioner also alleges that Julio describes a similar system to "'generate themed lighting selections' by controlling one or more lighting fixtures." *Id.* at 17 (citing Ex. 1006 ¶¶ 2, 11, 47).

Petitioner argues Morgan describes an effect simulator, as claimed, where "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).'" *Id.* at 17 (quoting Ex. 1005, 10:16–21; citing Ex. 1003 ¶ 72). Petitioner argues that "[c]ontrolling the lighting system . . . represents 'a time varying lighting value.'" *Id.* (citing Ex. 1003 ¶ 73). Petitioner explains that the lighting effects may have static and dynamic characteristics and relate to "color, brightness, perceived transition speed, perceived motion, periodicity, and the like" and the effects "maybe encoded as 'a sequential list of lighting states and transitions between lighting states, or frames of color data with reference to some time base, to provide a lighting program that maybe executed by the central controller 202 to generate lighting commands.'" *Id.* at 18 (quoting Ex. 1005, 1:51–55, 3:57–4:15, 22:12–18).

Petitioner contends that "Morgan also teaches the structural and functional elements required by Claim 1[b],"[5] including the "controller" and "lighting effects" that are "user customizable" because "Morgan teaches that 'one or more candidate lighting effects may . . . [be] processed by the central controller' to 'control the lighting system accordingly.'" *Id.* (citing Ex. 1003 ¶¶ 76–80; Ex. 1005, 25:39–50). Petitioner acknowledges that Morgan does not expressly describe use for videography, broadcasting, cinematography,

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[5] Petitioner definees Claim 1[b] as "wherein said at least one simulation parameter characterises a user customisable lighting effect selected from a range of different user customizable lighting effects for at least one of: videography, broadcasting, cinematography, studio filming, and location filming." Pet. 18.

studio filming or location filming, but instead asserts that a person of ordinary skill in the art would have understood Morgan's description of "'theatrical or other entertainment-based special effects' to include the same applications contemplated by the '257 patent." *Id.* at 18–19 (citing Ex. 1003 ¶ 77). Petitioner also asserts that a person of ordinary skill in the art would have understood Morgan's discussion of pulse duration control to suggest "cinematography, videography, and similar applications," because the skilled artisan "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." *Id.* at 19 (citing Ex. 1003 ¶ 78).

Petitioner alleges Morgan in view of Julio suggests that the simulation parameter is one of "a random brightness; a random duration; and a random interval." *Id.* at 19 (citing Ex. 1003 ¶¶ 80–85). Petitioner explains that Morgan describes lighting effects that include static and dynamic characteristics, such as "color, brightness, perceived transition speed, perceived motion, periodicity, and the like," but acknowledges that Morgan does not describe that these characteristics are random. *Id.* at 19–20 (citing Ex. 1003 ¶¶ 80–85; Ex. 1005, 1:51–55, 3:57–4:15). Petitioner asserts Julio, which is in a similar field—that is, the field of lighting systems and methods for producing lighting special effects using a plurality of LEDs—describes using random numbers for similar characteristics, i.e., "intensity selection," "fade delay," and "dwell delay," to "cause a theme or effect to 'appear to be ever-changing with no repetition.'" *Id.* at 20 (citing Ex. 1006 ¶¶ 10, 41, 51–56, 117; Ex. 1003 ¶ 83); *see also id.* at 14 (citing Ex. 1003 ¶¶ 61–64). Petitioner reasons "[t]he incorporation of random values in place of set

values would create realistic, and as sought by Morgan, aesthetically pleasing lighting effects." *Id.* at 21 (citing Ex. 1003 ¶ 85); *see also id.* at 14 (stating that a person of ordinary skill in the art "would have been motivated to combine the teachings of Julio and Morgan 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"), 15 (explaining that the '257 patent discussed a desire to produce "realistic" "lighting effects," which Julio and Morgan achieve). Petitioner further explains that "the combinations of Morgan and Julio proposed herein are combinations of known techniques and/or substitutions of art-known elements to yield predictable results." *Id.* at 15 (citing Ex. 1003 ¶ 65). Petitioner also contends that "combining Morgan with the teachings of Julio's random parametric values would produce predictable results, as it would have been well within the skill of the [person of ordinary skill in the art] to specify random or pseudorandom values for parameters in programming a particular lighting effect." *Id.* at 20–21 (citing Ex. 1003 ¶ 85).

Petitioner further alleges that the simulation parameters depend on effects selected by the user. *Id.* at 21 (citing Ex. 1003 ¶¶ 87–89). Petitioner argues that Morgan describes that the controlled lighting effects include characteristics and "that a user can 'chang[e] and/or select[] various *parameters of selected lighting effects*." *Id.* at 21 (citing Ex. 1005, 1:51– 3:57–4:15, 14:4–12). Petitioner further alleges that "Julio also teaches that a 'particular theme is defined by many parameters itself' and '[e]ach parameter defining a theme may have a range' and a user can provide 'range

selection of lighting parameters *within* a *selected theme*.'" *Id.* (citing Ex. 1006 ¶¶ 11, 50).

Lastly, Petitioner argues that Morgan's "lighting program may be executed in either an operation or simulated setting" and that "the controller is 'particularly configured to provide control signals to one or more of the light sources so as to generate' lighting effects." *Id.* at 22 (citing Ex. 1005, 32:14–21, 13:10–14; Ex. 1003 ¶ 92). Petitioner contends that "there are no substantive differences between Claim 1 and Claims 15 and 20" and relies of the same evidence identified above for claim 1, to support its assertion that Morgan in view of Julio renders claims 15 and 20 invalid as obvious. *Id.* at 23–24 (explaining that "[t]hese claims primarily differ in their preambles" but "[t]he body of each claim is substantively the same").

b) *Patent Owner's arguments*

Patent Owner argues Petitioner fails to demonstrate a reasonable likelihood of showing that Morgan in view of Julio renders the challenged claims of the '257 patent obvious. *See generally* Prelim. Resp. 32–51. In particular, Patent Owner asserts that neither Morgan nor Julio discloses each of the limitations of claim 1 (or claim 15 and 20). *Id.* at 32–45. Further, Patent Owner argues that Petitioner fails to show that Morgan and Julio are analogous art, that a reason to combine Morgan and Julio would have existed, and that a reasonable expectation of success would have existed in the combination of Morgan and Julio. *Id.* at 45–51.

Because we are persuaded by Patent Owner's argument that Petitioner fails to show that Morgan "calculate[s], using an effect simulation, a time varying lighting value based on at least one simulation parameter" or "different user customizable lighting effects for at least one of: videography,

broadcasting, cinematography, studio filming, and location filming," *see id.*
at 32–42, we limit our discussion below to Patent Owner's arguments
regarding those claim limitations.

> c) *whether Petitioner has shown that Morgan suggests an effect simulator that calculates a time varying lighting value*

Petitioner asserts that Morgan discloses an effect simulator that
calculates a time varying lighting value. Pet. 17–18. Patent Owner argues
that "Petitioner makes no attempt whatsoever to show that any <u>calculation</u> of
a time varying lighting value occurs in Morgan." Prelim. Resp. 33. Instead,
Patent Owner continues, "Morgan's 'controller,' which at best purports to
search a library of <u>pre-packaged lighting effects</u>, does not satisfy the
functionality of the 'effect simulator' of the '257 Patent." *Id.* According to
Patent Owner, Morgan's "light system composer" "encodes lighting effects
or lighting shows that are 'authored by a designer/programmer' into an
executable program that is subsequently used by the controller" and "[t]hese
executable programs are searched using criteria input by the user, and the
results of the search are presented to the user." *Id.* (citing Ex. 1005, 22:8–
24, 24:22–26:2); *see also id.* at 35. Then, "the <u>executable program(s)</u> are . . .
transmitted to the controller." *Id.* at 33–34 (citing Ex. 1005, Fig. 3). And
Patent Owner explains that "[w]hile Morgan discloses that the central
controller may perform other functions . . . none of this functionality relates
to 'calculating, using an effect simulator, a time varying lighting value based
on at least one simulation parameter' as required by the claims" and that any
"encoding performed by the light system composer is done . . . prior to the
user entering search criteria" and therefore cannot be a calculation based on
user input. *Id.* at 36–37 (citing Ex. 2001 ¶¶ 47–48; Ex. 1005, 22:1–18).

Patent Owner further asserts that "although Morgan discloses that a user may modify the pre-packaged executable lighting programs . . . these user modifications are accomplished by 'known aggregation functions, such as averaging, [which] may be used to automatically generate a new effect from a number of existing effects' and not by any calculations." *Id.* at 38 (citing Ex. 1005, 24:11–13, 26:11–22; Ex. 2001 ¶ 50). Patent Owner explains that a person of ordinary skill in the art "would understand that aggregating lighting effects using averaging techniques known at the relevant time simply means merging one or more pre-packaged files or portions together to create a single executable sequence and does not involve calculating a time varying lighting value from an effect simulator." *Id.* (citing Ex. 2001 ¶ 50).

We agree with Patent Owner that Petitioner fails to establish Morgan suggests "calculating, using an effect simulator, a time varying lighting value based on at least one simulation parameter," as claimed. Ex. 1001, 11:54–12:3 (claim 1), 12:57–13:8 (claim 15), 14:1–18 (claim 20). Specifically, Petitioner does not direct us to anything in Morgan that "calculates" at all, much less calculates a time varying lighting value based on a simulation parameter. Pet. 17–18. Petitioner alleges that Morgan's disclosure of "'one or more of the library of lighting effects/show[s]' 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)' . . . satisfies the functionality of the 'effect simulator' of the '257 Patent." Pet. 17 (citing Ex. 1005, 10:16–21; Ex. 1003 ¶ 72). However, merely identifying a controller that *searches* a library and *processes* pre-programmed lighting

effects, falls short of establishing that Morgan's controller actually "calculates." And, as Patent Owner aptly explains, the other functions performed by Morgan's controller similarly do not "calculate." Prelim. Resp. 36 (referring to Figure 3 and identifying "steps 302 (query user for input information), 304 (search lighting effects/shows), and 306 (provide user with indication of candidate lighting effects)").

Furthermore, we agree with Patent Owner that Petitioner does not demonstrate that Morgan suggests an effect simulator that calculates "a time varying lighting value based on at least one simulation parameter," as claimed. *Id.* at 36–37. Petitioner directs our attention to Morgan's description of "encoding" lighting effects that occurs in "reference to some time base" and implies this describes "a time varying lighting value based on at least one simulation parameter." Pet. 18. But, as Patent Owner contends, "the encoding performed by *the light system composer* is done based on lighting effects and lighting shows that are authored by a designer/programmer—*prior to a user entering search criteria*" and "later executed by the controller." Prelim. Resp. 37 (emphasis added). This encoding is not performed by the "effect simulator"—the central controller identified by Petitioner—and is performed prior to the "library searching" and "processing" which Petitioner alleges satisfies the functionality, i.e., calculating done by the "effect simulator." Therefore, on this record, Petitioner fails to establish sufficiently that Morgan suggests "calculating, using an effect simulator, a time varying lighting value based on at least one simulation parameter."[6]

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[6] We further observe that Mr. Holmes, Petitioner's witness, testified in a related *inter partes* review that even though "Morgan teaches substantially

In view of the foregoing, Petitioner fails to demonstrate a reasonable likelihood that the subject matter of claims 1, 15, and 20 of the '257 patent would have been obvious over the combined disclosures of Morgan and Julio.

> d) *whether Petitioner has shown that Morgan suggests a lighting effect for videography, broadcasting, cinematography, studio filming, or location filming*

Petitioner argues a person of ordinary skill in the art would have understood that Morgan discloses or suggests suggesting a lighting effect for "videography, cinematography, broadcasting, studio filming, or location filming," as the claims require. Pet. 18–19. Patent Owner disagrees. Prelim. Resp. 39. According to Patent Owner, "Morgan teaches that its lighting system can be employed in a variety of real-life (i.e., live) applications, including in a theatre setting" and "makes no mention, however, of implementing its lighting system in a recorded setting in which a camera is used, such as videography, broadcasting, cinematography, studio filming, and/or location filming." *Id*. at 39–40 (citing Ex. 1005, 10:46–58; Ex. 2001 ¶ 52). Patent Owner contends that a person of ordinary skill in the art would have understood that there are significant differences between lighting systems for live performances and those claimed in the '257 patent involving videography, cinematography, broadcasting, studio filming, and location filming. *Id.* at 40 (explaining that "lights can differ very significantly in their construction and functionality depending on their intended use") (citing Ex. 2001 ¶ 52).

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the same structural elements [, it] does not expressly teach an 'effect simulator' that 'calculates' the lighting effect onboard the lighting system." Ex. 2003 ¶ 98.

Patent Owner also argues Petitioner's assertion that Morgan's reference to "pulse duration control" suggests use in cinematography is incorrect, as "Morgan makes no mention of 'rolling shutter compensation.'" *Id.* Patent Owner also asserts that a person of ordinary skill in the art would not have understood "Morgan's discussion of pulse duration control to 'encompass cinematography, videography, and similar applications." *Id.* at 41. Instead, Patent Owner explains that "pulse duration control" is different than "rolling shutter compensation," and is used "to generate various to generate various intensities of light from the light sources" or to "mitigate potential undesirable or unpredictable variations in LED output that may arise if a variable LED drive current were employed." *Id.* (quoting Ex. 1005, 11:22–48; citing Ex. 2001 ¶ 53). Patent Owner states that because LEDs operate by "blinking," i.e., cycling through a rapid on/off state, a "flicker effect" may be observed by the human eye. *Id.* (citing Ex. 2001 ¶ 54). Patent Owner explains that Morgan implements pulse control modulation to overcome the undesirable variations in LED output. *Id.* at 41–42 (citing Ex. 1005, 12:14–35; Ex. 2001 ¶ 54).

On this record, Petitioner fails to demonstrate that Morgan discloses "at least one simulation parameter characterize[d by] a user customizable lighting effect . . . for at least one of videography, broadcasting, cinematography, studio filming, and location filming." Ex. 1001, 11:54–12:3 (claim 1), 12:57–13:8 (claim 15), 14:1–18 (claim 20). Petitioner asserts that Morgan describes "theatrical or other entertainment-based/special effects lighting," and that a person of ordinary skill in the art would have understood that to include "special effects for videography, broadcasting, cinematography, studio filming, or location filming." Pet. 18–19 (citing

Ex. 1005, 10:46–58; Ex. 1003 ¶ 77). However, in context, "Morgan teaches that its lighting system can be employed in a variety of real-life (i.e., <u>live</u>) applications, including in a theatre setting," as Patent Owner explains. Prelim. Resp. 39. Specifically, Morgan describes that its lighting system

> may be employed in a variety of applications including, but not limited to, direct view or indirect-view interior or exterior space (e.g., architectural) lighting and illumination in general, direct or indirect illumination of objects or spaces, theatrical or other entertainment-based/special effects lighting, decorative lighting, safety-oriented lighting, vehicular lighting, lighting associated with, or illumination of, displays and/or merchandise (e.g. for advertising and/or in retail/consumer environments), combined lighting or illumination and communication systems, etc., as well as for various indication, display and informational purposes.

Ex. 1005, 10:46–58. There is no mention of "videography, broadcasting, cinematography, studio filming, or location filming" in Morgan. Petitioner's witness provides no explanation as to why a person of ordinary skill in the art would have understood "theatrical or other entertainment-based/special effects lighting" to suggest "videography, broadcasting, cinematography, studio filming, and location filming," and offers nothing beyond what is alleged in the Petition. Ex. 1003 ¶ 77. Our reviewing court has "repeatedly recognized that conclusory expert testimony is inadequate to support an obviousness determination on substantial evidence review." *TQ Delta, LLC v. Cisco Sys., Inc*., 942 F.3d 1352, 1359 (Fed. Cir. 2019); *see* 37 C.F.R. § 42.65(a) ("Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.").

In contrast, Patent Owner, through the testimony of Mr. Kramer, explains that a person of ordinary skill in the art would have understood that "[l]ighting systems used in live applications, such as those in Morgan, are

notably different than the claimed use for 'videography, broadcasting, cinematography, studio filming, and location filming.'" Prelim. Resp. 40 (citing Ex. 2001 ¶ 52). As Patent Owner explains, these differences are not trivial and lighting systems "can differ very significantly in their construction and functionality depending on their intended use." *Id.* Some differences for consideration in studio filming include, among other things, the location of the light source, lenses to direct and focus the light, the quantity of light source, the modulation of the lighting, and the need to account for imaging device characteristics, like frame-rate. *Id.*

We are also not persuaded by Petitioner's position that a person of ordinary skill in the art would have understood that "Morgan's disclosure encompasses cinematography, videography, and similar applications based on its discussion of pulse duration control" and that the ordinarily skilled artisan "would recognize the need for rolling shutter compensation for preventing unwanted flicker, or other artifacts." Pet. 19 (citing Ex. 1003 ¶¶ 77). Petitioner suggests that "pulse duration control" and "rolling shutter compensation" refer to the same thing. Ex. 1003 ¶ 77 ("pulse duration control (also known as rolling shutter compensation in the art)"). However, Patent Owner persuasively explains that "pulse duration modulation is a common method of controlling the light output of LED light sources." Prelim. Resp. 41 (citing Ex. 2001 ¶ 54). Specifically, Patent Owner explains that "LEDs typically operate Pulse Width Modulation ('PWM'), which works by 'blinking' LEDs at a rapid rate, such that it cycles through 'on' and 'off' states many times per second in order to reduce the noticeability of the 'flicker effect' (flicker observed by the human eye)." *Id.* Morgan's description of its controller operation is consistent with Patent Owner's

position and explains that the controller applies voltage "at a frequency that is greater than that capable of being detected by the human eye" so that "an observer of the light generated by the light source does not perceive the discrete on-off cycles (commonly referred to as 'flicker effect'), but instead the integrating function of the eye perceives essentially continuous light generation." Ex. 1005, 12:9–28. Morgan does not mention "rolling shutter compensation" or the use of a camera. *See generally* Ex. 1005; Ex. 2001 ¶ 54. Accordingly, on this record, Petitioner fails to establish sufficiently that Morgan in view of Julio suggests "at least one simulation parameter characterize[d by] a user customizable lighting effect . . . for at least one of videography, broadcasting, cinematography, studio filming, and location filming."

In view of the foregoing, Petitioner fails to demonstrate a reasonable likelihood that claims 1, 15, and 20 of the '257 patent would have been obvious over the combined disclosures of Morgan and Julio.

4. Remaining Claims

Petitioner does not present any arguments or evidence with respect to claims 2–14, 16–19, and 21 that would remedy the defects noted above with respect to independent claims 1, 15, and 20. Thus, Petitioner fails to demonstrate a likelihood that the subject matter of claims 2–14, 16–19, and 21 would have been obvious over the combined disclosures of Morgan and Julio.

E. Discretion to Deny Institution under 35 U.S.C. § 325(d)

Petitioner and Patent Owner both address 35 U.S.C. § 325(d). Pet. 6–7; Prelim. Resp. 26. Because we deny the Petition on the merits, we do not address the arguments about discretion to deny institution.

III.   CONCLUSION

For the foregoing reasons, we determine that Petitioner does not demonstrate a reasonable likelihood that it would prevail with respect to at least one of the claims challenged in the Petition. Accordingly, we deny the Petition and do not institute an *inter partes* review of the '257 patent.

IV. ORDER

It is ORDERED that the Petition is *denied* as to all challenged claims of the '257 patent and no trial is instituted.

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