

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

JESCO LIGHTING GROUP, LLC,
Petitioner,

v.

AGS LIGHTING MANAGMENT LLC,
Patent Owner.

Case IPR2025-01328
Patent No. 11,751,302

PATENT OWNER'S PRELIMINARY RESPONSE

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EXHIBIT LIST

Exhibit No.	Description
2001	Letter from AGS Lighting Management to Jesco Lighting Group Regarding Notice of Patent Rights dated October 31, 2023
2002	Letter from Petitioner's attorney Frederick J. Dorchak to Patent Owner's Chief Legal Counsel Seeking Extension dated November 14, 2023
2003	Email Correspondence between Petitioner's attorney Frederick J. Dorchak and Patent Owner's Chief Legal Counsel
2004	Letter from Petitioner's Attorney Frederick Dorchak to Patent Owner's Chief Legal Counsel dated December 7, 2023
2005	Specification Sheet for LBI
2006	Letter from Petitioner's Attorney Frederick Dorchak to Patent Owner's Chief Legal Counsel dated January 25, 2024
2007	Screenshot of YouTube Video attached to Letter dated January 25, 2024
2008	Letter from Patent Owner's Attorney Jayne Piana to Frederick Dorchak dated February 8, 2024
2009	E-mail from Petitioner's Attorney David Radulescu to Patent Owner's representatives and counsel dated March 7, 2024
2010	E-mail from Petitioner's counsel in district court seeking extension to respond dated February 12, 2025
2011	E-mail from Petitioner's Attorney David Radulescu with attachment dated February 26, 2025
2012	G. Quinn, <i>Stewart Says USPTO Wants Early Validity Challenges, Not Late IPRs</i> , IP Watchdog (June 10, 2025)
2013	E-mail correspondence between Petitioner's and Patent Owner's district court counsel regarding extension to respond to complaint
2014	Docket in related litigation, Case No. 1:25-cv-00141, last accessed September 30, 2025
2015	E-mail from Petitioner's counsel to Patent Owner's counsel dated August 14, 2025

Exhibit No.	Description
2016	Jesco Lighting Group's Answer and Counterclaims in related litigation Case No. 1:25-cv-00141
2017	Specification Sheet for Patent Owner's Affiliate's Linear Lighting Product Listing '302 Patent
2018	Declaration Dr. Thomas M. Katona
2019	CV of Dr. Thomas M. Katona
2020	International Commission on Illumination, Technial Note: Terms Related to Planckian Radiation Temperatures for Light Sources, CIE TN 013 2022 (2022)
2021	Excerpt of U.S. Department of Energy, Solid State Lighting R&D Plan (June 2016)
2022	The 1976 Revision of the CIE Color System
2023	U.S. Department of Energy, Adoption of Light-Emitting Diodes in Common Lighting Applications (August 2020)
2024	PCMag How to Revive Your Smart Light Settings After a Power Outage

I. INTRODUCTION

Patent Owner, AGS Lighting Group, LLC (“Patent Owner” or “AGS”), submits this Patent Owner Preliminary Response (“POPR”) pursuant to 37 C.F.R. § 42.107(a) to the Inter Partes Review (“IPR”) petition (“Petition”) filed by Jesco Lighting Group, LLC (“Petitioner”) for claims 1-20 of U.S. Patent 11,751,302 (the “’302 Patent”). The Board should deny institution.

The ’302 Patent claims linear LED lighting apparatuses and systems. The claimed lighting systems have adjustable color temperature and luminescence. Additionally, two or more of the claimed lighting fixtures of different lengths can be connected together to have matching color temperatures between the lighting fixtures despite their different lengths.

As discussed in Patent Owner’s Request for Discretionary Denial of Institution (Paper 6), Petitioner has repeatedly represented that its strongest invalidity art is a system that cannot be part of an IPR. All that is left for this proceeding is the “best” of what is left over.

The Petition presents four obviousness-based grounds. Each of the grounds fails for multiple reasons, as detailed below. But setting aside those details, simply viewing the proposed combinations at a forest level shows that they are plainly motivated by hindsight informed by the ’302 Patent. For Grounds 1 and 2,

Petitioner proposes literally ripping out and throwing away a key element of the primary reference (Edwards) and replacing Edwards's LEDs with other LEDs that were known and rejected by Edwards's inventors for multiple reasons. For Ground 3 and 4, Petitioner suggests that the elegant network-based control of the primary reference (May) be replaced by a large and unwieldy knob assembly from the secondary reference (Jeswani). Petitioner's combinations result in Rube Goldberg-like combinations that should be rejected by the Board.

A. Background of the '302 Patent

On September 5, 2023, the United States Patent and Trademark Office duly issued U.S. Patent No. 11,751,302 (the '302 Patent), entitled "Controlling Color Temperature and Luminance in Linear LED Fixtures." The '302 Patent was filed on December 21, 2020 and claims priority to a provisional application filed on June 18, 2020.

The '302 Patent pertains to improvements in linear LED lighting technology. As the desire to use long continuous runs of LED lights in commercial spaces grew in popularity, the need arose for different lengths of LED fixtures to be connected together but still have the same color temperature and lumen output so that the fixtures matched when installed in long runs.

The inventors of the '302 Patent, Peter DallePezze and Andrew Svendsen, have worked in the lighting industry collectively for over 40 years. As they recognized in the '302 Patent, LED lighting systems tended to be custom-manufactured to produce light at a specific color temperature and one lumen output, and thus, after installation, the light produced from the fixtures is limited to a particular color temperature and lumen output. Ex.1001-1:32-38. For certain environments, linear LED light fixtures (LEDs disposed in a linear shape within the fixture) are desired to produce efficient light for large spaces. Ex.1001-4:16-21. To ensure that the light provided is uniform in color and luminance, each fixture was typically custom manufactured according to the desired length, color temperature, and luminance level. Ex.1001-4:21-26. Moreover, since every setting has unique dimensions and lengths, custom-manufactured linear light fixtures may use a custom number of LEDs with a specific color temperature, positioned in a custom-length LED array powered by a custom-built driver circuit to provide a sufficient amount of current to each LED of the LED array to thereby produce the desired luminance level. Ex.1001-4:25-31. When manufacturing such custom linear LED fixtures, each version of the fixture has specifically designed components for each different setting (length, color temperature, and brightness). Ex.1001-4:32-35. For example, if an LED linear lighting system is available in

three color temperatures, four brightnesses, and three different lengths, the manufacturer must make thirty-six different lighting fixtures, and a warehouse would need to store all of these combinations. If various combinations were not premade, then it could take weeks to produce the customer's desired lighting combination on-demand, leading to delays.

Recognizing those limitations, the inventors found that there was a need for modular linear fixtures in which the color temperature and the lumen output could be adjusted and where additional LED fixtures could be coupled together to form long runs for lighting installations. With careful engineering, the inventors found that linear light fixtures could be made with selectable color temperature and brightness using a switch assembly to control color temperature and brightness within the fixture. Ex.1001-4:36-40. The linear fixture, which may be formed from an assembly of multiple light fixture modules, may include an array of LEDs. The array may include a number of LED chips or circuits positioned in a linear manner such that each LED chip may receive current from one or more driver circuits that provide each LED chip substantially the same amount of current to cause each LED to illuminate at the same luminance level. Ex.1001-4:40-50. The '302 Patent teaches a "switch assembly [that] may include an additional switch to control a luminance or a lumen level output by the linear LED light fixture."

Ex.1001-5:17-19. The '302 Patent explains that “[t]he lumen level output of an LED may depend on the amount of current it receives. That is, as the current provided to the LED increases, the amount of luminance produced by the light output by the respective LED increases.” Ex.1001-5:19-23. In this way, brightness of the fixture is controlled.

As for color temperature, the fixture may include multiple strings of LEDs in the LED array that produce light at multiple color temperatures. Ex.1001-4:51-53. For example, a fixture may include two distinct linear strings of LEDs such that one string has a first color temperature (e.g. 3000K), and a second linear string has a second color temperature (e.g. 4000K). Ex.1001-4:54-60. A switch assembly coupled to the array of LEDs may direct current from the driver circuit to one or both of the two linear strings of LEDs, causing the fixture to produce light with the corresponding color temperature. Ex.1001-4:65-5:2; 8:41-60. To produce a color temperature of 3500K, for example, the switch assembly may direct the current output by the driver circuit to both LED strings such that half the current output is provided to each string. Ex.1001-8:51-60.

But the ability to have selectable color temperature and brightness did not fully solve the problem. The DC power required for a 4-foot fixture with a color temperature/brightness combination is different from the DC power required for an

8-foot fixture with the same color temperature/brightness combination. If an installer used the DC power supply for the eight-foot fixture with the four-foot light, the output of the four-foot fixture would be too bright. This would be especially noticeable if the incorrectly-powered four-foot fixture was installed near a correctly-powered eight-foot fixture.

The inventors recognized that the driver circuit of the 8-foot fixture module would need to output twice the amount of current than the driver circuit of the 4-foot fixture module would need to output to appear visually the same. Ex.1001-5:44-47. With this in mind, the modules may be manufactured according to a scale factor, leading to manufacturing simplicity. For example, an 8-foot module may be similar to a 4-foot module in that components in the 4-foot fixture are scaled by a factor of 2 in the 8-foot fixture because the number of LEDs that make up the 8-foot may be twice as much. Ex.1001-5:37-43.

By creating a lighting apparatus in this way, the linear light fixture modules may be manufactured as fixed lengths and then assembled or used individually to provide lighting solutions for different spaces of different sizes, while providing consistent light properties with the same color temperature and brightness when fixtures are connected, regardless of the sizes or combinations of fixture modules used in a space. Ex.1001-5:56-62. In this way, the number of combinations of

linear lighting fixtures that a manufacturer would need to stock in the prior example (fixtures with three color temperatures, four brightnesses, and three different lengths) could be reduced from thirty-six options to four, or one for each standard length of LED linear fixture.

By employing the various systems and techniques described and claimed in the '302 Patent, a user of the linear LED light fixture may modify a lumen output and/or color temperature of a string of LEDs based upon a user's preferences.

Ex.1001-12:47-50. In addition, by employing multiple linear LED light fixtures (light fixture modules) assembled together, a user has the ability to equip a certain setting with an uninterrupted, continuous surface of light that has consistent color and luminance properties at a variety of lengths. Ex.1001-12:50-55. Moreover, manufacturers of the linear LED light fixture modules may efficiently produce linear LED light fixtures to allow their customers to create custom-length linear LED light fixtures that have the same lumen output and/or color temperature selectable by the customer, without having to separately manufacture customized modules. Ex.1001-12:55-60.

B. Prosecution History of the '302 Patent

The application for the '302 Patent (17/129,228) was filed on December 21, 2020, claiming priority to a provisional application filed on June 18, 2020.

Ex.1004-1. On December 7, 2022, Examiner Crystal L. Hammond issued a non-final office action, rejecting claims 1-9 on obviousness grounds but allowing claims 10-20 as originally filed. Ex.1004-119, 124. In response to that Office Action, Patent Owner had a telephonic interview with the Examiner on January 5, 2023, where Patent Owner proposed amendments to claim one. Ex.1004-142-143. Those amendments are shown below:

1. A linear light-emitting diode (LED) lighting apparatus, comprising:
 - an array of light emitting diodes (LEDs) having a first length, wherein the array of LEDs comprises ~~comprising~~:
 - a first plurality of LEDs configured to produce a first light having a first color temperature, wherein the first plurality of LEDs aligns within a first linear shape;
 - a second plurality of LEDs configured to produce a second light having a second color temperature different from the first color temperature, wherein the second plurality of LEDs align within a second linear shape;
 - a driver circuit configured to output a plurality of currents;
 - a switch assembly configured to couple to the driver circuit, wherein the switch assembly comprises:
 - a first switch configured to cause the driver circuit to output one of the plurality of currents;
 - a second switch configured to cause the one of the plurality of currents to couple to the first plurality of LEDs, the second plurality of LEDs, or both; and
- wherein the linear LED lighting apparatus is configured to electrically couple to an additional linear LED lighting apparatus having a second length different than the first length by a scale factor, wherein the additional linear LED lighting apparatus is configured to produce a third light having the first color temperature via a third plurality of LEDs or a fourth light having the second color temperature via a fourth plurality of LEDs.

Ex.1004 at 143.

Following the interview, on January 25, 2023, Patent Owner submitted a response to the non-final office action noting that the Examiner indicated that amended claim 1 would overcome the current rejections and that an updated search would be required. Ex.1004 at 153. Following an additional search (Ex.1004-161-172), Examiner Hammond issued a notice allowing claims 1-20. Ex.1004-174, 178-179. The '302 Patent issued on September 5, 2023.

II. LEVEL OF SKILL IN ART

Petitioner states that “A Person of Ordinary Skill (POSA) would have a B.S. degree in electrical engineering, or an equivalent field, as well as at least 2-4 years of academic or industry experience designing LED light fixtures. A person of ordinary skill in art with a higher level of education may have fewer years of academic or industry experience, or vice versa. Ex.1002¶48.”

Patent Owner’s expert disagrees and finds that no formal degree is necessary but that a POSA would have “five years of industry experience designing LED lighting fixtures.” Ex.2018,¶19. Patent Owner does not believe it is necessary for the Board to determine the level of skill in the art to deny the Petition.

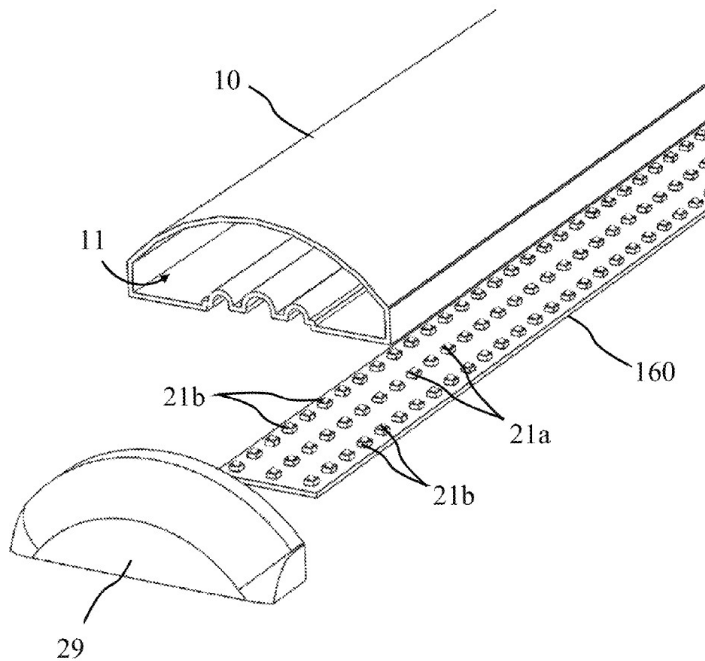
III. CITED REFERENCES

A. U.S. Patent No. 9,995,440 (Edwards)

Edwards, entitled “Color temperature tunable and dimmable solid-state linear lighting arrangements,” was filed on December 8, 2015, published on June 30, 2016, and issued June 12, 2019. Ex.1005-1. Edwards is directed to a “solid-state linear lamp comprises a co-extruded component, the co-extruded component comprising multiple photoluminescence portions corresponding to different color temperatures.” *Id.*-Abstract.

In Edwards, “the surface mountable lighting arrangement 260 includes a hollow integrated wavelength conversion component 10 and a substrate 160 having multiple arrays of LEDs 21.” Ex.1005-5:32-34.

The fixtures of Edwards produce light using non-white LEDs (21) and a “wavelength conversion component” (10) that is separated from the LEDs. Ex.1005-5:32-38.



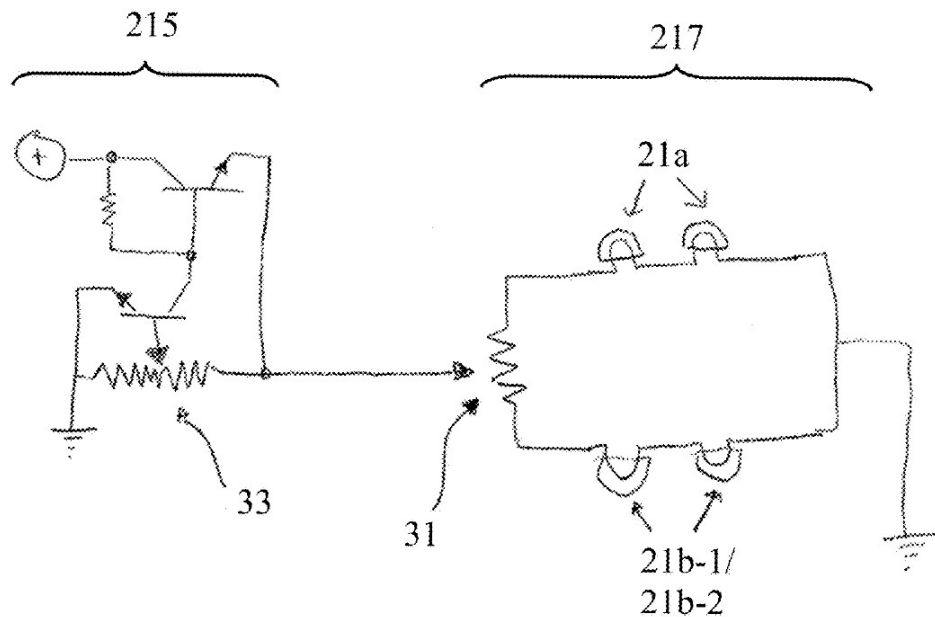
Ex.1005-Fig.1B.

Edwards states that “[t]he integrated wavelength conversion component 10 includes multiple wavelength conversion regions with different photo-luminescent materials (e.g., for a first light emission color, more typically first color temperature).” Ex.1005-5:39-46. Because the regions of the wavelength conversion component control the color temperature radiated from Edward’s fixture, Edwards LEDs can all be the same color, in particular blue. Edwards states that “Because all of the LEDs would be the same color (e.g., blue), this makes the electronics much simpler to implement (e.g., because they can be [driven] with the same voltages and drive conditions).” Ex.1005-17:8-12. Elsewhere, Edwards

suggests that the LEDs could be red, but a POSA would recognize that red LEDs cannot be used because the wavelength of light emitted is too low to appear white after passing through the phosphor in the wavelength conversion component.

Ex.1005-6:27-30;Ex.1018-¶32.

In Figure 5, Edwards sets out a control system for both brightness and color temperature. Brightness is controlled by potentiometer 33 and color temperature is controlled by potentiometer 31.



Ex.1005-Fig. 5.

Edwards discusses that the fixtures can include an electrical connector to connect fixtures together. Ex.1005-15:55-59. Edwards states that “Individual

linear lamps 1300 may range from 1 foot to 6 feet in length,” but offers no teaching of mixing and matching lamps of different lengths. Ex.1005-15:59-61; Ex.1018-¶33.

B. U.S. Printed Patent Application No. 2019/0320515A1 (Sadwick)

Sadwick, titled “Solid State Lighting Systems” was filed April 15, 2019 and published on October 17, 2019.

Sadwick is directed to “an apparatus for personalized lighting systems, including a power supply, a number of solid state lights connected to the power supply, a number of switches, each connected to one of the solid state lights and operable to switchably block electrical current from the power supply through an associated one of the solid state lights, and a clock generator connected to the switches and configured to activate the switches.” Ex.1006-Abstract. Sadwick states that the lighting system as “[e]mbodiments of the present invention can be used to replace fluorescent tubes in fixtures including fixtures in which the lamps either use total or partial indirect, reflected, etc., lighting or can be turned into indirect and/or direct, partially or totally reflected, etc. lighting.” Ex.1006-¶0040.

Sadwick discusses a control system for LED strings 820 and 822. The “current sharing driver” causes only one of these strings to be on at any time.

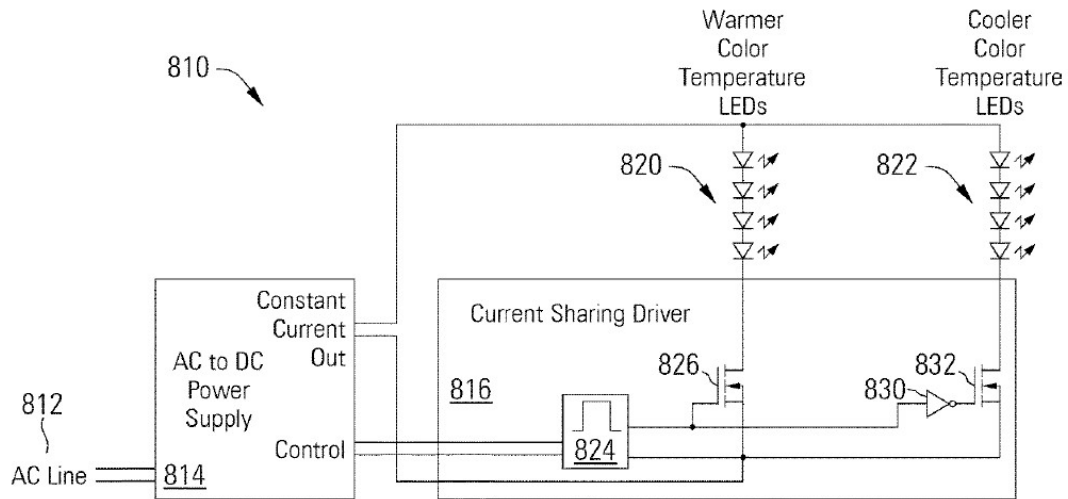


FIG. 35

Ex.1006-Fig. 35.

C. U.S. Patent No. 10,683,969 (Jeswani)

Jeswani provides a lamp that has a first switch for selecting a lumen setting and a second switch for selecting a correlated color temperature (CCT) in a lamp having a downlight geometry. Ex.1007-Abstract. The first switch 15a can control the lumen output of a downlight by changing an output current of a power supply going into a string of LEDs, while a circuit determines which string of LEDs to operate based on a position of the second switch 15b. Ex.1007-10:47-11:15.

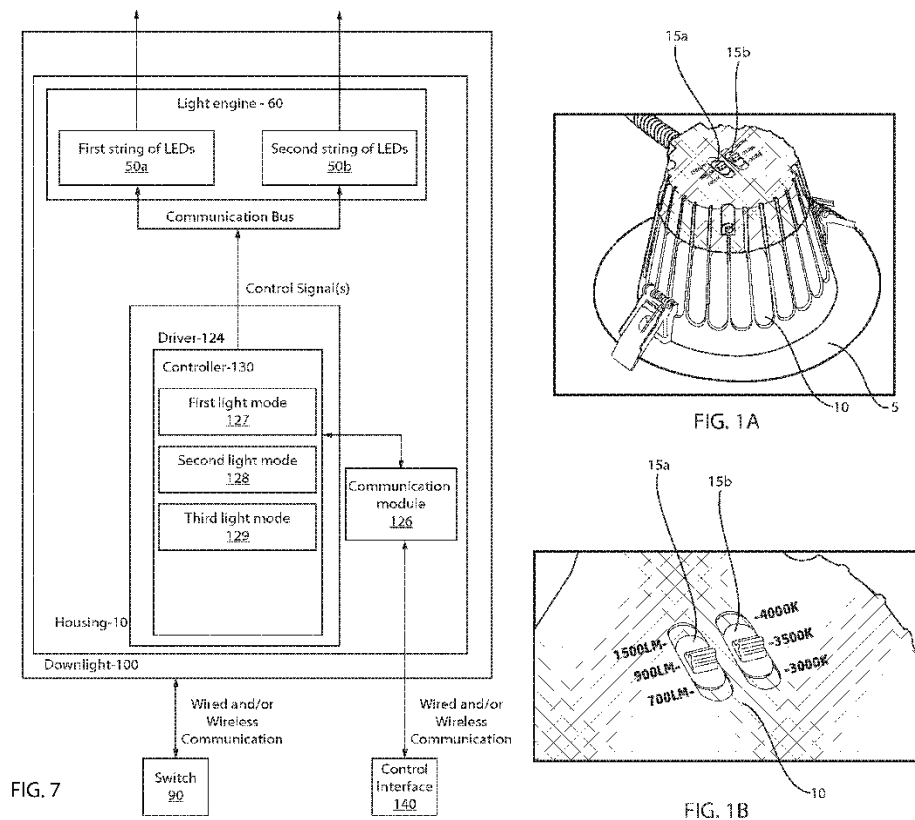
The methods and structures of Jeswani are used to provide different light output (lumen) levels and different light color levels (CCTs) in a single downlight. Ex.1007-3:13-15. Indeed, the downlights described in Jeswani are used in single

downlights for new construction and retrofit applications. Ex.1007-3:22-26.

Further, the switches for selecting lumen and color are mounted on a housing of a single unit. Ex.1007-3:33-37.

Jeswani describes a separate embodiment in which a controller 130 may output control signals to two LED strings based on input received from a remote source, such as a control interface 140. Ex.1007-14:42-59. The control interface 140 is employed to change emission modes of the downlight 100 via a driver 124, which sends signals to illuminate either string of LEDs 50a, 50b to provide one of three emission modes. Ex.1007-14:60-15:5.

As shown in FIG. 7, the control interface 140 is separate (or remote) from the housing 10 of the downlight 100. Ex.1007-FIG.7. As such, the control interface 140 cannot be reasonably construed as being implemented via switches 15a,15b, which are disposed on the housing 10 of the downlight 100. Ex.1007-FIG.1A. Indeed, the embodiment described in FIG. 7 provides a separate way in which the downlight 100 may be controlled remotely via the control interface 140.



Jeswani also describes remotely controlling the downlight 100 via a switch 90 that may turn the downlight 100 on by toggling the switch 90 to its ON position, thereby causing the downlight 100 to enter its first emission mode 127. Ex.1007-12:47-64. The downlight 100 enters into other emission modes based on detecting the toggling of the switch 90 additional times. *Id.*

D. U.S. Published Patent Application No. US 2019/0041009 (May)

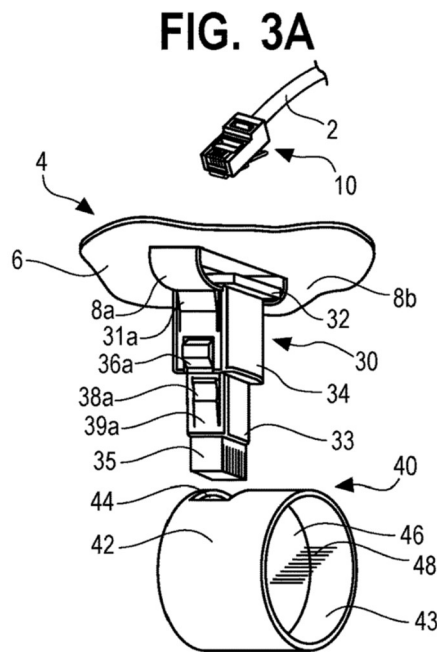
May is generally directed towards tubular lighting assemblies that are adapted for networked lighting systems. Ex.1008-¶¶0002. In particular, May discloses an LED “lighting system,” which provides the “benefits of [power over

Ethernet] PoE technology in the linear tube format.” Ex.1008-Abstract, ¶0030.

Indeed, May focuses on providing a cost-effective solution to allow LED lamp technology to integrate power over Ethernet (PoE) technology in an LED tube format to provide both data and power connectivity to the lighting system to expand the benefits and applications for PoE enabled LED lighting. Ex.1008-¶¶0021-0030.

As such, the lighting system of May includes connector assemblies that securely mount networkable linear LED lamps to conventional tube lamp lighting fixtures to provide integrated Ethernet power and data connectivity to internal components of the LED lamps. Ex.1008-¶0101. The connector assembly of May therefore provides “integrated power and data capabilities and Ethernet standardization to individual linear LED lamps.” *Id.* Further, the connector assembly includes jack 41, which may be any suitable Ethernet jack compatible with various Ethernet plugs to connect to a connector board for facilitating integrated power and data communication between a lamp and external devices of a local area network (LAN) using standard Ethernet protocols. Ex.1008-¶0107. As such, a connector 30, which may be positioned on support 4, provides a mechanical connection to securely mount an LED tube lamp and integrated power

and data connectivity between the LAN and internal components of the LED lamp as illustrated in FIG. 3A. Ex.1008-¶¶0103,0110.



As shown above, May is focused on retrofitting tube lighting systems with network-capable connectors that provide power and data connectivity. Indeed, to control the operations of the LED lighting system, May discloses a central control module that serves as a central point of communication and coordinates all data communication and power provided to lighting system. Ex.1008-¶0191. In addition, power is provided from an Ethernet switch to a first lamp 580 and may be distributed to subsequent lamps 580 via respective jumper cables. Ex.1008-¶0192. Each lamp may include a control module that may collect data associated with the

respective lamp and communicate the collected data back to the central control module. *Id.* The control module may include a driver that has three driver sub-circuits, which are each connected to an individual LED array, for *independently* controlling power to each individual array. Ex.1008-¶0211. For example, two LED arrays may be connected in parallel to a power regulation module and driven independently of each other. Ex.1008-¶0218. On one side of each LED array or string of LED emitters, an independent current-controlling driver can control the current *separately* to each string of LED emitters. *Id.* In some cases, a control node 1202 includes a driver for precisely controlling a magnitude of DC current provided to each LED array via a corresponding sub-circuit of the driver. Ex.1008-¶0211.

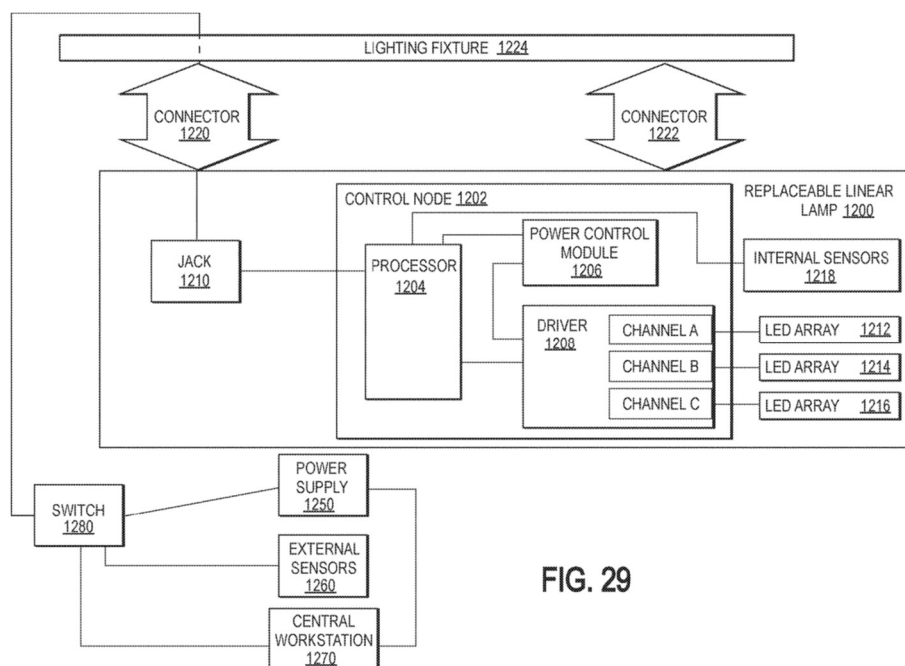


FIG. 29

To control the illumination level and color level parameters, the control module receives control packets from a data processing device connected to the lighting system via the Ethernet connection to control the parallel driver sub-circuits and transmit power to each LED emitter string. Ex.1008-¶0233. The control packet may specify an illumination level or other color level parameters, such that the control module executes an automated light tuning functionality of the lamp to control each driver sub-circuit that powers a respective illumination level for each respective string of LEDs. *Id.* The control module controls the color output in accordance with the color level parameters specified for each LED emitter string, as specified in the respective control packets. *Id.*

A user interface of a workstation may receive input parameters from a user to adjust power provided to one of the LED arrays. Ex.1008-¶0215. The control module may include circuitry that receives instructions from data communications to modify aspects of the LED array based on the instructions, such as controlling the brightness or color of the LED array. Ex.1008-¶0222.

With the foregoing in mind, May requires control packets to be defined and provided via a processing device or workstation, which generates and sends the control packets to the control node for controlling the illumination or color temperature of the LED emitter string. Indeed, the control packets may include

instructions related to these properties and may be defined by a user via the processing device. May, thus, requires the use of a processing device to control the light properties of the LED emitter string. Indeed, May never suggests incorporating a physical switch to control these light properties because a physical switch would render the networking features of the network-controlled lighting system utterly useless.

May does mention that manual operated switches may be networked to the control module, such that the activation of the switch may cause a processor to execute instructions that signal a power control module to control a channel of the driver to turn on one of the LED arrays. Ex.1008-¶0215. As such, even manual operated switches in May are described as being connected via a network, such as PoE technology, which is the key benefit of the invention. In this way, May fails to consider using physical switches for any purpose without having a network connection between the switch and the control node to enable the switch to signal to a corresponding processor to execute some default instructions to control the lighting system.

IV. CLAIM CONSTRUCTION

A. “plurality of LEDs” – Claims 1, 3, 6, 10, 17, 18, 20

Petitioner states that “[n]o construction is necessary to institute this petition.” Paper 1 at 10. But Petitioner’s expert includes claim construction arguments in his declaration. For example, claim 1[b] requires “a first plurality of LEDs configured to produce a first light having a first color temperature.” As discussed below in Section V.A this term is relevant because Petitioner’s primary reference for Ground 1 (Edwards) uses non-white LEDs that lack a first color temperature in combination with a *separate* phosphor layer. Petitioner has not shown that a POSA would understand the claimed “plurality of LEDs” to include the remote phosphor layers.

Petitioner’s expert concedes that a phosphor layer outside of the LED is necessary to produce white light. But Petitioner’s expert goes on to opine that “the ’302 Patent specification does not exclude blue LEDs separated by a small distance from its phosphor.” Ex.1002-¶ 120. On its face, this is an improper construction because neither Petitioner nor the expert provide any objective measure of how “small” of a distance an LED can be from phosphor and still be considered part of the LED, rather than part of the overall apparatus or system. The ’302 Patent claims and specification provide no support for Petitioner’s expert’s opinion that the “plurality of LEDs” include a remote phosphor layer. And Petitioner’s expert

has cited no extrinsic evidence for his opinion that the claimed “plurality of LEDs” include the remote phosphor layer. Ex.2018-¶¶52-61. For these reasons, to the extent that Petitioner’s expert’s statement is a claim construction, it should be rejected.

Petitioner’s expert further opines that a passage from 4:51-60 of the ’302 Patent shows that the claims set “the optical characteristics of a ‘string’ of LEDs, *viewed in the aggregate.*” Ex.1002-¶121. The claims, however, do not even recite a “string” of LEDs, they recite a first/second/third/fourth “plurality of LEDs.” Petitioner makes no argument that the claimed “plurality of LEDs” are interchangeable with the “string” of LEDs discussed in the specification. Moreover, even if the terms were interchangeable, Petitioner has not shown that an embodiment from the specification should be imported into the claims.

Petitioner therefore disagrees that plain and ordinary meaning of “plurality of LEDs” includes physically-separate phosphor layers. But Petitioner does not believe that this requires an explicit construction of the term. Petitioner reserves the right to seek a construction to reflect the understanding of a POSA later in this proceeding.

B. “linear light-emitting diode (LED) lighting apparatus” – Claim 1

The preamble of claim 1 requires, in part, “[a] linear light-emitting diode (LED) lighting apparatus.” This provides antecedent basis for “*the* linear LED lighting apparatus” in 1[h]. “[D]ependence on a particular disputed preamble phrase for antecedent basis may limit claim scope because it indicates a reliance on both the preamble and claim body to define the claimed invention.” *Catalina Marketing Int’l v. Coolsavings.com*, 289 F.3d 801, 808 (Fed Cir. 2002). In claim 1, the dependence of this term from the preamble shows that the patentee intended that this term in the preamble be limiting, as a matter of claim construction.

V. THE CLAIMS OF THE ’302 PATENT ARE PATENTABLE OVER THE ASSERTED GROUNDS.

A. Ground 1: The Petition fails to show that Claims 1, 2, 4, 5, 6, 7, 9-20 would have been obvious over Edwards and Sadwick.

Ground 1 alleges that independent claims 1, 10, and 18 are obvious over the combination of Edwards and Sadwick. “An obviousness determination generally requires [1] a finding that all claimed limitations are disclosed in the prior art, and [2] that a person of ordinary skill in the art would have been motivated to combine or modify the teachings in the prior art” *Univ. of Strathclyde v. Clear-Vu Lighting LLC*, 17 F.4th 155, 160 (Fed. Cir. 2021) (citations omitted).

Ground 1 fails because (1) the combination fails to disclose each claimed aspect to arrive at a workable solution and (2) the proffered motivation to combine is insufficient.

1. Edward and Sadwick fail to teach 1[b]: “a first plurality of LEDs configured to produce a first light having a first color temperature.”

a. Petitioner has not shown that Edwards teaches LEDs configured to produce a first light having a first color temperature.

The Petition does not allege that Edwards LEDs, by themselves, produce a first light having a color temperature. This is because color temperature is a property of white LEDs, and Edwards uses non-white LEDs in combination with a remote wavelength conversion component to produce white light with a color temperature. Ex.1005-Fig.1B;Ex.2018¶¶52-65. Instead, the Petition alleges that “[e]ach of the LEDs 21a produces light having a first color temperature when it emits light through a corresponding segment of the wavelength conversion component.” Pet.at14. Petitioner fails to show that if the wavelength conversion component were omitted, then the light emitted would have a first color temperature. Instead, if there is light with a first color temperature, it is emitted from the fixture of Edwards as-a-whole, not from “a first plurality of LEDs,” as required by the claim. Ex.2018¶¶59-60.

Petitioner offers an alternative theory that “Edwards discloses that the sets of LEDs themselves may emit different colors, with one group being red, and another group being blue, and would thus produce light having different color temperatures from the dies.” Pet.at15;Ex.1002-¶125. Petitioner’s expert reasons that a POSA could arrange a collection of blue, red, yellow, orange, and yellow LEDs so that the arrangement of LEDs “would appear to an observer as being white.” Ex.1002-¶123. Petitioner’s expert reaches this hypothetical arrangement based on a passage from Edwards that simply states that “the invention may be practiced using any combination of LEDs 21, that produce different colors of light.” Ex.1002-¶122 (citing Ex.1005-6:25-29). The chasm between the very broad statement from the Edwards’s specification and Petitioner’s expert’s unsupported conclusion is apparent. There is no teaching in the ’302 Patent, any of Petitioner’s references, or any other reference for such an arrangement of LEDs. Ex.2018-¶66.

As a further alternative, Petitioner argues that a POSA would substitute the non-white LEDs of Edwards with the white LEDs of Sadwick. As discussed below, a POSA would not make such a substitution.

b. Petitioner provides insufficient non-hindsight basis to combine Edwards and Sadwick to arrive at the claimed invention.

A POSA would not consider modifying Edwards with the teaching of Sadwick for multiple reasons. *First*, Petitioner's proposed combination of Edwards and Sadwick would remove the touted benefits of Edwards's fixture. *Second*, Petitioner provides no evidence to support that use of Sadwick's phosphor-coated LEDs would actually improve Edwards. *Third*, Petitioner has not shown that a POSA would have a reasonable expectation of success combining Sadwick with Edwards. The only rationale for Petitioner's proposed combination is thus based on hindsight.

i. Petitioner's proposed combination of Edwards and Sadwick removes the alleged benefits of Edwards' fixtures.

The Edwards inventors were aware of white LEDs where the phosphor material is a layered on the LED die. Ex.1005-1:17-22. But Edwards' inventors intentionally chose not to use Sadwick's white LEDs; instead, they chose to use a physically-separate integrated wavelength conversion component with phosphor. Ex.1005-6:8-13. Edwards describes numerous advantages of this chosen arrangement over the combination now proposed by Petitioner.

First, Edwards's lighting fixture arrangement allows for a uniform set of LEDs because the color temperature is regulated by the separate wavelength

conversion component rather than by a phosphor layer on the LED die itself.

Ex.1005-6:8-21;Ex.2018¶¶69-70. Edwards describes an embodiment where “the LED chips generate blue light” and “the phosphor(s) absorbs a percentage of the blue light and re-emits yellow light or a combination of green and red light, green and yellow light, green and orange or yellow and red light.” Ex.1005-6:12-17. The light not absorbed by Edwards’s wavelength conversion component “appears to the eye as being nearly white in color” with a color temperature. Ex.1005-6:17-21.

Edwards states that this arrangement is superior to “conventional LED-based linear lamps” because conventional LED based lamps “suffer from undesirable dimming characteristics for certain lighting applications.” Ex1005-10:10-13. Edwards further states that in embodiments “the arrays of LEDs are all selected to have the same color (e.g., blue LEDs) [and] [b]ecause all of the LEDs would be the same color (e.g., blue), this makes the electronics much simpler to implement (e.g., because they can be drive with the same voltages and drive conditions). . . There is also the benefit of simplicity of manufacturing.” Ex.1005-17:8-12. As Patent Owner’s expert explains, the use of the wavelength conversion component results in less heat on the LEDs. Ex.2018¶¶71-72. Edwards therefore teaches away from Petitioner’s proposed modification of Edwards to use Sadwick’s phosphor-coated LEDs.

Second, Edwards states that “[a]nother benefit pertains to the use of remote phosphor, which allows for improved light uniformity and ‘fill’ without excessive pixelation.” Ex.1005-17:12-16. Petitioner fails to account for the loss of this improved light uniformity and “fill” in its proposed combination.

Third, Edwards’s use of a separate wavelength conversion component allows for heat dissipation to be performed away from the LED. Edwards states that “a heat sink can be integrally formed into the integrated wavelength conversion component 10.” Ex.1005-9:40-42. Edwards states that this heat sink is an advantage because “[t]he integrally formed heat sink may be used to avoid the need to add an external heat sink during the manufacturing process for the lamp.” *Id.*-9:54-56. As Patent Owner’s expert explains, in a system using LEDs with a phosphor layer on the LED die, more heat must be dissipated from the LED die than in Edwards’ remote integrated wavelength conversion arrangement. Ex.2018¶¶71-72. Petitioner’s proposed combination of Edwards and Sadwick removes the advantage of heat dissipation on the separate wavelength conversion component. Petitioner does not explain how a POSA would compensate for the additional heat generated by Sadwick’s LEDs in the Edwards fixture.

Edwards’s inventors were well-aware of white phosphor-coated LEDs of Sadwick, but they intentionally chose *not* to use the arrangement now proposed by

Petitioner for the reasons discussed above. Petitioner's proposed combination is plainly motivated by hindsight to reconstruct the claims of the '302 Patent.

- ii. The combination of Edwards and Sadwick does not actually improve Edwards.

Petitioner contends that Edwards light fixture produces white light with color temperatures. Likewise, Petitioner contends that the same result is achieved by Sadwick's phosphor-coated LEDs. Nonetheless, Petitioner proposes that a POSA would (i) replace Edward's non-white LEDs with Sadwick's phosphor-coated white LEDs (despite Edwards' inventors rejecting this option); and (ii) physically tear out and throw away Edwards' wavelength conversion component. This is a substantial amount of modification to Edwards's fixture to achieve the same result. Petitioner's expert suggests that the removal of Edwards's wavelength conversion component and substitution of LEDs would result in "cost and manufacturing advantages of employing white LEDs", but his opinion is not supported by any evidence. Ex.1002-¶131;Ex.2018,¶69-70.

- iii. Petitioner has not shown that a POSA would have a reasonable expectation of success combining Sadwick with Edwards.

Petitioner has failed to show that a POSA would have a reasonable expectation of success with its proposed combination of Sadwick's LEDs into Edwards's fixture. The Petition states that because "Sadwick is directed towards

the same basic mechanism for controlling color temperature as Edwards, a POSA would have had a reasonable expectation of success swapping Edwards's white LEDs using a wavelength conversion component for Sadwick's conventional white LEDs." Pet.at17. *First*, as discussed below with respect to 1[g], Edwards uses a potentiometer based control system and Sadwick uses a time-based control system. See *infra* V.A.3. Petitioner's statement that the two system "use the same basic mechanism for controlling color temperature" is flatly incorrect. *Second*, Petitioner has failed to show how the proposed combination would overcome the deficiencies discussed above. For example, Petitioner and Petitioner's expert's reasoning for a reasonable expectation of success is simply that a POSA would swap in Sadwick's phosphor-coated LEDs and rip out and throw away Edward's wavelength conversion component. Pet.at17;Ex.1002-¶132. This reasoning ignores, for example, how the thermal issues identified above would be handled by the combined system. Ex.2018-¶71. For at least these reasons, the Petitioner has failed to show that a POSA would have a reasonable expectation of success in making the proposed combination.

2. Petitioner has not shown that Edwards and Sadwick teach 1[c] "a second plurality of LEDs configured to produce a second light having a second color temperature different from the first color temperature, wherein the second plurality of LEDs align within a second linear shape."

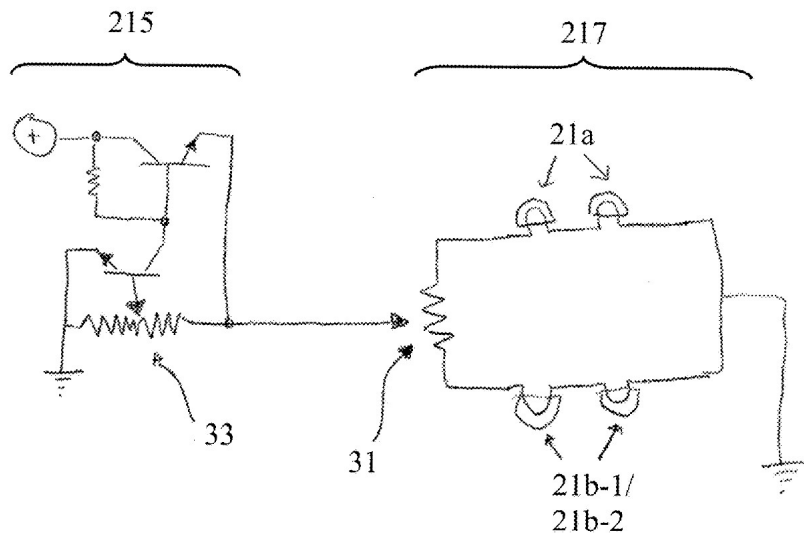
Petitioner relies on the same prior art teachings and reasoning as for 1[b] above. Pet.at17-18. Patent Owner disagrees for the same reasons presented above for 1[b].

3. Petitioner has not shown that Edwards and Sadwick teach 1[g]: "a second switch configured to cause the one of the plurality of currents to couple to the first plurality of LEDs, the second plurality of LEDs, or both."

- a. Petitioner has not shown that Edwards teaches 1[g].

Petitioner maps 1[g] to Edward's color temperature switch 215b. Pet.at26. Edwards describes the operation as "[t]he color temperature of the final light emission is controlled by the color temperature switch 215 *b*, where a cooler light emission is produced by shifting a higher proportion/ratio of the power to the LEDs 21 *a* that corresponds to portion 20 *a* (cool white light) and shifting a lower proportion/ratio of the power to the LEDs 21 *b*-1 and 21 *b*-2 that corresponds to portions 20 *b*-1 and 20 *b*-1 (warm white light)." The Petition fails to show, however, how "shifting a higher proportion/ratio of power to the LEDs 21a" meets the claimed "caus[ing] the one of the plurality of currents to couple to the first plurality of LEDs, the second plurality of LEDs, or both.." Ex.2018-¶¶74-78.

Petitioner further maps this element to resistor 31 in Edward's Fig. 5. That variable resistor 31 is a "potential divider and is used to select the relative drive currents I_A and I_B to achieve selected correlated color temperature (CCT). Ex. 1005-14:17-29.



Ex.1005-Fig.5.

Petitioner fails to show how variable resistor 31 is "configured to cause the one of the plurality of currents to couple to the first plurality of LEDs, the second plurality of LEDs, or both" as required by the claim. In particular, Petitioner does not explain how LEDs 21a or 21b are coupled to (or decoupled from) one of a plurality of currents. Ex.1008- ¶¶76-78

Petitioner further cites to Fig. 6 and 7 from Edwards, but it does not include any explanation of whether or how these circuits meet 1[g]. Patent Owner reserves the right to offer further rebuttal on these circuits if further analysis is presented.

b. Petitioner has not shown that Sadwick teaches 1[g].

In Sadwick, “[c]urrent is time-divided between two banks 820, 822 of solid-state lighting of any type, alternately lighting one and then the other.” Ex.1003-¶0194. Petitioner does not allege that current is ever provided to both banks 820 and 822 at the same time. Instead, Petitioner’s expert explains that “[t]he current splitter shown by Sadwick in Fig. 35 above is known as a ‘time splitter’ [that] ‘splits’ current in time by rapidly turning on and off the LED arrays.” Ex.1005-¶172. Claim 1[h], requires that the “second switch [is] configured to cause the one of the plurality of currents to couple to the first plurality of LEDs, the second plurality of LEDs, **or both**.” Sadwick’s time splitter never couples **both** banks 820 and 822 at the same time. Petitioner has therefore failed to show that Sadwick meets 1[g]. Ex.1008-¶¶79-80.

c. Petitioner fails to show why a POSA would combine the control circuit of Sadwick with Edwards.

Petitioner makes a general statement to combine Sadwick’s control circuit of Fig. 35 with Edwards. Petitioner states “as set forth above for elements 1[a] and

1[d], it would also be obvious to use the current control mechanism of Sadwick with the disclosure of Edwards with a reasonable expectation of success.”

Pet.at29. But 1[a] and 1[d] are plurality of LEDs, not control circuits. As an initial matter, Patent Owner rebutted the alleged motivations for combination above. See supra V.A.1.b. Petitioner has not shown why the motivations to combine Sadiwck’s LEDs into Edwards’ circuit would further motivate a POSA to combine the time-division control circuit of Sadwick into the fixture of Edwards. And Petitioner has not offered an independent motivation to combine Sadwick’s time-divided control circuit into Edwards’ fixture. Ex.2018-¶¶81-82.

4. Petitioner has not shown that Edwards and Sadwick teach 1[h]: “wherein the linear LED lighting apparatus is configured to electrically couple to an additional linear LED lighting apparatus having a second length different than the first length by a scale factor, wherein the additional linear LED lighting apparatus is configured to produce a third light having the first color temperature via a third plurality of LEDs or a fourth light having the second color temperature via a fourth plurality of LEDs.”

Petitioner relies solely on Edwards for this limitation, but Edwards fails to teach this limitation.

Claim 1[h] requires, in part that, “the linear LED lighting apparatus is configured to electrically couple to an additional linear LED lighting apparatus having a second length different than the first length by a scale factor.” The Petition relies on two portions of Edwards. The first portion discusses that “[t]he

case 1307 may further comprise an electrical connector 1309 (e.g., plug) extending past the length of the body 1301 on one end, and a recessed complimentary socket (not shown) configured to receive a connector on another end” and that “this allows several linear lamps 1300 to be connected in series to cover a desired area.” Ex.1005-15:52-58. The second portion of Edwards relied on discusses that Edwards’s lamps “range from 1 foot to 6 feet.” Ex.1005-15:59. Petitioner does not explain why this set of passages would teach a POSA to use two lamps of different lengths together. It is equally possible to use two lamps of the same length and thereby this limitation is not satisfied. Petitioner’s expert provides no further reason why a POSA would connect two lamps of different lengths together based on the teaching of Edwards. Ex.2018-¶¶87-88.

Claim 1[g] also requires matching color temperatures in the corresponding plurality of LEDs between the two fixtures. For this portion of 1[g], Petitioner offers only the conclusory statement that the color temperatures would match without any reasoning. Pet.at30. Patent Owner’s expert has explained why Petitioner’s bare assumption that these color temperatures would match is simply not supported. Ex.2018-¶¶90.

5. Petitioner has failed to show that Edwards and Sadwick meet independent claim 10.

a. Petitioner fails to analyze the claim language of claim 10.

Petitioner includes charts with the “claim feature” and where Petitioner argues that the “claim feature” is found for claims 10 and claim 1. Pet.36-38;Ex.1002-¶¶202-203. Petitioner’s “claim feature” appears to be a summarized or abbreviated version of the actual claim elements. For example, claim 10[b] recites “a first plurality of light-emitting diodes (LEDs) arranged within a first linear form factor and having a first number of LEDs, each LED of the first plurality of LEDs associated with a first color temperature.” In Petitioner’s chart this element is listed as “plurality of LEDs having first color temperature, and in linear form factor.” Pet.at81. The entry in Petitioner’s chart plainly is not the same as the actual claim language. Furthermore, Petitioner has not even requested that the actual claim language should be interpreted as the table entry based on claim construction. An invalidity analysis must be based on the actual claim language and not based on a summarized “claim feature” as shown in Petitioner’s table. This element is also not identical to claim element 1[b], which Petitioner’s lists in his chart for this element. Pet.at81.

Petitioner alleges, but does not explain why, “the following features are substantially identical between claim 1 and claim 10 and rendered obvious by

Edwards in view of Sadwick based on the disclosures and analysis for the corresponding elements in claim 1.” Pet.35-36;Ex.1002-¶¶202.

b. Edwards does not teach [10b] and [10i] because Edwards’s LEDs do not produce light having a color temperature and a POSA would not combine Edwards with Sadwick.

Petitioner states that claim 10[b] “substantially identical” to claim element 1[b]. Pet.at35-36;Ex.1002-¶¶202-203. If the Board agrees with Petitioner’s expert’s statement that these are substantially identical to claim 1[b], then these elements are not taught by Edwards or Sadwick for the same reasons as claim 1[b].Ex.2018-¶¶94-95.

Petitioner states that 10[i] is “similarly rendered obvious” over Petitioner’s mapping for 1[b]. Pet.at37. With respect to the portion of this limitation requiring that the “second number” of LEDs be greater than the “first number” of LEDs, Petitioner argues that this is obvious without any supporting evidence. Pet.at38-39; Ex.1002-¶¶206-209. Moreover, Petitioner’s argument does not address the deficiency that Edwards’s LEDs do not have a color temperature. Further, a POSA would not combine Edwards with Sadwick for the reasons discussed above for claim 1[b]. Ex.2018(Katona Dec.),¶¶93-95.

c. Edwards does not teach 10[m] because Edwards and Sadwick do not disclose or teach scaling current by a scale factor to the second plurality of LEDs.

Petitioner states 10[m] this is “similarly rendered obvious by Edwards in view of Sadwick according to the disclosures and analysis that I have presented for” for claim element 1[g]. Pet.37-38;Ex.1002-¶203. This element is not taught by Edwards or Sadwick for the same reasons discussed above for claim 1[g]. Ex.2018(Katona Dec.),¶¶96-99.

Petitioner does not argue that the current scaling of 10[m] is taught in Edwards or Sadwick. Instead, Petitioner argues that a POSA would modify the circuits of Edward or Sadwick, without any support from the references. Pet.40-41;Ex.2018-¶99. Petitioner further argues that a POSA would rearrange the circuits of both Edwards and Sadwick so that some strings of LEDs are connected in parallel, rather than series. Pet.40-41;Ex.1002-¶¶ 216-231. That such a modification *could* be made is not the issue. The issue is whether a POSA *would be motivated* to make such a modification, and Petitioner’s expert has simply not shown that the POSA would modify the references in this way. Ex.2018-¶99. Furthermore, Petitioner’s expert is relying on other references to show this motivation, but those references are not part of the Ground. *See* 37 CFR 42.104(b)(2) (the Petition must identify “[t]he specific statutory grounds under 35

U.S.C. 102 or 103 on which the challenge to the claim is based and *the patents or printed publications relied upon for each ground.*”);Ex.1002-¶¶219-222.

d. Edwards and Sadwick do not teach at least limitation 10[f] because Edwards does not disclose a switch configured to cause one of the plurality of currents to couple to the first plurality of LEDs, the second plurality of LEDs, or both.

Petitioner argues that that 10[f] is “substantially identical” to 1[g] and therefore obvious over Edwards and Sadwick. Pet.80. Patent Owner disagrees for the reasons for 1[g] above. Ex.2018-¶100.

6. Petitioner has failed to show that Edwards and Sadwick meet independent claim 18.

a. Petitioner fails to analyze the claim language of claim 18.

As discussed above with respect to claims 10, Petitioner includes charts with the “claim feature” and where Petitioner believes that “claim feature” is found in claim 18 and claim 1. Pet.45-47;49-50. Petitioner’s “claim feature” suffers the same issues discussed above with respect to claim 10. Ex.2018-¶¶102-103.

Petitioner has no explanation for its assertion that “the following features are substantially identical between claim 1 and claim 18 and accordingly for these elements of claim 18 these limitations are rendered obvious by Edwards in view of Sadwick based on the disclosures and analysis for the corresponding elements in

claim 1.” Pet.45-47;Ex.1002-¶242. The plain language of the claims is not “substantially identical.”

b. Edwards does not teach 18[c] and 18[d] because Edwards’s LEDs do not produce light having a color temperature and a POSA would not combine Edwards with Sadwick.

Petitioner argues that 18[c] and [d] are “substantially identical” to claim elements 1[b] and 1[c], respectively. Pet.45-46;Ex.1002-¶242. If the Board agrees that these are substantially identical to claims 1[b] and 1[c], then Patent Owner disagrees that these elements are taught by Edwards or Sadwick for the same reasons stated above for claims 1[b] and 1[c]. Moreover, a POSA would not combine Edwards with Sadwick for the reasons stated above for claim 1[b]. Ex.2018-¶104.

c. Sadwick and Edwards do not teach 18[o] and 18[p] because Edwards LEDs do not produce light having a color temperature and a POSA would not combine Edwards with Sadwick.

Petitioner argues that these claim elements correspond to claim elements 1[b] and [c], respectively. Pet.48-49;Ex.1002-¶247. Petitioner’s further arguments regarding the portion of the claim requiring that the first plurality of LEDs being longer than the second plurality of LEDs do not address the failure of Edwards to disclose LEDs having a color temperature, as discussed with respect to 1[b] and

1[c]. Pet.50-51;Ex.1002¶¶248-249. Moreover, Patent Owner’s expert shows that Petitioner’s reasoning is simply that it would be obvious without any supporting evidence. Ex.2018-¶105. Patent Owner therefore disagrees that these elements are disclosed or taught by Edwards or Sadwick for the same reasons stated above for claims 1[b] and 1[c].

d. Edwards and Sadwick do not teach 18[i], 18[j], 18[k], and [l] because Edwards and Sadwick do not disclose or teach the claimed second switch.

Petitioner argues that 18[i], [j], and [k] are “substantially identical” to claim element 1[g]. Pet.45-47;Ex.1002-¶242. If the Board agrees, Patent Owner disagrees that these elements are taught by Edwards or Sadwick for the same reasons stated above for claim 1[g]. Ex.2018-¶¶106-109.

With respect to 18[l], Petitioner argues that “Edwards discloses the entirety of a range of potential current distributions, from all of the current going to the first set of LEDs and second set of LEDs and all ranges in between” and that “[a] system in which maximum current levels are going to both sets of LEDs at the same time would entail sending half of the overall current to each set of LEDs and thus be within the scope of the claims.” Pet.47-48. As Patent Owner’s expert explains, simply because all LEDs are utilized does not mean that there is equal

current provided to both sets of LEDs, just that some current is provided to the LEDs. Ex.2018-¶108.

Petitioner argues that “[t]o the extent sending equal amounts of current is not expressly disclosed, it is obvious” and that “a POSA would be motivated to add a light setting where half goes to each as one of the commonly used applications for the varying light distribution with a reasonable expectation of success.”

Pet.48;Ex.1002-¶246. This is just a conclusory assertion without any supporting evidence. Ex.2018-¶¶108-109.

e. Edwards and Sadwick do not teach 18[t], [u], [v], and [w] because they do not disclose or teach the claimed fourth switch.

Petitioner maps 18[t], [u], and [v] to claim element 1[g]. Pet.92;Ex.1002-¶247. Patent Owner disagrees that these elements are taught by Edwards or Sadwick for the reasons stated above for claim 1[g]. Ex.2018-¶¶110-111. For 18[w], Petitioner refers to its argument for 18[l]. Pet.51 Patent Owner disagrees for the reasons presented above for 18[l]. Ex.2018-¶112.

7. Petitioner has failed to show that Edwards and Sadwick meet dependent claims 2, 4, 5, 6, 7, 9, 11-17, and 19-20.

Dependent claims 2, 4, 5, 6, 7, 9, 11-17, and 19-20 depend from one of claims 1, 10, and 18, which Petitioner has failed to show are unpatentable. If the prior art does not demonstrate that an independent claim is unpatentable, it cannot

be used to demonstrate that any corresponding dependent claim is also unpatentable. *See Hartness Int'l Inc. v. Simplimatic Eng'g Co.*, 819 F.2d 1100, 1108 (Fed. Cir. 1987).

B. Ground 2: Claims 2, 3, and 8 and not obvious over Edwards and Sadwick and further in view of Jeswani.

This ground is directed to dependent claims 2, 3, and 8, which depend from claim 1. Petitioner does not allege that Jeswani supplies the missing limitation from Edwards or Sadwick for independent claim 1. Therefore, for the reasons discussed above for Ground 1, this ground also fails. Patent Owner reserves the right to offer additional arguments why this ground fails if the IPR proceeds.

C. Ground 3: Claims 1-14 and 16-20 are not Obvious over May in view of Jeswani

Ground 3 alleges that independent claims 1, 10, and 18 are obvious over the combination of May and Jeswani. To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 180 U.S.P.Q. 580 (C.C.P.A. 1974). Indeed, the factual inquiry determining whether to combine references must be based on ***objective evidence of record***. *In re Lee*, 61 U.S.P.Q.2d 1430, 1436 (Fed. Cir. 2002).

Ground 3 fails because (1) the proffered motivation to combine is insufficient; and (2) the proposed combination would change the principle operation of May.

1. May and Jeswani fail to teach 1[e]: “a switch assembly configured to couple to the driver circuit.”

a. May and Jeswani do not teach 1[e] because there is no objective reason to combine a switch assembly to couple to a driver circuit.

Claim element 1[e] requires “a switch assembly configured to couple to the driver circuit.” The factual inquiry determining whether to combine references must be based on *objective evidence of record*. See *In re Lee*, 61 U.S.P.Q.2d 1430, 1436 (Fed. Cir. 2002). In view of this, Patent Owner stresses that there is no objective evidence in May or Jeswani to motivate a POSA to combine the network-controlled lighting system of May with the physical switches of Jeswani as claimed in [1e].

Petitioner admits that May does not teach a switch assembly and argues that Jeswani discloses an “interface on the lamp housing 100 for selecting a lumen setting and for selecting a correlate color temperature (CCT) setting for the light.” Pet.64;Ex.1007-8:19-25. Petitioner then argues that a POSA would be motivated to include the external CCT and brightness controls of Jeswani on the outer housing of the lamp 100 of May to control color temperature and brightness. Pet.66.

However, there is no objective evidence in May that suggests combining the controls of Jeswani with the lighting system of May. Ex.2018,¶¶116-118. Indeed, based on the descriptions of May and Jeswani provided above, a POSA would see

no reason to modify May to include the switches 15, 15b of Jeswani. At best, since Jeswani describes a manner in which to control downlight 100 in a remote fashion, a POSA *may* be motivated to modify the network-controllable lighting system of May in view of the remote-control features described in FIG. 7 of Jeswani.

Ex.2018-¶51. However, neither May nor Jeswani provides any objective reasoning to modify the remote controllable lighting system of May or the remote controllable downlight 100 of Jeswani to incorporate the physical switches 15a,15b of Jeswani. Indeed, if Jeswani anticipated using this combination, Jeswani would provide some insight into integrally combining the local controls provided by the switches 15a, 15b with the controller 130 that implements various lighting modes. *Id.*

Petitioner suggests that a POSA would include the external CCT and brightness controls of Jeswani on the outer housing of lamp 1100 of May to allow local control of each lamp in the event of a network failure. Pet.66-67. In support of this, Petitioner fails to cite to any disclosure in May or Jeswani indicating a motivation for the POSA to make the proposed modification other than the Petitioner's conclusory statement that such a modification would be a combination of known elements to obtain a predictable result. Pet.67.

Indeed, May *never* mentions the need to have local control of its lighting system. Instead, the focus of May is to provide a cost-effective solution to allow the benefits of “PoE LED lamp technology to be fully realized in the LED tube format, greatly expanding the potential benefits of, and applications for, PoE enabled LED lighting.” Ex.1008-¶¶30,241-242. Since May is focused on providing *networking capabilities* to lighting systems, May is unconcerned about the need to provide local controls, such as a switch, to enable a user to locally control the operation of the lighting system. Ex.2018-¶118.

Nevertheless, Petitioner insists that a POSA would be motivated to combine the switch for CCT and brightness controls to allow local control of each lamp in the event of a network failure. Pet.67. However, in making this statement, Petitioner ignores May’s actual proposal to address a power failure scenario. That is, in the event of a power failure, May indicates that LED emitter strings may be driven from an uninterruptible power supply (UPS) module 1132 to provide room lighting. Ex.1008-¶0226.

In the event of a network failure, it is also highly unlikely that a user would reach into the ceiling to physically adjust the position of a switch to adjust the brightness or CCT of the lighting system. Ex.2018,¶120. That is, May provides for PoE-enabled LED lighting that is removably mountable to a ceiling grid or support

structure. Ex.1008-¶30. As such, to locally adjust the brightness and CCT settings during a network outage, a user would need to gain access to the lighting system affixed to the ceiling after the network failure event occurs. Ex.2018-¶120. This is both impractical and highly unlikely, as the brightness and CCT settings are not likely concerns of users in a building having network-enabled lighting systems trying to operate in the event of a network failure. *Id.*

Instead, a POSA would assume that in the event of a network failure that the product would have a default condition that it reverts to that would replicate “typical” operation, unless there was some particular reason to alert the user of this “network outage.” *Id.* As such, an individual would not need to access a drop ceiling and manually switch over tens to hundreds of fixtures but could rely instead on a default condition implemented by the respective lighting systems. Ex.2018,¶122.

In view of the above, there is no evidence in May that teaches or suggests a reason to include the switch of Jeswani in the lighting system of May. In contrast, May provides explicit lighting solutions to address network and power supply issues that provide the advantage of maintaining operations according to a default condition in the event of power or network failure.

b. May and Jeswani do not teach [1e] because the proposed combination would change the principle of operation of the lighting system of May.

Patent Owner respectfully reminds the Board that if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (CCPA 1959); see M.P.E.P. § 2143.01.

With this in mind, the primary focus of May is providing integrated power and data connectivity to support network-compatible LED lighting systems. *See* Ex.1008-¶241. Indeed, the entire disclosure of May describes the benefits of updating existing lighting fixtures (e.g., fluorescent) with PoE smart lighting technology in a cost-effective manner. *Id.* As such, May provides details related to operating the lighting system in a network environment. For example, the lighting system of May includes a control module 1132 that receives illumination control packets via an Ethernet connection and outputs controls for parallel driver sub-circuits that provide power to different LED emitter strings. Ex.1008-¶¶222,233. As such, incorporating physical switches in the lighting system of May removes all of the advantages related to employing PoE smart lighting technology.

As discussed above, a POSA would likely assume that in the event of a network failure that the product would have a default condition that it reverts to that would replicate “typical” operation. Ex.2024. As such, a POSA would understand that the control module 1132 would likely execute default instructions and there would be no practical need to use local switches to control tens to hundreds of lighting fixtures in the event of a network outage. Ex.2018-¶125.

Indeed, May only describes operating the LED emitter strings via driver sub-circuits based on instructions executed by a processor. For instance, May describes networking manually operated light switches (e.g., wall mounted) into the lighting system to cause a processor 1204 to execute instructions that signal a power control module 1206 to control driver 1208 to turn an LED array on or off. Ex.1008-¶0215.

May never anticipates incorporating local switches on the housing of its lighting systems to control brightness and CCT of the lighting system. Indeed, once the lighting systems are installed in the ceiling, it would be more prudent to use remote switches because it’s impractical to change the setting of the local switches in a number of different light fixtures. In this way, Petitioner is asserting that a POSA would ignore May’s ability to remotely control the brightness and CCT of the light system based on network-transmitted instructions executed by a processor

and instead install light switches that require users to locally access the lighting systems to change the brightness and CCT disposed in ceilings. Ex.2018-¶127.

Indeed, it is unclear to a POSA how the lighting system of May would be designed to operate with local switches when the entire disclosure of May relies on executing instructions based on control packets sent via Ethernet or some other data communication platform. Ex.2018-¶128. Moreover, Petitioner fails to provide any insight into how May would operate with the local switches when the network is available. *Id.*

In addition, as mentioned above, May already includes details about operating the lighting system when the network is interrupted. Ex.1008-¶¶226-0227. To accommodate the local switches of Jeswani during a network outage, the computer code executed by the control module 1132 of May would need to be further modified to disregard the disclosed procedure to respond to emergency lighting scenarios and instead defer to the settings of the local switches of Jeswani. *See id.* However, Petitioner and May fail to provide any insight or suggestion as to why a POSA would be motivated to change the described operations of May to respond to a network interruption of May and instead defer to using the local switches provided by Jeswani. Ex.2018-¶129.

Indeed, an advantage of employing May's lighting system includes alerting users of network and power failures by modifying the produced light. Ex.1008-¶¶226-0227. However, in the proposed combination of May and Jeswani, in the event of a network failure, the control module 1132 would implement the settings defined by the local switches of Jeswani to produce light, thereby ignoring the benefits of the automated lighting features of May's system. Ex.2018-¶130. Indeed, the ability of May's system to operate in specific ways under certain circumstances is rendered useless when the lighting system defers to a setting set via a local switch.

May takes care to describe manufacturing the networking-capable lighting system in a cost-effective manner. Ex.1008-¶0031. In this way, adding any additional circuitry, such as the local controls of Jeswani, would increase the costs associated with manufacturing the lighting system and adversely affect the aesthetics of the lighting system of May. Ex.2018-¶131.

In view of the above, controlling the network-enabled lighting system of May using local controls would render the benefits of employing PoE technology in the May system useless. Indeed, including the local switches of Jeswani would change the principle operation of at least the control module 1132 of May by requiring it to include additional computer code that accounts for the settings of the

local switches when operating the LED arrays. Ex.2018-¶132. Indeed, if the lighting system of May used the local switches of Jeswani to control its brightness and CCT, the network capabilities and the UPS module integrated into the lighting system or the automated instructions to account for a power or network failure event would be rendered useless. *Id.*

2. May and Jeswani fail to teach [1d], [1f], and [1g] because the combination of May and Jeswani does not allow for one current output to be coupled to two pluralities of LEDs.

Claim 1 requires a driver circuit configured to output a plurality of currents (Claim [1d]), a first switch configured to cause the driver circuit to output one of the plurality of currents (Claim [1f]), and a second switch configured to cause the one of the plurality of currents to couple to the first plurality of LEDs, the second plurality of LEDs, or both (Claim [1g]). In other words, the combination of May and Jeswani should teach a first switch that selects one current of a plurality of currents to be output by a driver circuit and a second switch that causes the selected current to be coupled to the first plurality of LEDs, the second plurality of LEDs, or both. With this in mind, it is clear that the combination of May and Jeswani does not teach causing the selected current output by the driver circuit to be coupled to *both* the first plurality of LEDs and the second plurality of LEDs.

Petitioner asserts that Jeswani discloses switch 15a to control brightness and, when integrated within the lighting system of May, this switch would cause the control module of May to control the brightness of the lighting system. Pet.68. Petitioner also asserts that Jeswani discloses a switch 15b that controls the color temperature by varying current between two strings of LEDs and accordingly current is coupled to either or both of the strings of LEDs. Pet.69. However, in combining the switches 15a and 15b of Jeswani with the lighting system of May, Petitioner fails to appreciate the differences between how each respective driver of May and Jeswani connects to the different strings of LEDs. In view of these differences, the combination of May and Jeswani does not allow for one current output to be coupled to two pluralities of LEDs.

Referring first to May, the control module of May is designed to receive instructions from data communications (e.g., Ethernet packets) to modify aspects of the operation of the LED lamp based on the instructions, and the control module may independently control the magnitude of DC current provided to each string of emitters via independent sub-circuit drivers based on the control instructions. Ex.1002-¶278. With this in mind, Jeswani fails to provide any discussion how the local switch 15a would provide *data* to a control module of May to control the independent operation of the sub-circuit drivers of May. Ex.2018-¶135. Indeed,

each LED array of the lighting system of May is described as being independently controlled by a corresponding sub-circuit driver based on control instructions provided as Ethernet packets to a control module. Ex.1008-¶231. In response to receiving the control instructions, the control module controls corresponding driver sub-circuits that *independently* power each LED emitter string. Ex.1008-¶233. As such, May requires a device to send control instructions to the control module, such that the control module then controls the independent operation of the driver sub-circuits that powers respective LED emitter strings. Ex.2018-¶135. Since the switches 15a and 15b of Jeswani may be a toggle switch, a pushbutton switch, and/or a selector switch, it is unclear how any of these types of switches provide data communication, such as Ethernet packets, to a control module. Ex.1007-8:23-25. Ex.2018-¶136.

In addition, the operation of the sub-circuits of May and the electronics package 200 for controlling the illumination of the LED strings 60 of Jeswani are not compatible with each other. That is, the driver sub-circuits of May operate independently of each other and are each capable of providing an independent amount of DC current to a respective LED emitter string. Ex.1008-¶211. In contrast, the selected lumen output of switch 15a in Jeswani changes the power output provided to all of the LEDs 50 of Jeswani. Ex.1007-10:47-51. In this way,

all of the LEDs 50 are interconnected with the power supply in Jeswani, whereas each LED emitter string in May is independently connected to a driver sub-circuit. Accordingly, it is unclear to a POSA how the switch 15a of Jeswani that specifies an output current to be provided to the multiple connected strings of the LEDs 50 in Jeswani can be incorporated into the independently controllable sub-driver circuits of May. Ex.2018-¶139. Indeed, these two driver circuit configurations are incompatible with each other because incorporating the strings of LEDs into the driver-subcircuit of May would change the principle operation of May to independently controllable array of LEDs. Ex.2018-¶¶139-142.

Furthermore, combining the switch 15b of Jeswani, which specifies the CCT of the LEDs, into the lighting system of May fails to teach or suggest causing the one current of a plurality of currents output by a driver circuit to couple to the first plurality of LEDs and the second plurality of LEDs, as recited in claim [1g]. Again, since May employs a driver 1208 that independently controls the magnitude of the DC current transmitted to each LED array via driver sub-circuits, each the driver sub-circuit independently supplies a current to a respective LED array. Ex.1008-¶211. That is, the driver 1208 does not output one current to two LED emitter strings, such that the one current is split among the two LED emitter strings. In contrast, the driver 1208 precisely controls the magnitude of the DC current

transmitted to each LED emitter string via a respective driver sub-circuit. *Id.* In other words, May is incapable of providing one current of a plurality of currents to two LED emitter strings because each driver sub-circuit independently provides a respective current to the respective LED emitter string. Indeed, May can never allow one current to be split or coupled to two LED emitter strings. Ex.2018-¶¶139-142.

Also, incorporating the switch 15b of Jeswani into the lighting system of May fails to cure this deficiency. As discussed above, the switch 15b of Jeswani enables the LED string switching scheme 78 (e.g., circuit) to determine which string of LEDs to operate. Ex.1007-11:12-15. In addition, the switch 15a specifies the output current provided to the LEDs. Ex.1007-10:47-51. As such, Jeswani's LED strings use the same output current to control the lumens and CCT of the downlight. On the other hand, since May includes independently controllable driver sub-circuits to independently control a respective LED array, the incorporation of Jeswani's switches into the lighting system of May would not be feasible with the independently controllable driver sub-circuits. Ex.2018-¶141.

Indeed, if the LED strings with different CCTs of Jeswani are incorporated into the LED array of May, May would no longer be able to independently control the CCT of the respective LED array thereby changing a principle operation of the

lighting system of May. That is, each driver sub-circuit is coupled to a respective LED emitter string. As such, two LED emitter strings are not connected to the same driver sub-circuit and thus one current output by one driver sub-circuit will never be provided to two LED emitter strings. Ex.2018-¶142.

3. May and Jeswani do not teach at least limitations and [1h] because May does not disclose an additional linear LED lighting apparatus having a second length different than the first length by a scale factor with a matching color temperature.

Claim element [1h] has two separate elements that Petitioner has not shown are disclosed or taught in May. First, [1h] says “the linear LED lighting apparatus is configured to electrically couple to an additional linear LED lighting apparatus having a second length different than the first length by a scale factor.” This means that the fixtures have two different linear lengths that differ by a scaling factor. Second, [1h] requires that “the additional linear LED lighting apparatus is configured to produce a third light having the first color temperature via a third plurality of LEDs or a fourth light having the second color temperature via a fourth plurality of LEDs.” This means that both color temperatures of the additional linear LED lighting apparatus match the (first) linear LED lighting apparatus. This is not a trivial requirement. If the two linear LED lighting apparatuses have different color temperatures, then the set of the two will look mismatched and off-

putting to an observer. Petitioner provides no evidence that this would be a motivation or concern met by May.

May discloses arranging lamps as desired to provide efficient lighting for a particular application. Ex.1008-¶193. However, May does not explicitly teach or suggest connecting fixtures of different lengths for any particular application. *Id.* Indeed, in the example described in May regarding the connected light fixtures in FIG. 22, May describes illuminating a 30x20 ft room with fifteen 4-foot lamps with 2 feet spacing between the ends of the lamps. *Id.* As such, the disclosure of May never suggests any objective reasoning to connect different-sized linear LED lamps to each other. Ex.2018-¶145.

Though claim 40 and paragraph 205 of May describe lamps designed to accept linear lamps of standardized nominal lengths of about 2 feet, 3 feet, 4 feet, these portions of May do not describe different-sized LED lamps *being connected to each other*. Ex.1002-¶287. Indeed, these portions merely indicate that the linear LED lamp of May can be used to *replace* existing light fixtures and never expressly mentions that two linear LED lamps connected to each other would be different sizes. Ex.2018-¶145. Petitioner admits that May does not expressly teach using lamps of different lengths together and attempts to cure this deficiency by arguing that a POSA would be motivated to connect different sized lamps together

to cover additional space efficiently. Pet.,p.71. However, since Petitioner fails to provide any evidence indicating any reasons within the disclosure of May that expresses any motivation for a POSA to connect the linear LED lamps of May in this manner.

Accordingly, Petitioner has not shown that May and Jeswani teach or render obvious claim 1. Moreover, based at least on their dependency from claim 1, Petitioner has not shown that May and Jeswani teach or render obvious claims 2-4 and 6-9.

4. Petitioner fails to analyze claim language of claim 10.

With regard to claim 10, as set forth in Section V.A.5.a, Petitioner includes charts with the “claim feature” and where Petitioner believes that “claim feature” is found in claims 10 and claim 1, but does not actually analyze the claim language. Pet.81-82. Since invalidity analysis must be based on the actual claim language and not based on a summarized “claim feature,” Petitioner does not meet its burden to show obviousness by a preponderance of the evidence with respect to the elements of claim 10 purported to match elements of claim 1. *See* Section V.A.5.a.

5. May and Jeswani do not teach [10c], [10d], [10e], and [10f] because a POSA would not be motivated to add local controls of Jeswani to the lighting system of May.

As discussed above with reference to claim element [1e], [1f], and [1g], a POSA would not be motivated to combine the network-controlled lighting system

of May with the physical switches of Jeswani as claimed in [10c-10f]. No objective evidence in May suggests combining the controls of Jeswani with the lighting system of May. Moreover, Petitioner fails to provide any evidence to the contrary. Ex.2018-¶¶150-154. Indeed, since May provides networking capabilities to lighting systems, May is unconcerned about locally controlling a lighting system. Moreover, Petitioner ignores May's proposal to address the suggested motivation of a POSA to attend to a power failure scenario or a network failure, as described above. Ex.2018-¶¶150-154.

6. May and Jeswani do not teach claim element [10i] because May does not disclose a second modular linear lighting apparatus having a second length different than a first length of a first modular linear lighting apparatus by a scale factor with a second number of LEDs associated with the same color temperature as a first number of LEDs of the first modular linear lighting apparatus.

As discussed above with reference to claim [1h], claim elements [10h] and [10i] state that the two modular lighting apparatuses have two different linear lengths with two different pluralities of LEDs having a different number of LEDs that differ by a scaling factor, such that the two different pluralities of LEDs are associated with the same color temperature. This means that both color temperatures of the first and second modular linear LED lighting apparatuses match each other. Petitioner provides no evidence that this requirement would be met by May. Ex.2018-¶¶155-158.

7. May does not teach 10[m] because May and Jeswani do not teach or suggest scaling a first current output to a first plurality of LEDs by a scale factor to provide a second current output to a second plurality of LEDs.

Claim 10[m] requires “a second switch assembly configured to: . . . couple the one of the second plurality of currents to the second plurality of LEDs, wherein the one of the second plurality of currents is greater than the one of the first plurality of currents by the scale factor.” Petitioner relies solely on its expert to explain that a POSA would be motivated to use parallel connected strings of LEDs to provide longer fixtures disclosed in May and would scale the amount of current necessary to drive those additional strings according to the scale factor. Pet.84-85. However, Patent Owner stresses that Petitioner and Petitioner’s Expert provide no objective evidence within May or Jeswani that supports these statements.

More specifically, Petitioner assumes that current would be scaled in a second linear lighting apparatus by the scale factor without providing any objective evidence in May or Jeswani indicating a motivation or reason for designing the two linear lighting apparatuses to implement these requirements. In contrast, the ‘302 Patent anticipates the challenges related to manufacturing multiple linear light fixtures that traverse a certain environment and provide uniform color and luminance features throughout the environment. Ex.1001-4:13-25. The ‘302 Patent also describes manufacturing the linear light fixtures at different sizes based on a

ratio between the number of LEDs, such that the current output by a driver circuit is scaled by a scale factor that matches the ratio. Ex.1001-5:38-66. As a result, different combinations of different-sized linear light fixtures can be used in different-sized environments while providing consistent light properties with the same color temperature and luminance in the environment. *Id.* That is, regardless of the size of the linear light fixture, each linear light fixture provides the same luminance because the current is scaled consistently with respect to another linear light fixture. *Id.* By designing the linear light fixtures in this manner, the manufacturing process for producing linear light fixtures becomes more efficient while maintaining the ability to facilitate the lighting needs of various sized environments. *Id.*

On the other hand, in view of the proposed combination of May and Jeswani, it is unclear what LED array arrangement would be present in the proposed combination. Indeed, as discussed above with respect to claim elements 1[d], 1[f], and 1[g], it is unclear to a POSA how the switch 15a of Jeswani that specifies an output current to be provided to the multiple connected strings of the LEDs 50 in Jeswani can be incorporated into the independently controllable sub-driver circuits of May. As such, it is unreasonable to assume that a POSA would

understand a reason to scale the current with respect to the scale factor recited in claim element 10[m]. Ex.2018-¶¶161-164.

8. Petitioner fails to analyze claim language of claim 18.

Like claim 10, Petitioner includes charts with the “claim feature” and where Petitioner believes that “claim feature” is found in claims 18 and claim 1. Pet.87-92. However, the various entries in the Petitioner’s chart are not the same as the actual claim language. Since invalidity analysis must be based on the actual claim language and not based on a summarized “claim feature,” Petitioner does not meet its burden to show obviousness by a preponderance of the evidence with respect to the elements of claim 18 purported to match elements of claim 1.

9. May and Jeswani does not teach [18f], [18g], and [18h] because a POSA would not be motivated to add local controls of Jeswani to the lighting system of May.

As discussed above with reference to claim elements [1e], [1f], and [1g], a POSA would not be motivated to combine the network-controlled lighting system of May with the physical switches of Jeswani as claimed in [18f-18g]. As discussed above, there is no objective evidence in May that suggests combining the controls of Jeswani with the lighting system of May. Moreover, Petitioner fails to provide any evidence to the contrary outside of hindsight-biased conjecture. Indeed, since May is focused on providing networking capabilities to lighting systems, May is unconcerned about locally controlling the operation of the lighting

system. Moreover, Petitioner ignores May's proposal to address the suggested motivation of a POSA to attend to a power failure scenario or a network failure.

Ex.2018-¶¶167-169.

10. May and Jeswani do not teach at least limitations and [18l] because May does not disclose a switch that causes half of a portion of a current to couple to each LED of two pluralities of LEDs.

Claim element [18l] requires a second switch that causes "half of the first portion of the one of the first plurality of currents to couple to each LED of the first plurality of LEDs and each LED of the second plurality of LEDs." As such, claim element [18l] states that half of a portion of a current output by a driver circuit is to be coupled to each LED of two pluralities of LEDs.

As discussed above with respect to claim elements [1d], [1f], and [1g], May cannot be modified to have one selected current output from a driver circuit coupled to two LED arrays. That is, since each driver sub-circuit of May is coupled to a respective LED emitter string, two LED emitter strings are never connected to the same driver sub-circuit and thus half of a portion of one current output by one driver sub-circuit will never be provided to each LED of two different LED emitter strings in May. In one example provided by May, to produce light having a CCT between 4500K and 6500K, the current provided to each LED emitter string is independently controlled via a respective driver sub-circuit based on Ethernet

packets provided to the control module 1132. Ex.1008-¶231. As such, May relies on the Ethernet packets to specify a desired CCT, and the control module 1132 then determines the appropriate drive current to provide to each LED emitter string and *independently* controls the DC current output by each driver sub-circuit accordingly. That is, the control module 1132 specifies two currents to be provided to two corresponding LED emitter strings, respectively.

Petitioner asserts that a POSA would be motivated to use the teachings of May or Jeswani to configure the lamp to a color temperature halfway between the minimum and maximum to obtain a color temperature in the middle. Pet.89-90. However, Petitioner and Petitioner's Expert never detail any reason why a POSA would modify May's LED array, which is independently controllable by a driver sub-circuit, with the parallel arrangement of the two strings of LEDs in Jeswani. Ex.1002-¶¶256,339. Indeed, by modifying the LED arrays of May according to the structure of the strings of LEDs of Jeswani, the LED arrays of May would no longer be independently controllable using a respective driver sub-circuit, thereby changing the principle operation of May. Ex.2018-¶¶170-173. Further, since May's LED arrays are independently controlled based on respective driver sub-circuits, there would never be a need to cause half a portion of one current output

of a driver circuit to be sent to each LED of two different LED emitter strings, as recited in claim [18l].

11. May and Jeswani do not teach [18a] and [18g] because there is no objective reason to combine a switch assembly described in Jeswani to couple to a driver circuit described in May.

Claim 18[g] requires “a switch assembly configured to couple to the driver circuit” as claimed in limitations [1e]. A POSA would not be motivated to combine the network-controlled lighting system of May with the physical switches of Jeswani as claimed in [18g]. As discussed above, there is no objective evidence in May that suggests combining the controls of Jeswani with the lighting system of May. Indeed, May *never* mentions the need to have local control of its lighting system. Instead, the focus of May is to provide a cost-effective solution to allow the benefits of “PoE LED lamp technology to be fully realized in the LED tube format.” Ex.1008-¶¶30,241-242. Since May is focused on providing networking capabilities to lighting systems, May is unconcerned about providing local controls to locally control the operation of the lighting system. Ex.2018-¶¶174-176.

D. Ground 4: Claim 15 is not obvious over May and Jeswani and further in view of Sadwick

This Ground is directed to dependent claim 15, which depends from claim 10. Petitioner does not allege that Sadwick supplies the missing limitation from May or Jeswani for independent claim 1. Therefore, for the reasons discussed

above for Ground 3, this ground also fails. Patent Owner reserves the right to offer additional arguments why this ground fails if the IPR proceeds.

VI. CONCLUSION

In view of the foregoing, Petitioner fails to show that there is a reasonable likelihood that the Petition will prevail on a single claim. Institution should be denied.

Respectfully submitted,

Date: November 3, 2025

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CERTIFICATE OF COMPLIANCE

Pursuant to 37 C.F.R. § 42.24(d), the undersigned certifies that this Patent Owner's Preliminary Response complies with the type-volume limitations of 37 C.F.R. §§ 42.24(b)(1) because it contains 13,679 words, as determined by the word-processing program used to prepare the brief, excluding the parts of the brief exempted by 37 C.F.R. § 42.24(a)(1).

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CERTIFICATE OF SERVICE

The undersigned hereby certifies that the foregoing PATENT OWNER'S
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