

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

**DECLARATION OF DR. THOMAS M. KATONA
IN SUPPORT OF PATENT OWNER'S RESPONSE**

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I, Thomas M. Katona, Ph.D, of San Luis Obispo, California, hereby state and declare:

I. INTRODUCTION

1. I am over the age of 18 and am competent to make this Declaration. I have personal knowledge, or have developed knowledge, of these technologies based upon my education, training, and/or experience, of the matters set forth herein. If called upon to do so, I would testify competently thereto.

2. I have been retained by counsel for Patent Owner AGS Lighting Management, LLC (“AGS”) in the above matter. I am submitting this Declaration in response to the Petition for *Inter Partes* Review for U.S. Patent 11,751,302 (“’302 Patent”) and in rebuttal to the declaration of Dr. J. Gary Eden (Ex. 1002). Specifically, I have been asked to consider the validity of the claims of the ’302 Patent (the “Challenged Claims”) in view of prior art, obviousness considerations, and understanding of a person of ordinary skill in the art (“POSA”) at the time of the invention as it relates to the ’302 Patent.

II. BACKGROUND AND QUALIFICATIONS

3. I am a Professor of Innovation and Entrepreneurship in the Biomedical Engineering Department of the California Polytechnic State University, at San Luis Obispo. Attached hereto as Appendix A is a true and

correct copy of my *curriculum vitae* describing my background and experience.

4. My graduate work at the University of California, Santa Barbara (“UCSB”), one of the premier research universities in the field of light emitting diodes and systems, included work developing, characterizing and testing optical semiconductors including LEDs and lasers. During my time at UCSB, I was involved in all aspects of the development of LEDs. I studied under Dr. Steve DenBaars and Dr. Shuji Nakamura, among others. Dr. Shuji Nakamura received the Nobel Prize in Physics in 2014 for his work as the inventor of the blue LED. His discovery of methods that led to the development of the first blue LED in 1993 and corresponding white LEDs resulted in the revolution of the display and lighting industries changing to LED light sources almost entirely over the preceding two decades.

5. From 2009 to 2011, I was the Director of Device Engineering and Director of Marketing at Sora Inc. in Fremont, California. I was also the Director of Business Development from 2011-2012.

6. Sora Inc. was a vertically integrated lighting company that internally developed and manufactured LED chips and white light LED packages, and integrated these packages into commercial lighting products. I was involved in the development of LED die, packages, and the lighting products and their transition to

manufacturing. In addition, I was responsible for competitive analysis of both LED and lighting products which included tear-down analysis and product testing. Due to this work, I personally analyzed and benchmarked the structure and performance characteristics of leading LED and lighting products.

7. In 2012-2014 I moved to NEXT Lighting Corp., as Vice President of Products. NEXT Lighting was a lighting systems designer and manufacturer. I was responsible for all aspects of product development and manufacturing. This included LED component and vendor selection and integration. At NEXT Lighting I also worked with LED driver manufacturers who fabricated custom LED drivers to meet our internal specifications, including dimming and step-dimming functions. In addition to the lighting systems, I expanded NEXT Lighting's product line to include optical based occupancy and energy saving sensors that were designed to integrate with our lights and drivers to adjust the light output of our products based on both occupancy and ambient lighting levels. In this capacity, I was responsible for all aspects of product design, testing, and user integration.

8. I have also served as an expert in certain legal proceedings. A list of cases in which I have worked as an expert witness is provided in my *curriculum vitae*. Over the years, I have been retained by both patent owners and petitioners, as well as plaintiffs and defendants.

III. MATERIALS RELIED UPON IN FORMING MY OPINIONS

9. In preparing this Declaration, I have reviewed the '047 Patent and its prosecution history, and the Petition for IPR for the '302 Patent ("Pet."), including accompanying exhibits and the declaration of Dr. J. Gary Eden in support of the Petition. I have also reviewed the other documents and materials cited herein.

When quoting from these materials, all emphasis is added unless otherwise noted.

10. My opinions are also based upon my education, training, research, knowledge, and personal and professional experience.

IV. LEGAL STANDARDS FOR PATENTABILITY

11. I am not an attorney and I offer no opinions on the law itself. My understanding of the relevant legal principles in this section is based on information provided to me by counsel.

A. Claim Construction

12. I understand that claim terms are typically given their ordinary and customary meaning, as would have been understood by a person of ordinary skill in the art, at the time of the alleged invention, which I was asked to assume is the October 2013 timeframe. In considering the meaning of the claims, I also understand that one must consider the claim language, specification, prosecution history, and the knowledge of a person of ordinary skill in the art ("POSITA") at

the relevant time. I have followed these principles in my analysis.

B. Obviousness

13. I have been informed by counsel that a claim may be invalid if the invention recited in the claim would have been obvious to one of ordinary skill in the art at the time the invention was made in light of the prior art. I understand for a claim to be found obvious, every claim limitation must be found present in the combination of the prior art references before the obviousness analysis proceeds.

14. In considering whether a claim is obvious, I understand that one must consider (a) the level of skill in the art at the time of the claimed invention, (b) the scope and content of the prior art, (c) any differences between the prior art and the claims of the patent-in-suit, and (d) any “secondary factors” tending to show non-obviousness of the claimed invention, including commercial success, long-felt but unresolved need, failure of others, copying, praise by others, unexpected results, and simultaneous invention by others.

15. I understand that a claim composed of several elements is not proved obvious merely by demonstrating that each of its elements was independently known in the prior art. I also understand that obviousness should not be analyzed using the benefit of hindsight. Instead, it must be analyzed from the standpoint of what was known and understood by a POSITA at the time of the claimed

invention. I further understand demonstrating whether making a modification to a reference or whether combining multiple references would have been obvious requires providing a reason for why a POSITA would modify the reference or combine multiple references, and that reason must be supported with some rationale underpinning. Merely pointing out that two references are similar or in the same field of endeavor is not sufficient.

16. I understand that if a combination of two or more prior art references is used to render a claimed invention obvious, there must be a reasonable expectation of success in making or practicing the claimed invention based on such combination. I understand the combination cannot modify a prior art reference such that it would render the reference unsatisfactory for its intended purpose.

17. I understand that it is impermissible to use the patent as a template (and reason) for combining prior art references as that would be applying hindsight. I understand that a POSITA would have to be motivated to combine references to create the combination of features required by the claims of the patent.

V. LEVEL OF ORDINARY SKILL IN THE ART

18. In rendering the opinions set forth in this Declaration, I was asked to consider the patent claims and the prior art through the eyes of a person of ordinary

skill in the art (“POSITA”). The “art” is the field of technology to which a patent is related. In my Declaration, I use the term POSITA and skilled person to refer to the same hypothetical person of ordinary skill in the art. I considered factors such as the educational level and years of experience of those working in the pertinent art; the types of problems encountered in the art; the teachings of the prior art; patents and publications of other persons or companies; and the sophistication of the technology. I understand that a POSITA is not a specific real individual, but rather a hypothetical individual having the qualities reflected by the factors discussed above.

19. I understand that Petitioner and Dr. Eden have proposed the following set of qualifications: “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 the art with a higher level of education may have fewer years of academic or industry experience, or vice versa” Petition at 4; Ex. 1002 (Eden Dec.) ¶ 47. I disagree that a degree is necessary and find a POSA could have the requisite level of skill with no formal degree, but five years of industry experience designing LED lighting fixtures.

20. I am qualified to provide opinions concerning what a POSITA would have known and understood in June 2020, and my analysis and conclusions herein

are from the perspective of a POSITA and would apply under either set of qualifications.

VI. OVERVIEW OF THE '302 PATENT

21. I have reviewed the '302 Patent. It is my opinion that the claims of the '302 Patent are patentable, valid, and not rendered obvious in view of the prior art references presented by Petitioner.

22. The '302 Patent, entitled "Controlling Color Temperature and Luminance in Linear LED Fixtures," was filed on December 21, 2020, and issued on September 5, 2023. Ex. 1001 at 1. The '302 Patent claims priority to provisional application No. 63/040,585, filed on June 18, 2020. *Id.*

23. At the time of the invention of the '302 Patent (June 2020), LED lighting was already deployed and used in a variety of applications from residential to commercial and industrial lighting. Linear LED lighting, however, was lagging behind the adoption rate of other technologies because as a 2020 Department of Energy Report on LED adoption indicated "modern linear fluorescent systems (lamp and ballast) remain tough competitors in terms of efficacy, as well as initial and lifecycle costs". Ex. 2023 (August 2020 DOE Adoption of Light-Emitting Diodes in Common Lighting Applications) at 37. In addition, the report goes on to note that "although fluorescent troffers have evolved into a well-defined system of

modular products, the LED market is more fragmented." Id. at 37.

24. The relatively low adoption rate for linear LED lighting (~20% compared to 40%+ for many other indoor lighting applications) was at least partially related to initial and lifecycle costs. In addition, the report also notes that LED lighting with connected controls had an adoption rate of only 0.2% across all lighting categories with linear lighting specifically identified as one of the areas with the highest potential for energy savings with connected controls. Id. at 7.

25. At the time of the '302 patent, the potential for energy savings, high performance, and cost savings existed in the linear LED lighting market, but in practice the market was divided into complex high end lighting systems with a lot of functional capability (lighting controls, color tuning, etc.) that were both expensive to purchase and also expensive to install, in many cases requiring professional provisioning at installation, and the more widely adopted lowest cost linear LED lighting fixtures that, similar to their fluorescent predecessors, had only the ability to produce one color of white light.

26. The '302 patent provided a solution to enable a simple and low cost method to provide a linear lighting fixture with a range of capability and simple modification of the desired lighting effect (both CCT and illumination level) either at installation or to be modified later if desired. This provided the benefits of

making installation and adjustment of the lighting properties on site by non-lighting professionals possible, allowed customers to purchase one SKU type of fixture per length without any concern for whether they would have either the right CCT or illumination level on hand to match or adjust between different areas of their installation, and reduced manufacturing costs by drastically reducing the SKU count that had to be kept on hand in inventory at the manufacturing site.

27. The fixtures of the '302 Patent provide for both adjustable luminance and color temperature. Ex. 1001 ('302 Patent) at 4:36-40. The '302 Patent describes a first LED string with a color temperature of 3000 Kelvin and the second LED string has a color temperature of 4000 Kelvin. 8:41-60. The linear light fixture of the '302 patent includes a switch assembly for routing current to one or both of the strings of LEDs to later the color temperature. Ex. 1001 ('302 Patent) at 8:35-40. The '302 Patent also provides for producing the same color temperature from fixtures of different lengths and corresponding number of LEDs. Ex. 1001 ('302 Patent) at 5:37-43.

VII. OVERVIEW OF THE CITED PRIOR ART

A. USP 9,995,440 to Edwards (Ex. 1005)

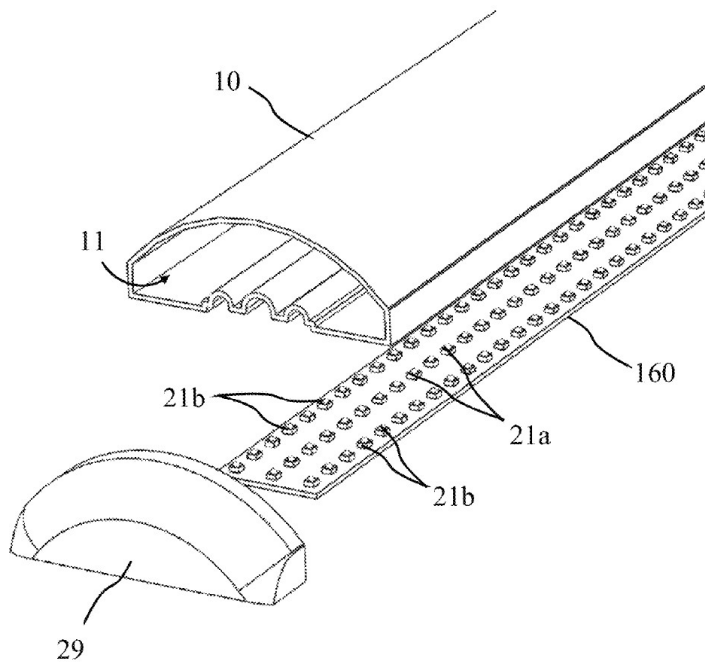
28. Edwards, entitled “Color temperature tunable and dimmable solid-state linear lighting arrangements,” was filed on December 8, 2015, published on

June 30, 2016, and issued June 12, 2019. Ex. 1005 at 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. at* Abstract.

29. In Edwards, light is emitted from non-white-light LEDs and then converted to white light by a physically separated “wavelength conversion component.”

30. 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 (Edwards) 5:32-34.

31. 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 (Edwards) 5:32-38.

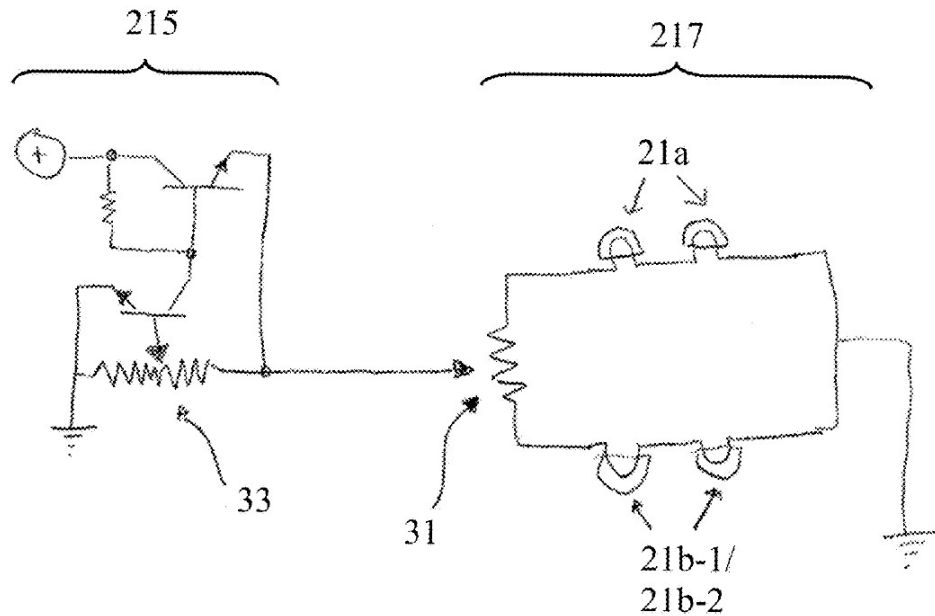


Ex. 1005 (Edwards) Fig. 1B.

32. “The 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 (Edwards) 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 drive with the same voltages and drive conditions).” Ex. 1005 (Edwards) 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 (Edwards) 6:27-30.

33. 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 (Edward) Fig. 5.

A POSA would likely not refer to the circuit of Fig. 5 as a driver, because the circuit shown in Fig. 5 is not regulated. In other words, when the power

applied to the circuit of Fig. 5 is increased, the output to the LEDs will increase correspondingly. On the other hand, in a regulated circuit, the output would not rise above a preset level even when the input power is increased. I also note that the circuit of Fig. 5 is inefficient because both of the potentiometers 33 and 31 convert at least a portion of the input power to heat. Edwards discusses that the fixtures can include an electrical connector to connect fixtures together. Ex. 1005 (Edwards) at 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 and speaks only more generally about covering desired areas. Ex. 1005 (Edwards) at 15:59-61.

B. U.S. Printed Publication 2019/0320515 to Sadwick (Ex. 1006)

34. U.S. Printed Patent Application No. 2019/0320515A1, titled “Solid State Lighting Systems” was filed April 15, 2019 and published on October 17, 2019.

35. 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 (Sadwick) Abstract.

36. Sadwick talks about uses for his lighting system as “Embodiments 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 (Sadwick), ¶ 0040.

37. Relevant to this IPR, in Fig. 35, Sadwick discloses 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.

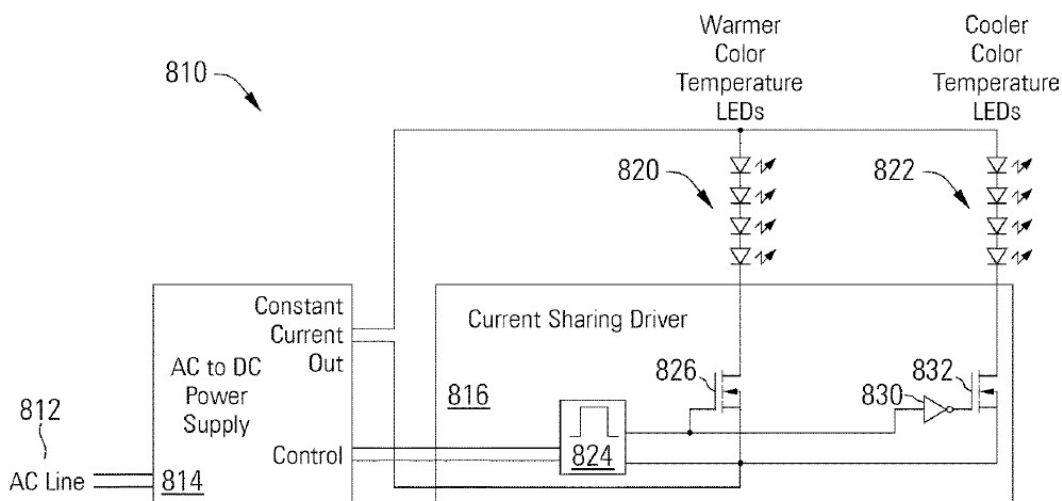


FIG. 35

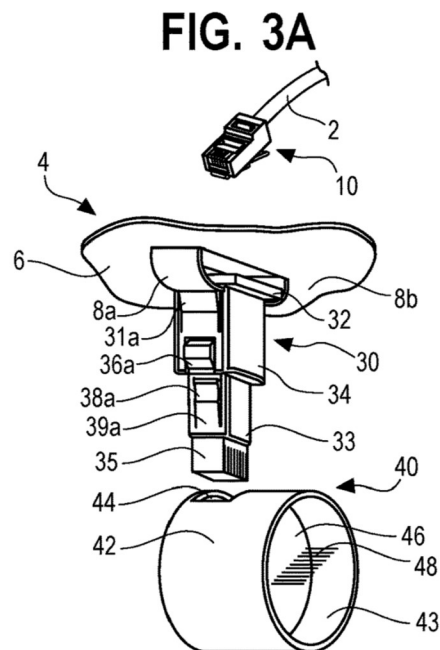
Ex. 1006 (Sadwick) at Fig. 35.

C. U.S. Printed Publication 2019/0041009 to May (Ex. 1007)

38. 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.

39. 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 lane 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.



40.

41. 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.

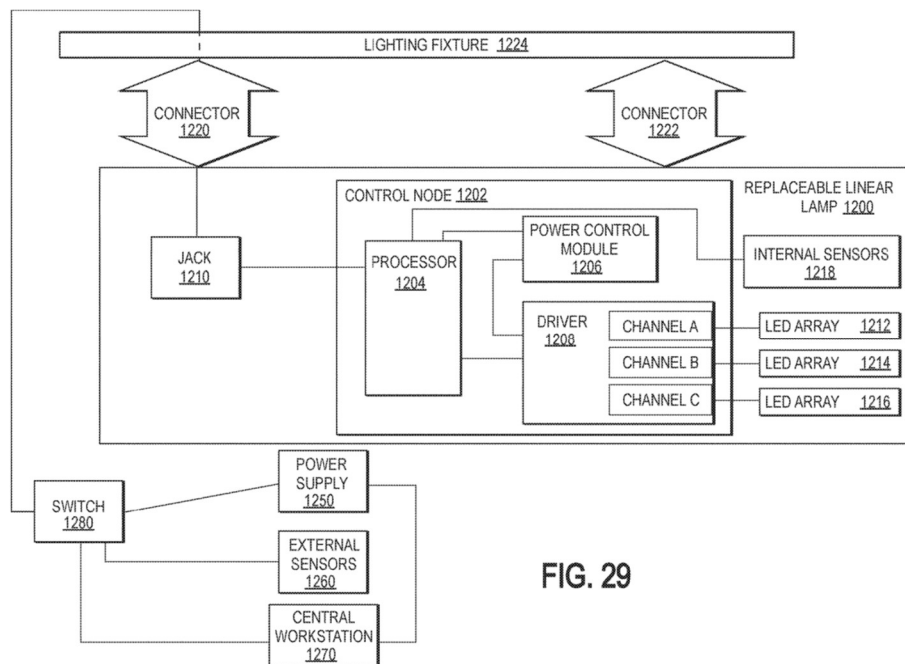


FIG. 29

42. 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.*

43. 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.

44. 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 useless.

45. 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 purposes 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 in accordance with the default instructions.

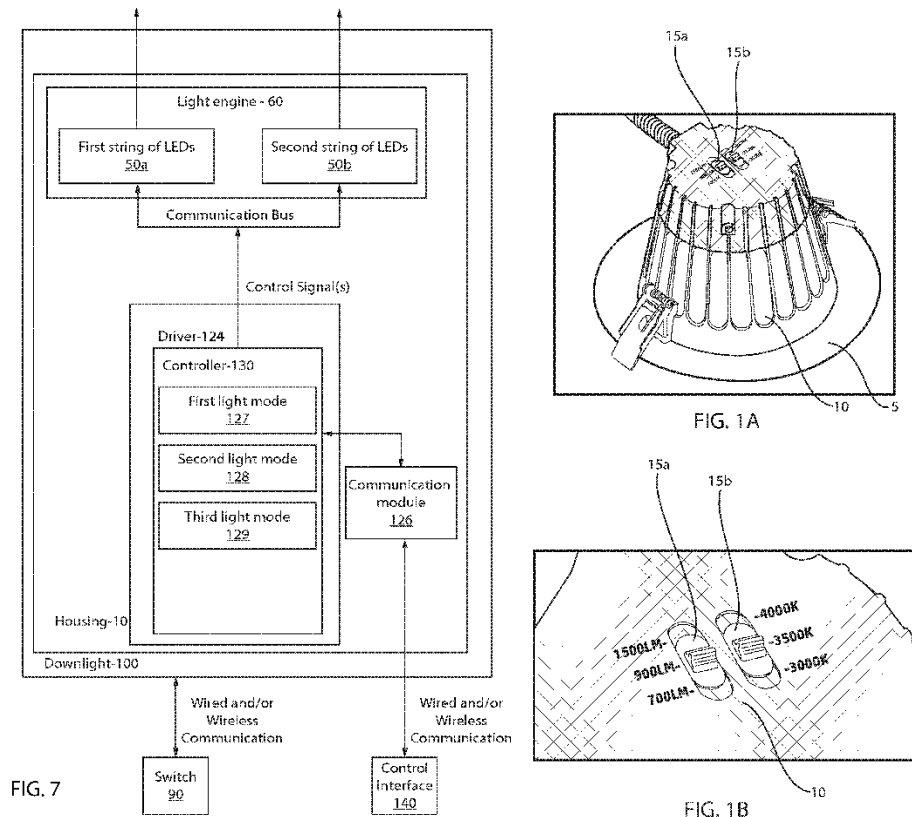
D. USP 10,683,969 to Jewsani (Ex. 1008)

46. 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.

47. 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.

48. 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.

49. 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.



50. 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.*

51. In view of these separate embodiments, 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. However, neither May nor Jeswani provides any objective reasoning as to modifying 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.

VIII. EDWARDS AND SADWICK DO NOT RENDER OBVIOUS CLAIMS 1, 2, 4-7, AND 9-20

A. Claim 1

1. Edwards does not teach 1[b] and 1[c] because Edwards LEDs do not produce light having a color temperature.

52. Claim 1 requires “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” and “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,” as claimed in limitations 1[b] and 1[c]. The Petition does not show that Edwards teaches or suggests these limitations.

53. In Edwards

Recently, white light emitting LEDs (“white LEDs”) have become more popular and more commonly used, replacing conventional fluorescent, compact fluorescent and incandescent light sources. White LEDs generally include one or more photo-luminescent materials (e.g., one or more phosphor materials), which absorb a portion of the radiation emitted by the LED and re-emit light of a different color (wavelength). The phosphor material may be provided as a layer on, or incorporated within a wavelength conversion component that is located remotely from the LED die. Typically, the LED generates 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. The portion of the blue light generated by the LED that is not absorbed by the phosphor material combined with the light emitted by the phosphor provides light which appears to the eye as being nearly white in color. Such white light LEDs are characterized by their long operating life expectancy (>50,000 hours) and high luminous efficacy (70 lumens per watt and higher).

For white LEDs, light is generated by two processes: electroluminescence and photoluminescence (rather than thermal radiation). Thus, the emitted radiation does not follow the form of a black-body spectrum. These sources are assigned what is known as a correlated color temperature (CCT). CCT is the color temperature of a black body radiator which to human color perception most closely matches the light from the lamp. Color temperature is a characteristic of visible light that has important applications in lighting. The color temperature of a light source is a measurement of the hue generated by that light source that corresponds to the temperature of an ideal black-body radiator that radiates light of comparable hue. Color temperature is conventionally stated in the unit of absolute temperature, the kelvin, having the unit symbol K. Color temperatures over 5,000 K are called cool colors (blueish white), while lower color temperatures (2,700-3,000 K) are called warm colors (yellowish white through red)

Ex. 1005 (Edwards) 2:14-52.

54. Edwards statement that “[t]he phosphor material may be provided as a layer on, or incorporated within a wavelength conversion component that is located remotely from the LED die” is specific to Edward’s implementation. To a POSA at the time of the invention, a “white LED” would have a phosphor material included within the LED package, not remotely located from the LED.

55. A POSITA would understand that a “color temperature” is a property of a white light emitting LED, but not of a non-white emitting LED, such as a blue LED that does not include an integrated phosphor conversion material within the LED. By themselves, a monochromatic (e.g. blue or red LED) have a *color*, but not a *color temperature*. The International Commission on Illumination or CIE is the international authority on light, illumination, colour, and colour spaces and was established more than 100 years ago. In their technical note CIE_TN_013_2022 (Ex 2020) Color Temperature is defined as the “thermodynamic temperature of a Planckian radiator whose radiation has the same chromaticity as that of a given stimulus” where a “Planckian Radiator Temperature” as the “thermodynamic temperature of a Plankian radiator (blackbody)”. Ex. 2020 (CIE_TN_013_2022) at 8. The technical note further goes on to state in the “Limits to applicability” section that “This means that the concept (of colour temperature) only applies to grey bodies, near-grey bodies, Planckian radiators, or near-Planckian radiators.

For other artefacts the correlated colour temperature should be used instead”. Ex. 2020 (CIE_TN_013_2022) at 8. Given that monochromatic sources are not “grey bodies, near-grey bodies, Planckian radiators, or near-Planckian radiators” a POSITA would understand that CIE_TN_013_2022’s section on Correlated Colour Temperature would be the next place to look to understand whether a monochromatic LED has a color temperature. With regard to CIE_TN_013_2022’s section on Correlated Colour Temperature there is a “Limits to applicability” section that states “Based on the concept of CCT, this term applies only to white light stimuli and should not be used for coloured light sources”. Ex. 2020 (CIE_TN_013_2022) at 10. Likewise, I note that Edwards says that “correlated color temperature (CCT) is the color temperature of a black body radiator which to human color perception most closely matches the light from the lamp.” Ex. 1005 (Edwards) at 2:44-47. Based on this, a POSITA would clearly understand that a red LED, blue LED, or other monochromatic LED does not have a color temperature.

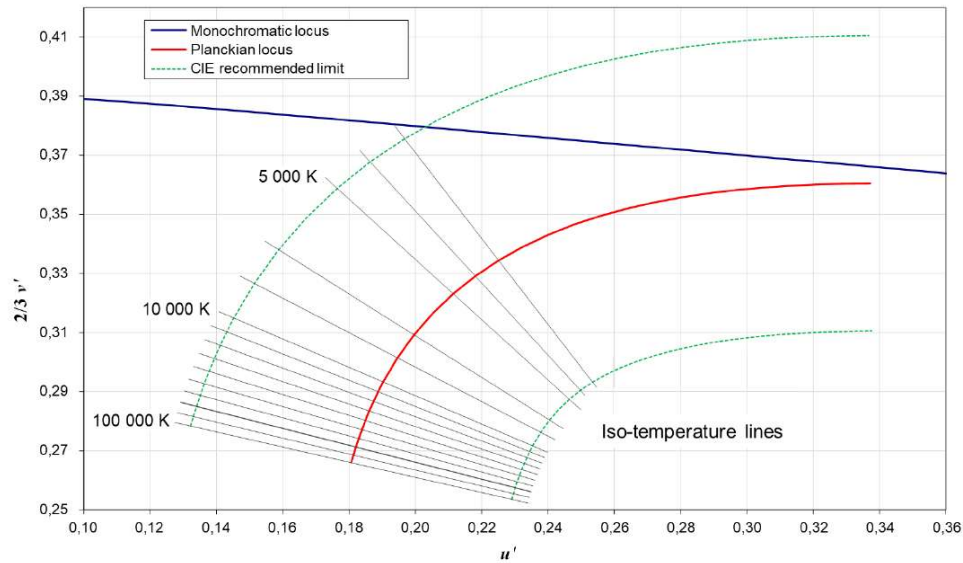
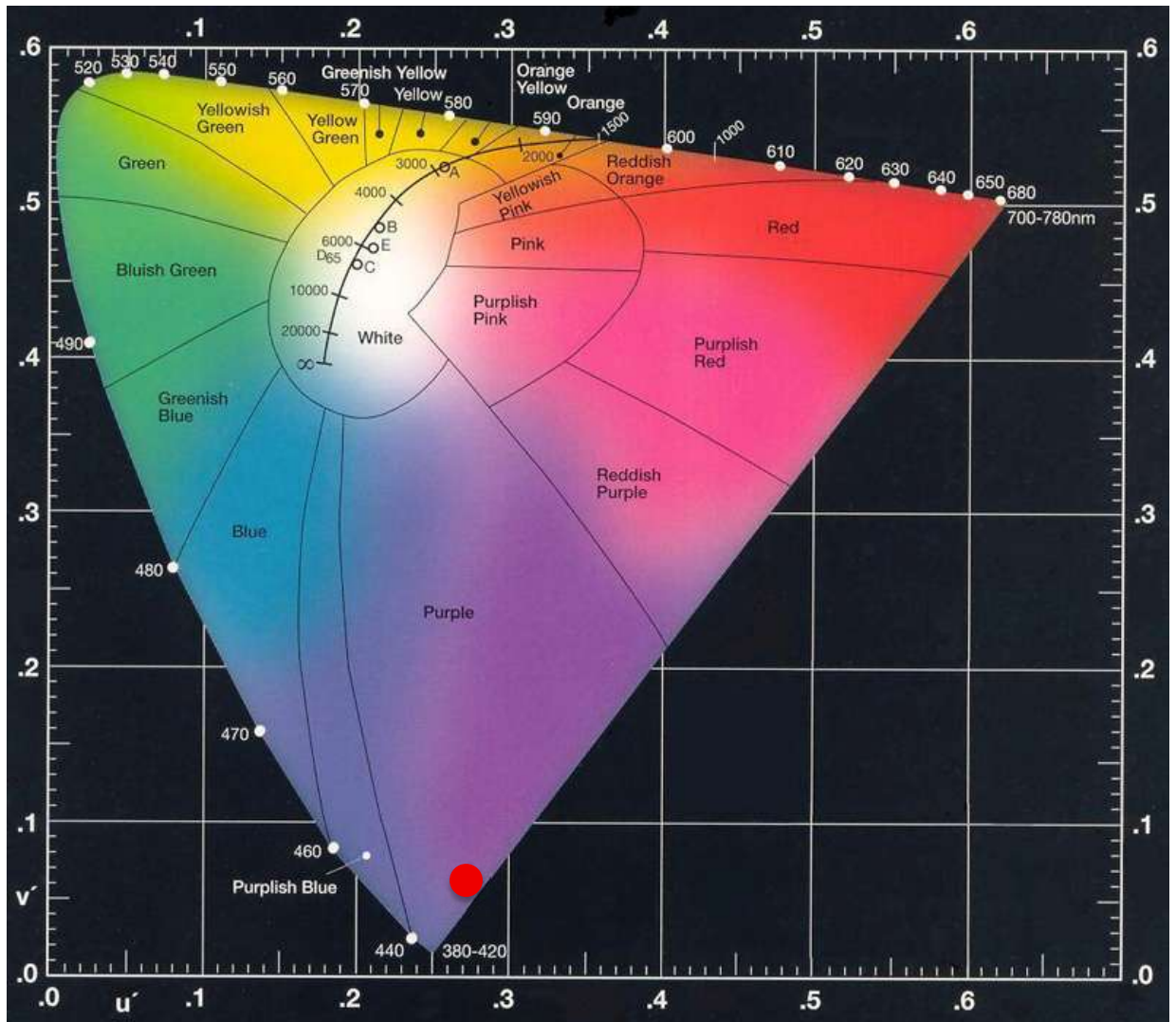


Figure 1 — (u' , $2/3 v'$) chromaticity diagram showing the Planckian locus and recommended limits to calculation of CCT

56. While CIE_TN_013_2022 was not published until 2022 which is after the publication date of the '302 patent, a POSA would have understood the same meaning and general limits to the use of color temperature to be a term that describes white light sources and not monochromatic sources. The figure below from 1976 Revision of CIE Color System shows the 1976 $u'v'$ color space with coloration shown on the diagram. Note that the color temperatures (20,000K, 10,000K, 6,000K, etc) are in the “White” color space. I have added a red circular marker (choosing red for visual clarity, not to represent that it's a red LED) for reference for where the typical blue LEDs of Edwards would be on this chart.



Ex. 2022 (1976 Revision of CIE Color System).

57. Prior to the publication date of CIE_TN_013_2022 and also well before the priority date of the Edwards patent, a POSA would have understood that the blue LEDs from Edwards, shown on the opposite end of the 1976 $u'v'$ color space and well beyond what's described as infinite CCT for white, would not in fact have a color temperature.

58. Dr. Eden concedes that color temperature is a property of white light, not non-white light that is emitted from Edwards' LEDs:

117. In summary, white light having a "first color temperature" and a "second color temperature" is produced in Edwards with blue LEDs and phosphors which convert the blue light into various visible light colors. Together, these colors result in light that is perceived by the human eye as white light having a particular CCT value. This is precisely the same process described in claim element 1[b]. . . .

118. Therefore, Edwards' LEDs function in precisely the same manner as that of all other white-light LEDs – namely, blue LEDs producing white light from combinations of phosphors.

Ex. 1002 (Eden Dec.) at ¶¶ 117-118.

59. In Edwards, light is emitted from non-white-light LEDs and then converted to white light by a physically separated "wavelength conversion component." "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 (Edwards) 5:32-34. I note that Edwards is precise in his language about what are "multiple arrays of LEDs" and separately what are the "integrated wavelength conversion components 10." Dr. Eden has not shown that a POSA would consider the combination of these two physically separate elements to be a "plurality of LEDs."

60. Edwards arrangement of LEDs 21a and 21b and the physically separated wavelength conversion component 10 is shown, for example, in

Edward's Fig. 1B:

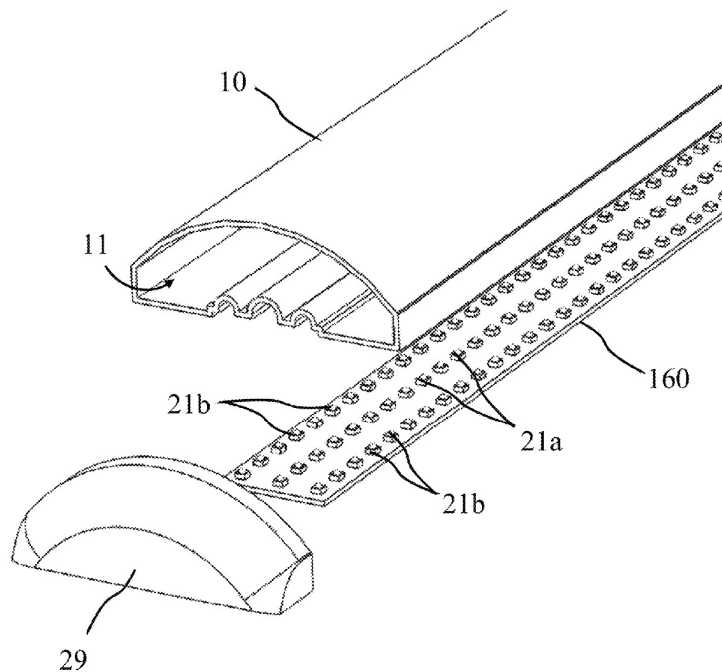


FIG. 1B

61. A POSA would not consider a LED and a physically separated wavelength conversion component to be “a first plurality of LEDs configured to produce a first light having a first color temperature” or “a second plurality of LEDs configured to produce a second light having a second color temperature.” Instead, what Dr. Eden is describing LEDs that are configured to produce a first color with an external lighting element that converts the first color of the LEDs into color temperatures of the lighting module, engine, or fixture.

62. Dr. Eden states:

119. For the purposes of the claim element, each “LED” may be one of the LEDs 21a (first plurality) or LEDs 21b (second plurality) or an LED (21a and 21b) in combination with a respective corresponding wavelength conversion component (20a and 20b).

120. Neither the language of Claim 1[b] (“a first plurality of LEDs configured to produce a first light having a first color temperature”) nor the ‘302 Patent specification identify any LED wavelength conversion materials (e.g., phosphors) or the manner in which any LED is constructed. The ‘302 Patent specification does not exclude blue LEDs separated by a small distance from its phosphor. Furthermore, the ‘302 Patent specification and claims do not require that the LEDs in a “string” be the same in any respect. The text of the specification simply requires certain specifications for the entire string.

63. In Dr. Eden’s understanding, blue LEDs that are each “separated by a small distance from its phosphor” is “a first plurality of LEDs configured to produce a first light having a first color temperature” is wrong.

64. Dr. Eden says:

Thus, each of the LEDs 21a provides a first color temperature when its emitted light is passed through the corresponding wavelength conversion component for the LEDs 20a and each of the LEDs 21b provides a second color temperature when their emitted light is passed through the second wavelength conversion portion 20b.

Ex. 1002 (Eden Dec) at ¶ 116.

65. I disagree with Dr. Eden’s conclusion. Edwards specifically teaches the use of non-white LEDs that produce light. But that light does not have a first color temperature or a second color temperature.

66. Dr. Eden offers the further option that:

125. Additionally, while the LEDs may produce light of a different color temperatures through the wavelength conversion components, 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 directly from the dies. Ex.1005-6:25-30. Therefore the red and blue LEDs could be arranged in lines 21a and 21b so as to realize Edwards's goal of providing different color temperatures.

Ex. 1002 (Eden Dec.) ¶ 125. Although Edwards suggests using only red and blue LEDs. Even if such an arrangement produced white light from the fixture, it would not produce light with a color temperature “from the dies,” as Dr. Eden alleges. Instead, the light “from the dies” would be red and blue without a color temperature. Edwards's wavelength conversion component would still be necessary to produce light with a color temperature. .

2. Dr. Eden has not shown that a POSA would combine Sadwick's LEDs with Edwards fixture.

67. Dr. Eden presents an alternative theory “should the PTAB rule that the LED array 21a and wavelength conversion region 20a of Edwards do not satisfy the Claim 1[b] language: “a first plurality of LEDs configured to produce a first light having a first color temperature” because the wavelength conversion phosphors of Edwards are not in direct contact with the blue LED.” Ex. 1002 (Eden Dec) ¶ 127. As I discussed above, Petitioner and Dr. Eden have not shown that Edwards meets the first and second plurality of LED limitations.

68. Dr. Eden explains his combination of Sadwick’s white phosphor-coated LEDs into Edwards’s fixture:

130. Although the phosphor-coated, integrated wavelength conversion component 10 of Edwards has the advantage of not requiring a diffuser, its manufacturing and materials cost would present significant drawbacks for commercialization, and a POSA would definitely be motivated to replace it with Sadwick’s LEDs for which the desired phosphor mixture is integrated into the LED itself and its packaging.

131. Long before the priority date for the ‘302 Patent, a POSA would be aware of the cost and manufacturing advantages of employing white LEDs having the same CCT value in arrays for a luminaire. A number of vendors manufacturing such white LEDs were available at that time and at present. The primary incentive for employing the integrated wavelength conversion component 10 of Edwards in a commercial product is the diffuse, spatially-uniform light produced by Edwards’ component 10. Also, the luminaire described by Edwards allows for the blue LED arrays to be “swapped out” easily which may be of value in certain office building or public school applications.

132. Overall, however, the higher cost of manufacturing Edwards’ luminaire is, for many commercial products, the deciding factor in a POSA’s decision to employ the white LEDs of Sadwick in Edwards’ luminaire. In this way, the integrated wavelength conversion component 10 can be simply discarded – the substitution is straightforward and thus a POSA could make the modification with more than a reasonable expectation of success.

Ex. 1002 (Eden Dec) ¶¶ 130-132.

69. I disagree. Dr. Eden’s proposed combination wipes out the alleged advantages of Edwards. Edwards “Background” section acknowledges the existence of phosphor-coated white LEDs, but then Edwards’s specification goes on to tout the advantages of using non-white LEDs with the physically separate

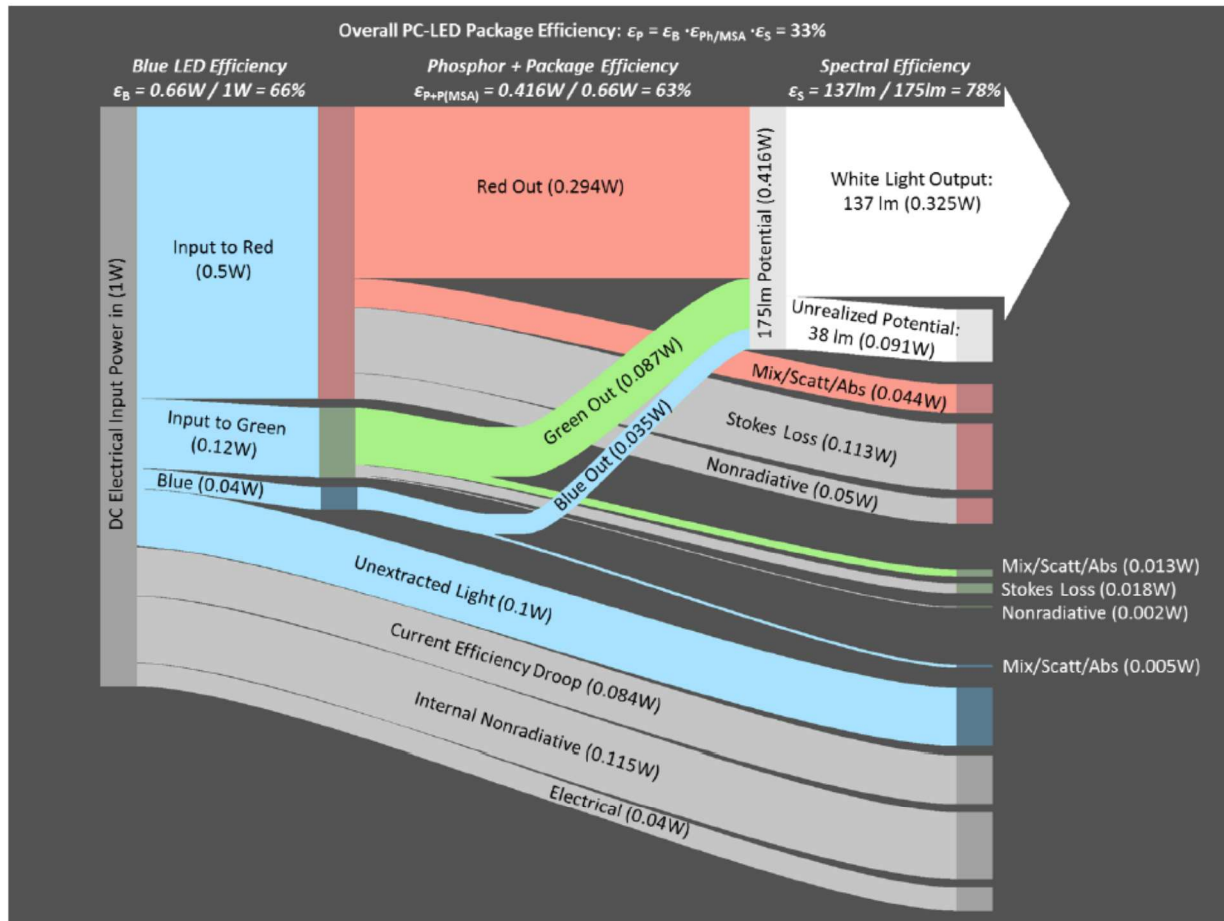
wavelength conversion component. Ex. 1005 (Edwards) 2:35-53 (discussing white LEDs); 8:16-44 (discussing the use of non-white LEDs and “integrated wavelength conversion component 10.”) Edward disclosure would discourage a POSA from using the modified arrangement suggested by Dr. Eden. Edwards has the advantage that both strings 21a and b can use one type of LED because the color temperature is dictated by the color conversion component, whereas Sadwick requires at least two different LED color temperatures that require additional manufacturing steps to ensure that binning and color matching is handled appropriately.

70. Moreover, Dr. Eden’s stated motivation of cost reduction is not supported by any evidence and may not actually be accurate. Dr. Eden provides no evidence of the alleged “cost and manufacturing advantages of employing white LEDs having the same CCT value in arrays for a luminaire” and “higher cost of manufacturing Edwards’ luminaire” than using phosphor coated white LEDs. Dr. Eden has provided no costs for the components in Eden, instead he has just assumed without any evidence that they would be more expensive despite the fact that Edwards has claimed cost savings. Without evidence of such a cost reduction, and in contradiction to Edwards itself (Edwards 8:16-44), I cannot accept Dr. Eden’s speculation of such a motivation to physically discard such an integral part of Edwards’s solution and swap out his non-white LEDs with white LEDs with

integrated phosphor.

71. Edwards' approach of having a separate wavelength conversion component that is not part of the LED package also has the advantage that it results in less heat on the LED's. As LEDs heat up they become less efficient and experience a phenomenon known as thermal droop. For single color LEDs (e.g. blue LEDs for example), the electrical to optical conversion efficiency is quite high, typically well over 50% (~66% in the example in the figure below from the DOE Solid-State Lighting R&D Plan). This means that in a typical single-color blue LED less than half of the power that is input into the LED needs to be dissipated as heat away from the LED. Even still, Edwards is clearly aware of the impact that heat has on the LEDs and describes embodiments of the invention to help handle that heat (See Edwards 6:39-59 for example). In a white LED with an integrated phosphor conversion layer this thermal problem becomes more pronounced. This happens because the phosphor material used for the conversion of blue to longer wavelength photons has at a minimum both an optical conversion efficiency loss and a fundamental loss from the difference in energy from the higher energy blue photon, to the lower energy longer wavelength photon. This latter loss is known as the Stokes loss. In a white LED with integrated phosphor these mechanisms result in increased thermal load in the LED package that

decrease the overall efficiency of the LED. As shown in the figure below these and other losses can typically result in another ~50% loss in optical energy from a blue LED to a phosphor converted white LED. One common method to account for this additional heat load or handle it in a lighting system is to increase the number of LEDs and run each LED at a proportionally lower power. While this helps with the thermal load and efficiency of the system it comes with an increased expense by requiring additional LEDs. Dr. Eden has not addressed how he would know that you could just take the white LEDs of Sadwick and put them into the design of Edwards and achieve the same intended benefits of Edwards, particularly given that the white LEDs of Sadwick specifically remove some of the Edward's benefits.

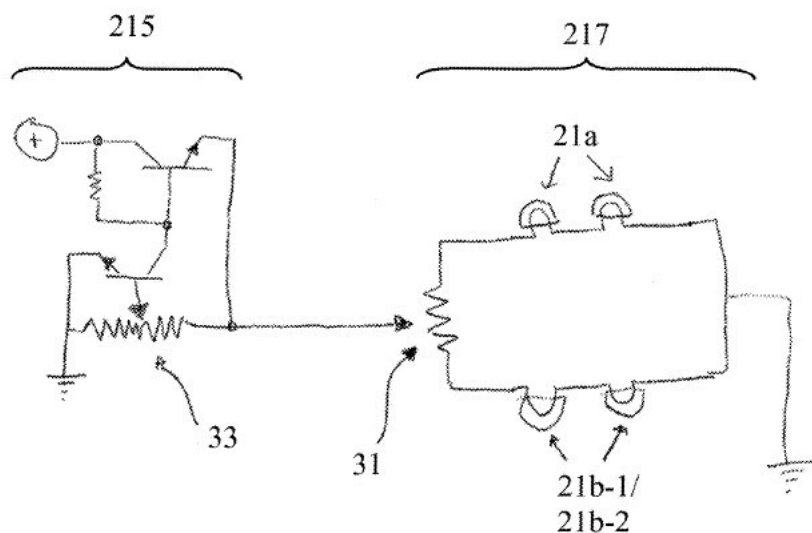


Note: The diagram gives estimates for how 1 W = 0.35 A x 2.85 V of DC power is distributed into various useful and non-useful (loss) streams en route to being converted into white light. The colors of the various streams indicate the type of power they contain: gray for electronic excitations, colored for light at various RGB wavelengths, and white for white light formed from a combination of colors. For each loss stream we indicate both its absolute power as well as the percentage it represents of its immediately preceding parent stream.

Ex. 2021 (Expert of DOE Solid-State Lighting R&D Plan) at 4.

3. Edwards does not teach at least limitation 1[g] 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.

72. Dr. Eden opines that this limitation is met by Edwards current distribution circuitry shown in Fig. 5.



Ex.1005-

Fig. 5

73. Edwards states:

The control circuit 217 comprises a variable resistor 31 R_w for controlling the relative drive currents I_A and I_B to the first and second LED arrays 21 a and 21 b-1/21 b-2. The LEDs of each of the first and second LED arrays 21 a and 21 b-1/21 b-2 are connected in series and the LED arrangements connected in parallel to the variable resistor 31. The variable resistor 31 is configured as a potential divider and is used to select the relative drive currents I_A and I_B to achieve a selected correlated color temperature (CCT).

Ex.1005 (Edward) 14:10-19.

74. First, Dr. Eden has not shown that there are a plurality of currents to couple to the first plurality of LEDs, the second plurality of LEDs, or both.

Instead, Dr. Eden states that

A POSA would understand that, by controlling the overall current from the driver circuit and specifying the proportion of the total available

current to be made available to each individual set of LEDs, Edwards is “coupling” the required plurality of currents to the LED strings.

Ex. 1002 (Eden Dec.) ¶ 165.

75. Dr. Eden’s opinion provides no evidence or reasons why a POSA would come to this understanding and is purely conclusory.

76. Further, the variable resistor 31 of Eden is not a switch. A POSA would understand a switch to be a different structure from a variable resistor. The two have different names, schematic symbols, and functions.

77. Dr. Eden further includes another statement that:

Similarly Figures 6 and 7 incorporate current dividers that can be used for controlling the color temperature. Either of these circuits could similarly perform the function of controlling color temperature in Edwards so as to meet claim element 1[g].

Ex. 1002 (Eden Dec.) ¶ 169.

78. Again, Dr. Eden does not show how either of these circuits provides a plurality of currents to couple to the first plurality of LEDs, the second plurality of LEDs, or both. His conclusory statement that either of these circuits could work does not meet Petitioner’s burden to show that this limitation is met by Edwards.

4. Sadwick also does not teach at least limitation 1[g] 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.

79. As an alternative, Dr. Eden suggests that a POSA would alternatively

use the PWM circuit of Sadwick in combination with Edwards. As Sadwick describes:

FIG. 35 depicts a non-limiting example schematic of a 2-channel current splitter 810 for SSL lighting. Current is time-divided between two banks 820, 822 of solid state lighting of any type, alternately lighting one and then the other. This can be used to tune the apparent color temperature of white LEDs, for example, or can be used to blend colors or different types of lighting.

Ex.1006 (Sadwick) ¶ 0194.

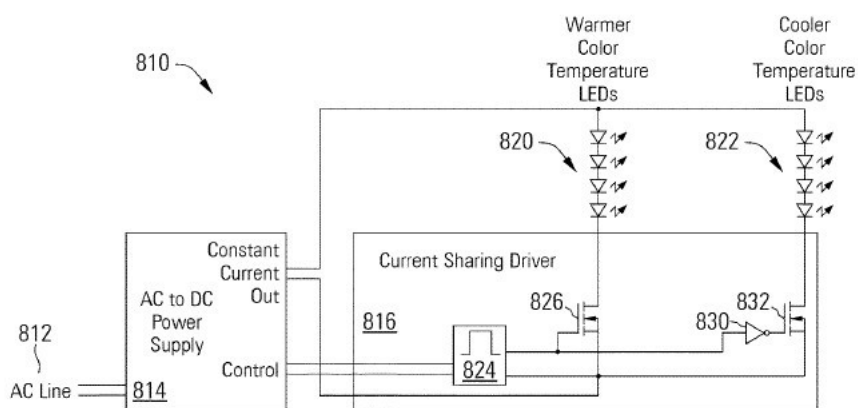


FIG. 35

Ex.1006-(Sadwick) Fig.35.

80. The current sharing driver 816 of Sadwick is time-based. Only one of LED string 820 or 822 is provided with current at a time while the other LED string receives no current. In particular, in the figure above, the NOT gate 830 imposes the limitation that when transistor 826 is ON, then transistor 832 is OFF, and vice-versa. The claim language of 1[g] “or both” requires that the switch be

capable of coupling current to both first and second plurality of LEDs at the same time. That cannot happen with Sadwick's circuit and Dr. Eden agrees that at any time only one string of LEDs has power. Instead, Dr. Eden appears to argue that this limitation is met even though only one string of LEDs receives current at any time. The claim is plain on its face that the second switch must be configured to causing one of the currents to be coupled to both the first and second plurality of LEDs. A POSA would understand that this means that the current is coupled to both of the LED string at the same time.

81. Even if Sadwick's time-based switching circuit met this limitation, Dr. Eden has provided only a conclusory statement that a POSA would use the Sadwick circuit in Edwards. He says:

As I describe above for elements 1[a] and 1[d] it would be obvious to a POSA use the current control mechanism of Sadwick with the disclosure of Edwards. For similar reasons, it would also have been obvious to use the color temperature control mechanism of Sadwick in combination with Edwards's color temperature control switch 215b. Doing so would meet this limitation.

Ex. 1002 (Eden Dec.) at ¶ 175.

82. The discussion of 1[a] and 1[d] involved the substitution of Sadwick's white LEDs with integrated phosphors for Edwards non-white LEDs with an external wavelength conversion apparatus. These LEDs and control structures are entirely different and any alleged reasons for combination are inapplicable between

the two. Dr. Eden has therefore provided no evidence or reasoning why a POSA would use Sadwick's PWM circuit in place of Edward's variable resistor control circuit.

83. Dr. Eden has therefore not shown that this limitation is met by Sadwick.

5. Petitioner and Dr. Eden have not shown that Edwards teaches at least limitations 1[g] because Dr. Eden already mapped the potentiometer to the claimed driver circuit.

84. Dr. Eden, to show element 1[d], states that:

Particularly, the control circuit 217, either alone or in combination with the dimmer switch 215a acts as a driver circuit.

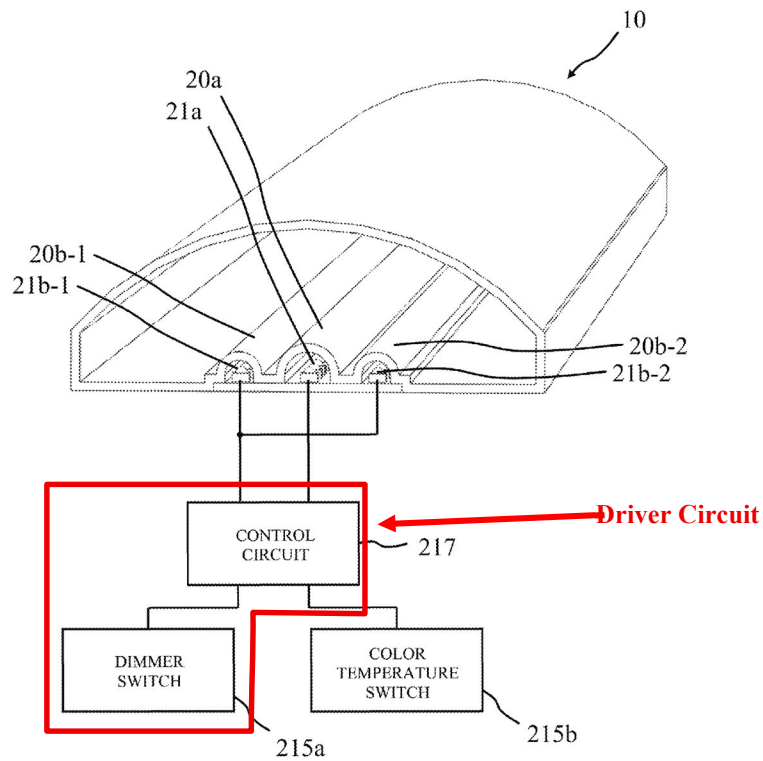
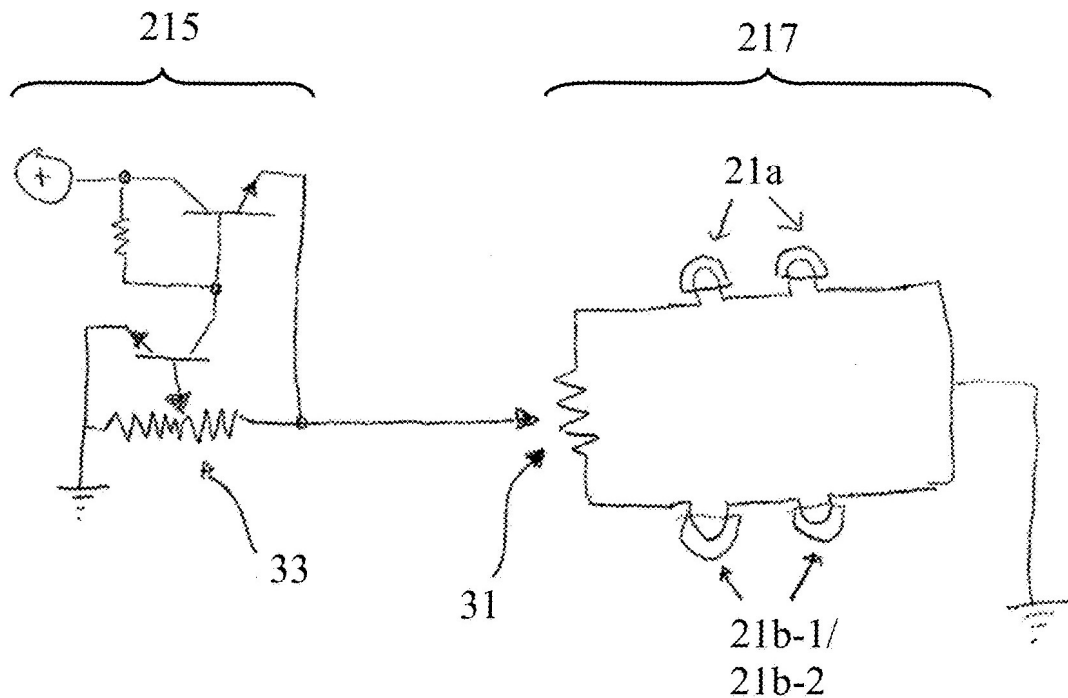


FIG. 3B

Ex.1005-Fig. 3B-Annotated.

Figure 5 illustrates one example of the dimmer switch and control circuit which together can provide a plurality of currents.



Ex.1005-Fig.5.

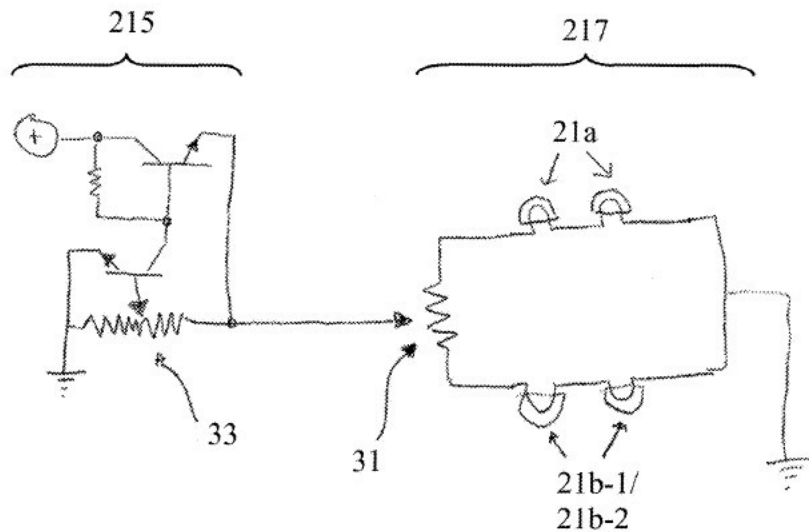
Ex. 1002 (Eden Dec.) at ¶¶ 141-142.

85. Dr. Eden’s declaration states that control circuit 217 and its potentiometer 31 are part of the claimed “driver circuit.” Later in his declaration, Dr. Eden states that the color temperature switch 215b of Edward’s 3B maps to the claimed “second switch.” Ex. 1002 (Eden Dec.) ¶¶ 162-163. Dr. Eden states that:

166. As described previously, Edwards states that such simple current distribution circuitry can include “resistor 31 [which] is configured as a potential divider and is used to select the relative drive currents I_A

and IB to achieve selected correlated color temperature (CCT).”

Ex.1005-14:17-19.



Ex.1005-Fig. 5

Ex. 1002 (Eden Dec.) ¶ 166.

86. Dr. Eden offers no explanation how potentiometer 31 is part of both the claimed “driver circuit” and the “second switch.” Dr. Eden’s opinion is therefore internally inconsistent and fails to show how potentiometer 31 can be both the “driver circuit” and the “second switch” of claim 1.

6. Edwards does not teach at least limitation 1[h] because Edwards 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.

87. Claim element 1[h] has two separate elements that Dr. Eden has not shown are disclosed or taught in Edwards. First, 1[h] 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.

88. For this first portion of 1[h], Dr. Eden relies on Edwards statement that Edwards’s linear lamp 1300 has a connector that

Finally, a POSA would also understand (in light of the earlier discussion concerning claim elements 1[pre]-1[h]) that a second fixture electrically connected to the first fixture would necessarily be able 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.” That is the “third light having the first color temperature via a third plurality of LEDs” would correspond to the light produced by the first plurality of LEDs of the first fixture and the “fourth light having the second color temperature via a fourth plurality of LEDs” would correspond to the second light produced by the second plurality of LEDs of the first fixture. In plain language, the ability to electrically connect linear lamp fixtures (or any lamp fixture, for that matter) in series allows for an installer to produce light from the second fixture, and the following fixtures in series, having the same characteristics as that generated by the first lamp fixture.

Ex. 1002 (Eden Dec) ¶ 180. Dr. Eden says “One skilled in the art would recognize that Edward’s limit of six feet in length is by no means a fixed upper limit. More importantly, Edwards states that the lamps connected in series may differ in length so as to accommodate the requirements of a particular lighting installation.” Ex. 1002 (Eden Dec.) ¶ 178. I disagree with Dr. Eden’s statement that “Edwards states that the lamps connected in series may differ in length so as to accommodate

the requirements of a particular lighting installation.” Edwards states that lamps can be 1-6 feet. Ex. 1002 (Edwards) 15:58-60. Edwards further states that “this allows several linear lamps 1300 to be connected in series to cover a desired area” Ex. 1002 (Edwards) 15: 57-58. This does not disclose or teach that lamps of different length are actually connected in series, but merely discloses that lamps can be connected in series to cover a desired area. In fact, a POSA would recognize that in most general lighting applications a desired area can be covered with only 4ft linear lamps connected in series, which is the most common installation for linear lighting. Connecting lamps of differing length in series is a requirement of linear lamps when very specific lighting effects are desired as opposed to just covering a desired area. Edwards does not disclose that the lamps can differ in length to accommodate the requirement of a particular lighting installation. Dr. Eden cites no disclosure in Edwards for that statement. Dr. Eden also cites no other evidence for his statement.

89. Second, 1[h] 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 matches the (first) linear LED lighting

apparatus and also requires the LEDs in the LED lighting apparatus to have a color temperature. 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. Dr. Eden provides no evidence that this would be met by Edwards. Instead, Dr. Eden provides on the following conclusory statement:

180. Finally, a POSA would also understand (in light of the earlier discussion concerning claim elements 1[pre]-1[h]) that a second fixture electrically connected to the first fixture would necessarily be able 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.” That is the “third light having the first color temperature via a third plurality of LEDs” would correspond to the light produced by the first plurality of LEDs of the first fixture and the “fourth light having the second color temperature via a fourth plurality of LEDs” would correspond to the second light produced by the second plurality of LEDs of the first fixture. In plain language, the ability to electrically connect linear lamp fixtures (or any lamp fixture, for that matter) in series allows for an installer to produce light from the second fixture, and the following fixtures in series, having the same characteristics as that generated by the first lamp fixture.

Ex. 1002 (Eden Dec) ¶ 180.

90. That fixtures can be connected in series does not mean that they will have matching color temperatures, as required by the claim. As previously discussed, Edwards does not disclose or teach LEDs that have a color temperature, but rather Edwards teaches LEDs that have color. In addition, Edwards is silent on matching the color temperature between adjacent connected linear lights and therefore has not disclosed claim 1h. Dr. Eden has not met his burden to show that

this element is disclosed or taught by Edwards.

91. For at least the reasons discussed in the preceding paragraphs (incorporated by reference herein), Petitioner has not shown that Edwards and Sadwick teach or renders obvious claims 2-9, which depend from claim 1. Thus, in my opinion, Petitioner does not meet its burden to show obviousness by a preponderance of the evidence.

B. Independent claim 10

1. Dr. Eden fails to analyze the claim language of claim 10.

92. At paragraphs 202 and 203 of his declaration, Dr. Eden includes charts with the “claim feature” and where Dr. Eden believes that “claim feature” is found in claims 10 and claim 1. Dr. Eden’s “claim feature” appears to be a summarized or abbreviated version of the actual claim elements. For example, claim 10[b] is “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 Dr. Eden’s chart this element is listed as “plurality of LEDs having first color temperature, and in linear form factor.” The entry in Dr. Eden’s chart is not the same as the actual claim language. Furthermore, Petitioner and Dr. Eden have not shown that the actual claim language should be interpreted as the table entry based on claim

construction. It is my understanding that an invalidity analysis must be based on the actual claim language and not based on a summarized “claim feature” as shown in Dr. Eden’s table. This element is also not identical to claim element 1[b], which Dr. Eden lists in his chart for this element.

93. Dr. Eden’s offers no explanation for his statement that “, the following features are substantially identical between claim 1 and claim 10 and accordingly for these elements of claim 10 these limitations are rendered obvious by Edwards in view of Sadwick based on the disclosures and analysis for the corresponding elements in claim 1, which I incorporate by reference into my analysis.” Ex. 1002 (Eden Dec.) ¶ 202. To the extent that Dr. Eden's summary charts comparing claims 1 and claim 10 are accurate, then his analysis of claim 10 is incorrect for all of the same reasons as previously stated in my analysis of claim 1.

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

94. Claim 10[b] and 10[i] require “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;” and “a second plurality of light-emitting diodes (LEDs) arranged

within a second linear form factor and having a second number of LEDs, each LED of the second plurality of LEDs associated with the first color temperature, wherein the second number is greater than the first number by a scale factor.” Dr. Eden states that 10[b] is “substantially identical” to claim element 1[b]. Ex. 1002 (Eden Dec.) ¶¶ 202-203. If the Board agrees with Dr. Eden’s statement that these are substantially identical to claim 1[b], then I disagree that these elements are disclosed or taught by Edwards or Sadwick for the same reasons I stated above for claim 1[b]. Moreover, a POSA would not combine Edwards with Sadwick for the reasons I stated above for claim 1[b].

95. Dr. Eden states that 10[i] is “similarly rendered obvious” over Petitioner’s mapping for 1[b]. Ex. 1002 (Eden Dec.) ¶¶ 202-203. With respect to the portion of this limitation requiring that the “second number” of LEDs be greater than the “first number” of LEDs, Dr. Eden opines that this is obvious without any supporting teaching from Edwards, as discussed above for 1[h]. Ex.1002 (Eden Dec.) at ¶¶206-209. I disagree for the same reasons presented above for 1[h]. Moreover, Dr. Eden 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].

3. Edwards and Sadwick do 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.

96. 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”

97. In his paragraph 203, Dr. Eden states that this is “similarity rendered obvious by Edwards in view of Sadwick according to the disclosures and analysis that I have presented for the claim elements below which are incorporated by reference” for claim element 1[g]. Ex. 1002 (Eden Dec.) ¶ 203. I disagree that these elements are disclosed or taught by Edwards or Sadwick for the same reasons I stated above for claim 1[g].

98. Dr. Eden further states:

211. As I discussed previously for claim element 10[i] a POSA would understand that the number of LEDs in fixture of Edwards would be proportional to the length of the fixture. A POSA would understand that for a given brightness level (lumens output) that the current sent to each LED fixture would be proportional to the number of LEDs and, accordingly, would rise linearly with the length of the fixture and, therefore, the scale factor.

212. In view of the above considerations, a POSA will conclude that the current delivered to a second fixture would be greater than the current delivered to the LEDs of the first fixture by that same scale factor.

213. If the number of LEDs in the “first plurality” of LEDs is denoted N_1 and the number of LEDs in the “second plurality” is denoted N_2 , then the scale factor is given by N_2/N_1 .

214. If a particular current (I_1) is required to power N_1 LEDs in the first lighting fixture (luminaire), it is obvious to a POSA that a current $I_2 = I_1 \times N_2/N_1$ will be required to power N_2 diodes in the second lighting fixture (assumed to be identical to those in the first lighting fixture).

215. Another way of saying this is that current scales up linearly with the number of individual LED lights.

Ex. 1002 (Eden Dec.) ¶¶ 211-214.

99. Dr. Eden does not opine that the scaling of current scaling of $10[m]$ is taught in Edwards or Sadwick. Instead, he says that a POSA would modify the circuits of Edward or Sadwick, without any support from the references. Dr. Eden goes on to state that a POSA would rearrange the circuits of both Edwards and Sadwick so that some string of LEDs are connected in parallel, rather than series.

Ex. 1002 (Eden Dec.) ¶¶ 216-231. While Dr. Eden just states that this modification would be obvious, he neglects the fact that there are a number of ways that one could design a product and power distribution to LEDs when you scale the length of light fixtures. One could scale current, scale voltage, or find a balance between scaling of current and voltage. These decisions could be influenced by a number of factors including the desired electrical class rating, the redundancy that is desired in the event of individual LED failures, and the specific

decisions related to the design of power supplies and decisions around SKU count. None of these factors are contemplated in Edwards and given that, Dr. Eden's analysis is overly simplified and in hindsight merely states that the specific design decision of the invention would have been obvious to a POSA. That a POSA could make such a modification is not the issue in this proceeding. The issue is whether a POSA actually would be motivated to make such a modification and Dr. Eden has simply not shown that the POSA would modify the references in this way. To the extent that Dr. Eden is relying on other references to show this motivation, I note that those additional references are not part of the Ground.

4. 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.

100. Dr. Eden states that 10[f] is "substantially identical" to 1[g] and therefore obvious over Edwards and Sadwick. I disagree for the reasons for 1[g] above.

101. For at least the reasons discussed in the preceding paragraphs (incorporated by reference herein), Petitioner has not shown that Edwards and Sadwick teach or renders obvious claims 11-17, which depend from claim 10. Thus, in my opinion, Petitioner does not meet its burden to show obviousness by a preponderance of the evidence.

C. Independent claim 18

1. Dr. Eden fails to analyze the claim language of claim 18.

102. As discussed above with respect to claims 10, at paragraphs 242 and 247 of his declaration, Dr. Eden includes charts with the “claim feature” and where Dr. Eden believes that “claim feature” is found in claim 18 and claim 1. Dr. Eden’s “claim feature” suffers the same issues discussed above with respect to claim 10.

103. Dr. Eden’s offers no explanation for his statement 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, which I incorporate by reference into my analysis.” Ex. 1002 (Eden Dec.) ¶ 242. The plain language of the claims is not “substantially identical.”

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

104. Claim 18[c] and 18[d] require “a first plurality of LEDs associated with a first color temperature, wherein the first plurality of LEDs aligns within a

first linear shape” and “a second plurality of LEDs associated with a second color temperature different from the first color temperature, wherein the second plurality of LEDs aligns within a second linear shape.” Dr. Eden states that these are “substantially identical” to claim elements 1[b] and 1[c], respectively. Ex. 1002 (Eden Dec.) ¶ 242. If the Board agrees with Dr. Eden’s statement that these are substantially identical to claims 1[b] and 1[c], then I disagree that these elements are disclosed or taught by Edwards or Sadwick for the same reasons I stated above for claims 1[b] and 1[c]. Moreover, a POSA would not combine Edwards with Sadwick for the reasons I stated above for claim 1[b].

3. Edwards and Sadwick does 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.

105. Claim 18[o] and 18[p] require “a third plurality of LEDs associated with a third color temperature, wherein the third plurality of LEDs aligns within a third linear shape, wherein the third color temperature matches the first color temperature, and wherein the third plurality of LEDs is longer than the first plurality of LEDs” and “a fourth plurality of LEDs associated with a fourth color temperature matching the second color temperature, wherein the fourth plurality of LEDs aligns within a fourth linear shape, and wherein the fourth plurality of LEDs is longer than the second plurality of LEDs.” Dr. Eden states that these are

corresponds to claim elements 1[b] and 1[c], respectively. Ex. 1002 (Eden Dec.) ¶ 247. Dr. Eden further opines that it would be obvious for these plurality of LEDs to be longer than the first and second plurality of LEDs. Ex. 1002 (Eden Dec.) ¶ 248-249. I disagree that these elements are disclosed or taught by Edwards or Sadwick for the same reasons I stated above for claims 1[b], 1[c], and 1[h].

4. 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.

106. Claim 18[i], [j], [k], and [l] require “a second switch configured to: cause a first portion of the one of the first plurality of currents to couple to each LED of the first plurality of LEDs; cause the first portion of the one of the first plurality of currents to couple to each LED of the second plurality of LEDs; or cause 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.”

107. In his paragraph 242, Dr. Eden states 18[i], [j], and [k] are “substantially identical” to claim element 1[g]. Ex. 1002 (Eden Dec.) ¶ 242. To the extent that the Board agrees that these limitations are substantially identical, I disagree that these elements are disclosed or taught by Edwards or Sadwick for the same reasons I stated above for claim 1[g].

108. With respect to 18[l], Dr. Eden opines 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.” Ex. 1002 (Eden Dec.) ¶¶ 243-246. Dr. Eden is unclear which dimmer switch he is referring to in Edwards. That all LEDs are utilized does not mean that there is equal current provided to both set of LEDs, just that *some* current is provided to the LEDs.

109. In his paragraph 246, Dr. Eden further opines that “[t]o the extent sending equal amounts of current is not expressly disclosed, it is obvious” and that “Having the half the current go to each set of LED would be a selection from a finite number of known predictable solutions.” Ex. 1002 (Eden Dec.) ¶ 246. Again, this is just an assertion that it would be obvious without any supporting evidence.

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

110. Claim 18[t], [u], [v], and [w] state “a fourth switch configured to cause a second portion of the one of the second plurality of currents to couple to

each LED of the third plurality of LEDs; cause the second portion of the one of the second plurality of currents to couple to each LED of the fourth plurality of LEDs; or cause half of the second portion of the one of the second plurality of currents to couple to each LED of the third plurality of LEDs and each LED of the fourth plurality of LEDs”

111. In his paragraph 247, Dr. Eden maps 18[t], [u], and [v] elements to claim element 1[g]. Ex. 1002 (Eden Dec.) ¶ 247. If the Board agrees that these are substantially the same, then, I disagree that these elements are taught by Edwards or Sadwick for the same reasons I stated above for claim 1[g].

112. With respect to 18[w], Dr. Eden refers to his discussion of 18[l] in paragraphs 243-246 and 250 that I disagree with for the reasons presented for 18[l] above.

113. For at least the reasons discussed in the preceding paragraphs (incorporated by reference herein), Petitioner has not shown that Edwards and Sadwick teach or renders obvious claims 19-20, which depend from claim 18. Thus, in my opinion, Petitioner does not meet its burden to show obviousness by a preponderance of the evidence.

IX. MAY AND JESWANI DO NOT RENDER OBVIOUS CLAIMS 1, 2, 4-7, AND 9-20

A. Claim 1

1. The combination of May and Jeswani does not teach 1[e].

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

114. Claim 1 requires “a switch assembly configured to couple to the driver circuit” as claimed in limitations 1[e]. A POSA would not be motivated to combine the network-controlled lighting system of May with the physical switches of Jeswani as claimed in 1[e].

115. 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.p.64 citing 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.,p.66.

116. However, there is no objective evidence in May that suggests combining the controls of Jeswani with the lighting system of May. Dr. Eden proposes that a POSA would include the external CCT and brightness controls of

Jeswani on the outer housing of lamp 1100 of May to provide convenience and multiple operating options to a customer because providing a user-selectable switch for these options would be a valuable feature in the lighting marketplace. Ex.1002,¶273. Dr. Eden continues to assert that since May is concerned with providing control of brightness and CCT for its lamps, a POSA would be motivated to combine the switch of CCT and brightness controls to allow local and manual control of each lamp in the event of a network failure or a scenario in which a user cannot send communications electronically. Ex.1002,¶274.

117. Dr. Eden cites no disclosure in May for this statement. Dr. Eden also cites no other evidence for this statement.

118. Indeed, the evidence on the record proposes the opposite. For instance, upon my review of May, 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.

119. Nevertheless, as mentioned above, Dr. Eden 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 or a scenario in which a user cannot send communications electronically. Ex.1002,¶274. However, in making this statement, Dr. Eden ignores May's proposal to address the power failure scenario in which the lighting system experiences a power failure. That is, with regard to 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. Indeed, May even describes controlling the LED emitters such that they flash with a strobe lighting effect, illuminate certain colored LEDs to provide a warning system of the power outage, and the like. *Id.*

120. In the portion of May accounting for the event of a network failure, May never suggests the need for providing a local switch to change the brightness or CCT of the lighting system in view of the network failure. Ex.1008,¶¶226-227. Indeed, in the event of a network failure, it is highly unlikely that a user would reach into the ceiling to physically adjust the position of a switch to change the brightness or CCT of the lighting system from its default setting. 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. 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. Instead, a POSA would assume that in the event of a network failure, if no other default condition is specified, 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.” In fact, this is a much more likely scenario than installing an additional switch to handle such an event because in a commercial setting it’s not clear who is responsible for such manual control, how they know what to do, or what training would be required to ensure the desired lighting state occurs. Dr. Eden appears to neglect the likely human response and error that would occur in a system designed to be functional only with human override and in doing so, has overlooked how other POE systems are commonly designed, with a default state in cases of specific failures affecting the control of the POE lighting system¹. This is consistent with

¹ Ex. 2024 <https://www.pcmag.com/how-to/how-to-revive-your-smart-light-settings-after-a-power-outage>

the teachings of May which states that “[b]ecause the UPS backup circuit is implemented internal to the lamp, the exiting mounting fixture *does not require any additional wiring or foreign components to be installed into the fixture*. This aspect of the invention thus allows for buildings to be equipped with emergency safety lighting without the increase of cost of installing dedicated breakers, circuits, emergency lights, specialized ballasts, outside battery sources, generators and other equipment” Ex. 1008 [0227].

121. Indeed, the very next paragraph in May states “Linear LED lamps made according to the principles of the disclosed subject matter may also be configured to support *automated* color tuning and color shifting.” Ex. 1008 [0228], not manual color tuning and color shifting. This further supports that the combination of Jeswani with May is in contradiction with the teachings of May.

122. Further, the switches in Jeswani are affixed to each fixture and are not designed to control a number of fixtures with one switch. Ex.1007,FIG.1A. As such, in the case of a network outage, an individual would need to access a drop ceiling or suspended luminaires and manually switch over tens to hundreds of fixtures as opposed to just having a default condition. In this way, May does not provide any motivation or suggestion to include local control switches in its lighting systems, as is made apparent by Dr. Eden’s lack of evidence in May

indicating the same.

123. In view of the above, there is clearly no evidence in May that teaches or suggests a need 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 providing an indication (e.g., flashing light, different color pattern) to alert users in the area that a network or power supply issue is present.

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

124. As discussed above, 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.

125. 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, unless there was some particular reason to alert the user of this “network outage.” Ex.2024. As such, a POSA would understand that the control module 1132 would likely execute default instructions to perform the pre-defined operations 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.

126. 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.

127. With this in mind, 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, it is impractical to make use of the local switches of Jeswani in the lighting system of May because a POSA would ignore May’s ability to remotely control the

brightness and CCT of the light system based on instructions executed by a processor and avoid locally accessing the lighting systems to change the brightness and CCT.

128. Assuming, for the sake of argument, if May was modified to include the local switches of Jeswani, the processor 1204 or the control module 1132 of May would need to account for the positions of these local switches when supplying power to the LED array. That is, for example, the logic executed by the control module 1132 would need to include software code that specifies whether it would operate based on the instructions executed by the control module 1132 or operate based on the positions of the local switches to control brightness and CCT of the LED arrays. Indeed, since each of the switches 15a and 15b of Jeswani have three positions that correspond to brightness and CCT settings, it is unclear to a POSA how the lighting system of May would operate with these 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. Moreover, Dr. Eden fails to provide any insight into how May would operate with the local switches when the network is available.

129. If the network was unavailable as Dr. Eden suggests, a POSA may presume that the control module 1132 may defer to the settings of the local

switches of Jeswani to control the LED arrays. However, as mentioned above, May already includes details with regard to operating the lighting system when the network is interrupted (e.g., provide room lighting, strobe lighting effect, different colored lighting via a UPS). Ex.1008, ¶¶226-0227. As such, 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, neither Dr. Eden nor May provides any insight or suggestion as to why a POSA would be motivated to disregard the described procedure to respond to a network interruption of May and instead defer to using the local switches provided by Jeswani.

130. In the event that power or the network is interrupted, May describes having the UPS module 1134 as part of the lighting system to provide power to the control module 1132 and LED emitters and continue providing lighting. Ex.1008, ¶225. In one example, May describes controlling one LED emitter array to provide room lighting, while independently controlling a second LED emitter array to produce a strobe effect or provide a light of a different color to provide a warning to users that the UPS has been invoked. Ex.1008, ¶225. In this way, an advantage of employing May's lighting system includes alerting users of network

and power failures by modifying the produced light. May describes the control module 1132 being “operatively connected” to a UPS 1134 such that there is no need to add any manual switches in the event of a power or network failure.

Ex.1008, 225. However, according to Dr. Eden’s assertion, 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 associated with the automated lighting features of May’s lighting system. Indeed, the ability of May’s lighting 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.

131. Moreover, another advantage of using May’s UPS as a backup circuit includes avoiding the installation of any additional wiring or foreign components into the fixture. Ex.1008, ¶0227. Further, May describes using the lighting system and the automated lighting applications to implement emergency 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 likely increase the costs associated with the lighting system and could also adversely affect the aesthetics of the lighting system of May.

132. In view of the above, it is clear that May never describes any need to

control the network-enabled lighting system of May using local controls because local controls would render the benefits of employing PoE technology in the lighting system of May useless. Indeed, the inclusion of the local switches of Jeswani would change the principle operation of at least the control module 1132 by requiring it to include additional computer code that accounts for the settings of the local switches when operating the LED arrays, even though such a control module would already include the functionality to set the lighting system to a desirable default condition in the event of a network or power failure making the switches of Jeswani redundant. The requirements or provisions for implementing this additional computer code are never described or suggested by May, Jeswani, or Dr. Eden. 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 would be rendered useless.

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

133. Claim 1 requires a driver circuit configured to output a plurality of currents (Claim 1[d]), a first switch configured to cause the driver circuit to output one of the plurality of currents (Claim 1[f]), 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 1[g]). In other words, the proposed 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 would at least 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.

134. Dr. Eden asserts that Jeswani discloses a 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. Ex.1002, ¶¶277-278. Indeed, Dr. Eden continues to assert that the control module of May can receive instructions from data communications (e.g., Ethernet packets) to modify aspects 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.

135. With this in mind, neither Dr. Eden nor Jeswani provides any discussion as to 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. Indeed, each LED array of the lighting system of May is 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.

136. Referring now to Jeswani, it is clear that Jeswani never provides control instructions or packets via Ethernet or any suitable communication platform that would enable the control module of May to operate. That is, the switches 15a and 15b of Jeswani may be a toggle switch, a pushbutton switch, and/or a selector switch. Ex.1007,8:23-25. None of these types of switches are configured to provide data communication, such as Ethernet packets, to a control module.

137. Further, although the switch 15b provides a selection of a CCT setting to the LED string switching scheme 78 (e.g., circuit) to determine which string of LEDs to operate. Ex.1007,11:12-15. Jeswani never explains how the LED string

switching scheme 78 selects the string of LEDs to operate. In any case, neither the LED switching scheme 78 nor the switches 15a or 15b are described as being able to communicate data packets to control the operation of an independently controllable driver circuit.

138. Although Dr. Eden alleges that a POSA would understand that each current sent from one of the sub-circuits can be one of the plurality of currents and provided in claim 1[f], Dr. Eden fails to describe how a POSA would incorporate the switches 15a and 15b of Jeswani to provide data packets to cause the control module of May to independently control the sub-circuit drivers connected to respective LED emitter strings. Indeed, a POSA may understand that switch 15a may provide some circuit measurement (e.g., resistance value) based on its position but this circuit measurement cannot be reasonably interpreted as being a data packet communicated via Ethernet. As such, the sub-circuit drivers of May cannot operate based on the settings of the switches 15a and 15b of Jeswani.

139. In addition, it is important to note that 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.

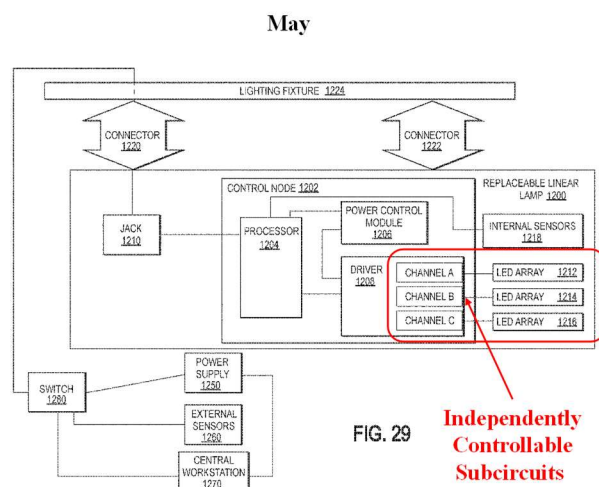


FIG. 29

Independently Controllable Subcircuits

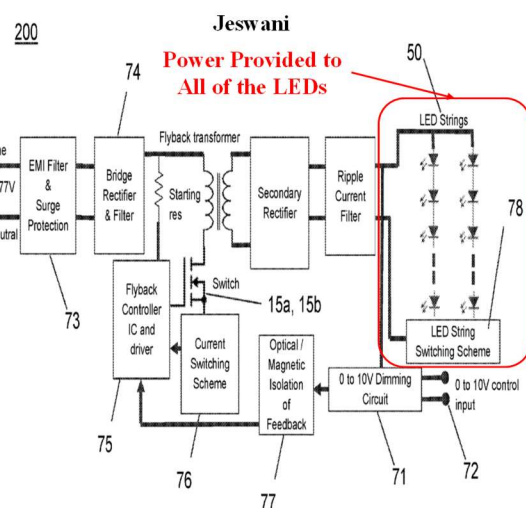


FIG. 6

140. 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

1[g]. 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 never provides 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.

141. 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 the switches or the associated circuitry of Jeswani into the lighting system of May would not be feasible with the independently controllable driver sub-circuits. Indeed, while Jeswani describes different LED arrays connected to the same output current, this is impossible to implement via the driver sub-circuits of May.

142. Moreover, May cannot be modified to have one selected current output from a driver circuit coupled to two LED arrays. That is, as mentioned above, 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. In one example provided by May, to produce light having a CCT between 4500K and 6500K, the drive 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.

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

143. Claim element 1[h] has two separate elements that Dr. Eden has not shown are disclosed or taught in May. First, 1[h] 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, 1[h] 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. Dr. Eden provides no evidence that this would be a motivation or concern met by May.

144. 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.

145. To the extent that May discloses that the linear LED lamps may vary by a scale factor, Dr. Eden merely points to claim 40 and paragraph 205 as describing linear LED lamps are designed to accept linear lamps of standardized nominal lengths of about 2 feet, 3 feet, 4 feet, etc. Ex.1002,¶287. However, these portions of May do not describe different-sized LED lamps being connected to each other. Indeed, these portions merely indicate that the linear LED lamp of May can be used to replace existing light fixture. These replacement linear LED lamps of May could be of different lengths, but May never expressly mentions that two linear LED lamps connected to each other would be of different sizes.

146. Dr. Eden even admits that May does not 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. Ex.1002,¶287. However, Dr. Eden fails to

provide any evidence indicating any reasons for a POSA to assume that someone would be motivated to connect the linear LED lamps of May in this manner.

147. For at least the reasons discussed in the preceding paragraphs (incorporated by reference herein), 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. Thus, in my opinion, Petitioner does not meet its burden to show obviousness by a preponderance of the evidence.

B. Claim 10

1. Dr. Eden fails to analyze the claim language of claim 10.

148. At paragraphs 303 and 304 of his declaration, Dr. Eden includes charts with the “claim feature” and where Dr. Eden believes that “claim feature” is found in claims 10 and claim 1. Dr. Eden’s “claim feature” appears to be a summarized or abbreviated version of the actual claim elements. For example, claim 10[b] is “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 Dr. Eden’s chart this element is listed as “plurality of LEDs having first color temperature, and in linear form factor.” The entry in Dr. Eden’s chart is not the same as the actual

claim language. Furthermore, Petitioner and Dr. Eden have not shown that the actual claim language should be interpreted as the table entry based on claim construction. It is my understanding that an invalidity analysis must be based on the actual claim language and not based on a summarized “claim feature” as shown in Dr. Eden’s table. This element is also not identical to claim element 1[b], which Dr. Eden lists in his chart for this element.

149. Dr. Eden offers no explanation for his statement that “the following features are substantially identical between claim 1 and claim 10 and accordingly for these elements of claim 10 these limitations are rendered obvious by May in view of Jeswani based on the disclosures and analysis for the corresponding elements in claim 1, which are incorporated by reference.” Ex.1002,¶303. Therefore, in my opinion, 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.

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

150. Claim 10 requires:

a first driver circuit configured to output a first plurality of currents;
a first switch assembly configured to:

cause the first driver circuit to output one of the first plurality of currents; and
couple the one of the first plurality of currents to the first plurality of LEDs;

151. As discussed above with reference to claim element 1[e], 1[f], and 1[g], a POSA would not be motivated to combine the network-controlled lighting system of May with the physical switches of Jeswani as claimed in 10[c]-10[f]. As discussed above, there is no objective evidence in May that suggests combining the controls of Jeswani with the lighting system of May. Moreover, Dr. Eden fails to provide any evidence to the contrary. Instead, Dr. Eden attempts to assert that May is concerned with providing control of brightness and CCT for its lamps, and that a POSA would be motivated to combine the switch of CCT and brightness controls to allow local and manual control of each lamp in the event of a network failure or a scenario in which a user cannot send communications electronically.

Ex.1002,¶274.

152. Instead, May *never* mentions the need to have local control of its lighting system, and instead, focuses on providing 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 assembly, to enable a user to locally control the operation of the lighting system.

153. Further, a POSA would not be motivated to combine the local controls of Jeswani with the lighting system of May despite Dr. Eden's suggestion that a POSA would be motivated to make this change in view of a potential power or network outage. However, as mentioned above, Dr. Eden ignores May's proposal to address the power failure scenario in which the lighting system experiences a power failure. That is, with regard to 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, ¶¶226. Indeed, May even describes controlling the LED emitters such that they flash with a strobe lighting effect, illuminate certain colored LEDs to provide a warning system of the power outage, and the like. *Id.*

154. In the portion of May accounting for the event of a network failure, May never suggests the need for providing a local switch to change the brightness or CCT of the lighting system in view of the network failure. Ex.1008, ¶¶226-227. Indeed, in the event of a network failure, it is 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.

3. May and Jeswani do not teach claim element 10[i] 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.

155. Claim element 10[h] has various elements that Dr. Eden has not shown are disclosed or taught in May. For example, 10[h] and 10[i] requires:

156. second modular lighting apparatus traversing a second linear distance that is longer than the first linear distance, wherein the second modular lighting apparatus comprises:

a second plurality of light-emitting diodes (LEDs) arranged within a second linear form factor and having a second number of LEDs, each LED of the second plurality of LEDs associated with the first color temperature, wherein the second number is greater than the first number by a scale factor.

157.

158. As such, claim elements 10[h] and 10[i] state that the two modular lighting apparatuses have two different linear lengths with two different plurality 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. As discussed above, Dr. Eden provides no evidence of any motivation in May that indicates that a POSA would be motivated to connect two different sized LEDs scaled according to a scale factor in view of the disclosure of May.

4. 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.

159. 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.”

160. In his paragraph 310, Dr. Eden states:

310. As I discussed previously for claim element 10[i] a POSA would understand that the number of LEDs in fixture of May would be proportional to the length of the fixture. A POSA would understand that for a given brightness level (lumens output) that the current sent to each LED fixture would be proportional to the length of the fixture. A POSA would understand and accordingly would go up with the scale factor.

311. In view of the above considerations, a POSA will conclude that the current delivered to a second fixture, would be longer than the first fixture by a “scale factor”, must and accordingly the second current (sent to the LEDs of the second fixtures) would be greater than the current to the LEDs of the first fixture by that scale factor.

312. If the number of LEDs in the “first plurality” of LEDs is denoted N_1 and the number of LEDs in the “second plurality” is denoted N_2 , then the scale factor is given by N_2/N_1 .

313. If a particular current (I_1) is required to power N_1 LEDs in the first lighting fixture (luminaire), it is obvious to a POSA that a current $I_2 = I_1 \times N_2/N_1$ will be required to power N_2 diodes in the second lighting fixture (assumed to be identical to those in the first lighting fixture).

314. Another way of saying this is that current scales up linearly with the number of individual LED lights.

Ex. 1002 (Eden Dec.) ¶¶ 311-314.

161. In view of the above, Dr. Eden provides no objective evidence within May or Jeswani that supports these statements. Indeed, Dr. Eden 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. That is, it is clear to me that 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. Indeed, the ‘302 Patent 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.*

162. 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. With this in mind, since Dr. Eden cannot reasonably identify a suitable LED circuit arrangement that incorporates the switches and switch circuitry of Jeswani with the independently controllable LED arrays of May, 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].

163. Moreover, while Dr. Eden just states that this modification would be obvious, he neglects the fact that there are a number of ways that one could design a product and power distribution to LEDs when you scale the length light

fixtures. One could scale current, scale voltage, or find a balance between scaling of current and voltage. These decisions could be influenced by a number of factors including the desired electrical class rating, the redundancy that is desired in the event of individual LED failures, and the specific decisions related to the design of power supplies and decisions around SKU count. None of these factors are contemplated in May and given that, Dr. Eden's analysis is overly simplified and in hindsight merely states that the specific design decision of the invention would have been obvious to a POSA.

164. For at least the reasons discussed in the preceding paragraphs (incorporated by reference herein), Petitioner has not shown that May and Jeswani teach or renders obvious claims 11-17, which depend from claim 10. Thus, in my opinion, Petitioner does not meet its burden to show obviousness by a preponderance of the evidence.

C. Claim 18

1. Dr. Eden fails to analyze the claim language of claim 18.

165. At paragraphs 338, 341, and 342 of his declaration, Dr. Eden includes charts with the "claim feature" and where Dr. Eden believes that "claim feature" is found in claims 18 and claim 1. Dr. Eden's "claim feature" appears to be a summarized or abbreviated version of the actual claim elements. As discussed

above with respect to the claim features of claim 10, the entries in Dr. Eden's chart are not the same as the actual claim language. Furthermore, Petitioner and Dr. Eden have not shown that the actual claim language should be interpreted as the table entry based on claim construction. It is my understanding that an invalidity analysis must be based on the actual claim language and not based on a summarized "claim feature" as shown in Dr. Eden's table. The various elements in the chart are not identical to claim elements of claim 1, which Dr. Eden lists in his chart for this element.

166. Dr. Eden's offers no explanation for his statement 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 May in view of Jeswani based on the disclosures and analysis for the corresponding elements in claim 1, which are incorporated by reference." Ex.1002,¶338.

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

167. As discussed above with respect to claim element 10[h], a POSA would not be motivated to combine the network-controlled lighting system of May with the physical switches of Jeswani as claimed in 18[f]-18[h]. Indeed, there is no objective evidence in May that suggests combining the controls of Jeswani with

the lighting system of May. Moreover, Dr. Eden fails to provide any evidence to the contrary. Instead, Dr. Eden attempts to assert that May is concerned with providing control of brightness and CCT for its lamps, and that a POSA would be motivated to combine the switch of CCT and brightness controls to allow local and manual control of each lamp in the event of a network failure or a power failure. Ex.1002, ¶274. However, May *never* mentions the need to have local control of its lighting system, and instead, focuses on providing 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 assembly, to enable a user to locally control the operation of the lighting system.

168. Further, as discussed above, a POSA would not be motivated to combine the local controls of Jeswani with the lighting system of May despite Dr. Eden’s suggestion that a POSA would be motivated to make this change in view of a potential power outage. As mentioned above, Dr. Eden ignores May’s proposal to address the power failure scenario in which the lighting system experiences a power failure. That is, with regard to 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. Indeed, May even describes controlling the LED emitters such that they flash with a strobe lighting effect, illuminate certain colored LEDs to provide a warning system of the power outage, and the like. *Id.*

169. In the portion of May accounting for the event of a network failure, May never suggests the need for providing a local switch to change the brightness or CCT of the lighting system in view of the network failure. Ex.1008,¶¶226-227. Indeed, in the event of a network failure, it is 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.

3. May and Jeswani do not teach at least limitations and 18[l] 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.

170. Claim element 18[l] 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 18[l] 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.

171. As I mentioned above with respect to claim elements 1[d], 1[f], and

1[g], 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 drive 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.

172. Dr. Eden indicates that Jeswani discloses an arrangement in which a setting on a switch may create a color temperature of 3500 by sending equal amounts of currents to LED groups of 3000K and 4000K. Ex.1002, ¶339. Dr. Eden then concludes 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. Ex.1002, ¶340. However, Dr. Eden never details any reason as to 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. 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 18[1].

173. Accordingly, Dr. Eden has not met his burden to show that this element is disclosed or taught by May or Jeswani. In the same manner, Dr. Eden has not met his burden in view of the arguments presented above with respect to claim elements 18[1], which correspond to claim elements 1[d], 1[f], and 1[g], as detailed above.

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

174. Claim 18[g] requires “a switch assembly configured to couple to the driver circuit” as claimed in limitations 1[e]. A POSA would not be motivated to combine the network-controlled lighting system of May with the physical switches of Jeswani as claimed in 18[g]. As discussed above, there is no objective evidence in May that suggests combining the controls of Jeswani with the lighting system of May. Dr. Eden proposes that a POSA would include the external CCT and brightness controls of Jeswani on the outer housing of lamp 1100 of May to provide convenience and multiple operating options to a customer because providing a user-selectable switch for these options would be a valuable feature in the lighting marketplace. Ex.1002,¶273. However, 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.

175. Accordingly, Dr. Eden has not met his burden to show that this element is disclosed or taught by May or Jeswani. Moreover, Dr. Eden has not met his burden in view of the arguments presented above with respect to claim element 18[g], which corresponds to claim element 1[e], as detailed above.

176. For at least the reasons discussed in the preceding paragraphs (incorporated by reference herein), Petitioner has not shown that May and Jeswani teach or renders obvious claims 19-20, which depend from claim 18. Thus, in my opinion, Petitioner does not meet its burden to show obviousness by a preponderance of the evidence.

X. ADDITIONAL REMARKS

177. I currently hold the opinions expressed in this Declaration. But my analysis may continue, and I may acquire additional information and/or attain supplemental insights that may result in added observations.

I hereby declare that all statements made are of my own knowledge are true and that all statements made on information and belief are believed to be true. I further declare that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of the Title 18 of the United States Code and that such willful false statements may jeopardize the validity of this proceeding.

Dated: 11/3/2025

By: 

Dr. Thomas Katona
San Luis Obispo, California