

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

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

TABLE OF CONTENTS

I.	INTRODUCTION	4
II.	BACKGROUND AND QUALIFICATIONS	4
III.	MATERIALS RELIED UPON IN FORMING MY OPINIONS	7
IV.	LEGAL STANDARDS FOR PATENTABILITY	7
A.	Claim Construction.....	7
B.	Obviousness.....	8
V.	LEVEL OF ORDINARY SKILL IN THE ART	9
VI.	OVERVIEW OF THE '302 PATENT.....	11
VII.	OVERVIEW OF LIGHT EMITTING DIODES.....	13
VIII.	OVERVIEW OF THE CITED PRIOR ART.....	16
A.	USP 9,995,440 to Edwards (Ex. 1005)	16
B.	U.S. Printed Publication 2019/0320515 to Sadwick (Ex. 1006).....	20
C.	U.S. Printed Publication 2019/0041009 to May (Ex. 1007)	22
D.	USP 10,683,969 to Jeswani (Ex. 1008).....	27
IX.	EDWARDS AND SADWICK DO NOT RENDER OBVIOUS CLAIMS 1, 2, 4-7, AND 9-20.....	30
A.	Claim 1	30
1.	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.	30
B.	Claim 2	32
C.	Claim 4	36

D.	Independent claim 10	39
1.	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.....	39
E.	Claim 15	40
F.	Claim 20	41
X.	MAY, JESWANI, AND SADWICK DO NOT RENDER OBVIOUS CLAIM 15	42
A.	Claim 15	42
XI.	ADDITIONAL REMARKS	43

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. This is a supplemental declaration to the declaration submitted November 3, 2025.

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 '302 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 has 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

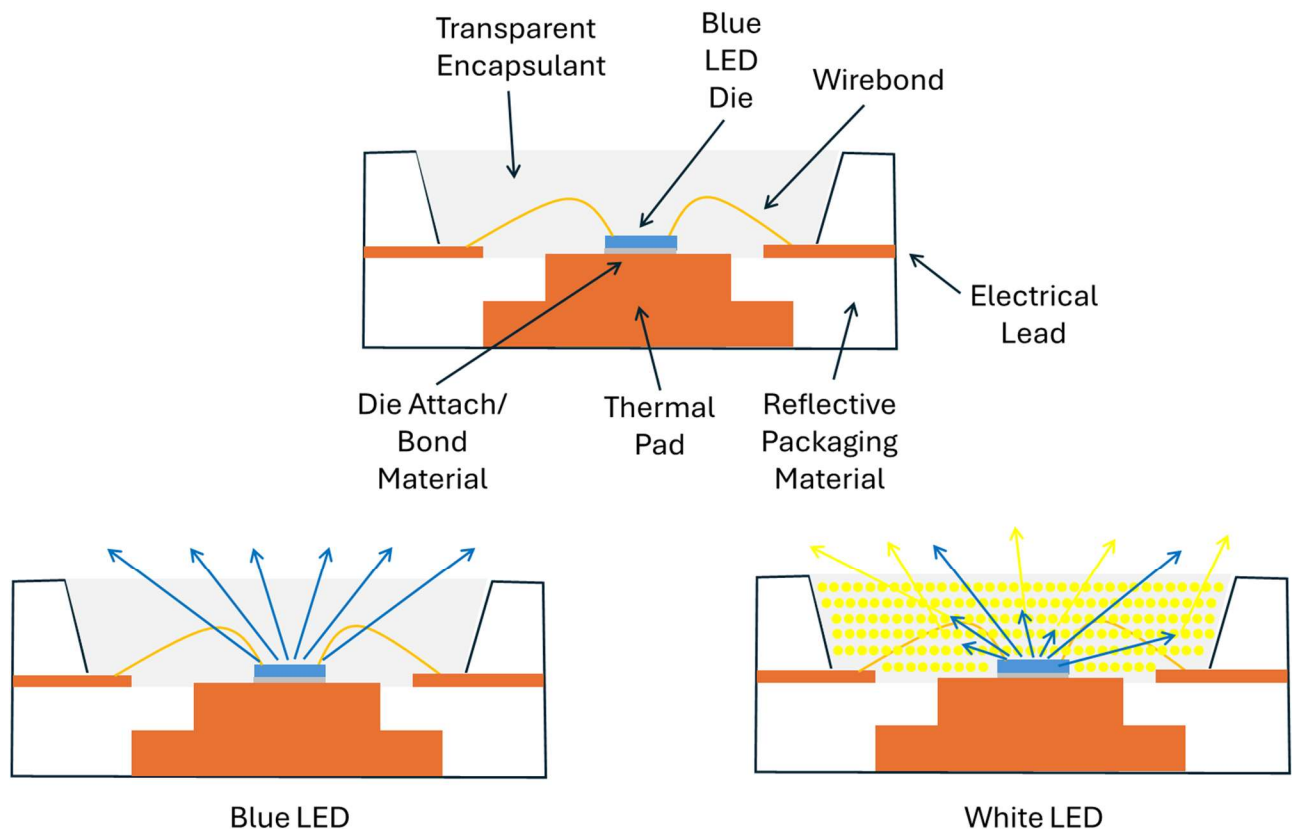
at installation or to be modified later if desired. This provided the benefits of making installation and adjustment of the lighting properties on site by non-lighting professionals possible, allowed customers to purchase one SKU type of fixture per length without any concern for whether they would have 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 adjust 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 LIGHT EMITTING DIODES

28. While Light Emitting Diodes (LEDs) appear to be simple devices, but they actually represent a complex engineered system to provide the performance

that is typically required for lighting applications. Referring to the figure below, this figure shows cross-sectional schematics of a blue LED package (top and bottom left) and a white LED package (bottom right).



29. The common attributes in these packages are:

- Blue LED Die or Chip, which is the semiconductor material that is designed to emit blue light at a high electrical to optical efficiency
- Wirebonds which serve as the electrical connections between electrical control signals provided to the LED package and the LED die
- Electrical Leads which carry the electrical control signal through the

LED package to the wirebonds, typically from a circuit board that the LED is mounted upon

- Reflective packaging material which makes up the structural body of the package, typically made from a plastic mold compound for low and mid-power LEDs
- Thermal Pad or Slug which provides a thermally conductive path from where heat is generated in the LED package (chiefly from the LED die) to the substrate that the LED is mounted upon
- Die Attach/Bond Material that mechanically fastens the LED die to the LED package
- Transparent Encapsulant material that is designed to seal and help protect the LED from its surrounding environment, ensure device reliability and aid in light extraction from the LED package

30. For white LEDs specifically, the schematic shows that the transparent encapsulant material is loaded with a slurry of small optically functional particles called phosphors. These phosphors are designed to absorb light of a particular wavelength, and then re-emit light with a different, typically longer wavelength or lower energy, emission spectrum. In most white LEDs, the phosphor slurry is developed in such a way that some blue light from the blue LED die passes

through the phosphor material and provides the blue portion of the resulting white spectrum, while the rest of the spectrum (greenish to deep red) comes from converting light from the blue LED die to these longer wavelengths. The combined LED die + phosphor spectrum results in what an observer sees as “white” of a certain color temperature. The color temperature is determined by the phosphor or phosphors that are used in this slurry. Warmer white or lower color temperature white has more red content from the phosphor than neutral or cool white which would typically have less red or orange content in the final spectrum. In addition, when light from the blue LED die is converted to longer wavelength light in a white LED package, that energy conversion generates additional heat in the LED package that must be dissipated thermally to prevent premature breakdown or reduced performance from the encapsulation materials, the LED die itself, and the packaging materials. This is particularly challenging for high energy density LEDs that are typically only a few millimeters by a few millimeters in area and are very thin.

VIII. OVERVIEW OF THE CITED PRIOR ART

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

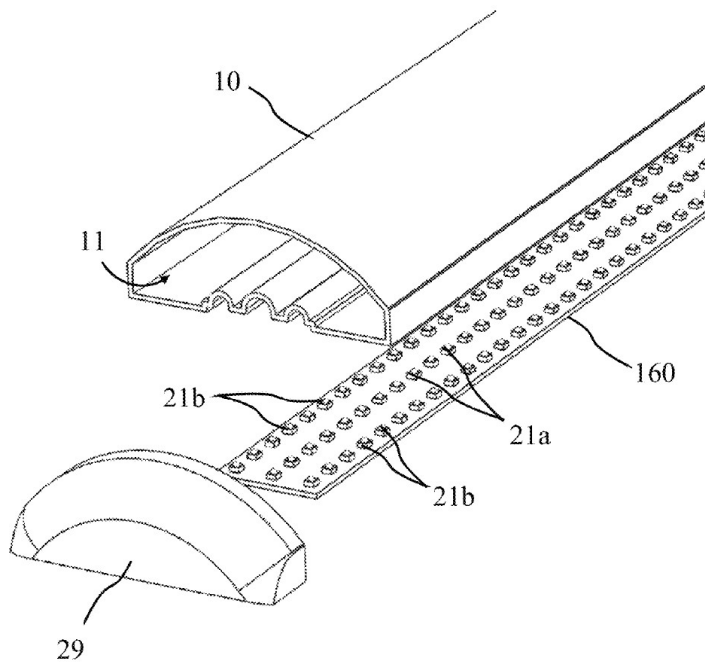
31. Edwards, entitled “Color temperature tunable and dimmable solid-state linear lighting arrangements,” was filed on December 8, 2015, published on

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.

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

33. 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.

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

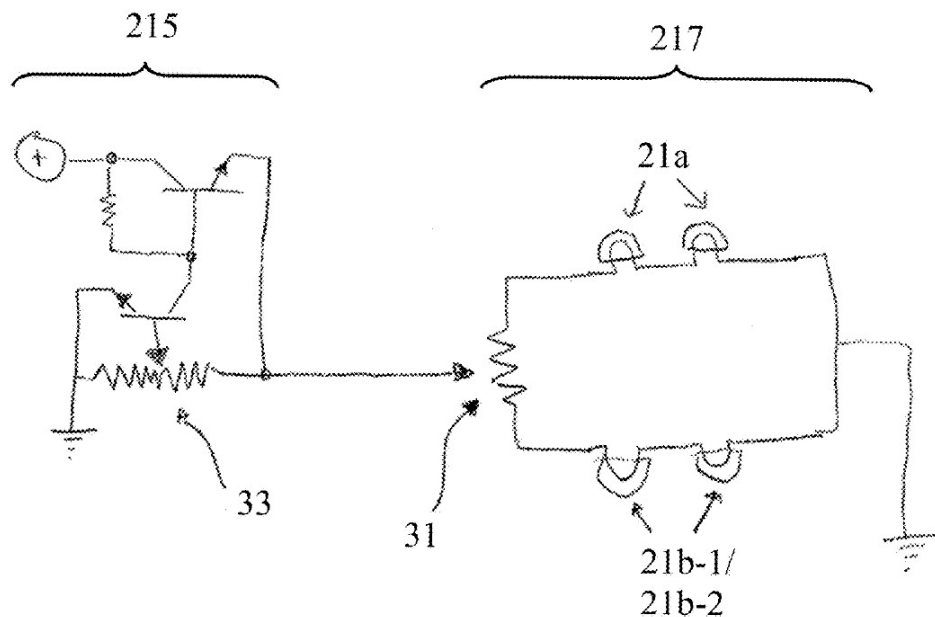


Ex. 1005 (Edwards) Fig. 1B.

35. “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.

36. 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)

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

38. 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.

39. 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.

40. 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.

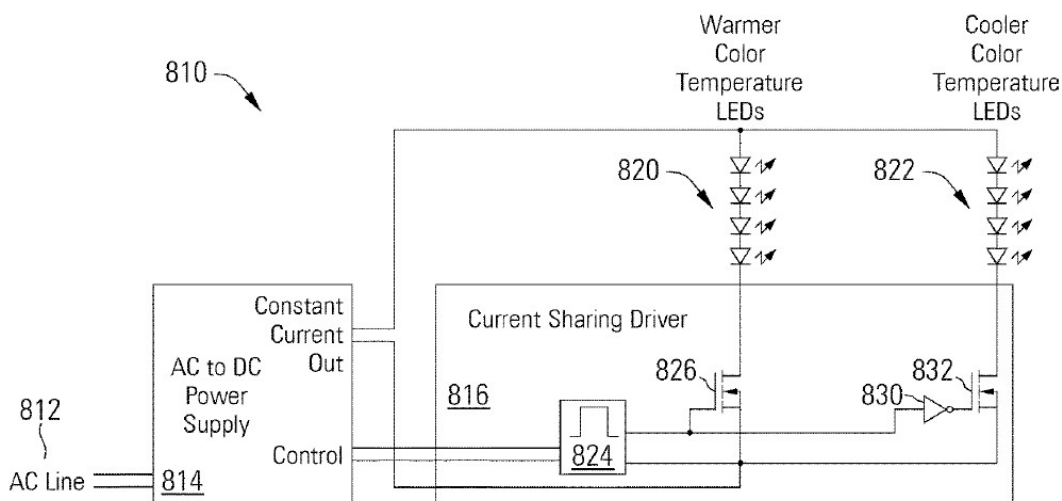


FIG. 35

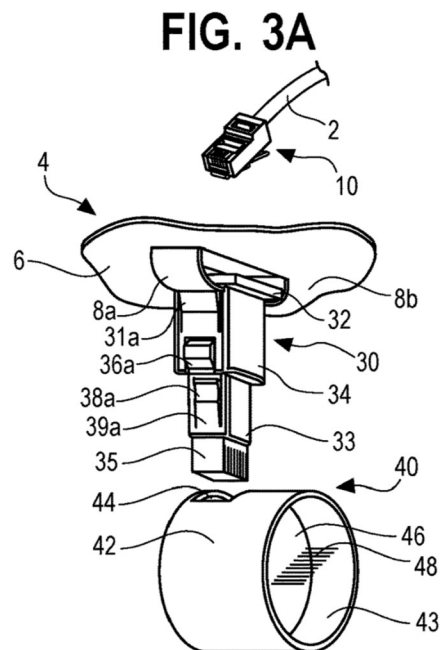
Ex. 1006 (Sadwick) at Fig. 35.

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

41. 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.

42. 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.



43.

44. 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.

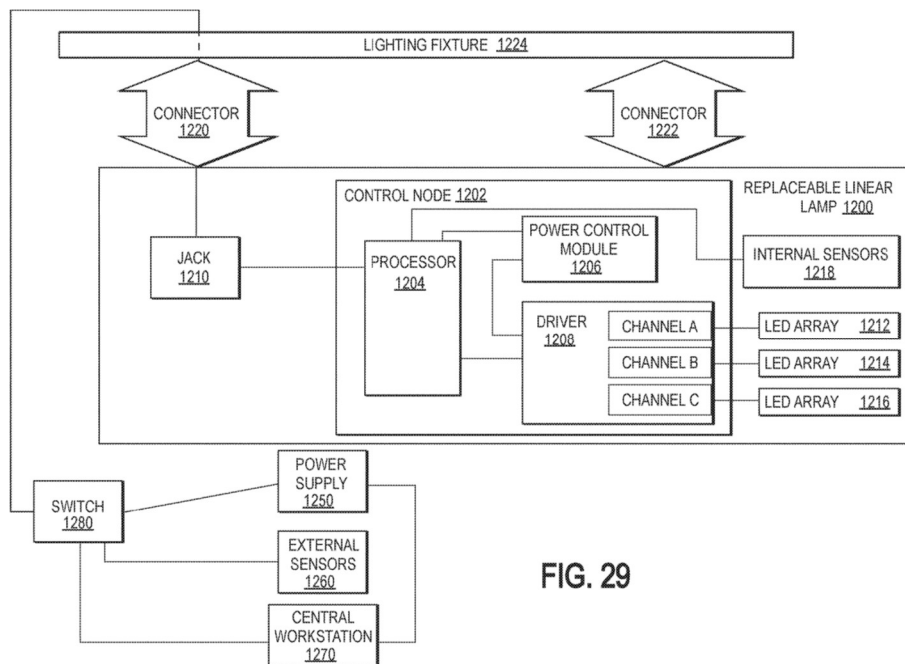


FIG. 29

45. 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.*

46. 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.

47. 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.

48. 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.

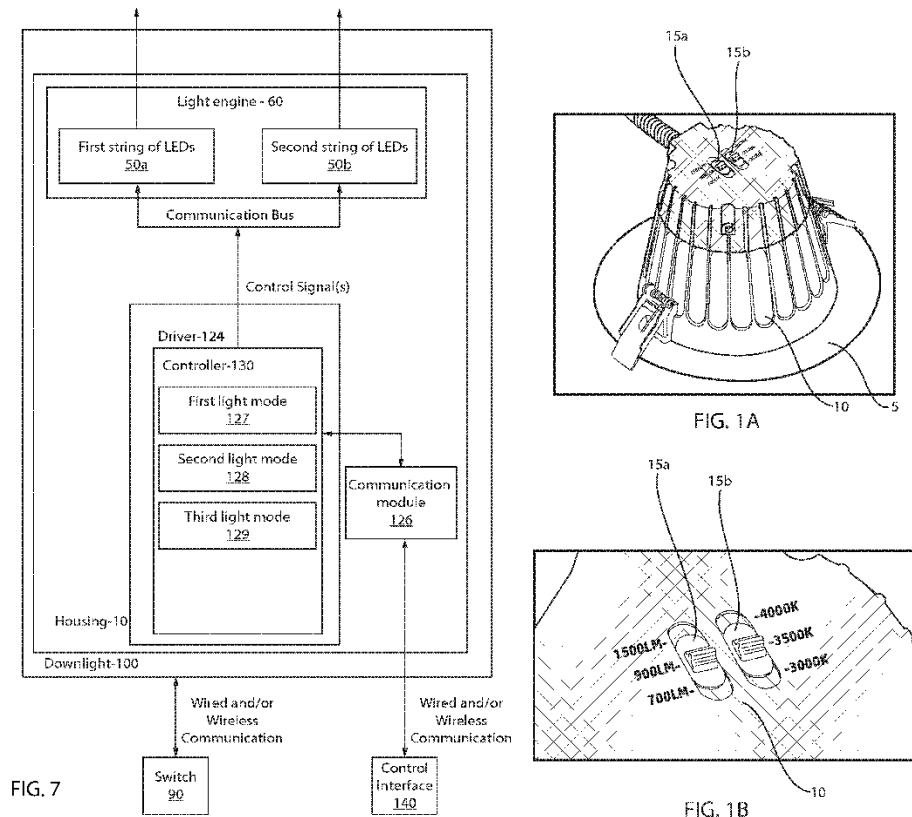
D. USP 10,683,969 to Jeswani (Ex. 1008)

49. 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.

50. 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.

51. 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.

52. 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.



53. 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.*

54. 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

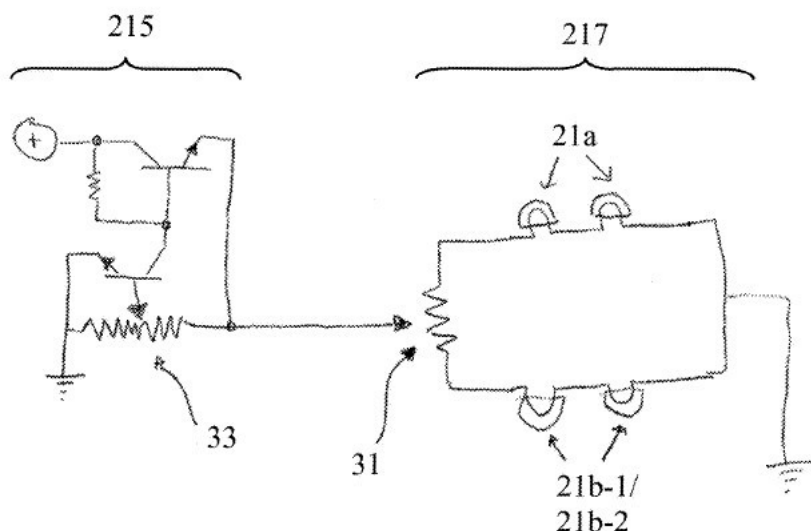
view of the remote-control features described in FIG. 7 of Jeswani. However, neither May nor Jeswani provides any objective reasoning as to modifying the remote controllable lighting system of May or the remote controllable downlight 100 of Jeswani to incorporate the physical switches 15a,15b of Jeswani. 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.

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

A. Claim 1

1. 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.

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



Ex.1005-

Fig. 5

56. 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.

57. Claim 1[g] is “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.” Edwards variable resistor 31 is always in contact with both LED strings 21a and 21b. The variable resistor 31 allows different amounts of current to be provided to strings 21a and 21b based on the setting of the variable resistor.

This variable current is different from the claimed “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” because the potentiometer is continually coupled to *both* 21a and 21b.

B. Claim 2

58. Claim 2 depends from claim 1 and states “The linear LED lighting apparatus of claim 1, wherein the second switch comprises a plurality of selectable positions.” Dr. Eden says this is disclosed by Edwards reference:

181. This limitation is also met by in Edwards. A POSA would understand that a color temperature switch 215b, which controls the color temperature would necessarily have a plurality of selectable positions.

182. Further as described above for element 1(h) the color temperature switch 215b can be used to change the color temperature between multiple settings. Edwards discloses that the dimmer switch includes an “on” position (Ex.100513:6-8) and that the color temperature switch would similarly have selectable positions, which control the fixture’s color temperature. Also, as discussed for claim element 1(g), the color temperature switch adjusts the resistor 31 for the purpose of controlling the distribution of current between the pluralities of LEDs.

Ex. 1002 (Eden Dec) ¶¶ 181-182.

59. Edwards says that “dimmer switch 215 is configured to generate a continuous range of output powers to be used for tuning the light emitting device.”

Ex.1005,11:39-41. Because the dimmer switch 215 is continuous, it does not have

the “plurality of selectable positions.” Edwards Fig. 5 further shows that Edwards dimmer switch 215 is a potentiometer, which has a continuous motion dial, not a plurality of selectable positions, as the claim requires. Despite Dr. Eden's assertion, the word "selectable" doesn't appear in the specification of Edwards, let alone that "the color temperature switch would similarly have selectable positions".

60. Dr. Eden makes a second argument that a POSA would put in a different switch.

183. Electrical switches have been available in a wide variety for more than 75 years and those most attractive for the “second switch” might be a rotary, slide, or multipole toggle switch and electronically-controllable versions of each. Any POSA would be quite familiar with these and other switches.

184. To the extent that it is not expressly disclosed, a POSA would be motivated to add multiple selectable positions to the color temperature switch 215b with a reasonable expectation of success because switches continue to be essential to the proper functioning of any electrical system. As described briefly in the Technical Background section of this report, electrical switches have been known and manufactured since the 19th century in a variety of forms. Such a modification would be the combination of known elements to obtain predictable results.

Ex. 1002 (Eden Dec.) ¶¶ 183-184.

61. Here, Dr. Eden is not drawing from the disclosure or teachings of Edwards or any other reference. Instead, this is just a general suggestion that multi-position switches were known *and* that a POSA would put such a switch

into the circuit of Edwards. But Dr. Eden does not explain why a POSA would make such a modification or how a POSA would actually modify the circuit of Edwards to include such a switch. Dr. Eden has not shown that a POSA would make the proposed combination of Edwards, Sadwick, and some other known switch.

62. Later, Dr. Eden says that a POSA would combine the switches from Jeswani with the circuit of Edwards.

The additional subject matter of claim 2 is additionally disclosed by Jeswani. Jeswani discloses an “interface on the lamp housing 100 for selecting a lumen setting and for selecting a correlated color temperature (CCT) setting for the light being emitted by the light engine 60 of the downlight 100.” Ex.1007-8:19-25. As shown below it includes a plurality of selectable positions.

* * *

255. As shown above the switch assembly of Jeswani includes a plurality of selectable positions. A POSA would be motivated to use the design the CCT and brightness switch assembly of Jeswani in the system of Edwards with a reasonable expectation of success. As both Edwards and Jeswani include switches for brightness and CCT, a POSA would be motivated to use the design of Jeswani to more easily allow the system of Edwards to be controlled and to minimize the physical profile of those controls. Such a combination would be the combination of known elements in known ways to achieve a predictable result. Because the insertion of physical controls were well known in the art a POSA would have a reasonable expectation of success in adding the physical controls of Jeswani.

Ex. 1002 (Eden Dec.) ¶¶ 254-255.

63. As with his very general statement about obviousness of switches ,

Dr. Eden does not explain how a POSA would go about modifying the circuit of Eden to include the controls from Jeswani. As I stated before, the dimmer switch 215 of Eden is very inefficient, but does allow a range of currents to be controlled though the two LED strings. Dr. Eden does not explain whether or how the switches from Jeswani could be substituted for the dimmer switch 215 of Eden. Even if it were possible, it would provide less precise control of the relative currents between the two LED strings, so it would actually be a less useful circuit. Dr. Eden has also failed to show that that the switches from Jeswani would actually “minimize the profile of those controls” compared with the circuits shown in Edwards. A POSA would not understand this to necessarily be true. Instead, a POSA may prefer a circuit with a compact potentiometer over physical switches based on the application and other parameters. In such a circumstance, a POSA would actually be motivated to not combine Jeswani’s switches with Edwards. Moreover, I note that Edwards states that one of the problems it addresses is "a problem with such devices involves the dimming/ correlated color temperature (CCT) characteristics of such devices." Ex. 1005 (Edwards) 3: 14-16. Here Edwards is referring to the problem they are addressing is that LED lights don't follow the blackbody curve as they are dimmed. Because of the described behavior, a POSA would understand Edwards is addressing the issue caused by

continuous dimming, like what is observed with incandescent lights. This contrasts with step-wise jumps in CCT that would occur with the proposed substitution of Jeswani's switches into Edwards' circuit. Dr. Eden has not shown that a POSA would make the proposed combination of Edwards, Sadwick, and Jeswani.

64. Thus, in my opinion, Petitioner does not meet its burden to show obviousness by a preponderance of the evidence.

C. Claim 4

65. Claim 4 depends from claim 1 and states "The linear LED lighting apparatus of claim 1, wherein the first color temperature corresponds to 3000 Kelvin and the second color temperature corresponds to 4000 Kelvin." Dr. Eden says this is disclosed by Edwards reference:

186. Edwards presents 4000K as a potential color temperature for one of the pluralities of LEDs, noting "[v]arious percentages of the LEDs can be turned on/off for the different warm white settings, e.g., where 25% are on for a very warm white setting, such that a 4K lumen fixture would shift from 4000K CCT at full 40001 ms to 2200KCCT at > 10001 ms." Ex.1005-13:9-13. In other words, the CCT can be varied between 4000 K and 2200 K at will.

187. Edwards also discloses that color temperatures of 3000K are desirable, noting that "[c]olor 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)... Typical incandescent light bulbs generate light of a warm yellowish white hue (e.g., 2,700-3,000K)." Ex.1005-2:49-62.

188. For LED lighting products, 3000 K and 4000 K are two of the most common CCT settings available. The lower of these, 3000 K, is desirable because the light is perceived by the human eye as being similar to that produced by incandescent lighting.

189. Consequently, a POSA would be motivated to incorporate a combination of 3000 K LEDs (for the first set of LEDs) and 4000 K LEDs (for the second plurality of LEDs) in Edwards. Because both of these CCT values were well known and commonly used in LED lighting products, it would be obvious to choose 3000 K and 4000 K to be included in a set of CCT values.

Ex. 1002 (Eden Dec.) ¶¶ 186-188.

66. As I have discussed above, Edwards LEDs do not have color temperatures, so LEDs with 3000K and 4000K are not disclosed by Edwards. The Edwards passage at 2:49-62 is discussing color temperatures generally and is not a disclosure of a specific LED with a color temperature.

67. Dr. Eden is also making some generalized obviousness argument that these color temperatures were known, so a POSA would use them. Here, Dr. Eden is not drawing on the references and is instead just making general “would be obvious” to a POSA arguments. This is nothing more than hand-waving and using the patents claims as hindsight to reconstruct the claimed invention. Dr. Eden’s reasoning, for example, does not show way a POSA would choose these colors over 700K and 5000K or 2400K and 6500K. If, under Dr. Eden’s criteria, all that is needed is that the color temperatures were “well known,” then a POSA would be equally likely to choose them than the claimed color temperatures. I therefore

disagree that Edwards discloses or teaches this claim or makes it obvious.

68. Dr. Eden makes a second argument on this claim:

190. While Edwards renders obvious this limitation on its own, to the extent that it is determined that Edwards does not render obvious a first set of LEDs with a 3000K color temperature it would certainly be obvious to combine Edwards with Sadwick. Sadwick discloses “connections 936 can go to two separate LED channels” having a color temperature such as “3000K.” Ex.1006¶0201.

191. A POSA would be motivated to incorporate a combination of 3000K LEDs (for the first set of LEDs) into the disclosure of Edwards with a reasonable expectation of success. Such a combination would be a combination of known elements to provide predictable results. Given that 3000K was a well known and commonly used LED temperature, a POSA would expect them to work correctly to provide color temperatures between 3000K and 4000K. Accordingly, on the basis of Edwards, Sadwick, and the experience of a POSA with LED lighting products, the choice of 3000 K and 4000 K as CCT values selectable with a switch would be obvious.

Ex. 1002 (Eden Dec.) at ¶¶ 190-191.

69. Neither Edwards nor Sadwick discloses the use of 4000K white LEDs, so the proposed combination fails to disclose the elements of the claim. Moreover, as discussed above, a POSA would not be motivated to combine Sadwick’s white LEDs into Edwards fixture that was designed to work with non-white LEDs. Dr. Eden’s assertion that a POSA would choose to use 4000 K LEDs fails under the proposed combination of Edwards with Sadwick for the same reason that the single-reference obviousness argument over Edwards fails. In particular, Dr. Eden’s choice to use 3000K and 4000K LEDs is based on hindsight

to reconstruct the claimed invention.

70. Thus, in my opinion, Petitioner does not meet its burden to show obviousness by a preponderance of the evidence.

D. Independent claim 10

1. 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.

71. 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”

72. For the part of this claim for “one of the second plurality of currents is greater than the one of the first plurality of currents by the scale factor ,” I note that neither Edwards nor Sadwick describe using a different driver that outputs a current that is scaled according to a ratio of LEDs in two different fixtures. This feature is lacking in both references because neither reference is concerned with matching color temperature and luminance across different light fixture of different lengths. As such, a POSA would not be motivated to make the proposed modification to the circuits of Edwards or Sadwick because of the added costs related to custom building these drivers.

E. Claim 15

73. Claim 15 depends from claim 10 and states “The linear LED lighting system of claim 10, wherein the first driver circuit comprise a current regulator.”

Dr. Eden says this is disclosed by the combination of Edwards and Sadwick references:

237. This feature would be obvious over Edwards in view of Sadwick, which discloses a current regulator. Sadwick discloses that “[t]he current source 126 can comprise, but is not limited to, a current power supply, a current driver, a constant current driver and/or power supply, a variable constant current driver and/or power supply, a dimmable current driver and/or power supply, etc.” Ex.1006¶0049. A POSA would understand that a “constant current driver” or “variable constant current driver” would necessarily include a current regulator to control the current as this would be a standard and necessary component for those drivers. A POSA would further be motivated to include the constant current driver or variable constant current driver of Sadwick in Edwards with a reasonable expectation of success. Such a system allows for better and more stable regulation of electrical operation and avoidance of damage to the LEDs. Incorporation of the current regulator of Sadwick in the system of Edwards would be the combination of known elements to obtain a predictable result. Given that constant current and variable constant current components were common a POSA would easily be able to adapt them to the system of Edwards.

74. Dr. Eden does not explain how a POSA would modify the circuit of Edwards to include a current regulator. Instead, he simply assumes that because current regulators were known, that a POSA would go ahead and include one in Edwards circuit. This is simply using hindsight to reconstruct the claimed

invention. Dr. Eden has not shown how a POSA would modify Edwards unregulated circuit to include a current regulator.

75. Thus, in my opinion, Petitioner does not meet its burden to show obviousness by a preponderance of the evidence.

F. Claim 20

76. Claim 20 depends from claim 18 and further states that “The linear LED system of claim 18, wherein a first ratio of the one of the second plurality of currents to the one of the first plurality of currents matches a second ratio of a first number of LEDs in the first plurality of LEDs to a second number of LEDs in the third plurality of LEDs.” Dr. Eden states:

253. As I have described with respect to element 10[m] the ratio of current sent to the second plurality of LEDs (referred to as the second plurality of current) and current sent to the first plurality of LEDs (referred to as the first plurality of currents) is the same as the scale factor between the first and second fixtures and particularly the number of LEDs and particularly the ratio between the number of LEDs in the second fixture and the number of LEDs in the first fixture.

Ex. 1002 (Eden Dec.) ¶ 253.

77. I disagree with Dr. Eden for the same reasons I discussed for 10[m].

X. MAY, JESWANI, AND SADWICK DO NOT RENDER OBVIOUS CLAIM 15

A. Claim 15

78. Claim 15 states “The linear LED lighting system of claim 10, wherein the first driver circuit comprise a current regulator.” Dr. Eden states:

348. As described for Ground 1, claim 15, Sadwick discloses a “constant current driver” and “variable constant current driver” which entails a current regulator. Ex.1006¶0049. A POSA would understand that a “constant current driver” or “variable constant current driver” would necessarily include a current regulator to control the current. A POSA would further be motivated to include the constant current driver or variable constant current driver of Sadwick in May with a reasonable expectation of success. Such a system allows for better and more stable regulation of electrical operation and avoidance of damage to the LEDs. Incorporation of the current regulator of Sadwick in the system of May would be the combination of known elements to obtain a predictable result. Given that constant current components were common a POSA would easily be able to adapt them to the system of May.

Ex. 1002 (Eden Dec.) ¶ 348.

79. Dr. Eden has not shown how a POSA could modify the circuits of May and Jeswani to include a current regulator. Dr. Eden’s opinion is no more than a bare assertion that a POSA would make the combination without evidence or reasoning to support his conclusion.

XI. ADDITIONAL REMARKS

80. 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: April 10, 2026

By: 

Dr. Thomas Katona
San Luis Obispo, California