IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors:	Michael Miskin; Robert L. Kottritsch		
Applicant:	Lynk Labs, Inc.		
Title:	COLOR TEMPERATURE CONTROLLED AND LOW THD LED LIGHTING DEVICES AND SYSTEMS AND METHODS OF DRIVING THE SAME		
Application No.:	16/440,884	Filing Date:	June 13, 2019
Examiner:	Le, Don P	Group Art Unit:	2844
Docket No.:	53998.19US04	Confirmation No.:	8410

Costa Mesa, California
August 22, 2019

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

RESPONSE TO OFFICE ACTION

Dear Examiner:

Applicant submits this response in reply to the Office Action dated July 23, 2019 in the above-identified patent application.

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IN THE CLAIMS

The following are claims 1 to 20:

1. (Currently Amended) An LED lighting system comprising:

at least one LED circuit having at least two LEDs, wherein an LED of the at least two LEDs is capable of emitting light of a different color or wavelength than at least one other LED of the at least two LEDs;

wherein a color of light emitted by the at least one LED circuit is controlled by a physical switch integrated in a package that includes the at least one LED circuit, the physical switch being ~~that is~~ controlled by an end user, and the color being produced by at least one of the at least two LEDs;

wherein the LED lighting system is driven with an AC mains voltage source; and

wherein the at least one LED circuit is enclosed in a water-resistant housing.

2. (Original) The LED lighting system of claim 1, wherein the water-resistant housing permits cleaning of the LED lighting system with pressurized water sprays.

3. (Original) The LED lighting system of claim 1, wherein the at least one LED circuit provides illumination intensity and color over a biological cycle of a plant.

4. (Original) The LED lighting system of claim 1 further comprising a current sensor.

5. (Original) The LED lighting system of claim 1, wherein the LED lighting system has a power factor above 90% and total harmonic distortion below 25%.

6. (Original) The LED lighting system of claim 1, further comprising:

a bridge rectifier that provides rectified AC voltage and current to the at least one LED circuit.

7. (Original) The LED lighting system of claim 1, further comprising:

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a sensor, wherein the at least one LED circuit changes color temperature in response to the sensor.

8. (Original) An LED lighting device comprising:

at least one LED circuit having at least two LEDs, an LED of the at least two LEDs being capable of emitting light of a different color or wavelength than at least one other LED of the at least two LEDs;

wherein a color of light emitted by the at least one LED circuit is controlled by a switch that is controlled by an end user, the color being produced by at least one of the at least two LEDs;

wherein the LED lighting device is driven with an AC voltage source;

wherein the at least one LED circuit with the at least two LEDs is integrated on a single substrate; and

wherein the LED lighting device has a power factor above 90% and total harmonic distortion below 25%.

9. (Original) The LED lighting device of claim 8, wherein a current sensor is mounted on the single substrate.

10. (Currently Amended) The LED lighting device of claim 8, wherein the LED lighting device is enclosed in a water resistant housing ~~at least one LED circuit is enclosed in a ruggedized housing~~.

11. (Original) The LED lighting device of claim 8 further comprising:

a DC-DC converter.

12. (Original) The LED lighting device of claim 11, wherein the DC-DC converter is a buck-boost converter.

13. (Original) The LED lighting device of claim 11, wherein the DC-DC converter is a boost converter.

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14. (Original) The LED lighting device of claim 11, wherein the DC-DC converter is a buck converter.

15. (Original) The LED lighting device of claim 11, wherein the DC-DC converter is a flyback converter.

16. (Original) An LED lighting device comprising:

at least one LED circuit having at least two LEDs connected in series;

a first set of connection leads configured to provide a connection to the at least two LEDs in the at least one LED circuit, wherein the first set of connection leads include a first connection lead and a second connection lead, the first connection lead being connected to an input of the at least one LED circuit and the second connection lead being connected to an output of the at least one LED circuit; and

a second set of connection leads, wherein the second set of connection leads includes a third connection lead and a fourth connection lead, the third connection lead being connected to an anode of at least one of the at least two LEDs and the fourth connection lead being connected to a cathode of the at least one of the at least two LEDs;

wherein the second set of connection leads is configured to provide a connection to less than all of the LEDs in the at least one LED circuit; and

wherein the LED lighting device has a power factor above 90% and total harmonic distortion below 25%.

17. (Original) The LED lighting system of claim 16 wherein the LED lighting device has a power factor above 95% and a total harmonic distortion below 20%.

18. (Original) The LED lighting system of claim 17, wherein the total harmonic distortion is below 15%.

19. (Original) The LED lighting system of claim 16 further comprising:

a bridge rectifier coupled to a DC-DC converter.

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20. (Original) The LED lighting system of claim 19, wherein the at least one LED circuit, the bridge rectifier, and the DC-DC converter are all mounted on a single substrate.

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REMARKS

Applicant submits the above amendments and these remarks in reply to the Office Action dated July 23, 2019.

Summary of Office Action

Claims 16-20 are allowed. Claims 1, 2, and 7 stand rejected under pre-AIA 35 U.S.C. § 102 as being allegedly anticipated by U.S. Patent No. 6,781,329 ("Mueller"). Claims 8, 10, 11, and 14 stand rejected under pre-AIA 35 U.S.C. § 102 as being allegedly anticipated by U.S. Patent Publication No. 2013/0093325 ("Scarpelli"). Claims 1 and 3 stand rejected under pre-AIA 35 U.S.C. § 103(a) as being allegedly unpatentable over U.S. Patent Publication No. 2011/0183368 ("Chapman") in view of Mueller and in view of U.S. Patent Publication No. 2010/0320934 ("Liu"). Claim 4 stands rejected under pre-AIA 35 U.S.C. § 103(a) as being allegedly unpatentable over Mueller in view of Liu. Claim 5 stands rejected under pre-AIA 35 U.S.C. § 103(a) as being allegedly unpatentable over Mueller in view of Scarpelli. Claim 6 stands rejected under pre-AIA 35 U.S.C. § 103(a) as being allegedly unpatentable over Mueller. Claims 9, 12, 13, and 15 stand rejected under pre-AIA 35 U.S.C. § 103(a) as being allegedly unpatentable over Scarpelli in view of Liu. Applicant respectfully traverses all rejections for at least the reasons set forth herein.

Allowable Subject Matter

Applicant thanks the Examiner for the allowance of claims 16-20 as set forth on pages 7-8 of the Office Action. Accordingly, Applicant understands that Office Action Summary that identified claims 16-20 being "objected to" was in error and that such claims were intended to be identified as "allowed" instead. Applicant respectfully submits that remaining claims 1-15 are also allowable in view of the presently submitted amendments and remarks.

Status of Claims

Claims 1-20 are pending, with claims 16-20 being allowed. Claims 1 and 10 are herein amended. No new claims are added. No new subject matter is added.

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Rejections Under § 102

1. Claims 1, 2, and 7 – Mueller

Without conceding to the Examiner's characterization of claims 1, 2, and 7, Applicant has amended independent claim 1 in order to further advance prosecution. Claim 1 has been amended to recite that "***the LED lighting system is driven with an AC mains voltage source***." Applicant respectfully submits that Mueller does not disclose each and every element of claim 1 and specifically, does not disclose at least the above-emphasized feature of claim 1.

The Office Action recognizes that Mueller is directed to LED pool lighting: "the apparatus of Mueller is water tight and resistant using in a pool." *Office Action*, page 3. However, it is well understood that pool lighting is subject to extensive regulation and is required to be low voltage—not mains voltage (e.g., for decades, the National Electrical Code has limited the voltage that can be used with lighting near water structures, such as pools; *see* https://www.ecmag.com/section/codes-standards/introducing-voltage-around-pool-area.) For safety, pool lighting systems should be driven with low voltage power rather than the higher voltage power provided by an AC mains voltage source. A person of ordinary skill in the art at the relevant time would have understood this. Accordingly, Mueller does not disclose each and every element of amended Claim 1. Furthermore, a person of ordinary skill in the art would be discouraged from combining Mueller with a general lighting system driven by an AC mains voltage source because Mueller is directed to LED pool lighting, which is low voltage wiring.

Therefore, claim 1 is allowable over Mueller. Further, claims 2 and 7, which depend from and include the subject matter of claim 1, are also allowable for at least the same reasons as those discussed above with respect to claim 1.

For these reasons, Applicant respectfully requests that the rejections of claims 1, 2, and 7 under § 102 over Mueller be withdrawn.

2. Claims 8, 10, 11, and 14 – Scarpelli

Applicant respectfully submits that Scarpelli does not disclose each and every element of independent claim 8, contrary to the Examiner's conclusions regarding Scarpelli. Claim 8

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recites a "***a color of light emitted by the at least one LED circuit is controlled by a switch that is controlled by an end user.***"

The Office Action alleges that Scarpelli teaches a "dimmer switch input, DIM input," as allegedly shown in Figure 7 of Scarpelli. *Office Action*, page 3. Scarpelli, however, does not disclose a switch that is controlled by an end user. With respect to Figure 7, Scarpelli merely discloses that "[a] dimming function (DIM) can be provided on the current control circuit 712." *Scarpelli*, [0059]. Nowhere does Scarpelli disclose that this dimming function (DIM) may be implemented via a switch that is controlled by an end user.

Further, Scarpelli's dimming function (DIM) does not disclose a switch to control "a color of light emitted by the at least one LED circuit," as required by claim 8. With respect to controlling the color of light, Scarpelli merely states: "[I]n applications where color is needed, LED lighting can be intelligently controlled allowing virtually millions of color possibilities." *Scarpelli*, [0113]. Paragraph 113 of Scarpelli discusses "color changing ability" as one of the numerous advantages provided by the LED lighting systems of *Scarpelli* but provides no further details about how this color changing ability may be controlled by a switch that is controlled by an end user. Further, Scarpelli does not provide any link between its disclosure of a dimming function (DIM) and the color changing ability. Accordingly, Scarpelli fails to disclose each and every element of claim 8.

Therefore, claim 8 is allowable over Scarpelli. Further, claims 10, 11, and 14, which depend from and include the subject matter of claim 8, are also allowable for at least the same reasons as those discussed above with respect to claim 8.

For these reasons, Applicant respectfully requests that the rejections of claims 8, 10, 11, and 14 under § 102 over Scarpelli be withdrawn.

Rejections Under § 103

1. Claims 1 and 3 – Chapman, Mueller, Liu

Without conceding to the Examiner's characterization of claims 1 and 3, Applicant has amended independent claim 1 in order to further advance prosecution. In addition to being amended to recite that "***the LED lighting system is driven with an AC mains voltage source***," as described above, claim 1 has also been amended to recite "***a physical switch***

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integrated in a package that includes the at least one LED circuit, the physical switch being controlled by an end user."

Chapman fails to teach or suggest at least "a physical switch integrated in a package that includes the at least one LED circuit, the physical switch being controlled by an end user." The Office Action relies on an inherency argument to support the position that Chapman teaches a switch that is controlled by an end user. *Office Action*, page 5. Specifically, the Office Action states that the switch is inherent in Chapman because "inherently there is a lighting controller control[led] by a user" in Chapman. *Id.* By setting forth this inherency argument, the Office Action acknowledges that Chapman itself does not teach a switch. Applicant respectfully disagrees with the Examiner's reasoning and conclusion that Chapman inherently teaches a switch. But, in order to expedite prosecution, Applicant has amended the claim to clarify that the switch is a "physical switch that is controlled by an end user."

Chapman describes a greenhouse lighting system where a processor controls the amount of current supplied to LEDs, and thus the color of light provided to the plants. *Chapman*, [0015], and [0016]. Chapman does not teach or suggest how this processor is programmed, let alone how the end user would be able to control the color of light via a physical switch. Further, a person of ordinary skill in the art would understand that are many ways to program a processor without the use of a physical switch controlled by an end user. Thus, contrary to the Examiner's conclusions, Chapman's lighting system that uses a processor to ultimately control light color does not "inherently" include a physical switch controlled by an end user.

Accordingly, Chapman fails to teach at least "a physical switch integrated in a package that includes the at least one LED circuit, the physical switch being controlled by an end user," where the physical switch controls "a color of light emitted by the at least one LED circuit." Further, Mueller and Liu each fail to remedy the deficiencies of Chapman. With respect to Mueller, the Office Action alleges that the "user interface 56" of Mueller teaches a switch controlled by a user. *Office Action*, page 2. But again, Mueller is directed to LED pool lighting and specifically indicates that its user interface is a ***remote*** user interface. *Mueller*, 11:15-18. Mueller further discloses a local user interface "to facilitate user selection of one or more operating modes of the controller 34 and the light source 24." *Mueller*, 15:12-

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15. But neither Mueller's remote user interface nor local user interface teach or suggest a physical switch, controlled by an end user, that is integrated in a package that includes the at least one LED circuit. Accordingly, Mueller fails to teach or suggest "a physical switch integrated in a package that includes the at least one LED circuit, the physical switch being controlled by an end user."

Therefore, Chapman, Mueller, and Liu, alone or in combination, do not teach or suggest the above-emphasized features of claim 1. Claim 1 is therefore allowable over Chapman, Mueller, and Liu. Further, claim 3, which depends from and includes the subject matter of claim 1, is also allowable for at least the same reasons as those discussed above with respect to claim 1.

2. Claims 4-6 – Mueller, Liu, Scarpelli

Claim 4 stands rejected under § 103 over Mueller in view of Liu; claim 5 stands rejected under § 103 over Mueller in view of Scarpelli; and claim 6 stands rejected under § 103 over Mueller. Claims 4, 5, and 6 depend from and include the subject matter of claim 1. As previously discussed, Mueller fails to teach or suggest at least that "***the LED lighting system is driven with an AC mains voltage source***." Scarpelli and Liu each fail to remedy the deficiencies of Mueller. Accordingly, claims 4, 5, and 6 are allowable for at least the same reasons as those discussed above with respect to claim 1.

3. Claims 9, 12, 13, and 15 – Scarpelli, Liu

Claims 9, 12, 13, and 15 stand rejected under § 103 over Scarpelli in view of Liu. Claims 9, 12, 13, and 15 depend from and include the subject matter of claim 8. As previously discussed, Scarpelli fails to teach or suggest that "***a color of light emitted by the at least one LED circuit is controlled by a switch that is controlled by an end user***." Liu fails to remedy the deficiencies of Scarpelli. Accordingly, claims 9, 12, 13, and 15 are allowable for at least the same reasons as those discussed above with respect to claim 8.

For all of the foregoing reasons, Applicant respectfully requests that the rejections of claims 1, 3-6, 8, 9, 12, 13, and 15 under § 103 over the various cited combinations of Chapman, Mueller, Liu, and Scarpelli be withdrawn.

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Conclusion

Applicant respectfully submits that all pending claims are in proper form for allowance. Reconsideration and withdrawal of all objections and rejections are respectfully requested and a timely Notice of Allowance is solicited.

Authorization is given to charge any fees due or credit any overpayments in regards to this communication to deposit account 08-1394. If the Examiner has any questions or concerns, a telephone call to the undersigned at (949) 202-3013 is welcomed and encouraged.

Certificate of Transmission

I hereby certify that this correspondence is being electronically transmitted via EFS Web to the Commissioner for Patents, on the date stated below.

Nidia Linares

August 22, 2019
Date

Respectfully submitted,

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