

Home Depot USA, Inc.
v.
Lynk Labs, Inc.

Patent Owner Demonstratives
PGR2023-00016
U.S. Patent No. 11,297,705
May 6, 2024

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DEMONSTRATIVE EXHIBIT - NOT EVIDENCE

Lynk Exhibit 2054
Home Depot v. Lynk Labs
PGR2023-00016, Page 1 of 45

Overview

1. Background
2. Claim Construction
 - A. “Forward Voltage”
 - B. “Switch”
 - C. “Selectable by a User Switching the Switch”
3. The ‘705 Patent Is Not Eligible For PGR
4. Ground 1: Claims 3, 10 and 17 Are Not Impossible
5. Ground 2
6. Grounds 3 and 6
7. Grounds 4 and 5

U.S. Patent No. 11,297,705

(12) **United States Patent**
Miskin et al.

(10) **Patent No.:** US 11,297,705 B2
(45) **Date of Patent:** Apr. 5, 2022

(54) **MULTI-VOLTAGE AND
MULTI-BRIGHTNESS LED LIGHTING
DEVICES AND METHODS OF USING SAME**

(56) **References Cited**

U.S. PATENT DOCUMENTS

(71) Applicant: **Lynk Labs, Inc.**, Elgin, IL (US)

3,582,932 A 6/1971 Chapman
3,712,706 A 1/1973 Stamm
(Continued)

(72) Inventors: **Michael Miskin**, Sleepy Hollow, IL
(US); **Robert L. Kottritsch**, Shefford
Bedfordshire (GB)

FOREIGN PATENT DOCUMENTS

(73) Assignee: **Lynk Labs, Inc.**, Elgin, IL (US)

AU 2003100206 4/2003
AU 2003100206 7/2003
(Continued)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 0 days.

OTHER PUBLICATIONS

(21) Appl. No.: **17/181,802**

European Search Report dated Oct. 22, 2012 in related European
Application—7 pages.

(22) Filed: **Feb. 22, 2021**

(Continued)

(65) **Prior Publication Data**

US 2021/0176839 A1 Jun. 10, 2021
US 2022/0015207 A9 Jan. 13, 2022

Primary Examiner—Crystal L Hammond

(74) Attorney, Agent, or Firm—K&L Gates LLP

Related U.S. Application Data

(63) Continuation of application No. 16/740,295, filed on
Jan. 10, 2020, now Pat. No. 10,932,341, which is a
(Continued)

(57) **ABSTRACT**

An LED lighting system is disclosed. The example LED
lighting system includes a first LED circuit and a second
LED circuit. The second LED circuit is configured to emit
a different color light compared to the first LED circuit. The
LED lighting system also includes a switch capable of at
least one of switching a voltage level input to at least one of
the first LED circuit or the second LED circuit, or switching
the second LED circuit 'on' or 'off'. The LED lighting
system further includes an LED driver connected to an AC
voltage power source. The LED driver is configured to
provide a DC voltage output to at least one of the first LED
circuit or the second LED circuit. The switch is electrically
connected between the DC voltage output and at least one of
the first LED circuit or the second LED circuit.

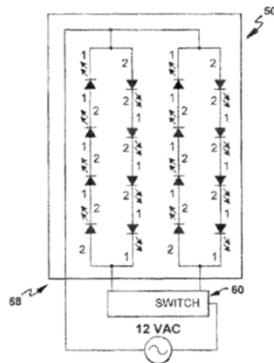
(51) **Int. Cl.**
H05B 45/40 (2020.01)
H05B 45/42 (2020.01)
H05B 45/00 (2020.01)

(52) **U.S. Cl.**
CPC *H05B 45/40* (2020.01); *H05B 45/00*
(2020.01); *H05B 45/42* (2020.01); *Y10T*
29/49002 (2015.01)

(58) **Field of Classification Search**

None
See application file for complete search history.

20 Claims, 8 Drawing Sheets



Multi-Voltage and Multi-Brightness LED Lighting Devices And Methods Of Using Same

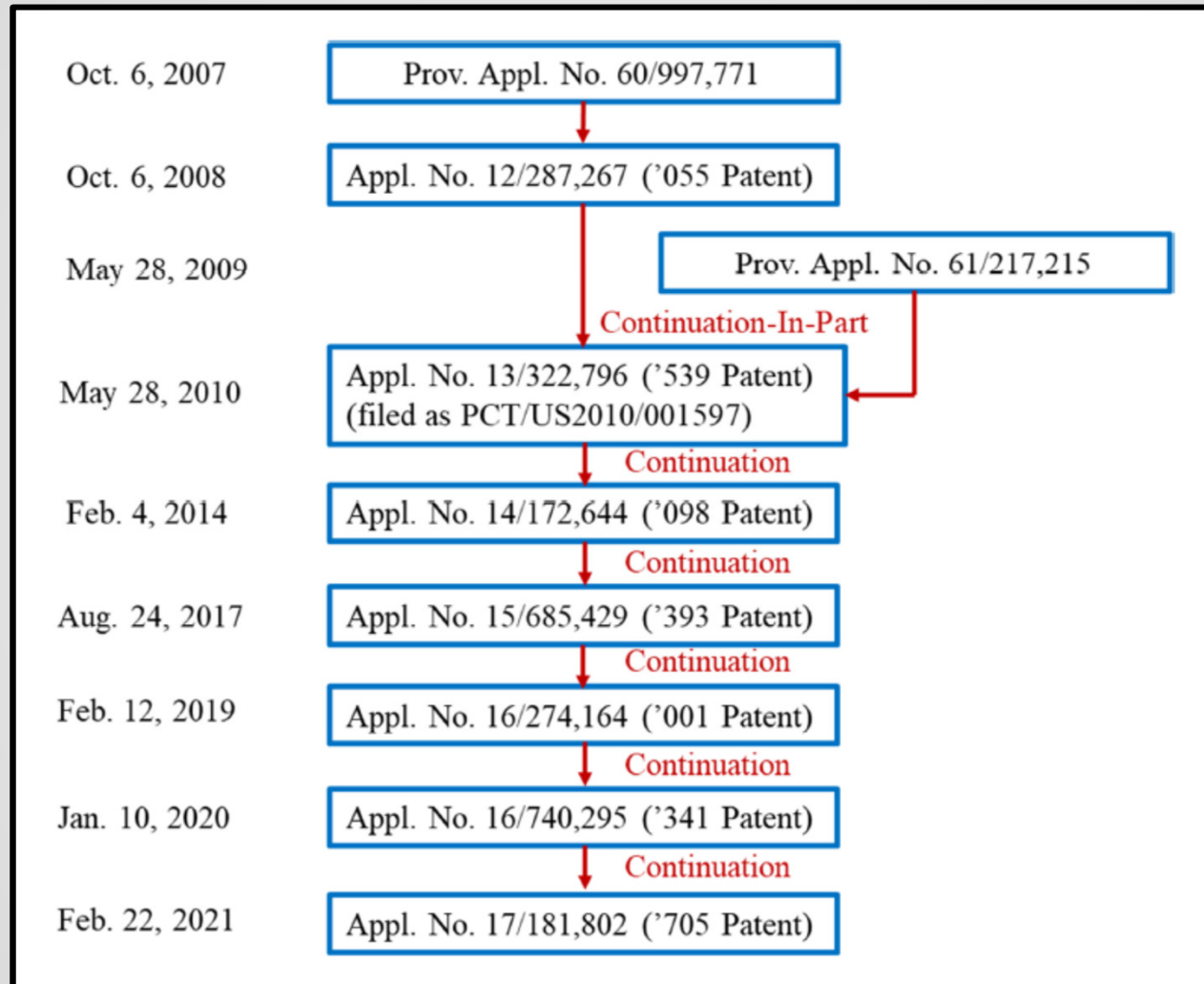
Ground 1	Claims 3, 10 and 17: Section 112
Ground 2	Claims 15, 17 and 19: Bruning (102)
Ground 3	Claims 1-3, 5, 7-10, 12, 14-17, and 19: Bruning in view of Evanicky
Ground 4	Claims 1-2, 5, 7-9, 12, 14-16, and 19: Doheny (102)
Ground 5	Claims 1-2, 5, 7-9, 12, 14-16, and 19: Van Winkle (103)
Ground 6	Claims 1-3, 5, 7-10, 12, 14-17 and 10: Bruning in view of Lee

Petition, 4-5

'705 Patent Representative Claim 1

1. An LED lighting system comprising:
a first operating LED circuit and at least one additional LED circuit,
at least one of the first operating LED circuit or the at least one additional LED circuit including at least two LEDs connected in either series or parallel, and the at least one additional LED circuit being configured to emit a different color light compared to the first operating LED circuit;
a switch capable of at least one of:
(a) switching a voltage level input to at least one of the first operating LED circuit or the at least one additional LED circuit, or
(b) switching the at least one additional LED circuit on or off,
wherein (a) or (b) is selectable by a user switching the switch; and
an LED driver including an input configured to connect to an AC voltage power source, the LED driver configured to provide a DC voltage output to at least one of the first operating LED circuit or the at least one additional LED circuit,
wherein the switch is electrically connected between the DC voltage output and at least one of the first operating LED circuit or the at least one additional LED circuit.

'705 Patent Priority Chain



POR, 5

'705 Patent Embodiments Are Combinable

known specified voltage and frequency output. Such packages can be of varied make up and can be combined with each other to create desired systems given the scalable and compatible arrangements possible with, and resulting from, the invention.

EX1001 ['705 Patent], 8:10-15; POR 32

Q: I was wondering which embodiment or embodiments is column 8, lines 3 through 14 related to?

A. ... The third sentence, I guess it's the last sentence of the paragraph, the packages can be of varied makeup, can be combined with each other. Again, that would apply to any of them.

EX2047 [Neikirk Dep. Tr.], 85:16-86:7; POR 32

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Forward Voltage

Patent Owner Construction

Operating voltage for the claimed LED circuit

POR, 8

Petitioner's Constructions

the minimum voltage difference required between the anode and cathode of the LEDs in the claimed circuit to allow current to flow through the LEDs

or

a voltage in a diode's forward direction."

Petition, 24-25

Forward Voltage

Patent Owner Construction

Operating voltage for the claimed LED circuit

POR, 8

'705 Patent Claim 3

3. The LED lighting system of claim 1, wherein the switching of the switch provides at least two different DC forward voltages to at least one of the first operating LED circuit or the at least one additional LED circuit.

EX1001 ['705 Patent], Claim 3

Forward Voltage

Petitioner's First Construction

the minimum voltage difference required between the anode and cathode of the LEDs in the claimed circuit to allow current to flow through the LEDs

Petition, 24

Representative Claim 3

3. The LED lighting system of claim 1, wherein the switching of the switch provides at least two different DC forward voltages to at least one of the first operating LED circuit or the at least one additional LED circuit.

EX1001 ['705 Patent], Claim 3

“It is a ‘bedrock principle’ of patent law that ‘the claims of a patent define the invention to which the patentee is entitled the right to exclude.’”

Phillips, 415 F.3 at 1312 (POR, 12)

“[A] construction that renders the claimed invention inoperable should be viewed with extreme skepticism.”

Talbert, 275 F.3d at 1376 (Sur-reply, 4)

Forward Voltage

Petitioner's First Construction

the minimum voltage difference required between the anode and cathode of the LEDs in the claimed circuit to allow current to flow through the LEDs

Petition, 24

coupling. This invention comprises circuits and devices that can be driven with more than one AC or DC forward voltage “multi-voltage” at 6V or greater based on a selectable desired operating voltage level that is achieved by electrically connecting the LED circuits in a series or parallel circuit configuration and/or more than one level of bright-

EX1001 [‘705 Patent], 3:15-17; POR, 12

According to another aspect of the invention multiple individual discrete LED chips are used to form at least one multi-voltage and/or multi-current AC LED circuit within a LED package thus providing a multi-voltage and/or multi-current AC LED package. Each multi-voltage and/or multi-current AC LED circuit within the package comprises at least two single voltage AC LED circuits. Each single

EX1001 [‘705 Patent], 6:50-56; POR, 14

“there is a strong presumption against a claim construction that excludes a disclosed embodiment.”

Nobel Biocare, 903 F.3d at 1381; POR, 13

Lynk Exhibit 2054

Forward Voltage

Petitioner's Position

“The references to ‘multi-voltage’ are explicitly defined to refer to the parallel/serial embodiment **which configuration is determined during manufacture.** EX1001, 3:15-20”

Reply, 4

There Is No “Explicit Definition”

coupling. This invention comprises **circuits** and devices that can be driven with **more than one AC or DC forward voltage “multi-voltage”** at 6V or greater based on a selectable desired operating voltage level that is achieved by electrically connecting the LED circuits in a series or parallel circuit configuration and/or more than one level of bright-

EX1001 [‘705 Patent], 3:15-20; Reply, 4

“the patentee must ‘clearly express an intent’ to redefine the term.”

Thorner, 669 F.3d at 1365; Sur-Reply, 5

“One of the cardinal sins of patent law [is] reading a limitation from the written description into the claims.”

Phillips, 415 F.3d at 1320; POR, 14
Lynk Exhibit 2054

Forward Voltage

Extrinsic Evidence

Exhibit 2051 (All About Circuits Textbook)

“Actually, forward voltage drop is more complex. An equation describes the exact current through the diode, given the voltage dropped across the junction, the temperature of the junction, and several physical constants. It is commonly known as the *diode equation* ... Just understand that the voltage dropped across a current-conducting diode does change with the amount of current going through it...”

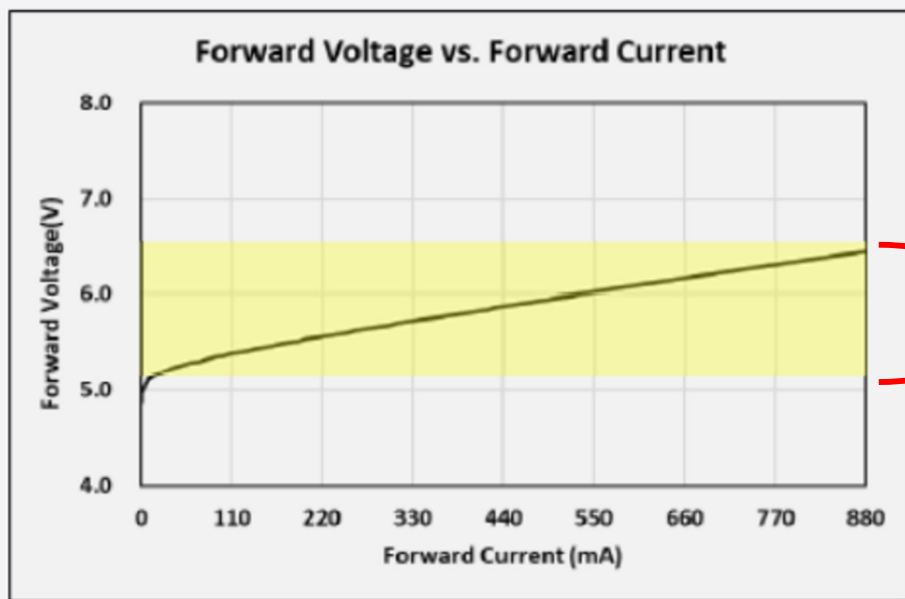
EX2051, 6-7; Sur-Reply, 7-8

Forward Voltage

Extrinsic Evidence

Exhibit 2036 (Samsung Datasheet)

b) Forward Current Characteristics ($T_j = 25^\circ\text{C}$)



“This graph [in EX2036] illustrates that you can apply a whole range of voltages in the forward direction.”

EX2047 [Neikirk Dep. Tr.], 80:4-5; POR, 16

Forward Voltage Range

EX2036, 10; Sur-Reply, 10; POR, 16-17

Forward Voltage

There Is No Prosecution History Disclaimer

“[B]ecause the prosecution history represents an ongoing negotiation between the PTO and the applicant, rather than the final product of that negotiation, it often lacks the clarity of the specification and thus is less useful for claim construction purposes.

Phillips, 415 F.3d at 1317, Sur-reply, 11

“Where an applicant’s statements are amenable to multiple reasonable interpretations, they cannot be deemed clear and unmistakable.”

3M, 725 F.3d at 1326, Sur-reply, 11

“[A] construction that renders the claimed invention inoperable should be viewed with extreme skepticism.”

Talbert, 275 F.3d at 1376, Sur-reply, 11

a claim is not impossible where “the only sensible reading of the claim” is clearly possible.

Individor, 930 F.3d at 1342, Sur-reply, 11-12

Forward Voltage

There Is No Prosecution History Disclaimer

p. 4; *Colby*, 4:26-31. However, Applicant respectfully submits that the disclosure of an AC voltage supplied from a wall outlet does not disclose the forward voltage of an LED. The “forward voltage” of an LED circuit, as recited in claim 1, is the minimum voltage difference required between the anode and cathode of the LEDs in the claimed circuit to allow current to flow through the LEDs. (See, e.g., *LED Tutorial – Learn the basics*, <https://www.baldengineer.com/led-basics.html>.) Thus, the recited forward voltage is different from the AC voltage provided by a typical wall outlet.

EX1023, 9; POR, 22-23

wherein the first operating LED circuit and the at least one additional LED circuit both have a forward voltage of 6V or greater.

EX1023, 1; POR, 22-23

Forward Voltage

There Is No Prosecution History Disclaimer

'705 Patent Claim 3

3. The LED lighting system of claim 1, wherein the switching of the switch provides at least two different DC forward voltages to at least one of the first operating LED circuit or the at least one additional LED circuit.

EX1001 ['705 Patent], claim 3; POR, 22-23

wherein the first operating LED circuit and the at least one additional LED circuit both have a forward voltage of 6V or greater.

EX1023, 1; POR, 22-23

Forward Voltage

Petitioner's Alternate Construction Is Incorrect

“The forward voltage cannot be just any voltage because when the forward voltage is outside of the operating range of the LED circuit, the LED circuit will not provide light or will otherwise not operate. For example, at high voltages and currents, the LED would short or burn out.”

EX2045 [Ducharme Decl.], ¶96

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“Selectable By A User Switching The Switch”

a switch capable of at least one of:

- (a) switching a voltage level input to at least one of the first operating LED circuit or the at least one additional LED circuit, or
- (b) switching the at least one additional LED circuit on or off,

wherein (a) or (b) is selectable by a user switching the switch; and

EX1001 [’705 Patent], Claim 1

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Claims 1-20 Are Supported By Pre-AIA Applications

“wherein the switch is electrically connected between the DC voltage output and at least one of the first operating LED circuit or the at least one additional LED circuit”

[Para 22] According to other aspects of the invention, **the LED circuit driver may be coupled to a dimmer switch that regulates voltage or frequency or may have integrated circuitry that allows for adjustability of the otherwise relatively fixed voltage and/or relatively fixed frequency output of the LED circuit driver. The LED circuits get brighter as the voltage and/or frequency of the LED circuit driver output is increased to the LED circuits.**

EX1014 ['215 Provisional], [Para 22], POR, 34

[Para 15] It would further be advantageous to provide multiple voltage level and/or multiple brightness level light emitting LED circuits, chips, packages and lamps "multi-voltage and/or multi-brightness LED devices" that can easily be electrically configured for at least **two forward voltage drive levels** with direct AC voltage coupling, bridge rectified AC voltage coupling **or constant voltage DC power source coupling.** This invention comprises

EX1018 ['597 PCT], [Para 15], Reply, 17

Claims 1-20 Are Supported By Pre-AIA Applications

“wherein the switch is electrically connected between the DC voltage output and at least one of the first operating LED circuit or the at least one additional LED circuit”

Even if *Lefebvre*'s circuits of Figs. 4 and 5 were combined, the switches would be placed *before* the bridge rectifiers (80, 86, 88). The switches of Claim 1 instead are located after a DC voltage output (of an LED driver), which provides for control of a DC voltage rather than attempting to control an AC voltage that is later converted into a DC voltage. Placing a switch *after* an LED driver is more efficient since the LED driver can optionally output a lower voltage, thereby reducing the amount of high voltage isolation needed for the switch. This LED driver-switch configuration enables the use of smaller and safer switches, and is safer for a user to actuate the switch while there is power being delivered through the lighting system. For at least this reason, *Lefebvre* fails to disclose a switch electrically connected between a DC voltage output (of an LED driver) and at least one of a first operating LED circuit or at least one additional LED circuit. Independent Claim 1 is accordingly patentable over *Lefebvre*.

EX1003 [File History], 183, Sur-reply, 16; Reply, 11

Claims 1-20 Are Supported By Pre-AIA Applications

“wherein the switch is electrically connected between the DC voltage output and at least one of the first operating LED circuit or the at least one additional LED circuit”

112. The “dimmer switch” is “coupled to an “LED circuit driver.” An LED circuit driver has an input and an output. The “dimmer switch” adjusts “the output of the LED circuit driver.” A broad interpretation of this disclosure teaches that the dimmer switch can be placed at the input or the output of the LED circuit driver. A narrow interpretation of this disclosure teaches the dimmer switch must be placed at the output of the LED circuit driver. Either way, the disclosure teaches a POSITA that a dimmer switch can be placed at the output of an LED circuit driver. Therefore, the '215 Provisional clearly teaches the dimmer switch can be placed at the output of the LED driver. Further, this knowledge was clearly within the possession of the inventor at the time.

EX2045 [Ducharme Decl.], ¶112; Sur-reply, 17

Claims 3, 10 And 17 Are Supported By Pre-AIA Applications

'705 Patent Claim 3

3. The LED lighting system of claim 1, wherein the switching of the switch provides at least two different DC forward voltages to at least one of the first operating LED circuit or the at least one additional LED circuit.

EX1001 ['705 Patent], Claim 3

voltage coupling or constant voltage DC power source coupling. This invention comprises circuits and devices that can be driven with more than one AC or DC forward voltage "multi-voltage" at 6V or greater based on a selectable desired operating voltage level that is achieved by electrically connecting the LED circuits in a series or parallel circuit configuration and/or more than one level of brightness "multi-brightness" based on a switching means that connects and/or disconnects at least one additional LED circuit to and/or from a first LED circuit. The desired operating voltage level and/or the desired

EX1018 [Para 15]; Sur-reply, 19

Claims 3, 10 And 17 Are Supported By Pre-AIA Applications

LED circuits and the LED circuit drivers. Individual LED circuits being the same or different colors, each requiring different forward voltages and currents may be driven from a single source LED circuit driver.

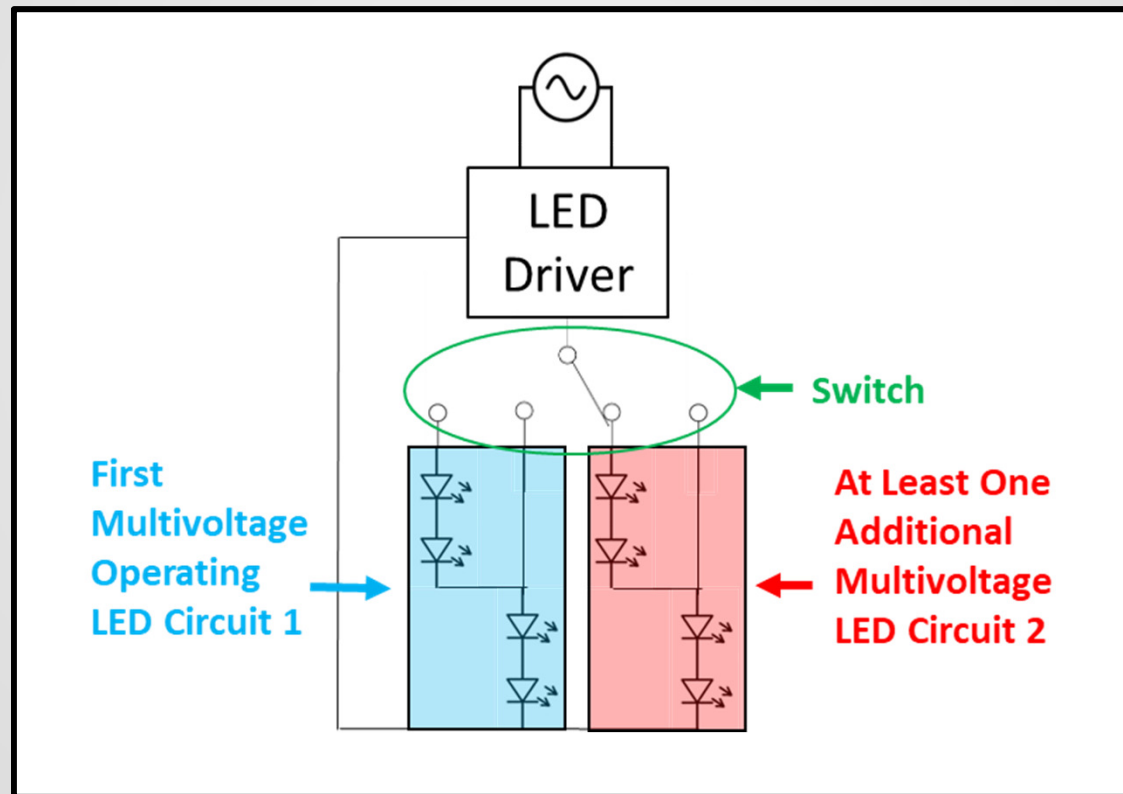
EX1014 ['215 Provisional] [Para 21]; POR, 51-52

voltage coupling or constant voltage DC power source coupling. This invention comprises circuits and devices that can be driven with more than one AC or DC forward voltage "multi-voltage" at 6V or greater based on a selectable desired operating voltage level that is achieved by electrically connecting the LED circuits in a series or parallel circuit configuration and/or more than one level of brightness "multi-brightness" based on a switching means that connects and/or disconnects at least one additional LED circuit to and/or from a first LED circuit. The desired operating voltage level and/or the desired

EX1018 [Para 15]; Sur-reply, 19; POR, 52-53

Claims 3, 10 And 17 Are Supported By Pre-AIA Applications

Claims 3, 10 and 17 Are Possible



POR, 53

Claims 4, 11, And 18 Of The '341 Patent

“[A] construction that renders the claimed invention inoperable should be viewed with extreme skepticism.”

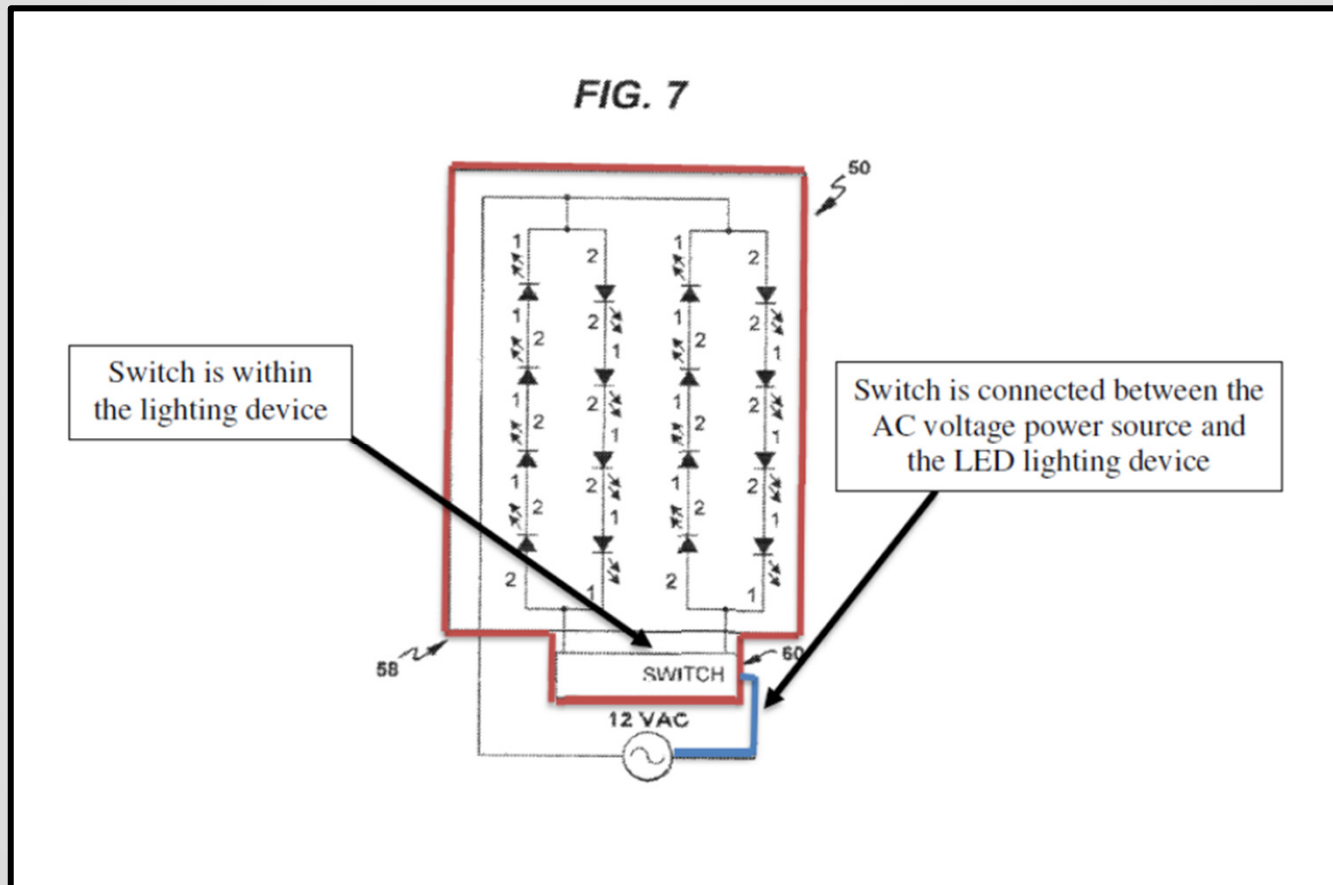
Talbert, 275 F.3d at 1376; Sur-reply, 23

A claim is not impossible where “the only sensible reading of the claim” is clearly possible

Indivior, 930 F.3d at 1342, Sur-reply, 23

Claims 4, 11, And 18 Of The '341 Patent

Claims 4, 11, and 18 Are Possible



Sur-Reply, 23

Claims 1-15 Of The '001 Patent

a switch that is selectable by a user and configured to at least one of independently switch on or off at least one of the first LED circuit or the at least one additional LED circuit, or switch at least one of the first LED circuit or the at least one additional LED circuit to a different level of brightness;

EX1020 ['001 Patent], claim 1; POR, 58

[Para 18] It would further be advantageous to provide multi-brightness LED devices that can be switched to different levels of brightness by simply switching additional circuits on or off in addition to a first operating circuit within a single chip and or LED package. This would allow LED lamps to switch to higher brightness levels just like 2-way or 3-way incandescent lamps do today.

EX1018 ['597 PCT], [Para 18]; Sur-reply, 25

Claim 15 Of The '001 Patent

15. The LED lighting device of claim 11, wherein the AC voltage power source is a mains power source, and wherein the LED lighting device is configured to be coupled to a dimmer switch, wherein the dimmer switch adjusts a voltage of the mains power source to dim the first LED circuit or the at least one additional LED circuit regardless of a user's selection via the switch.

EX1020 ['001 Patent], claim 15

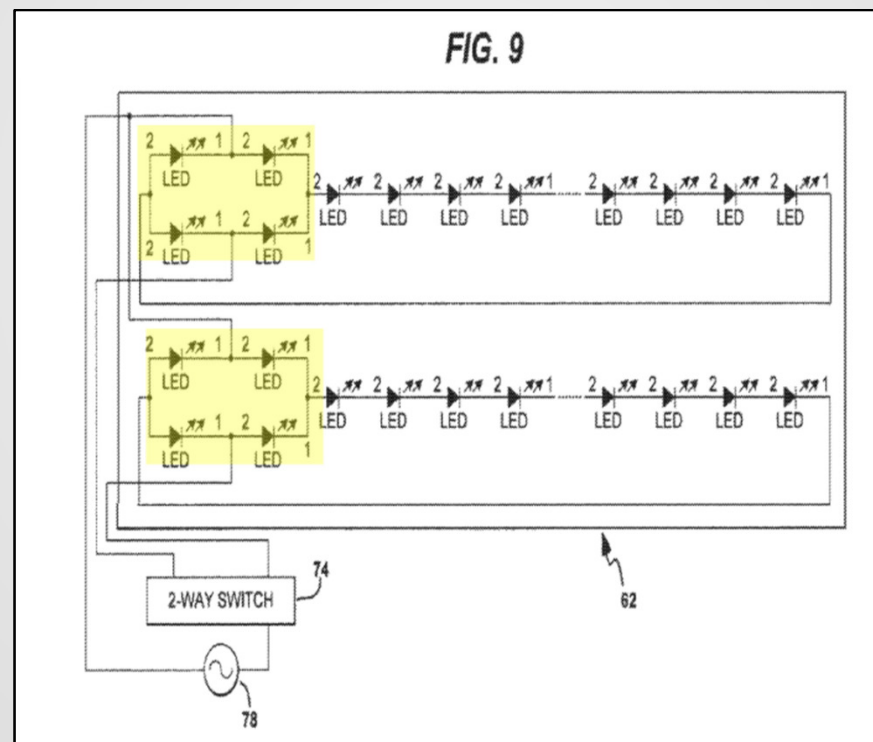
[Para 22] According to other aspects of the invention, the LED circuit driver may be coupled to a dimmer switch that regulates voltage or frequency or may have integrated circuitry that allows for adjustability of the otherwise relatively fixed voltage and/or relatively fixed frequency output of the LED circuit driver. The LED circuits get brighter as the voltage and/or frequency of the LED circuit driver output is increased to the LED circuits.

EX1014 ['215 Provisional], [Para 22], Sur-reply, 26; POR, 60-61

Claim 9 Of The '001 Patent

9. The multi-brightness LED lighting device of claim 6, further comprising the driver.

EX1020 ['001 Patent], claim 6



POR, 63

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Claims 3, 10 and 17 Are Possible

'705 Patent Claim 3

3. The LED lighting system of claim 1, wherein the switching of the switch provides at least two different DC forward voltages to at least one of the first operating LED circuit or the at least one additional LED circuit.

EX1001 ['705 Patent], Claim 3, POR 64

“It is highly disfavored to construe terms in a way that renders them void, meaningless, or superfluous”

Wasica, 853 F.3d at 1288 n.10; POR, 64-65

Claims 3, 10 and 17 Are Supported Under Any Construction

'705 Patent, 3:15-23

coupling. This invention comprises circuits and devices that can be driven with more than one AC or DC forward voltage “multi-voltage” at 6V or greater based on a selectable desired operating voltage level that is achieved by electrically connecting the LED circuits in a series or parallel circuit configuration and/or more than one level of brightness “multi-brightness” based on a switching means that connects and/or disconnects at least one additional LED circuit to and/or from a first LED circuit. The desired

EX1001 [’705 Patent], 3:15-23; POR, 68-69

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Grounds 3 and 6

In the combination the color-specific switches of Bruning are the switch and they are indirectly selectable by the user via the knob/slider of Evenicky and the controllers. Alternatively, the combination of the color-specific switches of Bruning, the controllers, and the slider/knob of Evanicky together are the switch, which is directly selected by the user. EX1002, ¶115.

Pet., 54

Not selectable by a user
switching the switch

POR, 70-71

Not electrically connected
between the DC voltage
output and LED circuits

POR, 70-71

Grounds 3 and 6

Claims 2, 9 and 16: “wherein the switch has at least two positions”

EX1001 [’705 Patent], claims 2, 9, and 16. Petitioner argues that “[i]n the combination, the switch includes the slider or knob of Evanicky. A slider or knob explicitly discloses at least two positions, as the user will slide the slider or turn the knob between multiple positions.” Pet., 54. *See id.*, 57, 59. As discussed above, Evanicky’s slider/knob is not electrically connected between the DC voltage output and at least one of the first operating LED circuit or the at least one additional LED circuit.” Instead, this combination relies on Bruning’s transistors for that limitation. Pet., 54. However, transistors have no movable positions (unlike, for example, a two-way switch)—they are simply controlled to enable current to pass through.

POR, 71

Overview

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Ground 4: Doheny Is Not Prior Art

(19) **United States**
(12) **Patent Application Publication**
Doheny et al.

(54) **CONFIGURABLE LIGHTING SYSTEM**

(71) Applicant: **Cooper Technologies Company,** (52)
Houston, TX (US)

(72) Inventors: **Seth Doheny,** Newman, GA (US);
Steven Walter Pyshos, Peachtree City,
GA (US)

(21) Appl. No.: **15/727,833**

(22) Filed: **Oct. 9, 2017** (57)

Related U.S. Application Data

(63) Continuation-in-part of application No. 15/435,141,
filed on Feb. 16, 2017, now Pat. No. 9,820,350. A h
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(60) Provisional application No. 62/297,424, filed on Feb. 19, 2016. pow
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- Priority for '705 Patent back to at least May 28, 2010
- Doheny's earliest effective filing date is February 19, 2016

POR, 71-72

EX1011 [Doheny]

Ground 4: Doheny Is Not Prior Art

Pre-AIA Applications Provide Written Description Support

voltage coupling or constant voltage DC power source coupling. This invention comprises circuits and devices that can be driven with more than one AC or DC forward voltage "multi-voltage" at 6V or greater based on a selectable desired operating voltage level that is achieved by electrically connecting the LED circuits in a series or parallel circuit configuration and/or more than one level of brightness "multi-brightness" based on a switching means that connects and/or disconnects at least one additional LED circuit to and/or from a first LED circuit. The desired operating voltage level and/or the desired

EX1018 ['597 PCT], [0015]; POR, 82

[Para 22] According to other aspects of the invention, the LED circuit driver may be coupled to a dimmer switch that regulates voltage or frequency or may have integrated circuitry that allows for adjustability of the otherwise relatively fixed voltage and/or relatively fixed frequency output of the LED circuit driver. The LED circuits get brighter as the voltage and/or frequency of the LED circuit driver output is increased to the LED circuits.

EX1015 ['215 Provisional], [0022]; POR, 82

Ground 5: Van Winkle Is Not Prior Art

(19) **United States**

(12) **Patent Application Publication**
Van Winkle

(54) **MANUALLY CONTROLLABLE LED
CORRELATED COLOR TEMPERATURE
LIGHT FIXTURE** (51)

(71) Applicant: **ETi Solid State Lighting Inc.**, Vernon
Hills, IL (US)

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- Priority for '705 Patent back to at least May 28, 2010
- Van Winkle's earliest effective filing date is January 13, 2017

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