

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

QUASAR SCIENCE LLC
Petitioner,

v.

COLT INTERNATIONAL CLOTHING, INC. d/b/a COLT LED
Patent Owner.

Case: To Be Assigned
U.S. Patent No. 10,197,224

**PETITION FOR *INTER PARTES* REVIEW OF
U.S. PATENT NO. 10,197,224**

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1001	U.S. Patent No. 10,197,224 to Macias <i>et al.</i> (“the ’224 Patent”)
1002	File History of the U.S. Patent No. 10,197,224 (“the File History”)
1003	Declaration of Fred Holmes (“Holmes Decl.”)
1004	U.S. Patent No. 7,507,001 to Kit (“Kit”)
1005	U.S. Patent No. 7,350,936 to Ducharme <i>et al.</i> (“Ducharme”)
1006	U.S. Patent Publication 2005/0047134 to Mueller (“Mueller”)
1007	U.S. Patent No. 8,026,532 to Ansems (“Ansems”)
1008	U.S. Publication No. 2010/0102960 to Ivey <i>et al.</i> (“Ivey”)
1009	U.S. Patent No. 8,668,361 to Hasnain (“Hasnain”)
1010	U.S. Publication No. 2010/0102729 to Katzir <i>et al.</i> (“Katzir”)
1011	“When white light isn’t white” by Mike Wood, 2008
1012	U.S. Publication No. 2004/0052076 to Mueller <i>et al.</i> (“Mueller ’076”)
1013	International Publication No. 2005/012997 to Morgan <i>et al.</i> (“Morgan”)
1014	U.S. Publication No. 2010/0315001 to Domagala <i>et al.</i> (“Domagala”)
1015	U.S. Patent. No. 7,049,761 to Timmermans <i>et al.</i> (“Timmermans”)
1016	Astera LED-Technology User Manual Wireless Pixel Tube (AL1) v.3.2.20 (July 23, 2010)

CLAIM APPENDIX

Claim Language for the '224 Patent

Identifier	Language
Claim 1[pre]	An LED lighting device configured for providing light suitable for a commercial image recording, the LED lighting device comprising:
Claim 1[a]	a support structure;
Claim 1[b]	a housing for the support structure;
Claim 1[c]	an array of LED emitting devices mounted on the support structure, wherein the array of LED emitting devices is configured to emit five different colors of light and comprises: a first set of LED emitting elements configured to emit light of a first color; a second set of LED emitting elements configured to emit light of a second color; a third set of LED emitting elements configured to emit light of a third color; a fourth set of LED emitting elements configured to emit light of at a fourth color; and a fifth set of LED emitting elements configured to emit a broad-spectrum white light within a predetermined Kelvin temperature range; and
Claim 1[d]	a controller coupled to the array of LED emitting devices and configured to receive commands for operating select ones of the LED emitting devices with varying amounts of power to produce light consisting of varying amounts of the five different colors provided by the first, second, third, fourth, and fifth sets of LED emitting elements to produce many different colors outputted from the lighting device,
Claim 1[e]	and further comprising an LED driver, the LED driver configured to selectively provide electrical power to the array of LED emitting devices;
Claim 1[f]	wherein the housing has a linear form factor substantially that of a fluorescent tube having an axial direction and having a diameter of no greater than about 41 mm, and further comprising an electrical input connection for receiving input power, wherein the input connection is in electrical communication with the LED driver, and

Identifier	Language
Claim 1[g]	wherein the housing has opposite ends and the support structure is in a form of an elongated and narrow surface extending in the axial direction and the housing having a top side and a bottom side which each extend in the axial direction, and
Claim 1[h]	wherein the LEDs are configured to emit light from the top side of the housing along a length of the housing between the opposite ends, and the top side of the housing has a diffusion cover extending the axial length of the support between the ends.
Claim 3	The LED lighting device of claim 1, wherein the LED driver is adapted for selectively driving each of the first set, second set, third set, fourth set and fifth set of LED emitting elements in increments of about 1/255 to selectively produce at least 255 different colors from the lighting device.
Claim 4	The LED lighting device of claim 3, wherein the LED driver is adapted for selectively driving each of the first set, second set, third set, fourth set and fifth set of LED emitting elements in response to DMX signals from an external computer console or lighting control board to selectively produce the at least 255 different colors of an entertainment industry color wheel emitted from the lighting device.
Claim 7	The LED lighting device of claim 1, wherein the fluorescent tube light has a substantially T12 form.
Claim 8	The LED lighting device of claim 1, wherein the fluorescent tube light has a substantially T12 form and is about one to four feet long.
Claim 9	The LED lighting device of claim 1, wherein at least one of the colors of the LEDs is amber.
Claim 10	The LED lighting device of claim 1, wherein the first, second, third and fourth LEDs are red, green, blue and amber, respectively.
Claim 11	The LED lighting device of claim 1, wherein among the colors the driver is configured to selectively produce are white light in each of daylight and tungsten temperature ranges.

Identifier	Language
Claim 12	The LED lighting device of claim 1, wherein the first, second, third, fourth and fifth LEDs are arranged substantially in a repeating matrix pattern along the length of the axial direction.
Claim 13[pre]	An LED lighting device configured for providing light suitable for a commercial image recording, the LED lighting device comprising:
Claim 13[a]	a support structure;
Claim 13[b]	a housing for the support structure;
Claim 13[c]	an array of LED emitting devices mounted on the support structure, wherein the array of LED emitting devices is configured to emit four different colors of light and comprises: a first set of LED emitting elements configured to emit light of a first color; a second set of LED emitting elements configured to emit light of a second color; a third set of LED emitting elements configured to emit light of a third color; and a fourth set of LED emitting elements configured to emit a broad-spectrum white light within a predetermined Kelvin temperature range; and
Claim 13[d]	a controller coupled to the array of LED emitting devices and configured to receive commands for operating select ones of the LED emitting devices with varying amounts of power to produce light consisting of varying amounts of the four different colors provided by the first, second, third, and fourth sets of LED emitting elements to produce many different colors outputted from the lighting device, and further comprising an LED driver, the LED driver configured to selectively provide electrical power to the array of LED emitting devices,
Claim 13[e]	wherein the housing has a linear form factor substantially that of a fluorescent tube of one of a T12 and T8 form, and having a length of no greater than about four feet and a diameter of no greater than about 41 mm, and further comprising an electrical input connection for receiving input power, and

Identifier	Language
Claim 13[f]	wherein the input connection is in electrical communication with the LED driver, wherein the housing has opposite ends and the support surface is in a form of an elongated and narrow surface extending in the axial direction, and the housing having a top side and a bottom side which each extend in the axial direction, and
Claim 13[g]	wherein the LEDs are configured to emit light from the top side of the housing along a length of the housing between the opposite ends, and the top side of the housing has a diffusion cover extending the axial length of the support between the ends.
Claim 23[pre]	An LED lighting device configured for providing light suitable for a commercial image recording, the LED lighting device comprising:
Claim 23[a]	a support structure;
Claim 23[b]	a housing for the support structure;
Claim 23[c]	an array of LED emitting devices mounted on the support structure, wherein the array of LED emitting devices is configured to emit five different colors of light and comprises: a first set of LED emitting elements configured to emit light of a first color; a second set of LED emitting elements configured to emit light of a second color; a third set of LED emitting elements configured to emit light of a third color; a fourth set of LED emitting elements configured to emit light of at a fourth color; and a fifth set of LED emitting elements configured to emit a broad-spectrum white light within a predetermined Kelvin temperature range; and
Claim 23[d]	a controller coupled to the array of LED emitting devices and configured to receive commands for operating select ones of the LED emitting devices with varying amounts of power to produce light consisting of varying amounts of the five different colors provided by the first, second, third, fourth, and fifth sets of LED emitting elements to produce many different colors outputted from the lighting device,
Claim 23[e]	and an LED driver configured to selectively provide electrical power to the array of LED emitting devices;

Identifier	Language
Claim 23[f]	wherein the housing has a linear form factor substantially that of one of a T12 and T8 form, and fluorescent tube light, and further comprising an electrical input connection for receiving input power, wherein the input connection is in electrical communication with the LED driver, and
Claim 23[g]	wherein the housing has opposite ends and the support structure is in a form of an elongated and narrow surface extending in the axial direction and the housing having a top side and a bottom side which each extend in the axial direction, and wherein the LEDs are configured to emit light from the top side of the housing along a length of the housing between the opposite ends, and the top side of the housing has a diffusion cover extending the axial length of the support between the ends.
Claim 25	The LED lighting device of claim 23, wherein the LED driver is adapted for selectively driving each of the first set, second set, third set, fourth and fifth set of LED emitting elements in increments of about 1/255 to selectively produce at least 255 different colors from the lighting device.
Claim 26	The LED lighting device of claim 5, wherein the LED driver is adapted for selectively driving each of the first set, second set, third set, fourth set and fifth set of LED emitting elements in response to DMX signals from an external computer console or lighting control board to selectively produce the at least 255 different colors of an entertainment industry color wheel emitted from the lighting device.
Claim 28	The LED lighting device of claim 23, wherein the electrical input connection is configured to receive AC input power.
Claim 29	The LED lighting device of claim 23, wherein the fluorescent tube light has a substantially T12 form.
Claim 30	The LED lighting device of claim 23, wherein the fluorescent tube light has a substantially T12 form and is about one to four feet long.
Claim 31	The LED lighting device of claim 23, wherein at least one of the colors of the LEDs is amber.
Claim 32	The LED lighting device of claim 23, wherein the first, second, third and fourth LEDs are red, green, blue and amber, respectively.

Identifier	Language
Claim 33	The LED lighting device of claim 23, wherein among the colors the driver is configured to selectively produce are white light in each of daylight and tungsten temperature ranges.
Claim 34	The LED lighting device of claim 23, wherein the first, second, third, fourth and fifth LEDs are arranged substantially in a repeating matrix pattern along the length of the axial direction.
Claim 35[pre]	An LED lighting device configured for providing light suitable for a commercial image recording, the LED lighting device comprising:
Claim 35[a]	a support structure;
Claim 35[b]	a housing for the support structure;
Claim 35[c]	an array of LED emitting devices mounted on the support structure, wherein the array of LED emitting devices is configured to emit four different colors of light and comprises: a first set of LED emitting elements configured to emit light of a first color; a second set of LED emitting elements configured to emit light of a second color; a third set of LED emitting elements configured to emit light of a third color; and a fourth set of LED emitting elements configured to emit a broad-spectrum white light within a predetermined Kelvin temperature range; and
Claim 35[d]	a controller coupled to the array of LED emitting devices and configured to receive commands for operating select ones of the LED emitting devices with varying amounts of power to produce light consisting of varying amounts of the five different colors provided by the first, second, third, and fourth sets of LED emitting elements to produce many different colors outputted from the lighting device which are uniform in color, and an LED driver configured to selectively provide electrical power to the array of LED emitting devices,
Claim 35[e]	wherein the housing has a linear form factor substantially that of a fluorescent tube light of one of a T12 and T8 form, and further comprising an electrical input connection for receiving input power, wherein the input connection is in electrical communication with the LED driver, and

Identifier	Language
Claim 35[f]	wherein the housing has opposite ends and the support structure is in a form of an elongated and narrow surface extending in the axial direction and the housing having a top side and a bottom side which each extend in the axial direction, and
Claim 35[g]	wherein the LEDs are configured to emit light from the top side of the housing along a length of the housing between the opposite ends, and the top side of the housing has a diffusion cover extending the axial length of the support between the ends.
Claim 36	The LED lighting device of claim 35, wherein the first, second, third and fourth sets of LED light emitting elements are evenly dispersed along the length of the lighting device.
Claim 37	The LED lighting device of claim 35, wherein the LED driver is adapted for selectively driving each of the first set, second set, third set and fourth set of LED emitting elements in increments of about 1/255 to selectively produce at least 255 different colors from the lighting device.
Claim 38	The LED lighting device of claim 37, wherein the LED driver is adapted for selectively driving each of the first set, second set, third set, fourth set and fifth set of LED emitting elements in response to DMX signals from an external computer console or lighting control board to selectively produce the at least 255 different colors of an entertainment industry color wheel emitted from the lighting device.
Claim 39	The LED lighting device of claim 35, wherein the LED driver is adapted for selectively driving each of the first set, second set, third set and fourth set of LED emitting elements to selectively produce at least 255 different colors of a color wheel from the lighting device.
Claim 41	The LED lighting device of claim 35, wherein the fluorescent tube light has a substantially T12 form.
Claim 42	The LED lighting device of claim 35, wherein the fluorescent tube light has a substantially T12 form and is about one to four feet long.
Claim 43	The LED lighting device of claim 35, wherein at least one of the colors of the LEDs is amber.

Identifier	Language
Claim 44	The LED lighting device of claim 35, wherein among the colors the driver is configured to selectively produce are white light in each of daylight and tungsten temperature ranges.
Claim 45	The LED lighting device of claim 35, wherein the first, second, third, and fourth LEDs are arranged substantially in a repeating matrix pattern along the length of the axial direction.

I. INTRODUCTION

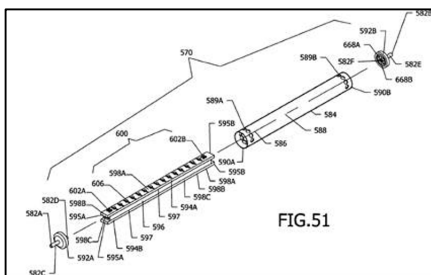
Under 35 U.S.C. §§ 311–319 and 37 C.F.R. § 42.100 et seq., Petitioner hereby requests IPR of Claims 1, 3, 4, 7–13, 23, 25, 26, 28, 29–39, and 41–45 (“the Challenged Claims”) of U.S. Patent No. 10,197,224 (the “’224 Patent”) (Ex. 1001).

With its ’224 Patent, Colt International Clothing, Inc. d/b/a Colt LED (“Patent Owner” or “Colt”) claims to have invented an LED-lighting system utilizing standard Red, Green, Blue, Amber, and White (“RGBAW”) LEDs in a fluorescent tube form factor for use in television and movies. Colt, however, has not “invented” anything. Colt has done nothing more than take well-known and conventional colored LEDs that existed before March 2012 (the purported priority date) and placed the LEDs in industry-standard fluorescent tubes. All of which had been done prior to Colt’s filings. There is nothing special about the LEDs used in the patent, and in fact, Colt has nothing to do with the LEDs themselves or their capabilities—all widely known at the time of Colt’s patent. Colt’s ’224 Patent merely describes conventional LEDs that were known and on the market at the time of alleged invention (May 2012).

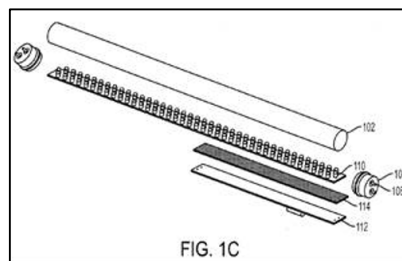
These points are made clear by the supporting expert Declaration of Fred Holmes (Ex. 1003). Mr. Holmes has decades of experience in the lighting industry, specifically working for Litepanels, Inc—an industry-leader in the area of LED-based lighting products for television and movie productions—at the time of

the alleged invention. Ex. 1003 at ¶¶ 3–12. As Mr. Holmes explains, a POSITA in 2012 would have been motivated to use known color LEDs, including RGBAW LEDs. Mr. Holmes’ testimony is supported by a plethora of prior art. As one example, Kit discloses an LED array retrofit in a fluorescent tube form factor, using multiple colored LEDs, including Red, Green, Blue, Orange, Amber, and White light, within a tubular form factor. Ex. 1004 at Fig. 51, 20:50–63.

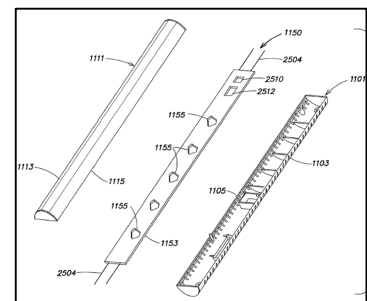
Further, the use of colored LEDs in a fluorescent tube form factor was well known before 2012. In addition to Kit, numerous prior art references teach the use of LEDs (including colored LEDs) in a fluorescent tube form factor *just like that claimed in the ’224 Patent*. Ex. 1004 at Abstract; Ex. 1005 at Abstract; Ex. 1008 at Abstract; Ex. 1010 at Abstract. These fluorescent tubes have industry-standard dimensions, such as a T12 tube having a 1.5-inch diameter, as Colt attempts to patent. Ex. 1009 at 4:33–36. Just a few examples include the below:



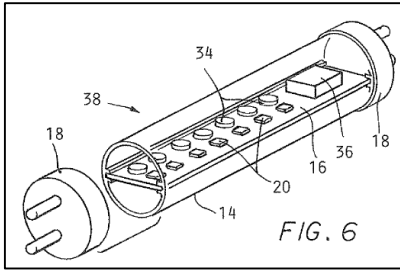
Ex. 1004 at Fig. 51



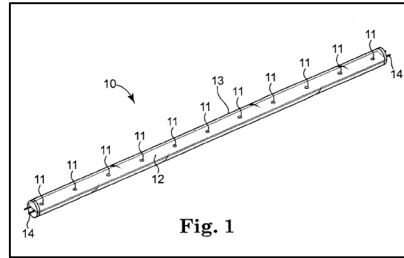
Ex. 1010 at Fig. 1C



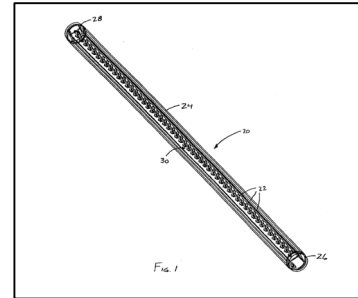
Ex. 1005 at Fig. 29



Ex. 1008 at Fig. 6.



Ex. 1014 at Fig. 1.



Ex. 1015 at Fig. 1.

The use of color LEDs in a fluorescent tube was not simply an aspirational invention disclosed in patents prior to 2012, but products existed on the market in this exact form, such as from Astera. *See, e.g.*, Ex. 1016 at 6.

Further, the use of LEDs in the image recording industry was well-known for years before 2012. Ex. 1003 at ¶¶ 34–53; Ex. 1005 at 18:33–54, 19:13–24; Ex. 1012 at [0273]; Ex. 1011 at page 1; Ex. 1013 at 15:1–16, 16:14–21. A POSITA would have been aware of the many benefits of using LEDs as opposed to traditional fluorescent lighting, and, importantly, the benefits to using LEDs in an elongated tube form factor. Those benefits include that LEDs provide more cost-efficient lighting, more versatile lighting, increased color fidelity, more control of the lighting environment through the use of DMX (or other control mechanism) signals to change or modify the lighting without having to change out fluorescent lights, more energy friendly, radiate less heat, provide less greenish hues, and have a longer lifespan. Ex. 1003 at ¶¶ 34–53.

As demonstrated below, the Challenged Claims describe conventional features known in the prior art that would have been obvious to use to achieve a robust and efficient lighting system for use in the image recording industry.

II. MANDATORY NOTICES

Quasar Science LLC (“Petitioner”) hereby submits these Mandatory Notices in accordance with 37 C.F.R. § 42.8 *et seq.*

A. Real Party-in-Interest (37 C.F.R. § 42.8(b)(1))

Real parties-in-interest are identified, as follows:

Quasar Science LLC (“Petitioner”), a limited liability company under the laws of Delaware, located at 687 S. Anderson Street, Los Angeles, CA 90023.

Videndum Production Solutions, Inc., located at 14 Progress Dr., Shelton, Connecticut 06484.

Videndum US Holdings Inc., c/o Morrison Cohen LLP 909 Third Ave., 27th Floor, New York, New York 10022.

Videndum Holdings, Ltd; Videndum Investments Limited; Videndum Group Holdings, Ltd; and Videndum plc; each located at Bridge House, Heron Square, Richmond TW9 1EN, United Kingdom.

B. Notice of Related Matters (37 C.F.R. § 42.8(b)(2))

The following pending matter relates to the challenged '224 Patent: *Colt International Clothing, Inc. d/b/a Colt LED v. Quasar Science LLC, et al.*, Case No. 22-cv-213-CFC (D. Del.).

C. Designation of Lead and Back-Up Counsel and Service

Information (37 C.F.R. § 42.8(b)(3))

Petitioner hereby identifies lead counsel as David M. Magee (Reg. No. 51,982), Armstrong Teasdale LLP, 800 Boylston St., 30th Floor, Boston, Massachusetts 02199, dmagee@atllp.com, telephone at 617-824-5131, and via fax at 617-830-8490. Backup counsel are: (1) Marc Vander Tuig (Reg. No. 57,964), Armstrong Teasdale LLP, 7700 Forsyth Blvd., Suite 1800, St. Louis, Missouri 63105, mvandertuig@atllp.com, via telephone at 314-621-5070, and via fax at 314-621-5065; and (2) Kyle G. Gottuso (*pro hac vice* forthcoming), Armstrong Teasdale LLP, 7700 Forsyth Blvd., Suite 1800, St. Louis, Missouri 63105, kgottuso@atllp.com, via telephone at 314-342-4131, and via fax at 314-621-5065.

A Power of Attorney is filed concurrently herewith.

D. Designation of Lead and Back-Up Counsel and Service

Information (37 C.F.R. § 42.8(b)(4))

Petitioner consents to electronic service to lead and backup counsel.

E. Grounds for Standing (37 C.F.R. § 42.104(a))

Petitioner certifies that the '224 Patent is available for IPR, and that Petitioner is not barred nor estopped from requesting an IPR on the grounds herein. On February 17, 2022, Patent Owner Colt International Clothing, Inc. d/b/a Colt LED ("Patent Owner") filed a Complaint asserting infringement of the '224 Patent. The Complaint was served on Petitioner on February 18, 2022. This Petition is timely.

F. Payment of Fees (37 C.F.R. § 42.15(a))

The required fees are submitted herewith. If additional fees are due, the Office is authorized to charge Deposit Account No. 012384.

G. Proof of Service (37 C.F.R. § 42.105)

Proof of service of this Petition on Patent Owner at the correspondence address of record for the '224 Patent is attached hereto.

III. IDENTIFICATION OF CHALLENGED CLAIMS (37 C.F.R. § 42.104(b))

Petitioner requests IPR of Claims 1, 3, 4, 7–13, 23, 25, 26, 28, 29–39, and 41–45 of the '224 Patent on the following grounds, and requests that the claims be found unpatentable as set forth below. Additional evidence is set forth in the Declaration of Fred Holmes.

Ground	Claims	Statutory Basis	Prior Art
I	1, 3, 4, 7–13, 23, 25, 26, 28, 29–39, and 41–45	§ 103	U.S. Patent No. 7,507,001 to Kit (“Kit”) in view of U.S. Patent No. 7,350,936 to Ducharme <i>et al.</i> (“Ducharme”) and U.S. Publication No. 2010/0102729 to Katzir <i>et al.</i> (“Katzir”)
II	1, 3, 4, 7–13, 23, 25, 26, 28, 29–39, and 41–45	§ 103	U.S. Patent Publication 2005/0047134 to Mueller (“Mueller”) in view of U.S. Patent No. 8,026,532 (“Ansems”) and U.S. Publication No. 2010/0102960 (“Ivey”)

IV. SUMMARY OF THE ’224 PATENT

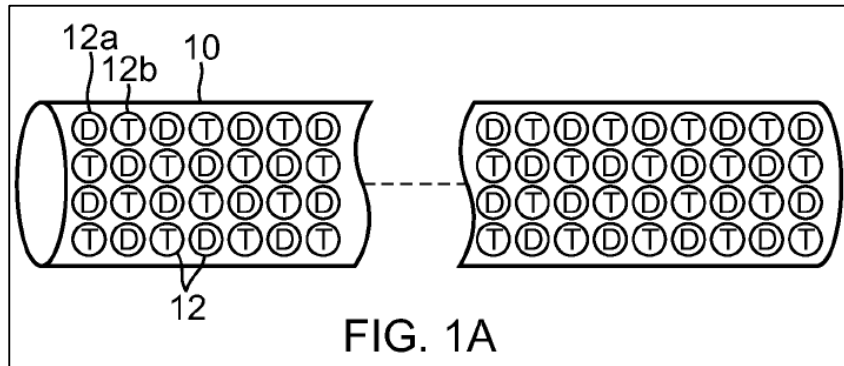
The application that matured into the ’224 Patent was filed on March 31, 2017, and issued on February 5, 2019. Ex. 1001 at Title Page. The ’224 Patent claims priority to U.S. Provisional Application No. 61/648,554, filed on May 17, 2012. *Id.* For purposes of this proceeding, the earliest effective filing date is May 17, 2012.

The '224 Patent, titled “Multicolored Tube Light With Improved LED Array,” is directed to a system for “producing light using LED lighting with output within a predetermined color temperature range for commercial lighting uses which may be bicolor or may be multicolored.” Ex. 1001 at Abstract. The “tube light” includes an LED array “capable of producing light within at least two desired predetermined color temperature ranges.” *Id.* at 1:24–26. The '224 Patent describes traditional fluorescent lamps used in the lighting industry, such as TV, stage, and film studio, can create “unwanted visual effects for the viewer.” *Id.* at 1:40–46. For example, traditional fluorescent lights can give a “greenish hue to skin tones giving people a sickly or unhealthy appearance.” *Id.* at 1:64–66.

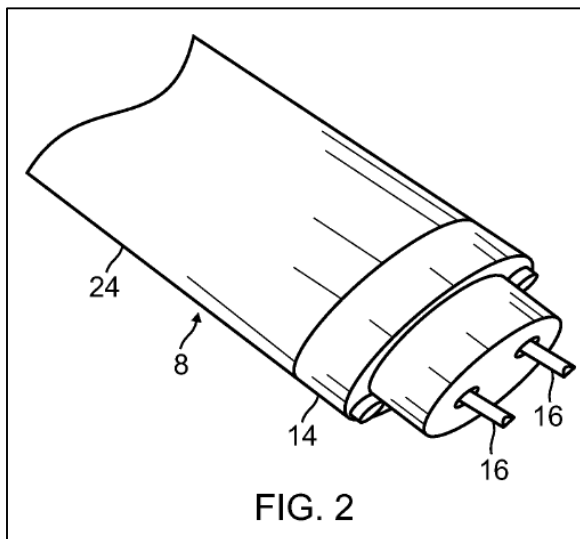
For this reason, the '224 Patent discusses the use of known LED lights placed in “a tubular form of a fluorescent bulb.” *Id.* at 2:51–53. The '224 Patent indicates that it is “desirable to maintain the shape and interface of a traditional fluorescent lamp so as to allow maximum usability in the lighting industry without requiring expensive and time consuming equipment overhaul and upgrades.” *Id.* at 5:16–20.

The claimed LED lighting system in the '224 Patent is configured to emit up to four different color LEDs plus a white LED, with the LEDs on a support structure in a tubular housing. *Id.* at Claim 1. In Figure 1A, below, the LEDs (12a

and 12b) are shown to be arranged in a matrix pattern on an elongated tubular support structure (10):



Id. at Fig. 1A, 5:13–37.



The LEDs in Figure 1A at 12a are daylight white, and the LEDs at 12b are tungsten light.

Figure 2 (left), is a portion of an LED lamp of the present invention that “is similar to a traditional fluorescent lamp tube.” *Id.* at Fig. 2, 10:42–45. The end of the tube lamp (8) includes a base (14) with electrical connectors (16) and is

“configured with dimensions equivalent to a ‘T8’ size traditional fluorescent tube, which is one inch in diameter, or a T12 size (one and a half inch diameter).” *Id.* at 10:42–61.

The claims of the '224 Patent are directed to an LED device configured to “emit five different colors of light” with a controller configured to receive

commands to “produce light consisting of varying amounts of the five different colors provided by the first, second, third, and fourth sets of LED emitting elements.” *Id.* at Claim 1. During prosecution, the Examiner rejected claims directed to “multiple color LEDs” as obvious (Ex. 1002 at 249–79), but ultimately allowed the claims because the prior art allegedly did not “have a light-diffusing top portion” (*id.* at 281–94)).

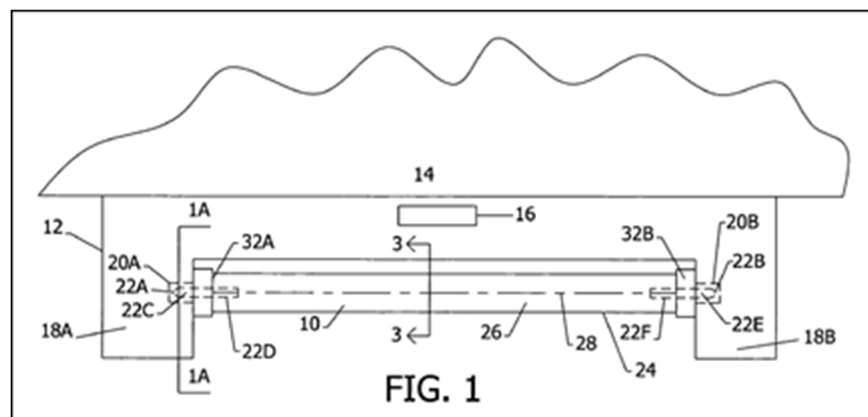
V. SUMMARY OF PRIOR ART

A. Overview of Kit

Kit was filed on May 21, 2007, and issued as a patent on March 24, 2009.

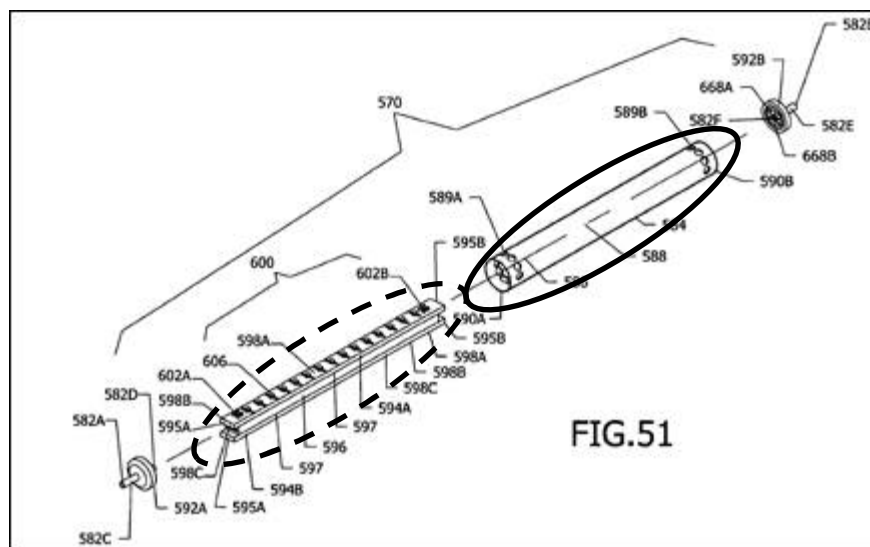
Ex. 1004 at Cover Page. Kit is available as prior art under 35 U.S.C. § 102(b).

Kit is directed to “[a]n energy saving device for an LED lamp mounted to an existing fixture for a fluorescent lamp where the ballast is removed or bypassed.” *Id.* at Cover Page, Abstract. Kit discloses replacing fluorescent lights with LED lights. *Id.* at 16:4–9. Figure 1 represents an assembled view of the LED retrofit lamp:



Id. at Fig. 1.

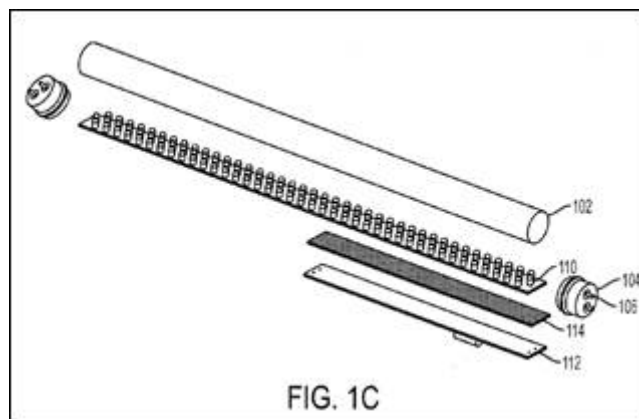
The LED lamp in Kit has an elongated housing and contains an LED array circuit board. *Id.* at 38:16–60. The disclosed LED lamp includes an elongated support structure, which is placed within the housing. *Id.* at 39:5–29. Figure 51 teaches an embodiment of the LED retrofit lamp. *Id.* at Fig. 51. This LED lamp also includes an elongated housing (circled in solid line below). *Id.* at 77:12–78:2. The housing contains an LED array circuit board and an elongated support structure (circled in dashed line below). *Id.*



B. Overview of Katzir

Katzir was filed on October 8, 2009, and published on April 29, 2010. Ex. 1010 at Cover Page. This reference precedes May 17, 2012, the earliest effective filing date of the '224 Patent. Katzir is prior art under 35 U.S.C. § 102(b).

Katzir is directed to a “lighting assembly [that] can replace a fluorescent tube light while providing a more comfortable and steady light source, consuming less power and with enhanced longevity.” Ex. 1010 at Cover Page, Abstract. Katzir teaches that the components of the lighting assembly include “a tube, a[n LED] panel disposed within the tube, a circuit board disposed within the tube, and insulation disposed between the [LED] panel and the circuit board.” *Id.* at Abstract. Figure 1C depicts an embodiment of the LED lighting assembly:



Id. at Fig. 1C, [0017].

The disclosed lighting assembly “provides LEDs with different color temperatures. *Id.* at [0050]. For example, Figures 5A–F illustrate possible LED layouts in multi-color LED panels. *Id.* at [0054]. Further, “any number of rows of

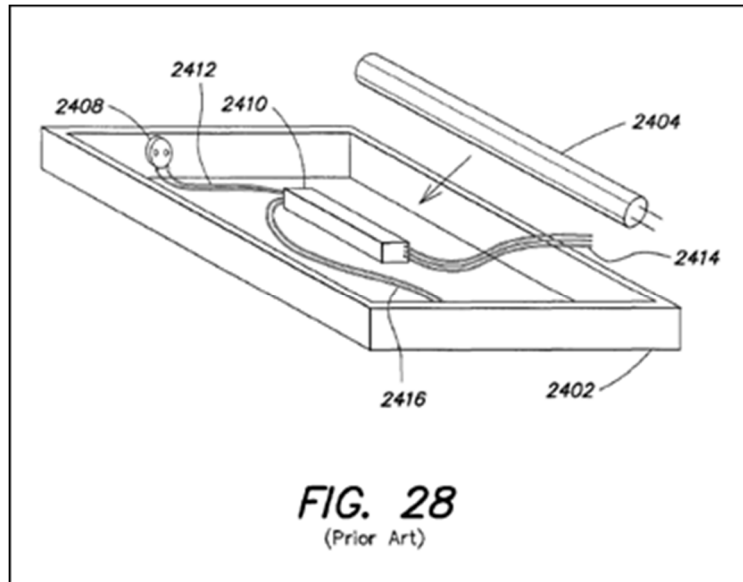
LEDs may be used according to the desired intensity, power consumption, or physical configuration of the lighting assembly.” *Id.*

Katzir also discloses that the LED arrays “may be configured in straight rows, staggered rows, or spaced in any other desired configuration on the LED panel...” *Id.* at [0054]. Katzir also teaches “various arrangements of LEDs in two-color and three-color configurations.” *See, e.g., id.*

C. Overview of Ducharme

Ducharme is a U.S. patent that issued on April 1, 2008 from an application filed on August 28, 2006. Ex. 1005 at Cover Page. This reference precedes May 17, 2012, the earliest effective filing date of the ’224 Patent. Ducharme is therefore prior art under 35 U.S.C. § 102(b).

Ducharme is directed to “LED-based light bulbs having one or more white LEDs, for replacing/retrofitting conventional light bulbs.” Ex. 1005 at Abstract. Ducharme discloses that “[a] high-quality LED-based light may be configured to replace a fluorescent tube,” describing an embodiment in which, “a replacement high-quality LED light source useful for replacing fluorescent tubes would function in an existing device designed to use fluorescent tubes. Such a device is shown in FIG. 28.” *Id.* at 28:53–60, Fig. 28.



Id. at Fig. 28. Ducharme teaches the use of LED lights in the image recording industry. *Id.* at 18:51–64 (“a film director could find light in a location where filming does not occur and measure that light using the sensor”), 19:14–24.

D. Overview of Mueller

Mueller was filed on September 30, 2004, and published on March 3, 2005. Ex. 1006 at Cover Page. Mueller is therefore prior art under 35 U.S.C. § 102(b).

Mueller discloses methods and systems of providing “controlled lighting” using “both white and non-white colored” LED-based lighting units. Ex. 1006 at Cover Page, Abstract. Mueller discloses using “multi-color lighting units in a variety of commercial applications,” including for entertainment lighting and in a fluorescent fixture arrangement. *Id.* at Abstract, [0185]. Mueller discloses that the LED-based lighting units “can thus be coordinated to be appropriate for the object being filmed or recorded by the camera.” *Id.* at [0265], [0049].

E. Overview of Ansems

The application that matured into Ansems was filed on November 28, 2005, and the patent issued on September 27, 2011. Ex. 1007 at Cover Page. Ansems is therefore prior art under 35 U.S.C. § 102(b).

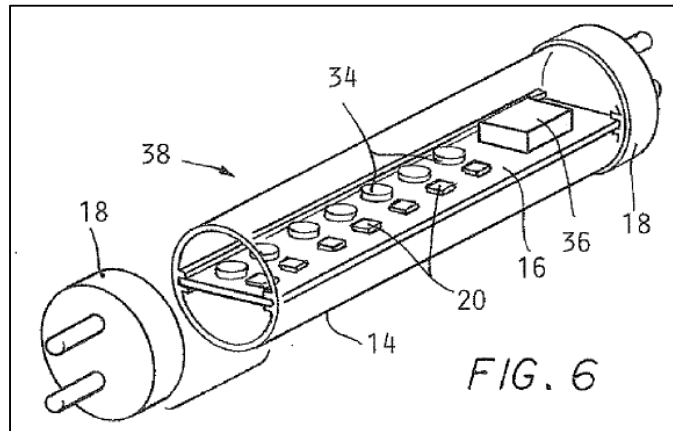
Ansems is directed to an array of LEDs that are formed on a substrate to provide multiple different colors. Ex. 1007 at Cover Page, Abstract. Ansems teaches that LED lighting systems may have many different LED colors: “white light typically utilizes multiple LEDs of different colors and the different colors are mixed together to obtain the white light, or light of any other color.” *Id.* at 1:17–21. Ansems teaches a “color variable light-emitting device that comprises an array of a plurality of light-emitting diodes formed on one highly resistive substrate.” *Id.* at 1:43–56.

F. Overview of Ivey

The application that matured into Ivey was filed on October 24, 2008, and the patent published on April 29, 2010. Ex. 1008 at Cover Page. Ivey is therefore prior art under 35 U.S.C. § 102(b).

Ivey discloses an LED-based light, coupled to a controller, that fits in a traditional fluorescent tube lighting form factor. Ex. 1008 at Cover Page, Abstract, [0015] (“FIG. 1 illustrates an LED-based light 10 for use in a standard fixture 12,

such as a fixture designed to accept T5, T8, T10, or T12 tubes.”). The LED device disclosed in Ivey is shown below in Figure 6:



Id. at Fig. 6.

VI. LEVEL OF ORDINARY SKILL IN THE ART

As of the earliest effective filing date claimed in the '224 Patent, a person of ordinary skill in the art with respect to the '224 Patent (“POSITA”) would have had at least a Bachelor of Science degree in electrical engineering, or a closely related field, along with at least two years of experience in the design of entertaining lighting systems, and the design and use of LED lights. Ex. 1003 at ¶¶ 32–33.

VII. CLAIM CONSTRUCTION

In an IPR, claims are interpreted under the *Phillips* standard. 37 C.F.R. § 42.100(b); *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). Under this standard, claim terms are given their plain meaning as understood by a person of ordinary skill in the art. *Id.* at 415 F.3d at 1312–13. Unless indicated

otherwise, all claim terms are given such ordinary and customary meaning for purposes of this Petition.

VIII. LEGAL STANDARDS FOR OBVIOUSNESS

A patent claim is unpatentable where “the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art.” 35 U.S.C. § 103. “The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 416 (2007).

IX. GROUND I: THE CHALLENGED CLAIMS WOULD HAVE BEEN OBVIOUS OVER KIT IN VIEW OF DUCHARME AND KATZIR

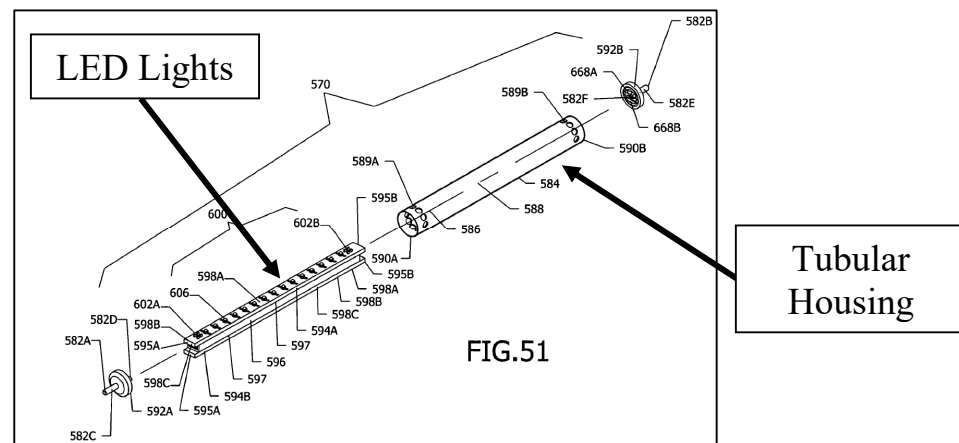
A. A POSITA Would Have Been Motivated to Combine Kit with Katzir and Ducharme, and Would Have Had a Reasonable Expectation of Success

“A person of ordinary skill is . . . a person of ordinary creativity, not an automaton” and “in many cases a person of ordinary skill will be able to fit the teachings of multiple patents together like pieces of a puzzle.” *See KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 415–18 (2007). “A motivation to combine may be found explicitly or implicitly in market forces; design incentives; the interrelated teachings of multiple patents; any need or problem known in the field of endeavor

at the time of invention and addressed by the patent; and the background knowledge, creativity, and common sense of the person of ordinary skill.”

Realtime Data, LLC v. Iancu, 912 F.3d 1368, 1374 (Fed. Cir. 2019).

Kit discloses an LED array retrofitted in a fluorescent tube form factor, including a T12 and/or T8 fluorescent tube form. Ex. 1004 at Abstract, 6:2–11, 12:65–13:3. The retrofit LED array in a tube housing is shown in Figure 51 of Kit:



Id. at Fig. 51, 77:12–78:2. Kit discloses using multiple different LEDs that emit five (or more) colors, including Red, Green, Blue, Orange, Amber, and various temperatures of white light. *Id.* at 20:50–63.

A POSITA would have known that the LED lights disclosed in Kit were well suited for use with any lighting environment, including the “commercial image recording” industry. Ex. 1003 at ¶¶ 95–103. Indeed, a POSITA would have been motivated to use the LED lighting device disclosed in Kit as a suitable lighting device for use with commercial image recording. *Id.* at ¶¶ 103–104. And the use of the LED lights in Kit would have been successfully used with image

recording based on the high-powered LEDs, with disclosed broad-spectrum white light temperatures in the daylight and tungsten ranges. *Id.* at ¶¶ 103–107

For instance, Kit explains that the disclosed LED lamp can be inserted “directly into the lamp socket of existing fluorescent lighting fixtures used for general lighting in public, private, commercial, industrial, residential buildings.” Ex. 1004 at 16:4–9. These existing fluorescent lights replaced by Kit were known in the lighting industry to be used for image recording purposes, such as “TV, stage, auditorium, and/or film studio use,” as discussed in the ’224 Patent. Ex. 1001 at 1:40–43. Before 2012, movie studios would have had existing fluorescent lighting fixtures in place, and a POSITA would have been motivated to replace the fluorescent lights with LEDs as LEDs are cheaper, more reliable, and more versatile. Ex. 1003 at ¶ 104. A POSITA would have been motivated to replace the existing fluorescent lights used for commercial image recording with the LED lamp disclosed in Kit. *Id.* at ¶¶ 95–108.

Further, ’224 Patent does not describe or explain any special properties of the claimed LEDs that make the lighting particularly “suitable” or unique for the image recording industry. Instead, the ’224 Patent asserts that LED lights in a fluorescent form factor were not suitable for film/TV light because a luminaire designer would allegedly not have been motivated to use a “highly restrictive linear tube form factor” to design LED lights for the film/tv industry due to

“inconsistent light level output” and “undesirable color shifting.” Ex. 1001 at 4:5–62. This is simply incorrect. Ex. 1003 at ¶ 105. Indeed, there is *nothing unique* to the LED lights claimed in the ’224 Patent that would make them particularly suitable for use in a tube form factor or for television or film recording. *Id.* at ¶¶ 105–107. The ’224 Patent utilizes conventional LED lights that achieve RGB colors and/or broad-spectrum white light in standard temperature ranges, such as 2800K to 5800K. Ex. 1001 at 16:23–29; Ex. 1003 at ¶ 106. A POSITA would have had no concern or issue with using a linear form factor to house LEDs of this nature and use such LED lighting to capture images. Ex. 1003 at ¶ 106.

Further, a POSITA would have been motivated to use the LED lighting in Kit for commercial image recording to take advantage of the versatility, and cost savings realized by using LEDs, and would have had an expectation of success in doing so based at least on the teachings of Ducharme. *Id.* at ¶¶ 107–108.

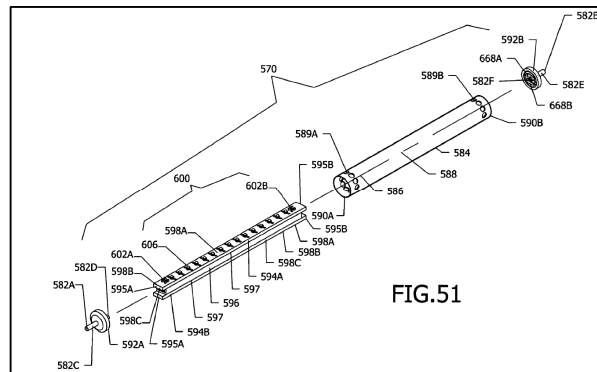
Ducharme, as one example, teaches that LED lights like those taught in Kit are suitable for image recording by disclosing the use of LEDs in a linear, tube-like form factor. Ex. 1005 at Figs. 5a–5b, 29, 12:49–67, 18:51–64 (describing the use of the disclosed lightings by a film director), 19:14–24 (using the disclosed lighting fixtures for image capturing); Ex. 1003 at ¶ 107. Ducharme even teaches a POSITA that “high-quality LED-based light[s] may be configured to replace a fluorescent tube,” and the LED light source would “function in an existing device

designed to use fluorescent tubes.” Ex. 1005 at 28:53–57, Figs. 28–29. Further, Ducharme discusses the proper color temperatures for LEDs and the use of high Color Rendering Index (CRI) for high-quality image capturing purposes, which match the disclosures in the ’224 Patent. *Id.* at 20:15–21:37.

Additionally, the use of Kit’s LED lighting device in the “image recording” industry is nothing more than using a known lighting device and form factor for a well-known purpose to yield predictable results. Ex. 1003 at ¶ 108; *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007); *see Sparton Corp. v. U.S.*, 89 Fed. Cl. 196, 237 (Fed. Cl. 2009) (“The variation of known mechanical designs to achieve an alternative solution to the same problem solved by the known mechanical designs in generally the same manner is obvious, especially where [a POSITA] could easily implement the variation.”). A POSITA would have had an expectation of success as using Kit’s LED lights in a linear form factor would have worked to capture high-quality images. *See* Ex. 1005 at 20:15–21:37.

A POSITA would also have been motivated to combine the teachings of Kit with that of Katzir. Ex. 1003 at ¶¶ 109–110. Katzir discloses an LED lighting device in a fluorescent tube form factor. Ex. 1010 at Fig. 1C, [0027]. This LED device is substantially similar to that disclosed in Kit:

Kit LED Tube Lighting



Ex. 1004 at Fig. 51.

B. Claims 1, 3, 4, 7–13, 23, 25, 26, 28, 29–39, and 41–45 Would Have Been Obvious Over Kit in View of Ducharme and Katzir

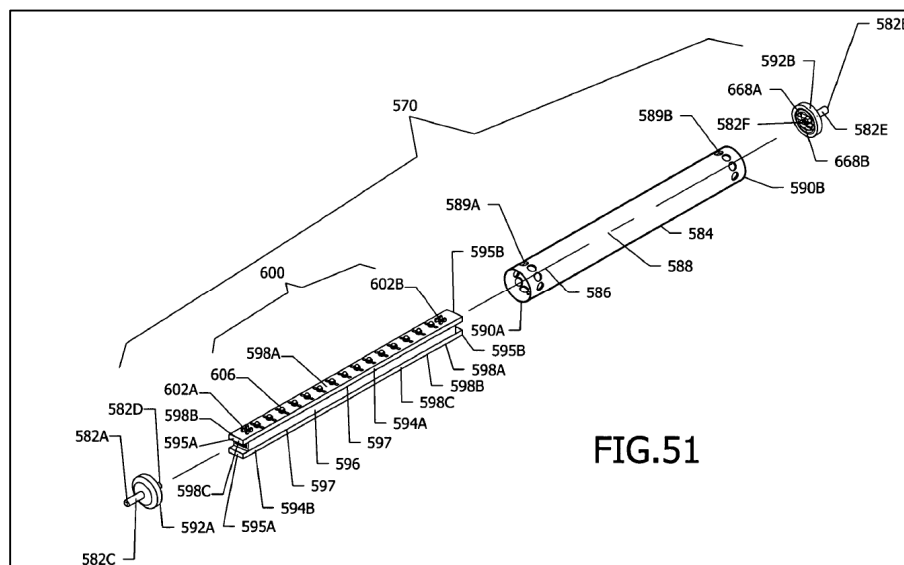
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motivated to combine Kit with Ducharme and Katzir for at least the reasons discussed below and as set forth in Section IX(A). *Id.* at ¶¶ 94–146.

(i) **Claim 1**

Claim 1[pre]

Kit, in view of Ducharme, satisfies the preamble. Ex. 1003 at ¶¶ 112–118. Like the '224 Patent, Kit explains that LED lights can replace standard fluorescent lights. Ex. 1004 at 12:53–13:3. Kit discloses an energy saving device for an LED lamp mounted to an existing fixture used for a fluorescent lamp. *Id.* at Abstract, 16:4–33. Kit teaches that the ballast for the preexisting fluorescent lamp is removed or bypassed and LEDs “are positioned within a tube and electrical power is delivered from a power source to the LEDs.” *Id.* at 15:21–25, Figs. 2, 51.



As for the LED light being “suitable for a commercial image recording,” this recitation for the *intended use* of the invention does not result in any structural difference between the ’224 Patent and the prior art, and thus does not provide any patentable distinction over Kit. *In re Casey*, 370 F.2d 576, 579-80 (CCPA 1967); *In re Otto*, 312 F.2d 937, 939 (CCPA 1963). Kit satisfies this limitation.

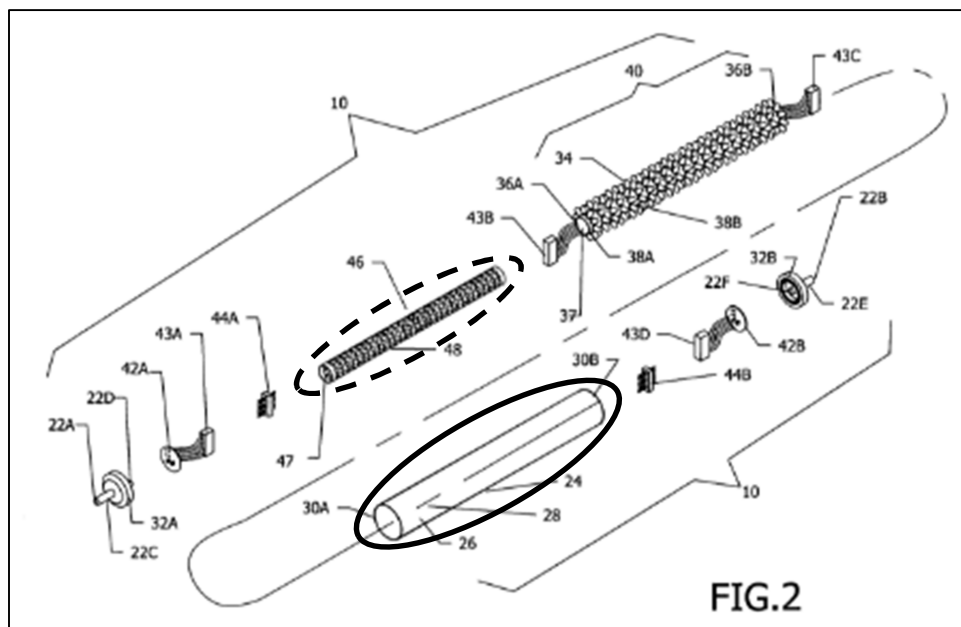
Regardless, it would have been obvious to a POSITA to use Kit’s LED lights for image recording applications. Ex. 1003 at ¶ 115. A POSITA would have known that the LED lights disclosed in Kit could be used with any lighting environment, including for “commercial image recording.” *Id.* Kit explains that the LED lamp can be inserted “directly into the lamp socket of existing fluorescent lighting fixtures used for general lighting in public, private, commercial, industrial, residential buildings.” Ex. 1004 at 16:4–9. These existing fluorescent lights being replaced by Kit were known to be used in the lighting industry, such as “TV, stage, auditorium, and/or film studio use,” as discussed in the ’224 Patent. Ex. 1001 at 1:40–46. The use of the Kit LEDs to replace standard fluorescent lights suitable for commercial image recording would have been obvious to a POSITA. Ex. 1003 at ¶¶ 115–117.

To the extent this limitation would not have been obvious in view of Kit alone, a POSITA would have known that the LED lights would have been used in, and suitable for, commercial image recording industry based on the teachings of

Ducharme. *Id.* at ¶ 118. Ducharme teaches that color LED lights like those in Kit are suitable for the image recording industry by disclosing the use of LEDs in a conventional fluorescent fixture. Ex. 1005 at Abstract, 18:33–54, 19:13–24.

Claim 1[a]

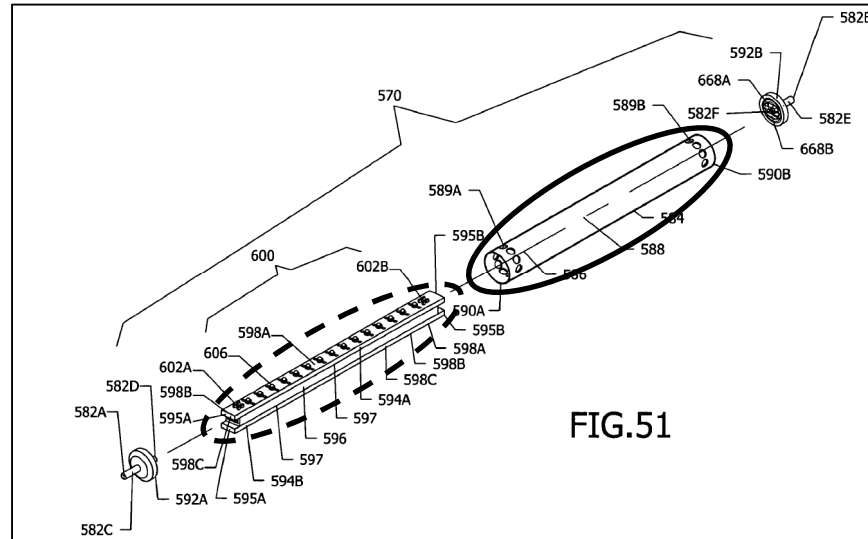
Kit discloses a “support structure.” Ex. 1003 at ¶¶ 119–122. Figure 2 discloses a support structure (46), a housing (26) for the support structure, and an array of LED emitting devices (34) mounted on the support structure. Ex. 1004 at 38:16–39:64.



Id. at Fig. 2 (exploded perspective view of the LED retrofit lamp) (housing circled in solid line, support structure circled in dashed line), 38:16–39:64; Ex. 1003 at ¶¶ 120–121. The support structure (46) is positioned within the housing and is

support for the cylindrical LED array and LED array circuit board. Ex. 1004 at 38:16–39:64, 18:7–19:7.

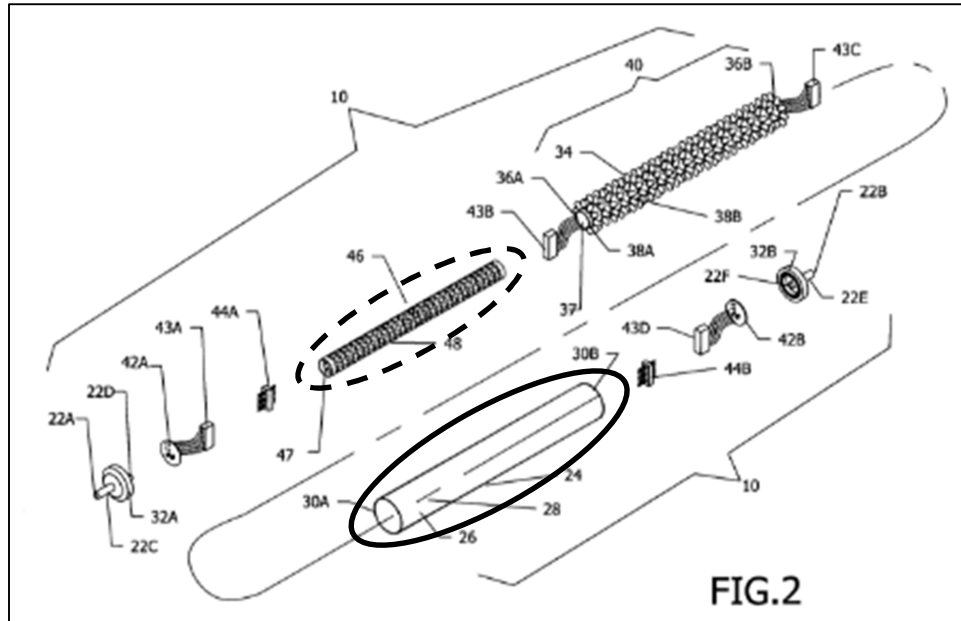
Figure 51 discloses a similar tube housing with a flat, elongated support structure:



Id. at Fig. 51 (housing circled in solid line, support structure circled in dashed line), 77:12–78:2.

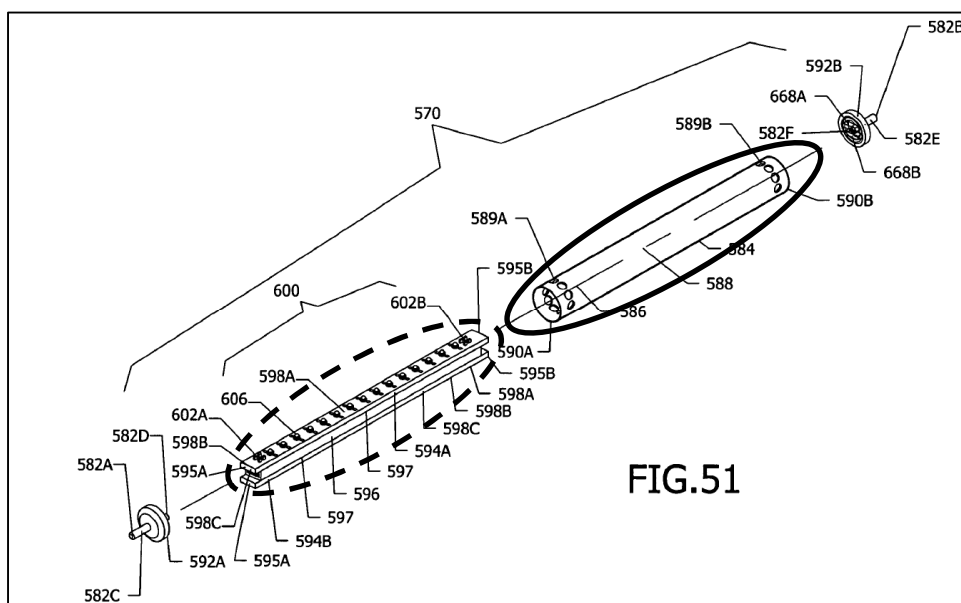
Claim 1[b]

Kit discloses “a housing for the support structure.” Ex. 1003 at ¶¶ 123–124. For instance, Figure 2 of Kit discloses a support structure (48), a housing (26) for the support structure, and an array of LED emitting devices (34) mounted on the support structure. Ex. 1004 at 38:16–39:64.



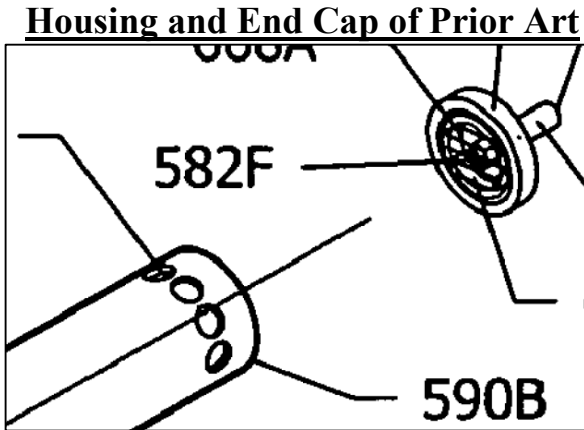
Id. at Fig. 2 (exploded perspective view of the LED retrofit lamp) (housing circled in solid line, support structure circled in dashed line), 38:16–39:64; Ex. 1003 at ¶ 125. The support structure is positioned within the housing (26). Ex. 1004 at 38:16–39:64, 18:7–19:7.

Figure 51 also discloses a similar tube housing with support structure:

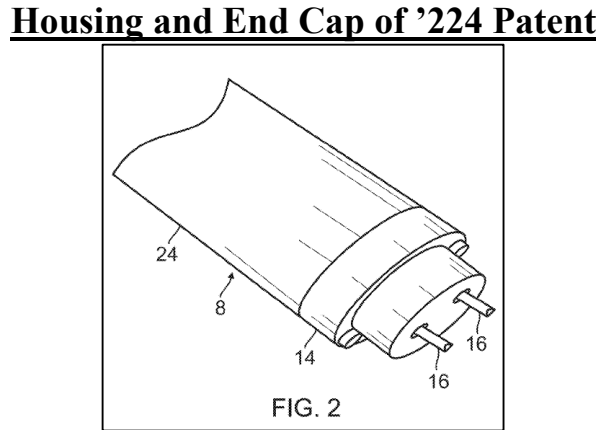


Id. at Fig. 51 (housing circled in solid line, support structure circled in dashed line), 77:12–78:2; Ex. 1003 at ¶¶ 125–127.

The housing disclosed in the '224 Patent is like that disclosed in Kit:



Ex. 1004 at Fig. 51.



Ex. 1001 at Fig. 2.

Claim 1[c]

The array of LEDs disclosed in Kit are mounted on the support structure, as explained above. Ex. 1003 at ¶¶ 128–129; Ex. 1004 at Figs. 2, 4, 12, 51, 53, 38:16–39:64, 77:12–78:2. The array of LEDs is configured to emit at least five different colors (including white), with five sets of LEDs configured to emit at least five different colors. Ex. 1004 at 24:27–41, 22:9–35, Ex. 1003 at ¶¶ 129–130.

Kit discloses that there are many types of LED lights, all of which may be used in the LED array disclosed in Kit, and the fifth set of LEDs can emit broad-spectrum white light within a predetermined Kelvin temperature range such as warm white, commercial white, or cool white light. Ex. 1004 at 20:50–63, 3:20–38 (can achieve “well-controlled and consistent color temperatures of 3200K (warm white), 4100K (commercial white) or 5500K (cool white).”); Ex. 1003 at ¶ 131.

Claim 1[d]

Kit discloses a controller that is coupled to the array of LEDs and is configured to receive commands for operating select LEDs with the claimed “varying amounts of power to produce light consisting of varying amounts of the five different colors.” Ex. 1004 at 24:27–41; Ex. 1003 at ¶¶ 132–133. Kit discloses the use of a controller coupled to the LED array that can be used to dim the lights, or can be used to control the color of the LEDs by providing various amounts of power to the lights:

Another circuit module can be a color effects module for use with color LEDs instead of white LEDs used in the LED lamps. **This module allows the LED lamp to change colors. The controllers used for the dimming modules can be modified to achieve the color changing function required here.** There will be a minimum of RGB color LEDs, but Amber or A can also be used.

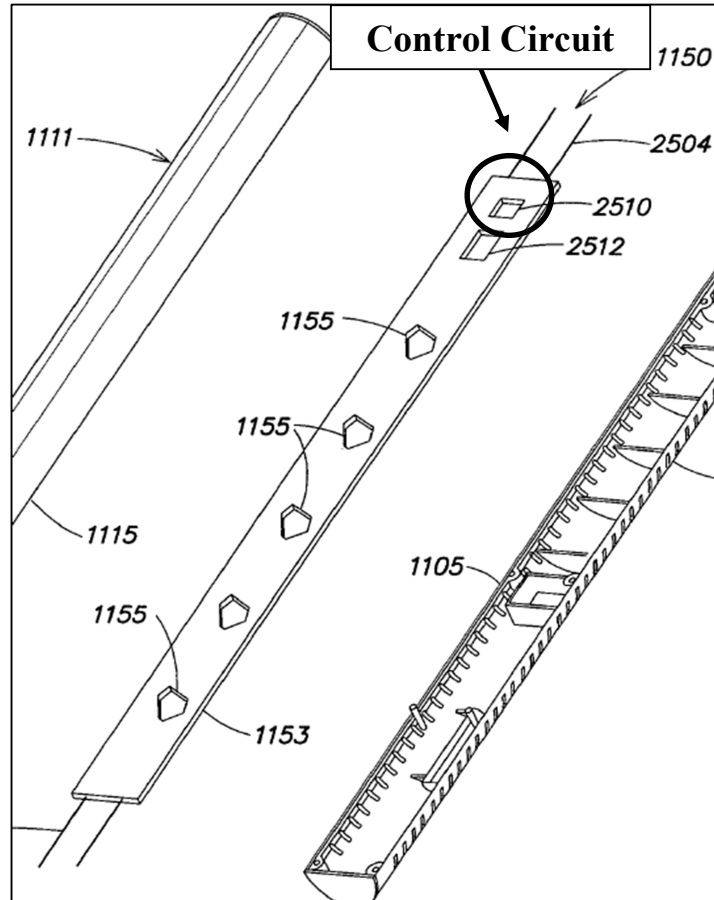
Ex. 1004 at 24:3–41 (emphasis added); Ex. 1003 at ¶ 133. While Red, Green, Blue (RGB), Amber, and white light are discussed here, Kit states that any type of color LEDs may be used on the LED array. Ex. 1004 at 20:50–63.

The “color effects module” and power control module disclosed in Kit “can be incorporated into the electrical circuits used in the LED retrofit lamp.” *Id.* at 23:31–33. Kit teaches that the circuit modules “contain the necessary electronics to decipher data input control signals and provide the current driver power to operate the LED arrays.” *Id.* Kit discloses the use of a dimming module; however,

as noted above, a color effects module may also be used. *Id.* at 23:31–42, 24:28–

42. The color effects module drives each array of colored LEDs, making it possible to “achieve different color combinations.” *Id.* at 24:28–42; Ex. 1003 at ¶ 133.

Ducharme also discloses a controller coupled to the array of LEDs that can receive commands for operating the LEDs. Ducharme’s controller can provide varying amounts of power to the LEDs. For instance, Figure 29 discloses a “control circuit” (2510) that is mounted on a support structure and can control color temperature and power to an LED. Ex. 1005 at Fig. 29 (control circuit circled below), 29:44–55 (“The control circuit (2510) may control the LEDs (1155) . . . or control circuit (2510) may generate control signals to operate the LEDs.”), 30:35–31:4, Figs. 10a and b, 17:59–18:33.



Id. at Fig. 29; Ex. 1003 at ¶ 133. Additionally, a POSITA would have been motivated to modify Ducharme to include an LED driver that can separately control the pluralities of LEDs based on Katzir. Ex. 1010 at [0011]–[0013], [0033]–[0034].

Claim 1[e]

Kit discloses an LED driver that is configured to selectively provide electrical power to the array of LEDs. Ex. 1004 at 23:31–55, 24:27–41, 121:7–38; Ex. 1003 at ¶¶ 134–135. Kit discloses that a “color effects module” can replace a “dimming module” to change the colors of the LED arrays. Ex. 1004 at 24:27–42.

The color effects module is a circuit module that uses multiple channels to selectively change the LED colors to achieve different color combinations. *Id.*; Ex. 1003 at ¶¶ 134–136.

This power control module and color effect module “can be incorporated into the electrical circuits used in the LED retrofit lamp” of Kit. *Id.* at 23:31–55. The circuit modules disclosed in Kit “contain the necessary electronics to decipher data input control signals and provide the current driver power to operate the LED arrays.” *Id.* And while Kit includes an example of a dimming module, Kit makes it clear that the dimming module can be replaced with a color effects module to provide power to LED lights to change the colors. Ex. 1003 at ¶ 136. Kit also discloses that the disclosed power control module in Kit “can be incorporated into the electrical circuits used in the LED retrofit lamp” of Kit. Ex. 1004 at 15:20–47, 23:31–33, Fig. 53.

Ducharme also discloses circuitry mounted on the support structure that includes a driver to selectively switch between driving first or second LEDs. Ex. 1003 at ¶ 136. This can include switching some LEDs off while other LEDs are on. *Id.* Figure 29 discloses a “control circuit” (2510) that is mounted on a support structure and can control color temperature and power to an LED. Ex. 1005 at Fig. 29, 29:44–55 (“The control circuit (2510) may control the LEDs (1155) with constant D.C. voltage or control circuit (2510) may generate control signals to

operate the LEDs. In a preferred embodiment, the control circuit (2510) would include a processor for generating pulse width modulated control signals, or other similar control signals, for the LEDs.”), 30:35–31:4, Fig. 10a and b, 17:59–18:33.

Additionally, to the extent this limitation is not disclosed by Kit or Ducharme, a POSITA would have been motivated to modify Kit to include an LED driver that can separately control the pluralities of LEDs based on Katzir. Ex. 1003 at ¶ 136; Ex. 1010 at [0011]–[0013], [0033]–[0034].

Claim 1[ff]

Kit discloses that the housing has a linear form factor like that of a fluorescent tube having an axial direction. Ex. 1004 at Figs. 2, 51, 16:4–12, 19:35–43, 77:20–78:2. Indeed, Kit discloses replacing standard fluorescent tubes with LED arrays. *Id.* at 1:42–48; Ex. 1003 at ¶¶ 137–138.

Kit also discloses that the linear form factor may have a diameter of no greater than about 41mm, with an electrical input connection for receiving input power and the input connection is in electrical communication with the LED driver. Ex. 1004 at 79:60–65; Ex. 1003 at ¶¶ 137–141. Kit teaches the use of T12 or T8 fluorescent tubes for its LED lighting system. Ex. 1004 at 12:43–13:3. A POSITA would know that a T12 fluorescent tube has a diameter of 1.5 inches (which is less than 41mm). Ex. 1003 at ¶ 141. This is the standard diameter of a

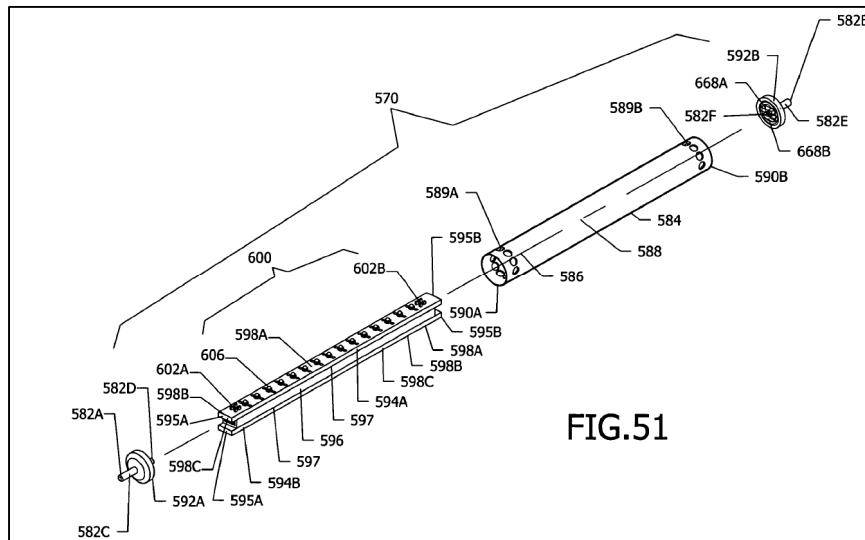
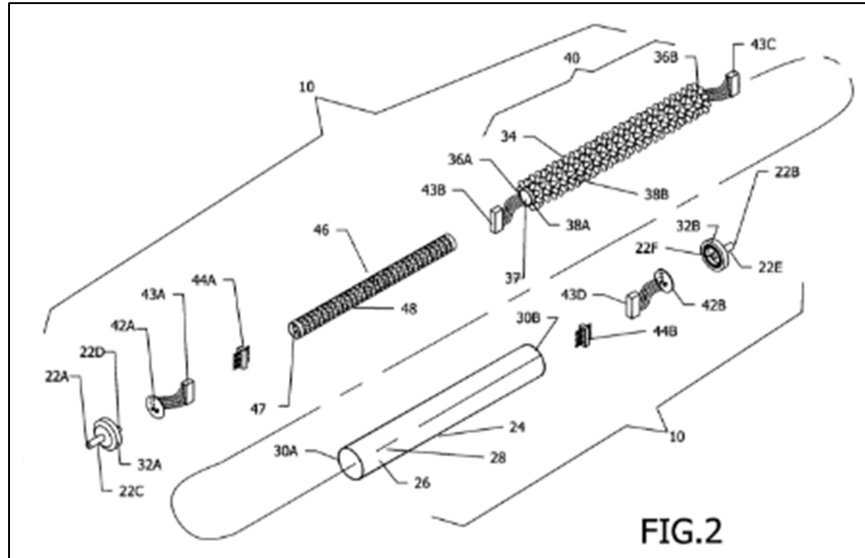
T12 fluorescent tube. Lastly, Kit teaches that the diameter of the tube housing can be 1.5 inches. Ex. 1004 at, *e.g.*, 42:24–28.

Kit discloses that the housing has an electrical input connection for receiving power where the input is in electrical communication with the LED driver. Ex. 1003 at ¶ 139. The LED lamps can be connected or wired between input power lines. Ex. 1004 at 19:35–43, 77:12–50.

Claim 1[g]

Kit discloses a housing with opposite ends where the support structure is an elongated and narrow surface extending in an axial direction. Ex. 1004 at Figs. 2, 51, 77:10–50. In Figures 2 and 51, Kit discloses a housing (28) (588) that has opposite ends (30A) (592A) and (30B) (592B). *Id.* at Fig. 2, 51, 38:16–60 (tubular wall 26 has opposed tubular wall ends 30A and 30B), 77:10–50. Kit also discloses that the housing has a top side and a bottom side with each extending in an axial direction. *Id.*; Ex. 1003 at ¶¶ 142–144.

The support structure extends in an axial direction within the housing and is an elongated and narrow surface. Ex. 1004 at Figs. 2, 51, 38:16–39:29. Figures 2 and 51 depict the housing and support structure:

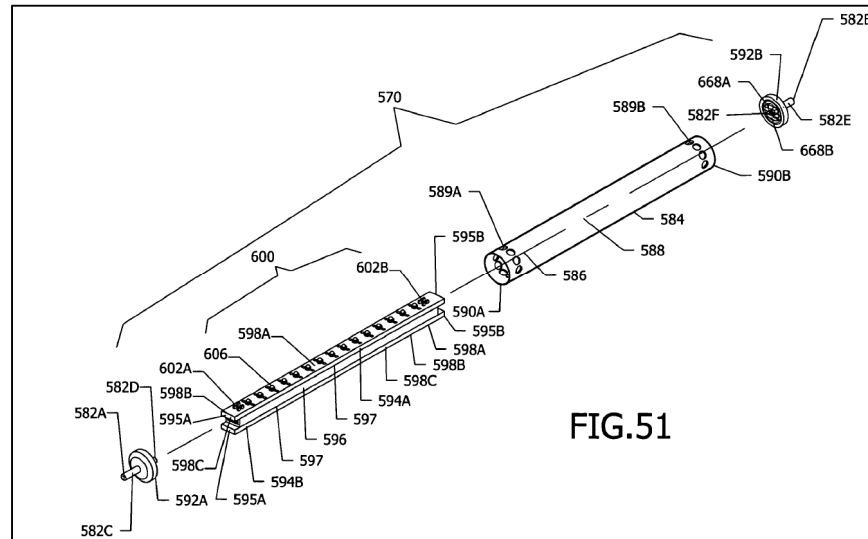


Id. at Figs. 2, 51.

Claim 1[h]

The LEDs disclosed in Kit are configured to emit light from the top side of the housing along a length of the housing between the opposite ends. Ex. 1003 at ¶ 146; Ex. 1004 at Figs. 2 and 51, 16:21–23. Kit also discloses a top side of the housing with a diffusion cover extending the axial length of the support structure

between the opposite ends. Ex. 1004 at Figs. 2 and 51, 16:21–23, 38:16–21; Ex. 1003 at ¶¶ 145–146.



Ex. 1004 at Fig. 51, 77:10–50. Ducharme similarly teaches the use of a diffusion cover in such a light fixture. Ex. 1005 at 12:5–16 (disclosing a diffusing filter), 27:19–26.

(ii) Claim 3

Kit discloses that the LED driver is adapted to selectively drive the five sets of LEDs in increments of $1/255$, which can produce more than 255 different colors. Ex. 1003 at ¶¶ 149–150. The '224 Patent describes that the claimed LED device uses a DMX signal with an RGBAW array (red, green, blue, amber, and white) to increment the color from zero (off) to 255 (full on). Ex. 1001 at 7:14–26. These increments correspond “to the different values of an 8 bit DMX signal.” *Id.* This

disclosure is the standard use of a DMX signal to control RGBAW LEDs. Ex.

1003 at ¶¶ 150–151.

Kit discloses that the LED lights can be controlled using a DMX512 signal, which can act as a color effect module to incrementally control the color of RGBAW lights. Ex. 1004 at 24:3–42. The DMX signal in Kit allows a user to fully control the RGBAW array to achieve “different color combinations,” and a POSITA would understand that a DMX signal could increment the RGBAW LEDs from 0 (being off) through 255, and achieve more than 255 different colors. Ex. 1003 at ¶ 151.

(iii) Claim 4

Kit discloses the limitations of Claim 4 for the same reason as disclosed in Claim 3. Section IX(B)(ii); Ex. 1003 at ¶¶ 155–157.

(iv) Claim 7

The LED device disclosed in Kit is in a form factor of a T12 fluorescent tube. Ex. 1004 at 12:53–13:3; Ex. 1003 at ¶ 162. Kit discloses T12 type fluorescent tube light, and states “an existing fluorescent fixture using an old magnetic ballast and an old T12 type lamp” which “serves as the base model with no upgrade.” Ex. 1004 at 5:31–34; Ex. 1003 at ¶¶ 161–162.

(v) Claim 8

The LED device disclosed in Kit is in a form factor of a T12 fluorescent tube. Ex. 1004 at 5:31–34, 12:53–13:3; Ex. 1003 at ¶ 167.

Kit further discloses that the fluorescent tube can be between one to four feet long. Ex. 1004 at 9:15–24, 17:49–56, 18:58–66; Ex. 1003 at ¶¶ 166, 168. Kit specifically discloses that “present linear fluorescent lamps are available in one, two, four, six, and eight foot lengths,” and thus “the flexible circuit board can be designed in increments of one-foot lengths.” Ex. 1004 at 17:49–52. Kit also discloses a specific embodiment of “a basic tubular 4-foot LED retrofit lamp.” *Id.* at 4:50–55.

(vi) Claim 9

Kit discloses an amber LED. Ex. 1004 at 20:50–57; Ex. 1003 at ¶¶ 172–174. Kit explains LEDs are “available in colors like Red, Blue, Green, Yellow, Amber, Orange, and many other colors including White. Although any type and color of LED can be used in the LED arrays used on the circuit boards of the present invention, an LED with a wide beam angle will provide a better blending of the light beams from each LED thereby producing an overall generally evenner distribution of light output omni-directionally and in every position.” Ex. 1004 at 20:50–57; Ex. 1003 at ¶ 173.

(vii) Claim 10

Kit discloses that the first, second, third, and fourth LEDs in the LED device are red, green, blue (RGB), and amber. Ex. 1004 at 20:50–57; Ex. 1003 at ¶ 178. Kit discloses that LEDs are “available in colors like Red, Blue, Green, Yellow,

Amber, Orange, and many other colors including White. Although any type and color of LED can be used in the LED arrays used on the circuit boards of the present invention.” Ex. 1004 at 20:50–57; Ex. 1003 at ¶ 179.

(viii) Claim 11

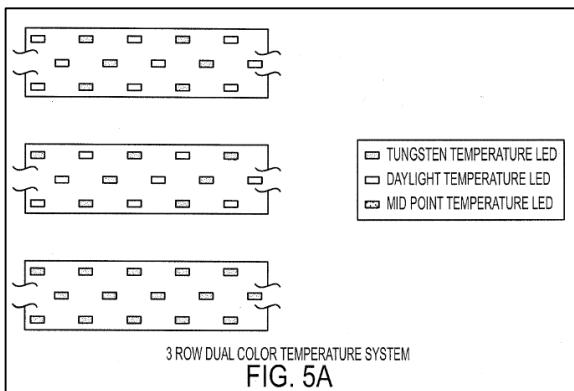
Kit discloses producing white light in the temperature ranges of daylight and tungsten. Ex. 1003 at ¶ 184. Kit teaches that “Lumileds Lighting, LLC now offers a Luxeon warm white LED with a 90 CRI (Color Rendering Index) and 3200 degrees Kelvin CCT (Correlated Color Temperature).” Ex. 1004 at 22:9–14. A POSITA would understand that a teaching of 3200 degrees Kelvin teaches a Tungsten temperature color. Ex. 1003 at ¶¶ 183–189.

Kit also discloses LEDs in the color temperature ranges of “3200K (warm white), 4100K (commercial white) or 5500K (cool white).” Ex. 1004 at 3:20–38. These color temperatures teach white light in the daylight (5500K) and tungsten (3200K) temperature ranges. Ex. 1001 at 2:7–11 (“[F]or example 3050 to 3300 K for tungsten (warm white), and, for example, 5400 to 5600 K for daylight (cool white).”); Ex. 1003 at ¶¶ 184 and 185.

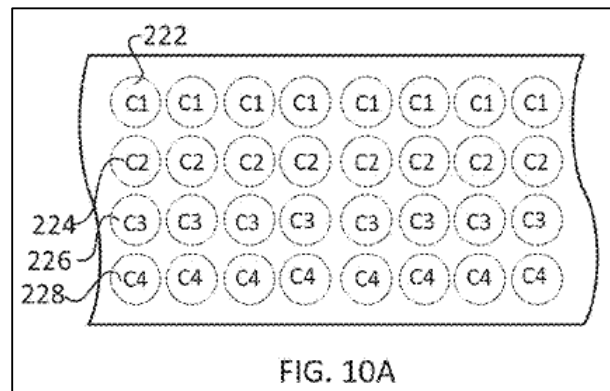
(ix) Claim 12

Katzir discloses that LEDs are arranged in a matrix pattern on the support structure. Ex. 1003 at ¶¶ 193–195. The LEDs can be placed in a checkerboard or matrix pattern in multiple rows, with both color and white light LEDs. Ex. 1010 at

[0054], Figs. 5A–5F; *compare with* Ex. 1001 at 6:3–6 (“The first and second types of LEDs are preferably arranged within the matrix in a checkerboard pattern, a row of LEDs alternating between the first type and the second type of LEDs.”). Katzir discloses multiple rows of LEDs arranged in a matrix like embodiments disclosed in the ’224 Patent:



Ex. 1010 at Fig. 5A.



Ex. 1001 at Fig. 10A.

(x) Claim 13

Independent Claim 13 is substantively similar (and verbatim in many instances) to independent Claim 1. Ex. 1003 at ¶¶ 147–148. The similar limitations in Claim 13 are disclosed and rendered obvious for the same reasons as disclosed in Claim 1. The below table pinpoints where these disclosures are found in the Petition:

Claim	Similar Claim	Disclosure
13[pre]	1[pre]	Section IX(B)(i)(Claim 1[pre]); Ex. 1003 at ¶¶ 199–205

13[a]	1[a]	Section IX(B)(i)(Claim 1[a]); Ex. 1003 at ¶¶ 206–210
13[b]	1[b]	Section IX(B)(i)(Claim 1[b]); Ex. 1003 at ¶¶ 211–215
13[c]	1[c]	Section IX(B)(i)(Claim 1[c]); Ex. 1003 at ¶¶ 216–219; <i>see also</i> material below
13[d]	1[d]–[e]	Sections IX(B)(i)(Claims 1[d], [e]); Ex. 1003 at ¶¶ 220–224; <i>see also</i> material below
13[e]		<i>See</i> material below
13[f]	1[f]–1[g]	Sections IX(B)(i)(Claim 1[f], [g]); Ex. 1003 at ¶¶ 230–234; <i>see</i> <i>also</i> material below
13[g]	1[h]	Section IX(B)(i)(Claim 1[h]); Ex. 1003 at ¶¶ 235–236

Claim 13[c]

Claim 13[c] is substantively similar to Claim 1[c]; however, the array in Claim 13[c] is configured to emit **four** different colors of light, while the array in Claim 1[c] is configured to emit **five** different colors. Claim 13[c] is disclosed for

the same reasons as discussed in Claim 1[c], as Kit explains that any combination of color LEDs may be used. *See* Section IX(B)(i)(Claim 1[c]); Ex. 1003 at ¶¶ 216–219.

Claim 13[d]

Claim 13[d] is substantively similar to Claims 1[d] and 1[e]; however, the controller in Claim 13[d] is coupled to an LED array that is configured to emit **four** different colors of light, instead of the **five** different colors emitted by the LED array in Claim 1[d]. Claim 13[d] is disclosed for the same reasons as discussed in Claim 1[d] and 1[e]. Section IX(B)(i)(Claims 1[d], [e]); Ex. 1003 at ¶¶ 220–224.

Claim 13[e]

The LED device disclosed in Kit discloses a housing of both a T12 and T8 fluorescent tube. Ex. 1004 at 6:6–11, 12:57–13:3; Ex. 1003 at ¶ 225. Kit discloses T12 type fluorescent tube light, and states “an existing fluorescent fixture using an old magnetic ballast and an old T12 type lamp” which “serves as the base model with no upgrade.” Ex. 1004 at 5:31–34.

Kit discloses that the fluorescent tube can have a length of no more than four feet long. *Id.* at 9:15–24, 17:49–56, 18:58–66; Ex. 1003 at ¶ 226. Kit discloses the use of “a basic tubular 4-foot LED retrofit lamp.” Ex. 1004 at 4:50–55. A POSITA would know that a T12 fluorescent tube has a diameter of 1.5 inches. Ex. 1003 at

¶¶ 227–229. Kit also expressly teaches that the diameter of the tube housing can be 1.5 inches, which is no greater than 41 mm. Ex. 1004 at, *e.g.*, 42:24–28.

Kit discloses that the linear form factor has an electrical input connection for receiving input power and the input connection is in electrical communication with the LED driver. *Id.* at 79:60–65, 9:15–24, 12:43–13:3; Ex. 1003 at ¶ 227.

Claim 13/fl

Claim 13[f] is substantively similar to Claim 1[f] and Claim 1[g]. Claim 13[f] is disclosed for the same reasons as discussed in Claim 1[f] and Claim 1[g]. Section IX(B)(i)(Claim 1[f], [g]); Ex. 1003 at ¶¶ 230–234.

(xi) Claim 23

Independent Claim 23 is substantively similar (and verbatim in many instances) to independent Claims 1 and 13. Ex. 1003 at ¶¶ 147–148. The similar limitations in Claim 23 are disclosed and rendered obvious for the same reasons as disclosed in Claims 1 and 13. The below table pinpoints where these disclosures are found in the Petition:

Claim 23	Similar Claim	Disclosure
23[pre]	1[pre]	Section IX(B)(i)(Claim 1[pre]); Ex. 1003 at ¶¶ 237–243
23[a]	1[a]	Section IX(B)(i)(Claim 1[a]); Ex. 1003 at ¶¶ 244–247

23[b]	1[b]	Section IX(B)(i)(Claim 1[b]); Ex. 1003 at ¶¶ 248–252
23[c]	1[c]	Section IX(B)(i)(Claim 1[c]); Ex. 1003 at ¶¶ 253–256
23[d]	1[d]	Section IX(B)(i)(Claim 1[d]); Ex. 1003 at ¶¶ 257–258
23[e]	1[e]	Section IX(B)(i)(Claim 1[e]); Ex. 1003 at ¶¶ 259–261
23[f]	13[e]–[f]	Section IX(B)(x)(Claim 13[e]/[f]); Ex. 1003 at ¶¶ 262–264
23[g]	1[g]–[h]	Section IX(B)(i)(Claim 1[g]/[h]); Ex. 1003 at ¶¶ 265–266

(xii) Claim 25

Claim 25 is substantively similar to Claim 3. Claim 25 is disclosed for the same reasons as discussed in Claim 3. Section IX(B)(ii); Ex. 1003 at ¶¶ 267–269.

(xiii) Claim 26

Claim 26 is substantively similar to Claim 4. Claim 26 is disclosed for the same reasons as discussed in Claim 4. Section IX(B)(iii); Ex. 1003 at ¶¶ 270–272.

(xiv) Claim 28

Kit discloses an electrical input connection to receive AC input power. Kit discloses a “direct line voltage AC to power the new LED retrofit lamp.” Ex. 1004 at 6:1–11, 12:53–60; Ex. 1003 at ¶¶ 273–274.

(xv) Claim 29

Claim 29 is substantively similar to Claim 7. Claim 29 is disclosed for the same reasons as discussed in Claim 7. Section IX(B)(iv); Ex. 1003 at ¶¶ 275–276.

(xvi) Claim 30

Claim 30 is substantively similar to Claim 8. Claim 30 is disclosed for the same reasons as discussed in Claim 8. Section IX(B)(v); Ex. 1003 at ¶¶ 277–280.

(xvii) Claim 31

Claim 31 is substantively similar to Claim 9. Claim 31 is disclosed for the same reasons as discussed in Claim 9. Section IX(B)(vi); Ex. 1003 at ¶¶ 281–283.

(xviii) Claim 32

Claim 32 is substantively similar to Claim 10. Claim 32 is disclosed for the same reasons as discussed in Claim 10. Section IX(B)(vii); Ex. 1003 at ¶¶ 284–285.

(xix) Claim 33

Claim 33 is substantively similar to Claim 11. Claim 33 is disclosed for the same reasons as discussed in Claim 11. Section IX(B)(viii); Ex. 1003 at ¶¶ 286–293.

(xx) Claim 34

Claim 34 is substantively similar to Claim 12. Claim 34 is disclosed for the same reasons as discussed in Claim 12. Section IX(B)(ix); Ex. 1003 at ¶¶ 294–297.

(xxi) Claim 35

Independent Claim 35 is substantively similar (and verbatim in many instances) to independent Claims 1 and 13. Ex. 1003 at ¶¶ 147–148. The similar limitations in Claim 35 are disclosed and rendered obvious for the same reasons as disclosed in Claims 1 and 13. The below table pinpoints where these disclosures are found in the Petition:

Claim 35	Similar Claim	Disclosure
35[pre]	1[pre]	Section IX(B)(i)(Claim 1[pre]); Ex. 1003 at ¶¶ 298–304
35[a]	1[a]	Section IX(B)(i)(Claim 1[a]); Ex. 1003 at ¶¶ 305–309
35[b]	1[b]	Section IX(B)(i)(Claim 1[b]); Ex. 1003 at ¶¶ 310–314
35[c]	1[c]	Section IX(B)(i)(Claim 1[c]); Ex. 1003 at ¶¶ 315–318; <i>See also</i> material below

Claim 35	Similar Claim	Disclosure
35[d]	1[d]	Section IX(B)(i)(Claim 1[d]); Ex. 1003 at ¶¶ 319–326; <i>see also</i> material below
35[e]	13[e]	Section IX(B)(x)(Claim 13[e]); Ex. 1003 at ¶¶ 327–328
35[f]	1[g]	Section IX(B)(i)(Claim 1[g]); Ex. 1003 at ¶¶ 329–331
35[g]	1[h]	Section IX(B)(i)(Claim 1[h]); Ex. 1003 at ¶¶ 332–333

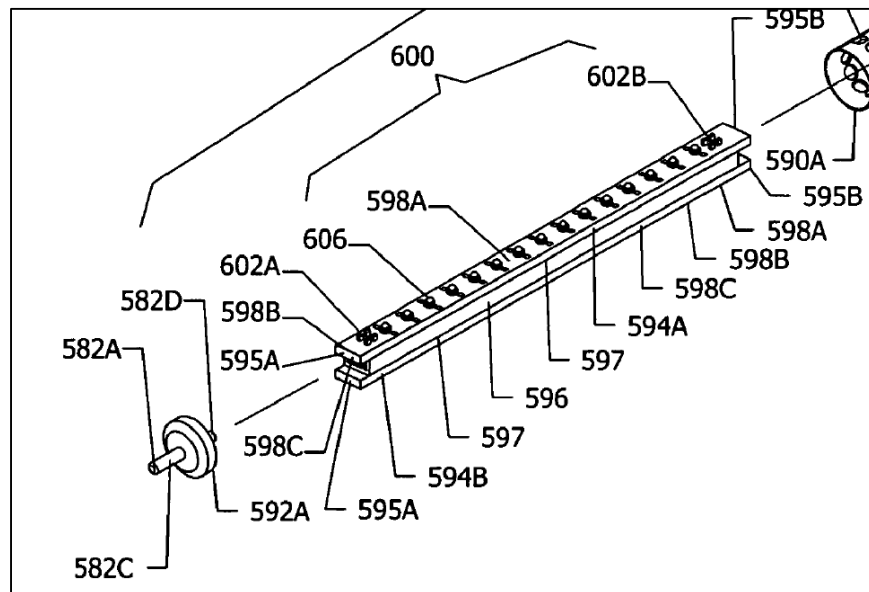
Claim 35[c]

Claim 35[c] is substantively similar to Claim 1[c], except Claim 35[c] requires the LEDs to be configured to emit **four** different colors as opposed to **five** different colors. Claim 35[c] is disclosed for the same reasons as discussed in Claim 1[c]. Section IX(B)(i)(Claim 1[c]); Ex. 1003 at ¶¶ 315–318.

Claim 35[d]

Claim 35[d]¹ is substantively similar to Claim 1[d]; however, Claim 35[d] requires the colored lights to be uniform. Claim 35[d] is disclosed for the same reasons as discussed in Claim 1[d]. Section IX(B)(i)(Claim 1[d]); Ex. 1003 at ¶¶ 319–326.

In addition, Kit discloses that the LEDs are “evenly dispersed along the length of the lighting device.” Ex. 1003 at ¶ 324. For example, in Figure 51, LED lights 606 are evenly dispersed along the LED array on the support structure, which is placed within the housing:



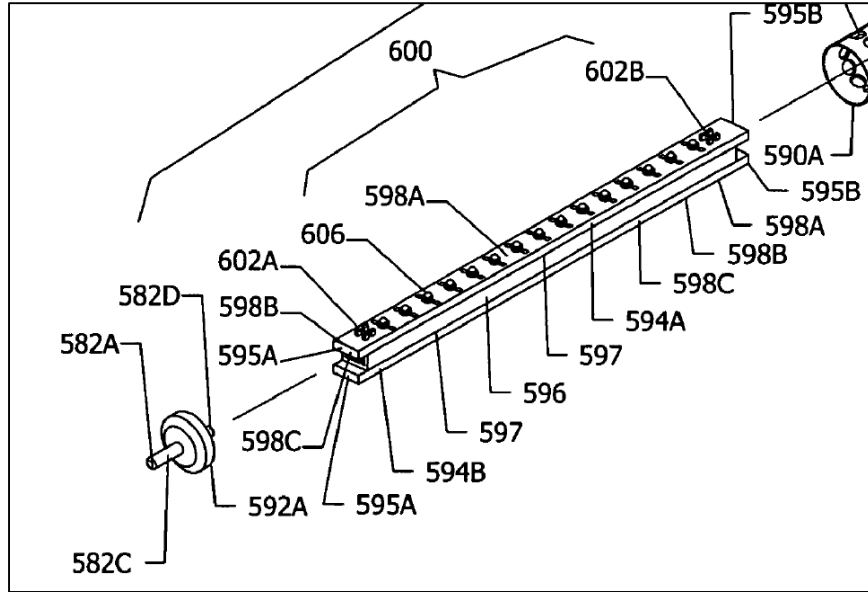
¹ Claim 35 refers to “the five different colors,” without an antecedent basis for “the five different colors.”

Ex. 1004 at Fig. 51 (LEDs 606 spaced evenly dispersed). Kit explains that the LEDs 606 are “preferably positioned and arranged equidistant from one another in LED string 66.” *Id.* at 79:44–49 (referring to Fig. 53, which relates to Fig. 51). Kit also discloses a top side of the housing with a diffusion cover extending the axial length of the support structure between the opposite ends. *Id.* at Figs. 2 and 51; 16:21–23, 38:16–21, 77:10–50; Ex. 1003 at ¶¶ 333, 325. A POSITA would know that the LED emitting device disclosed in Kit would produce uniform colored light. Ex. 1003 at ¶¶ 325–326.

Katzir also discloses that LEDs are arranged on an array on a support structure in a lighting device housing. *See, e.g.*, Ex. 1003 at ¶ 326. Katzir expressly discloses that the LEDs can be placed in a checkerboard or matrix pattern in multiple rows, with both color and white light LEDs. Ex. 1010 at [0054], Figs. 5A–5F; Ex. 1003 at ¶ 326. The colored light produced by the lighting device in Katzir would also be uniform. Ex. 1003 at ¶ 326.

(xxii) Claim 36

Kit discloses that the LEDs are “evenly dispersed along the length of the lighting device.” Ex. 1003 at ¶¶ 334–336. For example, in Figure 51, LED lights 606 are evenly dispersed along the LED array on the support structure, which is placed within the housing:



Ex. 1004 at Fig. 51 (LEDs 606 spaced evenly dispersed). Kit explains that the LEDs 606 are “preferably positioned and arranged equidistant from one another in LED string 66.” *Id.* at 79:44–49 (referring to Fig. 53, which relates to Fig. 51).

(xxiii) Claim 37

Claim 37 is substantively similar to Claim 3. Claim 37 is disclosed for the same reasons as discussed in Claim 3. Section IX(B)(ii); Ex. 1003 at ¶¶ 337–339.

(xxiv) Claim 38

Claim 38 is substantively similar to Claim 4. Claim 38 is disclosed for the same reasons as discussed in Claim 4. Section IX(B)(iii); Ex. 1003 at ¶¶ 340–342.

(xxv) Claim 39

Claim 39 is substantively similar to Claim 4. Claim 39 is disclosed for the same reasons as discussed in Claim 4. Section IX(B)(iii); Ex. 1003 at ¶¶ 343–345.

(xxvi) Claim 41

Claim 41 is substantively similar to Claim 7. Claim 41 is disclosed for the same reasons as discussed in Claim 7. Section IX(B)(iv); Ex. 1003 at ¶¶ 346–347.

(xxvii) Claim 42

Claim 42 is substantively similar to Claim 8. Claim 42 is disclosed for the same reasons as discussed in Claim 8. Section IX(B)(v); Ex. 1003 at ¶¶ 348–351.

(xxviii) Claim 43

Claim 43 is substantively similar to Claim 9. Claim 43 is disclosed for the same reasons as discussed in Claim 9. Section IX(B)(vi); Ex. 1003 at ¶¶ 352–354.

(xxix) Claim 44

Claim 44 is substantively similar to Claim 11. Claim 44 is disclosed for the same reasons as discussed in Claim 11. Section IX(B)(viii); Ex. 1003 at ¶¶ 355–362.

(xxx) Claim 45

Claim 45 is substantively similar to Claim 12. Claim 45 is disclosed for the same reasons as discussed in Claim 12. Section IX(B)(ix); Ex. 1003 at ¶¶ 363–367.

**X. GROUND II: THE CHALLENGED CLAIMS WOULD HAVE BEEN
OBVIOUS OVER MUELLER IN VIEW OF IVEY AND ANSEMS**

**A. A POSITA Would Have Been Motivated to Combine Mueller
with Ansems and Ivey, and Would Have Had a Reasonable
Expectation of Success**

Mueller discloses an LED array to be used for image capturing purposes, such as with “studio, theatre, TV and video lamps.” Ex. 1006 at [0295]. The LED array disclosed in Mueller includes multiple LED-based light sources, including color LEDs like those disclosed in the ’224 Patent. *Id.* at [0064], [0194], Fig. 3.

Mueller discloses specific temperature ranges suitable for the light emitted by the LED lights used for commercial image recording, such as warm and cool daylight lights. *Id.* at [0295], [0047]–[0049], [0062]–[0063]. Mueller further teaches that the “lighting unit may have any one of a variety of mounting arrangements for the light source(s), enclosure/housing arrangements and shapes, and/or electrical and mechanical connection configurations.” *Id.* at [0064]. This includes tubular linear housings like those of traditional fluorescent lights. Ex. 1003 at ¶ 373. Such a configuration would have been well-known and obvious to a POSITA. *Id.* A POSITA would have been motivated to use an elongated tube-like form factor for the LED lighting device disclosed in Mueller for a number of reasons. Fluorescent tubes were well-known to be used by movie studios before

2012, and a POSITA would have been motivated to replace the fluorescent lights in the already existing fluorescent light fixtures with LED lights as they were cheaper, more reliable, and more versatile. *Id.* at ¶ 374.

A POSITA would have had no concern or issue with using a linear form factor to house LEDs of this nature and use such LED lighting to capture images. *Id.* at ¶¶ 368–376. Ivey would have provided further teachings to a POSITA to use a fluorescent, linear form factor with the types of LEDs disclosed in Mueller. *Id.* Ivey, for instance, discloses a fluorescent form factor for LED lights. Ex. 1008 at Fig. 6, [006], [0016]–[0018]. Using the fluorescent form factor of a traditional T12 fluorescent lamp is nothing more than using a known lighting device for a well-known purpose to yield predictable results. Ex. 1003 at ¶ 375; *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 416 (2007); see *Sparton Corp. v. U.S.*, 89 Fed. Cl. 196, 237 (Fed. Cl. 2009).

A POSITA would further have been motivated to combine Mueller with Ansems, which teaches how to control an RGBW LED array that is arranged in a matrix. Ex. 1007 at 4:4–24; Ex. 1003 at ¶¶ 368–376. Ansems discloses LEDs that are arranged substantially in a repeating matrix pattern, and it would have been obvious to a POSITA to use such a repeating matrix pattern on Mueller’s LED device as it would have produced a uniform color combination and makes it easier to control the LEDs. Ex. 1003 at ¶ 440.

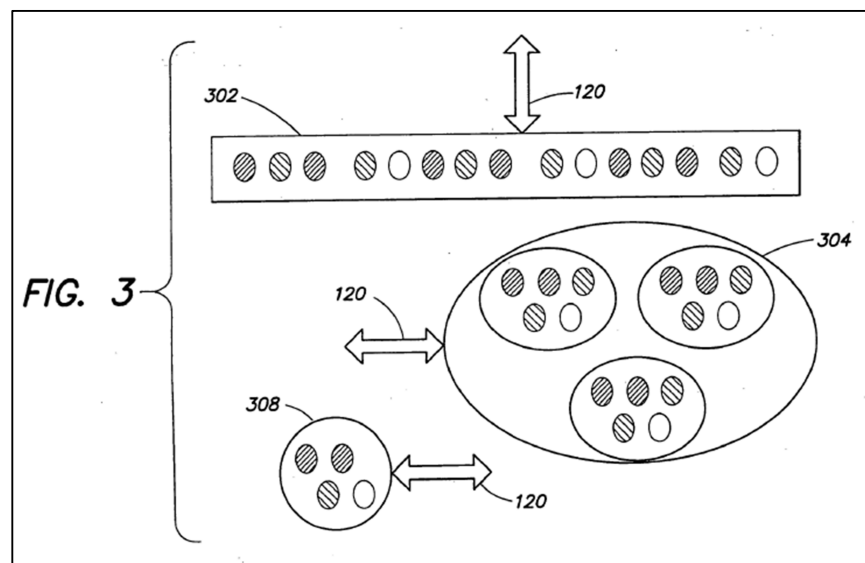
**B. Claims 1, 3, 4, 7–13, 23, 25, 26, 28, 29–39, and 41–45 Would Have
Been Obvious Over Mueller in view of Ivey and Ansems**

The combination of Mueller with Ivey and Ansems satisfies every element of the Challenged Claims. Ex. 1003 at ¶ 367. A POSITA would have been motivated to combine Mueller with Ivey and Ansems for at least the reasons discussed below and as set forth in Section X(A). *Id.* at ¶¶ 368–376.

(i) Claim 1

Claim 1[pre]

Mueller discloses an LED lighting device that is suitable for a commercial image recording. Ex. 1006 at Abstract, [0251], [0262], [0265]; Ex. 1003 at ¶ 377. For example, Mueller is directed to a system for controlled lighting “such as an LED-based lighting unit.” Ex. 1006 at Abstract, [0064]. Fig. 3 depicts different embodiments of the LED lighting:



Id. at Fig. 3. Mueller explains that the lighting unit 100 can include a variety of colors of LEDs. *Id.* at [0194]; Ex. 1003 at ¶¶ 378–381.

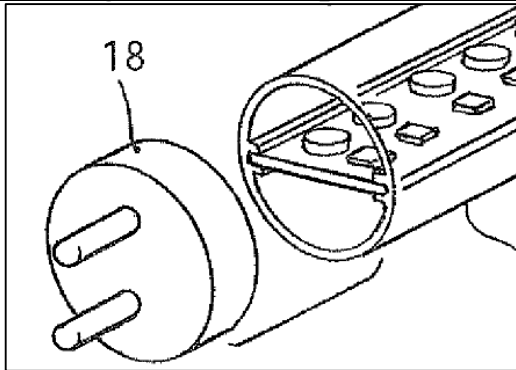
Further, lighting units 100 includes “specialty lamps, such as . . . studio, theatre, TV and video lamps,” which are used for commercial image recording. Ex. 1006 at [0295], [0049]; Ex. 1003 at ¶ 380.

Claim 1/a]

Mueller teaches that the disclosed “lighting unit may have any one of a variety of mounting arrangements for the light source(s), enclosure/housing arrangements and shapes, and/or electrical and mechanical connection configurations.” Ex. 1006 at [0064]. Mueller teaches that the LED lighting device may “resemble fluorescent lamps, such as” T12 and T8 fluorescent tube lighting. *Id.* at [0295]. A POSITA would know that the standard T12 and T8 fluorescent lights have a support structure to support the lighting element. Ex. 1003 at ¶¶ 382–385.

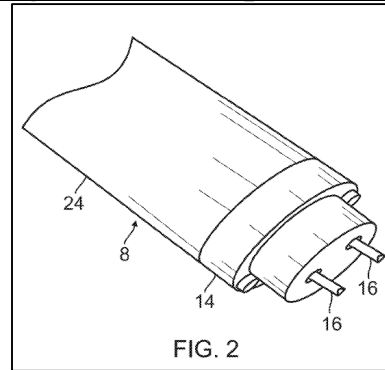
To the extent this limitation is not disclosed by Mueller, or would not have been obvious based on Mueller, Ivey discloses this limitation. *Id.* at ¶ 385. Ivey discloses a housing with a support structure on which LED lights are mounted that is nearly identical to that disclosed in the ’224 Patent:

Housing and End Cap of Prior Art



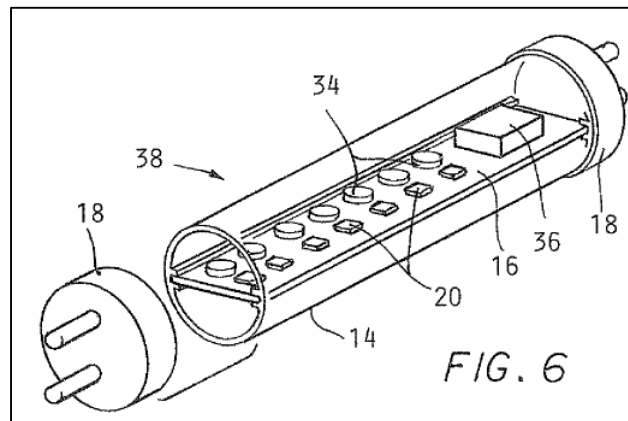
Ex. 1008 at Fig. 6.

Housing and End Cap of '224 Patent



Ex. 1001 at Fig. 2.

Expanded View of Housing and End Cap of Prior Art



Ex. 1008 at Fig. 6.

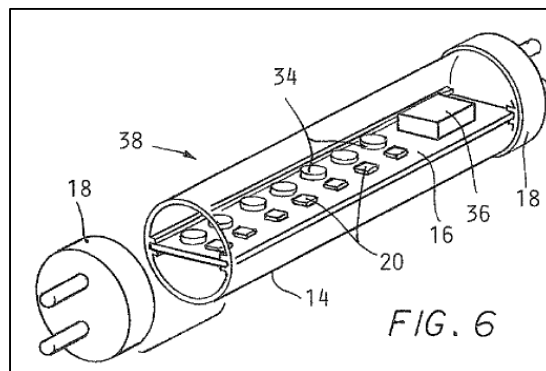
Ex. 1008 at Fig. 6, [0006], [0016]–[0018]. This limitation would have been obvious based on Mueller, alone, or based on Mueller in view of Ivey.

Claim 1/b/

Mueller teaches that the disclosed “lighting unit may have any one of a variety of mounting arrangements for the light source(s), enclosure/housing arrangements and shapes, and/or electrical and mechanical connection

configurations.” Ex. 1006 at [0064]. Mueller additionally teaches that the LED lighting device may “resemble fluorescent lamps, such as” T12 and T8 fluorescent tube lighting. *Id.* at [0295]. A POSITA would know that the standard T12 and T8 fluorescent lights have a tubular housing structure in which the lighting elements are housed. Ex. 1003 at ¶¶ 386–388.

To the extent this limitation would not have been obvious based on Mueller, Ivey discloses this limitation. *Id.* at ¶ 389. Ivey discloses a tubular housing with a support structure on which LEDs are mounted:



Ex. 1008 at Fig. 6, [0006], [0016]–[0018]. This limitation would have been obvious based on Mueller, alone, or based on Mueller in view of Ivey.

Claim 1[c]

Mueller discloses this limitation. Ex. 1003 at ¶¶ 390–392. For example, Mueller discloses an LED lighting device that can be a linear configuration with the following LED lights:

Lighting units 100 can also include a wide variety of **colors of LED, in various mixtures, including red, green, and blue LEDs to produce**

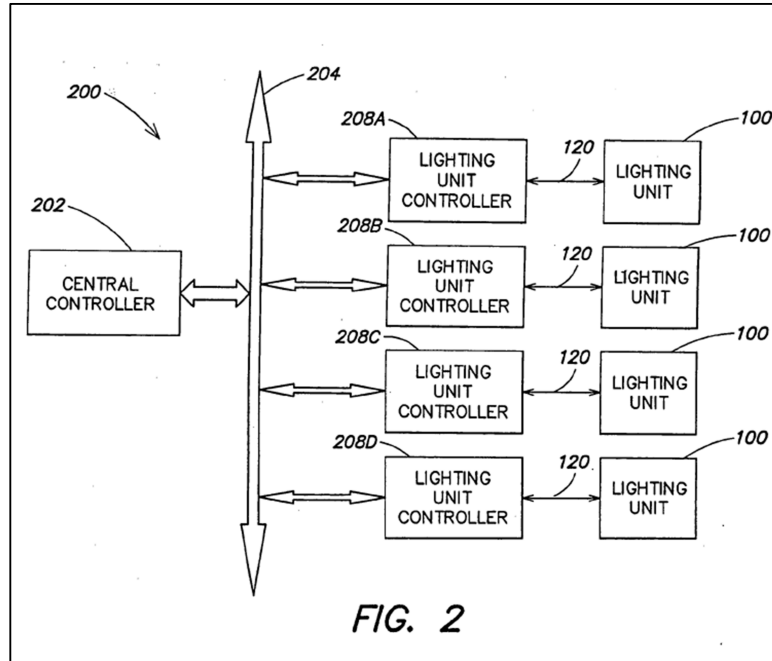
a color mix, as well as one or more other LEDs to create varying colors and color temperatures of white light. For example, red, green and blue can be mixed with amber, white, UV, orange, IR or other colors of LED.

Ex. 1006 at [0194] (emphasis added), [0046]. Mueller also discloses that the LED light may produce “broad spectrum LED-based light source.” *Id.* at [0308].

Claim 1[d]

Mueller discloses “a lighting system that includes a plurality of LEDs selected from the group consisting of red, green, blue, amber, white, orange and UV LEDs” and “a controller for controlling the color of light coming from the LEDs.” Ex. 1006 at [0043]. The LED lighting devices in Mueller “optionally may be associated with (e.g., include, be coupled to and/or packaged together with) various other components (e.g., control circuitry) relating to the operation of the light source(s).” *Id.* at [0064]; Ex. 1003 at ¶¶ 393–397.

A controller disclosed in Mueller is shown in Figure 2, and can control each lighting unit to provide power to the LEDs to vary amount of power to each of the LEDs:



Ex. 1006 at Fig. 2, [0190]–[0192], [0265]–[0269].

To the extent Mueller does not disclose this limitation, it is expressly disclosed in Ansems, which teaches: “The three sets [of LEDs] are separately connected to a LED driver unit 6 which independently can control the voltage and/or current through the three separate sets through the individual connectors for blue 7 (to cathode) and 17 (to anode), green 8 (to cathode) and 18 (to anode) and red 9 (to cathode) and 19 (to anode).” Ex. 1007 at 4:4–24; Ex. 1003 at ¶ 396.

Further, Ivey also teaches that a “controller 22 can be configured to control an amount of power provided to each LED 20 using pulse width modulation.” Ex. 1008 at [0020]–[0021].

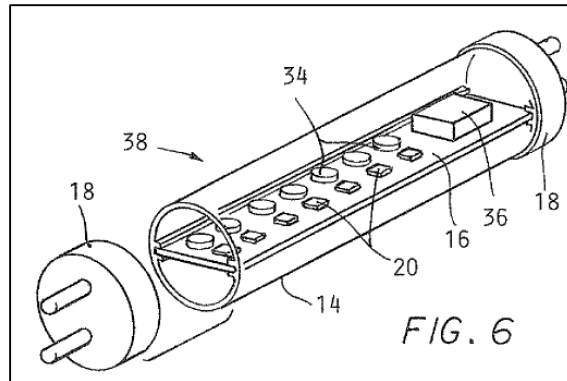
Claim 1[e]

The controller disclosed in Mueller powers the LED lights through the use of an LED driver that can control the power to the LED devices. Ex. 1006 at [0064]; Ex. 1003 at ¶¶ 399–401. To the extent this limitation is not disclosed by Mueller, this limitation is expressly disclosed in Ansems in describing how to control power to the LEDs. Ex. 1007 at 4:8–24; Ex. 1003 at ¶ 401.

Claim 1[f]

Mueller teaches that the disclosed “lighting unit may have any one of a variety of mounting arrangements for the light source(s), enclosure/housing arrangements and shapes, and/or electrical and mechanical connection configurations.” Ex. 1006 at [0064]. Mueller additionally teaches that the LED lighting device may “resemble fluorescent lamps, such as” T12 and T8 fluorescent tube lighting. *Id.* at [0295]. A POSITA would know that the standard T12 and T8 fluorescent lights have a linear form factor having an axial direction, and that a standard T12 fluorescent tube has a diameter no more than 41 mm. Ex. 1003 at ¶¶ 48, 402–405; Ex. 1004 at Figs. 2, 51, 9:15–24, 38:16–39:29, 77:10–50; Ex. 1009 at 4:33–36.

To the extent this limitation would not have been obvious based on Mueller, Ivey discloses this limitation. Ex. 1003 at ¶¶ 406–407. Ivey discloses a tubular housing with a support structure on which LEDs are mounted:



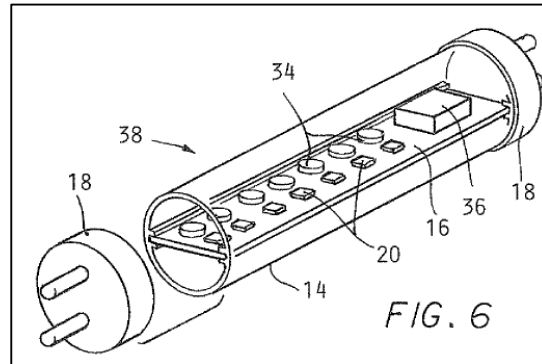
Ex. 1008 at Fig. 6, [0006], [0016]–[0018]. Ivey discloses that “[f]or compatibility with the fixture 12 . . . the housing 14 can have a length such that the light 10 is approximately 48” long and the housing 14 can have a 0.625”, 1.0”, or 1.5” diameter.” *Id.* at [0016]. Ivey also discloses that the housing ends (18) contain bi-pins for physically and electrically connecting the light to the fixture, and to provide power to the LEDs. *Id.* at [0018].

Claim 1[g]

Mueller teaches that the disclosed “lighting unit may have any one of a variety of mounting arrangements for the light source(s), enclosure/housing arrangements and shapes, and/or electrical and mechanical connection configurations.” Ex. 1006 at [0064]. Mueller additionally teaches that the LED lighting device may “resemble fluorescent lamps, such as” T12 and T8 fluorescent tube lighting. *Id.* at [0295]. A POSITA would know that the standard T12 and T8 fluorescent lights have a tubular, linear form factor with opposite ends, and a

narrow support structure. Ex. 1003 at ¶¶ 408–410; Ex. 1004 at Figs. 2, 51, 38:16–39:29, 77:10–50; Ex. 1010 at Fig. 2A, [0018], [0027].

To the extent this limitation would not have been obvious based on Mueller, Ivey discloses this limitation. Ex. 1003 at ¶¶ 411–412.

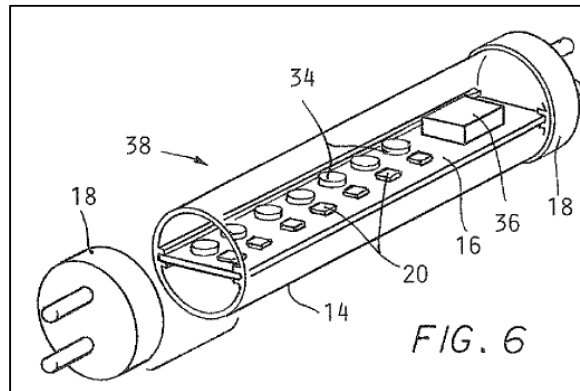


Ex. 1008 at Fig. 6, [0006], [0016]–[0018]. The housing disclosed in Ivey has opposite ends (18) and a top side and bottom side. *Id.* at Fig. 6, [0006], [0016]–[0018].

Claim 1[h]

Mueller teaches that the disclosed “lighting unit may have any one of a variety of mounting arrangements for the light source(s), enclosure/housing arrangements and shapes, and/or electrical and mechanical connection configurations.” Ex. 1006 at [0064]. The LEDs disclosed in Mueller emit light from the top side of a housing, such as a T12 or T8 fluorescent tube form factor. Ex. 1003 at ¶¶ 413–415.

To the extent this limitation would not have been obvious based on Mueller, Ivey discloses this limitation. *Id.* at ¶¶ 416–418. Ivey discloses a tubular housing with a support structure on which LEDs are mounted:



Ex. 1008 at Fig. 6, [0006], [0016]–[0018]. The housing disclosed in Ivey has opposite ends (18) and a top side and bottom side, and the LEDs emit light out of the top side of the housing. *Id.* at Fig. 6, [0006], [0016]–[0018]. The housing in Ivey “can include an opaque lower portion and a lens or other transparent cover attached to the lower portion to cover the LEDs 20. The housing 14 can be manufactured to include light diffusing or refracting properties, such as by surface roughening or applying a diffusing film to the housing 14.” *Id.* at [0006], [0016]–[0018].

(ii) Claim 3

Mueller discloses that the LED driver is adapted to selectively drive the five sets of LEDs in increments of 1/255, which can produce more than 255 different colors. Ex. 1003 at ¶¶ 419–420. The claimed LED device uses a DMX signal with

an RGBAW array to increment the color from zero (off) to 255 (full on). Ex. 1001 at 7:14–26. These increments correspond “to the different values of an 8 bit DMX signal.” *Id.* This disclosure is a standard DMX signal to control RGBAW LEDs. Ex. 1003 at ¶ 420.

Mueller discloses that the LED lights can be controlled using a DMX signal that can incrementally control the color of RGBAW lights. Ex. 1006 at [0183], [0158]. The DMX signal allows a user to fully control the RGBAW array to achieve different color combinations, and a POSITA would understand that a DMX signal could increment the RGBAW LEDs from 0 (being off) through 255, and achieve more than 255 different colors. Ex. 1003 at ¶ 420; Ex. 1006 at [0158] (“[E]ach of the colors is driven with PWM to vary its apparent intensity. This system allows for the generation of millions of colors (e.g., 16.7 million colors when 8-bit control is used on each of the PWM channels).”), [0043] (disclosing RGBAW).

(iii) Claim 4

Mueller discloses the limitations of Claim 4 for the same reason as disclosed in Claim 3. *See* Section X(B)(ii); Ex. 1003 at ¶¶ 421–423.

(iv) Claim 7

Mueller discloses that the lighting unit 100 (Figure 1) can be “configured to resemble all conventional light bulb types, so that lighting units 100 can be

conveniently retrofitted into fixtures and environments suitable for such environments.” Ex. 1006 at [0295]. For example, lighting unit 100 can “resemble fluorescent lamps, such as . . . T12” tubes. *Id.*; Ex. 1003 at ¶¶ 424–426.

(v) Claim 8

Mueller discloses that the lighting units 100 (in Figure 1) can be “configured to resemble all conventional light bulb types, so that lighting units 100 can be conveniently retrofitted into fixtures and environments suitable for such environments.” Ex. 1006 at [0295]. For example, lighting unit 100 can “resemble fluorescent lamps, such as . . . T12” tubes. *Id.*; Ex. 1003 at ¶¶ 427–429. A POSITA would know that a T12 fluorescent tube has a length of about four feet long. Ex. 1003 at ¶ 429 (citing ’224 Patent).

To the extent this limitation is not disclosed by Mueller, it would have been obvious based on Ivey, which discloses that an LED light housing may be made with a length of approximately “48” long” so that it may be compatible with traditional fixtures. Ex. 1008 at [0016]; Ex. 1003 at ¶ 430.

(vi) Claim 9

Mueller discloses that at least one of the LED lights in the lighting device is amber. Ex. 1006 at [0043]–[0051]; Ex. 1003 at ¶¶ 431–432.

(vii) Claim 10

Mueller discloses that the LED lights in the lighting device include red, green, blue, and amber. Ex. 1006 at [0043]–[0051]; Ex. 1003 at ¶¶ 433–434.

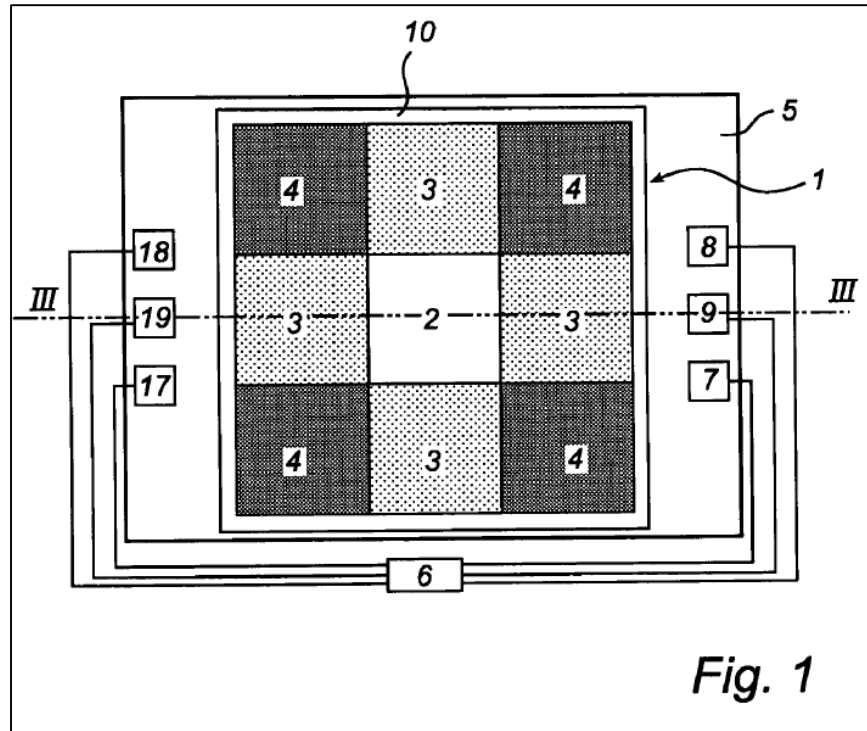
Mueller further discloses that “[l]ighting units 100 can also include a wide variety of colors of LED, in various mixtures, including . . . red, green and blue[, which] can be mixed with amber, white, UV, orange, IR or other colors of LED.” Ex. 1006 at [0194]; Ex. 1003 at ¶ 435-436.

(viii) Claim 11

Mueller discloses that the lighting device can selectively change the temperature of the white light LEDs to produce any desired color or color temperature from approximately 700 degrees K to over 10,000 degrees K. Ex. 1006 at [0194], [0062]–[0063]. Daylight and tungsten fall within this temperature range. Ex. 1003 at ¶¶ 436–438.

(ix) Claim 12

Ansems discloses LEDs that are arranged substantially in a repeating matrix pattern, and it would have been obvious to a POSITA to use such a repeating matrix pattern on Mueller’s LED device. Ex. 1003 at ¶¶ 439–440. Ansems Figure 1 discloses an LED array with RGBW lights:



Ex. 1007 at Fig. 1. Ansems teaches that the array may include more LEDs and can be in any geometry with any active elements. *Id.* at 5:2–16.

(x) Claim 13

Independent Claim 13 is substantively similar (and verbatim in many instances) to independent Claim 1. Ex. 1003 at ¶¶ 147–148. The similar limitations in Claim 13 are disclosed and rendered obvious for the same reasons as disclosed in Claim 1. The below table pinpoints where these disclosures are found in the Petition:

Claim 13	Similar Claim	Disclosure
13[pre]	1[pre]	Section X(B)(i)(Claim 1[pre]); Ex. 1003 at ¶¶ 441–445

Claim 13	Similar Claim	Disclosure
13[a]	1[a]	Section X(B)(i)(Claim 1[a]); Ex. 1003 at ¶¶ 446–449
13[b]	1[b]	Section X(B)(i)(Claim 1[b]); Ex. 1003 at ¶¶ 450–453.
13[c]	1[c]	Section X(B)(i)(Claim 1[c]); Ex. 1003 at ¶¶ 454–456; <i>see also</i> material below
13[d]	1[d]–[e]	Sections X(B)(i)(Claim 1[d], [e]); Ex. 1003 at ¶¶ 457–461; <i>see also</i> material below
13[e]		<i>See</i> material below
13[f]		<i>See</i> material below
13[g]	1[h]	Section X(B)(i)(Claim 1[h]); Ex. 1003 at ¶¶ 472–477

Claim 13[c]

Claim 13[c] is substantively similar to Claim 1[c]; however, the array in Claim 13[c] is configured to emit **four** different colors of light, while the array in Claim 1[c] is configured to emit **five** different colors. Claim 13[c] is disclosed for

the same reasons as discussed in Claim 1[c]. *See* Section X(B)(i)(Claim 1[c]); Ex. 1003 at ¶¶ 454–456.

Claim 13[d]

Claim 13[d] is substantively similar to Claims 1[d] and 1[e]; however, the controller in Claim 13[d] is coupled to an LED array that is configured to emit **four** different colors of light, instead of the **five** different colors emitted by the LED array in Claim 1[d]. Claim 13[d] is disclosed for the same reasons as discussed in Claims 1[d] and 1[e]. Sections X(B)(i)(Claim 1[d], [e]); Ex. 1003 at ¶¶ 457–461.

Claim 13[e]

Mueller discloses that the lighting unit 100 (Figure 1) can be “configured to resemble all conventional light bulb types, so that lighting units 100 can be conveniently retrofitted into fixtures and environments suitable for such environments.” Ex. 1006 at [0295]; Ex. 1003 at ¶ 462. For example, lighting unit 100 can “resemble fluorescent lamps, such as . . . T12” tubes. *Id.*; Ex. 1003 at ¶ 463. A POSITA would know that a T12 fluorescent tube has a length of about four feet long and a 1.5-inch diameter. Ex. 1003 at ¶ 463 (citing the ’224 Patent itself).

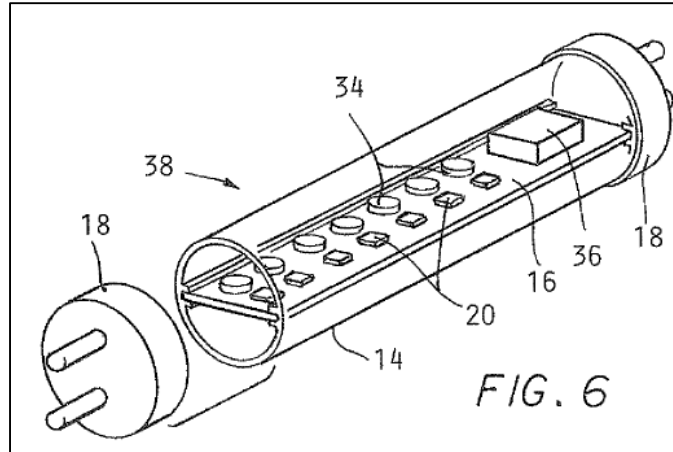
To the extent this limitation is not disclosed by Mueller, it would have been obvious based on the teachings of Ivey, which discloses that an LED light housing may be made with a length of approximately “48” long” and a diameter less than

1.5 inches (or less than 41mm) so that it may be compatible with traditional fixtures. Ex. 1008 at [0016]; Ex. 1003 at ¶ 464.

Claim 13/ff

Mueller teaches that the disclosed “lighting unit may have any one of a variety of mounting arrangements for the light source(s), enclosure/housing arrangements and shapes, and/or electrical and mechanical connection configurations.” Ex. 1006 at [0064]. Mueller additionally teaches that the LED lighting device may “resemble fluorescent lamps, such as” T12 and T8 fluorescent tube lighting. *Id.* at [0295]. A POSITA would know that the standard T12 and T8 fluorescent lights have a tubular, linear form factor with opposite ends, and a narrow support structure. Ex. 1003 at ¶ 467; Ex. 1004 at Figs. 2, 51, 38:16–39:29, 77:10–50; Ex. 1010 at Fig. 2A, [0018], [0027].

To the extent this limitation would not have been obvious based on Mueller, Ivey discloses this limitation. Ex. 1003 at ¶¶ 465–471. Ivey discloses a tubular housing with a support structure on which LEDs are mounted:



Ex. 1008 at Fig. 6, [0006], [0016]–[0018]. The housing disclosed in Ivey has opposite ends (18) and a top side and bottom side. *Id.*

Both Mueller and Ivey disclose that there is an electrical input connection in communication with the LED array and drivers. Ex. 1006 at [0064], [0185]; Ex. 1008 at [0006], [0016]–[0018].

(xi) Claim 23

Independent Claim 23 is substantively similar (and verbatim in many instances) to independent Claims 1 and 13. Ex. 1003 at ¶¶ 147–148. The similar limitations in Claim 23 are disclosed and rendered obvious for the same reasons as disclosed in Claims 1 and 13. The below table pinpoints where these disclosures are found in the Petition:

Claim 23	Similar Claim	Disclosure
23[pre]	1[pre]	Section X(B)(i)(Claim 1[pre]); Ex. 1003 at ¶¶ 478–482.

Claim 23	Similar Claim	Disclosure
23[a]	1[a]	Section X(B)(i)(Claim 1[a]); Ex. 1003 at ¶¶ 483–486.
23[b]	1[b]	Section X(B)(i)(Claim 1[b]); Ex. 1003 at ¶¶ 487–490.
23[c]	1[c]	Section X(B)(i)(Claim 1[c]); Ex. 1003 at ¶¶ 491–493.
23[d]	1[d]	Section X(B)(i)(Claim 1[d]); Ex. 1003 at ¶¶ 494–498.
23[e]	1[e]	Section X(B)(i)(Claim 1[e]); Ex. 1003 at ¶¶ 499–502.
23[f]	13[e]–[f]	Sections X(B)(x)(Claim 13[e]/[f]); Ex. 1003 at ¶¶ 503– 507.
23[g]	1[g]–[h]	Sections X(B)(i)(Claim 1[g]/[h]); Ex. 1003 at ¶¶ 508– 512.

(xii) Claim 25

Claim 25 is substantively similar to Claim 3. Claim 25 is disclosed for the same reasons as discussed in Claim 3. Section X(B)(ii); Ex. 1003 at ¶¶ 513–515.

(xiii) Claim 26

Claim 26 is substantively similar to Claim 4. Claim 26 is disclosed for the same reasons as discussed in Claim 4. Section X(B)(iii); Ex. 1003 at ¶¶ 516–518.

(xiv) Claim 28

Mueller discloses an electrical input connection to receive AC input power. Mueller discloses using any number of power sources, including “AC power sources.” Ex. 1006 at [0184]; Ex. 1003 at ¶¶ 519–521.

(xv) Claim 29

Claim 29 is substantively similar to Claim 7. Claim 29 is disclosed for the same reasons as discussed in Claim 7. Section X(B)(iv); Ex. 1003 at ¶¶ 522–524.

(xvi) Claim 30

Claim 30 is substantively similar to Claim 8. Claim 30 is disclosed for the same reasons as discussed in Claim 8. Section X(B)(v); Ex. 1003 at ¶¶ 525–528.

(xvii) Claim 31

Claim 31 is substantively similar to Claim 9. Claim 31 is disclosed for the same reasons as discussed in Claim 9. Section X(B)(vi); Ex. 1003 at ¶¶ 529–530.

(xviii) Claim 32

Claim 32 is substantively similar to Claim 10. Claim 32 is disclosed for the same reasons as discussed in Claim 10. Section X(B)(vii); Ex. 1003 at ¶¶ 531–533.

(xix) Claim 33

Claim 33 is substantively similar to Claim 11. Claim 33 is disclosed for the same reasons as discussed in Claim 11. Section X(B)(viii); Ex. 1003 at ¶¶ 534–536.

(xx) Claim 34

Claim 34 is substantively similar to Claim 12. Claim 34 is disclosed for the same reasons as discussed in Claim 12. Section X(B)(ix); Ex. 1003 at ¶ 537.

(xxi) Claim 35

Independent Claim 35 is substantively similar (and verbatim in many instances) to independent Claims 1 and 13. Ex. 1003 at ¶¶ 147–148. The similar limitations in Claim 35 are disclosed and rendered obvious for the same reasons as disclosed in Claims 1 and 13. The below table pinpoints where these disclosures are found in the Petition:

Claim 35	Similar Claim	Disclosure
35[pre]	1[pre]	Section X(B)(i)(Claim 1[pre]); Ex. 1003 at ¶¶ 538–542.
35[a]	1[a]	Section X(B)(i)(Claim 1[a]); Ex. 1003 at ¶¶ 543–546.
35[b]	1[b]	Section X(B)(i)(Claim 1[b]); Ex. 1003 at ¶¶ 547–550.

Claim 35	Similar Claim	Disclosure
35[c]	1[c]	Section X(B)(i)(Claim 1[c]); Ex. 1003 at ¶¶ 551–553; <i>see also</i> material below.
35[d]	1[d]	Section X(B)(i)(Claim 1[d]); Ex. 1003 at ¶¶ 554–558; <i>see also</i> material below.
35[e]	13[e]	Section X(B)(x)(Claim 13[e]); Ex. 1003 at ¶¶ 559–563.
35[f]	1[g]	Section X(B)(i)(Claim 1[g]); Ex. 1003 at ¶¶ 564–568.
35[g]	1[h]	Section X(B)(i)(Claim 1[h]); Ex. 1003 at ¶¶ 569–574.

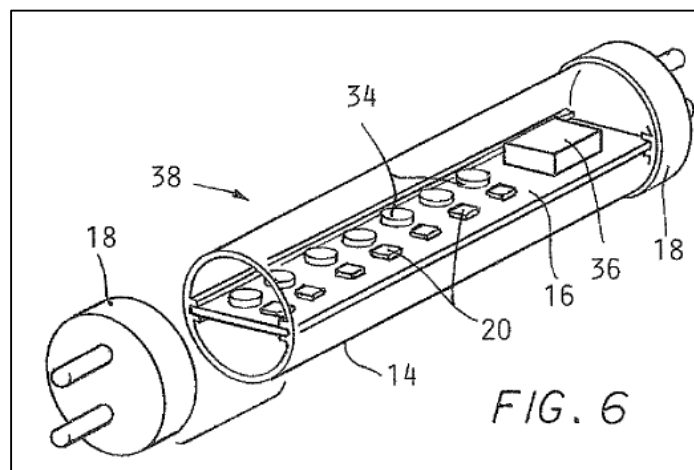
Claim 35[c]

Claim 35[c] is substantively similar to Claim 1[c], except Claim 35[c] requires the LEDs to be configured to emit **four** different colors as opposed to **five** different colors. Claim 35[c] is disclosed for the same reasons as discussed in Claim 1[c]. Section X(B)(i)(Claim 1[c]); Ex. 1003 at ¶¶ 551–553.

Claim 35[d]

Claim 35[d] is substantively similar to Claim 1[d]. Claim 35[d] is disclosed for the same reasons as discussed in Claim 1[d]. Section X(B)(i)(Claim 1[d]); Ex. 1003 at ¶¶ 554–558.

Mueller also discloses that the produced light can be “uniform and homogenous” and would produce uniform color. Ex. 1006 at [0213]. Ivey also discloses that the LEDs are evenly dispersed along the length of the lighting device. Ex. 1008 at [0020] (“The LEDs 20 can be evenly spaced along the circuit board 16, and the spacing of the LEDs 20 can be determined based on, for example, the light distribution of each LED 20 and the number of LEDs 20.”). In Ivey’s Figure 6, LED lights are evenly dispersed along the LED array on the support structure:

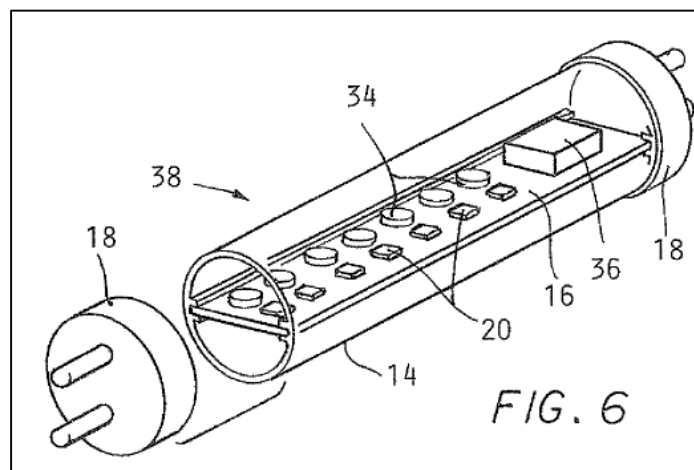


Id. at Fig. 6. The housing disclosed in Ivey has opposite ends (18) and a top side and bottom side, and the LEDs emit light out of the top side of the housing. *Id.* at

Fig. 6, [0006], [0016]–[0018]. The housing in Ivey “can include an opaque lower portion and a lens or other transparent cover attached to the lower portion to cover the LEDs 20. The housing 14 can be manufactured to include light diffusing or refracting properties, such as by surface roughening or applying a diffusing film to the housing 14.” *Id.* A POSITA would understand that the disclosed LED arrangement would produce light that is uniform in color.

(xxii) Claim 36

Mueller discloses that LED lights may be evenly dispersed along the length of the lighting device. Ex. 1006 at Fig. 3; Ex. 1003 at ¶¶ 575–576. Ivey discloses that the LEDs are evenly dispersed along the length of the lighting device. Ex. 1003 at ¶ 576. In Ivey’s Figure 6, LEDs are evenly dispersed along the LED array on the support structure, which is placed within the housing:



Ex. 1008 at Fig. 6.

(xxiii) Claim 37

Claim 37 is substantively similar to Claim 3. Claim 37 is disclosed for the same reasons as discussed in Claim 3. Section X(B)(ii); Ex. 1003 at ¶¶ 577–579.

(xxiv) Claim 38

Claim 38 is substantively similar to Claim 4. Claim 38 is disclosed for the same reasons as discussed in Claim 4. Section X(B)(iii); Ex. 1003 at ¶¶ 580–582.

(xxv) Claim 39

Claim 39 is substantively similar to Claim 4. Claim 39 is disclosed for the same reasons as discussed in Claim 4. Section X(B)(iii); Ex. 1003 at ¶¶ 583–585.

(xxvi) Claim 41

Claim 41 is substantively similar to Claim 7. Claim 41 is disclosed for the same reasons as discussed in Claim 7. Section X(B)(iv); Ex. 1003 at ¶¶ 586–588.

(xxvii) Claim 42

Claim 42 is substantively similar to Claim 8. Claim 42 is disclosed for the same reasons as discussed in Claim 8. Section X(B)(v); Ex. 1003 at ¶¶ 589–592.

(xxviii) Claim 43

Claim 43 is substantively similar to Claim 9. Claim 43 is disclosed for the same reasons as discussed in Claim 9. Section X(B)(vi); Ex. 1003 at ¶¶ 593–594.

(xxix) Claim 44

Claim 44 is substantively similar to Claim 11. Claim 44 is disclosed for the same reasons as discussed in Claim 11. Section X(B)(viii); Ex. 1003 at ¶¶ 595–597.

(xxx) Claim 45

Claim 45 is substantively similar to Claim 12. Claim 45 is disclosed for the same reasons as discussed in Claim 12. Section X(B)(ix); Ex. 1003 at ¶¶ 598–599.

XI. DISCRETIONARY DENIAL WOULD BE INAPPROPRIATE

Denial under 35 U.S.C. §§ 325(d) or 314(a) is not warranted because the presented invalidity positions are neither cumulative nor redundant of the grounds set forth during prosecution.

The Examiner did not consider any of the prior art combinations relied on in this Petition, nor did the Examiner consider any of the invalidity positions presented in this Petition. While Kit was cited on an IDS during prosecution, the Examiner did not rely on Kit for any rejections or in an Office Action. The same can be said for Katzir. Similarly, two publications relating to Ducharme (U.S. Publication 2004/0105261 and 2007/0258240) were cited during prosecution, but not relied upon for any rejections. Further, Ducharme itself was not cited during prosecution. Nor did the Examiner consider, or rely on, Mueller, Ansems, or Ivey, or any references substantially similar. Additionally, the Examiner did not have the benefit of the expert declaration presented in this Petition.

For these reasons, discretionary denial is inappropriate. *See, e.g., Group III International, Inc. v. Targus Group International, Inc.*, IPR2021–00371, No. 21 at 33 (P.T.A.B. 2021); *Intel Corporation v. Koninklijke Philips N.V.*, IPR2021–00370, No. 10, at 9 (P.T.A.B. 2021); *Analytics For Life, Inc. v. 8825319 Canada Ltd.*, IPR2017–01742, Paper 9 at 5–6 (P.T.A.B. 2018); *Aristocrat Techs., Inc. v. High 5 Games, LLC*, IPR2018-00529, Paper 8 at 10–11 (P.T.A.B. 2018).

XII. CONCLUSION

The prior art demonstrates that the Challenged Claims are directed to a well-known LED systems placed in a conventional elongated fluorescent tube form factor, with known LED properties. There is a reasonable likelihood that these claims are unpatentable based on the grounds presented in this Petition. Petitioner requests that the Board institute trial and cancel Claims 1, 3, 4, 7–13, 23, 25, 26, 28, 29–39, and 41–45 as unpatentable.

Dated: February 17, 2023

Respectfully submitted,

/David M. Magee/

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Counsel for Petitioner

CERTIFICATE OF SERVICE

Under 37 C.F.R. § 42.6(e), the undersigned certifies that on February 17, 2023, a copy of the foregoing PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,197,224, Petitioner's Power of Attorney, and all associated exhibits were served in their entirety on the following counsel of record for Patent Owner via UPS Next Day Air:

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**CERTIFICATE OF COMPLIANCE WITH TYPE-VOLUME
REQUIREMENTS UNDER 37 C.F.R. § 42.24**

Under 37 C.F.R. § 42.24(d), the undersigned certifies that the PETITION FOR *INTER PARTES* REVIEW OF U.S. PATENT NO. 10,197,224 complies with the type-volume requirements of 37 C.F.R. § 42.24(a)(1)(i) because it contains 13,933 words, excluding the parts of the Petition exempted by 37 C.F.R. § 42.24(a).

This Petition also complies with the typeface requirements of 37 C.F.R. § 42.6(a)(2)(ii) and the type style requirements of 37 C.F.R. § 42.6(a)(2)(iii) and (iv).

Dated: February 17, 2023

Respectfully submitted,

/David M. Magee/

Lead Counsel for Petitioner

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