



# QUASAR SCIENCE LLC v. COLT INTERNATIONAL CLOTHING, INC. d/b/a COLT LED

## IPR2023-00611: Petitioner's Demonstrative Exhibit

# IPR2023-00611: the '224 patent

|                                                                                                                                |                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| (12) <b>United States Patent</b><br><b>Macias</b>                                                                              | (10) <b>Patent No.:</b> <b>US 10,197,224 B1</b><br>(45) <b>Date of Patent:</b> <b>Feb. 5, 2019</b>                                                                                                                  |
| (54) <b>MULTICOLORED TUBE LIGHT WITH<br/>IMPROVED LED ARRAY</b>                                                                | 9/00; F21S 10/02; F21V 9/08; F21V<br>23/005; F21V 23/045; F21V 23/06; F21V<br>15/013; F21V 3/02; F21V 7/005; F21V<br>23/00;                                                                                         |
| (71) Applicant: <b>Guillermo Macias</b> , Santa Clarita, CA<br>(US)                                                            | (Continued)                                                                                                                                                                                                         |
| (72) Inventor: <b>Guillermo Macias</b> , Santa Clarita, CA<br>(US)                                                             | (56) <b>References Cited</b>                                                                                                                                                                                        |
| (73) Assignee: <b>COLT INTERNATIONAL<br/>CLOTHING INC.</b> , Santa Clarita, CA<br>(US)                                         | U.S. PATENT DOCUMENTS                                                                                                                                                                                               |
| (*) Notice: Subject to any disclaimer, the term of this<br>patent is extended or adjusted under 35<br>U.S.C. 154(b) by 0 days. | 6,357,893 B1 3/2002 Belliveau<br>6,720,745 B2 4/2004 Lys et al.<br>(Continued)                                                                                                                                      |
| (21) Appl. No.: <b>15/476,410</b>                                                                                              | FOREIGN PATENT DOCUMENTS                                                                                                                                                                                            |
| (22) Filed: <b>Mar. 31, 2017</b>                                                                                               | DE 20200901176 U1 * 2/2010                                                                                                                                                                                          |
| <b>Related U.S. Application Data</b>                                                                                           | OTHER PUBLICATIONS                                                                                                                                                                                                  |
| (63) Continuation-in-part of application No. 15/096,549,<br>filed on Apr. 12, 2016, now abandoned, and a<br>(Continued)        | DE 20200901176 U1 English Translation; <a href="https://dialog.proquest.com/professional/patenupatent?accountid=161361">https://dialog.proquest.com/professional/patenupatent?accountid=161361</a> .<br>(Continued) |
| (74) <i>Attorney, Agent, or Firm</i> — David L. Hoffman;<br>Hoffman Patent Group                                               | (57) <b>ABSTRACT</b>                                                                                                                                                                                                |

Ex. 1001

# Invalidity Grounds

| Ground | Claims                                                   | Statutory Basis | Prior Art                                                                                                                                                                                     |
|--------|----------------------------------------------------------|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| I      | 1, 3, 4, 7–13,<br>23, 25, 26, 28,<br>29–39, and<br>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,<br>23, 25, 26, 28,<br>29–39, and<br>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”)                                    |

Petition, 7

# '224 patent: claim 1

The invention claimed is:

1. An LED lighting device configured for providing light suitable for a commercial image recording, the LED lighting device comprising:

a support structure;

a housing for the support structure;

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 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

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, and further comprising an LED driver, the LED driver configured to selectively provide electrical power to the array of LED emitting devices;

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 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.

Ex. 1001, Claim 1

# Pertinent Disputes

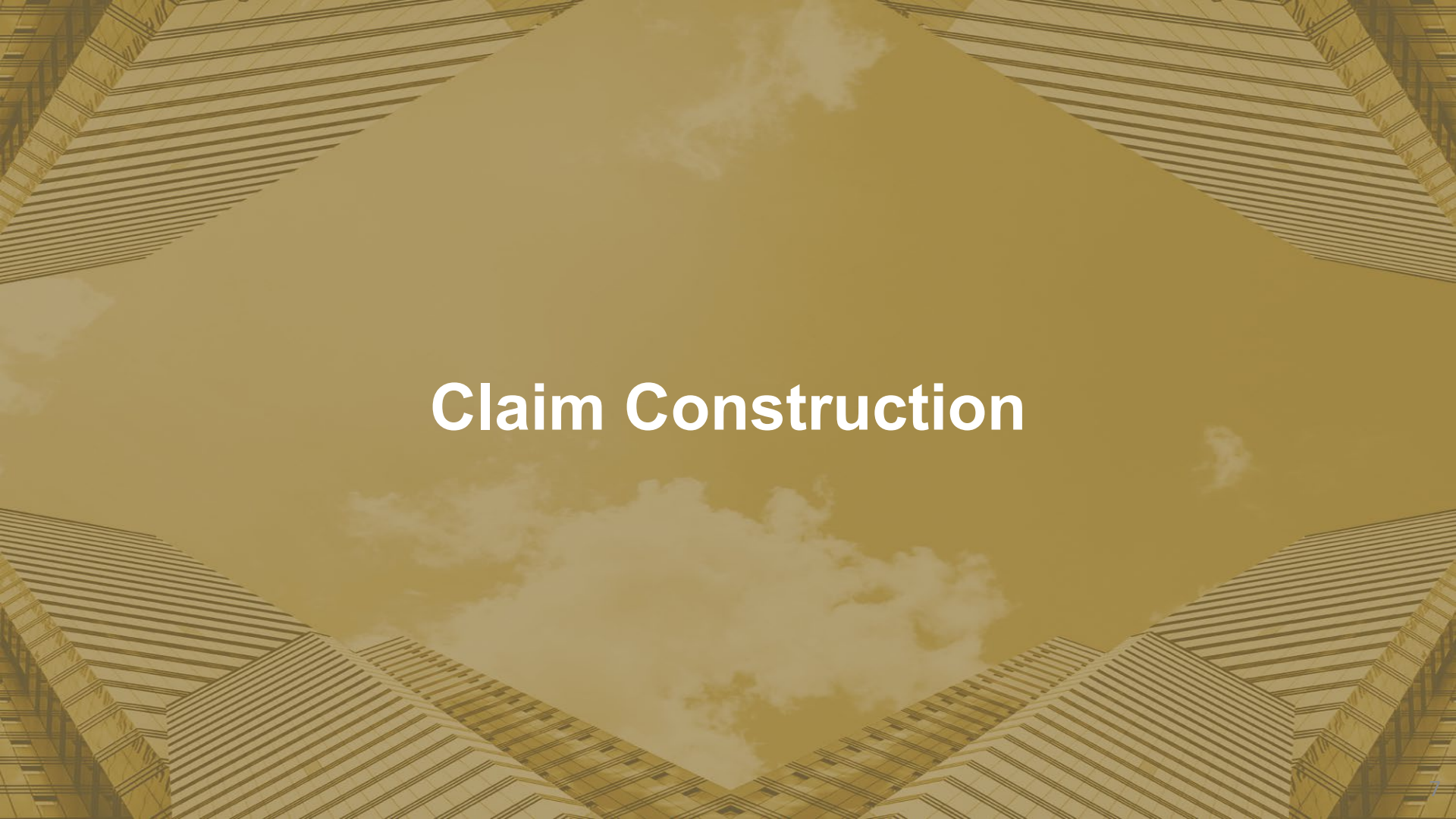
| Dispute                                      | Substance of Dispute                                                                                                                                                                                    |
|----------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Claim Construction                           | <ul style="list-style-type: none"><li>• Is the preamble limiting?</li><li>• “Broad-spectrum” white light</li></ul>                                                                                      |
| Ground 2: Mueller in view of Ansems and Ivey | <ul style="list-style-type: none"><li>• Does Mueller disclose the Colored LED requirement?</li><li>• Is an “onboard” driver required and is it disclosed?</li><li>• Is there a teaching away?</li></ul> |
| Secondary Considerations                     | <ul style="list-style-type: none"><li>• Was nexus established?</li><li>• Was copying established?</li></ul>                                                                                             |

# Preliminary Observations

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- Patent Owner Response generally duplicates the POPR
- No cross-examination of Petitioner's expert
- No expert declaration for Patent Owner

Reply, 1

The background of the slide features a low-angle, upward-looking perspective of a modern skyscraper's facade. The building's structure is composed of numerous horizontal and vertical lines, creating a complex geometric pattern. The entire image is overlaid with a semi-transparent golden-yellow filter. In the center of the slide, there is a rectangular area that appears to be a clear sky with some light, wispy clouds, providing a contrasting background for the title text.

# Claim Construction

# Preamble: Not Limiting

- “1. An LED lighting device configured for providing light suitable for a commercial image recording, the LED lighting device comprising:”
- Not limiting
  - A. Merely sets forth an intended use
  - B. The body of the claims apparently recites what Patent Owner believes to be the complete invention
  - C. The term “commercial image recording” is not recited in the body of the claim

*See Bicon, Inc. v. Straumann Co.*, 441 F.3d 945, 952 (Fed. Cir. 2006).

Reply, 3

# Sur-Reply Shows Not Limiting

Moreover, with respect to at least dependent claims 4 and 11, the term “suitable for commercial image recording” is connected to specific claim body language. In claim 4, there is reference to the “entertainment industry.” In claim 11, the two most popular color temperature ranges, tungsten and daylight, in the entertainment industry are referenced. Petitioner admits this. Reply, p. 16, bottom.

POSR, 2

# Even if limiting, the prior art discloses

- Patent Owner's construction:  
    *"suitable for a commercial image recording"* =  
    *"suitable for TV and studio image recording"* (POR, 15)
- Mueller's LED systems are *"suitable for TV & studio image recording:"*
  - "Mueller explains that the lighting unit 100 can include a variety of colors of LEDs. .... 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." (Petition, 54-55)

# “broad spectrum white light”

- Merely requires use of conventional phosphor-based LEDs, as the '224 patent admits:

“Alternatively, LED (light emitting diode) lighting has been developed and has recently gained popularity. ... There are two primary types of LED lighting used to create white light. ... The other is to use a phosphor material to convert monochromatic light from a blue or ultraviolet LED to broad-spectrum white light, also referred to as phosphor based LEDs.” (Ex-1001 at 2:44-50.)

Reply, 4-5

# Patent Owner Essentially Concedes

- POSR argument (in its entirety):

Petitioner argues that the specific combination of claims, five colors including producing daylight and tungsten, would have been obvious since they are commonly used in the entertainment industry. Reply, p. 16. Petitioner also argues that there broad-spectrum white is disclosed by Mueller, since he discloses phosphor-based LEDs. Reply, p. 16.

POSR, 2

# Mueller Discloses “broad spectrum white light”

(Petition at 58, citing Ex-1006 at ¶0043; *see also* Petition at 57-58, citing Ex-1006 at ¶0194.) The white LEDs of Mueller are phosphor-based LEDs that produce broad spectrum white light:

“In another implementation, a white light LED may be associated with a phosphor material that converts luminescence having a first spectrum to a different second spectrum. In one example of this implementation, luminescence having a relatively short wavelength and narrow bandwidth spectrum “pumps” the phosphor material, which in turn radiates longer wavelength radiation having a somewhat broader spectrum.”

(Ex-1006 at ¶0056.) Thus, Mueller discloses and renders obvious the “broad-

Reply, 5-6

The background of the slide features a stylized, low-angle view of a city skyline with several skyscrapers. The entire image is overlaid with a semi-transparent yellow filter. In the center, the text "Ground 2 Disputes" is written in a bold, white, sans-serif font.

# Ground 2 Disputes

A low-angle, upward-looking perspective of several modern skyscrapers. The buildings are characterized by repetitive horizontal window patterns and are arranged in a way that creates a sense of height and scale. The sky is a clear, vibrant blue, punctuated by soft, white cumulus clouds. The overall composition is symmetrical and geometric, emphasizing the architectural lines of the buildings.

# **Five Sets of Colored LEDs**

# Limitation 1[c]: five colored LED sets

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

Ex. 1001, Claim 1

# Mueller discloses five colored LED sets

Mueller discloses “broad spectrum white light.” As explained in the Petition,

Mueller discloses:

“Methods and systems disclosed herein include methods and systems for a lighting system that includes a plurality of LEDs selected from the group consisting of red, green, blue, amber, white, orange and UV LEDs....”

(Petition at 58, citing Ex-1006 at ¶0043; *see also* Petition at 57-58, citing Ex-1006 at ¶0194.) The white LEDs of Mueller are phosphor-based LEDs that produce broad spectrum white light:

Reply, 5

Reply, 6

in a lighting system. (POR at 28-29.) Not so. As shown above, Mueller specifically discloses that its lighting system can include multiple LEDs, including “red, green, blue, amber, white, orange and UV LEDs.” Mueller further discloses:

“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. Amber and white LEDs can be mixed to offer varying colors and color temperatures of white. Any combination of LED colors can produce a gamut of colors, whether the LEDs are red, green, blue, amber, white, orange, UV, or other colors.”

(Petition at 58, citing Ex-1006 at ¶0194.) Thus, Mueller discloses and renders obvious the use five different colored LEDs in its lighting devices.

# Case Law Shows Obviousness

Patent Owner argues it would not be obvious to try an LED light with five different colored LEDs in view of Mueller, citing *Bayer Schering Pharma AG v. Barr Labs., Inc.*, 575 F.3d 1341, 1347 (Fed. Cir. 2009) (“*Bayer*”). Patent Owner is wrong. The present circumstances are not comparable to those of *Bayer* where there was no guidance in the art as to which of a large number of possible solutions were likely to be successful. Instead, Mueller expressly guides the POSITA to use RGB LEDs with one or more of amber, white, UV, orange, and IR LEDs, i.e., Mueller does *not* disclose “numerous possible choices.” *Bayer* at 1347. This is also not a situation “where vague prior art does not guide an inventor toward a particular solution.” *Bayer* at 1347. Mueller expressly describes the use of multiple LEDs in

solution.” *Bayer* at 1347. Mueller expressly describes the use of multiple LEDs in as much detail as that of the ’224 patent. As noted in *KSR*:

“When there is a . . . problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options. . . . If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.”

*KSR*, 550 U.S. at 421 (2007). The Supreme Court’s logic from *KSR* applies here. Patent Owner has done nothing more than combine a plurality of known elements in a known fashion to create a predictable device. Such combinations are unpatentable. *Id.*

# Patent Owner Essentially Concedes

Petitioner first argues that Mueller discloses the five color combination of claim 1. Reply, Section III.C., pp. 6-7. But Mueller's laundry list does not provide sufficient direction to a POSITA. The secondary evidence here shows nonobviousness.

POSR, 2

A low-angle, upward-looking perspective of several modern skyscrapers. The buildings are characterized by repetitive horizontal window patterns and are arranged in a way that creates a sense of height and scale. The sky is a clear, vibrant blue, punctuated by soft, white cumulus clouds. The overall composition is symmetrical and geometric, emphasizing the architectural lines of the buildings.

# **“Onboard” LED Driver**

# Limitation 1[e]: no “onboard” requirement

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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, and further comprising an LED driver, the LED driver configured to selectively provide electrical power to the array of LED emitting devices;

Ex. 1001, Claim 1

## Limitation 1[f]: mere “electrical communication” required

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

Ex. 1001, Claim 1  
Reply, 8-9

# Patent Owner's Arguments

**Claim Elements 1[e] and 1[f]:** Mueller also does not disclose or teach “an LED driver ... configured to selectively provide electrical power to the array of LED emitting devices.” Mueller lacks any details of how a lighting unit is constructed. See, Petition, p. 60 (top); Ex. 1006 at [0064], and e.g., Fig. 3. While Mueller states that “a given lighting unit optionally may be associated with (e.g., include, be coupled to and/or packaged together with) various other components (e.g., control circuitry),” there is nothing disclosing that the lighting source has all components onboard a T12 or T8 tubular format. As recited in Claim element 1[f], the T12 format is narrow (41 mm).

POR, 29-30

POSR, 3

electrical connection. But, element 1[e] concerning the housing recites, last two lines, that the housing “further compris[es] an electrical input connection for receiving input power.” Element 1[f], first two lines, recites that the “input connection is in electrical communication with the LED driver.” Since the electrical input connection is part of the housing, and since power comes to that connection, and since logically and by the claim language the driver must be downstream of the input connection, the driver is onboard. This is consistent with the specification. Ex. 1001, Figs. 3-4 (driver 36 onboard) and Fig. 14A (showing AC power source 610 going into the input connection).

# Obvious to include in a single housing and “onboard”

Second, Mueller indisputably discloses a T12 LED lighting unit. (Petition at 55, citing Ex-1006 at ¶0295.) Mueller further discloses that its lighting unit “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).” (Petition at 58, citing Ex-1006 at ¶0064.) Thus, Mueller expressly discloses including any necessary circuitry within its lighting unit, which lighting unit may be a T12 lighting unit. Ivey supports Mueller and teaches a POSITA to use all

## Mueller Alone

Reply, 9

## Mueller + Ivey

may be a T12 lighting unit. Ivey supports Mueller and teaches a POSITA to use all necessary components, including circuitry, in the T12 lighting unit. (Petition at 57, citing Ex-1008 at FIG. 6, [0006] (“A circuit board extends longitudinally within the housing.”), [0016]–[0018].) As Ivey explains:

“As shown in FIG. 1, the light 10 includes a housing 14, a circuit board 16, a pair of end caps 18, multiple LEDs 20, and a controller 22 in a single package defined by the housing 14 and end caps 18.” (Ex-1008 at [0016].)

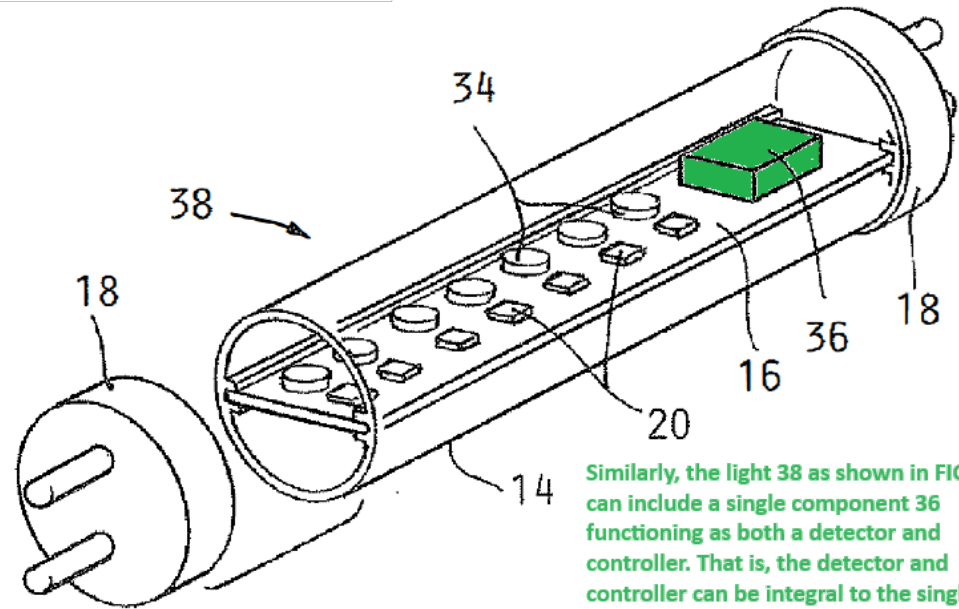
Thus, in view of Mueller and Ivey, a POSITA would have found it obvious to include all necessary components within a single T12 LED lighting unit, especially circuitry and/or drivers, which are software and/or small electrical components suited for fitting within small spaces.

# Ivey FIG. 6

[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**. As such, the LED-based light 10 can have the shape of a standard tube, i.e., the shape of a T5, T8, **T10, or T12 tube**...”

[0029] As another example, FIG. 6 illustrates a light 38 **having a similar structure as the light 10** (i.e., including the housing 14, the circuit board 16, the end caps 18, and the LEDs 20), but additionally including a group of color-producing LEDs 34.

Petition, 15-16, 60-61  
Reply, 9



Similarly, the light 38 as shown in FIG. 6 can include a single component 36 functioning as both a detector and controller. That is, the detector and controller can be integral to the single component 36.

Ivey, [0029]

# Patent Owner Misapplies Ivey

Petitioner refers to Ivey, Ex. 1008, having a controller in a package. Reply, p. 9-bottom; Ex. 1008-Ivey, [0016]. But Ivey discloses an LED-based light controller for an emergency notification system such as smoke or a fire or tornado. Ex. 1008 at Title and [0022].

POSR, 3

# Mueller and Ivey Disclose T8/T12 LEDs

- “Lighting units 100 can also be configured to resemble fluorescent lamps, such as T2 Axial Base, T5 Miniature Bipin, T8 Medium Bipin, T8 Medium Bipin, T12 Medium Bipin, U-shaped t-12, OCTRON T-8 U-shaped, OCTRON T8 Recessed Double Contact, T12 Recessed Double Contact, T14-1/2 Recessed Double Contact, T6 Single Pin, T8 Single Pin, T12 Single Pin, ICETRON, Circline 4-Pin T-19....”
  - Mueller, [0295]; Petition, 55.
- “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. As such, the LED-based light 10 can have the shape of a standard tube, i.e., the shape of a T5, T8, T10, or T12 tube, or otherwise be shaped for compatibility with the standard fixture 12.”
  - Ivey, [0015]; Petition, 15-16, 60-61.

# Patent Owner's Teach Away Argument

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Even if it is accepted for purposes of argument that one might try to construct a tubular LED luminaire with five different colors of LEDs onboard, designing such a luminaire with an onboard LED driver in the form factor of T12 or T8 would not have been obvious due to limited space. See, Ex. 2003 at Abstract (LED lighting device) and at [0012] (“fluorescent lighting systems are generally tube-shaped, which can limit the lighting configuration or mounting options.”) See, also Exs. 2003 and 2002 (first page) (regarding Mac Tech’s teaching away from multiple LED colors on a tubular luminaire).

POR, 22

# Patent Owner's Teach Away Evidence

## + Are Mac Tech LED tubes bi-color?

Ex. 2001

Mac Tech LED tubes are single color enclosures. We have found by comparison, that in producing a single color lamp we gain greater efficiency and truer, more consistent color reproductions.

## + Are Mac Tech LED tubes bi-color?

Ex. 2002

Most of our product line is single color for higher output; either 3200k or 5600k. However, our *Artist Series Flat Panels* are available in a bi-color configuration.

[0012] Fluorescent lighting systems generate much less heat than incandescent lighting systems, but nevertheless have their own drawbacks or limitations. For example, fluorescent lighting systems, like incandescent lighting systems, are often large and cumbersome. Fluorescent bulbs are generally tube-shaped, which can limit the lighting configuration or mounting options. Circular fluorescent bulbs are also commercially available, and have been used in the past for motion picture lighting.

Ex. 2003

POR, 22

# No Teach Away

- “A reference teaches away ‘when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken’ in the claim”
  - *Meiresonne v. Google, Inc.*, 849 F.3d 1379, 1382 (Fed. Cir. 2017)
- “A reference that ‘merely expresses a general preference for an alternative invention but does not criticize, discredit, or otherwise discourage investigation into’ the claimed invention does not teach away.”
  - *Galderma Labs., L.P. v. Tolmar, Inc.*, 737 F.3d 731, 738 (Fed. Cir. 2013)

Reply, 10-11

# No Independent Claim Is Patentable

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## **E. Independent Claims Conclusion**

The above arguments are the entirety of Patent Owner's Ground 2 arguments in favor of its independent claims. (POR at 36 (referring the reader to the claim 1 arguments for independent claims 13, 23, and 35).) Because none of these arguments have merit, they should be rejected and the independent claims should be found unpatentable in view of the Ground 2 prior art.

Reply, 11

A low-angle, upward-looking perspective of several modern skyscrapers. The buildings are characterized by repetitive horizontal window patterns and are arranged in a way that creates a sense of height and scale. The sky is a clear, vibrant blue, punctuated by soft, white cumulus clouds. The overall composition is symmetrical and geometric, emphasizing the architectural lines of the buildings.

# **Dependent Claims**

# Color Wheel Claims

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.

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.

Ex. 1001,  
Claims 3-4

# Conventional Technology

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Claim 3 merely claims well-known technology. The term “DMX” stands for “digital multiplexer.” (Ex-1001 at 24:20.) This technology was admittedly well-known prior to the ’224 patent:

“DMX512 (or currently DMX-512A) standard is maintained by ESTA (Entertainment Services and Technology Association), now Plasa. This standard is for digital communications networks used to control stage lighting (entertainment industry lighting) i.e., controllers such as lighting consoles and dimmers.” (Ex-1001 at 18:67-19:5.)

“DMX 512 is of particular applicability, since the DMX512 standard is a well-known standard in the art used for controlling set or stage lighting and set or stage effects.” (Ex-1001 at 20:24-27.)

Reply, 12

# Mueller Discloses

“Pulse width modulation (PWM) involves supplying a substantially constant current to the LEDs for particular periods of time.... The PWM technique is considered [one] of the preferred techniques for driving LEDs.... In an embodiment, three colors of LEDs are presented (e.g., red, green and blue) and each 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).” (Ex-1006 at ¶0158; Petition at 64.)

Thus, Mueller discloses use of the standard DMX protocol in combination with PWM using 8-bit control to generate millions of colors. Mueller’s disclosures are indistinct from that of the ’224 patent:

Reply, 13

# Patent Owner Essentially Concedes

## **A. Claims 4, 26 and 38 – Entertainment Industry Color Wheel**

Petitioner argues that Mueller discloses “an entertainment industry color wheel.” Petitioner equates the color wheel to DMX. Reply, p. 15-top. But there is nothing in Mueller but general reference to use of DMX. There is only passing reference to use in the industry. Ex. 1004 [0295] (“studio, theatre, TV and video”). This is not enough direction for a POSITA to construct the claimed invention. The secondary evidence here shows that.

POSR, 4-5

# Patent Owner's Color Combo Arguments

## B. Claims 10 and 32 -- RGBAW

Petitioner argues that the specific combination of claims 10 and 32 is that red, green, blue, amber and white are in the list of colored LEDs that Mueller discloses, and any combination may be assembled, and therefore this specification combination, red, green, blue, amber and white (“RGBAW”) is either disclosed or obvious. Reply, pp. 15-16. But Mueller lacks specific direction for this combination, and this combination is successful and was copied, as shown by the secondary evidence.

**10.** The LED lighting device of claim 1, wherein the first, second, third and fourth LEDs are red, green, blue and amber, respectively.

Ex. 1001, Claim 10

POSR, 5

# Mueller Discloses

10. The LED lighting device of claim 1, wherein the first, second, third and fourth LEDs are red, green, blue and amber, respectively.

Ex. 1001, Claim 10

“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.* Amber and white LEDs can be mixed to offer varying colors and color temperatures of white. ***Any combination** of LED colors can produce a gamut of colors, whether the LEDs are red, green, blue, amber, white, orange, UV, or other colors.*” (Ex-1006 at ¶0194.)

Reply, 15-16  
Petition, 66

# Patent Owner's Tungsten/Daylight Arguments

The Reply cites to three paragraphs of Mueller: Ex. 1006 at [0194] and [0062]-[0063]. Mueller, in paragraph [0194], has no mention of any specific color temperature ranges of white light. Ex. 1006 at [0194]. Mueller, at paragraph [0062], only refers to the broad range of 700K to 10,000K, and paragraph [0063] is only discussing temperatures that provide various color tints. Ex. 1006 at [0062]-[0063]. There is no guidance to putting the claimed color temperature ranges together with the other claimed elements. There is no guidance to a POSITA to pick and choose the claimed elements in combination without the use of hindsight.

POSR, 6-7

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.

Ex. 1001, Claim 11

# Admittedly Conventional

This claim depends on claim 1 and adds that “among the colors the driver is configured to selectively produce are white light in each of **daylight and tungsten temperature ranges**” in the claimed combination with broad-spectrum white light as well as multiple colors of LEDs and a tubular format, suitable for commercial image recording. Ex. 1001, claim 11 (emphasis added). These two ranges are very commonly used in the entertainment industry. The combination of these two ranges in the lighting device of claim 1, in addition to colors, would not have been obvious.

POR, 34-35

lighting often may need to be changed in order to match the scene or mood of the production. For example, recreating a scene taking place under sunlight with blue skies may require a color temperature of 9000 to 12000 Kelvin (K), while a scene taking place at sunrise or sunset may require a lighting color temperature of 3200 K or even substantially lower than 3200 K. The two most frequently used and desired color temperature ranges in the lighting industry for stage and set lighting have been found to be, for example, 3050 to 3300 K for tungsten (warm white), and, for example, 5400 to 5600 K for daylight (cool white). Some system designers may prefer a somewhat a more narrow or wider ranges (e.g., warm white range down to 2700 K, and so on). These ranges represent ideal color temperature ranges for producing ideal lighting for TV, photography and film studio scenarios.

Ex. 1001, 2:7-11  
Reply, 16-17

# Mueller Renders Obvious

- “For example, red, green and blue can be mixed with amber, white, UV, orange, IR or other colors of LED. Amber and white LEDs can be mixed to offer varying colors and color temperatures of white.”

- Mueller, [0194]; Petition, 66

- Tungsten is 3050-3300°K and Daylight is 5400-5600°K
- Both fall within 700-10,000°K range disclosed by Mueller (Ex. 1006, [0062]; Petition, 66)
- *Prima facie* obvious
  - *In re Peterson*, 315 F.3d 1325, 1330 (Fed. Cir. 2003)
- Especially obvious to operate at the “*two most frequently used and desired color temperature ranges*” of daylight and tungsten when Mueller’s device is used in “*studio, theatre, TV [or] video*” applications, as expressly contemplated by Mueller. (Ex-1006 at ¶0296.)

Reply, 17

The background of the slide features a stylized, low-angle view of a city skyline with several skyscrapers. The image is overlaid with a semi-transparent yellow filter. The text "Secondary Considerations" is centered in a white, bold, sans-serif font.

# Secondary Considerations

# No Nexus

- Patent Owner cannot point to any novel element
- Patent Owner's evidence is mere attorney argument
  - Infringement contentions drafted by Patent Owner's counsel
  - Quasar Marketing Materials analyzed by Patent Owner's counsel
  - No independent analysis *by a person skilled in the art*
  - Improper evidentiary basis to establish nexus
    - *ZAP Surgical Systems, Inc. v. Elekta Ltd.*, Case IPR2019-01659, Paper 48 at 23 (PTAB Mar. 30, 2021)

Reply, 19-20

# No Credible Evidence of Copying

- **Mr. Zhang (Patent Owner's declarant)**

- Not presented for questioning
- Says he met Mr. Ray Gonzales in the declaration relied on by Patent Owner (Ex. 2015) but two months later testified he never met Mr. Gonzales (Ex. 2023)
- In another proceeding, Inventor Mr. Macias testified that “**Zhang's Declaration was false.**”
  - *Laysion, LLC v. Macias, No. B319551*, California Court of Appeals, Second District, Third Division, Jul 28, 2023 at 3 (Ex. 1018)
- Clear that the Board cannot reasonably rely on any evidence from Mr. Zhang in this proceeding.

- **Ray Gonzales (Petitioner's declarant)**

- Sworn testimony submitted in this proceeding (Ex. 1025)
- Mr. Gonzales testified he has never met Mr. Zhang, and he “never asked Mr. Zhang or anyone else to duplicate a Colt bi-color tube.”
- Unrefuted: not cross-examined by Patent Owner

Reply, 20-22

# Evidence relates to other products

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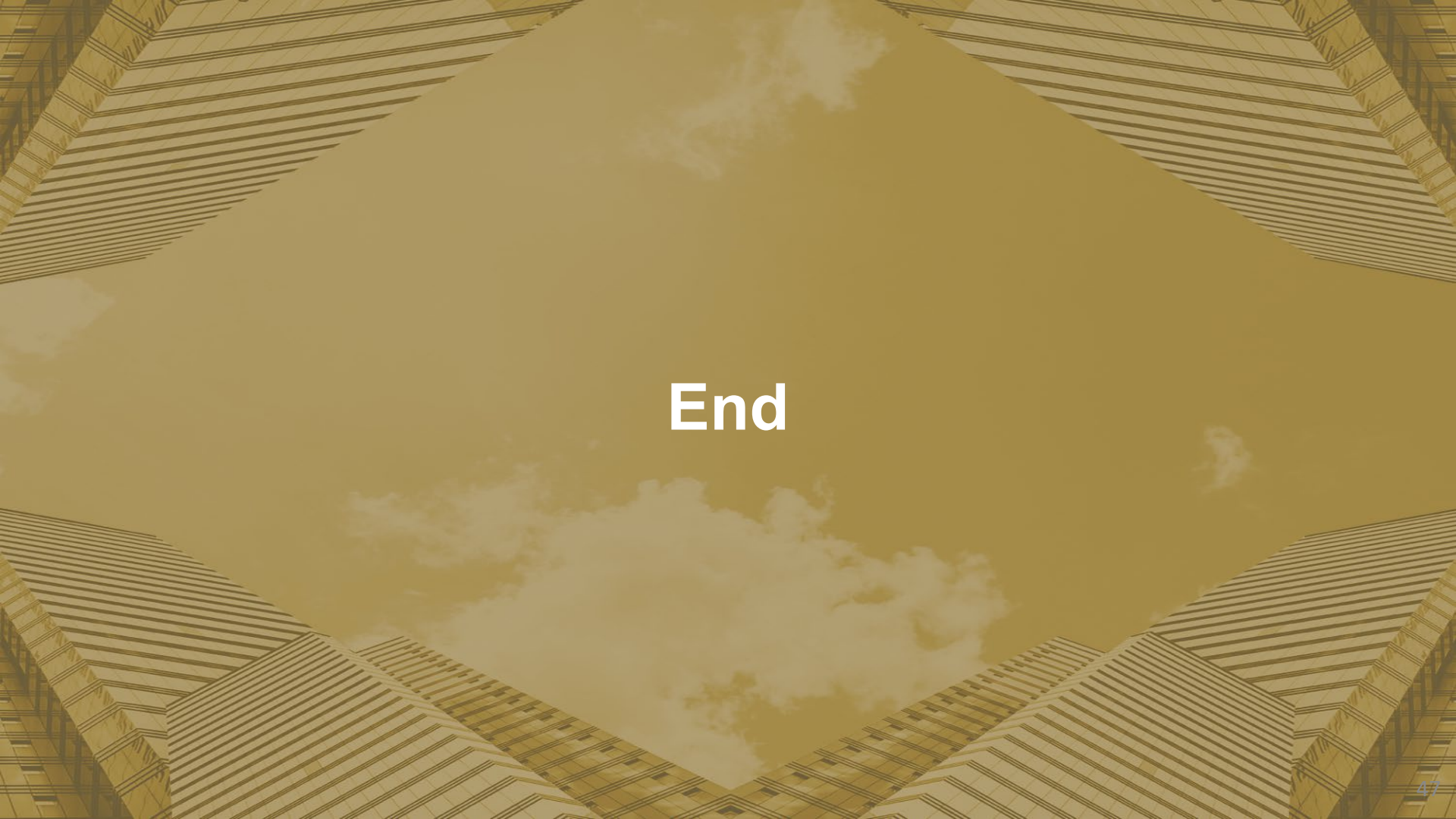
- The '224 claims relate to multi-color products
- Patent Owner admits the alleged copying evidence is for bi-color products
  - “This corroboration evidence, albeit with respect to copying Colt’s *bicolor* ...” (POSR, 11.)
- Evidence is not coextensive
  - *Fox Factory, Inc. v. SRAM, LLC*, 944 F. 3d, 1366, 1373 (Fed. Cir. 2019)

Reply, 23

# Commercial Success Not Proven

- No expert testimony and no market analysis
- Two sentence argument:
  - “Petitioner Quasar’s revenue from April 9, 2021 to the end of 2023 for its Rainbow/Rainbow 2 Models was \$2,379,870 in just a little over 2.5 years. ... If one considers that Hollywood was shut down due to the Writers’ Guild of America and the Screen Actors’ Guild striking much of the year, these sales are quite significant.” (POR, 48-49)
- Mere attorney argument that the “*sales are quite significant*”

Reply, 23-24



**End**