

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

HISENSE USA CORPORATION,
Petitioner,

v.

BRIGHTPLUS VENTURES LLC,
Patent Owner.

IPR2023-01401
Patent 8,941,331 B2

Before STACEY G. WHITE, KEVIN C. TROCK, and
JOHN D. HAMANN, *Administrative Patent Judges*.

HAMANN, *Administrative Patent Judge*.

DECISION
Granting Institution of *Inter Partes* Review
35 U.S.C. § 314

I. INTRODUCTION

Hisense USA Corporation (“Petitioner”) filed a petition for *inter partes* review of claims 17–25 (“the challenged claims”) of U.S. Patent No. 8,941,331 B2 (Ex. 1001, “the ’331 patent”). Paper 1 (“Pet.”). Brightplus Ventures LLC (“Patent Owner”) filed a Preliminary Response. Paper 6 (“Prelim. Resp.”).

Institution of an *inter partes* review is authorized by statute when “the information presented in the petition . . . and any response . . . shows that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a) (2018); *see* 37 C.F.R. § 42.108 (2023). Upon consideration of the papers, we conclude that the information presented shows that there is a reasonable likelihood that Petitioner would prevail in establishing the unpatentability of at least one challenged claim of the ’331 patent.

A. Real Parties-in-Interest

The parties identify themselves as real parties-in-interest. Pet. 1; Paper 4, 2. In addition, Petitioner states that it “is a subsidiary of Hisense Group,” and that “[o]ther privies or real parties in interest include companies within the Hisense Group, including Hisense International (Hong Kong) America Investment Co., Ltd.; Hisense Group Holdings Co., Ltd.; Hisense Visual Technology Co., Ltd.; Hisense International (HK) Co., Ltd.; Hisense International Co., Ltd.; [and] TVS REGZA Corporation.” Pet. 1.

B. Related Matters

The parties identify *Hisense USA Corp. v. Brightplus Ventures LLC*, No. 1:22-cv-02774 (N.D. Ga.), as a matter that may affect, or be affected by, a decision in this proceeding. Pet. 1; Paper 4, 2.

C. The Challenged Patent

The '331 patent relates to “solid state lighting, and more particularly to adjustable solid state lighting panels and to systems and methods for generating high voltages for illuminating solid state lighting panels.” Ex. 1001, 1:28–31. According to the '331 patent, “[s]olid state lighting arrays are used for a number of lighting applications.” *Id.* at 1:35–36. “For example, solid state lighting panels including arrays of solid state lighting devices have been used as direct illumination sources, for example, in architectural and/or accent lighting.” *Id.* at 1:36–39. The '331 patent also discloses that “[s]olid state lighting panels are commonly used as back lights for small liquid crystal display (LCD) display screens.” *Id.* at 1:48–51.

According to the '331 patent, “[f]or large-scale illumination applications, it is often desirable to provide a lighting source that generates a white light having a high color rendering index, so that objects illuminated by the lighting panel may appear more natural.” *Id.* at 2:8–11; *see also id.* at 2:1–3 (explaining that “[t]he color rendering index of a light source is an objective measure of the ability of the light generated by the source to accurately illuminate a broad range of colors”). The '331 patent adds that “[s]imilarly, for display backlight applications, it may be desirable to provide a backlight source that permits the display to have a large range of displayable colors (color gamut).” *Id.* at 2:11–14.

An embodiment of the '331 patent is illustrated in Figure 5, shown below. *Id.* at 4:45–47.

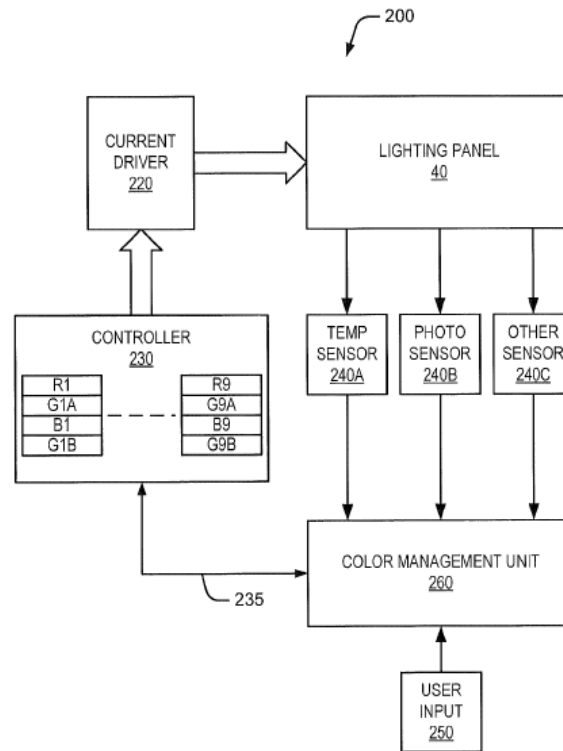


FIGURE 5

Figure 5 “is a schematic block diagram illustrating a lighting system in accordance with” embodiments of the ’331 patent. *Id.* Figure 5 illustrates a lighting system 200, which includes lighting panel 40. *Id.* at 9:60–62. Also illustrated is “current driver 220[, which] provides independent current control for each of the LED strings 23 [(not shown)] of the lighting panel 40.” *Id.* at 10:17–18. In addition, “current driver 220 may provide a constant current source for each of the . . . separate LED strings of the lighting panel 40 under the control of a controller 230.” *Id.* at 10:21–24.

The ’331 patent discloses that “controller 230 . . . may be programmed to provide pulse width modulation (PWM) control of . . . separate current supply blocks within the driver 220 for the” LED strings 23. *Id.* at 10:24–29. “Pulse width information for each of the . . . LED strings may be obtained by the controller 230 from a color management unit 260.”

Id. at 10:30–32. More specifically, “controller 230 may include a register, e.g. registers R1–R9, G1A–G9A, B1–B9, G1B–G9B, for each LED string 23, i.e. for a lighting unit with 36 LED strings 23, the color management unit 260 may include at least 36 registers,” for which “[e]ach of the registers is configured to store pulse width information for one of the LED strings 23.” *Id.* at 10:49–54. “[T]he register values may be adaptively changed over time based on user input 250 and/or input from one or more sensors 240 coupled to the lighting panel 40.” *Id.* at 10:56–58. As illustrated, “[t]he sensors 240 may include, for example, a temperature sensor 240A, one or more photosensors 240B, and/or one or more other sensors 240C.” *Id.* at 10:59–61.

D. The Challenged Claims

Petitioner challenges claims 17–25 in this proceeding. Claim 17 is the only independent, challenged claim. Claim 17 is illustrative of the challenged claims and is reproduced below:

17. A lighting system, comprising:
 - a lighting panel including at least first and second strings of solid state lighting devices that are respectively configured to emit at least a first light and a second light, respectively;
 - at least first and second current supply circuits coupled to the at least first and second strings of solid state lighting devices, respectively, and configured to supply an on state drive current to a respective one of the first and second strings of solid state lighting devices; and
 - a pulse width modulation (PWM) controller that is coupled to the first current supply circuit and the second current supply circuit and that is configured to generate, for each of the first current supply circuit and the second current supply circuit, a first PWM control signal and a second PWM control signal that are supplied to the each of the at least first and second strings.

Ex. 1001, 17:17–33.

E. Asserted Grounds of Unpatentability

Petitioner asserts that the challenged claims of the '331 patent are unpatentable based on the following grounds:

Claim(s) Challenged	35 U.S.C. §¹	Reference(s)/Basis²
17	103(a)	Lys, ³ Grootes ⁴
18–20, 22–25	103(a)	Lys, Grootes, Xu ⁵
21	103(a)	Lys, Grootes, Xu, Blum ⁶
17	103(a)	Muller, ⁷ Grootes
18, 20	103(a)	Muller, Grootes, Xu
21	103(a)	Muller, Grootes, Xu, Blum

Pet. 4, 17–65. Petitioner submits in support of its arguments the Declaration of Rafael Betancourt (Ex. 1003). Patent Owner submits in support of its arguments the Declaration of William Bohannon (Ex. 2001).

II. LEVEL OF ORDINARY SKILL IN THE ART

To determine whether an invention would have been obvious at the time it was made, we consider the level of ordinary skill in the pertinent art at the time of the invention. *Graham v. John Deere Co.*, 383 U.S. 1,

¹ The Leahy-Smith America Invents Act (“AIA”) included revisions to 35 U.S.C. § 103 that became effective on March 16, 2013. Because the '331 patent issued from an application having an effective filing date before March 16, 2013, we apply the pre-AIA version of the statutory basis for unpatentability.

² Petitioner also lists for each asserted ground the knowledge of one of ordinary skill in the art. Pet. 4. Such listing is unnecessary as we already consider such knowledge as part of our obviousness analysis. *See Randall Mfg. v. Rea*, 733 F.3d 1355, 1362–63 (Fed. Cir. 2013).

³ WO 2005/089293 A2, published Sept. 29, 2005 (Ex. 1005, “Lys”).

⁴ US 2007/0046485 A1, published Mar. 1, 2007 (Ex. 1006, “Grootes”).

⁵ CN 1588523A, published Mar. 2, 2005 (original (Ex. 1007) and English translation (Ex. 1008, “Xu”).

⁶ US 5,663,667, issued Sept. 2, 1997 (Ex. 1010, “Blum”).

⁷ US 2005/0047134 A1, published Mar. 3, 2005 (Ex. 1009, “Mueller”).

17 (1966). In assessing the level of ordinary skill in the art, various factors may be considered, including the “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made; sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962–63 (Fed. Cir. 1986)). “[O]ne or more factors may predominate.” *Id.*

Petitioner argues that one of ordinary skill in the art for the ’331 patent “would have had at least a graduate degree in mechanical engineering, physics, materials science, electrical engineering, or a related discipline, coupled with at least four years’ experience in designing backlighting systems for displays; the level of ordinary skill in the art is approximate and additional education could make up for a lack of experience or vice-versa.” Pet. 9; Ex. 1003 ¶ 24.

Patent Owner argues that one of ordinary skill in the art for the ’331 patent “would have (a) a Bachelor’s of Science degree in a technical field and at least four years of experience in the field of design and/or manufacture of display systems; (b) a Master’s of Science degree in a technical field and at least two years of experience in the field of design and/or manufacture of display systems; or (c) a PhD in a technical field relating to the design and/or manufacture of display systems.” Prelim. Resp. 4; Ex. 2001 ¶ 35. Patent Owner adds that “[a]dditional graduate education could substitute for professional experience, or significant experience in the field could substitute for formal education.” *Id.*

The parties’ dispute regarding the level of ordinary skill in the art does not substantively impact our analysis for purposes of institution. Rather, we find in applying either parties’ definition for what comprises the level of

ordinary skill in the art that Petitioner shows that there is a reasonable likelihood that it would prevail in proving the unpatentability of the challenged claims. At this stage of the proceeding, however, we adopt Petitioner's proposed definition of the level of skill for one of ordinary skill in the art. Pet. 9. This definition for the level of ordinary skill is consistent with the '331 patent and the asserted prior art, and we apply it in our analysis below.

During trial, and in accordance with our Rules, the parties should address what substantive effect, if any, different proposed definitions for the level of ordinary skill in the art have on analyzing what the prior art teaches or in otherwise evaluating unpatentability of the challenged claims.

III. CLAIM CONSTRUCTION

Because the Petition was filed after November 13, 2018, we apply the same claim construction standard that would be used in a civil action under 35 U.S.C. § 282(b), following the standard articulated in *Phillips v. AWH Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc). 37 C.F.R. § 42.100(b); 83 Fed. Reg. 51,340, 51,340–41, 51,343 (Oct. 11, 2018). In applying such standard, claim terms generally are given their ordinary and customary meaning, as would be understood by a person of ordinary skill in the art, at the time of the invention and in the context of the entire patent disclosure. *Phillips*, 415 F.3d at 1312–13. “In determining the meaning of the disputed claim limitation, we look principally to the intrinsic evidence of record, examining the claim language itself, the written description, and the prosecution history, if in evidence.” *DePuy Spine, Inc. v. Medtronic Sofamor Danek, Inc.*, 469 F.3d 1005, 1014 (Fed. Cir. 2006) (citing *Phillips*, 415 F.3d at 1312–17).

Here, the parties agree that no claim terms require construction. Pet. 9; Prelim. Resp. 5–6. Thus, for purposes of our Decision on Institution, we afford the claim terms their plain and ordinary meaning. *See, e.g., Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (“[W]e need only construe terms ‘that are in controversy, and only to the extent necessary to resolve the controversy.’”).

IV. PRINCIPLES OF LAW

A claim is unpatentable under 35 U.S.C. § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time of the invention to a person having ordinary skill in the art. *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) objective evidence of non-obviousness, if present.⁸ *See Graham*, 383 U.S. at 17–18. When evaluating a claim for obviousness, we also must “determine whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue.” *KSR*, 550 U.S. at 418 (citing *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)).

V. ALLEGED OBVIOUSNESS OVER LYS AND GROOTES

Petitioner argues that the combination of Lys and Grootes renders claim 17 obvious. Pet. 17–28. For the reasons that follow, we determine

⁸ Patent Owner does not present arguments or evidence of such objective evidence of non-obviousness. *See generally* Prelim. Resp.

that Petitioner establishes a reasonable likelihood that it would prevail in showing that the combination of Lys and Grootes renders claim 17 obvious.

A. Summary of Lys

Lys relates to “linear lighting systems [that] may include power systems for driving light sources in high-voltage environments.” Ex. 1005, code (57). Lys teaches “lighting unit 102 [that] is controlled by a control facility 3500,” which “controls the intensity, color, saturation, color temperature, on-off state, brightness, or other feature of light that is produced by the lighting unit 102.” *Id.* at 32:6–9. Lys teaches that lighting unit 102 can include “light source 300, which in embodiments is a solid-state light source.” *Id.* at 32:10–11.

Lys also teaches that lighting unit 102 or light source 300 may “include and/or be coupled to a power facility 1800,” such as an AC or DC power source. *Id.* at 60:13–17. Lys teaches that power facility 1800 may be associated with power conversion device(s) that provide power received by an external power source in a form suitable for operation of lighting unit 102. *Id.* at 60:17–19.

Lys also teaches that its control facilities may include complex drive facilities 3800, which include various forms of drive hardware 3802 that employ, among other things, pulse-width-modulation. *Id.* at 34:23–35:2. Moreover, Lys teaches that for an embodiment, control facility 3500 can switch between current-control mode 2502 (which itself could be controlled by a PWM stream) and separate PWM mode 2504, and such a system can include simultaneous current control via PWM for wavelength and PWM control balanced to produce desired output intensity and color. *Id.* at 85:17–20.

B. Summary of Grootes

Grootes relates to controlling LEDs for creating a white light backlight, such as for liquid crystal displays. Ex. 1006 ¶ 1. More specifically, Grootes provides an LED light source for backlighting “that can store optimal current settings for strings of LEDs, such that color and brightness uniformity in the backlight application is ensured.” *Id.* ¶ 10.

In relevant part, Grootes teaches mounting LEDs (e.g., strings of red LEDs, green LEDs, and blue LEDs) and current sources on a single printed circuit board. *Id.* ¶¶ 35–36. Moreover, Grootes teaches that “each string is connected to its own current source,” and that “[e]ach current source . . . is controllable to control the brightness of its associated LEDs to achieve the desired white point.” *Id.* ¶¶ 37, 41. In other words, Grootes teaches that “[b]y adjusting the currents through the RGB LEDs, any white point may be achieved by the backlight.” *Id.* ¶ 36.

C. Challenged Claim 17

1. Lighting System

Claim 17’s preamble recites “[a] lighting system.” Ex. 1001, 17:17. At this stage, we agree with Petitioner and find that Lys teaches claim 17’s preamble. Pet. 20. More specifically, we find that Lys teaches an exemplary lighting system 100, as illustrated in Figure 1. Ex. 1005, 32:6–12; Ex. 1003 ¶ 49.

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner at this stage of the proceeding, we are persuaded that Petitioner demonstrates, for purposes of this institution decision, that Lys teaches claim 17’s preamble. In light of our finding, we need not, and thus do not, reach whether claim 17’s preamble is limiting.

2. *At Least First and Second Strings*

Claim 17 further recites “a lighting panel including at least first and second strings of solid state lighting devices that are respectively configured to emit at least a first light and a second light, respectively.” Ex. 1001, 17:18–21. At this stage of the proceeding, we agree with Petitioner and find that Lys teaches this limitation. Pet. 20–21.

In particular, at this stage, we find that Lys teaches “housings^[9] 800 [that] may include panels 804 that consist of a support platform on which light sources 300 are disposed in an array.” Ex. 1005, 51:15–16, Fig. 8. Furthermore, Lys teaches an embodiment comprising a lighting unit¹⁰ 102 that “includes a light source 300 that is a solid-state light source, such as a semiconductor-based light source, such as a light emitting diode, or LED.” *Id.* at 36:17–20, Fig. 3. Lys teaches that “[l]ighting units 102 can include LEDs that produce a single color or wavelength of light, or LEDs that produce different colors or wavelengths, including red, green, blue, white, orange, amber, ultraviolet, infrared, purple or any other wavelength of light.” *Id.* at 36:20–23. Moreover, Lys teaches that the light “sources 300 can be point sources or can be arranged in many different configurations 302, such as . . . a circular configuration 308, an oval configuration 304 . . . or any other geometric configuration, including two-dimensional and three-dimensional configurations.” *Id.* at 36:30–37:2. Lys also teaches that

⁹ Lys teaches that “[h]ousings . . . may include enclosures, platforms, boards, mountings, and many other form factors, including forms designed for other purposes.” Ex. 1005, 51:10–11.

¹⁰ Lys teaches that the term “lighting unit” “refer[s] to an apparatus including one or more light sources,” and that “[a] given lighting unit . . . may have any one of a variety of mounting arrangements for the light source(s) in a variety of housings.” Ex. 1005, 51:7–10.

in some “embodiments the sources are mixed 300 to allow light of different colors or color temperatures, including color temperatures of white.” *Id.* at 37:6–8.

In addition, at this stage, we find that Lys teaches “control[ing] one or more LEDs in a string” and that “[m]ultiple such strings can be used to create a light fixture that can vary in color (HSB) and spectrum based on the current and on-off control.” *Id.* at 85:17–30. And at this stage, we agree with Petitioner that Lys teaches that “[e]ach of these strings of LEDs would be controlled to emit light, i.e., a first light and a second light.” Pet. 21 (citing Ex. 1005, 37:3–8; Ex. 1003 ¶¶ 51, 92).

After reviewing Petitioner’s arguments and evidence, which are not addressed by Patent Owner at this stage of the proceeding, we are persuaded that Petitioner demonstrates, for purposes of this institution decision, that Lys teaches this limitation.

3. At Least First and Second Current Supply Circuits

Claim 17 further recites “at least first and second current supply circuits coupled to the at least first and second strings of solid state lighting devices, respectively, and configured to supply an on state drive current to a respective one of the first and second strings of solid state lighting devices.” Ex. 1001, 17:22–26. At this stage of the proceeding, we agree with Petitioner and find that the combination of Lys and Grootes teaches this limitation. Pet. 21–24.

In particular, at this stage of the proceeding, we find that Lys teaches circuits for supplying current to strings of LEDs. In particular, Lys teaches that a “lighting unit 102 or a light source 300 . . . may include and/or be coupled to a power facility 1800,” which may comprise “AC power sources, DC power sources, batteries, solar-based power sources, thermoelectric or

mechanical-based power sources and the like.” Ex. 1005, 60:13–17. In addition, Lys teaches that “[p]ower supplies may be separate from lighting units 102 or may be incorporated on-board the lighting units 102 in power-on-board configurations,” and that “[p]ower supplies may power multiple lighting units 102 or a single lighting unit 102.” *Id.* at 60:21–27.

In addition, Lys teaches providing power factor correction (PFC) to power for a lighting unit 102. *Id.* at 61:29–30. For example, Lys teaches an embodiment having a power factor correction facility 1804 and a DC to DC converter 1812, which “are integrated into a single stage power factor correction/DC to DC converter facility 1908 that is integrated with the lighting unit 102, rather than being contained in a separate power supply.” *Id.* at 62:18–21, Fig. 17. This embodiment is illustrated in Fig. 17, shown below.

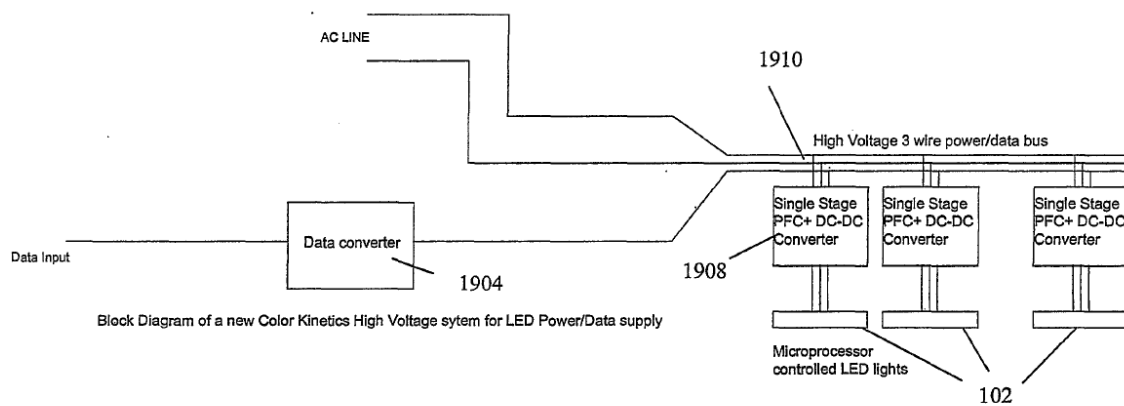


Fig. 17

Figure 17 “depicts an[] embodiment of a power system for a lighting system that includes power factor correction.” *Id.* at 29:25–26. As illustrated, “alternating current line power is delivered to a high-voltage three wire power/data bus 1910 that also carries input from a data converter 1904 that carries control signals for the lighting unit 102.” *Id.* at 62:21–23. Lys

teaches that “[p]ower factor correction and conversion to DC output voltages suitable for light sources 300 such as LEDs occurs at the lighting units 102.”

Id. at 62:24–25. In addition, at this stage, we find persuasive

Mr. Betancourt’s testimony that one “of ordinary skill in the art would recognize that a DC to DC converter is a current supply circuit” because we find such testimony is consistent with Lys’s teachings. Ex. 1003 ¶ 56.

Thus, Lys teaches for this embodiment having separate current supply circuits for each of the lighting units 102. *See, e.g.*, Ex. 1005, Fig. 17.

In addition, at this stage, we find that Grootes teaches using separate current supplies for each of a string of LEDs for a lighting structure. In particular, at this stage, we find that Grootes teaches that “[s]eries strings of red LEDs 32, green LEDs 33, and blue LEDs 34” and current sources 40, 41, and 42 are mounted on a single printed circuit board (PCB) 30, and the cathode of each string is “connected to its own current source 40, 41, 42.” Ex. 1006 ¶¶ 35–37, Fig. 4. In addition, Grootes teaches that “[e]ach current source 40–42 is controllable to control the brightness of its associated LEDs to achieve the desired white point.” *Id.* ¶ 41.

We agree with Petitioner and find that one of ordinary skill in the art would have been motivated to combine Lys and Grootes’s teachings to have a current supply circuit for each LED string in Lys’s lighting unit to achieve better color and brightness control and uniformity, and to achieve a desired white point. Pet. 18–20 (citing Ex. 1003 ¶¶ 82–84, 89), 24 (citing Ex. 1003 ¶ 61). At this stage, we find persuasive Mr. Betancourt’s cited testimony on this issue as it is consistent with Lys and Grootes’s teachings. For example, Lys teaches with respect to a lighting unit 102 that “[t]he sources 300 can also be mixed, including sources 300 of varying wavelength, intensity, *power*, quality, light output, efficiency, efficacy or other characteristics,”

and that sources 300 can be mixed to produce consistent light output or “to allow light of different colors or color temperatures, including color temperatures of white.” Ex. 1005, 37:3–8 (emphasis added). And Grootes explains, for example, that “[e]ach current source 40–42 is controllable to control the brightness of its associated LEDs to achieve the desired white point.” Ex. 1006 ¶ 41.

We also agree with Petitioner and find that one of ordinary skill in the art would have had a reasonable expectation of success in combining Lys and Grootes’s teachings to produce a lighting system having separate circuits for supplying each of the currents for the LED strings. Pet. 18; Ex. 1003 ¶ 88. Nor at this stage do we find that Lys’s lighting units having separate current supply circuits for each LED string would have been uniquely challenging or difficult for one of ordinary skill in the art. *See Leapfrog Enterprises, Inc. v. Fisher-Price, Inc.*, 485 F.3d 1157, 1162 (Fed. Cir. 2007) (citing *KSR*, 550 U.S. at 419–20) (finding that obviousness was supported because there was no evidence that making the combination was uniquely challenging or difficult for one of ordinary skill in the art).

Accordingly, at this stage, we find that Petitioner has provided sufficiently articulated reasoning with rational underpinning to support combining Lys and Grootes in the manner Petitioner proposes. *See In re Kahn*, 441 F.3d at 988; *see also Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1374 (Fed. Cir. 2019) (“A motivation to combine may be found ‘explicitly or implicitly in market forces; design incentives; . . . and the background knowledge, creativity, and common sense of the person of ordinary skill.’”) (quoting *ZUP, LLC v. Nash Mfg., Inc.*, 896 F.3d 1365, 1371 (Fed. Cir. 2018)).

At this stage, we find unavailing Patent Owner’s argument that Lys does not disclose the elements of a current supply circuit described in the Summary section of the ’331 patent. Prelim. Resp. 20 (quoting Ex. 1001, 2:38–3:31). First, we note that the cited portion of the Specification states that a current supply circuit “may” have certain features or “may” be configured for certain functions, rather than requiring such. Ex. 1001, 2:38–3:31. Second, the language of the limitation does not include the list of elements Patent Owner cites. We find unavailing Patent Owner’s argument which seeks to add additional requirements to the claim language. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) (stating limitations not appearing in the claims cannot be relied upon for patentability); *In re Hiniker Co.*, 150 F.3d 1362, 1369 (Fed. Cir. 1998) (stating “the name of the game is the claim”). To the extent that Patent Owner believes that limitations from the Specification should be included in the construction of “current supply circuits,” Patent Owner should provide factual and legal support for such during trial.

We also find unavailing Patent Owner’s argument that “none of the power supplies in Lys, such as the PFC/DC to DC converter 1908, supply an on-state drive current to the first and second LED strings.” Prelim. Resp. 20 (citing Ex. 2001 ¶ 68). We find the cited testimony of Mr. Bohannon for this argument to be unclear, as well as conclusory and unsupported. Ex. 2001 ¶ 68. Patent Owner also argues that “[t]he purpose of the converter 1908, as stated in Lys, is to ‘output voltages suitable for light sources 300 such as LEDs occurs at the lighting units in 102,’” and that “Lys does not mention or disclose supplying an on-state drive current to the strings.” Prelim. Resp. 20–21 (quoting Ex. 1005, 60:24–25; citing Ex. 2001 ¶ 69). At this stage, we find this argument to be unclear, and it appears to ignore the

fundamental relationship of power with voltage and current. *See* Ex. 2001 ¶¶ 68–69. Moreover, this argument does not account for Grootes’s teachings. *See In re Merck & Co.*, 800 F.2d 1091, 1097 (Fed. Cir. 1986) (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references.”).

We also find unavailing Patent Owner’s argument that “Lys is directed towards a completely different purpose than that of the ’331 patent and as such employs a number of components that are extraneous to the purpose of the ’331 patent.” Prelim. Resp. 12–13; *see In re Mouttet*, 686 F.3d 1322, 1331 (Fed. Cir. 2012) (“A reference may be read for all that it teaches, including uses beyond its primary purpose.”); *Lear Siegler, Inc. v. Aeroquip Corp.*, 733 F.2d 881, 889 (Fed. Cir. 1984) (finding that one of ordinary skill in the art in reading a reference’s disclosure is not “compelled to adopt every single aspect of its teaching without the exercise of independent judgment”).

We also find unavailing Patent Owner’s arguments relating to Patent Owner’s assertion that “[t]he electrical design and circuitry for the systems of Lys and Grootes vary greatly.” Prelim. Resp. 14; *see also id.* at 14–16 (arguing that Lys and Grootes would be “impractical if not impossible” to combine). These arguments are akin to arguing that Lys and Grootes’s teachings cannot be physically combined, which is an improper focus for determining whether the claim would have been rendered obvious by the prior art as a whole. *See Allied Erecting & Dismantling Co. v. Genesis Attachments, LLC*, 825 F.3d 1373, 1381 (Fed. Cir. 2016) (quoting *In re Sneed*, 710 F.2d 1544, 1550 (Fed. Cir. 1983)); *see also id.* (quoting *In re Etter*, 756 F.2d 852, 859 (Fed. Cir. 1985) (en banc)) (“Etter’s assertions that

Azure cannot be incorporated in Ambrosio are basically irrelevant, the criterion being not whether the references could be physically combined but whether the claimed inventions are rendered obvious by the teachings of the prior art as a whole.”). Rather, at this stage, we find that one of ordinary skill in the art would have “be[en] able to fit the teachings of [Lys and Grootes] . . . together like pieces of a puzzle” because the skilled artisan is “a person of ordinary creativity, not an automaton.” *KSR*, 550 U.S. at 420–21.

In sum, at this stage, we find that the combination of Lys and Grootes teaches “at least first and second current supply circuits coupled to the at least first and second strings of solid state lighting devices, respectively, and configured to supply an on state drive current to a respective one of the first and second strings of solid state lighting devices.” We also find, for purposes of institution, that Petitioner has provided sufficiently articulated reasoning with rational underpinning to support combining Lys and Grootes with a reasonable expectation of success.

4. Pulse Width Modulation Controller

Claim 17 further recites “a pulse width modulation (PWM) controller that is coupled to the first current supply circuit and the second current supply circuit and that is configured to generate, for each of the first current supply circuit and the second current supply circuit, a first PWM control signal and a second PWM control signal that are supplied to the each of the at least first and second strings.” Ex. 1001, 17:27–32. At this stage of the proceeding, we agree with Petitioner and find that the combination of Lys and Grootes teaches this limitation. Pet. 25–28.

In particular, Lys teaches that the “lighting unit 102 is controlled by a control facility 3500,” which “controls the intensity, color, saturation, color temperature, on-off state, brightness, or other feature of light that is produced by the lighting unit 102.” Ex. 1005, 32:6–9. In addition, Lys teaches that “a control facility 3500 may be as simple as a single processor 3600, data storage facility 3700 and drive hardware 3802,” but also “may include more complex drive facilities 3800, including various forms of drive hardware 3802, such as switches, current sinks, voltage regulators, and complex circuits, as well as various methods of driving 4300, including modulation techniques such as pulse-width-modulation . . . and constant current techniques.” *Id.* at 34:23–30.

Lys also teaches that a light “fixture can have narrow bandwidth light sources for multicolor light applications and then can change to a current and PWM control mode to get broad spectra to make good white light or non-white light with broader spectrum color characteristics.” *Id.* at 85:8–11. In particular, Lys teaches the following:

The control facility 3500 can switch between a current-control mode 2502 (which itself could be controlled by a PWM stream) and a separate PWM mode 2504. Such a system can include simultaneous current control via PWM for wavelength and PWM control balanced to produce desired output intensity and color. Fig. 25a shows a schematic diagram with one possible embodiment for creating the two control signals from a controller, such as a microprocessor to control one or more LEDs in a string. Multiple such strings can be used to create a light fixture that can vary in color (HSB) and spectrum based on the current and on-off control.

Id. at 85:17–24. In other words, Lys teaches that a controller creates PWM control signals for current control and for controlling the LED strings. *Id.*; *see also id.* at 79:24–25 (“In an embodiment the LEDs are modulated with

PWM as well as modulating the amplitude of the current driving the LEDs (Pulse Amplitude Modulation, or PAM).”).

Moreover, as we discuss above, Grootes teaches a circuit board having separate current supply circuits for each of three strings of LEDs also mounted on the board, and each current source is controllable. *See supra* Section V.C.3; Ex. 1006 ¶¶ 35–37, 41.

We find that the above discussed teachings of Lys and Grootes teach a PWM controller that is coupled to the current supply circuits, and which is configured to generate for each current supply circuit, first and second PWM control signals that are supplied to the LED strings.

We find unavailing Patent Owner’s argument that Lys’s teaching concerning “a current-control mode 2502 (which itself could be controlled by a PWM stream) and a separate PWM mode 2504” is unclear, and that a reasonable interpretation “is that the current control mode 2502 is controlled by a PWM stream, not that the control facility is controlled by a PWM stream.” Prelim. Resp. 22 (citing Ex. 1005, 83:17–18; Ex. 2001 ¶ 70). Rather, at this stage, we agree with Petitioner as to the meaning of this passage, especially when read as a whole. The parties should consider further developing during trial what this passage would have conveyed to one of ordinary skill in the art.

We also find unavailing Patent Owner’s argument that Lys teaches that “the converter 1908 only takes input from the AC line and the data converter,” and that Lys does not teach that the lighting unit generates and sends a PWM control signal to converter 1908. Prelim. Resp. 22–23 (citing Ex. 1005, 60:18–24, Fig. 17; Ex. 2001 ¶ 71). Lys’s disclosure is not limited to what is illustrated in Figure 17. Rather, Lys teaches that control facility 3500 provides current control for power facility 1800 of which the DC/DC

converter facility 1908 is a part. *See* Ex. 1005, 32:6–12, 34:23–30, 60:13–27, 73:7–13, 85:17–30, Figs. 17, 25a.

We also find unavailing Patent Owner’s argument that “Lys explicitly describes that each light string would have its *own microprocessor*, and therefore each string would have its own *PWM controller*,” and that “Lys only describes one PWM controller generating a signal for one string, not one PWM controller for multiple strings.” Prelim. Resp. 23–24 (citing Ex. 1005, 83:20–24, Fig. 25a; Ex. 2001 ¶ 72). This argument does not account for Grootes’s cited teachings. *See In re Merck*, 800 F.2d at 1097 (“Non-obviousness cannot be established by attacking references individually where the rejection is based upon the teachings of a combination of references”). As we discuss above, we find that Grootes teaches having on a printed circuit board separate current supply circuits for each of a string of LEDs. *See supra* Section V.C.3; Ex. 1006 ¶¶ 35–37, 41, Fig. 4. Thus, we consider how one of ordinary skill in the art would have viewed the combined teachings. *See KSR*, 550 U.S. at 421 (“When there is a design need or market pressure to solve 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 within his or her technical grasp.”).

We also find unavailing Patent Owner’s argument that combining Lys and Grootes’s teachings in the manner Petitioner does would cause potential faults and would perform poorly, if at all. Prelim. Resp. 26–27. We view such arguments as arguing that Lys and Grootes’s teachings cannot be physically combined, which is the incorrect focus. *See Allied Erecting*, 825 F.3d at 1381; *KSR*, 550 U.S. at 420–21.

In sum, at this stage, we find that the combination of Lys and Grootes teaches this limitation.

5. *Summary*

In summary, based on the current record, and for purposes of this institution decision, we determine that Petitioner shows a reasonable likelihood that it would prevail in showing that claim 17 would have been obvious to one of ordinary skill in the art in view of Lys and Grootes.

VI. ALLEGED OBVIOUSNESS OVER LYS, GROOTES, AND XU

Petitioner argues that the combination of Lys, Grootes, and Xu renders claims 18–20 and 22–25 obvious. Pet. 28–41. Petitioner already has demonstrated a reasonable likelihood of success in proving that at least one claim of the ’331 patent would have been obvious. In order to provide guidance to the parties, however, we address the issues in dispute for this ground. *See* Patent Trial and Appeal Board Consolidated Trial Practice Guide November 2019¹¹ (“CTPG”) 6 (“If a trial is instituted, the Board generally will provide analysis of the strengths and weaknesses of all challenges in the petition in order to provide guidance to the parties for the upcoming trial.”).

A. *Summary of Xu*

Xu “relates to a driving device for a light-emitting diode series, and in particular to a driving device for a light-emitting diode series for a backlight module.” Ex. 1008, 5:5–6. Xu describes that the direct current-direct current converter 208 in three examples may also be replaced by other buck converter, boost converter, boost-buck converter, flyback converter or full-bridge converter. *Id.* at 11:17–20. Xu further states that the feed circuit 206 comprises a current-voltage converter 214, and the current-voltage converter 214 is, for example, a resistor R_s . *Id.* at 8:8–11.

¹¹ Available at <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

B. Disputed Issues

1. Combining Xu with Lys and Grootes

Patent Owner argues that combining Xu with Lys and Grootes “would result in a non-functional system.” Prelim. Resp. 27; *see also id.* at 27–29 (arguing specific faults), 31, 33 (making similar arguments for claim 18), 34–35 (making similar arguments for claim 19). We view such arguments as arguing that Lys and Grootes’s teachings cannot be physically combined, which is the incorrect focus. *See Allied Erecting*, 825 F.3d at 1381; *KSR*, 550 U.S. at 420–21.

We also find unavailing Patent Owner’s argument that one of ordinary skill in the art “would not be motivated to combine [the references] since they . . . would not find the combination to be an improvement over any one of the individual systems (*e.g.*, the individual systems described by Xu, Grootes and Lys).” Prelim. Resp. 30 (citing Ex. 2001 ¶ 78), 33–34 (making a similar argument for claim 19). Petitioner is not required to show that the combination would be an improvement, but only that it was a suitable option. *See Intel Corp. v. PACT XPP Schweiz AG*, 61 F.4th 1373, 1381 (Fed. Cir. 2023). Patent Owner’s argument that Lys already includes the PWM supplying constant current to the LEDs is similarly unavailing. Prelim. Resp. 30; *Intel*, 61 F.4th at 1381.

At this stage, we find Petitioner’s proffered motivation that “one of ordinary skill in the art would have been [motivated] to provide a turn-on current with a constant level and achieve a constant color temperature” sufficient. Pet. 29 (citing Ex. 1003 ¶ 88).

2. Claim 18

Claim 18 recites “[t]he lighting system according to claim 17, wherein each of the first and second current supply circuits comprises a variable

voltage boost, constant current power supply circuit configured to operate in continuous current mode.” Ex. 1001, 17:34–38. At this stage, we find Petitioner’s showing for claim 18 sufficient for institution. Pet. 31–33.

At this stage, we find unavailing Patent Owner’s arguments focusing on Lys’s teachings. Prelim. Resp. 32. These arguments do not account for Xu’s teachings cited by Petitioner. Pet. 31–33. The relevant inquiry is not as to Lys alone, but rather to whether the claimed subject matter would have been obvious to those of ordinary skill in the art in light of the combined teachings of Xu, Lys, and Grootes. *See In re Keller*, 642 F.2d 413, 425 (CCPA 1981); *In re Merck*, 800 F.2d at 1097.

3. Claim 19

Claim 19 recites “[t]he lighting system according to claim 18, wherein each of the first and second current supply circuits comprises: a temperature sensor that is configured to generate a sensor output signal that the PWM controller uses to generate the first PWM signal or the second PWM signal, and a sense resistor that is coupled to an output terminal of the current supply circuit and that is configured to provide a feedback signal to the PWM controller.” Ex. 1001, 17:39–18:3. At this stage, we find Petitioner’s showing for claim 19 sufficient for institution. Pet. 33–36.

At this stage, we find unavailing Patent Owner’s argument that “Petitioner fails to show that a signal source 8400 or temperature sensor is implemented in the PFC/DC to DC converter 1908 of Lys,” and that “Lys doesn’t teach that the PFC/DC to DC conversion elements utilize a temperature sensor to send a temperature signal to the lighting unit or a PWM controller.” Prelim. Resp. 34; *see also id.* at 36 (making a similar argument for a sense resistor). These arguments do not account for Lys’s other teachings regarding other embodiments, nor how one of ordinary skill

in the art would have found it obvious to combine the teachings. Moreover, Lys expressly states that “[w]hile some examples presented [t]herein involve specific combinations of functions or structural elements, it should be understood that those functions and elements may be combined in other ways according to [Lys’s] invention to accomplish the same or different objectives,” and that “acts, elements, and features discussed in connection with one embodiment are not intended to be excluded from similar or other roles in other embodiments.” Ex. 1005, 148:8–13. We also note that this asserted ground is based on obviousness, not anticipation.

At this stage, we also find unavailing Patent Owner’s argument that “Lys does not describe the signal source 8400 as comprising a temperature sensor.” Prelim. Resp. 35. Rather, as Petitioner points out, Lys teaches that “[s]ome examples of a signal source 8400 that may be employed in, or used in connection with, the lighting unit 102 . . . include any of a variety of sensors 8402 or transducers that generate one or more signals in response to some stimulus,” and that “[e]xamples of such sensors include, but are not limited to, various types of environmental condition sensors, such as thermally sensitive (e.g., temperature, infrared) sensors.” Ex. 1005, 135:4–8; Pet. 33–34 (citing same).

4. Claim 20

Claim 20 recites “[t]he lighting system according to claim 17, wherein each of the first and second current supply circuits comprises a sense resistor that is coupled to an output terminal of the respective one of the first and second current supply circuits and that is coupled to a feedback input to provide the feedback signal to provide closed loop control.” Ex. 1001, 18:4–9. At this stage, we find Petitioner’s showing for claim 20 sufficient for institution. Pet. 36–37.

At this stage, we find unavailing Patent Owner’s argument that Lys does not teach any feedback control for the PFC/DC to DC converter 1908. Prelim. Resp. 36–37 (citing Ex. 2001 ¶ 83). Rather, as Petitioner argues, Lys teaches that “[c]urrent control can be provided with various embodiments, including feedback loops, such as using a light sensor as a signal source 8400” Ex. 1005, 85:1–4, 148:8–13 (teachings apply across embodiments); Pet. 36–37.

At this stage, we also find unavailing Patent Owner’s arguments that “Xu does not teach first and second current supply circuits coupled to the feedback input,” but instead, “only describes one feedback loop.” Prelim. Resp. 37 (citing Ex. 2001 ¶ 83). Patent Owner also argues that “Xu does not describe a sense resistor coupled to the output of a current control supply, but a sense resistor coupled to the cathode side of the LEDs.” *Id.* These arguments do not account for Lys’s teachings. *See In re Merck*, 800 F.2d at 1097. Rather, Petitioner relies on the combined teachings of Lys and Xu, and argues that one of ordinary skill in the art would have been motivated to combine Xu to the Lys-Grootes combination in order to provide greater control of the overall light output, especially the constant color temperature. Pet. 34–37.

5. *Claims 22–25*

At this stage, Patent Owner does not address separately Petitioner’s arguments and evidence as to how the combination of Lys, Grootes, and Xu teaches claims 22–25. *See* Prelim. Resp. 37. We find Petitioner’s showing for these claims sufficient for institution. Pet. 37–41.

6. *Summary*

We have reviewed the parties’ arguments regarding the combination of Lys, Grootes, and Xu rendering claims 18–20 and 22–25 obvious, and, on

the current record, we find Petitioner’s arguments persuasive for purposes of institution.

VII. ALLEGED OBVIOUSNESS OVER LYS, GROOTES,
XU, AND BLUM

Petitioner argues that the combination of Lys, Grootes, Xu, and Blum renders claim 21 obvious. Pet. 42–45. At this stage in the proceeding, Patent Owner does not address separately Petitioner’s arguments and evidence as to how this combination teaches claim 21. *See* Prelim. Resp. 37–38. We have reviewed Petitioner’s arguments and evidence regarding claim 21 for this ground, and, on the current record, we find them persuasive for purposes of institution.

VIII. ALLEGED OBVIOUSNESS OVER MUELLER AND GROOTES

Petitioner argues that the combination of Mueller and Grootes renders claim 17 obvious. Pet. 45–55. In order to provide guidance to the parties, we address the disputed issues for this ground. CTPG 6.

A. Summary of Mueller

Mueller relates to providing controlled lighting, including “providing both white and non-white colored lighting, including color temperature controlled lighting.” Ex. 1009, code (57). More specifically, Mueller provides “optical facilities for modifying light from a lighting unit, such as an LED-based lighting unit.” *Id.* Mueller also provides “for lighting control, including methods to assist lighting designers and installers to improve the quality of lighting in environments.” *Id.* Mueller also provides for intelligent dimmers, switches, sockets and fixtures, as well as facilities for programming and using them. *Id.* Mueller also teaches “various sensor-feedback applications of lighting technology, including sensor-feedback involving light sensors and forward voltage sensors.” *Id.*

B. Disputed Issues

1. Combining Mueller and Grootes

At this stage, we find unavailing Patent Owner’s argument that “it would be impractical if not impossible to modify Mueller to include Grootes’s independent current source for each string of LEDs.” Prelim. Resp. 41 (citing Ex. 2001 ¶ 86); *see also id.* at 41–42 (arguing that specific aspects of Mueller’s lighting unit preclude independent current sources). We view such arguments as arguing that Mueller and Grootes’s teachings cannot be physically combined, which is the incorrect focus. *See Allied Erecting*, 825 F.3d at 1381; *KSR*, 550 U.S. at 420–21.

We also find unavailing Patent Owner’s argument that “Mueller is directed towards a completely different purpose than that of the ’331 patent and as such employs a number of components that are extraneous to the purpose of the ’331 patent.” Prelim. Resp. 38; *see In re Mouttet*, 686 F.3d at 1331 (“A reference may be read for all that it teaches, including uses beyond its primary purpose.”); *Lear Siegler*, 733 F.2d at 889.

We also find unavailing Patent Owner’s arguments concerning Mueller and Grootes not being in the same field of endeavor. Prelim. Resp. 39–40. The proper focus is whether Mueller and Grootes are within the field of endeavor of the ’331 patent. We agree with Petitioner that each of Mueller and Grootes relate to setting the voltages and currents for LED strings, which corresponds to the ’331 patent’s broad field of endeavor of adjustable solid state lighting panels. Pet. 45 (citing Ex. 1003 ¶ 99); Ex. 1001, 1:28–31. We note that Patent Owner appears to argue that the ’331 patent’s field of endeavor is backlighting an LCD display. Prelim. Resp. 39 (citing Ex. 1001, 1:48–53). We disagree that it is so narrow. Rather, as we describe above, the ’331 patent also relates to lighting panels

for “use[] as direct illumination sources, for example, in architectural and/or accent lighting.” *Id.* at 1:36–39; *supra* Section I.C (providing a summary of the ’331 patent).

At this stage, we find Petitioner’s proffered motivation that “one of ordinary skill in the art would have been [motivated] to provide a pulse current with a constant level to achieve color and brightness uniformity” sufficient. Pet. 46 (citing Ex. 1003 ¶ 100).

2. *At Least First and Second Current Supply Circuits*

Claim 17 recites “at least first and second current supply circuits coupled to the at least first and second strings of solid state lighting devices, respectively, and configured to supply an on state drive current to a respective one of the first and second strings of solid state lighting devices.” Ex. 1001, 17:22–26.

Petitioner argues that one of ordinary skill in the art would have recognized that each of Mueller’s lighting units includes its own power supply because each lighting unit has its own light unit controller, as shown in Mueller’s Fig. 2. Pet. 51 (citing Ex. 1003 ¶ 59). At this stage, we agree with Patent Owner that such an inference is unfounded. Prelim. Resp. 43. Thus, we agree with Patent Owner and find that Mueller does not teach that each of Mueller’s lighting units includes its own power supply. Again, however, Petitioner also relies on Grootes’s teachings for this issue.

In addition, Patent Owner argues that Petitioner incorrectly identifies Mueller’s lighting unit controllers as the claimed current supply circuits because Mueller does not teach that the lighting unit controllers provide power to the lighting units. *Id.* at 43–44 (citing Ex. 1009 ¶ 190), 46. At this stage, we agree with Patent Owner. Thus, we question whether Petitioner’s grounds based on Mueller show unpatentability of the challenged claims.

We find unavailing Patent Owner’s argument that “Petitioner does not explain at all how Mueller would be combined with Grootes to satisfy this element because such a combination would be impractical, if not impossible.” *Id.* at 47 (citing Ex. 2001 ¶ 93). Petitioner argues that Grootes teaches that the cathode of each string is connected to its own current source 40, 41, and 42, and that “[e]ach current source 40–42 is controllable to control the brightness of its associated LEDs to achieve the desired white point.” Pet. 52 (citing Ex. 1006 ¶¶ 35–37, 41, Fig. 4; Ex. 1003 ¶ 60). And Petitioner argues that Mueller teaches that each lighting unit controller “is responsible for communicating with and generally controlling one or more lighting units 100 coupled to it.” *Id.* at 51 (quoting Ex. 1009 ¶ 189). Petitioner concludes that “it would have been obvious to modify Mueller to include Grootes’s individual current source control for each string to achieve the desired benefit better color and brightness uniformity, which are characteristics both Grootes and Mueller identify.” *Id.* at 52.

At this stage, we find that Petitioner sufficiently explains its proposed combination, and that Petitioner’s combination would have been obvious to one of ordinary skill in the art. *See Leapfrog*, 485 F.3d at 1162 (finding that obviousness was supported because there was no evidence that making the combination was uniquely challenging or difficult for one of ordinary skill in the art); *see also KSR*, 550 U.S. at 420–21 (finding a person with ordinary skill in the art is “a person of ordinary creativity, not an automaton,” and “in many cases . . . will be able to fit the teachings of multiple patents together like pieces of a puzzle”). The parties should consider further developing this issue during trial, in accordance with our Rules.

3. *Pulse Width Modulation Controller*

Claim 17 recites “a pulse width modulation (PWM) controller that is coupled to the first current supply circuit and the second current supply circuit and that is configured to generate, for each of the first current supply circuit and the second current supply circuit, a first PWM control signal and a second PWM control signal that are supplied to the each of the at least first and second strings.” Ex. 1001, 17:27–33.

The parties dispute what Mueller’s Figure 69, and its accompanying text disclose. Figure 69 is shown below.

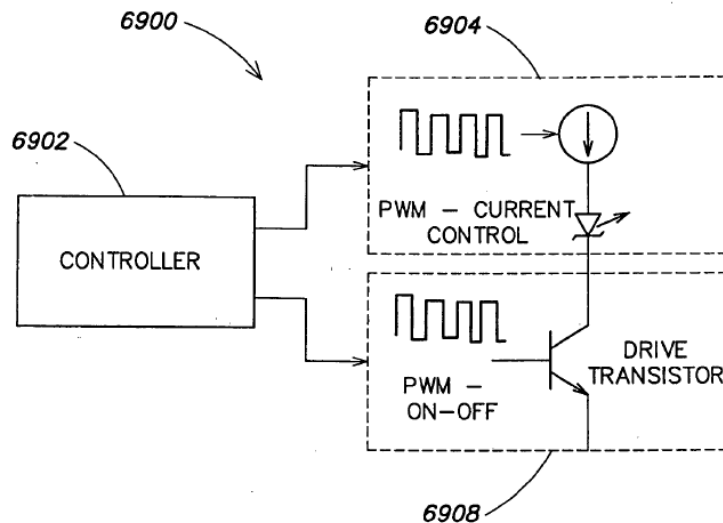


FIG. 69

Figure 69 “is a schematic diagram of a controller that can offer both current control and PWM control.” Ex. 1009 ¶ 150. Figure 69’s accompanying text includes the following:

Referring to FIG. 69, a control system 6900 embodiment can use a variety of well-known methods. Thus, the control facility 6902 can switch between a current-control mode 6904 (which itself could be controlled by a PWM stream) and a separate PWM mode 6908. Such a system can include simultaneous current control via PWM for wavelength and PWM

control balanced to produce desired output intensity and color. FIG. 69 shows a schematic diagram 6900 with one possible embodiment for creating the two control signals from a controller, such as a microprocessor to control one or more LEDs in a string. Multiple such strings can be used to create a light fixture that can vary in color (HSB) and spectrum based on the current and on-off control.

Id. ¶ 315.

Petitioner argues that this disclosure from Mueller teaches “controlling multiple LED strings, with each LED string receiving two PWM control signals (one for current control to adjust the wavelength, and the other for on-off control to adjust output intensity).” Pet. 54–55 (citing Ex. 1009 ¶ 315). Patent Owner argues that this passage instead teaches “really just one signal that may be modulated by the PWM controller.” Prelim. Resp. 49–50 (citing Ex. 1009 ¶ 315; Ex. 2001 ¶ 95). According to Patent Owner, “[t]his is not the same as two distinct signals and cannot drive two separate strings of LEDs.” *Id.* at 50 (citing Ex. 2001 ¶ 95). Patent Owner adds that its argument is supported by Figure 69, which shows that “[t]he two blocks are linked, [and] the signal is passed between current controller 6904 and PWM controller 6908.” *Id.*

At this stage, we agree with Petitioner’s reading of this passage. Mueller expressly teaches providing “simultaneous current control via PWM for wavelength and PWM control balanced to produce desired output intensity and color,” and creating “two control signals from a controller, such as a microprocessor to control one or more LEDs in a string.” Ex. 1009 ¶ 315. Moreover, we view the passage as teaching that the two modes can either be switched between or both be used simultaneously. *Id.*

In addition, we find unavailing Patent Owner’s arguments that combining Mueller and Grootes’s teachings “would introduce a potential fault point in the system,” cause voltage spikes, or “would perform poorly.” Prelim. Resp. 51–52. We view such arguments as arguing that Lys and Grootes’s teachings cannot be physically combined, which is the incorrect focus. *See Allied Erecting*, 825 F.3d at 1381; *KSR*, 550 U.S. at 420–21.

IX. ALLEGED OBVIOUSNESS OVER MUELLER, GROOTES, AND XU

Petitioner argues that the combination of Mueller, Grootes, and Xu renders claims 18 and 20 obvious. Pet. 56–61. At this stage, Patent Owner’s arguments for this ground are the same as, or similar to, arguments Patent Owner makes with respect to other grounds discussed above. *See* Prelim. Resp. 52–57. Accordingly, the guidance we provide above also applies here.

X. ALLEGED OBVIOUSNESS OVER MUELLER, GROOTES, XU, AND BLUM

Petitioner argues that the combination of Mueller, Grootes, Xu, and Blum renders claim 21 obvious. Pet. 62–65. At this stage in the proceeding, Patent Owner does not address separately Petitioner’s arguments and evidence as to how this combination teaches claim 21. *See* Prelim. Resp. 58. Accordingly, the guidance we provide above also applies here.

XI. CONCLUSION

For the foregoing reasons, we determine that Petitioner has demonstrated that there is a reasonable likelihood that it would prevail in proving the unpatentability of at least one of the challenged claims of the ’331 patent. We thus institute an *inter partes* review of all of the challenged claims of the ’331 patent on all grounds asserted in the Petition. *See* 37 C.F.R. § 42.108(a).

Any findings or conclusions in this Decision are made only for the purposes of institution and are not dispositive of any issue. We have not made a final determination with respect to the patentability of any challenged claim. Our final determination will be based on the record as fully developed during trial, including any evidence or argument timely presented by the parties under our Rules.

XII. ORDER

In consideration of the foregoing, it is hereby

ORDERED that, pursuant to 35 U.S.C. § 314(a), an *inter partes* review of the '331 patent is instituted on all of the challenged claims and all grounds asserted in the Petition; and

FURTHER ORDERED that pursuant to 35 U.S.C. § 314(c) and 37 C.F.R. § 42.4, notice is hereby given of the institution of a trial; the trial commences on the entry date of this Decision.

IPR2023-01401
Patent 8,941,331 B2

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