

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ADVANCED LIGHTING CONCEPTS LLC,
Petitioner,

v.

MATE LLC,
Patent Owner.

IPR2023-01266
Patent 8,957,601 B2

Before KRISTINA M. KALAN, KIMBERLY J. McGRAW, and
JAMES J. MAYBERRY, *Administrative Patent Judges*.

McGRAW, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. Background

Advanced Lighting Concepts LLC (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1–5, 8, 10–12, 14, 15, and 17 of U.S. Patent No. 8,957,601 B2 (Ex. 1001, “the ‘601 patent”). Paper 2 (“Pet.”). Patent Owner, mate LLC, filed a Waiver of Preliminary Response. Paper 7.

The standard for institution is set forth in 35 U.S.C. § 314, which provides that an *inter partes* review may not be instituted unless the information presented in the Petition 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 (2018); *see also* 37 C.F.R. § 42.4(a) (“The Board institutes the trial on behalf of the Director.”).

For the reasons that follow, we do not institute *inter partes* review of the challenged claims of the ‘601 patent.

B. Related Proceedings

The parties identify the following district court litigation as a related matter: *mate, LLC v. Advanced Lighting Concepts LLC (dba Environmental Lights)*, 3:22-cv-01095-CAB-DEB (S.D. Cal.). Pet. 1–2; Paper 3, 2 (Patent Owner’s Mandatory Notices). The parties also identify the following *inter partes* review proceedings for patents involved in the district court litigation: IPR2023-01257 (8,525,446); IPR2023-01258 (9,049,759); IPR2023-01259 (9,591,713); IPR2023-01264 (9,078,310); and IPR2023-01265 (9,320,093). *Id.*

C. Real Party-in-Interest

Petitioner identifies Advanced Lighting Concepts LLC as the real party-in-interest. Pet. 1. Patent Owner identifies mate LLC as the real party-in-interest. Paper 3, 2.

D. The '601 Patent

The '601 patent is titled “Configurable LED Driver/Dimmer for Solid State Lighting Applications.” Ex. 1001, code (54). The '601 patent was filed as U.S. application 13/466,509 (filed May 8, 2012), which claims priority to U.S. application 13/059,336 filed as Patent Cooperation Treaty (PCT) application PCT/CA2009/001295 (filed September 17, 2009), which claims priority to U.S. provisional application 61/097,963 (filed September 18, 2008). *Id.* at codes (21), (22), (60), (63), 1:8–12.

The invention provides a light emitting diode (“LED”) “driver/dimmer” for solid state lighting (SSL). *Id.* at 1:38–39. More particularly, the invention provides a configurable LED driver/dimmer at times referenced as more simply a “dimmer” and “function[ing] as either a driver, a dimmer or both.” *Id.* at 3:54–59.

Figure 12 is a block diagram illustrating a “configurable LED dimmer implemented in a low voltage DC distribution LED lighting system.”

Id. at 3:26–28, 10:39–41.

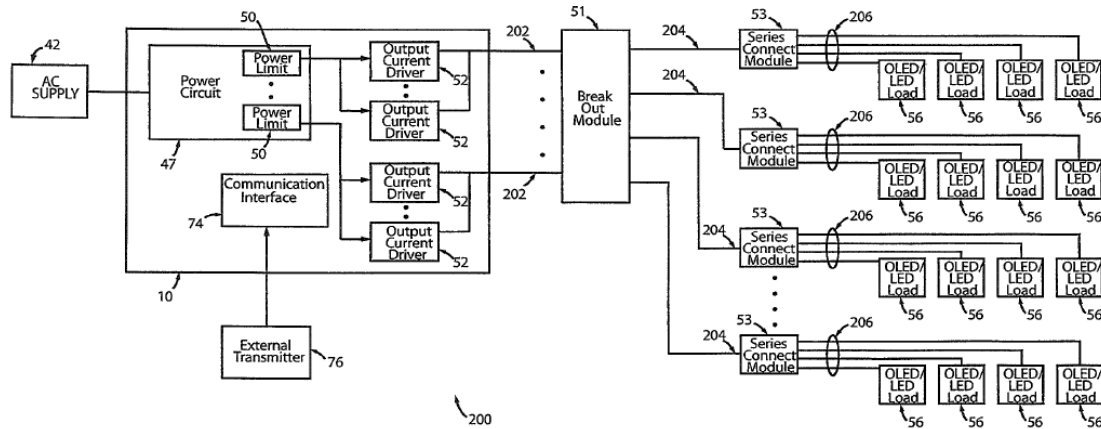


Figure 12 illustrates low voltage DC distribution LED lighting system 200, that includes LED dimmer 10, which receives power from AC supply 42; LED dimmer 10 is connected to at least one break-out module 51, which is in turn connected to a set of series connect modules 53 by means of communications cabling 204. *Id.* at 10:47–51. The “series connect modules are connected to individual Organic Light Emitting Diodes (OLED)/Light Emitting Diodes (LED) loads 56, or LED loads, via communications cabling 206.” *Id.* at 10:51–55.

Dimmer 10 comprises power circuit 47, which comprises power limit 50 and DC to DC converter 46 (not shown in Figure 12). *Id.* at 10:56–59; *see also* Fig. 3 (depicting power circuit 47 in greater detail). Power limit 50 limits the amount of power supplied to a set of output current drivers under normal operation or in the event of a single component failure. *See id.* at 11:4–9.

Dimmer 10, via output current drivers 52, connects into at least one break-out module 51 via cabling 202 as a set of output channels. *Id.* at

11:45–47. The breakout module splits the set of channels into individual channels or into a predetermined number of channels depending on the required configuration of the lighting system. *Id.* at 11:47–50. For example, in one configuration, a feed of 12 channels in 4 groups of 3 is connected into breakout module 51. *See id.* at 11:55–56. The breakout module “regroups the channels into groups of 2 for connection to the series connect module 53 using communications cabling 204 with 4 conductors or 2 twisted pairs of conductors.” *Id.* at 11:56–60. “This may be seen as the output of the breakout module 51 and represents a feed out of 12 channels with 6 groups of 2 channels.” *Id.* at 11:60–62.

E. Challenged Claims

The Petition challenges independent claims 1 and 15 and dependent claims 2–5, 8, 10–12, 14, and 17. Pet. 1. Claim 1 recites:

1. [p] Apparatus for configuring and powering a set of light fixture loads in a light emitting diode (LED) low voltage distribution system comprising:
 - 1[a] an LED driver including a power circuit having at least one power limit and a set of output current drivers connected to the at least one power limit in the power circuit; and
 - 1[b] a break-out module electrically connected to an output of the LED driver and the set of light fixture loads, the break-out module including power connectors;
 - 1[c] wherein the break-out module receives power from the LED driver via a set of input channels and delivers power to the set of light fixture loads via a set of output channels; and
 - 1[d] splits the set of input channels into individual output channels;
 - 1[e] wherein the LED driver is located remotely from the set of light fixture loads.

Ex. 1001, 14:48–64 (bracketed letters added to show Petitioner’s designations).

Claim 15 is similar to claim 1 except, instead of requiring that the break-out module “splits the set of input channels into individual output channels” as recited in claim element 1(d), claim 15 recites “wherein the break-out module regroups the number of output channels from the number of input channels.” Ex. 1001, 16:16–17.

F. Asserted Grounds and Prior Art

Petitioner asserts the following grounds of unpatentability:

Claims Challenged	35 U.S.C. §¹	Reference(s)
1, 10, 11, 14, 15	102(a)	Peng ²
1, 11, 12, 15, 17	102(a)	Leong ³
2–5, 8, 10	103(a)	Peng or Leong in view of Bornhurst ⁴
12	103(a)	Peng or Leong in view of Slot ⁵
1	102(a)	Shteynberg ⁶

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103. Because the ’601 patent claims benefits of priority applications antedating the March 16, 2013 effective date of the applicable AIA amendments, we refer to the pre-AIA versions of §§ 102 and 103. We note, however, that our analysis does not depend on whether the claims should be evaluated under the AIA statute or pre-AIA statute.

² US 2007/0267984 A1, published November 22, 2007 (Ex. 1005).

³ US 2005/0162101 A1, published July 28, 2005 (Ex. 1006).

⁴ US 5,640,061, issued June 17, 1997 (Ex. 1007).

⁵ US 2008/0191642 A1, published August 14, 2008 (Ex. 1008).

⁶ US 7,902,769 B2, issued March 8, 2011 (Ex. 1013).

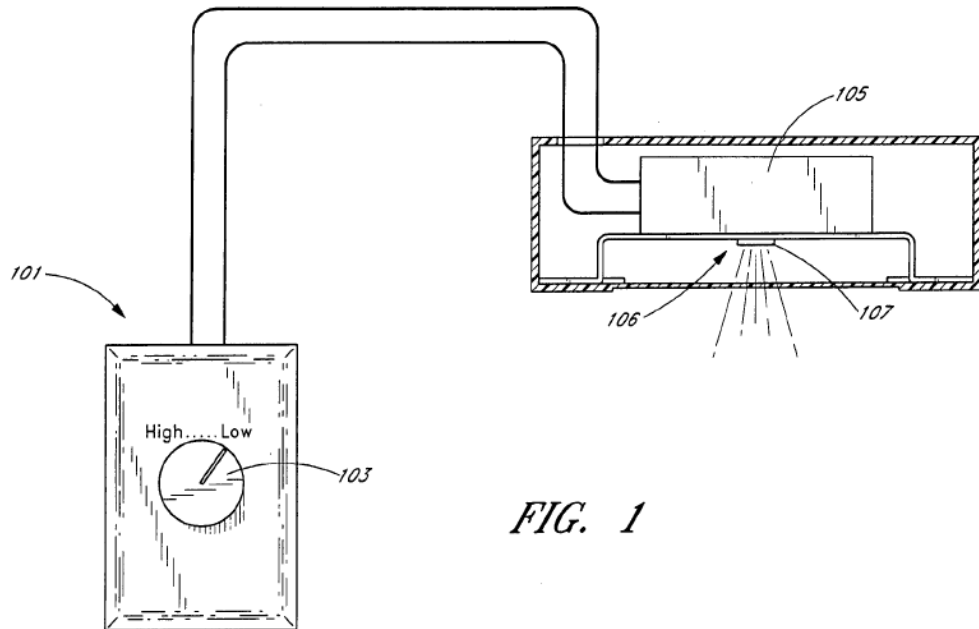
Petitioner relies on the Declaration of Joseph McAlexander in support of its arguments. Ex. 1002;⁷ *see also* Ex. 1003 (providing Mr. McAlexander's Curriculum Vitae).

The following subsections provide brief descriptions of the asserted prior art references.

1. *Peng (Ex. 1005)*

Peng, titled "System and Method for Selectively Dimming an LED," is a U.S. Patent Application Publication dated November 22, 2007. Ex. 1005, codes (43), (54). Peng describes its invention as relating "to a system and method for dimming a light emitting diode (LED)" and, "[m]ore particularly, . . . to an isolated dimmable LED ballast driver." *Id.* ¶ 2.

Peng's Figure 1 is reproduced below.



⁷ We note that the cover page of Exhibit 1002 recites IPR2023-01257, not IPR2023-01266. We assume this to be a typographical error.

Figure 1 depicts one embodiment of a phase controlled dimmer-LED lighting scheme having a phase controlled dimmer (101) operably connected to LED ballast 105, which is operably connected to lighting unit 106 having one or more LEDs 107. Ex. 1005 ¶ 38. LED ballast circuit 105 is responsive to the output of phase controlled dimmer 101. *Id.* The output of the phase controlled dimmer is responsive to lever 103 position. *Id.*

Peng Figure 3, reproduced below, is a circuit diagram that illustrates one embodiment of an LED ballast circuit. *Id.* ¶ 41.

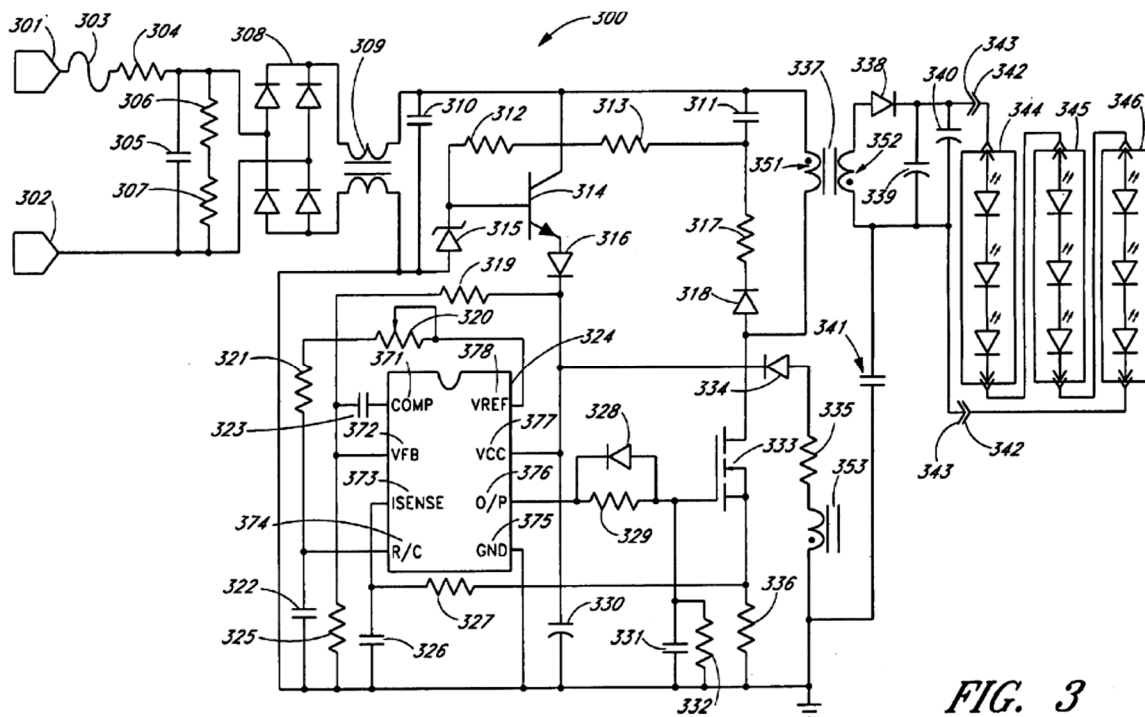


FIG. 3

Figure 3, reproduced above, depicts LED ballast circuit 300 having AC inputs (also called terminals) 301, 302. *Id.* ¶¶ 41, 42. Also depicted is a lighting unit comprising LED light modules 344, 345, 346, each of which comprises three LEDs arranged in series. *Id.* The phase controlled dimmer (not shown) supplies power (voltage) across terminals 301, 302. *Id.* ¶ 42. The supplied power is carried through impedance matching resistor 304, diode-bridge 308, EMI inductor 309, and high frequency filter capacitor 310.

Id. The power is rectified by the diode-bridge 308 and becomes a pulsating DC voltage on filter capacitor 310. *Id.* The power then charges storage capacitor 330 that provides a substantially constant DC voltage to integrated circuit (IC) 324. *Id.* Resistor 335 and diode 334 provide a secondary power supply to capacitor 330 through second secondary winding 353 to limit the inrush current. *Id.*

IC 324 is a standard current mode control pulse-width modulator (PWM) providing a constant frequency and constant duty-cycle gate drive signal to MOSFET 333. *Id.* ¶ 43. A reference voltage level is output by VREF output 378. *Id.* The duty cycle is output by O/P output 376. *Id.* When the duty cycle output is high, MOSFET 333 is gated on and power flows from rectified power on capacitor 310 through primary winding 351 of transformer 337. *Id.* When the duty cycle output is low, MOSFET 333 is gated off and power is not supplied to transformer 337. *Id.*

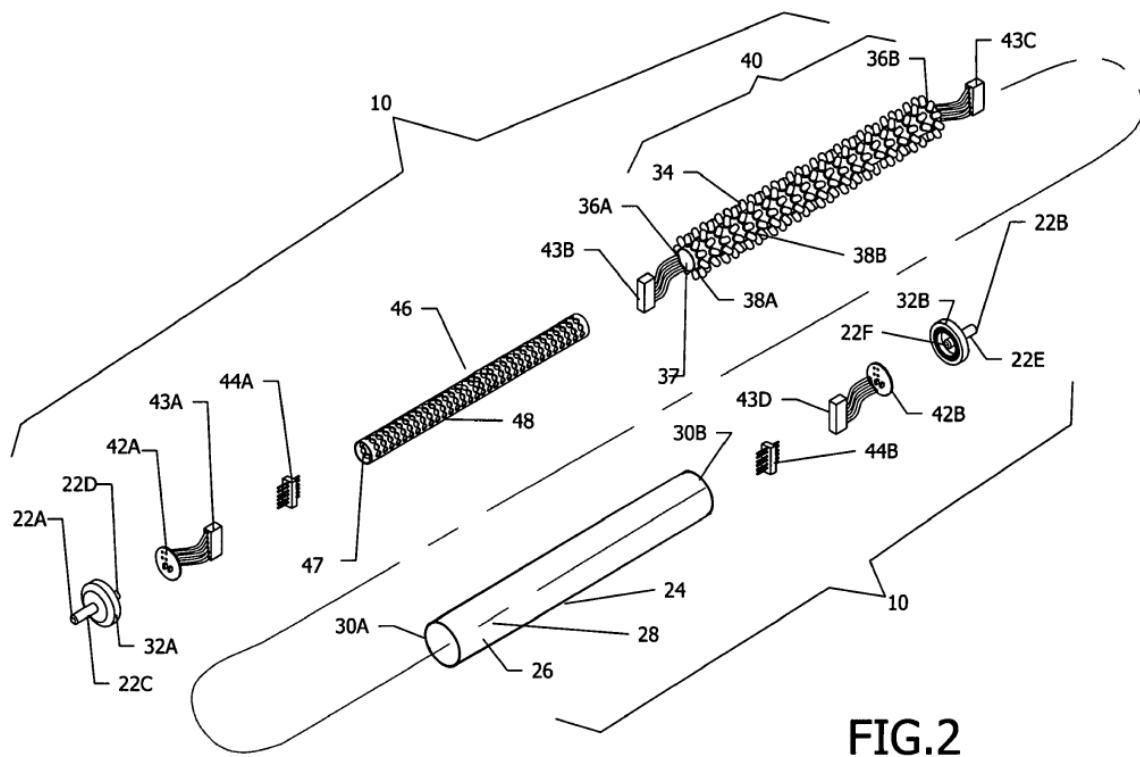
Current sense ISENSE 373 pin receives an input for monitoring current sense resistor 336. *Id.* ¶¶ 43, 45. Resistor 336 ensures MOSFET 333 will stay off before IC 324 is energized. *Id.* ¶ 45. Resistor 336 senses the MOSFET 333 switching current and provides a feedback to current sense pin ISENSE 373. *Id.*

An automatic LED over-voltage protection feature is provided. *Id.* ¶ 52. When the voltage across primary windings 351 rises—and thus across the LEDs rises—the voltage increase is reflected across second secondary windings 353. *Id.* ¶ 53. Voltage across capacitor 330 increases proportionally with second secondary winding 353 output voltage. *Id.* Two resistors 319, 325 divide this voltage and, if the resulting divided voltage on pin VFB 372 exceeds the internal reference voltage, IC 324 reduces

VCOMP 371 voltage output to thereby reduce the duty cycle and further thereby reduces the amount of time MOSFET 333 is gated on. *Id.* The duty cycle is adjusted until the divided voltage is equal to or less than the internal reference voltage. *Id.*

2. *Leong (Ex. 1006)*

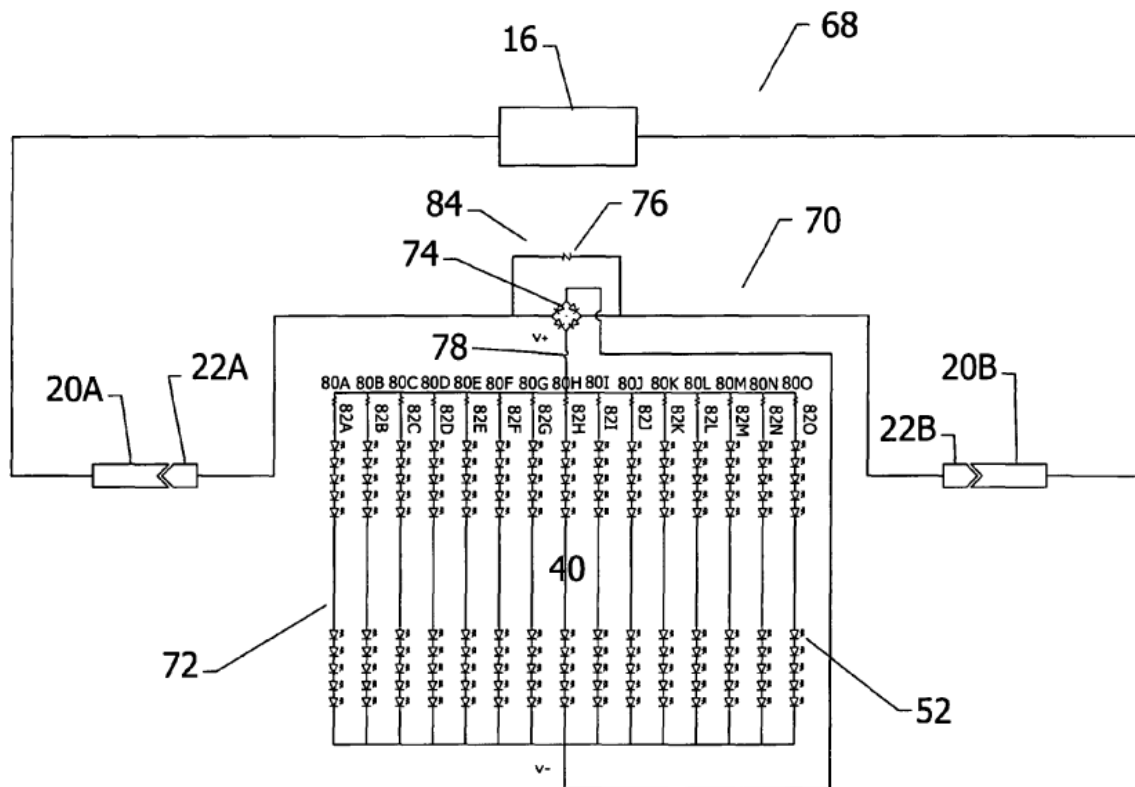
Leong, titled “Power Controls for Tube Mounted LEDs With Ballast,” is a U.S. Patent Application Publication dated July 28, 2005. Ex. 1006, codes (43), (54). Leong states that the invention relates “to tubular lamps having LED arrays with ballasts.” *Id.* ¶ 2. Figure 2, reproduced below, illustrates “an exploded perspective view of the LED retrofit lamp.” *Id.* ¶¶ 85, 22.



LED lamp 10 includes translucent housing 24, particularly configured as a tubular wall 26 circular cross-section 26 taken transverse to center line 28. *Id.* ¶ 246. LED lamp 10 also has an electrical LED array circuit board

34 that can be cylindrical. *Id.* LED array circuit board 34 is arranged within housing 24 and has bookending circuit-board circular ends 36A, 36B, which connect via six-pin connections 43A–D to respective circuit boards 42A, 42B, which connect to respective lamp base end caps 32A, 32B, which bookend-cap housing 24 and have respective external-mounted electrical contact pins 22A, 22B that insert into respective ballast electrical socket contacts 20A, 20B (not shown) supplying electrical power/connection from a ballast assembly 16 (not shown). *Id.* ¶¶ 246–247.

Figure 4, reproduced below, illustrates an “overall electrical circuit” for LED lamp 10. *Id.* ¶ 88.



In Figure 4, the total LED circuitry includes two assemblies—(i) existing ballast assembly circuitry 68 providing a voltage supply with fixed current limit across ballast socket electrical contacts 20A, 20B and (ii) LED

circuitry 70 including LED array 72 and integral electronics 84. *Id.* ¶ 250. LED circuitry provides electrical circuits for LED lighting element array 40. *Id.* When electrical power is applied, ballast circuitry 68 provides either an AC or DC voltage with a fixed current limit across ballast socket electrical contacts 20A and 20B, which is conducted through ED circuitry 70 by way of single contact pins 22A and 22B to a voltage input a bridge rectifier 74. *Id.* Voltage suppressor 76 is used to protect LED lighting element array 40 and other electronic components, primarily including LEDs 52, by limiting the initial high voltage generated by ballast circuitry 68 to a safe and workable voltage. *Id.* ¶ 251. LED array 72 includes fifteen parallel electrical strings 80A–80O all in parallel relationship with all LEDs 52 within each string being wired in serial. *Id.* ¶ 254.

Leong Figure 77, reproduced below, is a schematic block diagram depicting network 1116 of two LED lamps 1116A and 1116B. *See id.* ¶ 513.

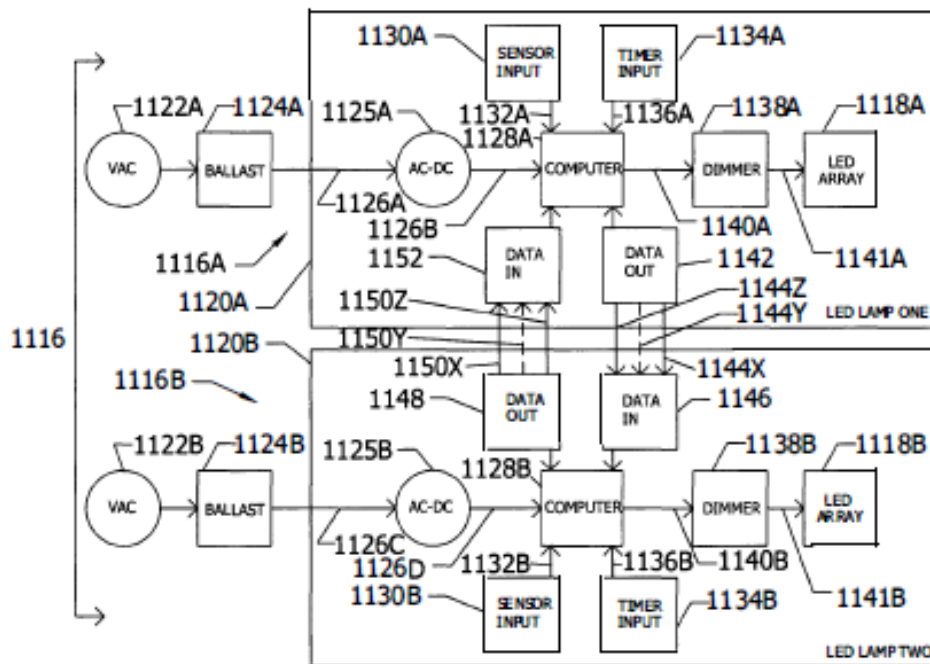


FIG. 77

Figure 77 depicts, *inter alia*, VAC power supply 1122A, ballast 1124A, AC-DC converter 1125A, computer 1128A, dimmer 1138A, and LED array 1118A. *Id.* ¶ 513. LED lamp 1116A (LED lamp one shown on top) includes LED array 1118A positioned in a translucent tube 1120A that is connected to a power supply comprising source of VAC power 1122A electrically connected to ballast 1124A, which is external to tube 1120A. *Id.*

3. *Shteynberg (Ex. 1013)*

Shteynberg is a U.S. Patent titled “Current Regulator for Modulating Brightness Levels of Solid State Lighting,” that issued from an application filed January 19, 2007. Ex. 1005, codes (22), (54). The disclosed “field” describes the invention as “related to power conversion, and more specifically, to a system, apparatus and method for supplying power to solid state lighting devices, such as for providing power to light emitting diodes (‘LEDs’) and LEDs integrated with digital controllers or processors.”

Id. at 1:18–22. The disclosed “background” describes the invention as providing “an LED driver circuit . . . [operated by] a typical or standard dimmer switch of the existing lighting infrastructure.” *Id.* at 4:26–28.

Figure 7, reproduced below, illustrates “a block diagram of an exemplary second embodiment of a current regulator (or converter).”

Id. at 7:29–31.

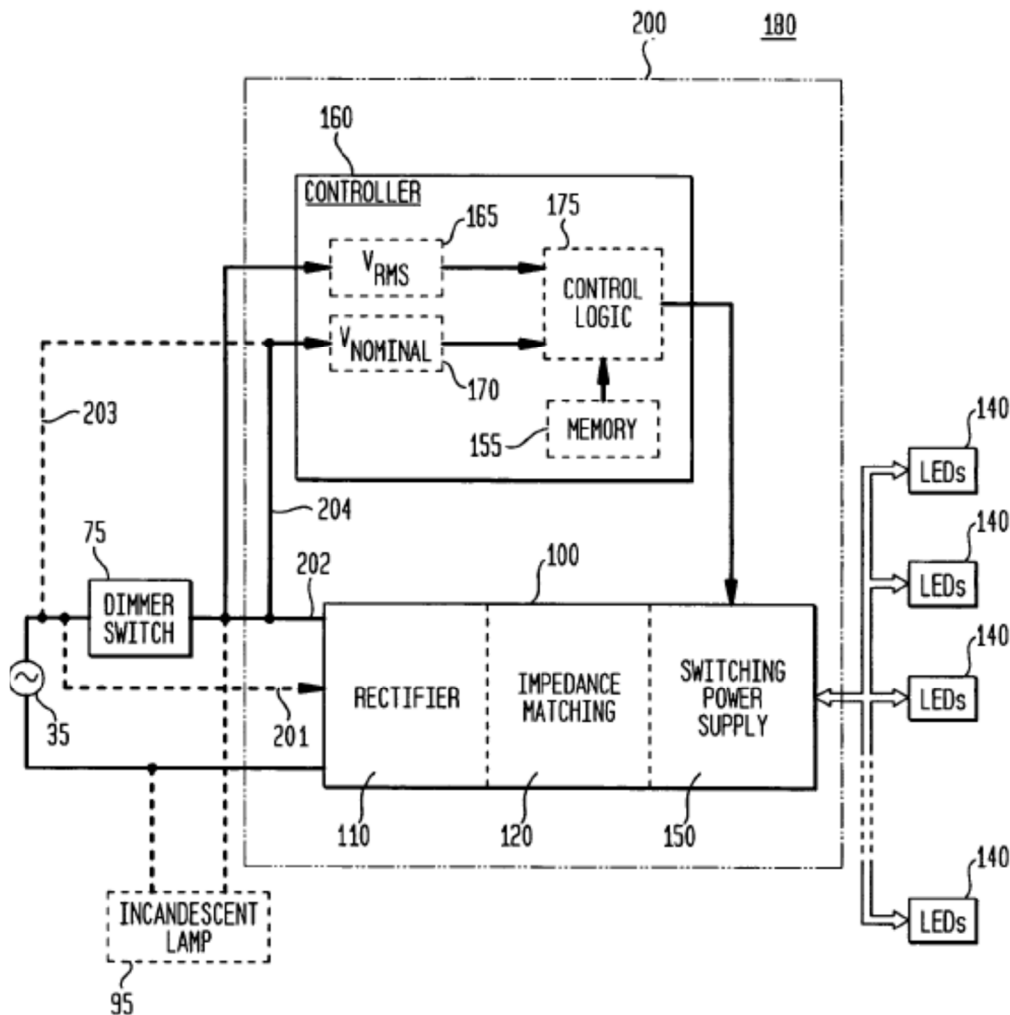


Figure 7 is a block diagram of a second embodiment of a current regulator (or converter) 200. *Id.* at 9:3–5. Current regulator 200 comprises, *inter alia*, switching power supply 150 and controller 160 coupled to receive

an output from dimmer switch 75. *Id.* at 9:5–7. Regulator 200 provides power to LEDs 140. *Id.* at 9:9–10.

II. PRELIMINARY MATTERS

A. *Level of Ordinary Skill in the Art*

The level of skill in the art is “a prism or lens” through which we view the prior art and the claimed invention. *Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). Petitioner’s declarant, Joseph McAlexander, testifies that a person having ordinary skill in the art (“POSITA”) to which the ’601 patent pertains, would have “at least a bachelor’s degree in electrical engineering, computer science, or a related field and significant experience with power regulation devices, like LED drivers and dimmers.” Ex. 1002 ¶ 31. Patent Owner, having waived its Preliminary Response, does not contest Petitioner’s articulation of the level of skill in the art. Paper 7. We regard Petitioner’s definition as consistent with the prior art before us and the skill reflected in the Specification of the ’601 patent. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001) (prior art may reflect an appropriate level of skill). Thus, for the purpose of this Decision, we apply Mr. McAlexander’s definition.

B. *Claim Construction*

We interpret claim terms using “the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b).” 37 C.F.R. § 42.100(b). In this context, claim terms “are generally given their ordinary and customary meaning” as understood by a person of ordinary skill in the art in question at the time of the invention. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312–13 (Fed. Cir. 2005) (citations omitted) (en banc).

Petitioner states that “[e]ach claim term challenged by this Petition should be construed in accordance with its ordinary and customary meaning for purposes of resolving the issues raised in this Petition,” but does not otherwise explicitly articulate any particular claim construction. Pet. 14.

We determine that we need not expressly construe any claim terms to resolve the parties’ disputes on the current record. *See Realtime Data, LLC v. Iancu*, 912 F.3d 1368, 1375 (Fed. Cir. 2019) (“The Board is required to construe ‘only those terms that . . . are in controversy, and only to the extent necessary to resolve the controversy.’”) (quoting *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)). .

III. ANALYSIS OF THE CHALLENGED CLAIMS

A. *Principles of Law*

1. *Anticipation*

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. Inc., v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987); *see also Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008) (to anticipate a patent claim under 35 U.S.C. § 102, “a single prior art reference must expressly or inherently disclose each claim limitation”). Moreover, “[b]ecause the hallmark of anticipation is prior invention, the prior art reference—in order to anticipate under 35 U.S.C. § 102—must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net MoneyIN, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008) (quoting *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)).

Whether a reference anticipates is assessed from the perspective of a person of ordinary skill in the art. *See Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368 (Fed. Cir. 2003) (“[T]he dispositive question regarding anticipation [i]s whether one skilled in the art would reasonably understand or infer from the [prior art reference’s] teaching’ that every claim element was disclosed in that single reference.” (quoting *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991))).

2. Obviousness

A claim is unpatentable under 35 U.S.C. § 103 if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *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) differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) if in evidence, objective evidence of nonobviousness.⁸ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). A decision on the ground of obviousness must include “articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006). The obviousness analysis “should be made explicit” and it “can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention

⁸ The record does not contain any arguments relating to objective evidence of nonobviousness.

does.” *KSR*, 550 U.S. at 418. We consider Petitioner’s arguments in accordance with the above principles.

B. Asserted Anticipation of Claims 1, 10, 11, 14, and 15 by Peng (Ground 1)

Petitioner contends that Peng anticipates claims 1, 10, 11, 14, and 15. Pet. 15–32. Petitioner supports this assertion with testimony from its declarant, Mr. McAlexander. Ex. 1002 ¶¶ 58–67.

1. Claim 1

In general, claim 1 is directed to an “assembly” for configuring and powering “a set of light fixture loads” in an LED low voltage distribution system. Claim 1(preamble). Claim 1 requires the assembly to comprise both “an LED driver” and a “break-out module.” Claim elements 1(a), (b). The LED driver includes a “power circuit” that has “at least one power limit” and a “set of output current drivers connected to the at least one power limit.” Claim element 1(a). The LED driver must also be “located remotely from the set of light fixture loads.” Claim element 1(e).

Claim 1 also contains a number of limitations regarding the break-out module that also involve the LED driver. For example, the break-out module must, *inter alia*:

- Be electrically connected to an *output of the LED driver* and the set of light fixture loads (claim element 1(b)), and
- Receive power from the LED driver via a set of input channels and deliver power to the set of light fixture loads (claim element 1(c)).

Thus, limitations regarding the LED driver are found in claim elements 1(a), (b), (c), and (e). We address Petitioner’s contentions regarding the LED driver limitations below. *See* Pet. 15–20, 22.

a) *LED driver*

We begin with claim element 1(b), which requires the break-out module to be electrically connected to an output of the LED driver and to the set of light fixture loads. Petitioner appears to map Peng's LED ballast circuit to the claimed break-out module. *See* Pet. 19 (stating "the LED ballast circuit of Peng is analogous⁹ to the break-out module" and citing Ex. 1002 ¶ 62). Although Petitioner asserts a POSITA would understand that Peng's LED ballast is connected to LEDs, which serve as a light fixture load (Pet. 19), Petitioner does not explain how Peng's LED ballast circuit (the asserted break-out module) is electrically connected to an output of the LED driver. Petitioner does, however, cite to Peng's paragraph 38 discussing Peng's Figure 1 as follows:

FIG. 1 illustrates one embodiment of a phase controlled dimmer-LED lighting scheme. A phase controlled dimmer 101 has a user adjustable control lever 103. The phase controlled dimmer 101 is operably connected to an LED ballast 105 which is operably connected to a lighting unit 106 comprising one or more LEDs 107. In operation, the LEDs 107 are responsive to the LED ballast circuit 105. The LED ballast circuit is responsive to the output of the phase controlled dimmer 101. The output of the phase controlled dimmer 101 is responsive to the lever 103 position. Thus, the LEDs 107 produce an amount of light responsive to the user adjusted position of the lever 103.

Pet. 18 (quoting Ex. 1005 ¶ 38). Peng's Figure 1 is reproduced below.

⁹ Petitioner's use of the term "analogous," here and throughout the Petition, is also problematic to its anticipation arguments. "Analogous" does not mean identical, but rather indicates that two items are similar or comparable. Anticipation "requires that the identical invention that is claimed was previously known to others." *Continental Can Co. v. Monsanto Co.*, 948 F.2d 1264, 1267 (Fed. Cir. 1991).

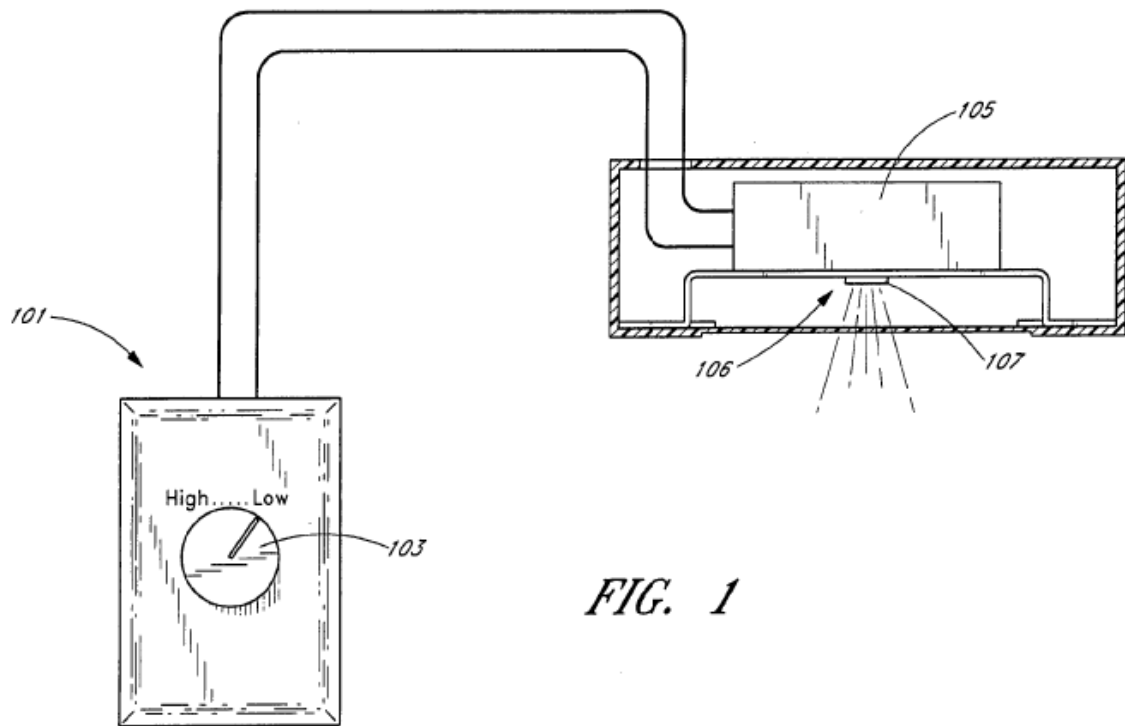


FIG. 1

Figure 1 above depicts one embodiment of a phase controlled dimmer-LED lighting scheme having phase controlled dimmer 101, which is operably connected to LED ballast 105, which is operably connected to lighting unit 106 comprising one or more LEDs. Ex 1005 ¶ 38.

From this cited disclosure, it appears that Petitioner maps Peng's phase controlled dimmer 101 to the claimed "LED driver" and Peng's statement that "phase controlled dimmer 101 is operably connected to an LED ballast 105" to the claim limitation requiring the break-out module electrically connected to an output of the LED driver."

Claim element 1(c) requires the break-out module to receive power from the LED driver via a set of input channels. Again, Petitioner does not explicitly state what structure in Peng constitutes the claimed "LED driver," but does cite to Peng paragraph 38 as stating that "phase controlled dimmer 101 is operably connected to an LED ballast 105" (Pet. 19 (citing Ex. 1005 ¶ 38)) and to Peng paragraph 40 as stating that "[a]s the switch on the phase

controlled dimmer is adjusted, more or less of the waveform is effectively removed by the phase controlled dimmer. These outputted phase controlled waveforms are then supplied to the inputs of an LED ballast circuit” (Pet. 20 (citing Ex. 1005 ¶ 40)). Petitioner further asserts that a “POSITA would understand that the outputted phase controlled waveforms supplied to the inputs of an LED ballast circuit are analogous to the breakout module receiving power from the LED driver.” Pet. 20 (citing Ex. 1002 ¶ 63). Thus, it appears that Petitioner again maps Peng’s phase controlled dimmer 101 to the claimed “LED driver.”

Claim element 1(e) requires that the LED driver is located remotely from the set of light fixture loads. Citing to paragraph 38 of Peng, Petitioner again appears to map Peng’s phase controlled dimmer 101 to the LED driver. *See* Pet. 22 (citing Ex. 1005 ¶ 38; Ex. 1002 ¶ 65). As noted above, paragraph 38 discusses Peng’s Figure 1, which depicts phase controlled dimmer 101—having adjustable control lever 103—located remotely from the LEDs 107. *See also* Ex. 1002 ¶ 65 (stating a “POSITA would recognize that the LED driver is located a distance away from the lights and can be controlled by the lever”).

Thus, for claim elements 1(b), (c), and (e), Petitioner appears to map Peng’s phase controlled dimmer 101 to the claimed “LED driver.”

For claim element 1(a), however, which requires the “LED driver [to include] a power circuit having at least one *power limit* and a *set of output current drivers* connected to the at least one power limit in the power circuit” (Ex. 1001, 14:51–53 (emphasis added)), Petitioner does not map Peng’s phase controlled dimmer 101 to the claimed LED driver. *See* Pet. 16–19. Indeed, Petitioner does not map *any* components in Peng

specifically to either the LED driver or the power circuit recited in claim element 1(a). *See id.* (citing Ex. 1005 ¶¶ 7, 19, 52–53, 72 but not specifying where either the LED driver or power circuit is found within these paragraphs). Petitioner does map components of Peng to the *power limit* and the *set of output current drivers* included *within* the LED driver as recited in claim element 1(a). None of the components that Petitioner maps to the power limit or the set of output current drivers, however, are found within Peng’s phase controlled dimmer 101.

For the “power limit” limitation, Petitioner asserts that a POSITA would have understood that the “overload-protection features employing IC 324 to reduce the VCOMP of Peng” illustrated in Peng Figure 3 “is equivalent to the power limit of the ’601 Patent.” Pet. 17 (citing Ex. 1002 ¶ 60). As shown in Figure 3 *supra*, however, IC324 is not included within phase controlled dimmer 101. *See, e.g.*, Ex. 1005, Fig. 3 (depicting IC324 as external to the phase controlled dimmer), ¶ 42 (stating that “power supplied by the phase controlled dimmer is applied across the terminals 301, 302” thereby indicating that the phase controlled dimmer is external to terminals 301, 302 and, thus, to IC324).

For the “set of output current drivers,” Petitioner cites to Peng’s discussion of Figure 6B, which states that “the driver 605 comprises a case 901 that encloses electrical components and circuitry for power conditioning, such as for example, a ballast circuit” (Ex. 1005 ¶ 72) and to Peng’s statement that “the power conditioning unit comprises an over-Voltage protector configured to automatically adjust the duty cycle to prevent damage due to a non-normal operating condition in which the load voltage exceeds a rated voltage of the fixture” (Ex. 1005 ¶ 7). Pet. 17.

Petitioner asserts that a POSITA would have understood that Peng's "power conditioning unit comprises including the driver 605 of Peng is equivalent to the set of output drivers of the '601 patent." Pet. 17–18 (citing Ex. 1002 ¶¶ 60–61). Driver 605 of Figure 6B, however, is not included within Peng's phase controlled dimmer 101. *See, e.g.*, Ex. 1005, Fig. 6B (depicting driver 605 as external to the phase controlled dimmer), ¶ 72 (stating that "flexible conductors 903," which communicate line voltage to the driver circuitry, are connected to the output of a phase controlled dimmer switch which is connected to a voltage"). As such, driver 605 is not included within Peng's phase controlled dimmer.

Thus, Petitioner's mapping of the LED driver recited in claim elements 1(b), 1(c), and 1(e) to Peng's phase controlled dimmer 101 is inconsistent with its mapping of the claimed components included in the LED driver of claim element 1(a) to components located external to Peng's phase controlled dimmer 101. Because of Petitioner's inconsistent mapping of Peng to the claimed LED driver, Petitioner fails to show that Peng discloses an LED driver that meets all of the limitations set forth in claim 1. *See Net MoneyIN*, 545 F.3d at 1369 (stating for a prior art reference to anticipate a claim, it "must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements 'arranged as in the claim'").

Additionally, Petitioner's failure to articulate, *inter alia*, which components in Peng correspond to either the LED driver or the power circuit recited in claim element 1(a) violates our rules requiring that the "petition *must specify where each element of the claim is found in the prior art patents or printed publications relied upon*" (37 C.F.R. § 42.104(b)(5) (emphasis

added)) and that the “petition must include a full statement of the reasons for relief requested, including a *detailed explanation of the significance of the evidence including material fact*” (37 C.F.R. § 42.22(a)(2) (emphasis added)). *See also* 37 C.F.R. § 42.104(b)(4) (stating the Board may “give no weight to the evidence where a party as failed to state its relevance”).

As such, Petitioner does not show a reasonable likelihood that it will prevail in showing that claim 1 is anticipated by Peng.

2. *Claim 15*

Independent claim 15 is similar to claim 1 and recites the same limitations regarding the LED driver discussed above. *Compare* Ex. 1001, 14:51–64 *with id.* at 16:6–19. Petitioner’s arguments for these limitations are essentially the same as the arguments set forth regarding claim 1 and thus suffer the same shortcomings. *Compare* Pet. 15–20, 22 *with* Pet. 24–32. Accordingly, Petitioner does not show a reasonable likelihood that it will prevail in showing that claim 15 is anticipated by Peng.

3. *Conclusion*

We have considered the arguments and evidence presented by Petitioner, and are not persuaded that Petitioner has demonstrated a reasonable likelihood that independent claim 1 or 15 is anticipated by Peng. We also have considered Petitioner’s arguments and evidence as to dependent claims 10, 11, and 14, each of which depend directly from claim 1, and are not persuaded that Petitioner’s arguments for those claims overcome the deficiencies in Petitioner’s arguments for claim 1. For the foregoing reasons, Petitioner has not established a reasonable likelihood of prevailing in showing anticipation of claims 1, 10, 11, 14, and 15 by Peng.

C. Asserted Anticipation of Claims 1, 11, 12, 15, and 17 by Leong (Ground 2)

Petitioner contends that Leong anticipates claims 1, 11, 12, 15, and 17. Pet. 32–47. Petitioner supports this assertion with testimony from its declarant, Mr. McAlexander. Ex. 1002 ¶¶ 62, 67–68, 70–76.

1. Claim 1

a) LED Driver – Claim elements 1(a), (b), (c), (e)

As discussed above, the term “LED driver” is recited in claim elements 1(a), (b), (c), and (e). Claim element 1(a) recites “an LED driver including a power circuit having at least one power limit and a set of output current drivers connected to the at least one power limit in the power circuit.” Thus, claim element 1(a) requires, *inter alia*, the claimed assembly to comprise an LED driver and that the LED driver include a power circuit having a power limit and a set of output current drivers connected to the power limit.

Petitioner’s argument that Leong discloses the limitations of claim element 1(a) is as follows:

Leong discloses “[p]ower control modules and other components can be incorporated into the electrical circuits used in the LED lamp of the present invention. The first circuit module may be a dimming module placed in between the DC voltage input to the LED array.” Ex. 1006, 8[0077] (emphasis added). It further discloses “[t]he dimming current driver module will contain the necessary electronics to decipher data input control signals and provide the current driver power to operate the LED arrays.” Ex. 1006, 8[0077]. And, “[t]he **dimming controller** can be used to program presets during the day or have a manual adjustment to dim the LED lamp down to full off or anywhere between 0% and 100% brightness.” Ex. 1006, 9[0077] (emphasis added).

A POSITA would recognize that the power control modules and dimming controller of Leong are equivalent to the power circuit and power limit of the ‘601 Patent. Ex. 1002, ¶¶70-71.

Leong further discloses the “LED lamps of the present invention using computers, a self-contained program stored in the computer operates the current driver outputs of each dimmer controlling each LED array depending on the condition of the sensor and timer outputs.” Ex. 1006, 57[0547]. Moreover, “[a]n external and remote data control signal can be imposed on the power line to provide instructions to computer to operate the *current driver outputs* of dimmer to control the LED arrays.” Ex. 1006, 57[0547]-58[0547] (emphasis added).

A POSITA would recognize that the current driver outputs of Leong are equivalent to the output current drivers of the ‘601 Patent. Ex. 1002, ¶72. Therefore, Leong discloses an LED driver including a power circuit having at least one power limit and a set of output current drivers connected to the at least one power limit in the power circuit.

Pet. 33–35 (bold and italicized emphasis added by Petitioner; underlining added for additional emphasis).

Thus, Petitioner maps Leong’s “power control modules” and “dimming controller” discussed in Leong paragraph 77 to the claimed “power circuit” and claimed “power limit,” respectively, and maps the “current driver outputs” discussed in Leong paragraph 547 to the claimed set of “output current drivers.”

Neither Petitioner, nor its declarant, however, clearly identify where the claimed LED driver—which includes the power circuit, power limit, and the set of output current drivers—is found in Leong. See Pet. 33–35 (citing Ex. 1002 ¶¶ 70–72).

Although Mr. McAlexander does provide some general discussion about conventional constant current and current-regulated LED drivers in paragraph 72, this discussion does not identify where an LED driver may be found in Leong. *See, e.g.,* Ex. 1002 ¶ 72 (stating a “*constant LED driver is an LED power supply that regulates the current flowing through an LED array so as to maintain a desired level of light output*” and a “*current-regulated LED driver is an AC-DC or DC-DC converter with output tailored to the electrical characteristics of the array of LEDs*”) (emphasis added). Mr. McAlexander further testifies that a “POSITA would recognize, based on their identical functions, that the current driver outputs of Leong are equivalent to the output current drivers of the ’601 patent. Therefore, Leong discloses an LED driver including a power circuit having at least one power limit and a set of output current drivers connected to the at least one power limit in the power circuit.” *Id.* Mr. McAlexander’s testimony, however, does not clearly identify where the claimed LED driver may be found in Leong.

Claim element 1(b) requires, *inter alia*, that the break-out module be “electrically connected to an output of the LED driver.” For this limitation, Petitioner asserts:

Leong discloses “[a] light emitting diode (LED) lamp for mounting to an existing fixture for a fluorescent lamp having a ballast assembly including ballast opposed electrical contacts, comprising: a tube having tube ends, at least one LED.” Ex. 1006, 58[Claim 1]. Leong further discloses “[b]allasts can be connected or wired between the input power line and the lamp in a number of configurations.” Ex. 1006, 6[0056].

A POSITA would understand that the ballast assembly is equivalent to the break out module of the ’601 Patent. Ex. 1002,

¶62. Thus, Leong discloses the ballast assembly is connected to the LED driver and a lamp.

Finally, Leong discloses:

A pair of end caps 252A and 252B secured to tubular ends 250A and 250B, respectively, are provided with bi-pin electrical connectors 254A and 254B that are electrically connected to ballast double contact electrical sockets 256A and 256B in a manner previously described herein with regard to LED lamp 124.

Ex. 1006, 27[0334].

A POSITA would understand that bi-pin electrical connectors 254A and 254B are power connectors that are electrically connected to ballast double contact electrical sockets 256A and 256B. Ex. 1002, ¶73. Therefore, Leong discloses a break out module electrically connected to an output of the LED driver and the set of light fixture loads, the break out module including power connectors.

Pet. 35–36.

Again, Petitioner fails to clearly identify where Leong discloses an LED driver. Regarding Petitioner’s citation to Leong claim 1, the claim merely states that the ballast assembly (i.e., break-out module) includes ballast opposed electrical contacts. *See* Ex. 1006, claim 1 (stating “a fluorescent lamp having a ballast assembly including ballast opposed electrical contacts”). The cited language of Leong claim 1 does not state what the electrical contacts are electrically connected to, let alone that the contacts are electrically connected to an output of an LED driver. Petitioner does cite to Leong paragraph 56, which states that “[b]allasts can be connected or wired between the input power line.” Pet. 35 (citing Ex. 1006 ¶ 56). However, Petitioner makes no argument that Leong’s input power

line constitutes an LED driver. Petitioner’s discussion of Leong’s bi-pin electrical connectors 254A and 254B as electrically connected to ballast double contact electrical sockets 256A and 256B (*see* Pet. 36 (citing Ex. 1006 ¶ 334; Ex. 1002 ¶ 73)), relates to Petitioner’s argument that Leong discloses a break-out module that is connected to the set of *light fixture modes*, not that the break-out module is connected to the output of an *LED driver*. *See* Ex. 1006 ¶ 334.

Claim element 1(c) recites “wherein the break-out module receives power from the LED driver via a set of input channels.” For this limitation, Petitioner asserts:

Leong discloses “[a] light emitting diode (LED) lamp for mounting to an existing fixture for a fluorescent lamp having a ballast assembly including ballast opposed electrical contacts.” Ex. 1005, 58[Claim 1]. Further, Leong discloses “means for suppressing ballast voltage being delivered from the ballast assembly, said means for suppressing ballast voltage being in electrical connection with said electrical circuit means and means for controlling the delivery of said electrical power from said ballast assembly to said at least one LED.” Ex. 1006, 58[Claim 1]. Leong also discloses “means for controlling includes a current driver dimmer positioned in said LED lamp and in operative signal and power association with said at least one LED.” Ex. 1006, 58[Claim 22]. Moreover, Leong explains:

Ballasts can be connected or wired between the input power line and the lamp in a number of configurations. Multiple lamp ballasts for rapid start or instant start lamps can operate lamps connected in series or parallel depending on the ballast design. When lamps are connected in series to a ballast and one lamp fails or is removed from the fixture, the other lamp(s) connected to that ballast would not light. When the lamps are connected in parallel to a

ballast and one lamp fails, or are removed, the other lamp(s) will continue to light.

Ex. 1006, 6[0056].

A POSITA would recognize that Leong's disclosure of the current driver dimmer controlling the degree of illumination and ballast assembly transmitting power to the LED lamp is analogous to the break-out module receiving power and delivering power to the set of output channels. Ex. 1002, ¶74. Therefore, Leong discloses a ballast out module that receives power from the set of input channels and delivers power to the set of light fixture loads via a set of output channels.

Pet. 36–38.

Again, nowhere does Petitioner clearly identify where Leong discloses the claimed LED driver. *See* Pet. 36–38; Ex. 1002 ¶ 74. Indeed, other than when reciting the claim language of the '601 patent, the Petition does not even refer to an LED driver in its analysis of claim element 1(c). *See* Pet. 36–38.

In connection with claim element 1(e), which requires that the “LED driver is located remotely from the set of light fixture loads,” Petitioner states:

Leong discloses “[t]his *dimming module* can take a control input either from a hard-wired sensor like an occupancy motion occupancy sensor, a timer, a computer or from a hand-held or wall mounted remote control box that sends the dimming signal to the *dimming module located within the LED lamp*.” Ex. 1006, 8[0077].”

Leong's disclosure makes clear that the *dimming module* (*i.e., the LED driver*) can be located in varying locations. *See* Ex. 1006, 8[0077].”

Pet. 38–39 (emphasis added).

Again, Petitioner fails to clearly identify where or how Leong discloses the LED driver. Although Petitioner appears to explicitly state Leong's dimming module is the LED driver (*see* Pet. 39, stating "dimming module (i.e., the LED driver)"), the cited portion of Leong also states that the "dimming module [is] located within the LED lamp." Ex. 1006 ¶ 77. Thus, Petitioner's contention that the dimming module is remote from the set of light fixture loads is quite different, and arguably inconsistent, with Leong's disclosure that the dimming module is located within the LED lamp. *See* Pet. 38–39. To the extent Petitioner contends that a dimming module located within an LED lamp is located remotely from the set of light fixture loads, any such argument is not clearly articulated and is not supported. Alternatively, to the extent Petitioner contends that the other structures recited in paragraph 77, which are located remotely from the LED lamp (e.g., the hand-held remote control box), any such argument is similarly not clearly articulated and is not supported.

Furthermore, as noted above, claim element 1(a) requires that the LED driver comprise a power circuit having a power limit and a set of output current drivers connected to the power limit. Petitioner fails to explain how the dimming module, or any structure recited in paragraph 77, such as the hand-held remote control box, constitutes an LED driver that comprises a power circuit having a power limit and a set of output current drivers connected to the power limit as recited in claim element 1(a). Thus, again, Petitioner fails to clearly identify where or how Leong discloses the LED driver required by claim 1.

As noted above, our rules require that the "petition must specify where each element of the claim is found in the prior art patents or printed

publications relied upon.” 37 C.F.R. § 42.104(b)(5). Additionally, the “petition must include a full statement of the reasons for relief requested, including a *detailed explanation of the significance of the evidence including material facts.*” 37 C.F.R. § 42.22(a)(2) (emphasis added); *see also* 37 C.F.R. § 42.104(b)(4) (stating the Board may “give no weight to the evidence where a party as failed to state its relevance”).

Here, the Petition fails to specify where or how the LED driver recited in claim elements 1(a), (c), and (e) is found in Leong. Accordingly, Petitioner’s arguments are insufficient to show that Leong discloses an LED driver as required by claim elements 1(a), (c), or (e). Thus, for these reasons, the Petition fails to show a reasonable likelihood that claim 1 is anticipated by Leong.

b) Reliance on Multiple Embodiments – Claim Elements 1(a), (b), (c), (e)

For a prior art reference to anticipate a claim, it “must not only disclose all elements of the claim within the four corners of the document, but must also disclose those elements ‘arranged as in the claim.’” *Net MoneyIN*, 545 F.3d at 1369. For example, in *Net MoneyIN*, the Federal Circuit held that an “Internet payment system” was not anticipated by a prior art reference that disclosed all the components of the invention, because the reference disclosed two separate payment protocols, each of which contained only a subset of the components claimed in the patent at issue. *Id.* at 1371. “[T]he [prior art] reference must clearly and unequivocally disclose the claimed [invention] or direct those skilled in the art to the [invention] without any need for picking, choosing, and combining various disclosures

not directly related to each other by the teachings of the cited reference.” *Id.* at 1371 (citation omitted).

To support its contention that Leong discloses the LED driver recited in claim elements 1(a), (c), and (e), Petitioner points to various disclosures throughout Leong, including paragraphs 56, 77, 547, and claims 1 and 22. To support its contention that Leong discloses the limitations recited in claim elements 1(b) and (d), Petitioner further cites to Leong paragraphs 334 and 256. *See* Pet. 35–36 (relying on Leong paragraphs 56, 334, and claim 1 as disclosing the “break-out module electrically connected to an output of the LED driver and the set of light fixture loads; the break-out module including power connectors”); *id.* at 38 (relying on Leong paragraph 256 as disclosing a break-out module that “splits the set of input channels into individual output channels” as required by claim element 1(e)). These disclosures, however, do not appear to relate to a single embodiment that discloses each of the claimed elements as arranged in claim 1. *See e.g.*, Ex. 1006 ¶¶ 56, 77 (discussing the “summary of the invention”), ¶ 256 (discussing Figure 4), ¶ 334 (discussing Figures 21 and 21A), ¶ 547 (discussing, *inter alia*, Figures 77 and 78A).

To the contrary, Leong expressly states that certain figures discussed in the paragraphs cited by Petitioner relate to different embodiments. *See e.g.*, Ex. 1006 ¶¶ 244–245 (stating “LED lamp 10 shown in FIGS. 1–10” is “retrofitted to an existing elongated fluorescent fixture” and that when referring to Figures 1–10, that the same reference numeral is used to refer to “identical of [*sic* “or”] similar parts”), ¶ 289 (stating “[a]nother embodiment of a retrofitted lamp is shown in FIGS. 11–20”), ¶ 332 (describing Figure 21 as showing a “horizontally aligned curved LED lamp 238”), Figure ¶ 513

(stating “FIG. 77 shows another embodiment of the present invention”), ¶ 533 (stating “FIG. 78A shows another embodiment of the present invention”). Additionally, Petitioner makes no argument as to how claims 1 or 22 relate to the disclosures of the other cited paragraphs of Leong. Thus, Petitioner fails to show that the cited material of Leong discloses the limitations of claim 1 arranged in the same way as the ’601 patent without the need to pick and choose disparate disclosures.

Thus, for at least this additional reason, based on the information set forth in the Petition, Petitioner fails to show a reasonable likelihood that claim 1 is anticipated by Leong.

2. *Claim 15*

Claim 15 recites the same limitations found in claim elements 1(a), (b), (c), and (e). *Compare* Ex. 1001, 14:48–60, 63–64 (claim 1) *with* Ex. 1001, 16:3–15, 18–19. Petitioner argues Leong discloses these limitations for similar reasons it set forth in connection with claim 1. *Compare* Pet. 33–39 *with* Pet. 41–45.¹⁰ Petitioner’s arguments are not persuasive for the same reasons set forth above.

3. *Conclusion*

We have considered the arguments and evidence presented by Petitioner, and are not persuaded that Petitioner has demonstrated a reasonable likelihood that independent claim 1 or 15 is anticipated by Leong. We also have considered Petitioner’s arguments and evidence as to

¹⁰ Petitioner also cites to Leong claim 23 as disclosing a means for suppressing ballast voltage and means for controlling the delivery of electrical power from the ballast assembly to at least on LED. Pet. 44–45. The language quoted by Petitioner as being from claim 23 is found in claim 1, not claim 23.

dependent claims 11 and 12, which depend directly from claim 1, and claim 17, which depends from claim 15, and are not persuaded that Petitioner's arguments for those claims overcome the deficiencies in Petitioner's arguments for claims 1 and 15. For the foregoing reasons, Petitioner has not established a reasonable likelihood of prevailing in showing anticipation of claims 1, 11, 12, 15, and 17 by Leong.

D. Asserted Anticipation of Claim 1 by Shteynberg (Ground 5)

Petitioner argues that Shteynberg discloses each element of, and thus, anticipates claim 1. Pet. 55–61. We address certain of Petitioner's arguments below.

1. Claim element 1(a)

As discussed above, claim element 1(a) recites “an LED driver including a power circuit having at least one power limit and *a set of output current drivers* connected to the at least one power limit in the power circuit.” Ex. 1001, 14:51–53 (emphasis added).

For this claim element, Petitioner first cites to Shteynberg claim 28 as disclosing a “*power converter* for providing variable brightness levels for solid state lighting, the *power converter* couplable to a phase-modulating switch which is couplable to an AC line voltage.” Pet. 55–56 (quoting Ex. 1013, 22:26–29) (emphasis added). Petitioner asserts that a “power circuit” is “any circuit used to carry electricity that operates a load” and that Shteynberg's power converter carries electricity from the AC line voltage to provide variable brightness levels for solid state lighting. Pet. 56 (citing Ex. 1002 ¶ 82). Petitioner then contends that a POSITA would understand that “the power converter of Shteynberg is analogous to the claimed power circuit of the '601 Patent.” Pet. 56 (citing Ex. 1002 ¶ 82). Thus, we

understand Petitioner to assert that Shteynberg’s “power converter” is the claimed “power circuit.”

With respect to the “set of output current drivers” recited in claim element 1(a), Petitioner asserts:

Shteynberg discloses a set of output current drives [*sic*] connected to the power limit. For example, Shteynberg discloses:

LED driver circuits and LEDs [(i.e., light fixture loads)] will be wired within existing lighting infrastructure, such as replacing an incandescent bulb (placed within an Edison socket) or replacing an incandescent lamp, with wiring to existing switches, such as dimmer switches. In a second phase, existing switching connections may be rewired, allowing LED driver circuits to be co-located in the same junction or wall box as the switches, but wired directly to the AC line voltage, with existing switching (such as dimmers) generating only a control signal to regulate LED brightness.

Pet. 56–57 (quoting Ex. 1013, 8:20–29). Petitioner contends that a POSITA would understand that the LED driver circuits and driver circuits contained in the switching power supply are equivalent to the set of output circuit drivers of the ’601 patent. Pet. 57 (citing Ex. 1002 ¶ 85). In paragraph 85, Mr. McAlexander testifies that “[a] POSITA would understand that the LED driver circuits and driver circuits contained in the switching power supply are equivalent to the set of output circuit drivers of the ’601 patent based on their identical stated functions of providing current to LED loads.” Ex. 1002 ¶ 85. Thus, we understand Petitioner to map LED driver circuits and driver

circuits contained in Shteynberg's power supply (e.g., switching power supply 150 of Figure 7) to the claimed "set of output circuit drivers."

We have considered Petitioner's contentions and Mr. McAlexander's testimony and find that Petitioner fails to demonstrate a reasonable likelihood that Shteynberg discloses the LED driver including a power circuit having at least one power limit and a *set of output current drivers* connected to the at least one power limit in the power circuit as recited in claim element 1(a). We start by reproducing Shteynberg's Figure 7 below.

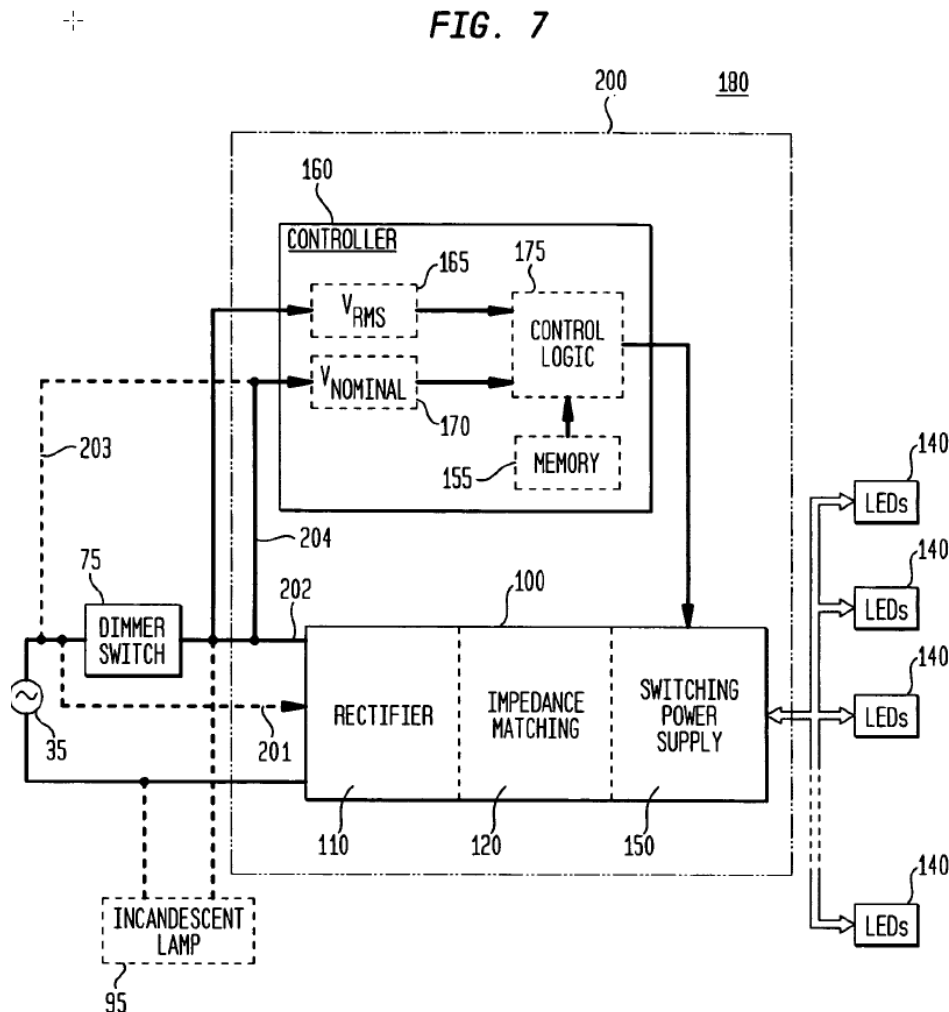


Figure 7 depicts "a block diagram of an exemplary second embodiment of a current regulator (or converter)." Ex. 1005, 7:29–30. Current regulator 200

includes rectifier 110, impedance matching circuit 120, switching power supply (or driver) 150, and controller 160. *Id.* at 9:5–8. These components are coupled to dimmer switch 75 and receive output signals from the dimmer switch. *Id.* at 9:8–9. Current regulator 200 also provides power to one or more LEDs 140. *Id.* at 9:9–10.

As seen in Figure 7 above, Shteynberg discloses single switching power supply 150, the alleged output current driver, connected to a set of LEDs 140. That is, Petitioner does not explain adequately how Shteynberg discloses *a set* of output current drivers.

We recognize that Shteynberg, at column 8, lines 20 to 29 (relied upon at Pet. 57) mentions “LED driver circuits,” that is, plural circuits. But this disclosure in Shteynberg, in and of itself, is insufficient to support Petitioner’s contentions. The statement upon which Petitioner relies discusses, generally, the transition to solid state lighting, including the three phases that Shteynberg anticipates will occur during the transition. *See* Ex. 1005, 8:18–29. Petitioner does not direct us to any specific embodiment to which this discussion applies, let alone that this discussion discloses that Shteynberg’s switching power supply constitutes or comprises a set of output current drivers. *Cf. Wasica Fin. GmbH v. Cont’l Auto. Sys., Inc.*, 853 F.3d 1272, 1284 (Fed. Cir. 2017) (“[I]t has long been understood that ambiguous references do not, as a matter of law, anticipate a claim.”); *Verve, LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1120 (Fed. Cir. 2002) (“A single reference must describe the claimed invention with sufficient precision and detail to establish that the subject matter existed in the prior art.”).

Accordingly, for at least this reason, we find that Petitioner fails to demonstrate a reasonable likelihood that Shteynberg discloses the recited set of output current drivers as recited in claim element 1(a).

Additionally, Petitioner fails to clearly identify the where the claimed LED driver that includes, *inter alia*, a power circuit, may be found in Shteynberg. *See* 37 C.F.R. § 42.104(b)(5) (stating the “petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon”). Although Petitioner points to Shteynberg’s disclosure of LED driver circuits and driver circuits (*see* Pet. 56–57 (citing Ex. 1013, 8:20–29)), Petitioner asserts that a POSITA would have understood that “the LED driver circuits and driver circuits contained in the switching power supply are equivalent to the set of output circuit drivers of the ’601 patent.” Pet. 57 (citing Ex. 1002 ¶ 85). Accordingly, Petitioner appears to map the LED driver circuit to the “set of output circuit drivers” and not to the “LED driver,” and thus does not clearly specify where the claimed LED driver can be found in Shteynberg.

2. Claim element 1(d)

Claim element 1(d) requires that the break-out module “splits the set of input channels into individual output channels.” Ex. 1001, 14:57–62.

Petitioner’s entire argument for this limitation is as follows:

Shteynberg discloses the splitting the set of input channels into individual output channels of the ’601 Patent. For example, Shteynberg discloses the current regulator provides power to one or more LEDs 140 which may also be an array or multiple arrays of LEDs. Ex. 1013, 9:9-12. A POSITA would understand that in order to power multiple LEDs or multiple arrays of LEDs individual output channels are needed. Thus, Shteynberg discloses the splitting of the set of input channels into individual output channels.

Pet. 60; *see also* Ex. 1013, 9:9–12 (stating “current regulator 200 [of Figure 7] also provides power to one or more LEDs 140”).

Petitioner fails to sufficiently map Shteynberg’s disclosure to the claimed break-out module that “splits the input channels into the individual output channels.” Significantly, Petitioner does not explicitly identify where the claimed break-out module may be found in Shteynberg. *See* 37 C.F.R. § 42.104(b)(5) (stating the “petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon”). Nor does Petitioner sufficiently articulate where Shteynberg discloses “break-out module electrically connected to an output of the LED driver” as required by claim element 1(b).

Accordingly, Petitioner fails to sufficiently map Shteynberg’s disclosure to the break-out module recited in claim 1. Thus, for at least this additional reason, Petitioner fails to demonstrate a reasonable likelihood that Shteynberg anticipates claim 1.

E. Asserted Obviousness based on Peng or Leong in view of Bornhurst (Ground 3)

Petitioner argues that claims 2–5, 8, and 10, which depend from claim 1, would have been obvious over Peng or Leong in view of Bornhurst. Pet. 47–54. Petitioner’s arguments regarding these dependent claims do not remedy the deficiencies that we identify for claim 1. Accordingly, we determine that Petitioner fails to show a reasonable likelihood that claims 2–5, 8, and 10 would have been obvious over Peng or Leong in view of Bornhurst.

*F. Asserted Obviousness based on Peng or Leong in view of Slot
(Ground 4)*

Petitioner argues that claim 12, which depends from claim 1, would have been obvious over Peng or Leong in view of Slot. Pet. 55–61. Petitioner’s arguments regarding claim 12 do not remedy the deficiencies that we identify for claim 1. Accordingly, we determine that Petitioner fails to show a reasonable likelihood that claim 12 would have been obvious over Peng or Leong in view of Slot.

IV. CONCLUSION

Based on the information presented, we determine, for the reasons provided above, that Petitioner has not established a reasonable likelihood that it would prevail with respect to any of the challenged claims. Accordingly, we decline to institute an *inter partes* review.

V. ORDER

In consideration of the foregoing, it is hereby:
ORDERED that an *inter partes* is not instituted.

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Patent 8,957,601 B2

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