

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

ADVANCED LIGHTING CONCEPTS LLC,
Petitioner,

v.

MATE, LLC.,
Patent Owner.

IPR2023-01258
Patent 9,049,759 B2

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

MAYBERRY, *Administrative Patent Judge*.

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

I. INTRODUCTION

A. *Background and Summary*

Advanced Lighting Concepts, LLC (“Petitioner”) filed a Petition requesting *inter partes* review of claims 1, 2, 5, 6, 8, 9, 13, 15–17, 19, 20, and 24 (the “Challenged Claims”)¹ of U.S. Patent No. 9,049,759 B2 (Ex. 1001, “the ’759 patent”). Paper 1 (“Pet.”), 1, 16–49. Patent Owner, mate LLC, waived preliminary response to the Petition. Paper 7.

We have authority to determine whether to institute an *inter partes* review. 35 U.S.C. § 314 (2018); 37 C.F.R. § 42.4(a) (2023) (permitting the Board to institute trial on behalf of the Director). To institute an *inter partes* review, we must determine that the information presented in the Petition shows “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). For the reasons set forth below, we decline to institute *inter partes* review on any of the alleged grounds of unpatentability.

B. *Real Parties-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 4, 2.

C. *Related Matters*

The parties each identify the following litigation as a matter related to the ’759 patent: *mate LLC v. Advanced Lighting Concepts, LLC d/b/a Environmental Lights*, 3:22-cv-1095-CAB-DEB (S.D. Cal.). Pet. 1–2; Paper 4, 2.

¹ The list of Challenged Claims in the Petition (Pet. 1) omits claims 2 and 8, but these claims are identified in the grounds themselves.

Patent Owner also identifies the following *inter partes* review proceedings for patents involved in the litigation: IPR2023-01257, IPR2023-01259, IPR2023-01264, IPR2023-01265, and IPR2023-01266. Paper 4, 2.

D. The '759 Patent

The '759 patent, titled “Configurable LED Driver/Dimmer for Solid State Lighting Applications,” issued June 2, 2015, from application US 13/941,871, filed July 15, 2013. Ex. 1001, codes (54), (45), (21), (22). The '759 patent claims priority to provisional application, US 61/097,963, filed on September 18, 2008, and US 13/059,336, filed as PCT/CA2009/001295, on September 17, 2009. *Id.* at codes (60), (63).

The '759 patent relates to “a configurable light emitting diode (‘LED’) driver for powering a set of light fixture loads.” Ex. 1001, code (57). According to the '759 patent, “[i]n recent years, controllable power sources for Solid State Lighting (SSL) applications have entered the market with integrated features,” and “[i]n addition, digital controllers within power sources have enabled the development of configurable options to provide a wider flexibility of solutions for Solid State Lighting applications.” *Id.* at 1:29–34. The '759 patent further states that “[t]he ability to dim the light output of LEDs is also important to reduce energy consumption.” *Id.* at 1:34–35. The '759 patent states that “lighting companies are faced with considerable challenges in adopting SSL technology due to their unfamiliarity and lack of expertise in the driving and dimming requirements for LEDs,” and that “[t]herefore, there is provided a novel LED Driver/dimmer for solid state lighting applications.” *Id.* at 1:36–41.

We reproduce Figure 3 of the '759 patent below.

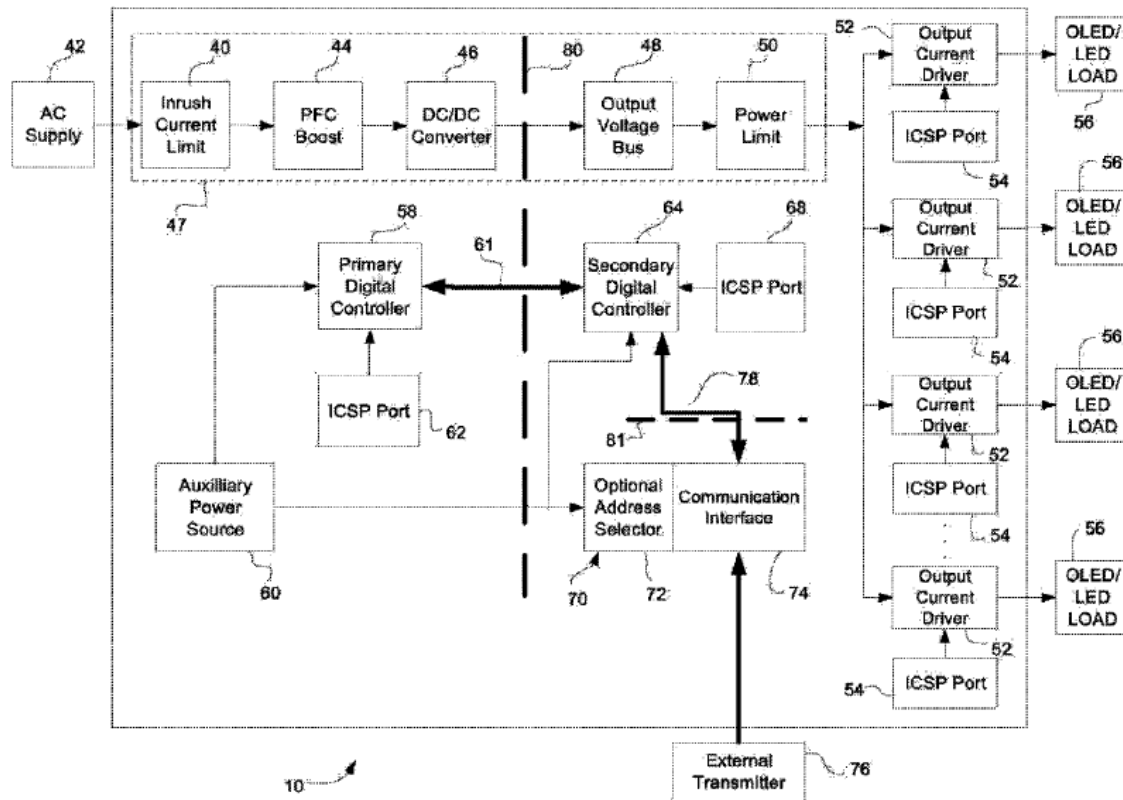


FIGURE 3

Figure 3 depicts “a schematic block diagram of the configurable LED Driver/dimmer.” Ex. 1001, 3:7–8. “LED dimmer 10 includes an inrush current limit 40, or inrush current limit circuit, which receives power from an AC power source or supply 42, located external to the dimmer 10.” *Id.* at 4:4–7. “The inrush circuit 40 is connected to a Power Factor Correction (PFC) Boost 44 which, in turn, is connected to a DC/DC Converter 46, or power conversion stage.” *Id.* at 4:7–10. Further, “converter 46 is connected to an Output Voltage bus 48 which is connected to a power limiter 50.” *Id.* at 4:10–12. According to the ’759 patent, “inrush circuit 40, the PFC boost 44, the DC/DC converter 46, the Output Voltage Base bus 48 and the power limit 50 can be seen as a power circuit 47.” *Id.* at 4:12–14.

The '759 patent further discloses that “power limiter 50 is connected to a set of output current drivers 52, whereby each of the output current drivers 52 has an associated in-circuit serial programming (ICSP) port 54.” Ex. 1001, 4:16–19. “The output of the output current drivers 52 is connected to individual Organic Light-Emitting Diodes (OLED)/Light-Emitting Diodes (LED) loads 56.” *Id.* at 4:19–21.

E. Challenged Claims

The Petition challenges claims 1, 2, 5, 6, 8, 9, 13, 15–17, 19, 20, and 24. Claims 1 and 20 are independent, and are reproduced below.

1. [p]² A configurable light emitting diode (LED) driver for powering a set of light fixture loads comprising:

[a] a power circuit including: an inrush current limit; a DC/DC converter;

[b] a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter;

[c] a regulated output voltage bus connected to the DC/DC converter;

[d] a primary controller for controlling the power circuit;

[e] a set of output current drivers, each of the set of output current drivers connected to one of the set of light fixture loads for powering the associated light fixture load, and;

[f] an apparatus for configuring the set of output current drivers to an output current set point.

Ex. 1001, 10:42–55.

20. [p] A configurable light emitting diode (LED) driver for powering a set of light fixture loads comprising:

[a] a power circuit including:

[b] an inrush current limit;

² We include Petitioner’s limitation labels. *See* Pet. 53–54.

[c] a DC/DC converter;

[d] a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter;

[e] a regulated output voltage bus connected to the DC/DC converter; and

[f] at least one power limit connected to the regulated output voltage bus; and

[g] a set of output current drivers, each of the set of output current drivers connected to one of the set of light fixture loads for powering the associated light fixture load.

Ex. 1001, 12:3–17.

F. Prior Art and Asserted Grounds

Petitioner asserts that the Challenged Claims are unpatentable based on three grounds:

Claims Challenged	35 U.S.C. §	References/Basis
1, 6, 13, 19, 20	102 ³	Shteynberg ⁴
2, 5, 15, 19	103	Shteynberg, Kim ⁵
8, 9, 16, 17, 19, 24	103	Shteynberg, Morgan ⁶

Pet. 16–49.

³ The Leahy-Smith America Invents Act (“AIA”), Pub. L. No. 112-29, 125 Stat. 284, 296–07 (2011), took effect on September 16, 2011. The changes to 35 U.S.C. §§ 102 and 103 in the AIA do not apply to any patent application with an effective filing date before March 16, 2013. Petitioner appears to assume an effective filing date of July 15, 2013 (the filing date of the application that matured into the ’759 patent) for at least claims 2, 5, 15, and 19, as Petitioner contends that Kim is prior art to those claims. Because our analysis in the Decision does not depend on whether the claims should be evaluated under the AIA statute or pre-AIA statute, we apply the AIA statute to all Challenged Claims.

⁴ US 7,902,769; issued Mar. 8, 2011 (Ex. 1005, “Shteynberg”).

⁵ US 2012/0007512; published Jan. 12, 2012 (Ex. 1006, “Kim”).

⁶ US 2006/0022214; published Feb. 2, 2006 (Ex. 1007, “Morgan”).

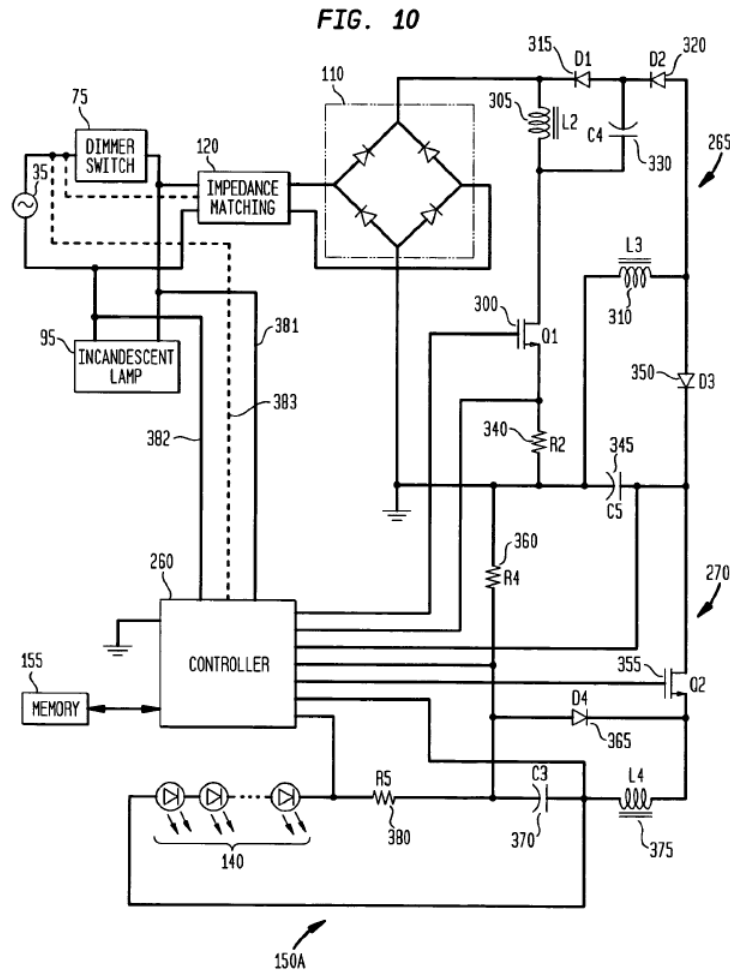
Petitioner also relies on the declaration testimony of Joseph McAlexander. Ex. 1002; *see also* Ex. 1003 (providing Mr. McAlexander’s Curriculum Vitae).

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

1. Shteynberg (Ex. 1005)

Shteynberg, titled “Current Regulator for Modulating Brightness Levels of Solid State Lighting,” issued March 8, 2011, from application US 11/655,308, filed January 19, 2007. Ex. 1005, codes (54), (45), (21), (22). The application ultimately claims priority to a provisional application, US 60/760,157, filed January 20, 2006. *Id.* at code (60).

Shteynberg relates “to a system, apparatus, and method for supplying power to solid state lighting devices, such as for providing power to LEDs and LEDs integrated with digital controllers or processors.” Ex. 1005, 1:19–22. We reproduce Shteynberg’s Figure 10, below.



Shteynberg's Figure 10 depicts "a circuit diagram of an exemplary embodiment of a switching power supply for a current regulator (or converter)." Ex. 1005, 7:40–42. According to Shteynberg, "switching power supply 150A is coupled via impedance matching circuit 120 to a phase modulation module/dimmer, such as a dimmer switch 75." *Id.* at 13:61–63. "The switching power supply 150A is implemented in two stages, an AC/DC converter 265 and a buck converter 270." *Id.* at 13:65–67. "The switching power supply 150A also comprises a controller 260." *Id.* at 14:18–19. According to Shteynberg,

The AC/DC converter 265 is utilized to provide a high input impedance, thereby eliminating the high input capacitance that

the single stage approaches have (and which can cause triacs of dimmers to misfire . . .). This first stage will convert a relatively poor, phased modulated AC voltage into a manageable DC voltage, while the second stage (buck converter 270) will perform LED driving using current PWM, through switching transistor 355 (Q2).

Id. at 13:67–14:8.

Further according to Shteynberg, “controller 260 may determine V_{RMS} using measurements from connections to the output of dimmer switch 75 on lines 381 and 382,” and “may determine $V_{NOMINAL}$ using measurements from connections to the output of dimmer switch 75 on lines 381 and 382, using measurements from connections to the AC line voltage 35 on lines 382 and 383 (dashed line), or using stored parameter values.” Ex. 1005, 14:22–28. “[C]ontroller 260 correspondingly adjusts the duty cycle of the pulse-width modulation of current provided to the LEDs 140 through switching transistor 355 (Q2).” *Id.* at 14:29–31. Shteynberg indicates that “[a] ‘controller’ or ‘processor’ . . . may be any type of controller or processor, and may be embodied as one or more controllers . . . , adapted to perform the functionality discussed.” *Id.* at 18:8–11.

2. *Kim (Ex. 1006)*

Kim, titled “Power Supply Device for Driving Light Emitting Diode,” published January 12, 2012, from application US 13/181,045, filed July 12, 2011. Ex. 1006, codes (54), (43), (21), (22). Kim “relates to a power supply device and, more particularly, a power supply device for driving a light emitting diode (LED) capable of controlling the switching of multiple output powers, in synchronization with the frequency of one of the

multiple output powers and simplifying a power conversion stage in supplying power for driving an LED.” *Id.* ¶ 3. For example, Kim discloses “an LED driving unit supplying [a] plurality of first powers maintained in current balancing by [a] current balancing unit to a plurality of LED units.” *Id.* ¶ 10.

3. *Morgan (Ex. 1007)*

Morgan, titled “LED Package Methods and Systems,” published February 2, 2006 from application US 11/178,214, filed July 8, 2005. Ex. 1007, codes (54), (43), (21), (22). The application claims priority to two provisional applications: US 60/588,090, filed July 15, 2004, and US 60/586,939, filed July 8, 2004. *Id.* at code (60).

Morgan discloses a “method for providing a light source including providing at least one LED in an LED die, and packaging the LED die with a submount, wherein the submount incorporates an electronic component for controlling the LED, wherein the electronic component facilitates control of at least one of the intensity and the apparent intensity of the LED die.” Ex. 1007 ¶ 14.

Morgan discloses a light system manager that may operate in part on an authoring computer, which may include a mapping facility. Ex. 1007 ¶ 433. The mapping facility may include a graphical user interface, or management tool, which may assist a user in mapping lighting units to locations. *Id.* Morgan further discloses that the management tool may include “[a] lights/interfaces pane [that] lists lighting units or lighting unit interfaces that are capable of being managed by the management tool. *Id.* According to Morgan, “[i]nterfaces may include power/data supplies (PDS) . . . for one or more lighting systems, DMX interfaces, DALI interfaces,

interfaces for individual lighting units, interfaces for a tile lighting unit, or other suitable interfaces.” *Id.*

II. ANALYSIS OF PETITIONER’S CHALLENGES

A. *Applicable Law*

Petitioner’s asserted grounds of unpatentability are based on anticipation under 35 U.S.C. § 102 and on obviousness under 35 U.S.C. § 103. A “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)).

With respect to obviousness under 35 U.S.C. § 103,

[a] patent for a claimed invention may not be obtained, notwithstanding that the claimed invention is not identically disclosed as set forth in section 102, if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains. Patentability shall not be negated by the manner in which the invention was made.

35 U.S.C. § 103 (2011); *see 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) when available, objective evidence, such as commercial success, long felt but unsolved needs, and

failure of others. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966); see *KSR Int’l Co.*, 550 U.S. at 407 (“While the sequence of these questions might be reordered in any particular case, the [Graham] factors continue to define the inquiry that controls.”). The Court in *Graham* explained that these factual inquiries promote “uniformity and definiteness,” for “[w]hat is obvious is not a question upon which there is likely to be uniformity of thought in every given factual context.” *Graham*, 383 U.S. at 18.

The Supreme Court made clear that we apply “an expansive and flexible approach” to the question of obviousness. *KSR Int’l Co.*, 550 U.S. at 415. Whether a patent claiming the combination of prior art elements would have been obvious is determined by whether the improvement is more than the predictable use of prior art elements according to their established functions. *Id.* at 417. To support this conclusion, however, it is not enough to show merely that the prior art includes separate references covering each separate limitation in a challenged claim. *Unigene Labs., Inc. v. Apotex, Inc.*, 655 F.3d 1352, 1360 (Fed. Cir. 2011). Rather, obviousness additionally requires that a person of ordinary skill at the time of the invention “would have selected and combined those prior art elements in the normal course of research and development to yield the claimed invention.” *Id.*

“[O]bviousness must be determined in light of *all the facts*, and . . . a given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine” teachings from multiple references. *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (emphasis added); see also *PAR Pharm., Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1196 (Fed. Cir. 2014) (“The presence or

absence of a motivation to combine references in an obviousness determination is a pure question of fact.”). As a factfinder, we also must be aware “of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning.” *KSR Int’l Co.*, 550 U.S. at 421.

For institution, “[t]he ‘reasonable likelihood’ standard is a somewhat flexible standard that allows the Board room to exercise judgment.” Patent Trial and Appeal Board Consolidated Trial Practice Guide 53 (Nov. 2019), *available at* <https://www.uspto.gov/TrialPracticeGuideConsolidated>.

B. 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 to which the ’759 patent pertains “would have had 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.

We apply this definition of the level of ordinary skill in the art. We determine that this definition is consistent with the prior art of record and the skill reflected in the Specification of the ’759 patent, based on our review of the limited record.

C. Claim Construction

In *inter partes* reviews, we interpret a claim “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). Under this standard, we construe the claim “in accordance with the ordinary and

customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

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.” Pet. 16.

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)).

D. Ground 1: Asserted Anticipation of Claims 1, 6, 13, 19, and 20 by Shteynberg

Petitioner contends that Shteynberg anticipates each limitation of claims 1, 6, 13, 19, and 20. Pet. 16–37. We address Petitioner’s relevant contentions below.

1. Independent claim 1

a) Limitation 1(a)⁷

Claim 1 recites, in relevant part, “a power circuit including: an inrush current limit; [and] a DC/DC converter.” Ex. 1001, 10:44–45 (limitation 1(a) of claim 1). Petitioner contends that “Shteynberg discloses the [recited] inrush current limit.” Pet. 17. Specifically, Petitioner cites to Shteynberg’s discussion of its Figure 5 for the disclosure. *Id.* We reproduce this discussion in its entirety below:

⁷ We use the limitation labels for claim 1 used by Petitioner. *See* Pet. 17–25 (labeling limitations 1(a)–1(f)).

For example, as illustrated in FIG. 5, a switching off-line LED driver 90 typically includes a full wave rectifier 20 with a capacitive filter 15, which allows current to flow to the filter capacitor (C) 15, when the input Voltage is greater than the Voltage across the capacitor. The inrush current to the capacitor is limited by the resistance in series with the capacitor. Under normal operating conditions, there may be a Negative Temperature Coefficient resistor (NTC) or thermistor in series with the capacitor to minimize inrush current during initial charging.

Id. (quoting Ex. 1005, 3:42–51). Petitioner contends that a person having ordinary skill in the art “would readily understand that using a resistor in series with a capacitor to limit inrush current as described in Shteynberg is analogous to the inrush current limit of the ‘759 [p]atent.” *Id.* at 18 (referencing Ex. 1002 ¶ 56).

In addressing limitation 1(b),⁸ Petitioner states “as discussed above (and as shown in Figure 10), Shteynberg discloses that the inrush current limiter (capacitor 345) is directly connected to the DC/DC converter.” Pet. 20 (referencing Ex. 1005, 14:11–18). We understand from this statement that Petitioner contends that Shteynberg’s capacitor 345, depicted in Figure 10, corresponds to the recited inrush current limit.

Mr. McAlexander testifies that “[i]nrush current occurs when a device is turned on and, during the initial stage, a huge amount of current rushes into the circuit.” Ex. 1002 ¶ 56 (citing Sourav Gupta, *Inrush Current – Causes, Effects Protection Circuits and Design Techniques*, CIR. DIG. (Nov. 27, 2019), available at <https://circuitdigest.com/tutorial/inrush-current-causes-effects-protection-circuits-and-design-techniques>). Mr.

⁸ Limitation 1(b) recites “a power factor correction (PFC) boost connected to the inrush current limit and the DC/DC converter.” Ex. 1001, 10:46–47.

McAlexander continues that “[a]n inrush current limiter is a component used to limit inrush current to avoid gradual damage to components and avoid blowing fuses or tripping circuit breakers.” *Id.* Mr. McAlexander opines that “[u]sing a resistor in series with a capacitor to limit inrush current as described in Shteynberg is analogous to the inrush current limit of the ‘759 [p]atent because the *resistor* when used as described limits current to an amount that is proportional to the amount of the resistance.” *Id.* (emphasis added).

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 recited inrush current limit. First, to the extent that Petitioner relies on the disclosure in Shteynberg’s Figure 5 beyond background support for Petitioner’s contentions, such reliance is misplaced. Shteynberg’s Figure 5 depicts a prior art current regulator (or converter). Ex. 1005, 3:36–55, 7:24–25, Fig. 5 (labeled as “PRIOR ART”). Indeed, in describing its invention, Shteynberg discloses first and second embodiments of its current regulator (or converter). *Id.* at 8:52–9:26, Figs. 6, 7. This description of Shteynberg’s first and second embodiments does not mention inrush current limiters. To anticipate, Shteynberg must disclose “every element of the claimed invention arranged as recited in the claim.” *Net MoneyIN, Inc.*, 545 F.3d at 1369 (holding that, to anticipate, the prior art reference must not only disclose all element of the claim within the four corners of the document, but must also discloses those elements “arranged as in the claim”) (internal citation omitted).

Second, Petitioner states that a person having ordinary skill in the art “would readily understand that using a *resistor in series with a capacitor* to

limit inrush current as described in Shteynberg is analogous to the inrush current limit of the ‘759 [p]atent.” Pet. 18 (emphasis added). Petitioner, however, identifies a *capacitor* only—capacitor 345 in addressing this element in connection with its limitation 1(b) arguments. *Id.* at 20.

Petitioner does not identify a resistor in series with capacitor 345 to act as the inrush current limiter in discussing this limitation. Shteynberg discloses that “[t]he inrush current to the capacitor is limited by the resistance in series with the capacitor.” Ex. 1005, 3:46–47. Shteynberg continues that, “[u]nder normal operating conditions, there may be a Negative Temperature Coefficient resistor (NTC) or thermistor in series with the capacitor to minimize inrush current during initial charging,” highlighting the role of the resistor. *Id.* at 3:48–51.

Similarly, Mr. McAlexander explains that “the *resistor* when used as described limits current to an amount that is proportional to the amount of the resistance.” Ex. 1002 ¶ 56. Consistent with Shteynberg’s disclosure, Mr. McAlexander makes it clear that it is the resistor that limits the flow of current. Neither Petitioner nor Mr. McAlexander identifies a resistor in Shteynberg’s current regulator or switching power supply that limits the inrush current.

Also, we are not persuaded that Petitioner’s “analogous to” argument comports with the standard for anticipation. Under the applicable standard for anticipation, neither Petitioner nor its declarant provides persuasive analysis that would show that one skilled in the art would have reasonably understood or inferred from Shteynberg that its capacitor 345 is the claimed inrush current limit. *Cf. Eli Lilly & Co. v. L.A. Biomedical Research Inst.*, 849 F.3d 1073, 1074–1075 (Fed. Cir. 2017) (“[T]he dispositive question

regarding anticipation is whether one skilled in the art would reasonably understand or infer from a prior art reference that every claim element is disclosed in that reference”).

For these reasons, we find that Petitioner fails to demonstrate a reasonable likelihood that Shteynberg discloses the recited inrush current limit in limitation 1(a).

b) Limitations 1(e) and 1(f)

Claim 1 also recites, in relevant part, “a set of output current drivers, each of the set of output current drivers connected to one of the set of light fixture loads for powering the associated light fixture load.” Ex. 1001, 10:51–53 (limitation 1(e) of claim 1). Relatedly, claim 1 recites “an apparatus for configuring the set of output current drivers to an output current set point.” *Id.* at 10:54–55 (limitation 1(f) of claim 1).

Petitioner contends, with respect to limitation 1(e), that

Shteynberg discloses that:
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. 24 (quoting Ex. 1005, 8:20–29). Petitioner contends that this disclosure supports Petitioner’s contention that “Shteynberg discloses a set of output current drivers for controlling the LED brightness.” *Id.*

Petitioner contends, with respect to limitation 1(f), that “Shteynberg discloses that ‘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.’” Pet. 25 (quoting Ex. 1005, 8:20–24).

Petitioner also contends that

Shteynberg, in its discussion of Figure 7, further discloses that “the controller 160 (and 260, FIG. 10) is programmed, adapted or configured to emulate the brightness or intensity control provided by the dimmer switch 75, to control the switching power supply 150 and correspondingly modify the brightness (or intensity) provided by the LEDs 140.”

Pet. 25 (quoting Ex. 1005, 9:21–26); *see id.* at 26 (reproducing Shteynberg’s Figure 7). Petitioner concludes that a person having ordinary skill in the art “would understand, as discussed above, that the controller 160 or 260 is the apparatus that configures the set of output current drivers (switching power supply 150) to an output current set point.” *Id.* at 26 (referencing Ex. 1002 ¶ 60). Petitioner contends that the switching power supply 150 corresponds to the recited current drivers. *See id.*

Mr. McAlexander does not address limitations 1(e) and 1(f) directly. *See* Ex. 1002 ¶¶ 54–63 (addressing Ground 1). In paragraph 60, cited by Petitioner, Mr. McAlexander testifies that Shteynberg’s controller 160 corresponds to the recited primary controller and Shteynberg’s controller 260 corresponds to the recited secondary controller. *Id.* ¶ 60. Mr. McAlexander testifies that these controllers can perform functions, but does not specify the functions. *See id.* He does not testify how the

controllers relate to output current drivers or configuring the set of output current drivers to an output current set point. *See id.*

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 subject matter of limitations 1(e) and 1(f). We start by reproducing Shteynberg’s Figure 7, below, which is cited by Petitioner. *See* Pet. 25–26 (citing Ex. 1005, Fig. 7, 9:21–26 (discussing Fig. 7)).

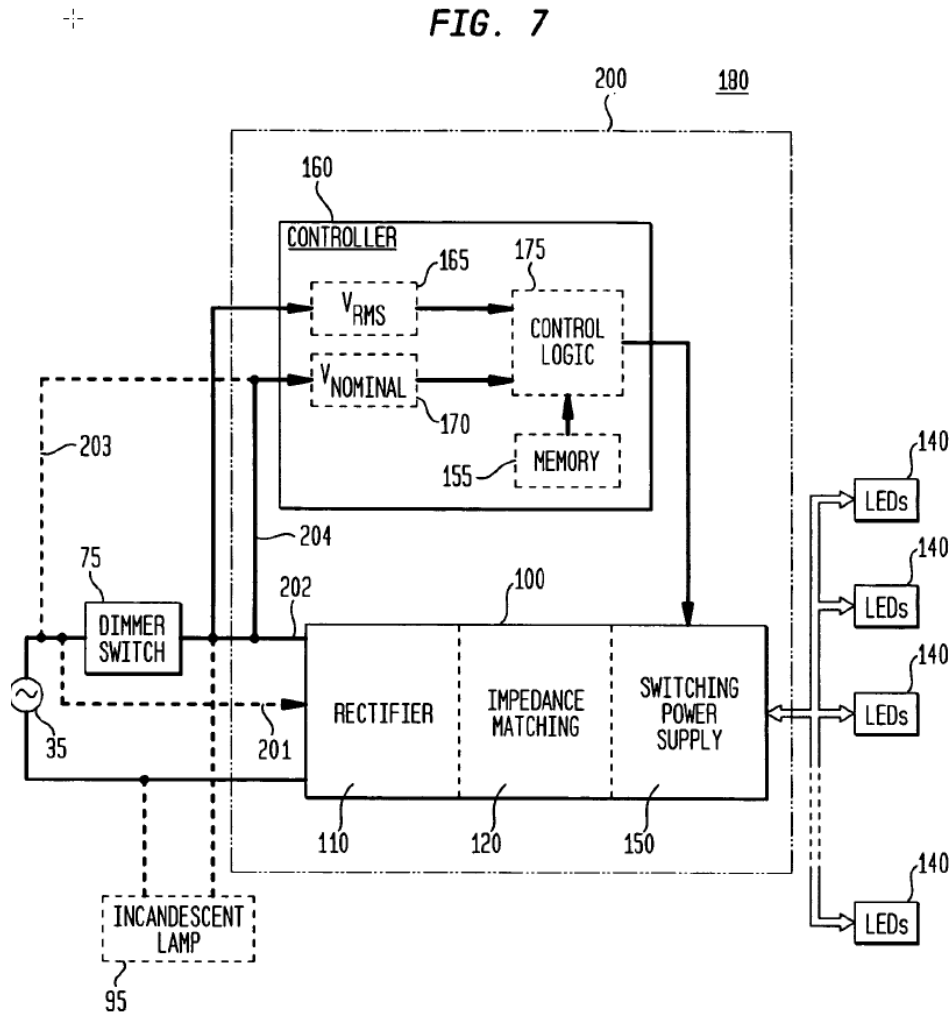


Figure 7 depicts “a block diagram of an exemplary second embodiment of a current regulator (or converter).” Ex. 1005, 7:29–30. Current regulator 200

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 a single switching power supply 150, which Petitioner contends is the output current driver, connected to a set of LEDs 140. Pet. 26 (“the set of output current drivers (switching power supply 150)”). 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. 24) 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. *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.”).

Even if we accept that a person having ordinary skill in the art would have understood Shteynberg to disclose the subject matter of limitation 1(e),

Petitioner does not adequately explain how controller 160 or controller 260 configures switching power supply 150 (the asserted output current driver) to an output current set point as required by claim element 1(f). Petitioner quotes a portion of Shteynberg that discloses the controllers may be configured to emulate the brightness corresponding to a dimmer switch setting, but Petitioner does not explain how controller 160 or controller 260 in turn *configures switching power supply 150* to an output current set point. *See* Pet. 25 (quoting Ex. 1005, 9:21–26).

As we state above, Mr. McAlexander does not specifically address claim limitations 1(e) and 1(f). Also, Petitioner’s reliance on Mr. McAlexander’s testimony that Shteynberg’s controller 160 corresponds to the recited primary controller and Shteynberg’s controller 260 corresponds to the recited secondary controller does not remedy the deficiency we identify. Controller 160 is a controller for an embodiment of a current regulator, which includes a switching power supply. *See* Ex. 1005, 9:3–10:40 (describing the embodiment of Figure 7), Fig. 7. Controller 260 is a controller for an embodiment of a switching power supply. *See id.* at 13:34–14:21 (describing Fig. 10, which is a “circuit diagram of an exemplary embodiment of a switching power supply 150A,” and includes controller 260). Petitioner does not explain adequately how Mr. McAlexander’s characterization of controller 160 and controller 260 supports Petitioner’s contention that controller 160 or controller 260 corresponds to the recited “apparatus” of limitation 1(f), including the functional limitation contained therein.

For these reasons we find that Petitioner fails to demonstrate a reasonable likelihood that Shteynberg discloses the recited set of output

current drivers and apparatus for configuring the set of output current drivers of limitations 1(e) and 1(f), arranged as recited in these limitations. *Cf. Net MoneyIN, Inc.*, 545 F.3d at 1369 (“[A] 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.’”).

c) Conclusion

For the reasons discussed above, we determine that the information in the Petition fails to demonstrate a reasonable likelihood that claim 1 is unpatentable as anticipated by Shteynberg.

2. Independent claim 20

Claim 20 recites, in relevant part, “a power circuit” that includes “an inrush current limit.” Ex. 1001, 12:5–6 (limitation 20(b)⁹ of claim 20). Petitioner contends that “Shteynberg discloses ‘[i]t may also be assumed during a first phase that dimmer switches generally and initially will not be changed or rewired, so all of their existing performance characteristics will be maintained, such as power harmonics, inrush currents during initial powering on, . . . and audio harmonics (such as buzzing).’” Pet. 31 (quoting Ex. 1005, 8:44–49). Petitioner adds that “Shteynberg further discloses that ‘[t]he exemplary embodiments are also more power efficient, reducing the supplemented current (and therefore I²R power loss) when there are other loads providing or sinking currents or when the phase angle α is small.’” *Id.*

⁹ See Pet. 54 (identifying the association between the limitations of claim 20 and Petitioner’s claim notation). We note, however, that in the Petition, Petitioner labels this limitation “1(b).” See *id.* at 31. We treat this error as a typographical error.

at 31–32 (quoting Ex. 1005, 10:37–39). Petitioner concludes that a person having ordinary skill in the art “would readily understand that maintaining the level of inrush currents as described in Shteynberg is analogous to the inrush current limit of the ‘759 patent.” *Id.* at 32 (referencing Ex. 1002 ¶ 56).

Claim 20 also recites, in relevant part, “a power factor correction (PFC) boost connected to the inrush current limit.” Ex. 1001, 12:8–9 (limitation 20(d) of claim 20). That is, claim 20 requires the inrush current limit to be connected to a PFC boost.

Mr. McAlexander testifies, at paragraph 56 of his Declaration (upon which Petitioner relies), that “[i]nrush current occurs when a device is turned on and, during the initial stage, a huge amount of current rushes into the circuit.” Ex. 1002 ¶ 56 (citing Gupta, *Inrush Current— Causes, Effects Protection Circuits and Design Techniques*). Mr. McAlexander continues that “[a]n inrush current limiter is a component used to limit inrush current to avoid gradual damage to components and avoid blowing fuses or tripping circuit breakers.” *Id.* Mr. McAlexander opines that “[u]sing a resistor in series with a capacitor to limit inrush current as described in Shteynberg is analogous to the inrush current limit of the ‘759 [p]atent because the resistor when used as described limits current to an amount that is proportional to the amount of the resistance.” *Id.*

We have considered Petitioner’s contentions and find that they fail to demonstrate a reasonable likelihood that Shteynberg discloses the recited inrush current limit as arranged in claim 20. Petitioner’s reliance on Shteynberg’s disclosure at column 8, lines 44 to 49 is unconvincing. This disclosure 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. Shteynberg does not discuss how these phases relate to its disclosed circuits. Petitioner does not identify any component in any of the circuits disclosed in Shteynberg upon which Petitioner relies for the power circuit component of claim 20 that corresponds to the recited inrush current limit.

Also, Petitioner fails to explain adequately how this disclosure demonstrates that Shteynberg’s disclosed power circuit, upon which Petitioner relies for the other limitations of claim 20, would include an inrush current limit. For example, in discussing limitation 20(d), Petitioner concludes that the PFC boost is connected to the inrush current limit, but does not provide any information about what corresponds to the inrush current limit or how the component is connected to the PFC boost. *See* Pet. 33–34.

Also, as discussed above in connection with our analysis of claim 1, we are not persuaded that Petitioner’s “analogous to” argument comports with the standard for anticipation. *Cf. Eli Lilly & Co.*, 849 F.3d at 1074–1075.

Mr. McAlexander’s testimony also fails to support Petitioner’s contention. Mr. McAlexander testifies that a resistor “limits current to an amount that is proportional to the amount of the resistance” and “[u]sing a resistor in series with a capacitor to limit inrush current as described in Shteynberg is analogous to the inrush current limit of the ‘759 [p]atent.” Ex. 1002 ¶ 56. But Petitioner does not identify a resistor in series with a capacitor in its analysis of limitation 20(b).

Even if we assume that Petitioner intended to reference its analysis for limitation 1(a)'s inrush current limit, in which Petitioner identifies capacitor 345 from Shteynberg's Figure 10, such a reliance is insufficient. As we discuss above, in connection with our analysis of claim 1, Petitioner's contention is insufficient to demonstrate that that Shteynberg discloses the recited inrush current limit, because it does not identify a resistor.

For these reasons, we find that Petitioner fails to demonstrate a reasonable likelihood that Shteynberg discloses the recited inrush limit in limitation 20(b). Accordingly, we determine that the information in the Petition fails to demonstrate a reasonable likelihood that claim 20 is unpatentable as anticipated by Shteynberg.

3. Dependent claims 6, 13, and 19

Dependent claims 6, 13, and 19 depend, directly or indirectly, from claim 1. We discern nothing in Petitioner's analysis directed to these dependent claims that remedies the deficiencies we identify for claim 1. Accordingly, we determine that that the information in the Petition fails to demonstrate a reasonable likelihood that claims 6, 13, and 19 are unpatentable as anticipated by Shteynberg, for at least the reason that these claims depend from a claim that is not proven unpatentable.

E. Ground 2: Asserted Obviousness of Claims 2, 5, 15, and 19 over Shteynberg and Kim

Petitioner contends that claims 2, 5, 15, and 19 are rendered obvious by the combination of Shteynberg and Kim. Dependent claims 2, 5, 15, and 19 depend, directly or indirectly, from claim 1. We discern nothing in Petitioner's analyses directed to these dependent claims, including its analysis directed to Kim's teachings, that remedy the deficiencies we

identify for claim 1. Accordingly, we determine that that the information in the Petition fails to demonstrate a reasonable likelihood that claims 2, 5, 15, and 19 are unpatentable as obvious over Shteynberg and Kim, for at least the reason that these claims depend from a claim that is not proven unpatentable.

F. Ground 3: Asserted Obviousness of Claims 8, 9, 16, 17, 19, and 24 over Shteynberg and Morgan

Petitioner contends that claims 8, 9, 16, 17, 19, and 24 are rendered obvious by the combination of Shteynberg and Kim. Dependent claims 8, 9, 16, 17, and 19 depend, directly or indirectly, from claim 1, and claim 24 depends directly from claim 20. We discern nothing in Petitioner's analyses directed to these dependent claims, including its analysis directed to Morgan's teachings, that remedy the deficiencies we identify for claims 1 and 20. Accordingly, we determine that that the information in the Petition fails to demonstrate a reasonable likelihood that claims 8, 9, 16, 17, 19, and 24 are unpatentable as obvious over Shteynberg and Morgan, for at least the reason that these claims depend from a claim that is not proven unpatentable.

III. 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.

IV. ORDER

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

IPR2023-01258
Patent 9,049,759 B2

For PETITIONER:

Winston O. Huff
Jamil N. Alibhai
MUNSCH HARDT KOPF & HARR, P.C.
EL-mate-IPRs@munsch.com

For PATENT OWNER:

Melanie J. Reichenberger
Kevin P. Moran
MICHAEL BEST & FRIEDRICH LLP
mjreichenberger@michaelbest.com
kpmoran@michaelbest.com