

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VIZIO, INC.,
Petitioner

v.

POLARIS POWERLED TECHNOLOGIES, LLC,
Patent Owner

Case IPR2024-00073
U.S. Patent No. 7,843,148

PATENT OWNER RESPONSE UNDER 37 C.F.R. § 42.120

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PATENT OWNER'S UPDATED EXHIBIT LIST

Exhibit No.	Description
2001	Declaration of Aidan M. Brewster in Support of <i>Pro Hac Vice</i> Admission
2002	Declaration of Thomas L. Credelle
2003	<i>Curriculum Vitae</i> of Thomas L. Credelle
2004	Transcript of the Deposition of Regan A. Zane, Ph.D.
2005	U.S. Patent No. 7,948,468 to Zane et al., issued May 24, 2011
2006	“Comprehensive Dictionary of Electrical Engineering,” Taylor & Francis Group, LLC, 2 nd Edition (2005) (Excerpts)
2007	Final Rulings on Markman/Claim Construction, <i>Polaris PowerLED Techs., LLC v. VIZIO, Inc.</i> , No. 2:23-cv-03478 (C.D. Cal. May 8, 2024)
2008	U.S. Patent No. 4,156,288 to Spandorfer, issued May 22, 1979
2009	U.S. Patent No. 3,166,715 to Cogar, issued January 19, 1965

I. INTRODUCTION

The Board should refuse to find claims 1-22 of U.S. Patent No. 7,843,148 (“the ’148 patent,” EX1001) unpatentable.

Thomas does not disclose at least two limitations of the ’148 patent’s independent claims. First, the independent claims recite “a plurality of current set circuits.” For each of the claimed “current set circuits,” Petitioner maps a single passive resistor of Thomas to a claimed current set circuit. But a single passive resistor is *not* a “circuit.” Second, the independent claims require applying a PWM brightness control signal to the current set circuit. Thomas does not disclose this limitation because the modulating signal in Thomas is applied to a switch, *not* to the single passive resistor that Petitioner identifies as the claimed set circuit. Both elements are required by the independent claims, and thus, every claim of the ’148 patent. Therefore, Thomas cannot anticipate the challenged claims.

Petitioner’s backup obviousness ground for the independent claims based on Thomas is facially deficient. Petitioner provides *no* analysis or explanation of its obviousness positions. Such conclusory allegations of obviousness cannot succeed.

Second, Petitioner’s declarant, Dr. Zane, is an author of the asserted *Zane* paper in Petitioner’s second set of grounds. This creates unresolvable bias issues that prevent Dr. Zane from testifying as to a POSITA’s understanding of this reference. Without Dr. Zane’s testimony, Petitioner’s contentions regarding *Zane*

are merely unsupported attorney argument, and are insufficient to meet Petitioner's burden. Further still, Petitioner has not shown that *Zane* teaches or suggests the modification proposed by Petitioner to meet the elements of dependent claims 5 and 16.

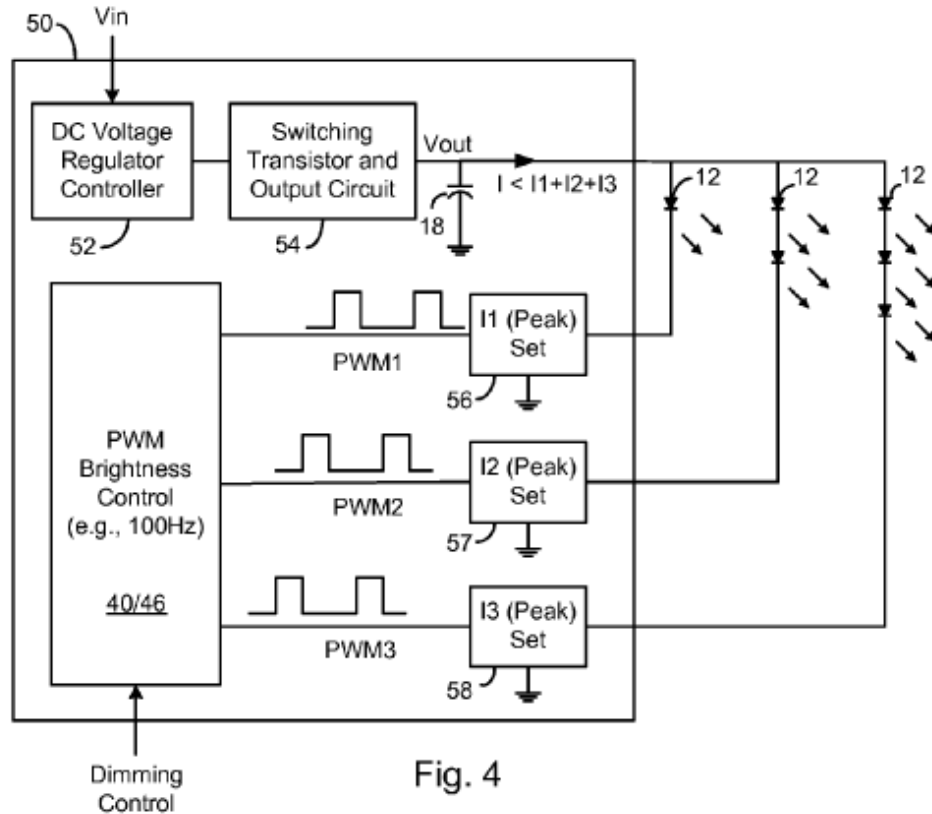
The Petition therefore fails to show that any of the challenged claims are anticipated or obvious.

II. THE '148 PATENT

A. Summary

The '148 patent is directed to a light emitting diode (LED) driver that drives LEDs in parallel. EX1001, 1:6-7. Instead of applying current to all the parallel paths at the same time, as in the prior art, the '148 patent uses staggered application of current to each parallel path, under the control of a pulse-width modulation (PWM) brightness control signal. EX1001, 2:65-67; EX2002, ¶24. "This reduces ripple in the power supply, since the current provided by the power supply when the PWM signal goes high is not the sum of all the LED peak currents." EX1001, 3:1-3; EX2002, ¶¶24, 28. It also "reduces noise, eases the constraints on the power supply, improves the color output of the LEDs, reduces artifacts caused by lights flickering, and provides other benefits." EX1001, 4:9-12; EX2002, ¶¶24, 28.

Figure 4, reproduced below, illustrates an LED driver according to an embodiment of the '148 patent. EX1001, 3:56-59.



EX1001, FIG. 4.

As shown in Figure 4, one or more LEDs 12 are connected in parallel paths. EX1001, 5:18-25; EX2002, ¶¶25-26. DC voltage regulator controller 52 and switching transistor and output circuit block 54 provide an output voltage (V_{out}) to the LED paths. EX1001, 5:26-47; EX2002, ¶26. Thus, “[a]ll LED paths are energized with the same voltage.” EX1001, 5:48-50; EX2002, ¶26. The LED paths, however, “may draw different currents, set by the current set circuits 56, 57, and 58.” EX1001, 5:48-50; EX2002, ¶26.

“The current set circuits 56-58 are effectively enabled and disabled by their associated staggered PWM brightness control signal PWM1, PWM2, or PWM3.” EX1001, 5:50-52; EX2002, ¶27. PWM brightness control unit 40/46 may be implemented, for example, as the shift register 40 shown in FIG. 2A or the shift register 46 shown in FIG. 2B. EX1001, 5:54-57; *see* EX1001, 4:31-64. The PWM brightness control signals are identical but staggered, and are generally out of phase with each other. EX1001, 4:43-46, 4:57-58; EX2002, ¶27. However, “[i]f the driver drives many parallel paths, some paths may be driven in phase and other paths driven out of phase.” EX1001, 4:63-64.

B. Person of Ordinary Skill in the Art (POSITA)

“[T]he level of skill in the art is a prism or lens through which . . . the Board views the prior art and the claimed invention.” *Okajima v. Bourdeau*, 261 F.3d 1350, 1354-55 (Fed. Cir. 2001). “This reference point prevents these factfinders from using their own insight or, worse yet, hindsight, to gauge obviousness.” *Id.*

Petitioner and Dr. Zane allege that a POSITA “would have had at least a bachelor’s degree in physics, electrical engineering, or a related field, and approximately two years of experience in the fields of LED technology, backlights, LED devices and control thereof, or other related fields” and that “advanced education in the fields of physics, electrical engineering, or a related field can compensate for lesser work experience in the relevant fields.” Pet., 16; EX1003,

¶¶34-35. For the purposes of this proceeding, Patent Owner applies Petitioner's definition of a POSITA. EX2002, ¶22. However, as discussed in more detail below, Section III.B.2, Dr. Zane cannot credibly testify from the perspective of a POSITA as to the *Zane* paper.

C. Claim Construction

Patent Owner agrees with Petitioner, Pet., 16, that no claim terms need to be expressly construed to resolve the disputed issues. EX2002, ¶23.

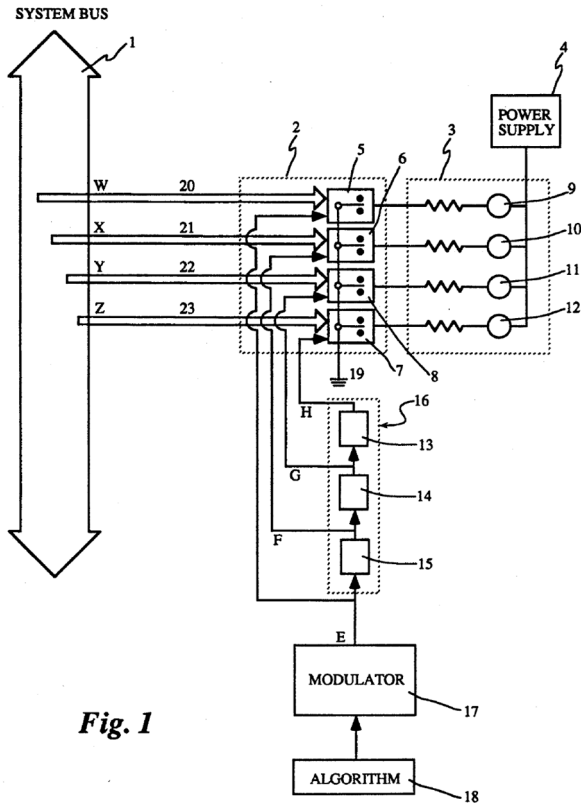
III. THE PETITION FAILS TO DEMONSTRATE ANTICIPATION OR OBVIOUSNESS OF ANY CHALLENGED CLAIM.

A. Grounds 1, 2A, 2B, and 2C: Petitioner fails to demonstrate that Thomas anticipates or renders obvious the challenged claims.

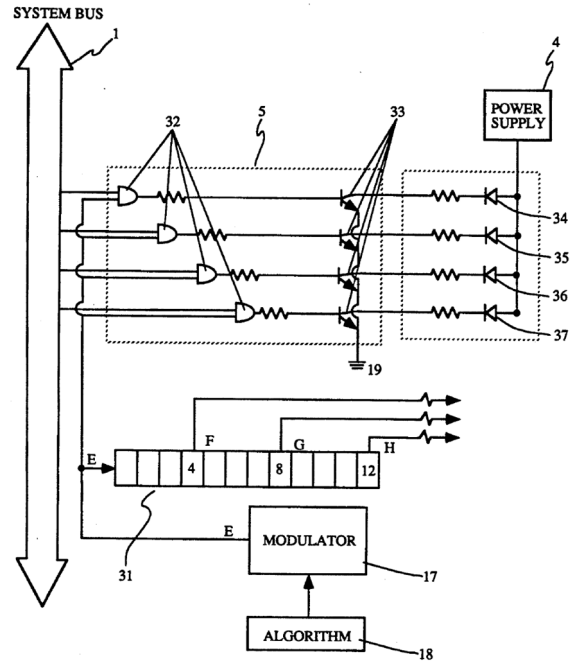
1. Summary of Thomas

Thomas relates to a method and apparatus that controls a plurality of LEDs using pulse width modulation. EX1005, Abstract; EX2002, ¶29. The PWM signals are staggered such that four LED strings are energized sequentially with only one group of LEDs energized at a time. EX1005, Abstract; EX2002, ¶29.

Thomas's LED control circuit is shown in Figures 1 and 2, reproduced below. Figure 2 is a partial circuit diagram of the circuit of Figure 1, showing one group of four LEDs and their respective control lines and control devices. EX1005, 3:3-5; EX2002, ¶30.



EX1005, FIG. 1.



EX1005, FIG. 2.

Control signals X, W, Y, Z, are transmitted to the LED's 9-12 through activation switches 5-8. EX1005, 3:24-32; EX2002, ¶30. Modulating signals E, F, G, H, which act to modulate the control signals, are shifted in time relative to each other using a shift register. EX1005, 3:64-4:16; EX2002, ¶¶29-30. The intensity of the LEDs are controlled by providing a PWM signal to the AND gates such that LEDs 9-12 will not turn on at the same time. EX1005, 4:66-5:10; EX2002, ¶30. Each LED 34-37 in a group of LEDs 9 is connected to driving transistors 33 through respective resistors, which are shown in Thomas's Figure 2 but are unlabeled and not further described. EX1005, 3:32-35, FIG. 2; EX2002, ¶31. The

gates of driving transistors 33 are controlled by the output of the AND gates 32.

EX1005, 3:39-42; EX2002, ¶31. A power supply 4 “provide[s] current” to activate the individual LEDs in each group 9-12. EX1005, 3:42-45; EX2002, ¶31.

2. Thomas does not anticipate claims 1, 3, 7, 9, 10-12, 14, 17, 18, and 20-22.

It is black letter law that “the hallmark of anticipation is prior invention.” *Net MoneyIn, Inc. v. VeriSign, Inc.*, 545 F.3d 1359, 1369 (Fed. Cir. 2008). So, for a reference to anticipate under 35 U.S.C. § 102, 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.’” *Id.* at 1369 (quoting *Connell v. Sears, Roebuck Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)). Thus, in order to show Thomas anticipates any challenged claim, Petitioner must show that it discloses each and every element of the claim “arranged or combined in the same way as recited in the claim.” *Id.* at 1371. Petitioner has not made such a showing here, and, thus, has not met its burden to prove anticipation.

a. Claim [1.b]/[14.b]: Thomas’s resistor does not disclose a “current set circuit.”

Petitioner’s identification of individual passive resistors in Thomas as the claimed “plurality of current set circuits” (recited in elements [1.b] and [14.b]) does not satisfy independent claims 1 and 14. EX2002, ¶¶34-38. This is fatal to Petitioner’s Ground 1—anticipation based on Thomas.

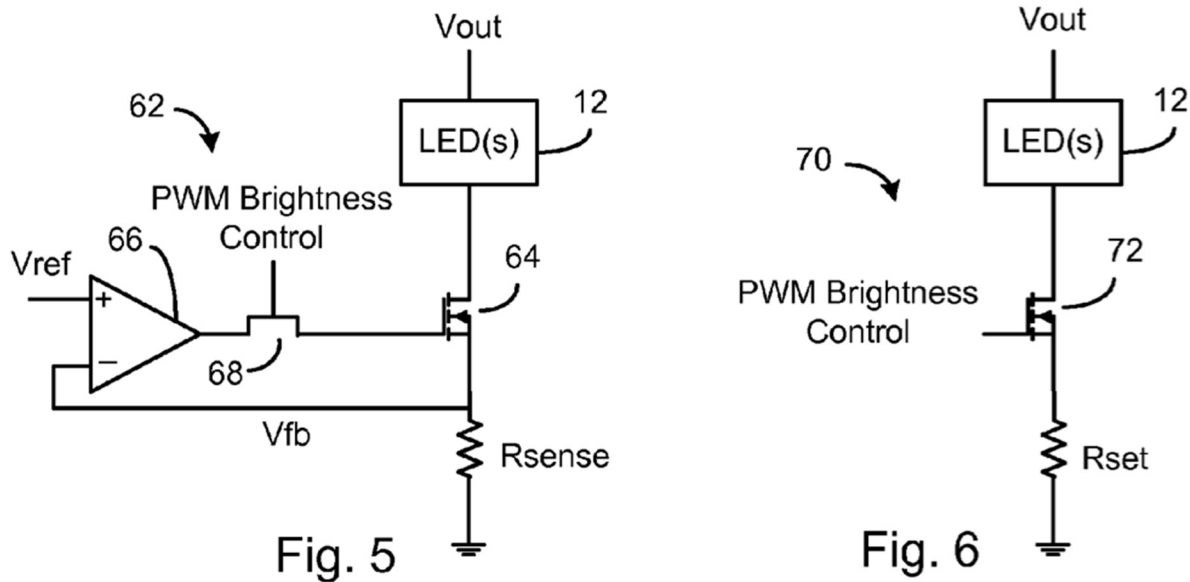
The dispositive flaw in Petitioner’s Ground 1 is simple. Petitioner and Dr. Zane rely on an individual passive resistor (a single electronic component) for the “current set circuit” limitation. Pet., 26 (alleging that “the resistors shown in Thomas’ Figure 1 (and more specifically, the individual resistors in each sub-path in Figure 2) are each a current set circuit, and there is one current set circuit per parallel path shown in Figure 1 which controls the peak current through the LED in each parallel path”); EX1003, ¶¶62-63; EX2004, 84:3-87:17; *see* EX2004, 85:1-3 (“And it is my opinion that those resistors are current set circuits.”); *see* EX2004, 86:18-87:17 (confirming that Thomas’s resistors have fixed values, i.e., are passive not variable resistors); EX2002, ¶31 (confirming that Thomas’s resistors are “passive resistors”). The Petition does not identify an actual “circuit” (i.e., multiple electronic components that are connected by conductive material) as required by the plain meaning of the term and the language of the claims, and as supported by the ’148 patent’s specification and figures. EX2002, ¶34. The intrinsic and extrinsic evidence confirm that simple passive resistors, such as those in Thomas on which the Petition relies, cannot satisfy the claimed “current set circuits.” Petitioner’s identification of an individual passive resistor for each of the claimed “plurality of current set circuits” does not satisfy independent claims 1 and 14. EX2002, ¶34. Petitioner has, thus, failed to demonstrate that Thomas anticipates *any* claim of the ’148 patent. Ground 1 fails as a result.

First, Petitioner’s identification of a resistor as a “current set circuit” is inconsistent with a POSITA’s understanding of the plain meaning of the term “circuit” recited in the claims. EX2002, ¶¶34, 37. A POSITA would understand “circuit” to mean *two or more* components that are connected by conductive material so that current can flow between the components. EX2002, ¶34. The claimed “circuit” cannot be met by a single electronic component, such as a resistor or capacitor. EX2002, ¶34. Indeed, a POSITA would *not* have understood any individual electronic component, such as a resistor, diode, capacitor, wire, or the like, to be a “circuit.” EX2002, ¶34. Petitioner’s own declarant, Dr. Zane, confirmed this at his deposition. When asked, “[w]hat is an electric circuit?”, Dr. Zane responded: “generally speaking, an electrical circuit would be a circuit made up of electrical componentss, such as resistors, transistors, capacitors, inductors, diodes, et cetera,” recognizing that circuits require plural (i.e., *multiple*) electronic components. EX2004, 35:10-16 (emphasis added).

Petitioner, however, erroneously identifies each individual resistor in Thomas as teaching the ’148 patent’s claimed “current set circuit.” Pet., 26 (“Thus, the resistors shown in Thomas’ Figure 1 (and more specifically, the individual resistors in each sub-path in Figure 2) are each a current set circuit”). This unequivocally fails to disclose the “current set *circuit*” of claims 1 and 14 because, as discussed above, a simple resistor is not a circuit. In order to comprise a circuit,

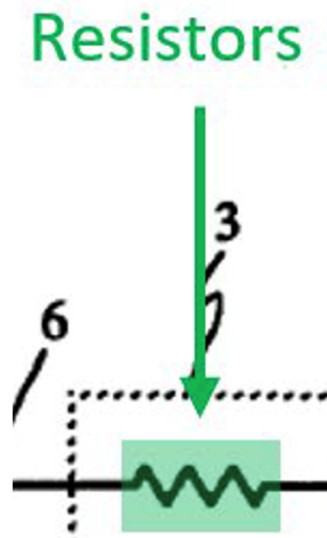
Petitioner would need to identify at least two electronic components connected to each other. EX2002, ¶34. For this reason alone, Petitioner's assertion of Thomas fails to anticipate any claim of the '148 patent.

Second, Petitioner's identification of a simple resistor as the claimed "current set circuit" is inconsistent with the specification of the '148 patent itself. EX2002, ¶¶35-37. The '148 patent provides two exemplary embodiments of the "current set circuit" of claims 1 and 14. Figures 5 and 6 each illustrate an example circuit "that may serve as each of the current set circuits 56-58 in FIG. 4." EX1001, 5:58-59, 6:7-8. Unsurprisingly, as shown below, each figure depicts *multiple* electronic components as part of the current set circuit:



EX1001, FIGs. 5, 6.

Specifically, Figure 5 depicts that “[a] low value *sense resistor* (R_{sense}) and *MOSFET* 64 are connected in series with the one or more LEDs.” EX1001, 5:59-62 (emphasis added). Similarly, Figure 6 depicts that “[a] *current set resistor* R_{set} and *MOSFET* 72 are connected in series with the one or more LEDs.” EX1001, 6:9-11 (emphasis added). Neither of these examples, in which the current set circuits consist of two or more electronic components, EX2002, ¶¶34-35, supports Petitioner’s position that a single resistor meets the claimed “current set circuit” (shown below):



EX1005, FIG. 1 (excerpted; Petitioner’s annotations, Pet., 25).

Tellingly, neither Petitioner nor its declarant Dr. Zane provides *any argument or explanation* as to how an individual passive resistor is a “circuit,” as claimed. Dr. Zane’s only usage of the term “circuit” with respect to the resistor is a conclusory sentence that the claim element is disclosed. EX1003, ¶63

(“Accordingly, Thomas discloses resistors connected in series with the LEDs in each parallel path which are current set circuits”). Nor does Petitioner explain how its interpretation is consistent with the ’148 patent specification’s repeated description of circuits comprising more than one component. Because it is Petitioner’s position that Thomas’s simple resistor is a “circuit” as claimed, it is Petitioner’s burden to explain why this is so. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). Petitioner has not.

Accordingly, for at least the above reasons, Petitioner’s identification of individual passive resistors as the claimed “plurality of current set circuits” does not satisfy independent claims 1 and 14. Therefore, Petitioner has failed to meet its burden in demonstrating that Thomas discloses elements [1.b]/[14.b] of claims 1 and 14. Ground 1 fails as a result.

b. Claim [1.d]/[14.d]: Thomas does not disclose applying a PWM brightness control signal *to the current set circuit*.

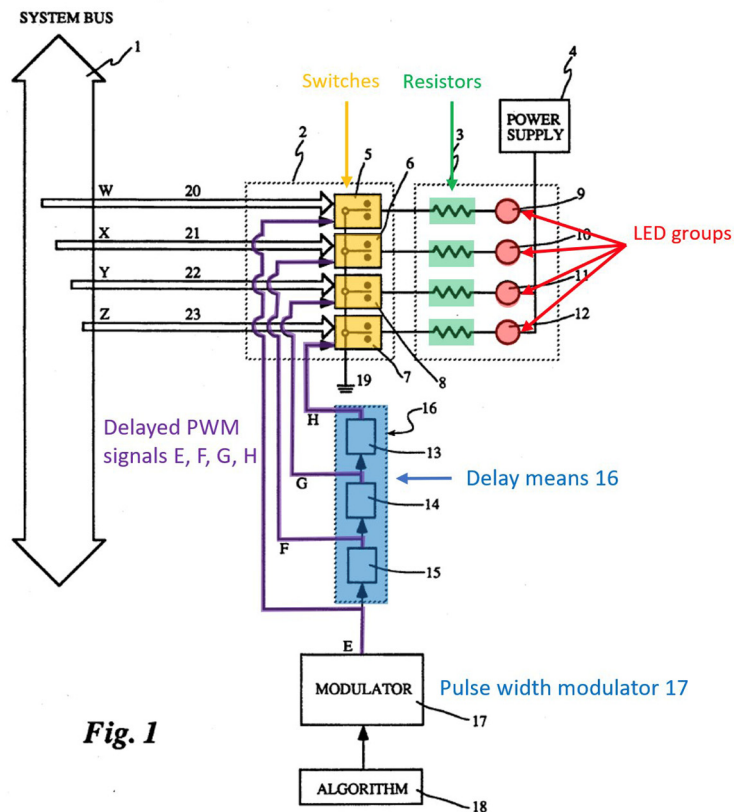
Element [1.d] recites that “each current set circuit being configured to draw the peak current through its associated one or more LEDs at a duty cycle substantially corresponding to a duty cycle of *a PWM brightness control signal applied to it*,” and element [14.d] similarly recites “applying a different staggered PWM brightness control signals to each current set circuit.” Thomas does not disclose elements [1.d] and [14.d], because Thomas does not “apply” a PWM

brightness control signal to the alleged “current set circuits.” As a primary matter, as discussed in Section III.A.2.a above, a resistor is not a current set circuit.

EX2002, ¶¶34-37. For that reason alone, Thomas does not disclose elements [1.d] and [14.d] for the same reasons it does not disclose elements [1.b] and [14.b].

However, even assuming *arguendo* that a resistor can be considered a current set circuit, Petitioner’s identification of elements [1.d] and [14.d] in Thomas is insufficient. EX2002, ¶¶39-42.

Petitioner maps the “current set circuits” of claim 1 as corresponding to the “resistors” in Thomas’s Figure 1, reproduced below:



EX1005, FIG. 1 (Petitioner’s annotations, Pet., 31).

Petitioner identifies the resistors labeled in green in the figure as the alleged “current set circuit[s]” of claims 1 and 14. Pet., 26 (“Thus, the resistors shown in Thomas’ Figure 1 (and more specifically, the individual resistors in each sub-path in Figure 2) are each a current set circuit”); EX1003, ¶63. Petitioner’s declarant, Dr. Zane, confirmed this mapping at his deposition. EX2004, 83:22-85:3; EX2004, 84:22-85:3 (“Thomas discloses the resistors connected in series with the LEDs. And it is my opinion that those resistors are current set circuits”).

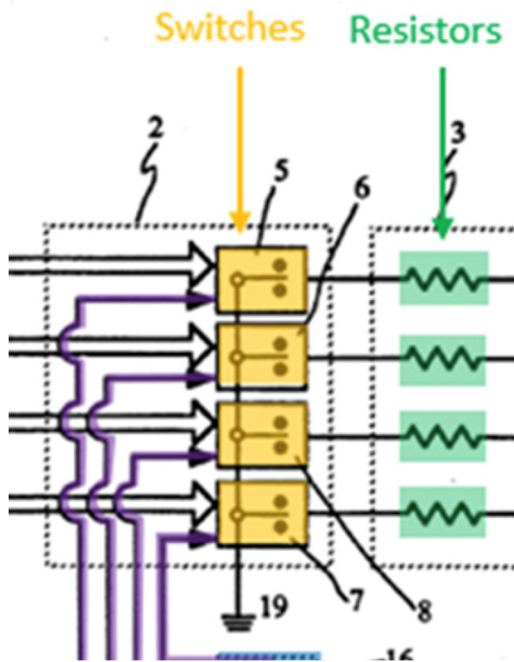
Critically, the PWM signal is never *applied* to the resistors in Thomas. EX2002, ¶¶40-41. Instead, as even the Petition itself recognizes, “the staggered PWM signals *E*, *F*, *G*, and *H* are fed into activation switches 5, 6, 8, and 7, respectively.” Pet., 30; EX2002, ¶40. In other words, the PWM signals go to the activation switches, and more specifically the gating control logic 32 thereof. EX1005, FIG. 2, 3:51-55 (“a modulating signal is supplied . . . *to the gating control logic (32)*” (emphasis added)); EX2002, ¶40. The only thing applied to the resistors that Petitioner has identified as the “current set circuits” is the current itself, which is *different* from the PWM brightness control signal. EX2002, ¶40. Indeed, Petitioner *confirms* that the PWM brightness control signal only reaches the switches, and the current is the only thing that flows through the resistors. Pet., 31 (“The switches activate their respective parallel paths (allowing current to flow through the current set circuit) when *the switches receive a high pulse from the*

PWM signal.” (emphasis added)). Dr. Zane also confirmed that Thomas’s PWM signal is applied to the AND gates that are part of the activation switches, *not* to the resistors. EX2004, 81:7-10 (“Q And so that modulating signal E is applied as input to the activation switch 5. Correct? A That is correct.”), 82:1-8 (“Q And Figure 2 shows the activation switch as including four AND gates which are labeled 32. Correct? A That is correct. Q Each AND gate accepts as input control signal W from the system bus 1 and modulating signal E from the modulator 17. Right? A That is correct.”); *see generally* EX2004, 79:19-83:8 (discussing the signals in Thomas’s Figures 1 and 2).

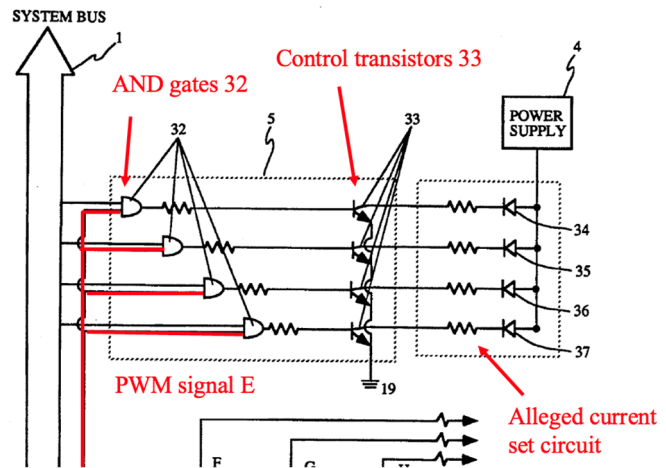
This distinction is not simply a matter of terminology. The PWM brightness control signal is different from the current flow through the resistors and LEDs. EX2002, ¶¶40-41. Indeed, the district court in the parallel litigation acknowledged this distinction. *See, e.g.*, EX1030, 6 (discussing the duty cycle of the current and the duty cycle of the PWM brightness control signal as separate elements). In Thomas, the alleged PWM brightness control signal serves a specific function, which the Petition itself describes: “when the switches receive a high pulse from the PWM signal,” the “current . . . flow[s] through the current set circuit.” Pet., 31.

Furthermore, the Petition makes no specific argument that the PWM brightness control signal is somehow applied to the resistors, instead alleging that it is applied to the switches and making the conclusory assertion that such an

the resistors:



EX1005, FIG. 1
(Petitioner's annotations, excerpted).



EX1005, FIG. 2
(annotated, excerpted).

“BJTs”). EX2002, ¶41. When the BJTs are turned “on,” current flows from the

power supply 4 though the LEDs 34-37 and the resistors (i.e., the alleged current set circuits) to ground 19. EX2002, ¶41. But the PWM signal does not have any direct effect on the relevant resistors of Thomas, by design, because it would make no sense to do so. EX2002, ¶42. Rather, the PWM signal (which is applied upstream from the resistors) triggers the flow of current *through* the resistors, but is never *applied to* the resistors. Thus, under Petitioner’s identification of the resistors as “current set circuits,” it is not possible for Thomas to disclose elements [1.d] and [14.d]. The PWM signal identified by Petitioner does not—and cannot—reach the alleged “current set circuits.” EX2002, ¶42. Because Thomas does not disclose elements [1.d] and [14.d], Thomas does not anticipate claims 1 or 14 of the ’148 patent or any claims depending therefrom.

c. Claim 3: Thomas does not disclose “a current regulator.”

In addition to the predicate failure to anticipate claim 1 from which claim 3 depends, Thomas does not disclose that “each current set circuit is a current regulator,” as recited in claim 3. As for claim 1, in which Petitioner relies on Thomas’s resistors as purportedly disclosing the claimed “current set circuits” (*see supra* Section III.A.2.a), Petitioner likewise points to Thomas’s passive resistors as disclosing the “current regulator” of claim 3. Pet., 32; EX1003, ¶73; *see* EX2004, 86:18-87:17 (confirming that Thomas’s resistors are passive). But passive resistors are not current regulators. EX2002, ¶¶43-45. Furthermore, this interpretation of the

claims is contrary to the '148 patent specification.

Petitioner fails to identify a current regulator. EX2002, ¶43. A current regulator is a narrower concept than a current *set* circuit, which the '148 patent itself describes. Figures 5 and 6 are both examples of the broader concept of a current set circuit, but only Figure 5 is described in the '148 patent as a current regulator. *See* EX1001, 3:60-65. A current regulator is a circuit that allows for regulation of current. EX2002, ¶44; *see* EX2006, 163-164 (“*current regulator* a device used to control the magnitude and phase of the current in DC, AC or other electrical variable speed drives.”), 584 (“*regulator* a controller designed to maintain the state of the controlled variable at a constant value despite fluctuations in the load.”). A passive resistor *is not* a current regulator. EX2002, ¶¶43-45. A passive resistor has no ability to actively “regulate” the current passing through it. EX2002, ¶45. In fact, a passive resistor has no ability to *do* anything, unlike a current regulator, which would include components that can make changes to the current in real time. EX2002, ¶¶44-45. Quite simply, a passive resistor is *not* a current regulator. EX2002, ¶¶43-45. Thus, Thomas does not anticipate claim 3.

In identifying a passive resistor as the recited current regulator, neither Petitioner nor Dr. Zane offers any argument or explanation regarding the recited term “current regulator.” Instead, they offer a scant two substantive sentences, and cite back to their arguments regarding claim element [1.b]. *See, e.g.,* Pet., 32;

EX1003, ¶73. Petitioner essentially makes the same argument for why the resistor discloses claim 3’s current regulator as it does for the resistor being a current set circuit. But aside from repeating the claim term verbatim, neither Petitioner nor Dr. Zane attempts to explain *how* a passive resistor “regulates” the current. *See, e.g.*, Pet., 32; EX1003, ¶73. Petitioner, thus, has not shown that Thomas discloses a “current regulator” (which it does not), and therefore has not shown that Thomas anticipates claim 3.

For the above reasons, Thomas does not anticipate claim 3 of the ’148 patent.

d. Claim 7: Thomas does not anticipate claim 7, because a clock is *not* an inherent component of a shift register, as Petitioner alleges.

Element [7.b] recites “a clock connected to the shift register for shifting the bits along the shift register.” Petitioner asserts that Thomas inherently anticipates this claim element, alleging that “[a]ll shift registers *must* have a clock connected to them for shifting the bits.” Pet., 34 (emphasis Petitioner’s). Petitioner goes further, asserting that “[w]ithout a clock, a shift register would not be able to shift the bits – it would not even be considered a shift register.” Pet., 35. These assertions are manifestly incorrect. *See* EX2004, 96:18-100:7 (Dr. Zane discussing asynchronous shift registers); EX2004, 99:19-21 (“In an asynchronous register, that would typically not include a separate dedicated clock from the data going into

the register itself.”); *see also* EX2009, 2:12-15 (“The *asynchronous device* as contrasted with the synchronous device mentioned above *does not require a clock* or timing pulse for its operation.” (emphasis added)); EX2008, 1:6-30 (describing asynchronous shift registers generally); EX2002, ¶¶46-51.

“Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim.” *Therasense, Inc. v. Becton, Dickinson & Co.*, 593 F.3d 1325, 1332 (Fed. Cir. 2010). “Inherency . . . may not be established by probabilities or possibilities. The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient.” *Id.* at 1332 (quoting *Cont’l Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1269 (Fed. Cir. 1991) (emphasis in original)).

Without an express disclosure of a clock in Thomas, it is not enough to anticipate claim 7 that Thomas *could* have a clock, but rather it “necessarily must be present.” *See Par Pharm. Inc. v. TWI Pharms., Inc.*, 773 F.3d 1186, 1195–96 (Fed. Cir. 2014); *Schering Corp. v. Geneva Pharm.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003). As Mr. Credelle explains in his declaration, shift registers without clocks are not only possible, but a well-understood electronic circuit with a variety of uses. EX2002, ¶¶47-50. Indeed, a reference submitted *by Petitioner* shows such a circuit. EX1011, 118 (FIG. 12.4); EX2002, ¶¶48-50. In such circuits, bits are shifted—contrary to Petitioner’s claim otherwise—without any clock, instead

using signals from another source to shift the bits. EX2002, ¶¶48-49.

Petitioner provides no argument for Thomas’s disclosure of a clock connected to the shift register other than its inherency argument. *See* Pet., 34-35. Indeed, Petitioner does not attempt to identify any actual disclosure of a clock in Thomas because Thomas does not disclose a clock. Pet., 34-35. Rather, Petitioner merely alleged, incorrectly, that a clock *must* be in Thomas. But the mere possibility of a clock in insufficient to prove anticipation.

Thus, because Petitioner has failed to demonstrate that Thomas discloses “a clock connected to the shift register for shifting the bits along the shift register” as recited in element [7.b], Petitioner has failed to meet its burden in showing that Thomas anticipates claim 7 of the ’148 patent.

- 3. Petitioner has not shown that Thomas, either alone or in combination with AAPA and/or Tatewaki, renders obvious any of challenged claims 1-3, 6-15, and 17-22.**
 - a. Petitioner’s obviousness challenge is facially deficient for independent claims 1 and 14 because Petitioner provides no analysis or explanation of its obviousness positions.**

Petitioner presents Ground 2A, “obviousness over Thomas alone,” as a back-up position to its flawed anticipation ground based on Thomas. Pet., 45. But Petitioner’s obviousness challenge does not (and cannot) remedy any of the deficiencies in its anticipation challenge. Indeed, Petitioner’s obviousness analysis is a bare, conclusory statement that “[t]o the extent that Thomas does not anticipate

Claim 1, any differences between Thomas and Claim 1 are such that Claim 1 as a whole would have been obvious to a POSITA as of the time of the invention of Claim 1.” Pet., 45; EX1003, ¶106; *see also* Pet., 46 (similar statement regarding independent claim 14); EX1003, ¶108. This falls far short of meeting Petitioner’s burden for proving obviousness.

Petitioner’s obviousness contentions cannot remedy the anticipation deficiencies because Ground 2A does not address any specific elements of the independent claims. *See* Pet., 45-46. *KSR* instructs that “obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). Yet here, Petitioner provides *only* conclusory statements, without *any* articulated reasoning. *In re Magnum Oil Tools International, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016) (“To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.”). For example, Petitioner does not allege any modifications to Thomas to remedy any of the deficiencies in the anticipation ground. Nor does Petitioner address why it would have been obvious to make any such purported modifications with a

reasonable expectation of success (in part, because it does not even suggest any modifications). *Endo Pharms., Inc. v. Actavis LLC*, 922 F.3d 1365, 1373 (Fed. Cir. 2019) (“An obviousness determination requires finding that a [POSITA] would have been motivated to combine or modify the teachings in the prior art and would have had a reasonable expectation of success in doing so.”); *In re Stepan Co.*, 868 F.3d 1342, 1345-46 (Fed. Cir. 2017) (“An obviousness determination requires finding both ‘that a skilled artisan would have been motivated to combine the teachings of the prior art . . . and that the skilled artisan would have had a reasonable expectation of success in doing so.’” (quoting *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1367–68 (Fed. Cir. 2016))). This requirement applies even where there is a single prior art reference. *In re Stepan*, 868 F.3d at 1346 n.1. Thus, Petitioner’s Ground 2A fails to satisfy the requisite legal standard.

Furthermore, in an IPR, “the *petitioner’s* contentions . . . define the scope of the litigation all the way from institution through to conclusion.” *FanDuel, Inc. v. Interactive Games LLC*, 966 F.3d 1334, 1342 (Fed. Cir. 2020) (quoting *SAS Inst. Inc. v. Iancu*, 138 S. Ct. 1348, 1357 (2018) (emphasis in original)). And Petitioner bears the burden of proving unpatentability of the challenged claims; this burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC*, 800 F.3d at 1378. Petitioner cannot simply allege claims alternatively would have been

obvious without providing a shred of evidence or explanation to support this assertion. *See, e.g., Syrinix, Inc. v. Blacoh Fluid Control, Inc.*, IPR2018-00415, Paper 32, at 65-66 (P.T.A.B. May 28, 2019) (finding Petitioner had not shown obviousness of certain challenged claims, where the obviousness challenge did not address elements for which deficiencies were found in the anticipation challenge); *Elekta, Inc. v. Varian Med. Sys., Inc.*, IPR2016-00476, Paper 40, at 15-16 (P.T.A.B. June 16, 2017) (finding that a deficiency in Petitioner’s anticipation challenge was not fixed in an obviousness challenge where the obviousness challenge did not address the missing element; also declining to reach a new obviousness argument presented for the first time in Petitioner’s Reply).

The only statement Petitioner presents in Ground 2A is that “a POSITA would have understood from Figures 1 and 2 [of Thomas] based on the well-known functionality of resistors that these resistors are used to limit current to a peak current $I=(V-V_{LED})/R$.” Pet., 45; EX1003, ¶107. This argument is merely that a POSITA would have been familiar with the application of Ohm’s Law to Thomas’s circuit. EX2002, ¶38. But this does not remedy the deficiencies discussed above that Thomas’s single passive resistor relied on by Petitioner does not disclose the claimed “current set circuit.” *See supra* Section 0; EX2002, ¶38. Contrary to *KSR*’s requirement to provide articulated reasoning, Petitioner provides no explanation as to why the knowledge of Ohm’s Law or its application

to Thomas’s circuit results in the claimed invention. *KSR*, 550 U.S. at 418. Nor does Petitioner provide any explanation regarding a POSITA’s reasonable expectation of success in making any purported modifications. *Endo Pharms., Inc.*, 922 F.3d at 1373; *In re Stepan Co.*, 868 F.3d at 1345-46. Thus, Petitioner’s unsupported obviousness assertions cannot save the deficiencies in its anticipation challenge.

b. Claim 13: Petitioner has not demonstrated that a POSITA would have been motivated to modify Thomas as required to meet claim 13.

Claim 13 recites that “the driver is formed as an integrated circuit.”

Petitioner admits that “Thomas does not expressly state that the driver, or the majority of the driver, is formed as an integrated circuit” Pet., 52. Instead, Petitioner asserts that it would have been obvious to a POSITA to implement Thomas’s alleged driver as an integrated circuit. Pet., 52-54. Petitioner’s argument is premised on a construction that a “majority” of the driver components must be included in the integrated circuit, but this argument has multiple flaws:

(1) Petitioner’s position relies on a mischaracterization of Patent Owner’s infringement contentions in the parallel district court case; (2) Petitioner’s arguments are inconsistent with the plain language of the claims; and (3), when viewing the claims under the proper interpretation, forming Thomas’s driver as an integrated circuit would not have been obvious. Accordingly, Petitioner has failed

to demonstrate that Thomas renders obvious claim 13 of the '148 patent.

First, Petitioner mischaracterizes the content of Patent Owner's initial infringement contentions in the parallel district court case, falsely asserting that "Patent Owner contends in its infringement contentions that Claim 13 is met because the accused televisions each have a driver in which the majority of the circuitry is part of an LED driver." Pet., 53 n. 9 (citing EX1015, 53-56). But Patent Owner's infringement contentions make no such argument regarding a "majority of the circuitry" being part of the integrated circuit. *See* EX1015, 53-56. Rather, Patent Owner simply identified examples where "the driver is formed as an integrated circuit." EX1015, 53. Petitioner may disagree with Patent Owner's infringement contentions, but Patent Owner did not make the express claim construction argument that Petitioner implies is present in the infringement contentions. Tellingly, Petitioner does not cite any express language in the infringement contentions to justify its position, because Patent Owner's infringement contentions do not make this argument. *See* Pet., 53 n. 9; EX1015, 53-56.

Second, Petitioner's obviousness analysis is premised on a reading of claim 13 that is *expressly inconsistent* with the claim language. Claim 13 explicitly requires that "the driver" of claim 1 "is formed as an integrated circuit." EX1001, claim 13. Claim 1 defines "the driver" as including a voltage source, a plurality of

current set circuits, and a PWM brightness control signal generator. EX1001, claim 1. Petitioner claims that a POSITA evaluating the claim—which expressly requires that the voltage source, current set circuits, and PWM signal generator (i.e., “the driver”) be formed as an integrated circuit—would interpret the claim as *not* requiring all of these components to be part of the integrated circuit. Pet., 52-53 (“In evaluating Claim 13’s limitation a POSITA would be aware that similar language is commonly used to describe a driver comprising most of its circuitry integrated into packages while having some components such as resistors or capacitors, external to the integrated circuits.”). But this is not what the claim recites, nor what any rational POSITA would interpret the claim to require. Essentially, Petitioner argues that the Board should ignore certain elements of the claim and that a POSITA would have similarly ignored the unambiguous requirements of claims 1 and 13. Petitioner’s argument is not credible and should be ignored.

Third, Petitioner has not demonstrated it would have been obvious to a POSITA to form all of the recited components of the driver as an integrated circuit. In fact, Petitioner’s declarant, Dr. Zane, expressly testified during his deposition that a POSITA would *not* have actually been motivated to place all of the elements of the driver into a single package. For example, Dr. Zane testified “there may be components that are *part of a voltage source* for connecting to the first ends of

LEDs in a plurality of parallel paths that may be components *that would be understood as not appropriately considered as necessary in an integrated circuit package* when considering the terminology of Claim 13 in the context of the '148 patent.” EX2004, 111:10-18 (emphasis added). *See also, e.g.,* EX2004, 114:6-11 (“I believe what you’ve stated is correct, that there may be some components that a skilled person would recognize as not having to literally be in the same substrate or package to meet this limitation from the claim elements -- the elements included in Claim 1.”). But, as discussed above, the claim requires that the voltage source, current set circuits, and PWM signal generator be formed as an integrated circuit. At base, Petitioner’s declarant recognizes that a POSITA would *not* have considered it obvious to place the whole driver in an integrated circuit package by stating that a POSITA would have instead only placed certain components within the integrated circuit. Indeed, in describing the prior art, the '148 patent notes that *prior* LED drivers only have “[m]ost components of the driver 10 . . . formed on an integrated circuit chip,” which Petitioner acknowledges. EX1001, 1:40-45; Pet., 53. Thus, absent impermissible hindsight based purely on the '148 patent claims, a POSITA would not have sought to form all of the recited components of the driver as an integrated circuit.

For these reasons, Petitioner has failed to meet its burden in showing that Thomas renders obvious claim 13 of the '148 patent.

B. Grounds 3 and 4: Petitioner has not shown that *Zane* anticipates or renders obvious the challenged claims.

1. Summary of *Zane*

Zane relates to “a digital architecture suitable for driving a large number of High Brightness Light Emitting Diodes (HB-LEDs).” EX1006, Abstract; EX2002, ¶32. *Zane*’s “proposed architecture . . . consists of a power converter driving multiple strings of LEDs, controlled current sources, digital multiphase modulator block, threshold detector circuit to sense the voltage drop across each string and digital control logic.” EX1006, 288; EX2002, ¶32.

A phase shifted pulse width modulator (PS-PWM) “controls the switching sequence and duty cycle of individual current sources.” EX1006, 288; EX2002, ¶33. “Dynamic bus voltage regulation is used to improve efficiency by maintaining the bus voltage at the minimum value required to keep all active LED strings in regulation.” EX1006, 289; EX2002, ¶33. “A single comparator is used for each LED string, which compares the voltage across the current sink devices to a known threshold limit. For any voltage greater than the threshold, the current sink maintains a near constant output current.” EX1006, 289; EX2002, ¶33. Further, “a linear programmable current sink is used to regulate the LED forward current to a desired level.” EX1006, 290; EX2002, ¶33.

2. Dr. Zane cannot offer unbiased opinions regarding *Zane*, and his testimony should be given little to no weight—Petitioner’s anticipation and obviousness challenges are thus merely unsupported attorney argument.

Dr. Zane is co-author of the *Zane* paper. EX1006, 287; EX1003, ¶32.

Having an author provide expert testimony about their own work is unconventional at best and riddled with issues of bias at worst. Unsurprisingly, Dr. Zane admitted that he could not recall having ever come across such a circumstance in his work as an expert witness. EX2004, 47:21-49:2; EX1004, 35-37 (listing expert testimony experience in the past 6 years, including 15 PTAB proceedings, as well as many district court and ITC proceedings).

Dr. Zane contends in his declaration that his “analysis of that paper [(i.e., *Zane*)] is from the perspective of a POSITA reviewing that paper at the relevant time.” EX1003, ¶32. It strains credibility, however, that Dr. Zane could just forget his subjective knowledge of the *Zane* paper, including undisclosed assumptions that would not be understood (or even known) by an *ordinary* person of skill when simply reading *Zane*’s text, in rendering his opinions. In *Glaxo Grp. Ltd. v. Apotex, Inc.*, the Federal Circuit affirmed a district court’s decision to not credit testimony where the expert impermissibly used knowledge of the challenged patent to design experiments related to inherency of certain features in the asserted art. 376 F.3d 1339, 1348–49 (Fed. Cir. 2004). The Court recognized that a POSITA, without using the knowledge of the patent, would not necessarily have designed the

experiments in the same way. *Id.* In other words, having impermissible knowledge when rendering an opinion can make the opinion unreliable. Likewise, here, as an author of the *Zane* paper, Dr. Zane has knowledge of, and his own insight about, *Zane* that a POSITA simply could not possess.

Dr. Zane himself also recognized the impact of bias related to authorship when reviewing scientific articles such as the *Zane* paper. For example, Dr. Zane acknowledged that “a blind review in the peer-review process is intended to *remove biases* from the review process itself; for example, *by not providing the names of authors* during the review.” EX2004, 41:4-8 (emphasis added).

Furthermore, Dr. Zane agreed that “removing a reviewer’s bias would allow the reviewer to objectively review the content of the scientific article.” EX2004, 42:13-22. Dr. Zane cannot remove such bias when analyzing his own paper in view of the ’148 patent claims.

Further still, Dr. Zane has personal incentives and motivations to invalidate the ’148 patent claims that are akin to the priority-of-invention issues that arise in the context of interference proceedings. Dr. Zane believes that *he* invented the technology described in at least claims 1-4, 11, 12, 14, 17, and 22 of the ’148 patent before the inventors of the ’148 patent. EX2004, 61:22-62:21. And, Dr. Zane is a co-inventor on U.S. Patent No. 7,948,468 (“’468 patent,” EX2005), which he characterizes in the same way as both the ’148 patent and the *Zane* article

as using “staggered PWM signals for dimming control of parallelly connected LEDs.” EX1003, ¶15. As part of his work at the University of Colorado research center, Dr. Zane attempted to commercialize the technology of the ’468 patent. EX2004, 71:1-72:11. Dr. Zane also received funding from the National Science Foundation (NSF), as well as sponsorships from industrial partners, both of which supported the work leading to the *Zane* article and Dr. Zane’s ’468 patent. EX2004, 65:3-22; *see also* EX1006, 287 (“This work is co-sponsored by the National Science Foundation (under Grant No. 0348772) and industry sponsors of the Colorado Power Electronics Center.”). Such funding, and in particular “the results of the funding . . . , such as . . . resulting advancements in the field that are a result of that funding,” is, according to Dr. Zane, a “significant factor” “considered when making decisions for advancement of a faculty member [such as Dr. Zane] within a university system.” EX2004, 68:14-69:2; *see also* EX2004, 70:5-22 (describing additional professional benefits of filing patent applications (which would include the application leading to the ’468 patent)).

Dr. Zane received outside funding to pursue the technology, believes he invented the technology first, and he attempted to commercialize his invention. He thus has strong personal incentives to invalidate the ’148 patent, which inevitably leads to improper bias (even if unconscious).

Because of these unresolvable bias issues, the Board should give Dr. Zane's testimony little or no weight when considering Petitioner's Grounds 3 and 4.

Without Dr. Zane's testimony, Petitioner's contentions regarding *Zane* are merely unsupported attorney argument, which are insufficient to meet Petitioner's burden. *See In re Geisler*, 116 F.3d 1465, 1470 (Fed. Cir. 1997) (attorney arguments are entitled to little probative value); *see also Invitrogen Corp. v. Clontech Lab., Inc.*, 429 F.3d 1052, 1068 (Fed. Cir. 2005) ("Unsubstantiated attorney argument regarding the meaning of technical evidence is no substitute for competent, substantiated expert testimony.").

Dr. Zane's bias is particularly troubling with respect to his uncorroborated testimony that the claims challenged in Ground 4 would have been obvious in light of *Zane* alone. Pet., 17. Patent law has long recognized, in the context of priority of invention, that uncorroborated inventor testimony is insufficient and unreliable due to inventor bias. *Medtronic, Inc. v. Teleflex Innovations S.A.R.L.*, 68 F.4th 1298, 1306 (Fed. Cir. 2023) ("Inventor testimony may serve as evidence of reduction to practice, but it must be corroborated by independent evidence."); *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1170 (Fed. Cir. 2006) ("Credibility concerns undergird the corroboration requirement," and "[t]he requirement of independent knowledge remains key to the corroboration inquiry."); *but see Thomson, S.A. v. Quixote Corp.*, 166 F.3d 1172, 1176 (Fed. Cir. 1999) (under clear and convincing

evidence standard, testimonial evidence by inventors about an unpatented prior invention relied on to prove the prior invention's availability as anticipatory prior art under §102(g) does not require corroboration).

Here, Dr. Zane's uncorroborated testimony that claims 1-4, 5, 11-17, and 22 would have been obvious in light of *Zane* is analogous to uncorroborated inventor testimony in the context of an interference proceeding. Again, Dr. Zane believes that he invented the technology before the inventors of the '148 patent, and Petitioner relies on his uncorroborated testimony alone to allege that claims 1-4, 5, 11-17, and 22 would have been obvious in view of *Zane* alone. Pet., 17; *see e.g.*, EX1003, ¶¶182-186 (providing uncorroborated testimony that element 5.a would have been obvious), ¶¶201-202 (providing similar, uncorroborated testimony). Dr. Zane's bias, even if unintentional, renders his testimony (and Petitioner's challenges) insufficient to demonstrate unpatentability.

Accordingly, Petitioner's anticipation and obviousness grounds based on *Zane* fail.

3. Petitioner's obviousness challenge is facially deficient because Petitioner provides no analysis or explanation of its obviousness positions.

a. Independent Claims 1 and 14

Petitioner presents Ground 4, "obviousness in view of *Zane* alone," as a back-up position to its flawed anticipation ground based on *Zane*. Pet., 75. But, as

similarly discussed above for Thomas, Petitioner's obviousness challenge based on *Zane* also does not (and cannot) remedy any of the deficiencies in its anticipation challenge. Indeed, Petitioner's obviousness analysis is again limited to a bare, conclusory statement unsupported by sufficient evidence or explanation to support such a finding. Pet., 75-76. In particular, Petitioner argues that "[t]o the extent that *Zane* does not anticipate Claim 1, any differences between *Zane* and Claim 1 are such that Claim 1 as a whole would have been obvious to a POSITA as of the time of the invention of Claim 1." Pet., 75; *see also* Pet., 75-76 (similar statement regarding independent claim 14). This falls far short of meeting Petitioner's burden for proving obviousness.

For the same reasons discussed above for Thomas, *supra* Section III.A.3.a, Petitioner's conclusory obviousness assertions cannot save its anticipation challenge. Ground 4 does not address any specific elements of the independent claims. *See* Pet., 75-76. Contrary to *KSR*'s instruction that "there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness," 550 U.S. at 418, Petitioner provides *only* conclusory statements, without *any* articulated reasoning. Petitioner does not allege any modifications to *Zane* to remedy any of the deficiencies in the anticipation ground. Nor does Petitioner address why it would have been obvious to make any such purported modifications with a reasonable expectation of success (in part, because

it does not even suggest any modifications). *See Endo Pharms., Inc.*, 922 F.3d at 1373; *In re Stepan*, 868 F.3d at 1345-46. Thus, Petitioner's Ground 4 fails to satisfy the requisite legal standard.

Furthermore, Petitioner cannot simply allege that claims alternatively would have been obvious without providing a shred of evidence or explanation to support this assertion. *See, e.g., Syrinix, Inc.*, IPR2018-00415, Paper 32, at 65-66; *Elekta Inc.*, IPR2016-00476, Paper 40, at 15-16. Here, this is further compounded by the fact that Dr. Zane's testimony regarding the *Zane* paper is infected with bias and thus unreliable. As discussed in Section III.B.2, the Board should give Dr. Zane's testimony little or no weight, leaving Petitioner with mere attorney argument alleging the obviousness of the claims. Petitioner's unsupported obviousness assertions cannot save the deficiencies in its anticipation challenge.

a. Claims 5 and 16

Petitioner and Dr. Zane do not allege that claims 5 and 16 are anticipated by *Zane*. Instead, they allege these claims would have been obvious in view of *Zane* alone. Pet., 75-79, 82-84; EX1003, ¶¶181-189, 198-203. As explained above, Dr. Zane's testimony is fatally flawed and should not be considered due to his bias. But even if the Board considers his testimony, Petitioner's challenge still fails. EX2002, ¶¶52-57. Specifically, Petitioner contends the circuit configuration of claims 5 and 16 would have been merely an obvious design choice. But Petitioner

and Dr. Zane do not provide sufficient explanation to support a finding that a POSITA would have been motivated to modify *Zane* to arrive at the claimed configuration.

Claim 5 recites “each current set circuit further comprises a PWM brightness control transistor connected between an output of the feedback circuit and a control terminal of the current control transistor, the PWM brightness control transistor being connected to the PWM brightness control signal generator for receiving a staggered PWM brightness control signal to couple the output of the feedback circuit to the control terminal of the current control transistor at a duty cycle of the staggered PWM brightness control signal.” Claim 16 similarly recites, in part, “coupling each staggered PWM brightness control signal to a control terminal of an associated pass transistor, each pass transistor being connected between a control terminal of a respective current control transistor and a regulating control voltage, such that the current control transistor is turned on and off corresponding to a duty cycle of the associated pass transistor.” Petitioner has not shown that *Zane* alone renders these claims obvious.

“Merely stating that a particular placement of an element is a design choice does not make it obvious. [One] must offer a reason for why a [POSITA] would have made the specific design choice.” *Cutsforth, Inc. v. MotivePower, Inc.*, 636 F. App’x 575, 578 (Fed. Cir. 2016) (non-precedential); *see also InTouch Techs., Inc.*

v. VGO Commc'ns, Inc., 751 F.3d 1327, 1352 (Fed. Cir. 2014) (rejecting obviousness arguments where “testimony primarily consisted of conclusory references to [expert’s] belief that one of ordinary skill in the art *could* combine these references, not that they *would* have been motivated to do so” (emphasis in original)); *Polaris Indus., Inc. v. Arctic Cat, Inc.*, 882 F.3d 1056, 1068–69 (Fed. Cir. 2018) (overturning an obviousness determination where “the Board focused on what a skilled artisan would have been *able* to do, rather than what a skilled artisan would have been *motivated* to do at the time of the invention” (emphasis in original)).

The requirement to provide a sufficient explanation of a motivation to combine or modify the prior art elements in the specific manner alleged “serves to prevent hindsight bias.” *Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1164 (Fed. Cir. 2006) (internal citations and quotations omitted); *see also ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012) (rejecting expert testimony “fraught with hindsight bias” where testimony was “essentially a conclusory statement” that a skilled artisan “would have known, based on the ‘modular’ nature of the claimed components, how to combine any of a number of references to achieve the claimed inventions”).

Here, Petitioner admits that “Zane does not disclose that the PWM brightness control transistor is ‘connected *between* an output of the feedback

circuit and a control terminal of the current control transistor.” Pet., 77 (emphasis Petitioner’s). Instead, Petitioner contends that “it would have been obvious to modify *Zane* by moving the PWM brightness control transistor from the noninverting input of the op amp to between the output of the op amp (the output of the feedback circuit) and the control terminal of the current control transistor Q.” Pet., 77. According to Petitioner, “[t]he PWM brightness control transistor may be placed in several locations in this circuit without changing the overall operation of the circuit.” Pet., 78. Petitioner further alleges “it would have been obvious to try any of those solutions as a design choice.” Pet., 79. Similarly, Dr. Zane alleges that “if ten engineers were given the task of implementing the circuit design from *Zane*, I would expect some of them to place the switch at the noninverting input as I did, but I would also expect some to place the switch between the output of the op amp and the transistor Q, and some might even place the switch elsewhere.” EX1003, ¶186. But as precedent prescribes, merely alleging something would have been obvious does not make it so.

Neither Petitioner nor Dr. Zane provides any explanation as to *why* a POSITA would have made the particular modification to *Zane* required to arrive at the claims. Petitioner and Dr. Zane simply contend that the brightness control transistor “*may* be placed in several locations in this circuit,” without pointing to any reason or motivation to place it in the specific claimed location. Pet., 78

(emphasis added); EX1003, ¶185. But the question is not whether a POSITA *could* make a particular modification, but rather whether they *would* do so. *InTouch Techs., Inc.*, 751 F.3d at 1352; *Polaris Indus., Inc.*, 882 F.3d at 1068–69. Petitioner argues the former, not the latter. Thus, Petitioner’s contentions are classic hindsight. *Medichem, S.A.*, 437 F.3d at 1164. As such, the Board should disregard this unsupported argument.

Further still, a “finding of obviousness based on design choice is precluded where the difference between the claimed feature and prior art results in a functional difference.” *Lumenis Be Ltd. v. BTL Healthcare Techs. A.S.*, IPR2021-01275, Paper 8, at 30 (P.T.A.B. Feb. 8, 2022) (citing *In re Gal*, 980 F.2d 717, 719 (Fed. Cir. 1992)). Here, a POSITA would have understood there were material differences between *Zane* and the claimed arrangement that would affect the design and operation of the circuit. EX2002, ¶¶53-57. In particular, as Patent Owner’s expert Mr. Credelle explains, Petitioner and Dr. Zane’s proposed modification “would frustrate the purpose and function of the circuit by hampering its ability to maintain a precision voltage.” EX2002, ¶57. Absent hindsight, a POSITA would not have been motivated to modify *Zane*’s circuit in the manner proposed. *See* EX2002, ¶¶53-57.

Accordingly, Petitioner has not met its burden to show that claims 5 and 16 would have been obvious in view of *Zane*.

IV. CONCLUSION

For the reasons above, all of Petitioner's grounds fail to show that any of the challenged claims are unpatentable.

Respectfully submitted,

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CERTIFICATE OF WORD COUNT (37 C.F.R. § 42.24(d))

1. This Patent Owner Response complies with the type-volume limitation of 14,000 words, comprising 8,754 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

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Respectfully submitted,

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