

Filed: February 22, 2024

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

XU PEICHENG (HONG KONG) OPTOELECTRIC
TECHNOLOGY CO., LIMITED,

Petitioner

v.

SEMISILICON TECHNOLOGY CORP.,

Patent Owner

Case IPR2024-00156

Patent No. 8,884,546

PATENT OWNER'S PRELIMINARY RESPONSE

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I. INTRODUCTION

Patent Owner Semisilicon Technology Corp. respectfully requests that the Board deny institution of Petitioner Xu Peicheng (Hong Kong) Optoelectronic Technology Co., Limited's IPR Petition challenging claims 1-6 and 8 of U.S. Patent No. 8,884,546 ("the '546 Patent") (Ex. 1001).

The Petition should be rejected. Although it raises six obviousness grounds, none provides the "particularity" required by 35 U.S.C. § 312. Several independent reasons support denying institution. None of the grounds sets forth any adequate obviousness analysis under the four *Graham* factors. For example, Petitioner does not identify the differences between the cited references and the claims; Petitioner does not articulate any motivation for a Person of Ordinary Skill in the Art (POSITA) to modify or combine one reference with another; and Petitioner does not explain – and in several instances does not even allege – a reasonable expectation of success in modifying the primary reference. Instead, all six obviousness grounds rely on conclusory statements – with similarly conclusive expert statements repeating attorney arguments and providing no analysis – to bridge canyons between the claim language and the reference disclosures.

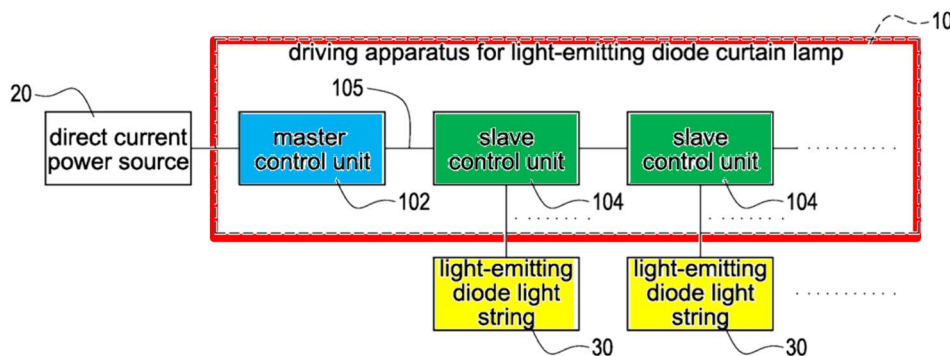
The only support cited for the obviousness positions in the Petition is the declaration of Petitioner's expert, Dr. Schubert. But the declaration itself offers no analysis, cites no supporting evidence, and provides no expert opinion that is not a

carbon copy of the Petition. In other words, the declaration parrots the attorney arguments, saying nothing more than what is already in the Petition. Because this Board's precedent mandates that such expert declaration must carry no weight, the Petition grounds, fatal deficiencies aside, consist entirely of unsupported attorney argument.

For these reasons and the additional reasons set forth below, the Petition should be denied.

II. THE '546 PATENT

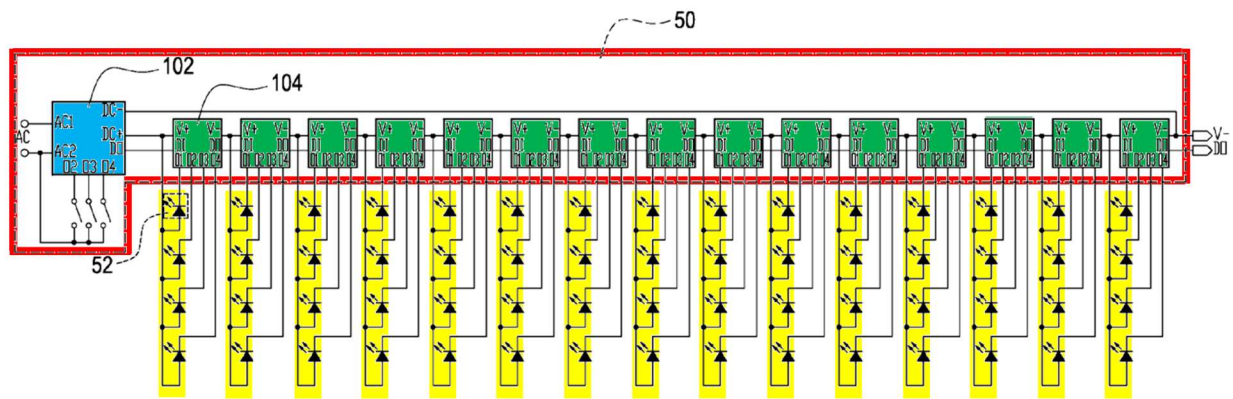
The '546 patent discloses multiple embodiments of a driving apparatus for a light-emitting diode (LED) curtain lamp. Ex. 1001, Title, Abstract, 1:25-2:16. Figure 1 shows a block diagram of one of the disclosed embodiments:



'546 Patent (Ex. 1001), Fig. 1 (annotated)

As shown in Fig. 1, the **driving apparatus 10** (circled in **red**) includes a **master control unit 102** (highlighted in **blue**), multiple **slave control units 104** (highlighted in **green**), and **light-emitting diode light strings 30** (highlighted in **yellow**)

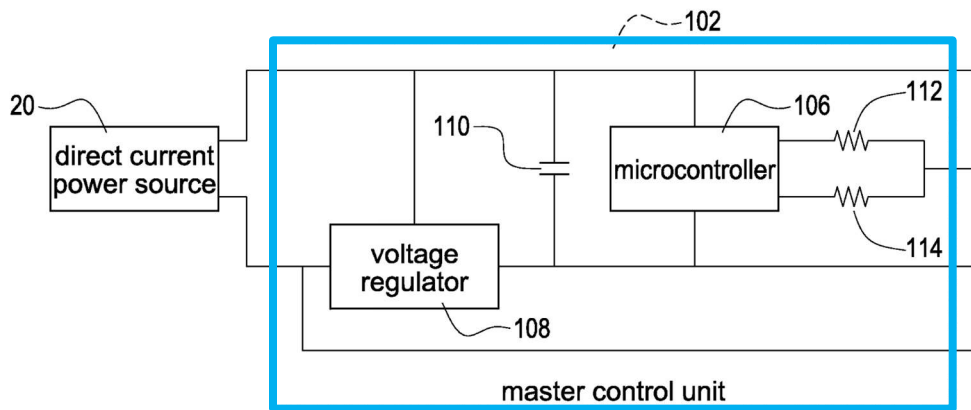
connected to each slave control unit. Fig. 7, below, is a circuit diagram of an example of an LED curtain lamp, with a more detailed illustration of the **LED light strings** (in **yellow**) connected to each **slave control unit** (in **green**):



'546 Patent (Ex. 1001), Fig. 7 (annotated)

Just as the plain words of the claim language suggest, the '546 Patent is directed to a lamp having **LED light strings** (in **yellow**, above) arranged to form a “curtain” of lights extending from one or more **slave control units** (in **green**). Each of independent claims 1, 4, and 8 recites “at least a light-emitting diode string” or “light-emitting diode string.” Ex. 1001, 7:7-8:44.

Independent claims 1, 4, and 8 are directed to various embodiments of the LED curtain lamp driving apparatus. Claim 1 recites, among other things, a direct current power source, and a master control unit that includes a microcontroller and a voltage regulator (Ex. 1001, 7:11-15), which Fig. 2 illustrates:

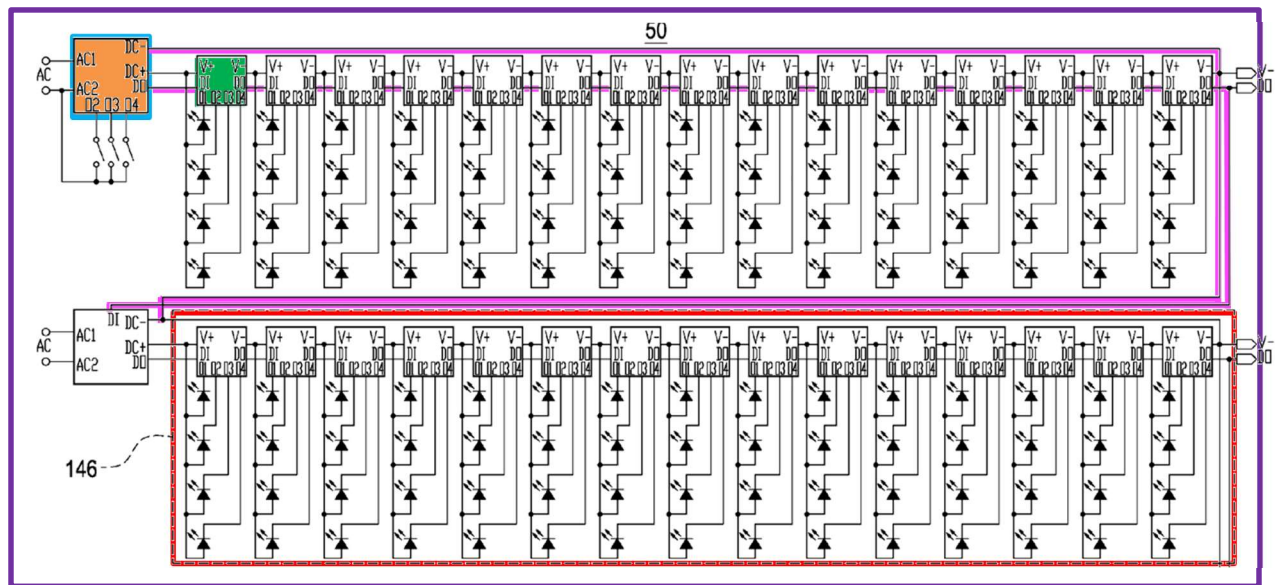


'546 Patent (Ex. 1001), Fig. 2 (annotated, showing exemplary components of the master control unit 102)

Independent claim 1 further recites a transmission line, between the master control unit and the slave control unit, that transmits 1) control signals, and 2) synchronous signals. Ex. 1001, 7:19-20, 23-24.

Independent claim 4 recites an alternating current power source, requires the master control unit to have a power negative terminal pin and a signal output pin, and requires the slave control unit to have a signal input pin and a signal output pin. Ex. 1001 at 7:35-8:7.

Independent claim 8 recites, among other elements, a slave control unit having a signal processor, as well as “an alternating current voltage transferring to direct current voltage circuit electrically connected to the slave control unit [of a curtain lamp driving apparatus]” *and* electrically connected to a second curtain lamp. *Id.*, 8:39-44. These elements of claim 8 are illustrated in Fig. 8:



'546 Patent (Ex. 1001), portion of Fig. 8 (annotated)

As shown above, a “**light-emitting diode string 50**” (circled in **purple** because “50” refers to the entire figure) includes a **master control unit** (circled in **blue**) having an “**alternating current voltage transferring to direct current voltage circuit**” (“AC/DC converter,” in **orange**) that is electrically connected to a **slave control unit** (in **green**). As illustrated by the **connection lines** (in **pink**), the **AC/DC converter** is also electrically connected to a **second curtain lamp 146** (circled in **red**).

The Petition has not established that any of the cited references disclose these elements of the independent claims, or sufficiently established that any of these elements was within the general knowledge of a POSITA.

During examination, the Office considered the elements discussed above and other elements of the claims to be reasons for allowance. Ex. 1002 at 93-94. The Office identified allowable claims on two separate occasions: First, the Office rejected claim 1 based on the Debevec reference (Ex. 1005) and indicated that claims 2-10 contained allowable subject matter. Ex. 1002 at 68-71. Second, the Office withdrew the rejection and allowed all claims. *Id.*, 93-94.

III. THE PETITION SHOULD BE DENIED BECAUSE IT LACKS THE NECESSARY DEGREE OF PARTICULARITY FOR EACH IDENTIFIED GROUND

To institute an IPR, there must be “a reasonable likelihood that the petitioner would prevail with respect to at least [one] of the claims challenged in the petition.” 35 U.S.C. § 314(a). An IPR petition must identify “with particularity, each claim challenged, the grounds on which the challenge to each claim is based, and the evidence that supports the grounds for the challenge to each claim.” 35 U.S.C. § 312(a)(3). “The petition must specify where each element of the claim is found in the prior art patents or printed publications relied upon . . .” 37 C.F.R. § 42.104(b)(4). The burden to show unpatentability with particularity is on the petitioner. *See Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016). Petitioners should “focus on concise, well-organized, easy-to-follow arguments supported by

readily identifiable evidence of record.” Office Patent Trial Practice Guide, November 2019 Ed., 84 Fed. Reg. 64, 280 (Nov. 21, 2019).

To allege obviousness, Petitioner must address (i) the scope and content of the prior art, (ii) differences between the claimed subject matter and the prior art, (iii) the level of skill in the art, and (iv) objective evidence of nonobviousness. *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 17–18 (1966). The Board has made clear that petitioners must “meaningfully” address at least the first two *Graham* factors: (i) the scope and content of the prior art, and (ii) any differences between the claimed subject matter and the prior art. *Google Inc. v. EveryMD.com LLC*, IPR2014-00347, Paper 9 at 23–25 (PTAB May 22, 2014).

The Board has denied petitions that lack particularity or present deficient or conclusory analysis. *See Adaptics Ltd. v. Perfect Co.*, IPR2018-01596, Paper 20 at 24 (Mar. 6, 2019) (exercising § 314(a) discretion to deny institution because the petition lacked particularity). Institution is not warranted if a petition lacks a clear statement of the relief requested and a thorough explanation of the alleged unpatentability grounds. *See, e.g., Shopkick, Inc. v. Novitaz, Inc.*, IPR2015-00279, Paper 7 at 29 (PTAB May 29, 2015). Nor is institution warranted when a petition fails to “adequately tie the evidence of the references to specific claim limitations.” *Zetec, Inc. v. Westinghouse Elec. Co.*, IPR2014-00384, Paper 10 at 14 (PTAB July 23, 2014). The Petition here is deficient for all these reasons.

Like other petitions that the Board has denied institution, this Petition provides “no analysis, argument or rationale explaining what would have been obvious and why.” *See Analytics for Life, Inc., v. 8825319 Canada Ltd.*, IPR2017-01742, Paper 9 at 30 (PTAB Jan. 31, 2018).

A. The Petition Fails to Articulate the Basis for Obviousness in Grounds 1-6

The Petition should be denied for failing to clearly articulate the obviousness grounds for each of independent claims 1, 4, and 8, and in turn, obviousness for each claim that depends from the independent claims. Petitioner relies heavily on the “general knowledge of a POSITA” for essentially all its grounds, but provides no explanation of the differences, no motivation to combine or modify, and no discussion of likelihood of success. Specifically, the Petition asserts obviousness of independent claim 1 in Grounds 1 and 3, asserts obviousness of independent claim 4 in Ground 5, and asserts obviousness of independent claim 8 in Grounds 3 and 6. Pet. at 3. Grounds 1, 3, and 5 cite the “general knowledge of a POSITA” as part of the obviousness grounds. *Id.* Ground 6 does not cite to the “general knowledge of a POSITA.” *Id.* As explained below, the Petition does not explain how or why any of the primary references are modified or combined with the “general knowledge of a POSITA,” and indeed, there is no clear explanation of obviousness in any of these grounds.

1. Grounds 1, 3, and 5 Do Not Explain Why or How the Claims Are Obvious in View of the “General Knowledge of a POSITA”

In each of Grounds 1, 3, and 5, Petitioner alleges obviousness based on one of Kuang, Lys, or Hiroyuki in view of the general knowledge of a POSITA. Pet. at 3, 6, 23, 49. These grounds are problematic on their face for relying on the “general knowledge of a POSITA” to supply missing claim limitations, because “references to common sense, whether to supply a motivation to combine or a missing patent claim limitation, cannot be used as a wholesale substitute for reasoned analysis and evidentiary support, especially when dealing with a limitation missing from the prior art references specified.” *Samsung Electronics Co., Ltd. v. Mojo Mobility Inc.*, IPR2023-01086, Paper No. 10 at 20 (PTAB Feb. 13, 2024) (institution denied) (internal quotations omitted), citing *Arendi S.A.R.L. v. Apple Inc.*, 832 F.3d 1355, 1361-62 (Fed. Cir. 2016).

More troublesome, the Petition does not explain how or why the “general knowledge of a POSITA” is used in the obviousness combinations. Indeed, the Petition does not even attempt to address the first two *Graham* factors, because Grounds 1, 3, and 5 do not: 1) identify the scope and content of Kuang, Lys, or Hiroyuki; or 2) acknowledge any differences between these references and the claims. Instead, Petitioner cites portions of the primary references for every claim element, and then conclusively asserts that a POSITA would have understood that

the cited part of the reference meets the claim element. No explanation was made as to the differences between the reference and the claim element or how the POSITA's general knowledge "meets" the claim element or such difference. In **no less than thirty-three instances**, Petitioner makes such unsupported assertions about what "a POSITA would have understood" to bridge gaps between the references and the claim language. *See*, Pet. at 7-8, 14, 16-18, 25-29, 32-33, 36, 38, 40, 42, 46, 47, 51, 54, 55, 57-60, 62, 63, 66-68, 72, 77, 80. Each of the thirty-three assertions lacks any acknowledgement of a deficiency or difference between the references and the claims.

Here, Petitioner has left it to Patent Owner and the Board to speculate on which of the features of the asserted art differs from the claims and how the asserted art would have been modified. Without the Petition's identification of differences between the claims and the primary references, it is impossible to determine whether the Petitioner asserts that claim elements 1) are disclosed by the reference, 2) are inherent in the reference, 3) are lacking in the reference and are disclosed elsewhere, or 4) are obvious for other undisclosed reasons.

The absence of articulated differences also "renders it difficult to present, and have a patent owner and the Board analyze, whether a petitioner has set out 'some articulated reasoning with [some] rational underpinning to support the legal conclusion of obviousness.'" *Analytics for Life, Inc.*, IPR2017-01742, Paper 9 at 14

(PTAB Jan. 31, 2018); *see also Front Row Techs., LLC v. MLB Advanced Media, L.P.*, IPR2015-01932, Paper 7 at 17 (PTAB Mar. 25, 2016) (denying institution for failure to identify “any differences between the prior art . . . and the claims at issue, or provide a substantive analysis of why or how a person of ordinary skill in the art would have modified the prior art to render the claims obvious.”).

The Petition fails to explain what modifications are being proposed to the primary reference, or what the resulting combination/modification would be. The Board has denied institution, noting that “[f]ailure on the part of a petitioner to explicitly identify a difference complicates an evaluation of obviousness.” *Johns Manville Corp. v. Knauf Insulation, Inc.*, IPR2015-01402, Paper 18 at 12-14 (PTAB Oct. 21, 2015); *see also LG Electronics, Inc. v. Cellular Communications Equipment LLC*, IPR2016-00197, Paper 7 at 11 (Apr. 29, 2016) (denying institution because the petition “does not explain what differences between the challenged claims and [the primary reference] are being addressed by [the secondary reference].”) The Petition should be denied for failure to make all arguments accessible to the Board and requiring the Board “to play archaeologist with the record.” *Johns Manville Corp. v. Knauf Insulation, Inc.*, IPR2015-01402, Paper 18 at 12-14 (PTAB Oct. 21, 2015).

2. Grounds 3 and 6 Have Dissimilar Reference Combinations yet Both Rely on the “General Knowledge of a POSITA”

Petitioner’s inconsistent reliance upon “general knowledge of a POSITA” between Grounds 3 and 6 is even more confusing. Ground 3 includes “general knowledge of a POSITA” as part of the stated obviousness ground. Pet. at 3. On the other hand, “general knowledge of a POSITA” is not part of obviousness Ground 6 stated in the Statement of Precise Relief Requested or in Ground 6 itself. Pet. at 3, 66. Despite the dissimilar obviousness ground statements, Grounds 3 and 6 both rely on what “a POSITA would have understood” including, for example, when addressing the following terms of claim 8:

	Ground 3: “Lys in view of <i>the general knowledge of a POSITA</i>”	Ground 6: “Hiroyuki in view of Kuang”
Claim 8 term	Petition page(s) discussing “<i>knowledge of a POSITA</i>”	Petition page(s) discussing “<i>knowledge of a POSITA</i>”
“light-emitting diode curtain lamp” in 8 <pre>[pre]</pre>	Pet. at 38	Pet. at 72
“slave control units” in 8[A]	Pet. at 40	Pet. at 77

“microcontroller” and “signal processor” in 8[B]	Pet. at 42	Pet. at 77 (also referring to page 68 for the discussion of “microcontroller”)
“electrically connected” in 8[D]	Pet. at 46-47	Pet. at 80

When addressing the same claim terms in Grounds 3 and 6, the Petition repeats the same assertions about what “a POSITA would have understood” even though the “general knowledge of a POSITA” is *not* identified as part of obviousness Ground 6. Thus, despite relying on the “general knowledge of a POSITA” to bridge gaps, Ground 6 does not purport to establish obviousness using the general knowledge of a POSITA. The Petition lacks vital explanation and clarity about what the Petitioner’s proposed grounds are, and how the references and supposed “general knowledge” are combined in the grounds. Given the differences between the grounds recited on page 3 of the Petition and the Petition’s nebulous reliance on the “general knowledge of a POSITA,” the Petition should be denied because there is no clear statement of the relief requested and a thorough explanation of the unpatentability grounds. *See, e.g., Shopkick*, IPR2015-00279, Paper 7 at 29.

B. The Petition Does Not Explain Any Motivation for Modifying the Primary References

Each of the six obviousness grounds lacks a clear articulation of a motivation to combine or modify the references. “Whether an ordinarily skilled artisan would have been motivated to modify the teachings of a reference is a question of fact.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1327 (Fed. Cir. 2016) (citations omitted). A complete obviousness analysis requires that the Petition include an “explanation of how the teachings of the references would be arranged or combined or why a person of ordinary skill would have made the combination” and “some reason why a person of ordinary skill in the art would have thought to combine particular available elements of knowledge, as evidenced by the prior art, to reach the claimed invention.” *Heart Failure Techs., LLC v. Cardiokinetix, Inc.*, IPR2013-00183, Paper 12, at 9 (PTAB Jul. 31, 2013) (citing *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 418 (2007)). By failing to do so here, the Petition fails to establish a reasonable likelihood of success for any ground.

For example, Ground 1 alleges that claims 1 and 2 are obvious based on Kuang in view of the general knowledge of a POSITA. Pet. at 3. Petitioner relies upon what “a POSITA would have understood” *six times* to bridge gaps between Kuang’s disclosure and independent claim 1. Pet. at 7-9, 14, and 16-17. Not once does Petitioner ever admit what is missing from Kuang, or provide any factual

underpinnings to explain why or how a POSITA would have been motivated to modify Kuang based on the general knowledge of a POSITA to reconstruct the claimed invention. In Ground 3, Petitioner repeats the same pattern in addressing independent claims 1 and 8, invoking the knowledge of a POSITA again without acknowledging any deficiencies in Lys or alleging any motivation to modify Lys. *See* Pet. at 25-29, 32-34, 38, 40, 42, 46, and 47.

Addressing independent claim 4, Ground 5 follows the same pattern. *See* Pet. at 51, 54, 55, 57-60, 62, 63, 65, and 66. Ground 5 states that element 4[D] is “obvious over Hiroyuki in view of the general knowledge of a POSITA.” *Id.*, 65. Assertions were made about series and parallel circuits, assumptions about voltage levels in Kuang’s circuit, and the general knowledge of electrical circuits. *Id.*, 65-66. But there is not a single citation to any evidence for these assertions. Dr. Schubert’s declaration is similarly lacking by repeating the petition verbatim, which should be given no weight as discussed in further detail below in Section IV. Petitioner alleges that series and parallel circuits “are two basic circuit configurations,” *id.*, 65-66, but does not explain why a POSITA *would have been motivated* to change Kuang’s existing circuitry, apply a different circuit layout, alter the operation of Kuang’s components, or make these changes to achieve different effects. For these additional reasons, Ground 5 fails to sufficiently set forth a motivation to modify Kuang to meet independent claim 4.

Ground 6 also addresses independent claim 8 and lacks sufficient reasoning for modifying Hiroyuki based on Kuang. Ground 6 largely repeats the same deficient pattern of discussing what “a POSITA would have understood” without acknowledging any deficiencies or explaining motivations to modify Hiroyuki to meet the claimed invention. *See* Pet. 72, 77, and 80. In discussing 8[B], the Petition refers to the discussion of claim 5 about adding Kuang’s microcontroller to Hiroyuki’s circuit board. Pet. at 77, referring to 68-70. Petitioner’s only basis for modifying Hiroyuki to add Kuang’s controller is the unsupported assertion that Kuang’s “microcontroller would enable features (such as dynamically flashing LED lights) that are considered attractive and desirable.” *See* Pet. at 70, and 82. Petitioner does not explain how Hiroyuki is deficient in its ability to provide “desirable” lighting, and fails to identify any other deficiency in Hiroyuki’s circuitry that would warrant adding a microcontroller, other than sheer hindsight to reconstruct claim 8. Petitioner also does not explain why a POSITA would have found it obvious to add a microcontroller to the specific circuit arrangement in Hiroyuki, and what effect the microcontroller from Kuang would have on the existing circuitry of Hiroyuki. Ground 6, like Grounds 1, 3, and 5, is fatally flawed for lacking a complete obviousness analysis required for institution. The Board should deny institution for these additional reasons.

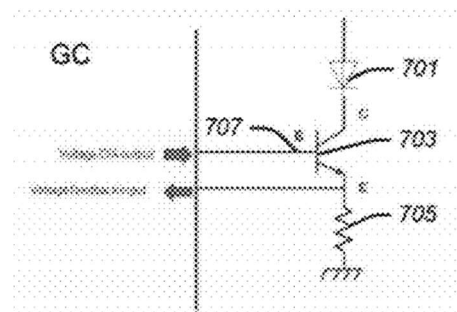
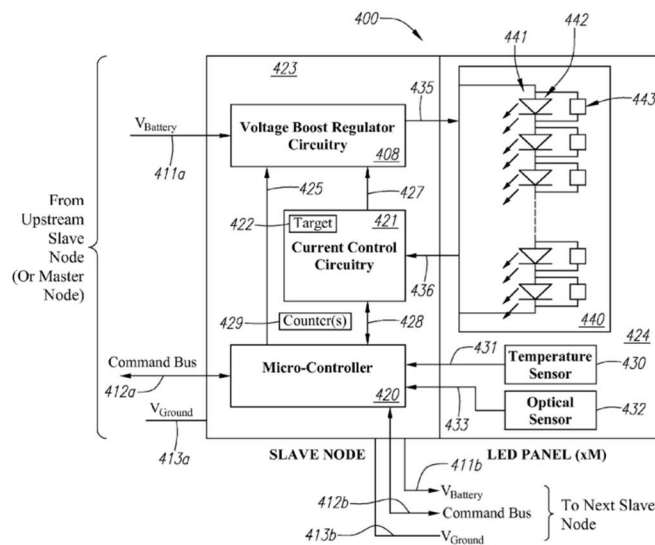
C. The Petition Fails to Show Reasonable Expectation of Success

Each of the six obviousness grounds fails to allege or explain a reasonable expectation of success in modifying the primary reference. “[W]here a party argues a skilled artisan would have been motivated to combine references, it must show the artisan ‘would have had a reasonable expectation of success from doing so.’” *Arctic Cat Inc. v. Bombardier Recreational Prods. Inc.*, 876 F.3d 1350, 1360–61 (Fed. Cir. 2017) (quoting *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1068–69 (Fed. Cir. 2012)). “[T]he expectation of success must be founded in the prior art, not in the applicant’s disclosure.” *In re Dow Chemical Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988). Petitioner has failed to carry its burden in establishing a reasonable expectation of success as required for a complete obviousness analysis; therefore, institution should be denied.

Regarding Grounds 1, 3, and 5, the Petition does not even attempt to allege a reasonable expectation of success. This fatal omission is readily apparent from the table of contents in the Petition. *See* Pet. at ii, iii. Nowhere in Ground 1 (Pet. at 6-20), Ground 3 (Pet. at 23-48), or Ground 5 (Pet. at 49-66) does the Petition discuss a “reasonable expectation of success” or anything equivalent.

Grounds 2, 4, and 6 include a bare assertion that “a POSITA . . . would have had a reasonable expectation of success.” Pet. at 21, 48, and 81. Aside from reciting these words, the Petition does not sufficiently explain why a POSITA would have

reasonably expected success. In Ground 2, for example, Petitioner does not explain how or why a POSITA would have modified Kuang's slave node 423, which already includes voltage boost regulator circuitry 408, current control circuitry 421, and micro-controller 420. *See* Pet. at 17-20, Kuang Fig. 4. Petitioner also does not explain why a POSITA would have reasonably expected to be successful in adding transistor 703 from Debevec, let alone "a transistor electrically connected to the signal processor" as recited in claim 3. The Petition does not address how the existing voltage boost regulator circuitry 408, current control circuitry 421, and micro-controller 420 in Kuang would be affected by the addition of Debevec's transistor that is implemented in Debevec's entirely different circuit:



Kuang (Ex. 1004) Fig. 4 (left), Debevec (Ex. 1005) Fig. 7 (right)

Petitioner does not set forth any basis in Ground 2 for showing how, or why, a POSITA would have combined these two disparate circuits. Grounds 4 and 6 are no better.

Skipping the required analysis entirely, the Petition simply alleges that “both references are from the same field of endeavor,” “[a] transistor is a common electrical switch,” “[a] POSITA would be aware of suitability of a transistor as an electronic switch or valve,” and “electric circuits are known to be predictable” and “not subject to unpredictable results.” Pet. at 21-22. These generic statements do nothing to address, let alone explain, why a POSITA would have reasonably expected success in modifying the slave node circuit of Kuang to add the transistor of Debevec’s circuit. The sole basis Petition cites is paragraph 58 of Dr. Schubert’s declaration (Ex. 1003), but that simply repeats the Petition verbatim without saying anything more. This expert testimony is entitled to no weight. *Xerox Corp. v. Bytemark, Inc.*, No. IPR2022-00624, Paper 12, 5 (PTAB Feb. 10, 2023). Ground 4 includes the same fatally deficient analysis as Ground 2, and Ground 6 fails for many of the same reasons as discussed above. Pet. at 48-49, 81-82.

For the reasons above, each of obviousness Grounds 1-6 lacks a sufficient showing of reasonable expectation of success, and the Petition should be denied for this additional reason.

IV. THE PETITION SHOULD BE DENIED FOR RELYING ENTIRELY ON A DECLARATION THAT REPEATS THE PETITION AND DESERVES NO WEIGHT

The Petition cites to the declaration of Dr. Schubert (Ex. 1003) as the sole support for all obviousness positions. But the expert declaration adds nothing to the analysis in the Petition, because the declaration simply repeats unsupported attorney argument. For this additional reason, the Petition lacks the requisite analysis and evidence of obviousness needed to support institution, and none of the grounds can prevail.

Under 37 C.F.R. § 42.65(a), “[e]xpert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.” According to the Director, the Board should give little weight to the Petitioner’s expert where “the expert declaration merely offered conclusory assertions without underlying factual support and repeated, *verbatim*, Petitioner’s conclusory arguments.” *Xerox*, IPR2022-00624, Paper 12 at 5. The Federal Circuit has also held that “adopting an argument that the petitioner has not sufficiently made” constitutes error under the Administrative Procedure Act. *Apple Inc. v. Corephotonics, Ltd.*, 81 F.4th 1353, 1360 (Fed. Cir. 2023). Thus, when the expert’s declaration is given little weight, the Board denies institution of grounds that fail to provide sufficient information to demonstrate that the combination renders the claims obvious. *See Hebei Huatong Wires and Cables Group Co, Ltd. v. Gulf Coast*

Downhole Technologies LLC, IPR2023-00908, Paper No. 4 at 18-19 (PTAB Nov. 22, 2023).

The expert declaration in this case embodies everything that the Director warned against in the *Xerox* decision. Dr. Schubert’s declaration (Ex. 1003) is a *carbon copy* of the Petition grounds, repeating every word of the petition *verbatim*. The Petition includes only conclusory statements of obviousness and lacks explanations of motivations to modify any references, or a reasonable expectation of success, as explained in Section III. The declaration repeats the same conclusory statements, and says nothing more than the Petition. Below is but one example of a paragraph from the Petition and the identical corresponding expert declaration paragraph:

Petition at 16-17	Declaration ¶ 50 (Ex. 1003)
Kuang also discloses a master node that sends synchronous signals to all slave nodes, and in turn, all LEDs. In this context, a POSITA would have understood the term “synchronous signals” to mean signals that are sent to the slave nodes to control their	50. Kuang also discloses a master node that sends synchronous signals to all slave nodes, and in turn, all LEDs. In this context, a POSITA would have understood the term “synchronous signals” to mean signals that are sent to the slave nodes to control their

corresponding LED strings at the same time. As explained in Kuang, “[a] master light shutoff command may also be sent from the master node 203 instructing <i>all</i> LED/slave nodes to turn off. The micro-controller 420 may also respond to commands from the master node 203 to dim the LEDs 442 <i>on all or selected ones of the LED units 424</i> , in which case the micro- controller 420 may instruct the current control circuitry 421 to reduce the PWM duty cycle for the affected LED units 424 by an appropriate amount.” <i>Id.</i> at [0054] (emphasis added). EX1003, ¶ 50.	corresponding LED strings at the same time. As explained in Kuang, “[a] master light shutoff command may also be sent from the master node 203 instructing <i>all</i> LED/slave nodes to turn off. The micro-controller 420 may also respond to commands from the master node 203 to dim the LEDs 442 <i>on all or selected ones of the LED units 424</i> , in which case the micro-controller 420 may instruct the current control circuitry 421 to reduce the PWM duty cycle for the affected LED units 424 by an appropriate amount.” <i>Id.</i> at [0054] (emphasis added).
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In paragraph 50 reproduced above, Dr. Schubert regurgitates the Petition’s assertion that “a POSITA would have understood the term ‘synchronous signals’ to mean signals that are sent to the slave nodes to control their corresponding LED strings at the same time.” The declaration does not provide any technical detail, explanation,

or supporting evidence for this assertion, which seems to be Petitioner’s claim construction despite having suggested that no claim term requires construction. Furthermore, the declaration does not explain *why* a POSITA would have understood “synchronous signals” to control LED strings at the same time, or cite to any supporting materials informative of the knowledge of a POSITA. Instead, Dr. Schubert’s declaration “sets forth Petitioner’s conclusory assertions as though they are facts, rather than setting forth facts and evidence in support of Petitioner’s assertions,” like the deficient declaration in *Xerox*.

Even more problematic is that Dr. Schubert does not explain *how* the cited references meet Petitioner’s proposed definitions of certain claim terms. In paragraph 50 reproduced above, Dr. Schubert repeats the Petition’s definition of “synchronous signals,” but never explains how Kuang’s disclosure of turning off or dimming “all” lights meets the proposed definition of controlling lights *at the same time*. The Board should not afford weight to such conclusory expert testimony that lacks discussion of how the prior art meets the claim limitations. *See Advance Medical Designs, Inc. v. Corbin Clinical Resources, LLC*, PGR2023-00041, Paper No. 12 at 31 (PTAB Jan. 23, 2024).

Dr. Schubert’s declaration is replete with such conclusory and unsupported assertions that simply repeat the Petition, and the Board should decline to afford any

weight to the declaration. *See Wellmatics, LLC et al. v. Canatex Completions Solutions, Inc.*, IPR2023-01149, Paper No. 8 at 16 (PTAB January 8, 2024).

V. THE PETITION SHOULD BE DENIED BECAUSE IT DOES NOT ESTABLISH THAT THE CHALLENGED CLAIMS ARE UNPATENTABLE

As established above, the Petition should be denied because none of the grounds presents a complete obviousness analysis. The Petition also fails because it does not establish that the cited references disclose every element of the challenged claims. The grounds are replete with vast but unsubstantiated assertions about the knowledge of a POSITA and the reference disclosures, leaving the Patent Owner and the Board to struggle to understand what features of the references are being alleged to correspond to the claim elements, and what claim limitations are met by a combination or modification of references. Having stated that no claim construction is needed, the Petition nevertheless sets forth its own definitions of claim terms without any evidence in support. Despite having proposed those definitions, the Petition does not explain how the prior art disclosures meet Petitioner's own definitions. By failing to reconcile large gaps between the claim language and the applied prior art, the Petition lacks the requisite degree of particularity to meet Petitioner's burden to show unpatentability. *See Harmonic*, 815 F.3d at 1363 (citing 35 U.S.C. § 312(a)(3)).

For these reasons, as further detailed below, the Petition fails to establish a reasonable likelihood of success that any of independent claims 1, 4, or 8, or their dependent claims will be found unpatentable over any of Kuang, Lys, Hiroyuki, Debevec, or the general knowledge of a POSITA.

A. Ground 1 Fails to Show That Kuang Meets 1[D]

1[D] recites “wherein the slave control unit is controlled by the master control unit to drive the light-emitting diode light string; the transmission line is used to transit *control signals and synchronous signals*” (emphasis added). That is, the transmission line transits two types of signals: 1) control signals, and 2) synchronous signals. The Petition alleges that Kuang discloses both types of signals, but Petitioner is wrong.

For the claimed “synchronous signals,” Petitioner alleges that “a POSITA would have understood the term ‘synchronous signals’ to mean signals that are sent to the slave nodes to control their corresponding LED strings at the same time.” Pet. at 16-17. There is no support for this assertion other than Petitioner’s expert declaration, Ex. 1003 at ¶ 50, which says nothing more than the Petition and should be given no weight.

Even taking Petitioner’s interpretation of “synchronous signals” at face value, the Petition does not establish that Kuang discloses the claim limitation or Petitioner’s own definition. Petitioner cites to Kuang’s disclosure which states, in

part, that “[a] master light shutoff command may also be sent from the master node 203 instructing all LED/slave nodes to turn off.” Pet. at 17, quoting Ex. 1004 at [0054] (emphasis omitted). Petitioner does not explain how the “master light shutoff command” constitutes the claimed “synchronous signal,” even under Petitioner’s own definition. That is, Petitioner does not explain how the “master light shutoff command” in Kuang is a command “sent to the slave nodes to control their corresponding LED strings *at the same time*.” A command sent for “instructing all LED/slave nodes” in Kuang says nothing about whether the LED/slave nodes are instructed to turn off *at the same time*, and the Petition does not establish otherwise. Therefore, Ground 1 of the Petition fails to establish obviousness of every element of independent claim 1.

With respect to the claimed “control signals,” Petitioner points to the same passage in Kuang discussing commands that are sent over a command/data bus to control LED lighting fixtures. Pet. at 16, citing Ex. 1004 at [0034] (The master node 203 may control lighting fixtures 202 “through commands or queries transmitted over the command/data bus 212.”). But Petitioner errs by failing to explain how these “commands” on a “data bus” teach or amount to the claimed “control signals.” Petitioner’s broad-brush assertion without specific evidence is also evident from its reliance on the commands in Kuang as meeting *both* the claimed “control signals” and the “synchronous signals” of 1[D].

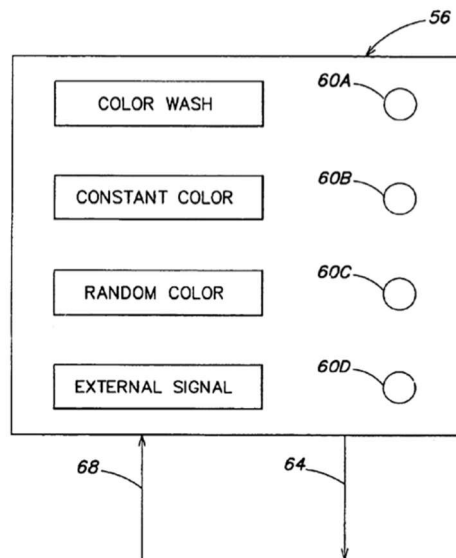
B. Ground 3 Fails to Show That Lys Meets 1[A]

1[A] recites “a master control unit electrically connected to the direct current power source, including a microcontroller and a voltage regulator electrically connected to the microcontroller.” The Petition argues that either a “local user interface 43” or a “remote user interface 56” in Lys meets 1[A], but Petitioner is wrong. *See* Pet. at 25-28.

Regarding the “local user interface 43,” the Petition admits that “local user interface 43 can be a button, switch, or dial.” Pet. at 25, citing Lys at 14:17-29. There is no evidence or explanation of record for the Board to find that Lys’s button, switch, or dial includes a microcontroller and a voltage regulator. The Petition vaguely asserts that elements of the remote control interface 56 – an entirely different part of Lys’s system – could somehow be “combined and associated with local user interface 43.” Pet. at 26. Neither Petitioner, nor its expert, explain how a POSITA would have found it obvious to modify local user interface 43 based on the remote control interface 56, or how such a modified local user interface 43 would operate. Therefore, even based on the Petition own assertion, the “local user interface 43” in Lys does not meet the claimed “master control unit” in claim 1.

Regarding the “remote user interface 56,” there is no showing that the remote user interface 56 includes a voltage regulator, as claimed. The Petition alleges that selectors 60A and 60B in the remote user interface 56 are voltage regulators, on the

basis “a POSITA would have recognized that the selectors in Lys meet the “voltage regulator” limitation, because controlling/changing current is proportional to a changing voltage (per Ohm’s law).” Pet. at 27. There is nothing in the record indicating that selectors 60A and 60B “control or change current,” or otherwise act as voltage regulators. Instead, Lys describes “remote user interface 56” like a remote control, and selectors 60A-60D are simple buttons. See Ex. 1008 at 13:40-54 (discussing selectors 60A and 60B generating “mode” and “options” signals), Fig. 5:



Lys (Ex. 1008), Fig. 5 (showing remote user interface 56
and selectors 60A-60D)

Petitioner and its expert appear to assume that selectors 60A and 60B include voltage regulators because they can change lighting mode, but these unsupported assumptions alone cannot support institution. *Upjohn Co. v. Mova Pharm. Corp.*,

225 F.3d 1306, 1311 (Fed. Cir. 2000) (“Lack of factual support for expert opinion to factual determinations, however, may render the testimony of little probative value in a validity determination.”); *see also Samsung Electronics Co., Ltd. v. Mojo Mobility Inc.*, IPR2023-01102, Paper 11, 13 (PTAB 2024) (denying institution and affording little weight to expert testimony that is based upon assumptions).

At bottom, Lys does not support that remote user interface 56 includes the claimed voltage regulator, and the Petition provides nothing more than attorney argument, plus expert statement repeating the same argument and citing no support, in an attempt to bridge gaps between Lys and the claim limitation. Therefore, Ground 3 of the Petition fails to establish obviousness of every element of independent claim 1.

C. Ground 5 Fails to Show That Hiroyuki Meets 4[A]

4[A] recites “a master control unit including a *power negative terminal pin* of master control unit and a *signal output pin* of master control unit, the master control unit being electrically connected to the alternating current power source” (emphases added).

Hiroyuki does not disclose pins. The Petition concedes as much, because Petitioner attempts to fill gaps between Hiroyuki and the claimed pins by proposing a definition of “pin.” Pet. at 55. Citing to a dictionary, Petitioner states that “a POSITA would have understood a “pin” to be “[a] terminal on a connector, plug, or

tube base.” *Id.* (emphasis omitted), citing Ex. 1009 at 566. Citing to Dr. Schubert, the Petition further states that “[a] ‘pin’ can be understood as a pointed terminal.” *Id.* at 55, citing Ex. 1003 ¶ 100. Petitioner’s proposed definition of “pin” does not make sense in the context of claim 4, because the claim already recites the word “terminal” in the term “terminal pin.” Nevertheless, even if the Board were to adopt these definitions, the Petition does not establish that Hiroyuki meets the claim term or Petitioner’s own definition.

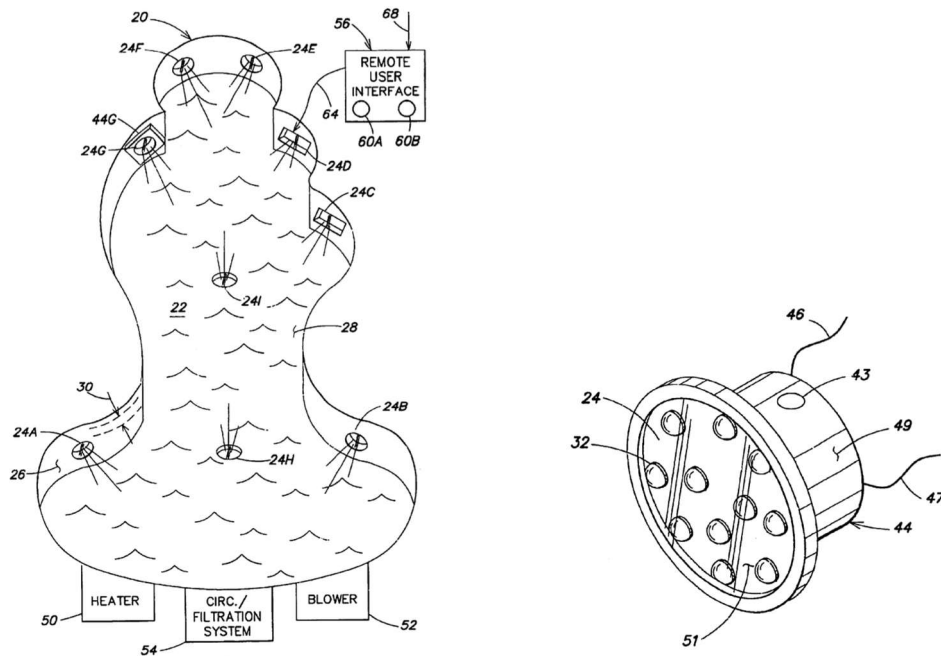
The Petition maps “terminals 60” and “terminal units 64” in Hiroyuki to the “power negative terminal pin” and the “signal output pin,” respectively, of claim 4[A]. Pet. 53-54. As Hiroyuki does not disclose or describe “pins,” the Petition leans on its definition of “pin” in order to bridge this gap in Hiroyuki. However, in alleging that Hiroyuki’s terminals meet 4[A] because they are “terminals,” Petitioner does not explain how Hiroyuki’s terminals are “on a connector, plug, or tube base” to satisfy the entirety of Petitioner’s definition of pin. *See* Pet. at 55, Ex. 1009 at 556. Furthermore, Petitioner states that a pin is a “*pointed* terminal,” but does not establish that Hiroyuki’s terminals are pointed, or that such a modification to Hiroyuki would have been obvious to a POSITA. At most, the Petition shows that Hiroyuki discloses what it says, a “terminal.” 4[A], on the other hand, requires various “terminal pins,” and the Petition fails to establish that 4[A] would have been obvious based on Hiroyuki.

D. Ground 3 Fails to Show That Lys Meets 8[D]

8[D] recites “*a second curtain lamp* electrically connected to the alternating current voltage transferring to direct current voltage circuit” (emphasis added). The Petition fails to establish that Lys discloses at least this element of independent claim 8.

Ground 3 asserts that Lys in combination with the knowledge of a POSITA renders independent claim 8 obvious, but Petitioner fails establish that Lys discloses anything resembling “a second curtain lamp,” that is “electrically connected to the alternating current voltage transferring to direct current voltage circuit.”

Lys discloses light sources for “illumination of liquids.” Ex. 1008 at Abstract. In Figures 3 and 4 of Lys, relied upon by Petitioner, Lys discloses “a light source for illumination in a pool or spa” and “a networked lighting system for illumination in a pool or spa environment,” respectively. *Id.*, 3:64-4:2. Figure 3 illustrates a round housing 44 for a waterproof lighting fixture:



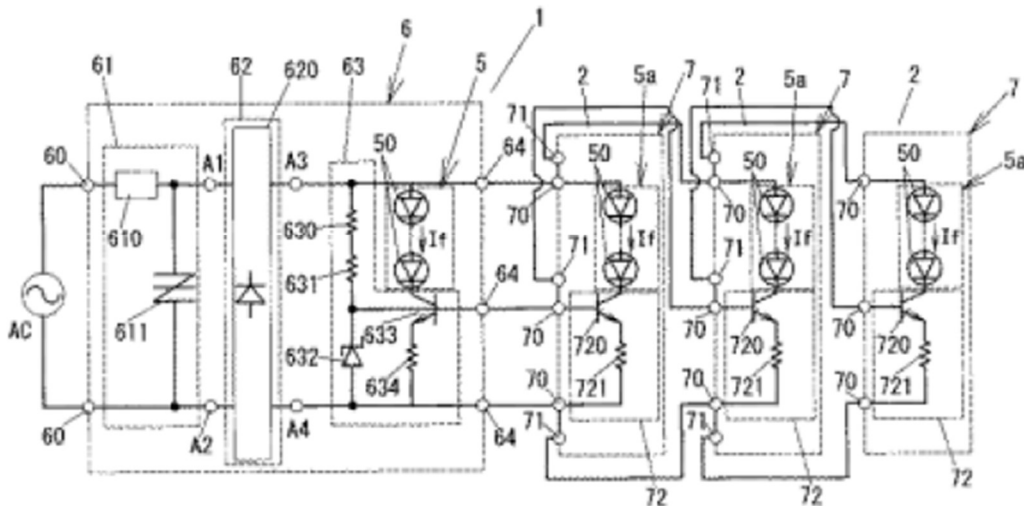
Lys (Ex. 1008), Figs. 1 (left) and 3 (right)

Petitioner alleges – several times – that a “curtain lamp” is “commonly understood to be one or more light strings,” Pet. at 8, 25, 38, 51, 72, but does not cite any support or evidence for this allegedly “common understanding” of the claim term. Petitioner also makes no attempt to explain how the pool lighting fixtures and the light sources for illumination in a pool or spa of Lys disclose “*a second curtain lamp.*” See Pet. at 44-46. For example, Petitioner does not explain how the light sources for illumination in a pool or spa of Lys constitute “one or more light strings” under Petitioner’s own definition of “curtain lamp.” See Pet. at 38 (addressing 8[Pre]), 44-47 (addressing 8[D]). Therefore, the Petition does not, and cannot, establish that Lys meets 8[D] in Ground 3.

E. Ground 6 Fails to Show That Hiroyuki in View of Kuang Meets 8[B]

8[B] requires that “the slave control unit includes *a signal processor*.” (emphasis added). The Petition argues that the “constant current circuit unit 72 of the slave drive unit” in Hiroyuki “*acts as* a signal processor” and meets 8[B], but Petitioner is wrong. *See* Pet. at 75-77.

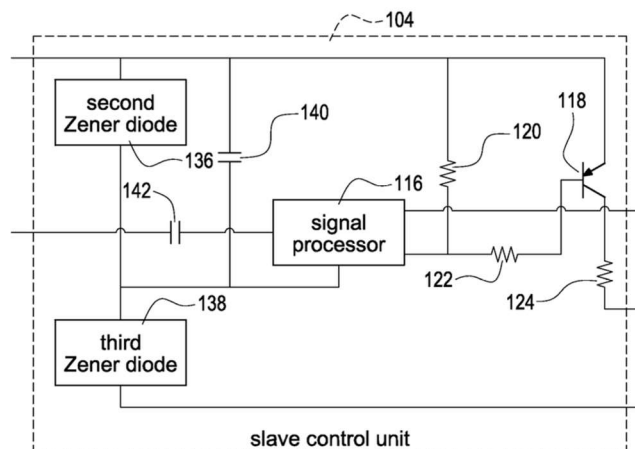
There is nothing in Hiroyuki indicating that the constant current circuit unit 72 is a “signal processor.” The figures of Hiroyuki do not show a “signal processor” and the Petition admits as much by resorting to arguing that a circuit “acts as” a signal processor. *See* Pet. at 75-76. Instead, Hiroyuki describes that “the constant current circuit unit 72” includes “a transistor 720 and a resistor 721 connected in series.” *See* Ex. 1007 at [0030], Fig. 1:



Hiroiyuki (Ex. 1007), Fig. 1

Petitioner alleges that “a POSITA would have understood the constant current circuit unit 72 in Hiroyuki to meet the ‘signal processor’ limitation as claimed because it regulates the power supply to keep its output current constant in spite of changes in load, line, or temperature.” Pet. at 75-77 (citing Hiroyuki at [0030]). There is no support for this purported “understanding of a POSITA” other than Petitioner’s expert declaration, Ex. 1003 at ¶ 127, which says nothing more than the Petition and should be given no weight.

Furthermore, the Petition fails to explain how a transistor 720 and a resistor 721 connected in series in Hiroyuki constitutes a “signal processor” in view of the disclosure of the ’546 Patent. Fig. 6 of the ’546 Patent illustrates an example of a slave control unit having a transistor 118 connected with resistors 122 and 124, *in addition to* signal processor 116:



'546 Patent (Ex. 1001), Fig. 6

The '546 Patent suggests, such as in Fig. 6 above, that a “signal processor” is more than just a transistor and a resistor connected in series. The Petition fails to sufficiently explain why Hiroyuki’s transistor and resistor should also be interpreted as a “signal processor.”

For these reasons, the Petition fails to explain how Hiroyuki meets 8[B] in Ground 6. For these reasons, the Petition fails to establish a reasonable likelihood that Ground 6 would prevail with respect to at least 8[B] based on Hiroyuki in view of Kuang.

F. Grounds 2, 4, and 6 Fail Because Grounds 1, 3, and 5 Fail

Grounds 2 and 4 address claim 3 that depends from independent claim 1, addressed in Grounds 1 and 3. Ground 6 addresses claims 5 and 6 that depend from independent claim 4, addressed in Ground 5. As established above, Petitioner has failed to establish that any of independent claims 1 or 4 are unpatentable in Grounds 1, 3, or 5. The Petition thus also fails to establish a reasonable likelihood of prevailing on any of the dependent claims addressed in Grounds 2, 4, or 6.

VI. CONCLUSION

For at least the reasons provided above, the Petition should be denied.

Respectfully submitted,

Dated: February 22, 2024

By: /Ming-Tao Yang/
Ming-Tao Yang, Reg. No. 62,019
Lead Counsel for Patent Owner
SEMISILICON TECHNOLOGY CORP.

CERTIFICATE OF COMPLIANCE

The undersigned hereby certifies that the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** contains 7,208 words, excluding those portions identified in 37 C.F.R. § 42.24(a), as measured by the word-processing system used to prepare this paper.

Dated: February 22, 2024

/Ming-Tao Yang/
Ming-Tao Yang, Reg. No. 62,019
Lead Counsel for Patent Owner

CERTIFICATE OF SERVICE

The undersigned hereby certifies that a copy of the foregoing **PATENT OWNER'S PRELIMINARY RESPONSE** was served on February 22, 2024, via e-mail directed to counsel of record for the Petitioner at the following:

John Handy
john.handy@rimonlaw.com

Jason Xu
jason.xu@rimonlaw.com

Dated: February 22, 2024

By: /Daniel E. Doku/
Daniel E. Doku
Litigation Legal Assistant

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, LLP