

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

VOLTAGE, LLC
Petitioner,

v.

SHOALS TECHNOLOGIES GROUP, LLC,
Patent Owner.

Case IPR2024-00877
U.S. Patent No. 10,553,739

PATENT OWNER PRELIMINARY RESPONSE

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EXHIBIT LIST

Exhibit No.	Description
2001	Combined Transcripts of Public Versions of Evidentiary Hearing in ITC Investigation No. 337-TA-1365, <i>Certain Photovoltaic Connectors and Components Thereof</i> , March 18-22, 2024 [EDIS Doc. IDs 816318, 816393, 816472, 816792, 816795]
2002	National Electrical Code (2014) excerpts: -- Article 100 – Definitions -- Article 690 – Solar Photovoltaic (PV) Systems -- Informative Annex A – Product Safety Standards
2003	U.S. Patent No. 8,604,342 to Solon.
2004	U.S. Patent No. 10,347,775 to Solon.
2005	U.S. Patent No. 8,408,929 to Solon
2006	U.S. Patent No. 8,962,998 to Solon.
2007	U.S. Patent Publication No. 2014/0071563 to Solon.
2008	<i>About NABCEP</i> , North American Board of Certified Energy Practitioners, https://www.nabcep.org/about-us/ .
2009	<i>Electricity Explained: Electricity in the United States</i> , U.S. Energy Information Administration, https://www.eia.gov/energyexplained/electricity/electricity-in-the-us.php .
2010	<i>Solar Explained: Photovoltaics and Electricity</i> , U.S. Energy Information Administration, https://www.eia.gov/energyexplained/solar/photovoltaics-and-electricity.php#:~:text=Photovoltaic%20cells%20convert%20sunlight%20into,or%20particles%20of%20solar%20energy .
2011	Shoals Q1 2023 Investor Presentation [ITC Hrg. Ex. JX-0113]
2012	Shoals Slide Presentation [ITC Hrg. Ex. CX-0144]
2013	Shoals Interconnect System Wire Harness User Manual [ITC Hrg. Ex. JX-0338]

Patent owner Shoals Technology Group, LLC (“Shoals”) respectfully submits the following preliminary response pursuant to 37 C.F.R. § 42.207(a).

I. INTRODUCTION AND SUMMARY OF ARGUMENTS

The information presented in the petition fails to meet the statutory threshold; it does not show that there is a reasonable likelihood that Voltage¹ would prevail, if trial were instituted, with respect to at least one of the claims of the ’739 patent.² *See* 35 U.S.C. § 314(a). The Board should deny the petition and decline to institute trial.

First, there are global failures that render the petition incapable of meeting the required standard, including the failure of Voltage’s expert witness, Dr. Kenny, to possess the solar photovoltaic industry experience required to competently speak to the views of a person of ordinary skill in the art (POSA) of the photovoltaic in line fuse assemblies and photovoltaic wire harnesses claimed in the ’739 patent. Voltage also failed to confront known evidence of objective indicia of nonobviousness developed in an ITC investigation involving both Shoals and Voltage.

¹ “Voltage” refers to the petitioner Voltage, LLC and its real party-in-interest, parent company Ningbo Voltage Smart Production Co.

² U.S. Patent No. 10,553,739.

As for the nine individually stated grounds for unpatentability, all share a major common flaw—conclusory assertions masquerading as motivation to combine, with no evidentiary support. Dr. Kenny’s lack of solar industry experience allows him to view the art simplistically which results in a hindsight driven approach that asks what a POSA **could** have done once handed the references, instead of asking what a POSA **would** have done in 2013 without present-day prompting from Voltage.

II. THE ITC INVESTIGATION

Shoals filed a complaint against Voltage (and others) with the U.S. International Trade Commission (ITC) on May 4, 2023, styled *Certain Photovoltaic Connectors and Components Thereof*, stating claims for infringement of the ’739 patent and other patents. See 88 Fed. Reg. 37905 (notice of institution of Investigation No. 337-TA-1365); 88 Fed. Reg. 56883 (Aug. 21, 2023) (regarding amendment to add additional patent).

A five-day evidentiary hearing took place from March 18–22, 2024. Shoals withdrew the ’739 patent shortly prior so the hearing was focused on a different patent, but one that also involved components for use in solar photovoltaic power installations, as evident from the name of the investigation and in the cited Federal Register notices. Voltage’s expert in the present proceeding, Dr. Kenny, also testified for Voltage at the ITC evidentiary hearing. Much of his sworn testimony

from the hearing remains highly relevant here because it shows his admitted lack of experience with anything relating to solar photovoltaic systems, whether academic or professional. The public version of the full hearing transcript is filed herewith as EX2001 and Shoals cites to it where appropriate for evidence regarding matters not dependent upon the specifics of the claimed invention, such as solar technology generally, the level of skill in the art, and Dr. Kenny's lack of solar experience.

III. THE '739 PATENT AND SHOALS' IN LINE FUSE AND WIRE HARNESS PRODUCTS

Utility-scale solar power plants consist of vast arrays of solar panels, often covering several acres or even square miles. These solar panels are typically arranged in rows and installed on open land or rooftops. When sunlight strikes the solar panels, the photovoltaic (PV) effect occurs, generating direct current (DC) electricity within each panel. EX2009, 4; EX2010, 1 (“A photovoltaic (PV) cell, commonly called a solar cell, is a nonmechanical device that converts sunlight directly into electricity.”). The DC electricity from each of the solar panels must then be collected and sent to inverters. Inverters convert the DC electricity into alternating current (AC) electricity, which is suitable for distribution and use on the power grid. EX2009, 4; EX2010, 2. Because they rely on the photovoltaic effect, solar power systems are often called “PV” or “photovoltaic” systems. See EX2002, Art. 100, p. 70-33 (National Electrical Code (NEC) defining “Photovoltaic (PV)

System” as “[t]he total components and subsystem that, in combination, convert solar energy into electric energy suitable for connection to a utilization load.”).³

The major components of a solar energy project are solar panels, inverters, the mounting system, and “EBOS” (Electrical Balance of Systems). EBOS encompasses all of the components that are necessary to carry the electric current produced by solar panels to an inverter and ultimately to the power grid for use by consumers in homes and businesses. EX2011, 6, 7 [ITC Hrg. Ex. JX-0113]; EX2001, Tr. (Macias⁴) at 104:20–105:1; Tr. (Brooks⁵) at 384:13–19; Tr. (Weiner⁶)

³ Because the terms “PV,” “photovoltaic,” and “solar” are often used interchangeably when referring to sunlight-driven energy producing systems, Shoals does the same herein.

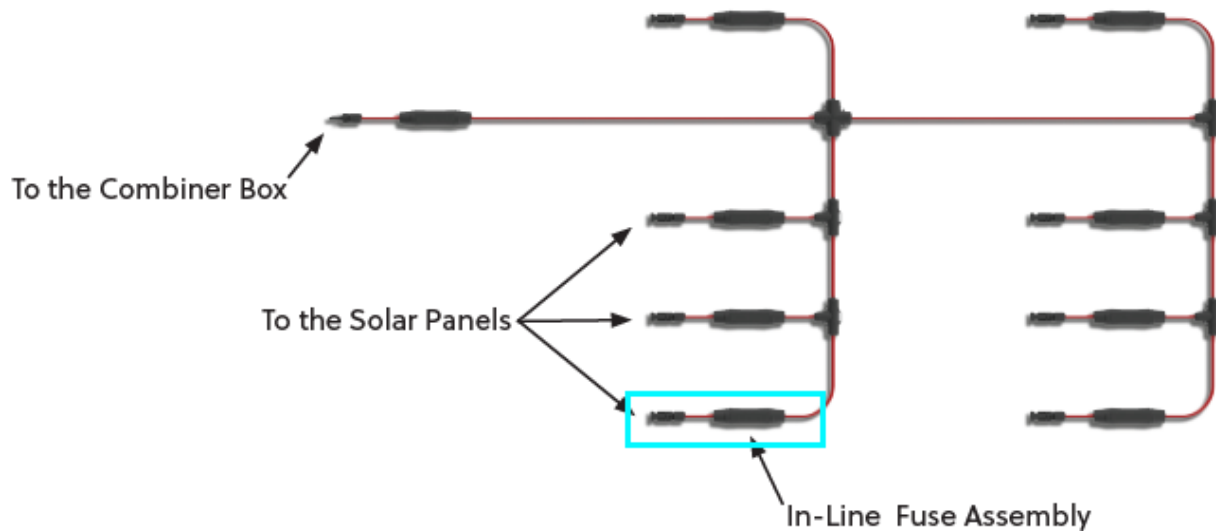
⁴ Ben Macias, Shoals’ Chief Revenue Officer, testified as a Shoals fact witness at the evidentiary hearing. EX2001, 103:4–19.

⁵ Bill Brooks testified for Shoals as technical expert, EX2001, 381:14–25, admitted by Judge Bhattacharyya to testify “as an expert on photovoltaic solar energy systems, EBOS, and the electrical wiring for such systems,” *id.*, 389:5–7.

⁶ Josh Weiner testified as Shoals’ validity expert, EX2001, 1256:16–1257:7, “admitted as an expert in photovoltaic solar energy systems, EBOS, and the electrical wiring for solar systems,” *id.*, 1263:1–3.

at 1262:2–13. Major EBOS components include cable and wire, joints, connectors, combiner boxes, wire management solutions, fuses, combiners, disconnects, recombiners, junction boxes, ground fault detectors, transition enclosures, and splice boxes. EX2011, 7 [ITC Hrg. Ex. JX-0113].

Shoals' EBOS component that is the subject of '739 patent is a photovoltaic in line fuse assembly, which can be incorporated into a photovoltaic wire harness, as shown below:



EX2013, 7 [ITC Hrg. Ex. JX-0338] (blue box added).

Since electrical power is generated at individual solar modules, the efficient collection and consolidation of power from many modules—which can number in the hundreds or even thousands—is critical. EX2011, 18. Typically, solar modules are electrically connected along individual “strings.” A string of solar modules is typically referred to as a solar “panel,” and a conventional solar installation may

have many such panels or strings of modules. *Id.* The DC current generated at each string of modules is collected and provided to a combiner box via a separate wire. In this wiring architecture, commonly referred to as a “homerun” solution, the combiner box connects to multiple strings of modules via individual wire runs and serves as an electrical junction into a single feeder cable that can be used to carry the combined DC current to the inverter. *Id.*

Making each wire run from the strings of solar modules to a combiner box is a laborious process. Each wire run must be measured, laid out and fished through conduits that are typically buried in trenches across the project site. *Id.*, 19. Because each string of modules is individually connected to a combiner box, the same distances are covered with multiple wire runs. Making the crimped connections between wires and interconnecting them in the combiner box is a complex, error-prone process that requires special tools. *Id.* Each wire must be cut and have a precise amount of insulation removed; the bare end must be inserted the correct depth into a terminal; and special tools must be used to deform metal sleeves and torque lock nuts to ensure an environmental seal. The entire installation must be performed by licensed electricians with special training and any mistake in the process can result in a system failure. *Id.*

For safety and protection against faults, each combiner box would typically include overcurrent protection devices, such as fuses, associated with each string.

These protection devices are essential for safety and to prevent excessive current in the event of a fault, such as a short circuit or ground fault. If a fault occurs in one string, the corresponding protection device will trip, isolating that string without affecting the other strings. For example, an installation having 30 solar modules per string and 24 strings per combiner box would require each combiner box to accommodate 24 separate fuses.

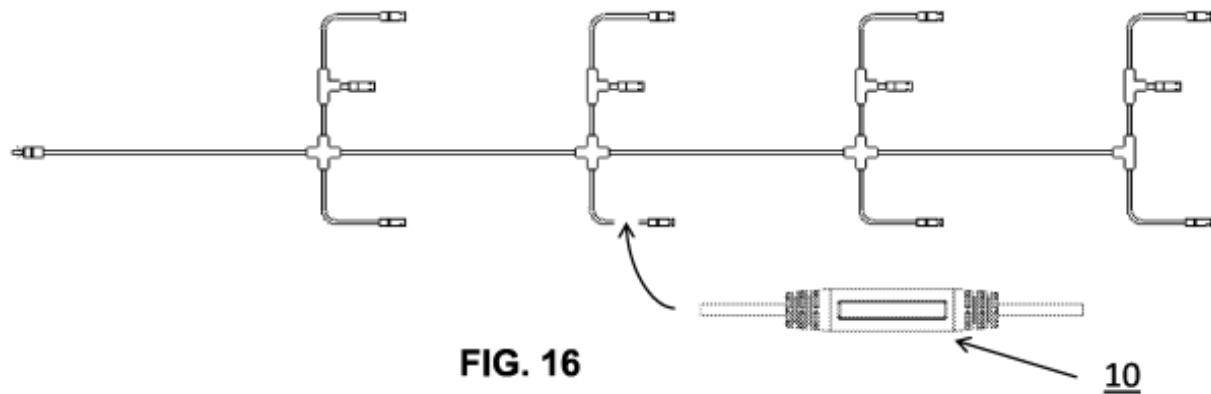
Incorporating fuses within an enclosed combiner box can be undesirable, both in terms of installation and wire maintenance, and in terms of overheating due to the large number of fuses. In addition, a blown fuse requires a technician to open a combiner box, which exposes them to potentially dangerous voltages. When fuses are located within combiner boxes, maintenance requires shutting down the entire box, which can be both time-consuming and costly. Further, the inclusion of large numbers of fuses within the combiner box takes up physical space, which might increase the number of combiner boxes needed in a given solar field. Moreover, there are advantages to eliminating the combiner box altogether. This requires relocation of the photovoltaic fuses. The '739 patent discloses and claims a fuse assembly that addresses each of these issues. *See* EX1001, 1:25–62.

In particular, the claims of the '739 patent are directed to a fuse assembly that can be integrated within a wire that is receiving power from one or more solar modules. For example, it might be integrated within a wire harness connected to a

string of solar modules. This arrangement allows for circuit protection to be moved from the combiner box to the wire harness (or similar structure). The fuse assembly of the '739 patent might include various connector configurations (e.g., male, female, or wire) to allow its connection within a desired location and allow for easy installation in existing harnesses. One innovation of the '739 patent is that it allows placement of fuses outside of the combiner box at more accessible locations. In this way, the risk associated with maintenance is greatly reduced, as technicians no longer need to interact directly with high voltage areas (e.g., the confines of a combiner box). Moreover, relocation of the fuses outside of the combiner box to more accessible locations allows for quicker, safer maintenance without the need for full shutdown of a combiner box.

Since the fuse assembly of the '739 patent is intended to reside outside of the confines of a combiner box (or similar structure), it is designed to withstand environmental conditions, provide adequate electrical insulation, and maintain adequate strain relief. EX1001, abstract. In part, this is provided by adequately sealing the fuse. This is accomplished by the fuse assembly of the '739 patent with a dual-mold configuration, where a primary seal of the fuse is provided with an undermold, and a secondary seal is provided via an overmold. Dissimilar materials in the undermold and the overmold are utilized to enhance the seal.

Integration of an exemplary fuse assembly according to the '739 patent within a wire harness is shown in Fig. 16 from the patent, reproduced below:



IV. LEVEL OF SKILL IN THE ART

In the ITC proceeding, Judge Bhattacharyya issued a claim construction order that included a finding as to the level of ordinary skill in the art: someone with “at least a bachelor’s degree in mechanical or electrical engineering or a related scientific field and at least two years experience working with photovoltaic systems and electrical wiring, with recognition that more education could substitute for experience and that experience combined with training could substitute for formal education.” EX1023, 12.⁷ Voltage argued at the ITC, as it

⁷ The order issued in February 2024 at which time the '739 patent remained an asserted patent in the ITC proceeding. EX1023, 1, 5–6. The level of skill in the art analysis was applicable to the '739 patent at that time, and remains so.

does here, that photovoltaic experience—solar experience—is unnecessary for understanding how a POSA would have viewed a patent having “photovoltaic in line fuse assembly” in its title and “photovoltaic fuse” and “photovoltaic connector” in each and every claim. Pet., 11; EX1001.

Judge Bhattacharyya was right about the level of skill requiring solar experience, as application of the law to the facts confirms. The level of ordinary skill in the art may be determined by reference to several factors, including “(1) the educational level of the inventor; (2) type of problems encountered in the art; (3) prior art solutions to those problems; (4) rapidity with which innovations are made; (5) sophistication of the technology; and (6) educational level of active workers in the field.” *Daiichi Sankyo Co. v. Apotex, Inc.*, 501 F.3d 1739, 1256 (Fed. Cir. 2007) (citation and quotation marks omitted). “These factors are not exhaustive but are merely a guide to determining the level of ordinary skill in the art.” *Id.* In addition, “[t]he patent’s purpose can also be informative.” *Best Med. Int’l, Inc. v. Elekta Inc.*, 46 F.4th 1346, 1353 (Fed. Cir. 2022).

As noted above, the in line fuses and wire harnesses of the ’739 patent are EBOS components. EX2011, 7–9 [ITC Hrg. Ex. JX-0113] (identifying “inline fuses” and “cable assemblies” among “mission critical EBOS components”); EX2012, 8–11 [ITC Hrg. Ex. CX-0144]. Changes were starting to happen in the EBOS field by June 3, 2013, the priority date for the ’739 patent. Indeed, the ’739

patent's sole named inventor, Dean Solon, was leading the way, filing seven different EBOS patent applications between 2009 and June 2013, including the application for the '739 patent:

- On July 14, 2009, Mr. Solon filed an application titled “Low Leakage Electrical Joints and Wire Harnesses, and Method of Making the Same,” which later issued as U.S. Patent No. 8,604,342. EX2003.
- On March 1, 2010, Mr. Solon filed an application titled “Solar Energy Wire Harness with In-Line Fuses,” which later issued as U.S. Patent No. 8,937,249. EX1008. Dr. Kenny and the petition refer to this filing as “Solon” and identify it as the published application for this '249 patent, 2011/0209741, (Pet., 6; EX1003, ¶ 72), but the document filed as EX1008 is in fact the issued '249 patent.
- On August 30, 2010, Mr. Solon filed an application titled “Solar Array Recombiner Box with Wireless Monitoring Capability,” which later issued as U.S. Patent No. 10,347,775. EX2004.
- On March 28, 2011, Mr. Solon filed an application titled “Guard for Connection Point of Adjoined Wire Connectors,” which later issued as U.S. Patent No. 8,408,929. EX2005.
- On February 7, 2013, Mr. Solon filed an application titled “Solar Panel Junction Box Capable of Integrating with a Variety of Accessory Modules,

and Method of Use,” which later issued as U.S. Patent No. 8,962,998.

EX2006.

- On March 10, 2013, Mr. Solon filed an application titled “Monitoring System for and Method of Preventing Electrical Arcs in a Solar Energy System,” which later published as U.S. Patent Pub. No. 2014/0071563.

EX2007.

Beginning in 1984, the National Electrical Code (NEC) had a separate article (Article 690) devoted specifically to PV systems. In 2003, the North American Board of Certified Energy Practitioners (NABCEP) began administering “Solar PV Installer” certification exams (now called “PV Installation Professional”). EX2008. As the solar industry matured, NEC Article 690 became more granular, as did other applicable codes and regulations, so that by the early 2010s, component designers were increasingly specialized between panels, EBOS, and other BOS (Balance of Systems) components. For example, the 2014 edition of the NEC (NEC 2014),⁸ which was the tenth edition after Article 690’s 1984

⁸ NEC 2014 “was prepared by the National Electrical Code Committee and acted on by NFPA at its June Association Technical Meeting held June 10–13, 2013, ... [and] was issued by the Standards Council on August 1, 2013, with an effective

introduction, (EX2002, p. iv), required that “[p]rotection devices for PV source circuits and PV output circuits,” like fuses, “shall be in accordance with the requirements of 690.9(B) through (E),” (*id.*, § 690.9(A), p. 70-627), with § 690.9(C) specifically requiring that “[o]vercurrent devices, either *fuses*⁹ or circuit breakers, used in any dc portion of a PV power system shall be listed,”—by a nationally recognized Testing Laboratory (NRTL), such as Underwriters Laboratory (UL)¹⁰—“and shall have the appropriate voltage, current, and interrupt ratings,” (*id.*, § 690.9(C), p. 70-627).

NEC 2014 also identified many additional PV-specific product safety standards from UL and others, including: Concentrator Photovoltaic Modules and Assemblies, Subject 8703; Connectors for Use in Photovoltaic Systems, Subject 6703; Flat-Plate Photovoltaic Modules and Panels, UL 1703; Low-Voltage Fuses — Fuses for Photovoltaic Systems, Subject 2579; Molded-Case Circuit Breakers, Molded-Case Switches, and Circuit-Breaker Enclosures for Use with Photovoltaic

date of August 21, 2013.” EX2002, p. iv. NEC 2014 is therefore reasonably representative of solar industry knowledge and practices as of the June 2013 priority date for the ’739 patent.

⁹ All instances of emphasis are supplied by Shoals unless otherwise indicated.

¹⁰ See EX2002, Art. 100, p. 70-32 (definition of “Listed”).

(PV) Systems, Subject 489B; Multi-Pole Connectors for Use in Photovoltaic Systems, Subject 6703A; Photovoltaic DC Arc-Fault Circuit Protection, Subject 1699B; Photovoltaic Junction Boxes, Subject 3730; Photovoltaic Wire, Subject 4703; and Solar Trackers, Subject 3703. EX2002, Informative Annex A - Product Safety Standards, pp. 70-772–70-774.

As for types of problems encountered, solar EBOS presents unique challenges. To put solar EBOS into context, according to the U.S. Energy Information Administration’s website:

The United States uses many different energy sources and technologies to generate electricity. ...

The three major categories of energy for electricity generation are fossil fuels (coal, natural gas, and petroleum), nuclear energy, and renewable energy sources.

EX2009, 1.

Renewable energy sources are further subdivided into wind, hydro, biomass, geothermal—and solar. EX2009, 1. “Photovoltaic (PV) and solar-thermal power are the two main types of solar electricity generation technologies.” *Id.*, 4. “Most solar-thermal power systems use steam turbines to generate electricity,” just like fossil fuel and nuclear power systems. *Id.* Photovoltaic systems are different: “PV conversion produces electricity directly from sunlight in a photovoltaic cell” with each PV cell generating around 1–2 Watts. *Id.*; EX2010, 2. To be useful for larger-

scale electricity generation, PV cells are electrically connected in a packaged, weather-tight PV module. *Id.* PV modules may then be wired together thereby aggregating the generated power. *Id.*

Based on the foregoing considerations and in light of the '739 patent and its claims, the skilled artisan cannot be accurately described in terms of generic “electrical wiring and connectors,” or without regard to PV-specific education and experience, as Voltage and Dr. Kenny argue. Pet., 11; EX1003, ¶ 57. A more accurate description is Judge Bhattacharyya’s determination in the ITC proceeding, i.e., that the level of ordinary skill in the art requires at least two years of experience working with photovoltaic systems and electrical wiring. EX1023, 12. Shoals thus agrees with ITC Judge Bhattacharyya that the level of skill in the art requires “at least a bachelor’s degree in mechanical or electrical engineering or a related scientific field and at least two years experience working with photovoltaic systems and electrical wiring, with recognition that more education could substitute for experience and that experience combined with training could substitute for formal education.” *Id.*

V. CLAIM CONSTRUCTION

Voltage’s petition fails for a number of reasons, but none is affected by the meaning of the claim language. Shoals therefore takes no position at this time regarding claim construction but reserves the right to do so if trial is instituted.

VI. THE PETITION FAILS TO SHOW A REASONABLE LIKELIHOOD THAT VOLTAGE WOULD PREVAIL IF TRIAL WERE TO BE INSTITUTED.

The petition fails in a variety of ways to make the showing required by statute: “that there is a reasonable likelihood that the petitioner would prevail with respect to at least 1 of the claims challenged in the petition.” 35 U.S.C. § 314(a). A brief overview of the petition’s asserted grounds for unpatentability will facilitate understanding why. The petition states nine grounds, but there are really only three—(1) Grounds 1–3, (2) Grounds 4–6, and (3) Grounds 7–9—as illustrated in the table below:

		Challenged Claims		
		Claims 1–5	Claim 7	Claims 10–13, 15–18
1	Ground 1	Fan + Ba + Yen		
	Ground 2	Fan + Ba + Yen	+ Darr	
	Ground 3	Fan + Ba + Yen		+ Solon
2	Ground 4	Ye + Gilman		
	Ground 5	Ye + Gilman	+ Darr	
	Ground 6	Ye + Gilman		+ Solon
3	Ground 7	Ba + Ye + Yen		
	Ground 8	Ba + Ye + Yen	+ Darr	
	Ground 9	Ba + Ye + Yen		+ Solon

Ground 1 asserts a base combination of Fan + Ba + Yen; Ground 2 adds Darr; and Ground 3 adds Solon. Pet., 6–7. Grounds 4–6 and 7–9 repeat this pattern, with Ground 4 stating the base combination as Ye + Gilman and Ground 7 stating it as Ba + Ye + Yen. Pet., 7. Darr (in Grounds 5 and 8) and Solon (in Grounds 6

and 9) are used in the same way against the same claims as in Grounds 2 and 3, (Pet., 30, 54–55, 56, 58, 75–78), so there are only three unique base combinations of references.

For each of the three asserted base reference combinations, Voltage provides nothing more than conclusory rationales for the alleged motivations to combine, with no support other than the equally unsupported testimony of Dr. Kenny, an alleged expert with no experience working with solar PV technologies. *See* §§ VI.B.1, VI.B.2, VI.B.3, below. Any place where the petition purports to address motivation to combine, it consistently cites Dr. Kenny’s declaration for evidence of what a POSA “designing a solar power system” would have thought of the asserted prior art references, as shown in the table below.

		Challenged Claims			Petition Pages Citing Kenny re POSA “designing a solar power system”
		Claims 1–5	Claim 7	Claims 10–13, 15–18	
1	Ground 1	Fan + Ba + Yen			14, 15, 29
	Ground 2	Fan + Ba + Yen	+ Darr		29
	Ground 3	Fan + Ba + Yen		+ Solon	31
2	Ground 4	Ye + Gilman			42, 54
	Ground 5	Ye + Gilman	+ Darr		54
	Ground 6	Ye + Gilman		+ Solon	55, 56
3	Ground 7	Ba + Ye + Yen			61, 62, 73, 75
	Ground 8	Ba + Ye + Yen	+ Darr		73
	Ground 9	Ba + Ye + Yen		+ Solon	74, 75

A person like Dr. Kenny, having no experience, either practical or academic, with “designing a solar power system,” cannot possibly speak to the knowledge, understanding, or motivation of a person having such experience. This is so regardless of whether solar experience is part of the POSA definition that the Board ultimately adopts because the perspectives that the petition purports to point to are those of the POSA “***designing a solar power system.***” Whether solar is or is not part of the definition, that POSA must have some degree of competence in “designing a solar power system.” Otherwise, the POSA’s impressions of the asserted art are irrelevant.

Either way, Dr. Kenny’s lack of solar experience is a fatal shortfall in Voltage’s evidence. His conclusions are not grounded in his own experience, and as shown below, neither he nor the petition cites any other evidentiary support for the alleged concerns, perspectives, and motivations of a POSA “designing a solar power system.” Dr. Kenny’s opinions on motivation to combine are thus conclusory and unsupported, and merely stating them in the petition amounts to nothing more than attorney argument. As a result, the petition fails to show the motivation-to-combine element critical to a prima facie showing of obviousness, and the rules preclude Voltage from trying to provide the missing evidence for the first time with a reply brief (either preliminarily or during the trial phase). See *Intelligent Bio-Sys., Inc. v. Illumina Cambridge Ltd.*, 821 F.3d 1359, 1369–70

(Fed. Cir. 2016) (affirming Board’s refusal to consider party’s “entirely new rationale to explain why one of skill in the art would have been motivated to combine” prior art references “by reference to new evidence” raised in the reply); 37 C.F.R. § 42.23(b) (“All arguments for the relief requested in a motion must be made in the motion. A reply may only respond to arguments raised in the corresponding opposition or patent owner response.”); Consolidated Trial Practice Guide¹¹ at 73 (“Petitioner may not submit new evidence or argument in reply that it could have presented earlier, e.g. to make out a prima facie case of unpatentability.”).

The Board should deny the petition because, with no more than attorney argument standing in for motivation-to-combine evidence, the petition does not show that there is a reasonable likelihood that Voltage would prevail in proving obviousness if trial were instituted.

A. Dr. Kenny lacks solar experience and is therefore not qualified to testify as to the perspective of a person of skill in the art.

Obviousness is evaluated from the POSA’s perspective. *Otsuka Pharm. Co., v. Sandoz, Inc.*, 678 F.3d 1280, 1296 (Fed. Cir. 2012) (“[w]hat matters is the path that the person of ordinary skill in the art would have followed, as evidenced by the pertinent prior art”). The views of non-POSAs on these issues are thus

¹¹ Available at <https://www.uspto.gov/patents/ptab/trials/practice-guides>.

irrelevant distractions. *Kyocera Senco Indus. Tools Inc. v. Int’l Trade Comm’n*, 22 F.4th 1369, 1376–78 (Fed. Cir. 2022). Voltage has not provided **any** analysis of obviousness from the perspective of a POSA in the field of the ’739 patent having **solar experience**, as required by Judge Bhattacharyya’s order in the ITC proceeding. See § IV, above; EX1023, 12. Instead, Voltage has provided the opinions of Dr. Kenny. EX1003.

Dr. Kenny, although certainly qualified in other areas, admitted in the ITC that he has “no experience with photovoltaic systems,” EX2001, 1231:22–24, professional or otherwise, *id.*, 1187:1–11, 1221:3–19, 1226:8–1229:22, 1228:20–1229:2. Dr. Kenny is thus not a POSA under the correct definition from the ITC claim construction order, which requires “at least two years experience working with photovoltaic systems.” EX1023, 12. Neither Dr. Kenny nor Voltage contests this point. Instead, they double-down by arguing that Dr. Kenny’s physics education and work with robotics are all that is needed. EX1003, ¶¶ 57, 58. As a result, each and every one of Dr. Kenny’s opinions is simply that—his opinion. None could even purport to be the opinion or understanding of a POSA having solar experience.

To be sure, the record from the ITC proceeding effectively precludes Dr. Kenny from attempting to spin his qualifications to include solar industry experience or education in photovoltaic systems. He admitted having no such

experience and no such education, so he cannot substitute his lack of practical experience with additional education. EX2001, 1187:1–11, 1221:3–19, 1231:22–24. He testified at the ITC that he did not take any “classes that were specific to any content that is related to installing or building solar installations.” *Id.*, 1229:14–16. Indeed, in response to Judge Bhattacharyya’s direct inquiry about his experience with such systems, Dr. Kenny could only muster that it was “part of [his] education in physics” in that he worked with “semiconductor devices” where electrons flow through band structures where energy may be extracted. *Id.*, 1186:23–1187:7. But there is no evidence to support a finding that understanding semiconductor physics translates to experience in photovoltaic **systems**, their layout, construction, and infrastructure.

Dr. Kenny also testified at the ITC that he has not authored any papers that include solar-related subject matter; that he has not participated in symposia related to solar installations; and that he has not testified as an expert witness in any solar cases. EX2001, 1226:8–1229:22. He agreed that the word “solar” does not appear on his résumé, and that he has not consulted or advised on the design or implementation of a solar installation of any size. *Id.*, 1228:3–10. In fact, Dr. Kenny testified that his only solar experience was related to personal use of “low-power applications for consumer-grade electronics,” e.g., charging phones and camping trips. *Id.*, 1228:20–1229:2.

Further, Dr. Kenny admitted that he does not have any solar-related certifications or accreditations, nor does he have any working knowledge of codes or standards that relate to solar, prior to his work on this case, such as, for example, sections of the National Electrical Code (NEC) that govern solar installations.

EX2001, 1229:18–22. Dr. Kenny was indeed fairly emphatic on this point:

Q. [D]id you have any familiarity or working knowledge of the National Electrical Code as it pertains to solar?

A. *Almost certainly not.*

Id. Thus, while a **POSA** would certainly have been familiar with the applicable NEC sections, Dr. Kenny is not a POSA and is in no position to divine what a POSA would have understood of them. And even if the Board decides the POSA definition does not require solar experience, Dr. Kenny still requires that experience in order to speak to the views of a POSA “designing a solar power system.”

Moreover, the POSA in June 2013 would have looked to the then-current NEC, not the 2002 version that Dr. Kenny points to, filed as EX1012. The NEC was updated at least in 2011 and 2014, (EX2002, iv), with the latter edition being the product of action by the issuing body at its June 2013 meeting, (*id.*). Both the 2011 and 2014 editions were much more relevant in June 2013 to the state of the art and to those working in the field of the ’739 patent. Indeed, reliance on the 2002 version of the NEC in the 2013 timeframe could have constituted a serious

health and safety risk given the likely changes and improvements in EBOS equipment and functionality over the intervening 11 years. The 2002 version of Article 690 (Solar Photovoltaic (PV) Systems) is indeed less than two-thirds the length of the 2014 version. *Compare* EX1012 with EX2002. As such, a POSA in 2013 would likely not have looked to the 2002 version of the NEC for guidance because doing so would have created an unnecessary risk.

Dr. Kenny's reliance on the 2002 edition of the NEC further underscores his complete lack of experience with solar power generation systems and consequent inability to speak to the state of the art or the POSA perspective in 2013. Combined with his admissions at the ITC hearing, it is clear that Dr. Kenny is not a POSA, is not capable of speaking to the understanding of a POSA in 2013, and that his opinions on what would have been obvious to a POSA at that time should be given no weight. He is equally incapable of channeling the views of a POSA tasked with "designing a solar power system."

Dr. Kenny's lack of solar experience renders his opinions both irrelevant and unreliable, because "*a witness who is 'not qualified as an expert by knowledge, skill, experience, training, or education in the pertinent art ... [cannot] assist the trier of fact to understand the evidence or to determine a fact in issue.'*"

HVLPO2, LLC v. Oxygen Frog, LLC, 949 F.3d 685, 688–89 (Fed. Cir. 2020)

(quoting *Sundance, Inc. v. DeMonte Fabricating Ltd.*, 550 F.3d 1356, 1361–62

(Fed. Cir. 2008) and Fed. R. Evid. 702) (brackets added by *HVLPO2* court).

Indeed, the Federal Circuit has more recently noted that POSA-level testimony from one who lacks POSA qualification could “serve[] only to cause mischief and confuse,” and “amount[] to nothing more than advocacy from the witness stand”:

To offer expert testimony from the perspective of a skilled artisan in a patent case—like for claim construction, validity, or infringement—a witness must at least have ordinary skill in the art. ***Without that skill, the witness’ opinions are neither relevant nor reliable.*** The opinions would not be based on any specialized knowledge, training, or experience that would be helpful to the factfinder. In fact, “[a]dmitting testimony from a person ... with no skill in the pertinent art serves only to cause mischief and confuse the factfinder.” *Sundance*, 550 F.3d at 1362. That testimony would “amount[] to nothing more than advocacy from the witness stand.” *Id.* at 1364–65.

Kyocera, 22 F.4th at 1376–77 (brackets in *Kyocera*).

Dr. Kenny has neither the experience nor the educational training in the field of photovoltaic systems required of a POSA under the correct definition, or of any POSA “designing a solar power system.” The Board should thus assign no weight to Dr. Kenny’s testimony insofar as it purports to state the views of a POSA in 2013.

B. The petition fails as to all grounds because it states only conclusory motivations to combine, supported only by Dr. Kenny, who has no solar industry experience.

As illustrated in the table at page 17, above, the petition provides a short section purporting to address of the motivations for combining:

- (1) Fan, Ba, and Yen (Grounds 1–3), Pet. 13–15;
- (2) Ye and Gilman (Grounds 4–6), *id.*, 41–43; and
- (3) Ba, Ye, and Yen (Ground 7–9), *id.*, 60–62.

Each motivation-to-combine section purports to state the views of a POSA, and each follows a formula: a first paragraph proclaiming the references combinable because they are “analogous,” a last paragraph declaring an expectation of success because the references allegedly teach “well-known ... configurations” and “well-understood ... materials,” a paragraph about the base reference, and one or two paragraphs purporting to explain the alleged motivation for combining one or more secondary references with the base reference. Pet., 13–15, 41–43, 60–62.

The petition’s motivation-to-combine assertions amount to nothing more than attorney argument, and “[a]ttorney argument is no substitute for evidence.” *Enzo Biochem, Inc. v. Gen-Probe, Inc.*, 424 F.3d 1276, 1284 (Fed. Cir. 2005). In *Enzo*, attorney argument was unsuccessfully presented regarding the facts behind a

pre-filing offer for sale. *Id.* Here, the petition offers only attorney argument regarding facts that allegedly support a motivation to combine.

First, the petition cites no evidence to support the motivation-to-combine positions taken, beyond Dr. Kenny’s speculation about what a POSA “designing a solar power system” would have thought about the references. Pet., 13–15, 41–43, 60–62. But, as explained above, Dr. Kenny lacks any experience with “designing a solar power system,” and “[w]ithout that skill, [his] opinions are neither relevant nor reliable.” *Kyocera*, 22 F.4th at 1377 (brackets added). The Board should therefore disregard Dr. Kenny’s testimony because “it is an abuse of discretion to permit a witness to testify as an expert on the issues of noninfringement or invalidity unless that witness is qualified as an expert in the pertinent art.” *Sundance*, 550 F.3d at 1363; *see also Kyocera*, 22 F.4th at 1377–78 (finding abuse of discretion by administrative law judge in ITC proceeding for admitting testimony from unqualified witness “on any issue that is analyzed through the lens of an ordinarily skilled artisan”). Without Dr. Kenny’s testimony, the petition’s motivation-to-combine positions are just attorney argument.

As a result, and as shown in the sections that follow, each of the petition’s motivation-to-combine assertions is also conclusory. For example, there is no evidence that the stated driver for the alleged motivation, if any, would have been something of significance to a POSA. “[A] conclusory assertion with no

explanation is inadequate to support a finding that there would have been a motivation to combine[, because t]his type of finding, without more, tracks the *ex post* reasoning *KSR* warned of and fails to identify any actual **reason** why a skilled artisan would have combined the elements in the manner claimed.” *In re Van Os*, 844 F.3d 1359, 1361 (Fed. Cir. 2017) (emphasis in original) (citing *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 421 (2007)).

Even if Dr. Kenny’s motivation-to-combine testimony were considered, it too is effectively conclusory because the stated rationales are not found in or implied by the references themselves or any external sources; they emanate solely from Dr. Kenny’s own unqualified perspective. EX1003, ¶¶ 77–86, 193–205, 320–332. “Conclusory expert testimony does not qualify as substantial evidence,” *TQ Delta, LLC v. CISCO Sys., Inc.*, 942 F.3d 1352, 1358–59 (Fed. Cir. 2019) (collecting cases), and “substantial evidence” is required to survive appellate review of factual determinations, including motivation to combine, *Outdry Techs. Corp. v. Geox S.p.A.*, 859 F.3d 1364, 1368 (Fed. Cir. 2017). If trial were instituted and later ended in a judgment of unpatentability, Dr. Kenny’s conclusory opinions will likely not be considered in any subsequent appellate review for substantial evidence. That fact should feature in the present evaluation of whether the petition shows a reasonable likelihood that Voltage would prevail at trial.

One more reason to disregard the cited testimony from Dr. Kenny is that crediting it would amount to allowing an improper incorporation by reference. 37 C.F.R. § 42.6(a)(3) (“Arguments must not be incorporated by reference from one document into another document.”). For the two-page explanation of the Fan, Ba, and Yen combination, the petition cites 17 paragraphs from the Kenny declaration, which span about 12 pages (six pages regarding motivation to combine plus a two-page description for each of the three references). *Compare* Pet., 13–15 with EX1003, ¶¶ 60–61, 68–70, 73–75, 77–86. In like fashion, the petition’s two-page explanation of the Ye and Gilman combination cites to about 13 pages of Dr. Kenny’s declaration testimony, *compare* Pet., 41–43 with EX1003, ¶¶ 62–67, 193–205, and the two-page explanation of the Ba, Ye, and Yen combination cites to another 14 pages of the Kenny declaration, *compare* Pet., 60–62 with EX1003, ¶¶ 60–61, 65–70, 320–332. As shown in the table below, the result is 34 pages of allegedly explanatory content found **not** in the petition, only in the declaration, but nonetheless relied upon in the petition:

	Combination	Petition Pages	Decl. Pages	Excess Decl. Pages
Ground 1	Fan + Ba + Yen	2	12	10
Ground 4	Ye + Gilman	2	13	11
Ground 7	Ba + Ye + Yen	2	15	13
TOTALS:		6	40	34

Thirty-four pages of double-spaced Times New Roman 14-point font content amounts to about 6,500 extra words that Voltage chose not to include in the petition.¹² The petition's certificate of compliance states the word count as 13,671. Pet., 84. Had the cited declaration content been included in the petition, the petition would have exceeded 20,000 words, well beyond 14,000-word limitation for IPR petitions. 37 C.F.R. § 42.24(a)(1)(i).

“This practice of citing the Declaration to support conclusory statements that are not otherwise supported in the Petition amounts to incorporation by reference.” *Cisco Sys., Inc. v. C-CationTechs., LLC*, IPR2014–00454, Paper 12 at 9 (PTAB Aug. 29, 2014) (informative). The rules prohibit incorporation by reference, 37 C.F.R. § 42.6(a)(3), so as to “minimize[] the chance that an argument would be overlooked and [to] eliminate[] abuses that arise from incorporation and combination,” 77 Fed. Reg. 48,612, 48,617 (Dep’t of Commerce Aug. 14, 2012); otherwise the Board would be forced to “play archeologist with the record” for arguments that might have been made outside the parties’ briefing, *id.* (citing *DeSilva v. DiLeonardi*, 181 F. 3d 865, 866–67 (7th Cir. 1999)). In addition, “[i]t is ‘fundamentally unfair to allow a party to use incorporation to exceed word count.’” *Promptu Sys. Corp. v. Comcast Cable Commc’ns, LLC*, 92 F.4th 1384, 1385 (Fed.

¹² <https://wordcounter.net/words-per-page>.

Cir. 2024) (quoting *Microsoft Corp. v. DataTern, Inc.*, 755 F.3d 899, 910 (Fed. Cir. 2014)). The improper incorporation by reference of 34 pages of Dr. Kenny's motivation-to-combine analysis provides another reason for the Board to deny the petition. *3M Co. v. Evergreen Adhesives, Inc.*, 860 F. App'x 724, 725–26 (Fed. Cir. 2021) (unpublished) (affirming Board's refusal to consider expert testimony improperly incorporated by reference, and consequent rejection of petitioner's obviousness challenge).¹³

¹³ The improper incorporation by reference is not limited to the motivation-to-combine arguments. The petition's claim 1 analysis for the Fan, Ba, Yen combination is 9 pages in length, (Pet., 16–25), but it cites to 49 paragraphs of Dr. Kenny's declaration, which span 25 pages and include illustrations not found in the petition, (EX1003, ¶¶ 88–136, pp. 49–74). The extra 16 pages Dr. Kenny used for this one claim in this single asserted ground amount to more than 3,000 extra words. The same pattern is found in the claim 1 analyses for the Ye + Gilman and the Ba + Ye + Yen combinations, yielding another 41 extra pages used by Dr. Kenny (over 7,800 extra words). *Compare* Pet., 43–50 (8 pages), 52–71 (9 pages) with EX1003, ¶¶ 207–257(29 pages), ¶¶ 334–380 (29 pages).

1. The petition fails as to Grounds 1, 2, and 3 because the rationales provided for combining Fan, Ba, and Yen are conclusory and unsupported.

Grounds 1, 2, and 3 all rely on the premise that a POSA “designing a solar power system” in June 2013 would have been motivated to combine Fan, Ba, and Yen. Pet. 13–15. The petition’s argument is just over two pages in length and consists of five paragraphs. *Id.* Other than the references themselves, the petition cites only Dr. Kenny’s declaration for support. *Id.* (citing EX1003, ¶¶ 60–61, 68–70, 73–75, 77–86).

The first paragraph argues that “Fan, Ba and Yen are analogous prior art to the ’739 patent” and are also “complimentary because they disclose different elements and materials.” Pet., 13–14. The petition does not explain why this is true but even if it had done so, similarity in subject matter is insufficient to establish that a POSA would have been motivated to combine references. *Microsoft Corp. v. Enfish, LLC*, 662 F. App’x 981, 990 (Fed. Cir. 2016) (unpublished) (holding that the fact that two references “were directed to the same art or same techniques” was “inadequate to show persuasively that a relevant skilled artisan would have been motivated to combine the references”); *see also Securus Techs., Inc. v. Global Tel*Link Corp.*, 701 F. App’x 971, 977 (Fed. Cir. 2017) (unpublished) (“[A] broad characterization of [prior art references] as both falling within the same alleged field ... without more, is not enough for [a petitioner] to meet its burden of

presenting a sufficient rationale to support an obviousness conclusion.”); *see also Salpeter v. Wave*, IPR2019-01384, Paper 12 at 17 (PTAB Jan. 27, 2020) (“Simply contending that it would have been obvious to combine these references ‘as they involved the same system being used’ is no reason.”). Likewise, demonstrating that a reference is truly analogous art, i.e., that it is relevant to the field of endeavor of the challenged patent, “is not sufficient to establish that one of ordinary skill would have had reason to combine its teachings with other prior art in the manner set forth in the claim.” *Johns Manville Corp. v. Knauf Insulation, Inc.*, IPR2018-00827, Paper 9 at 10 (PTAB Oct. 16, 2018) (informative). At most, establishing that references are similar in subject matter merely shows that an ordinary skilled artisan **could have** combined their teachings; not that such an individual **would have** done so. *Id.* (denying institution where petitioner failed to establish a sufficient rationale to combine, in showing only that the references were analogous and **could** be combined, without showing that a skilled artisan **would** have made the modification).

The petition argues, with no support other than Dr. Kenny, that a POSA “would have looked to Fan **when designing a solar power system**,” (Pet., 14), that a POSA “**designing a solar power system** would also have looked to Ba,” (*id.*), that a POSA “would have been motivated to improve upon the in-line fuse of Fan by using the plug and connector of Ba to provide a plug and connector (mentioned

but not shown in Fan) that physically integrated with the fuse protector of Fan, eliminating the extra wire pieces,” (*id.*), and that a POSA “would have been motivated to combine the teachings of Fan and Ba to provide an in-line fuse that simplifies installation in solar system power lines at convenient locations,” (*id.*, 15). There is no explanation in the petition of what “extra wire pieces” are “eliminat[ed]” from Fan, nor of why a POSA would have found that motivating. There is no explanation of what a POSA would have understood the “plug and connector (mentioned but not shown in Fan)” to be, since Fan says only that “[a] required plug and connector are separately injection molded on two ends of the power supply line 1.” EX1009, p. 3, ll. 3–5. There is likewise no explanation of what it means to “simplif[y] installation in solar system power lines at convenient locations,” nor of why a POSA would have found that to be a desirable feature, to the extent understood.

The petition further argues, again with no support other than Dr. Kenny, that a POSA “***designing a solar power system*** would also have looked to Yen,” (Pet., 15), and “would have been motivated to modify the in-line fuse configurations of Fan in view of Ba to improve the electrical insulation of the protective shell by using an arc-resistant material (e.g., crystalline or amorphous thermoplastics) as an inner layer (undermold) that is encapsulated in an outer layer (overmold) as taught in Yen,” (*id.*). There is no explanation in the petition for why a POSA reading Fan

and Ba would have seen a need for “using an arc-resistant material,” nor of why a POSA would have perceived an arcing problem in the Fan + Ba combination that would have benefitted from Yen’s “arc-resistant material.”

An unsupported allegation of benefits to be achieved, without facts to support a conclusion that a POSITA **would have** made the proposed combination, is insufficient to establish a motivation to combine. *Amneal Pharmaceuticals LLC v. Cubist Pharmaceuticals LLC*, IPR2020-00193, Paper 7 at 31 (PTAB May 29, 2020) (holding that petitioner’s assertion that a proposed combination would “improve the stability” of a composition falls short of petitioner’s burden to point out with particularity why the specific combination being proposed would have been made); *see also Hulu, LLC v. Sound View Innovations, LLC*, IPR2018-00582, Paper 34 at 21–22 (PTAB Aug. 5, 2019) (informative) (concluding that “generic desire” and a “bald statement about what could have been achieved” by combining the art were insufficient); *see also Johns Manville*, IPR2018-00827, Paper 9 at 11–12 (informative) (concluding that generic assertions about interchangeable binders in a claimed thermosetting composition were insufficient to meet petitioner’s burden).

The petition’s stated motivations for combining Fan, Ba, and Yen are thus conclusory, unsupported other than by a witness who knows nothing of the views of a POSA “designing a solar power system,” and therefore inadequate.

The petition includes one short paragraph purporting to describe the POSA's expectation of success, but the rationale is again conclusory and supported only by Dr. Kenny: "[b]ecause Fan, Ba and Yen involve well-known in-line fuse configurations, use well-understood molded insulation materials, and provide easy-to-follow instructions for assembly." Pet., 15. There is no explanation or support for these characterizations ("well-known," "well-understood," "easy-to-follow") nor any explanation to connect them to the alleged expectation of success in combining the teachings of Fan, Ba, and Yen.

It is insufficient to simply assert the existence of a reasonable expectation of success. An unsupported allegation of expected success, without facts supporting why a person of ordinary skill in the art **would have** had a reasonable expectation of success are insufficient to establish a motivation to combine. *See In re Stepan Co.*, 868 F.3d 1342, 1347 (Fed. Cir. 2017) (vacating decision holding claims obvious because, in part, the Board failed to "articulate why a person of ordinary skill in the art would have had a reasonable expectation of success to formulate the [claimed invention]").

The petition states only conclusory and unsupported rationales as the alleged motivations to combine Fan, Ba, and Yen, and as the alleged expectation of success. The petition thus fails to show a reasonable likelihood that Voltage would prevail as to Grounds 1, 2, and 3, if trial were instituted.

2. The petition fails as to Grounds 4, 5, and 6 because the rationales provided for combining Ye and Gilman are conclusory and unsupported.

Grounds 4, 5, and 6 all rely on the premise that a POSA “designing a solar power system” in June 2013 would have been motivated to combine Ye and Gilman. Pet. 41–43. The petition’s argument is about two pages in length and consists of four paragraphs. *Id.* Other than the references themselves, the petition cites only Dr. Kenny’s declaration for support. *Id.* (citing EX1003, ¶¶ 62–67, 193–205).

For the Ye + Gilman combination of Grounds 4–6, the petition follows the same pattern as with the Fan, Ba, and Yen combination of Grounds 1–3. The section begins with the same argument regarding analogousness, (Pet., 41), and concludes with the same conclusory expectation of success argument, (*id.*, 43). Those arguments fail for the same reasons stated above at pages 31–32 and 35.

The petition argues that a POSA “would have looked to Ye **when designing a solar power system**,” (Pet., 42), and “would have been motivated to improve the in-line fuse assembly of Ye by replacing the holder body with the protective wrapping materials of Gilman to provide better waterproofing and by modifying the fuse connection to include fuse end cap connections as described in Gilman,” (*id.*). The petition does not explain how a POSA would have envisioned doing this, and it is far from intuitive. The petition likewise does not explain why a POSA

would have looked to Gilman “to provide better waterproofing” when Ye states that its invention “is waterproof, corrosion resistant and well-sealed, and meets the requirements for use in harsh outdoor environmental conditions, ensuring stable and reliable operation.” EX1005, abstract. There is also no explanation of how the “fuse end cap connections” of Gilman would have improved Ye in any way.

The petition further argues that Gilman’s “heat-shrinkable materials for waterproofing in-line fuses provide advantages a POSITA would understand complement protections of the insulating case of Ye.” Pet., 42. The petition does not support this assertion with anything other Dr. Kenny’s uninformed perspective, nor does it explain what it means to “complement protections” or why a POSA would have perceived Ye’s protections to be in need of “complement[ing].”

The petition states only conclusory and unsupported rationales as the alleged motivations to combine Ye and Gilman, and as the alleged expectation of success. The petition thus fails to show a reasonable likelihood that Voltage would prevail as to Grounds 4, 5, and 6, if trial were instituted.

3. *The petition fails as to Grounds 7, 8, and 9 because the rationales provided for combining Ba, Ye, and Yen are conclusory and unsupported.*

Grounds 7, 8, and 9 all rely on the premise that a POSA “***designing a solar power system***” in June 2013 would have been motivated to combine Ba, Ye, and Yen. Pet. 60–62. The petition’s argument is just over two pages in length and

consists of four paragraphs. *Id.* Other than the references themselves, the petition cites only Dr. Kenny’s declaration for support. *Id.* (citing EX1003, ¶¶ 60–61, 65–69, 320, 323–332).

For the Ba + Ye + Yen combination of Grounds 7–9, the petition follows the same pattern as with the Fan, Ba, and Yen combination of Grounds 1–3. The section begins with the same argument regarding analogousness, (Pet., 60–61), and concludes with the same conclusory expectation of success argument, (*id.*, 62). Those arguments fail for the same reasons stated above at pages 31–32 and 35.

The petition argues that a POSA “***designing solar power systems*** would have looked to Ba,” (Pet., 61), “would have looked to Ye ***when designing solar power systems,***” (*id.*) and “would have been motivated to improve the in-line fuse assembly of Ba by encasing it in the insulating case of Ye to provide further waterproofing, corrosion-resistance, and sealing of the in-line fuse,” (*id.*). The petition does not explain why the POSA would have been so motivated despite the plain teaching of Ba that that its “first housing 10 is connected to the second housing 20 in a sealing and butted manner to achieve waterproof performance ... [such that] the present invention can be adapted to work in an outdoor environment.” EX1011, ¶ 30. The petition also recognizes the significant disincentive of the Ba + Ye combination that “casting an insulating case over the in-line fuse per Ye means the fuse assembly cannot be disassembled after

installation,” but rationalizes that “the resulting in-line fuse retains the primary benefits identified by Ba,” so the POSA would remain motivated and would not be dissuaded. Pet., 61–62. The petition does not, however, explain why the POSA would have perceived this trade-off of one alleged benefit at the expense of another as worthwhile.

The petition contends that a POSA “*designing a solar power system*” would also have looked to Yen” and “would have been motivated to modify the in-line fuse configuration of Ba in view of Yen to improve the electrical insulation of the protective shell.” Pet., 62. The petition does not explain why a POSA would have viewed the Ba configuration as needing additional electrical insulation, or why adding an additional layer from Yen would have been worth the added expense involved in adding materials and an extra manufacturing step.

The petition states only conclusory and unsupported rationales as the alleged motivations to combine Ba, Ye, and Yen, and as the alleged expectation of success. The petition thus fails to show a reasonable likelihood that Voltage would prevail as to Grounds 7, 8, and 9, if trial were instituted.

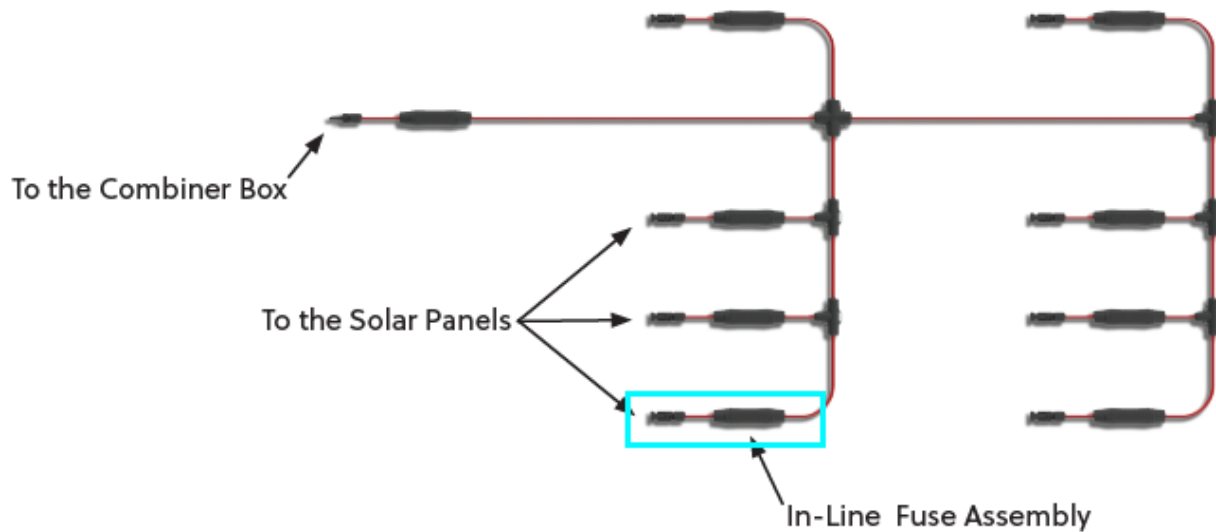
C. The petition fails to confront commercial success and other known evidence of objective indicia of nonobviousness.

The petition also fails to address all four *Graham* factors, notably omitting the objective indicia of nonobvious despite knowing of all the evidence and argument presented during discovery in the ITC proceeding.

Obviousness is a question of law based on underlying facts. *KSR*, 550 U.S. at 427. The underlying facts are the four *Graham* factors, namely: (1) the scope and content of the prior art; (2) differences between the prior art and the claims at issue; (3) the level of ordinary skill in the pertinent art; and (4) objective indicia of nonobviousness, often called secondary considerations, such as long-felt but unmet need, industry skepticism, industry praise, and commercial success. *Id.*; *Graham*, 383 U.S. at 17–18. A determination of obviousness “requires consideration of all four *Graham* factors, and it is error to reach a conclusion of obviousness until all those factors are considered.” *Apple Inc. v. Samsung Elecs. Co.*, 839 F.3d 1034, 1048 (Fed. Cir. 2016) (en banc). Voltage’s burden as the petitioner was to show a “reasonable likelihood” of prevailing on the issue of obviousness at the petition stage, so a wholesale failure to address known evidence of one of the four *Graham* factors—factor (4) regarding objective indicia of nonobviousness—amounts to a failure to carry that burden, because “[o]bjective indicia of nonobviousness must be considered in every case where present.” *Id.*

The evidentiary hearing in the ITC proceeding was the culmination of a one-year investigation in which Shoals disclosed to Voltage, and put through the adversarial crucible, evidence of objective indicia of nonobviousness. The hearing dealt solely with a different patent, but the interrogatory responses and evidence

shared during discovery outlined the objective indicia of nonobviousness for the commercial embodiment of the '739 patent, shown below:



EX2013, 7 [ITC Hrg. Ex. JX-0338] (blue box added).

The objective indicia evidence for the '739 patent was and remains very well known to Voltage, yet Voltage failed to confront it in the petition. The Board has seen this scenario before and has “cautioned petitioners ... that petitions may be denied if they do not address ***known evidence of secondary considerations.***”

Stryker Corp. v. KFx Medical, LLC, IPR2019-00817, Paper 10 at 28–29 (PTAB Sept. 16, 2019) (citing *Robert Bosch Tool Corp. v. SD3 LLC*, IPR2016-01751, Paper 15 at 23 (PTAB Mar. 22, 2017) (denying institution in view of objective indicia presented during an ITC proceeding but not addressed in petition));

Coalition for Affordable Drugs V LLC v. Hoffman–LaRoche, Inc., IPR2015–01792, Paper 14 at 18 (PTAB Mar. 11, 2016) (denying institution, in part for

failure to address objective indicia considered by Examiner during original prosecution).

The Board should thus deny Voltage's petition for failure to address all four *Graham* factors despite knowing of Shoals' arguments and evidence regarding objective indicia of nonobviousness.

VII. CONCLUSION

The petition fails to show a reasonable likelihood that the challenged claims are unpatentable as obvious in view of the cited art and, therefore, the Board should deny institution.

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Respectfully submitted,

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

1. This Patent Owner Preliminary Response complies with the type-volume limitation of 14,000 words, comprising 9,139 words, excluding the parts exempted by 37 C.F.R. § 42.24(a)(1).

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CERTIFICATE OF SERVICE

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