

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

VOLTAGE, LLC
Petitioner

v.

SHOALS TECHNOLOGIES GROUP, LLC,
Patent Owner

Case PGR202400022

U.S. Patent No. 11,689,153

**DECLARATION OF JOSHUA WEINER, IN SUPPORT OF
PATENT OWNER PRELIMINARY RESPONSE**

MAIL STOP PATENT BOARD
Patent Trial and Appeal Board
United States Patent & Trademark Office
P.O. Box 1450
Alexandria, Virginia 22313-1450

Shoals Technologies Group, LLC
EXHIBIT 2001
Voltage, LLC v.
Shoals Technologies Group, LLC
PGR2024-00022

I, Joshua Weiner, hereby declare and state as follows:

I. INTRODUCTION

1. My name is Joshua Weiner. I make this declaration at the request of Shoals Technologies Group, LLC (“Shoals” or “Patent Owner”) in response to and in rebuttal of the petition filed by Voltage, LLC (“Voltage” or “Petitioner”) to institute post-grant review (PGR) of U.S. Patent No. 11,689,153 (“the ’153 patent”).

2. More specifically, I have been asked to consider and respond to opinions expressed by Thomas W. Kenny, Ph.D., in his declaration signed March 27, 2024, and filed with the petition as EX1003, titled “Declaration of Thomas W. Kenny in Support of the Petition for Post-Grant Review of U.S. Patent No. 11,689,153.”

3. I am being compensated for my work in this matter at my standard hourly rate of \$650 per hour for consulting services. My compensation in no way depends on the outcome of this proceeding.

4. The opinions expressed in this declaration are based on, among other things, my review of the evidence filed with the petition, although I understand that Patent Owner has the right to object to and seek exclusion of some of that evidence. I may modify my opinions based on additional evidence, including

expert witness testimony, or any other information I may receive in the future. I reserve my right to supplement or amend my opinions as appropriate.

II. PROFESSIONAL BACKGROUND

5. In this section, I provide a summary of my educational background, employment background, expert consulting background, patents and publications, and other relevant qualifications. A more detailed statement of my professional qualifications, including education, publications, certifications and awards, professional activities, consulting engagements, and other relevant experience is included in my resumé, which is incorporated herein by reference herein, and which I understand is being filed concurrently herewith as EX2002.

6. In 2005, I earned a bachelor's degree in astrophysics and astronomy, and a minor in physics, from University of California, Berkeley. My coursework included stellar physics, electromagnetism and optics, high energy particle physics and astrophysics, statistical mechanics and thermodynamics, special and general relativity, nuclear physics, among others.

7. Upon receiving my undergraduate degree in 2005, I began my career at Akeena Solar, one of the leading turn-key residential and commercial solar contractors. From approximately 2006–2009 I worked mainly on the design and installation of solar power installations, including photovoltaic (PV) modules and panels and interconnection of PV electrical systems. From about 2006 to 2009 I

took on a supervisory role managing the engineering and project management teams in designing and implementing solar power installations. Those installations supported over 20 Megawatts of energy generation in both residential and small photovoltaic (PV) systems including over 2,000 residential projects and dozens of commercial and industrial projects.

8. In 2009, I founded SepiSolar, a national renewable energy design, engineering, and consulting company. SepiSolar specializes in supporting solar and energy storage engineering, procurement and construction (EPC) contractors, developers, asset owners, and installers in the development, design, planning, execution, and regulatory navigation of a solar energy project. My expertise in that role includes designing, engineering, and project managing residential, commercial, and utility-scale solar power systems. These solar power systems include components commonly grouped together as Electrical Balance of Systems (EBOS) including, for example, wire harnesses, connectors, fuses, combiner boxes, inverters, and other components used in the collection, storage, and interconnection of energy generated by solar power systems.

9. In May of 2024 I sold the majority of my engineering contracts in SepiSolar and now work for companies operating primarily in the product development and utility-scale solar power production space.

10. In addition to founding SepiSolar, I co-founded Green Charge Networks in 2009. Green Charge Networks was awarded a \$10 million grant from the United States Department of Energy to deploy eight micro-grid and utility-interactive solar and energy storage projects. The purpose of these projects was to optimize “behind-the meter” electricity usage. That is, to improve the ability of buildings and electric vehicles to generate, store, and use electricity. After exiting Green Charge Networks in 2015, I have continued to develop grid-connected and off-grid energy storage and micro-grid projects with roles dedicated to, for example, business, finance, policy, project development, product, hardware, and software.

11. In 2007, I earned from the North American Board of Certified Energy Practitioners (NABCEP) its PV Installation Professional certification, described by the NABCEP as “the gold standard for PV professionals in the renewable energy industry.” (See <https://www.nabcep.org/certifications/nabcep-board-certifications/>.) I have maintained that certification through the present day, which requires ongoing professional training and coursework.

12. In 2010, I was hired by the University of California, Berkeley, to develop and teach an extension program course, “Advanced PV System Design and Project Management,” in solar PV system design, engineering, development, and project management.

13. Throughout my career, I have helped to design and engineer over 1,000 residential solar power systems including, for example, rooftop residential solar power systems. I have, in addition, helped to design and engineer hundreds of commercial, industrial, and agricultural solar power systems as well as over a dozen utility-scale solar power systems. My breadth of experience with different sizes of solar installations has made me intimately familiar with the unique challenges presented by residential solar installations as compared with commercial/industrial scale solar installations, and as further compared with utility-scale solar installations.

14. Over the past 19 years, I have become recognized as an expert in designing and engineering solar power installations. In that capacity, I have been directly involved with several contractual and other disputes. As an expert, matters where I have offered my expert opinion are listed in my case history attached here as Exhibit 2023.

15. Particularly relevant to this PGR, I have provided expert consulting services in connection with the enforcement of the '153 patent at the International Trade Commission (ITC) in the investigation between Patent Owner (Shoals) and Petitioner (Voltage) (the "ITC proceeding"). Specifically, in the ITC proceeding, I provided live expert testimony and prepared a rebuttal expert report on the validity of the '153 patent.

16. At the evidentiary hearing in the ITC proceeding, after I testified to my credentials, training and background, the Administrative Law Judge (ALJ) admitted me as an expert in photovoltaic solar energy systems, EBOS, and the electrical wiring for solar systems. EX2003, 1262:19–1263:3.

III. MATERIALS RELIED UPON

17. I have reviewed and relied upon documents filed by Voltage with the Petition and discussed in this Declaration, including the '153 patent (EX1001), U.S. Published Patent Application No. 2011/0209741 to Solon (“Solon ’741”) (EX1005), U.S. Patent No. 6,268,559 to Yamawaki (“Yamawaki”) (EX1006), “Solar Line – Photovoltaic Interconnections System – Helios,” Amphenol Industrial Solar Technologies (“Amphenol”) (EX1007), Chinese Patent No. CN 2785100 to Shao et al. (“Shao”) (EX1008), Chinese Patent No. CN 2785100 to Shao et al. (“Shao”) (EX1012), and Japanese Patent No. 4080663 to Tamura (“Tamura”) (EX1013).

18. In addition, I have considered and relied upon parts of the live witness testimony presented at the evidentiary hearing in the ITC proceeding, the public transcripts of which are filed herewith as Exhibit 2003. I have likewise relied on orders issued by the ALJ in the ITC proceeding, such as Order No. 16 regarding claim construction and the level of skill in the art (EX1017).

19. I have also relied on my over two decades of experience working and teaching in the field of solar installation design.

20. My opinions concerning the validity of the Challenged Claims of the '153 patent, however, are offered through the perspective of a person of ordinary skill in the art (a "POSA") as of the date of invention. Since the '153 patent claims priority to Provisional Application No. 62/047,773 and lists September 9, 2014, as its priority date, I will regard that date as the date of invention for purposes of my analysis. I reserve the right to revisit the opinions stated herein if the date of invention proves to be earlier.

IV. RELEVANT LEGAL STANDARDS

21. I am not a lawyer and Shoals' counsel has instructed me as to the applicable legal standards relevant to this Declaration.

A. Claim Construction

22. It is my understanding that in determining whether a patent claim is rendered obvious in view of the prior art in a Post Grant Review (PGR) proceeding, the Patent Trial and Appeal Board (PTAB) gives claims their ordinary and customary meaning, or the meaning that the term would have to a POSA at the time of the invention. I understand that the claim language, specification, and prosecution history are relevant to determine the meaning of a claim term. I understand that the prosecution history of a patent provides the record of the

examination of a patent application before the U.S. Patent and Trademark Office (USPTO). The prosecution history provides evidence of how the patent examiner and the inventors understood the patent application and the claims and can therefore be instructive on how to interpret the claims. My understanding is that extrinsic evidence may also be used in understanding the meaning of a claim term. Extrinsic evidence includes dictionaries, treatises, expert testimony, and prior art. But it is my understanding that one should first look to the intrinsic evidence in construing claims.

23. My understanding is that there are at least two circumstances where the words in a patent claim may differ from and not be given their plain and ordinary meaning. One circumstance is when the applicants act as their own lexicographer by clearly setting forth a definition of a claim term that may differ from the plain and ordinary meaning it would otherwise possess. Another circumstance is when the applicant includes or provides an intentional disclaimer, or disavowal, of claim scope. My understanding is that an applicant may act as their own lexicographer, or disclaim or disavow claim scope, in either the specification or the prosecution history of the patent. My understanding is also that the applicant may act as a lexicographer, or disclaim or disavow claim scope, by making amendments to the claims during prosecution, or by making assertions to the PTO about the differences between the claimed inventions and the prior art.

24. As explained in paragraph 22, above, and as counsel has informed me, I understand the relevant timeframe for assessing the '153 patent is just prior to September 9, 2014, which is the earliest priority date of the '153 patent. If I refer to the time of the invention of the '153 patent in this Declaration, I am referring to this timeframe.

25. Unless otherwise noted, my analysis applies the plain meaning of the '153 patent's claim terms.

26. As I explain in further detail below, I interpret the term "aperture" as used in claims 1, 21, and 24 of the '153 patent in a manner that is consistent with the ALJ's construction in the parallel ITC proceeding: "[the] entire pathway for the [drop line/feeder cable] within the [undermold/primary mold] when viewed as if the [feeder cable or drop line] were removed." EX1017, 12.

B. Obviousness

27. Counsel has informed me, and I understand, that an issued patent claim is invalid as obvious if it can be shown that the differences between the claim and the prior art are such that claim as a whole would have been obvious, at the time the invention was made, to a person having ordinary skill in the art. Relevant considerations include the level of ordinary skill in the art; the scope and content of the prior art; differences between the prior art and the claims at issue;

and the so-called objective indicia, or secondary considerations, of nonobviousness.

28. Counsel has informed me, and I understand, that in order to evaluate the obviousness of any claim of the '153 patent over a given prior art reference or combination, I should analyze whether the prior art references, included collectively in the combination, disclose each and every element of the allegedly invalid claim as those references would have been read by the person of ordinary skill in the art at the time of the invention. Then I am to determine whether that combination would have made the claims of the '153 patent obvious to the person of ordinary skill in the art by a preponderance of the evidence, at the time of the inventions. I understand that such preponderance of the evidence is satisfied if the proposition is more likely to be true than not true.

29. Counsel has informed me, and I understand, that the obviousness inquiry requires that the prior art be considered in its entirety.

30. Counsel has informed me, and I understand, that even where all of the claim limitations are expressly disclosed in the prior art references, there must be some showing that a person of ordinary skill in the art would have been motivated to combine such prior art references and that there would have been a reasonable expectation of successfully achieving the claimed invention from such combination.

31. Counsel has informed me, and I understand, in considering the obviousness of a claimed invention, one should not view the invention and the prior art with the benefit of hindsight. It is for that reason, I am informed, and I understand, that obviousness is assessed by the person of ordinary skill in the art at the time the invention was made. In this regard, I am informed, and I understand that the invention cannot be used as a guide to selecting and understanding the prior art. I understand that the appropriate standard is to determine whether a person of skill in the art *would* have been motivated to combine or modify the references, not whether they *could* have done so.

32. Counsel has informed me, and I understand, that obviousness cannot be predicated on what was unknown at the time of the invention, even if the inherency of a certain feature is later established. Counsel has also informed me, and I understand, that unknown properties of the prior art may not be relied upon to provide the rationale for modifying or combining the prior art to reach the claimed subject matter.

33. Counsel has informed me, and I understand, that a reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant of the '153 patent.

C. Indefiniteness

34. Counsel has informed me, and I understand, that a patent should include claims particularly pointing out and distinctly claiming the subject matter which the inventor regards as the invention. Counsel has informed me, and I understand, that this is the definiteness requirement. Counsel has informed me, and I understand, that the test for determining whether the claims are indefinite is not whether a claim is susceptible to differing interpretations, but whether the claim language, read in light of the specification, the prosecution history, and other relevant evidence, permits a skilled artisan to determine infringement, with reasonable certainty.

D. Written Description

35. Counsel has informed me, and I understand, that a specification may be said to include adequate written description when it reasonably conveys to those skilled in the art that the inventor had possession of the claimed subject matter as of the filing date of the patent. Counsel has also informed me, and I understand, that the test requires an objective inquiry into the four corners of the specification from the perspective of a person of ordinary skill in the art to show that the inventor actually invented the invention claimed. Counsel has also informed me, and I understand, that claims may be supported by words, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention.

36. Counsel has also informed me, and I understand, that the written description analysis is a two-step process. The scope of the claimed subject matter must be ascertained through the performance of a proper claim construction and then the claimed subject matter may be compared to the relied-upon disclosure. Counsel has also informed me, and I understand, that a determination of lack of written description must be based on proper claim construction; one that considers the entire patent, including the written description and prosecution history.

V. LEVEL OF SKILL IN THE ART

37. Counsel has informed me, and I understand, that claim interpretation and validity assessment are from the perspective of a person of ordinary skill in the art at the time of the invention.

38. Counsel has informed me, and I understand, that the “person of ordinary skill in the art” (sometimes referred to herein as a “POSA”) is a hypothetical person who is presumed to be familiar with the relevant scientific field and its literature at the time of the invention. This hypothetical person is also a person of ordinary creativity capable of understanding the scientific principles applicable to the pertinent field.

39. I understand from Dr. Kenny’s report, that he provides the following description of a skilled artisan, he states:

[A] person of ordinary skill in the art (POSITA) would have a B.S. degree in electrical engineering, mechanical engineering, or an equivalent such as applied physics or general engineering, and two years of professional experience relating to the design and/or manufacturing of electrical wiring and connectors. Lack of professional experience can be remedied by additional education and related experience, and vice versa.

EX1003, ¶ 60. Notably absent from Dr. Kenny's description of a skilled artisan is any reference to knowledge and/or experience with photovoltaics or solar installations. I disagree with that characterization of a POSA as explained in further detail below.

40. In the ITC proceeding, the ALJ determined the level of skill in the art to be 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. EX1017, p. 12. I agree with the ALJ's determination for at least the reasons explained below.

41. I am informed by counsel and I understand that the level of ordinary skill in the art may be determined by reference to certain factors, including (1) the type of problems encountered in the art, (2) prior art solutions to those problems,

(3) the rapidity with which innovations are made, (4) the sophistication of the technology, and (5) the educational level of active workers in the field. I further understand that in a given case, every factor may not be present, and one or more factors may predominate.

42. I am familiar with the knowledge of a person of ordinary skill in the field related to the subject matter of the '153 patent in the September 2014 timeframe. In forming my opinions, I considered several things, including the technological problems, regulatory considerations, practical challenges of designing and installing solar power installations, the architecture of various types of solar installations, to name a few considerations. I also considered the sophistication of the technology involved, and the educational background and experience of those actively working in the field at the time including, for example, the inventor of the '153 patent, Dean Solon. A brief explanation of portions of my analysis are included below:

43. I understand from my own experience that innovation was endemic to solar EBOS in and around the early 2010s (and continuing to the present). Mr. Solon's own inventive activity is illustrative. In addition to the '153 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 (“Solon ’342”). EX2004.

- 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. Dr. Kenny refers to the application for this patent as “Solon ’741.” EX1005.
- 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. 8,937,249. EX2006.
- 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. EX2007.
- 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. EX2008.
- On March 10, 2013, Mr. Solon filed an application titled “Monitoring System for and Method of Preventing Electrical Arcs in a Solar Energy System.” EX2009.

- On May 3, 2014, Mr. Solon filed an application titled “Master Recombiner Box with Wireless Monitoring Capability,” which later issued as U.S. patent No. 9,847,196. EX2010.
- Also on May 3, 2014, Mr. Solon filed an application titled “Disconnect Cabinet with Wireless Monitoring Capability,” which later issued as U.S. Patent No. 9,589,752. EX2011.
- On October 13, 2014, Mr. Solon filed an application titled “Modular Photovoltaic Power Skid Base System,” which later issued as U.S. Patent No. 9,847,627. EX2012.

44. The foregoing applications were filed before Mr. Solon’s application for the ’254 patent, the parent patent of the ’153 patent. Mr. Solon’s inventive activity continued apace, thereafter.

45. By the early 2010s, the solar field had matured to the point that people and companies working in the solar field were generally specialized in it. Within the field, people and companies were increasingly specialized between “rooftop” and utility-scale systems, and component designers were increasingly specialized between panels, EBOS (Electrical Balance of Systems), and other BOS (Balance of Systems) components. Reflecting and driving that specialization:

- Beginning in 1984, the National Electrical Code (NEC) had a separate article (Article 690) devoted specifically to PV systems.

- The 2014 edition of the NEC (NEC 2014) required that “wiring systems and fittings” be “specifically listed”—by a nationally recognized Testing Laboratory (NRTL), such as Underwriters Laboratory (UL)—“for use on PV arrays.” EX2005, 690.31(A).
- The catalog of Product Safety Standards in NEC 2014’s Informative Annex A (EX2005) already included many PV-specific UL standards, including: Concentrator Photovoltaic Modules and Assemblies, Subject 8703; Connectors for Use in Photovoltaic Systems, Subject 6703; Flat-Plate Photovoltaic Modules and Panels, 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 (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.
- “The first NABCEP Solar PV Installer certification exam (now called PV Installation Professional) was administered in 2003.” (<https://www.nabcep.org/about-us/>). EX2013, 1.

46. As for types of problems encountered, solar EBOS presents unique challenges. To put solar EBOS in 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.

EX2014, 1.

47. Renewable sources are further subdivided into wind, hydro, biomass, geothermal—and solar. Electricity is generated from most of those sources by using some sort of turbine—most commonly steam turbines (for fossil fuel, nuclear, biomass, and geothermal), but also gas, hydro, and wind turbines. *Id.*

48. There are “two main types of solar electricity generation technologies”: photovoltaic (PV) and “solar-thermal power.” “Most solar-thermal power systems use steam turbines to generate electricity,” just like fossil fuel and nuclear power systems. Photovoltaic systems are different: “PV conversion produces electricity directly from sunlight in a photovoltaic cell.” EX2014, 4. Skilled artisans tend (now and in 2014) to use PV, photovoltaic, and solar interchangeably when referring to energy producing systems.

49. “The PV cell is the basic building block of a PV system. ... However, one cell only produces 1 or 2 Watts, which is only enough electricity for small uses, such as powering calculators or wristwatches.” To be useful for larger-scale electricity generation, “PV cells are electrically connected in a packaged, weather-tight PV *module*. EX2015, 2.

50. “Photovoltaic cells generate direct current (DC) electricity.” Steam and other turbines, on the other hand, typically generate alternating current (AC) electricity. “Nearly all electricity is supplied as alternating current (AC) in electricity transmission and distribution systems,” likewise, nearly all the electricity used by consumers (residential and commercial) is also AC. *Id.*

51. The fact that PV electrical generation uses panels of PV cells, rather than turbines, must be borne in mind in evaluating the transferability of technology from non-PV environments to PV environments. In particular, any electricity generating system will have, in addition to the components (turbines or panels) that generate electricity, BOS (including EBOS) components for taking electricity generated by those production components to the “grid” through which the electricity will be distributed. But PV BOS has to work with electricity-producing components that are relatively much more dispersed than in turbine systems; PV BOS will generally have much greater outdoor, environmental exposure than turbine BOS (unlike turbines, solar panels cannot

be housed in a dam or powerplant building); and PV BOS consists mainly of DC power rather than AC power.

52. Regulatory considerations amplify the weight of the technical distinctions between PV and non-PV installations described above. Codes generally require electrical system components to be certified by NRTLs. Because certification is both structure- and use-specific, changing either the structural characteristics or the use of a component requires re-certification. And there is no guarantee that certification will be made for either the modified structure or the alternative use. In addition, there is no guarantee that the same device is certified at different points in time. Regulations change with the evolution of the technology and understanding the risks associated therewith. This is particularly true of PV installations in the past several decades as the technology has undergone technological shifts commensurate with burgeoning, widespread technology.

53. Differences between PV and other forms of electricity generation should be accounted for, when describing a POSA.

54. Finally, the '153 patent is PV specific. This is reflected in its title, abstract, preambles of each independent claim, and many other claim elements that specifically recited “solar module”, “solar array”, “solar panel”, etc.

55. Based on the foregoing considerations and in light of my review of the '153 patent and its claims, I disagree with Dr. Kenny's description of a skilled artisan. The skilled artisan cannot be accurately described in terms of generic "electrical wiring and connectors," or without regard to PV-specific education and experience. A more accurate description, and one that was adopted by the ALJ in the ITC proceeding (EX1017, 12), is: 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.

56. Based on my experience and training described above and in my resumé, I am qualified and prepared to testify as a person who (1) has a bachelor's degree in a scientific field related to mechanical or electrical engineering; astrophysics and astronomy, in particular; and (2) has at least two years' experience working with photovoltaic systems and electrical wiring; specifically, from 2005 to the present (over two decades).

57. I presently meet these qualifications, and likewise met them as of the priority date of the '153 patent. I am therefore qualified to opine as to the

perspective of a POSA in this matter, both presently and as of the priority date of the '153 patent.

A. Dr. Kenny is not sufficiently qualified to credibly opine on these issues as a Person of Ordinary Skill in the Art.

58. I understand that a threshold inquiry when assessing obviousness is to ask whether the claimed invention would have been obvious to a POSA as of the priority date of the '153 patent. Voltage has failed to offer *any* analysis of invalidity from the perspective of a POSA in the field of the '153 patent because Dr. Kenny does not qualify as a skilled artisan in this case. Indeed, in my several years staffing, training, supervising, and designing solar installations with engineers, I would not look to Dr. Kenny even as a credible candidate to assist in the design of solar installations, much less offer an expert opinion that is deeply intertwined in the design complexity of solar installations.

59. Dr. Kenny, although certainly qualified in other areas, admitted in the ITC that he has “no experience with photovoltaic systems.” EX2003, 1231:22–24. By extension, he also admits that he is not a POSA under the definition of a POSA set forth in the ITC that Shoals adopts above as the proper definition of a POSA in this instance:

A person of ordinary skill in the art would have had 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.

EX1017, p. 12 (emphasis added). During his testimony at the ITC hearing, Dr. Kenny admitted that he does not have any experience with photovoltaic systems, professional or otherwise. *See, e.g.*, EX2003, 1187:1–11, 1221:3–19, 1226:8–1229:22, 1228:20–1229:2. In addition, Dr. Kenny is not able to substitute the apparent and admitted lack of practical experience with additional education because he has no education, formal or otherwise, related to PV systems and electrical wiring of PV systems as it relates to the '153 patent. EX2003, 1187:1–11, 1221:3–19. Dr. Kenny stated—in response to the judge’s inquiry about his experience with PV systems—that the extent of his experience related to PV systems was “part of [his] education in physics” in that he worked with “semiconductor devices” where electrons flow through band structures and energy can be extracted. EX2003, 1186:23–1187:7 Understanding semiconductor physics is a far cry indeed from experience in PV systems.

60. Dr. Kenny also testified 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. EX2003, 1226:8–1229:22. He agreed that the word “solar” does not appear on his C.V., and that he has not consulted or advised on the design or

implementation of a solar installation of any size. In fact, Dr. Kenny testified that his only PV experience was related to personal use of “low-power applications for consumer-grade electronics” – e.g., charging phones and camping trips. EX2003, 1228:20–1229:2. Nor does Dr. Kenny have the type of education— formal or otherwise— that might substitute for experience. EX1017, p 12. Dr. Kenny testified explicitly that he did not take any “classes that were specific to any content that is related to installing or building solar installations.” EX2003, 1229:14–16.

61. In addition to his lack of formal collegiate education regarding solar installations, 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. *See* EX2003, 1229:18–22.

62. Despite his admission at the ITC hearing that he did not have any solar-related experience or expertise and despite Voltage’s attempts at reading out “solar” and “photovoltaics” from the relevant field of the ’153 patent, Voltage nevertheless argues that a POSA would have a working knowledge of solar-related chapters of the NEC. For example, Voltage states at least four (4) times in its petition that “a POSITA would have been familiar with the NEC

2002 which illustrates Figure 690.1(B).” *See, e.g., Pet.*, pp. 31, 61, 89, 118. Of course, Dr. Kenny admitted at the ITC hearing in March 2024 that he did not have any knowledge of NEC sections—including section 690—which governs solar installations. *See* EX2003, 1229:18–22.

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, even according to Voltage’s own arguments against the validity of the ’153 patent, Dr. Kenny is unable to properly provide an opinion as a skilled artisan in this case.

63. Furthermore, even Dr. Kenny’s citation to solar authority illustrates his lack of understanding of the field of solar installations at the time of the ’153 patent (ca. 2014). Dr. Kenny cites to a chapter from a solar textbook from 2001 (EX1011) which, even in 2014, was woefully out of date. In addition, Voltage cites to the 2002 version of the NEC (EX1010), but the NEC was updated at least in 2011 and 2014 (EX2005), both of which were much more relevant to the state of the art and to those working in the field of the ’153 patent at the time.

64. In addition, use of the 2002 version of the NEC in the 2014 timeframe would, at the time, constitute a serious health and safety risk. In the twelve-year period between the 2002 and 2014, safer products, means, and

methods were created to improve the functionality and safety of solar installations, this is particularly true for EBOS. As such, a POSA in 2014 would never look to the 2002 version of the NEC for guidance because doing so would create an unnecessary risk. Dr. Kenny's citations to these out-of-date references is an indication that he simply does not understand PV installations and he certainly did not and does not understand the state of the art of PV installations at the time of the '153 patent.

65. In sum, Dr. Kenny admits that he does not have experience or educational training in the field of the '153 patent. As such, Dr. Kenny cannot qualify as a person of skill in the relevant art under the proposed definition. Thus, although Dr. Kenny purports to opine that all the asserted claims of the '153 patent are invalid, those opinions are not credible because that analysis must be from the perspective of a POSA as of the effective filing date of the patent at issue.

66. For all the reasons articulated above, Dr. Kenny should not be considered a POSA with respect to the '153 patent and any opinions offered by Dr. Kenny as an allegedly skilled artisan with respect to the '153 patent and its validity should be excluded or afforded no weight.

VI. CHALLENGED CLAIMS

A. Grounds

67. I understand Voltage is challenging the validity of claims 1–24 of the '153 patent (the “Challenged Claims”). Pet., 6–8. I understand that Voltage asserts invalidity of the Challenged Claims on the following grounds:

- **Ground 1** – Obviousness of claims 1, 5–7, 11–14, 16, 17, and 21–24 over Solon '741 (EX1005) in view of Yamawaki (EX1006).
- **Ground 2** – Obviousness of claims 1–3, 5–19, and 21–24 over Amphenol (EX1007) in view of Shao (EX1008) and further in view of Yamawaki (EX1006).
- **Ground 3** – Obviousness of claim 20 over Amphenol (EX1007) in view of Shao (EX1008), Yamawaki (EX1006) and further in view of Tamura (EX1009).
- **Ground 4** – Obviousness of claims 1–3, 5, 8–11, 13, 15–24 over Amphenol (EX1007) in view of Shao (EX1008), and further in view of Tamura (EX1009).
- **Ground 5** – Obviousness of claims 1–3, 5–10, 12–15, 18, 19, and 21–24 over Yamawaki (EX1006) in view of Shao (EX1008).
- **Ground 6** – Obviousness of claims 11, 16, and 17 over Yamawaki (EX1006) in view of Shao (EX1008) and further in view of Solon '741 (EX1005).

- **Ground 7** – Obviousness of claim 20 over Yamawaki (EX1006) in view of Shao (EX1008) and further in view of Tamura (EX1009).
- **Ground 8** – Indefiniteness of claims 1–24 under 35 U.S.C. § 112 and for lack of written description.

B. Claim Language

31. The language of the claims at issue is:

Claim 1	
1(Preamble)	A lead assembly for use in a solar energy installation including:
1(a)	a drop line terminating at a drop line connector, the drop line connector configured to connect with a central trunk of a wire harness, the central trunk of the wire harness having a plurality of branches that each are configured to electrically connect to a separate solar panel contained in an array of a plurality solar panels;
1(b)	a feeder cable electrically coupled to the drop line at a nexus;
1(c)	an undermold that fully encases the nexus, the undermold further comprising:
1(c)(i)	a first aperture extending completely through the undermold and having a first diameter, wherein the feeder cable extends through the first aperture along a first longitudinal axis; and

1(c)(ii)	a second aperture extending partially through the undermold and having a second diameter different than the first diameter, wherein the drop line extends from the second aperture along a second longitudinal axis;
1(c)(iii)	a third aperture extending partially through the undermold and having a third diameter different than the first diameter, wherein a second drop line extends from the third aperture along a third longitudinal axis; and
1(d)	an overmold surrounding the undermold and forming an undermold-overmold interface at an outer surface of the undermold.

Claim 2

The lead assembly of claim 1 wherein the drop line includes a section of exposed wire at the nexus.

Claim 3

The lead assembly of claim 2 wherein the feeder cable includes a section of exposed wire at the nexus.

Claim 4

The lead assembly of claim 1 wherein the overmold defines at least one attachment aperture.

Claim 5

The lead assembly of claim 1, wherein the feeder cable terminates at a feeder cable connector.

Claim 6

The lead assembly of claim 5, wherein the feeder cable connector is configured to attach directly to an inverter.

Claim 7

The lead assembly of claim 5, wherein the feeder cable connector is configured to attach directly to a jumper cable, which in turn connects directly to an inverter.

Claim 8

The lead assembly of claim 1, wherein the first longitudinal axis and the second longitudinal axis are substantially parallel.

Claim 9

The lead assembly of claim 1, wherein the second diameter is smaller than the first diameter.

Claim 10

The lead assembly of claim 1, wherein the third longitudinal axis is substantially concentric with the second longitudinal axis, and substantially parallel with the first longitudinal axis.

Claim 11

The lead assembly of claim 1, wherein the drop line includes a fuse.

Claim 12

The lead assembly of claim 1, wherein said lead assembly combines power received from the plurality of solar panels and conducts that power directly to an inverter electrically connected to the feeder cable.

Claim 13

The lead assembly of claim 1, wherein the second drop line terminates at a second drop line connector, the second drop line connector configured to connect with a central trunk of a second wire harness, the central trunk of the second wire

Claim 14

The lead assembly of claim 13, wherein the lead assembly is configured to combine electrical power received from the array of solar panels and the second array of solar panels at the nexus and to deliver the combined electrical power to an inverter that is in electrical communication with the feeder cable.

Claim 15

The lead assembly of claim 1, wherein the second drop line includes a section of exposed wire at the nexus so as to be electrically connected to the feeder cable.

Claim 16

The lead assembly of claim 1, wherein the drop line and the second drop line each includes a wire of between four (4) to eighteen (18) gauge.

Claim 17

The lead assembly of claim 16, wherein the feeder cable includes a wire of between 250 MCM to 1000 MCM.

Claim 18

The lead assembly of claim 15, wherein the electrical coupling between the feeder cable, the drop line and the second drop line at the nexus is secured with at least one of a compression lug, a solder connection, a splice, and a crimp.

Claim 19

The lead assembly of claim 1, wherein the undermold is applied by injection molding.

Claim 20

The lead assembly of claim 1, wherein the overmold is applied by injection molding.

Claim 21

21(Preamble)	A solar power system comprising:

21(a)	a plurality of solar panels each electrically coupled to one of a plurality of branches of a wire harness to form a first solar array;
21(b)	a lead assembly comprising:
21(b)(i)	a drop line electrically connected to a central trunk of the wire harness and configured to receive power from the plurality of solar panels;
21(b)(ii)	a second drop line electrically connected to a central trunk of a second wire harness and configured to receive power from a plurality of solar panels in a second solar array;
21(b)(iii)	a feeder cable, the feeder cable electrically connected to the drop line and the second drop line at a nexus; and
21(b)(iv)	a primary mold that fully encases the nexus so as to substantially seal the nexus from external environmental conditions, the primary mold further comprising:

21(b)(iv)(1)	a first aperture extending completely through the primary mold and having a first diameter, wherein the feeder cable extends through the first aperture;
21(b)(iv)(2)	a second aperture extending partially through the primary mold and having a second diameter smaller than the first diameter, wherein the drop line extends into the second aperture and
21(b)(iv)(3)	a third aperture extending partially through the primary mold and having a third diameter smaller than the first diameter, wherein the second drop line extends into the third aperture.
Claim 22	
The solar power system of claim 21, wherein the feeder cable is directly electrically connected to a component selected from the group consisting of a trunk buss jumper, an inverter, a connection unit, a recombiner, and a disconnect unit.	

Claim 23
The solar power system of claim 21, further comprising a secondary mold surrounding the primary mold and forming an undermold-overmold interface at an outer surface of the primary mold.

Claim 24

24(Preamble)	A solar power system comprising:
24(a)	a plurality of solar panels electrically coupled by a wire harness to form a first solar array;
24(b)	a lead assembly comprising:
24(b)(i)	a first drop line electrically connected to the wire harness and configured to receive power from the plurality of solar panels;
24(b)(ii)	a feeder cable, the feeder cable electrically connected to the drop line at a nexus;
24(b)(iii)	a primary mold that fully encases the nexus so as to substantially seal the nexus from external environmental conditions, the primary mold further comprising:

24(b)(iii)(1)	a first aperture extending completely through the primary mold and having a first diameter, wherein the feeder cable extends through the first aperture along a first longitudinal axis;
24(b)(iii)(2)	a second aperture extending partially through the primary mold and having a second diameter smaller than the first diameter, wherein the drop line extends into the second aperture along a second longitudinal axis; and
24(b)(iv)	a second drop line electrically connected to a second wire harness that connects to a plurality of solar panels, the second drop line electrically connected to the feeder cable at the nexus fully encased by the primary mold, wherein the second drop line extends into a third aperture defined by the primary mold along a third axis.

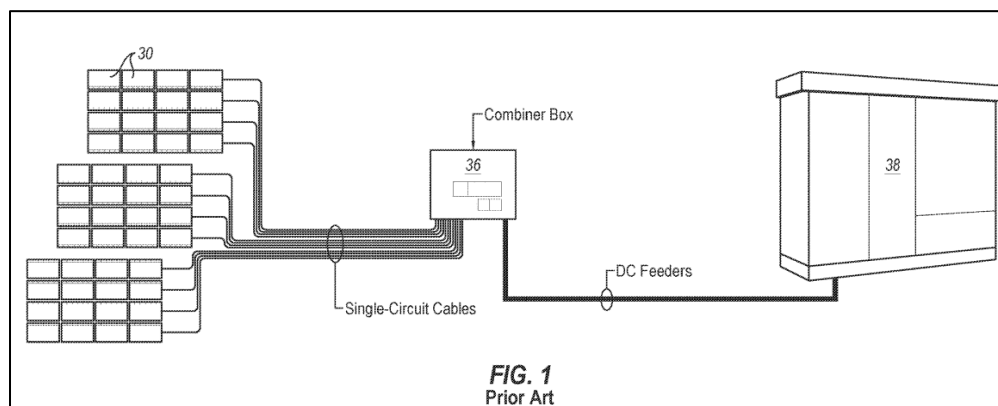
VII. SUMMARY OF THE '153 PATENT

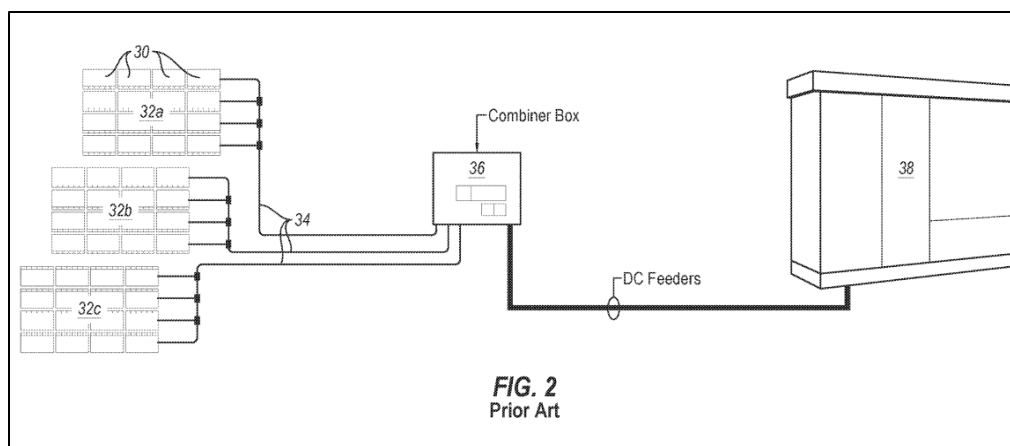
A. The Specification and Claims

68. The '153 patent is a continuation of U.S. Patent No. 10,992,254 filed September 9, 2015, and claims priority from provisional application No. 62/047,773 filed September 9, 2014. EX1001, face page. The '153 patent is titled “Lead Assembly for Connecting Solar Panel Arrays to Inverter” and describes an apparatus and a system that is capable of consolidating power from multiple solar panel arrays and transmitting the consolidated power directly to an inverter, without the need of a combiner box. *See, e.g., id.*, 1:20–24. The result is an entirely different architecture for utility-scale solar power installations.

69. The independent claims recite a lead assembly and a system that employs the lead assembly. The lead assembly is a device that is designed to consolidate power from multiple solar arrays via wire harnesses, where the consolidation of power occurs at a nexus that is encased by a mold. EX1001, cls. 1, 21, and 24.

70. The '153 patent is not just a simplification or consolidation of existing architecture at the time of filing, as Voltage suggests (*see, e.g.*, Pet. at 19); rather, the '153 patent represents a fundamental shift in the architecture of utility-scale solar power installations, a shift that cannot be boiled down to a combination of cables, wires, connections, or even various wire harnesses. In fact, the '153 patent explains the prior art which includes the wire harness architecture where wire harnesses, such as, for example, the wire harnesses taught Solon '741 are used. Figs. 1 and 2 of the '153 patent are instructive:





EX1001, Figs. 1–2. Through Figs. 1 and 2 and the accompanying text, the ’153 patent acknowledges that the prior art includes, for example, solar modules, solar panels, insulated wires, molds, wire harnesses, combiner boxes, inverters, etc. The ’153 patent thus informs the skilled artisan that those individual elements are not the claimed invention. Instead, the invention taught by the ’153 patent is a combination of elements, the combination of elements together achieving the goal of the ’153 patent: eliminating the need for a combiner box.

71. The ’153 patent explains that Fig. 2 is a simplification of the architecture illustrated in Fig. 1, where the simplification that was achieved “by the wire harness of U.S. Pat. No. 8,604,342 [Solon ’342, EX2004].”¹ EX1001, 1:32–36. Solon ’342 is an earlier of Dean Solon’s EBOS patents that “relates generally to ... simplifying the

¹ Two other then-pending Solon patent applications that show the same wire harness are also identified.

electrical infrastructure associated with solar energy utilities.” EX2004, 1:8–11. For example, the ’153 patent describes Figs. 1 and 2 as follows:

FIG. 1 depicts a conventional wiring configuration with each solar panel individually wired to a central combiner box;

FIG. 2 depicts an improved but known wiring configuration with solar panels harnessed together to form solar arrays, with each solar array individually wired to a central combiner box; . . .

EX1001, 2:21–27. The ’153 patent explains the progression from Figs. 1 to 2 as follows:

As depicted in FIG. 1, a conventional solar power configuration includes a plurality of solar panels 30 each connected to a central combiner box 36, and a plurality of combiner boxes (not shown) connected to an inverter. The inverter converts the direct current (DC) generated by the solar panels into alternating power (AC), which goes in the “grid”.

The configuration of FIG. 1 has been simplified in recent years by the wire harness of [Solon ’342] hereby incorporated by reference. More specifically, as shown in FIG. 2, wire harnesses 34 connect multiple solar panels 30 in an array 32, so each array has a single input via wire harness 34 into the combiner box.

Id. at 1:25–39. In short, the single-circuit cables of Fig. 1—designed to take power from individual solar panels (a collection of modules) to a combiner box—are

grouped into wire harnesses (ref. no. 34) of Fig. 2. However, the '153 patent qualifies this simplification as progress, not victory: “Unfortunately, however, a combiner box is still a necessary component in known solar power installations because the energy from solar arrays must be combined prior to going into an inverter.” *Id.* at 1:39–42.

72. Fig. 3 depicts the invention of the '153 patent: the *lead assembly* which is designed to consolidate power from wire harnesses at a nexus encased by a mold. *See, e.g.*, EX1001, cl. 1. The lead assembly enables a totally different solar power architecture, one which does not need a combiner box. *Id.* at Figs. 3–4. Fig. 3 schematically represents this shift from old to new architecture including a combiner box for illustrative purposes:

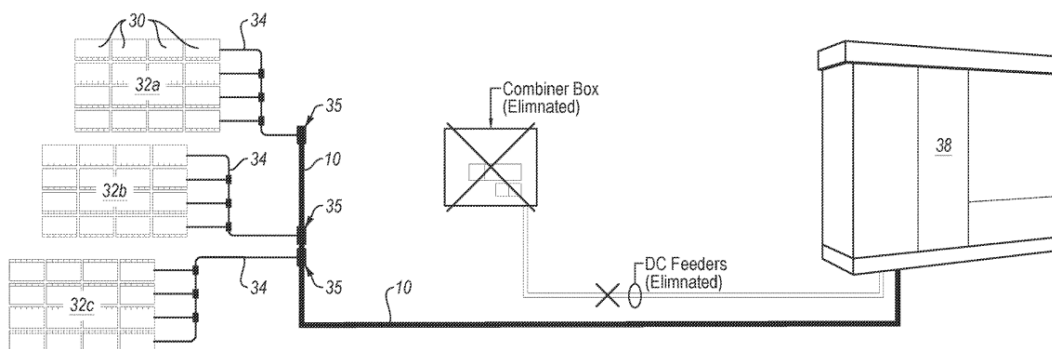


FIG. 3

Id. at 2:24–27. Fig. 4 schematically represents a system including the lead assembly:

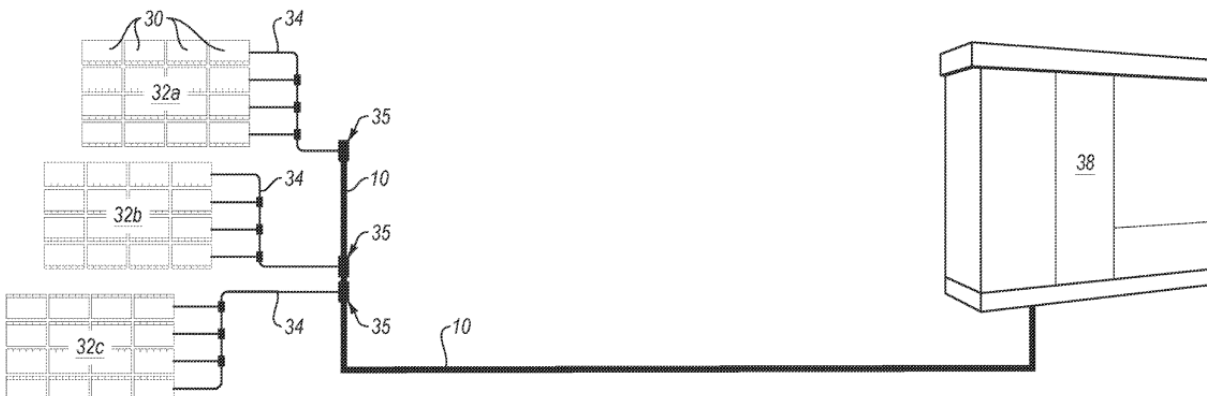


FIG. 4

Id. at 2:28–29. The '153 patent thus teaches a difference between consolidating and thereby reducing the number of connections feeding into combiner boxes—in the manner taught, for example, by Solon '342 and Solon '741—and eliminating the combiner boxes, in the manner taught by the '153 patent.

VIII. OVERVIEW OF CONCLUSIONS

73. It is my opinion that none of the challenged claims would have been obvious to a POSA at the time of invention in view of the cited art provided in the petition. In addition, it is my opinion that the claims are not indefinite under 35 U.S.C. § 112 and that the claims are supported adequately by the disclosure in the '153 patent. My opinions are further explained in this Declaration.

74. It is my opinion that each of claims 1, 5–7, 11–14, 16, 17, and 21–24 of the '153 patent is patentable over the combination of Solon '741 and Yamawaki.

75. It is my opinion that each of claims 1–3, 5–19, and 21–24 of the '153 patent is patentable over the combination of Amphenol, Shao, and Yamawaki.

76. It is my opinion that claim 20 of the '153 patent is patentable over the combination of Amphenol, Shao, Yamawaki, and Tamura.

77. It is my opinion that each of claims 1–3, 5, 6, and 8–24 of the '153 patent is patentable over Amphenol, Shao, and Tamura.

78. It is my opinion that each of claims 1–3, 5–10, 12–15, 18, 19, and 21–24 of the '153 patent is patentable over the combination of Yamawaki and Shao.

79. It is my opinion that each of claims 11, 16, and 17 of the '153 patent is patentable over the combination of Yamawaki, Shao, and Solon '741.

80. It is my opinion that claim 20 of the '153 patent is patentable over the combination of Yamawaki, Shao, and Tamura.

81. It is my opinion that each of claims 1–24 is definite, and each satisfies the written description requirements under 35 U.S.C. § 112.

82. Because many of the arguments presented by Voltage and Dr. Kenny hinge on particular combinations of references, my analysis below will focus on those cited art combinations, many of which affect more than one ground. Therefore, my arguments will be presented with reference to the particular combination as well as the grounds impacted by the combination.

IX. GROUNDS 2, 3, AND 4 – AMPHENOL

A. There is no evidence to suggest that the Amphenol brochure of EX1007 was available to the public before the priority date of the '153 patent.

83. To begin, it is my understanding that for a printed publication to qualify as prior art, as Voltage and Dr. Kenny allege is the case for the Amphenol brochure, it must be shown that the publication was available to the interested public before the priority date of the '153 patent. However, Voltage and Dr. Kenny provide no basis for showing that the Amphenol brochure was published or otherwise publicly accessible prior to the priority date of the '153 patent. The Amphenol brochure is, therefore, not prior art and should not be considered in any obviousness analysis including in grounds 2–4 presented in the petition.

84. Dr. Kenny includes one conclusory statement about Amphenol as prior art:

I understand that Amphenol is prior art under AIA § 102(a) because it was published no later than November 30, 2012, more than one (1) year before the earliest possible priority date of the '153 Patent.

EX1003, ¶ 28. Nothing in Dr. Kenny's statement indicates a factual basis for the alleged publication date or public availability. The only date found on the document is an "ICS 18-6 Release Date: November 2012". EX1007-1. It is not self-evident to what "ICS 18-6" is referring. It is possible that ICS indicates an

internal publication or set of documents available to select employees, for example. That date, alone, is certainly not evidence that the document was available to the interested public in November of 2012.

85. The only other evidence Voltage points to is a citation to the declaration of Gary Joseph (EX1024), a former sales representative for Amphenol and current director of sales for Voltage, LLC (EX1024)—the petitioner. However, even Mr. Joseph’s declaration does nothing to corroborate the publication date of the Amphenol brochure. He states that his recollection is that various products included in the Amphenol brochure had been offered for sale in 2012. EX1024, ¶¶ 4–6. However, Voltage and Dr. Kenny are not, to my knowledge, alleging the products as prior art based on sales dates; instead, they put forward the brochure as printed publication prior art. As a publication, the best evidence that Voltage points to is Mr. Joseph’s statement that “it was Amphenol’s regular practice to make at least the latest version of the Solar Line Brochure available for download on Amphenol’s website.” EX1024, ¶ 8. Mr. Joseph does not declare that he remembers *this* brochure, EX1007, being available or that *this* brochure, EX1007, was ever available. Indeed, he does not explain what an ICS Release Date is or corroborate that such brochures would have been available to the public. His testimony is that some form of a product brochure was available to the public in

2012. His testimony says nothing about the public availability of *this* brochure, EX1007.

86. Therefore, it is my understanding that at least due to the above, Voltage and Dr. Kenny have not shown that the Amphenol brochure was available to the public by the priority date of the '153 patent and, therefore, the brochure cannot be considered prior art for purposes of any invalidity analysis including invalidity for obviousness. Based on the above, grounds 2–4 do not render the claims of the '153 patent obvious.

B. Even if the Amphenol brochure was available to the public, it does not teach what Dr. Kenny alleges.

87. Even if Voltage and Dr. Kenny adequately showed evidence of the Amphenol brochure's public availability (they do not), Amphenol does not teach what Dr. Kenny and Voltage propose. In particular, Amphenol does not teach a lead assembly connecting to wire harnesses to alleviate the need for combiner boxes in utility-scale solar installations, as taught in the '153 patent.

88. To begin, Voltage and Dr. Kenny conflate a wire harness with intra-module wiring. A “wire harness” as identified in the claims and specification of the '153 patent is a device that includes a “central trunk” and “a plurality of branches where each of the plurality of branches is configured to electrically connect to a

separate solar panel contained in an array of a plurality of solar panels.” EX1001, cl. 1. Figure 4 of the ’153 patent (shown below) is instructive:

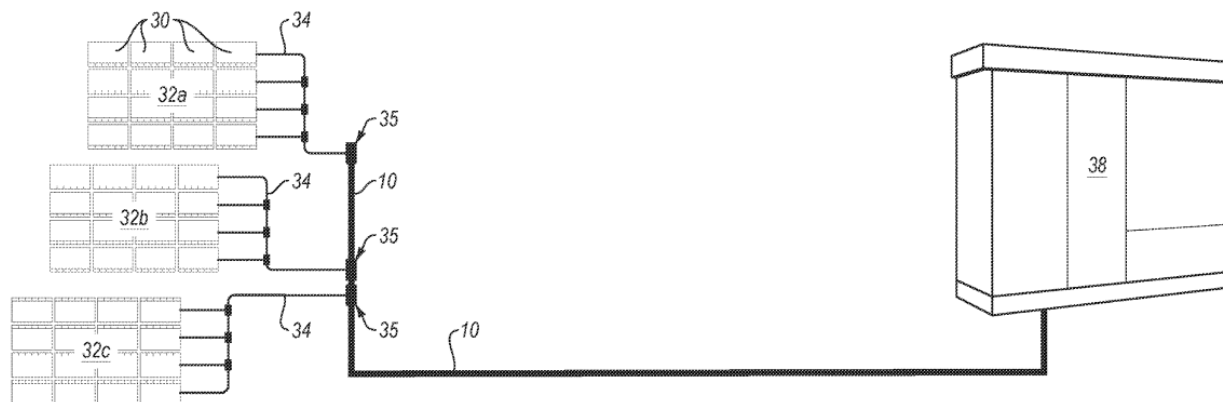
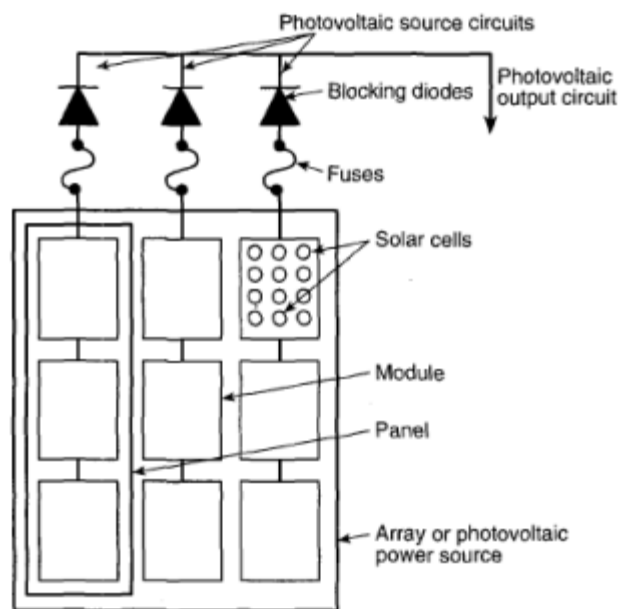


FIG. 4

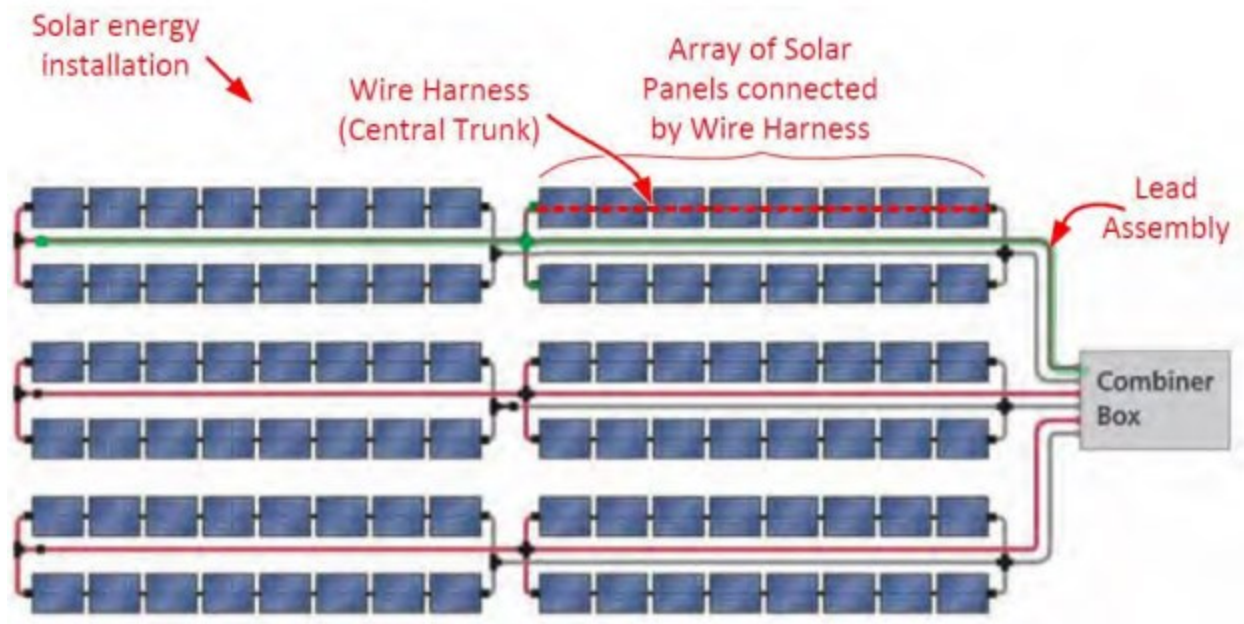
EX1001, Fig. 4. In figure 4, wire harnesses 34 each include, as an example, four (4) branches each connecting to the output of a solar panel (or a group of modules 30). In this instance, figure 4 shows a row of solar modules 30—each an individual solar panel—connected to one of the four branches in the wire harness. Each wire harness 34 collectively groups outputs of the solar panels, forming a solar array (32a, 32b, and 32c, respectively).

89. Use of intra-module wiring between solar modules to form a solar panel is a well-known concept. Indeed, the concept is even illustrated in the NEC section (section 690) cited by Dr. Kenny in his expert declaration. *See* EX1003-39 (*citing* EX1010). Section 690.1(A) illustrates the following:



EX1010, Fig. 690.1(A). The figure above shows three modules in a column, each of the modules is connected to another one of the modules in the column, forming a solar panel. The lines between solar modules indicate electrical connections or intra-module wiring between the solar modules. What is not shown in Fig. 690.1(A) is a wire harness: individual branches connecting to outputs of solar panels and grouping those outputs at a central trunk. A wire harness is not the same as intra-module wiring, the scale and purpose are entirely different.

90. To illustrate their point, Voltage and Dr. Kenny created the following annotated figure from the Amphenol brochure as evidence that Amphenol teaches wire harnesses and lead assemblies.



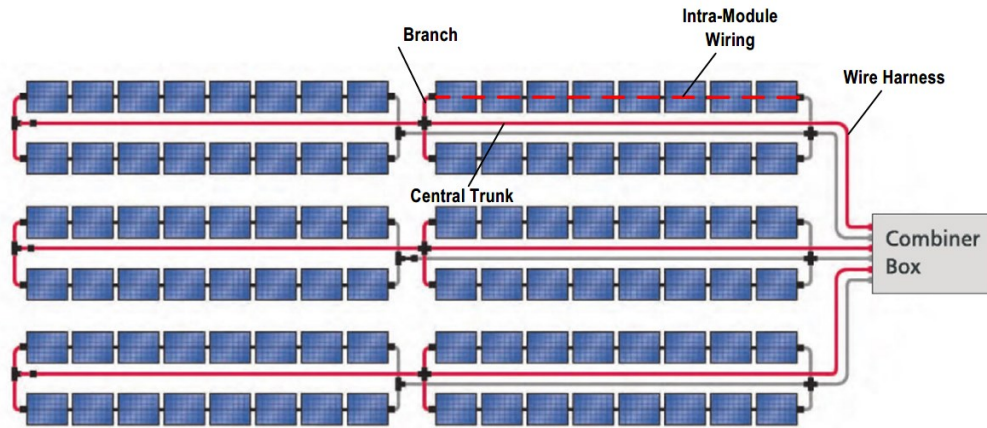
EX1003, ¶ 185 (citing EX1007, p. 5 with annotations). Dr. Kenny includes a red dotted line between the solar modules shown in the Amphenol brochure and declares that the red dotted line shows the existence of a wire harness. Not so.

91. First, nothing in Amphenol indicates what sort of wiring connects the solar modules in each row. Indeed, there are many wiring techniques between modules that can be employed such as, for example, stringing modules together with wiring from individual junction boxes, skip-stringing, parallel wiring, etc. However, each of these wiring techniques have nothing to do with a wire harness. Regardless of the wiring used to electrically connect various solar modules together, at the end of each row of solar modules is an output—positive and negative—which will be connected to, for example, a branch of a wire harness.

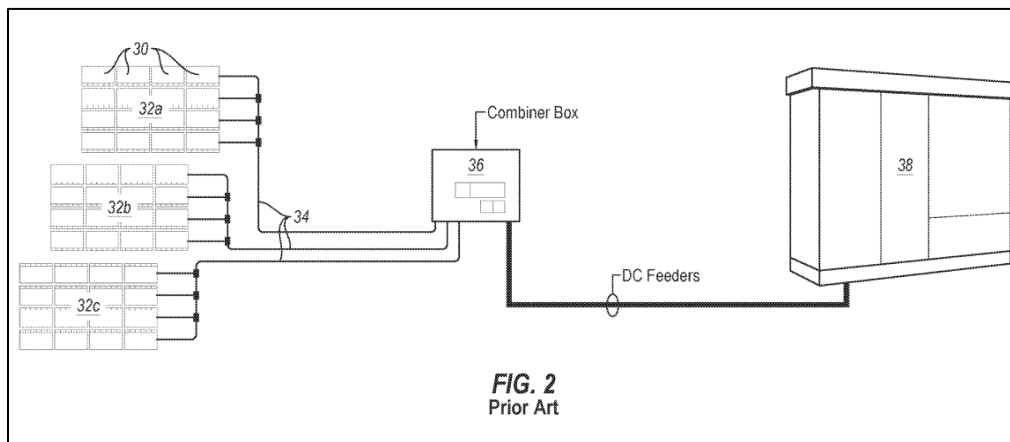
This is clearly the case in Amphenol. As shown in the figure above, each solar panel (row of solar modules) has an output that is connected to a branch corresponding to the green line in Dr. Kenny's annotation. However, what he has labeled a "lead assembly" is actually just a wire harness, like the wire harness 34 in figure 4 of the '153 patent and the wire harness in claim 1(a) of the '153 patent.

92. That the green lines in the above-annotated figure in Amphenol is a wire harness is also evident based on what the central trunk of the wire harness is connected to—a combiner box. Again, the purpose of the lead assembly is to eliminate the need for a combiner box. If the green line was truly a lead assembly, its central trunk would connect directly to an inverter rather than a combiner box, as shown, for example, in figure 4 of the '153 patent. EX1001, Fig. 4. It does not, however, because what Dr. Kenny labels as a lead assembly is, in fact, a wire harness and what he labels a wire harness is some form of intra-module wiring.

93. From my experience, what Amphenol teaches is a common architectural layout of a utility-scale solar power installation prior to the invention of the lead assembly disclosed in the '153 patent. The proper annotated layout of the figure in Amphenol is as follows:



EX1007, p. 5 (Weiner annotations). Indeed, this architectural layout is consistent with the layout described in the '153 patent as prior art shown, for example, in figure 2 below:



EX1001, Fig. 2. Figure 2, like Amphenol, illustrates rows of solar modules (30) wired together to form solar panels. The outputs of those solar panels are

individually connected to respective branches of the wire harnesses (34) and the power from each solar panel is grouped at the central trunk of the wire harness (34). Figure 2 shows three wire harnesses (34) whose power is consolidated at a combiner box (36), just like the figure in Amphenol.

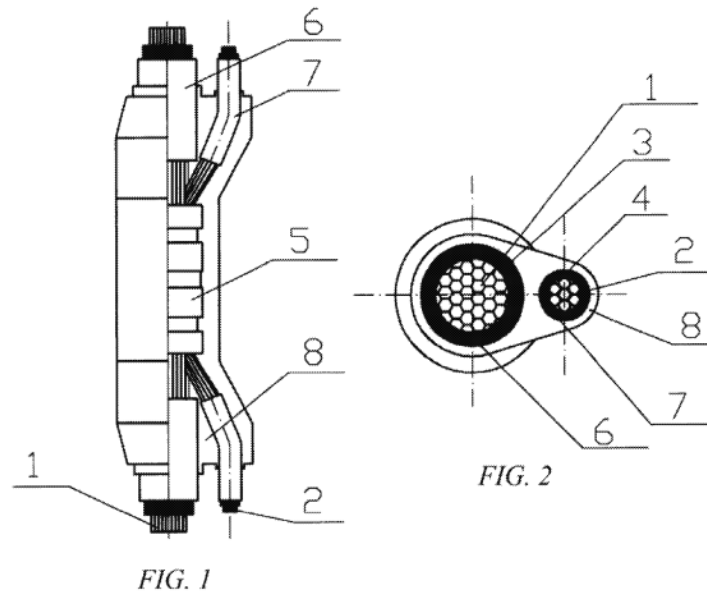
94. In sum, Amphenol does not disclose what Dr. Kenny indicates. Amphenol does not include any information whatsoever about the intra module wiring electrically connecting the solar modules together and Dr. Kenny does not remedy that deficiency by relying on any other materials or expertise in the field. In addition, even assuming any number of methods of electrically connecting the solar modules together, that intra-module wiring is not a wire harness, and what Dr. Kenny indicates is a lead assembly in Amphenol is, in fact, a wire harness, as defined by the '153 patent. Therefore, Amphenol does not teach any elements of the claims corresponding to the lead assembly, including, for example, “a feeder cable”, “drop line”, “nexus”, “apertures”, “undermold”, “overmold”, etc. and none of the references combined with Amphenol remedies that deficiency. As such, grounds 2–4 fail to show each of the elements of any claim in the '153 patent. Therefore, none of the claims of the '153 patent is rendered obvious by Amphenol and any of the combinations listed in grounds 2–4.

C. A POSA would not have been motivated to combine Amphenol with Shao.

95. Dr. Kenny relies on Shao to teach the details of the electrical connection at various junctions shown in Amphenol. For example, Dr. Kenny relies on Shao to show “a feeder cable electrically coupled to a drop line at a nexus”, “a first aperture extending completely through the undermold”, second and third apertures “extending partially through the undermold”, and second and third diameters “different than the first diameter.” As a threshold matter, as explained above, Amphenol does not teach a lead assembly and, therefore, the combination of Amphenol and Shao does not render any of the claims obvious. In addition, Shao is not analogous art as compared with the ’153 patent and, therefore, a POSA would not look to Shao to inform their design decisions. A more fulsome discussion on analogousness with respect to Shao is discussed further in this Declaration with respect to the Yamawaki/Shao combination. That discussion applies with equal weight here and in each ground that cites Shao as a reference in the combination.

96. For the purposes of argument, assuming that Amphenol teaches each of the claim elements that Dr. Kenny alleges (it does not), and assuming that Shao is analogous art to the ’153 patent (it is not), a POSA would still not be motivated to combine the two.

97. Shao is titled “Power Cable with Bidirectional K Type Branch.” The only figures in Shao—figures 1 and 2—are reproduced below and show, in relevant part, a trunk line with conductor (ref. no. 1), insulation (3), and sheath (7), as well as a branch line with conductor (2), insulation (4), and sheath (8):



98. Shao is more specifically directed to *branch* cabling for power distribution. EX1008. According to one definition, “branch” cabling is the cabling “between the final overcurrent device protecting the circuit and the outlet.” See EX2005, 100 [definition of “Branch Circuit”]. In a typical house, that would be the wiring that is found between the circuit breaker panel and individual outlets, electrical appliances (e.g., ovens), and fixtures (e.g., lights).

99. According to Dr. Kenny, it would have been obvious to combine Amphenol with Shao because Shao “provide[s] a more robust connection with the benefits of improved reliability and simplicity if used for the assembly of at least

some of the cable junctions of Amphenol for solar power combining applications.” EX1003, 111. More specifically, Dr. Kenny points to Shao as “provid[ing] protection from external environmental factors such as would be important for the installation of solar power system components of Amphenol.” *Id.* He states, for example, that Shao “provide[s] ‘good insulation performance, heat resistance stability and overheating aging performance.’” *Id.* He also mentions that “the wire harnesses, lead assemblies and solar photovoltaic power generation systems disclosed by Amphenol are intended for use in a harsh outdoor environment and would benefit from added protection from the elements and improved reliability for the branch structures provided by the more robust design and manufacturing processes for the connectors disclosed in Shao.” *Id.* at ¶ 201.

100. However, while Dr. Kenny extols the virtues of Shao, those virtues find no basis in comparison with Amphenol. For example, Dr. Kenny provides no basis for the assertion that an indoor-rated device in Shao would provide *more* protection from environmental factors than the outdoor rated, solar devices in Amphenol. Nor does Dr. Kenny use his own experience as a factual basis to backfill the lack of disclosure in Shao and Amphenol.

101. In my experience, outdoor-rated devices for solar applications need to withstand severe environmental conditions including, for example, severe heat and cold, temperature cycling, rainy environments, humid environments, dry

environments, wind and debris, etc. Further, in order to use these devices in a solar installation, the design would need to be approved by a Nationally Recognized Testing Laboratory (NRTL) which rigorously tests each device to ensure that it can withstand the harsh conditions of an outdoor solar installation. The notion that a POSA would look to an indoor-rated device to provide *more* protection than that garnered by the devices shown in Amphenol is incorrect on its face. Even less, Dr. Kenny provides nothing more than a conclusory statement in support of the assertion.

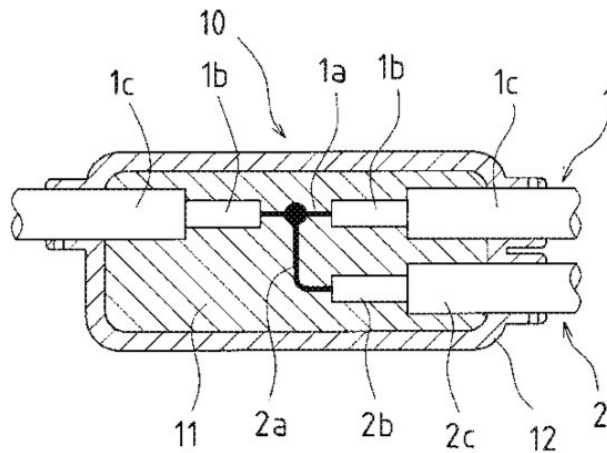
102. Dr. Kenny further states that a POSA would have a reasonable expectation of success in combining Amphenol with Shao because Shao “complements the disclosure of Amphenol” and constitutes an “appropriate choice” for design and materials for the junctions in Amphenol while also providing alternative junction configurations. *Id.* at 110.

103. I disagree. Dr. Kenny has not identified anything in Amphenol or Shao that suggests Amphenol’s choice of design or materials is deficient or would be improved by combination with Shao; nor has he identified anything in Amphenol or Shao that would have motivated a skilled artisan to swap Amphenol’s junction and/or mold configuration for Shao’s.

D. A POSA would not have been motivated to combine Amphenol with Tamura.

104. Tamura is a Japanese patent, titled “Cabling Branch Molding Method,” which was issued on April 23, 2006. Figure 1 of Tamura, reproduced below, shows a trunk cable (ref. no. 1) and branch cable (2), surrounded by an inner mold part (11) and a mold part (10):

【図 1】



105. The accompanying text explains that the cables could be used to connect “the solar cell module” or “electric devices such as the module for snow melting tile or the module for tape heater.” (*Id.*, ¶ 0025.) To a skilled artisan, this conveys that Tamura is concerned with rooftop installations or installations with low voltages and currents—*i.e.*, solar modules used for tape heaters or melting snow tiles.

106. Dr. Kenny states that a POSA would be motivated to combine Amphenol, Shao, and Yamawaki with Tamura because “Tamura provides further improvements to the Amphenol-Shao combination by providing a 2-layer molding process that Tamura explains will offer better reliability and performance. . . and the use of the inner mold and outer mold [] provides a ‘double water proof effect.’” EX1003, ¶ 315 (quoting EX1009, ¶ 17).

107. I disagree. Tamara discloses that the double-molding process is for use in a small device (i.e., solar module connected to a tape heater). Nothing in Tamura teaches a POSA that the benefits of the double-molded structure for small devices on a roof would translate to junctions on a ground-mounted utility-scale solar installation, one with much larger voltages and currents and, therefore experiences different types of temperature fluctuations. For example, Tamura is designed for roof-mounted systems which experience larger external temperature fluctuations (e.g., an additional 20–30 as compared to the ground). Continuing the example, the larger voltages and currents in ground-mounted utility scale solar installations translates to much larger internal temperatures experiences, for example, by junctions, molds, etc. A POSA would not be motivated to combine the molding in Tamura with a ground-mounted utility scale solar installation at least because there is no indication, from Tamura or Dr. Kenny, that the molding

structure would plausibly function properly in the context of a utility-scale solar installation.

108. In addition, Dr. Kenny does not point to any portion of Amphenol that would teach that the junctions in Amphenol suffer from problems with waterproofing or weather resistance. Dr. Kenny instead appears to rely on the idea that two molds are always better than one. This is not the case. In my experience, molds and junctions suffer from separation and failures due to temperature cycling, separation between the molding and the electrical connection or between layers of molding themselves. As such, it is not clear that a double-molded structure for use in small scale devices would function in place of the junctions in Amphenol, and Dr. Kenny provides no support for such a notion.

109. Further, like his analysis for combining Amphenol with Shao, Dr. Kenny has not identified anything in Amphenol or Tamura that suggests Amphenol's choice of design or materials is deficient or would be improved by combination with Tamura; nor has he identified anything in Amphenol or Tamura that would have motivated a skilled artisan to swap Amphenol's junction configuration and/or mold structure for Tamura's.

E. A POSA would not have been motivated to combine Amphenol with Yamawaki.

110. Like Tamura, Yamawaki "relates to a photovoltaic generation system capable of obtaining electric power by means of photovoltaic cells arranged on, for

example, a roof of a building, and a wiring apparatus and a wiring structure for conducting electric power produced by the generation system into the building such as a house.” EX1006 at 1:7–12.

111. Dr. Kenny adds Yamawaki to Amphenol to add the cover member 33f in Yamawaki to the junctions in Amphenol. *See, e.g.*, EX1003, ¶ 204. More specifically, Dr. Kenny asserts “A POSITA would be motivated to combine the teachings of Amphenol, Shao, and Yamawaki, specifically the addition of the overmold, in the form of a cover member, over an undermold to achieve further improvements in reliability and performance such as the ‘water-resistance’ as described by Yamawaki.” *Id.*, ¶ 471.

112. I disagree. Just like Tamura, Yamawaki does not include any teachings that its design would improve the weatherproof nature of devices in Amphenol. Additionally, nothing in Dr. Kenny’s declaration or in Amphenol indicates that the harnesses in Amphenol require more waterproofing. Further, Yamawaki solves a particular problem which, as described in more detail below, includes increasing the flexibility of wire harnesses on rooftop solar installations. Yamawaki does not teach that its branch junctions 33 would be useful to a utility-scale solar installation, where flexibility and customization is much less of a concern and consistency of design and installation is much more of a prominent factor in design considerations for junctions.

X. GROUND 5, 6, 7 – YAMAWAKI + SHAO

113. Voltage alleges that the combination of Yamawaki and Shao renders independent claim 1 obvious. However, the combination of Yamawaki and Shao does not render obvious any of the independent claims of the '153 patent for several reasons. First, Shao is not analogous art and therefore would not have even been available for a POSA to consider in an obviousness analysis. Second, even if Shao was analogous art and therefore available to a POSA for consideration, a POSA would not have been motivated to make the combination of Yamawaki with Shao. Finally, even if Shao is analogous art (it is not) and even if a POSA would have been motivated to combine Yamawaki with Shao (it has not), the combination still fails to teach many of the elements of the independent claims. Thus, the Yamawaki-Shao combination does not render any of the claims of the '153 patent obvious.

A. Shao is not analogous art.

114. It is my understanding that in order to determine whether prior art would have been available to a POSA, the prior art must be analogous. I understand that determining whether cited art is analogous is a two-pronged test: (1) whether the art is from the same field of endeavor, regardless of the problem addressed, and (2) if the reference is not within the field of the inventor's endeavor, whether the reference still is reasonably pertinent to the particular

problem with which the inventor is involved. Because the Shao reference is from a different field of endeavor than the '153 patent and is not pertinent to the problem addressed by the inventor of the '153 patent, it is not analogous art and should not be considered as prior art to the '153 patent.

i. The Shao reference and the '153 patent are in different fields of endeavor.

115. In the PGR petition, Voltage, backed by Dr. Kenny, establishes at least two versions of its characterization of the field of endeavor of the '153 patent. First, Voltage appears to assert that the field of the '153 patent is “design[] of cable junction elements that can be used to combine or distribute electrical power” (Pet. at 102), notably absent from Voltage’s first characterization of the field of endeavor is any mention of solar or photovoltaics. Subsequently in the petition, Voltage comes much closer to its characterization of the field of endeavor asserted at the ITC hearing: “electrical connectors *and* solar installations.” *Id.* at 136 (emphasis added).

116. While it is clear that Voltage’s first characterization of the field in its petition is attempting to read out any mention of “solar” in the field of endeavor of the '153 patent, the '153 patent is clearly centered around utility-scale solar installations. Indeed, the specification and claims are replete with the references to solar and solar installations including the title, abstract, figure descriptions, figures, and claims. Indeed, the independent claims recite many elements directed to solar

installations specifically; for example, “[a] lead assembly for use in a solar installation”, “a plurality of branches that each are configured to electrically connect to a separate solar panel in an array of solar panels”, “[a] solar power system”, “a plurality of solar panels” “a first solar array”, “a second solar array”, to name a few. *See, e.g.*, EX1001, cls. 1, 21, and 24. As such, it would be inaccurate to omit any reference to solar installations or solar power systems in the field of endeavor of the ’153 patent.

117. Remaining consistent with the characterization of the field of endeavor of the ’153 patent offered at the ITC hearing, the field of endeavor of the ’153 patent is solar energy installations or solar power system.

118. In contrast, the record is clear that Shao has nothing to do with solar applications, and Dr. Kenny agreed at the ITC hearing by stating: “[t]here’s no mention of solar technology in the Shao patent.” EX2003, 1202:21–23. Voltage’s petition and Dr. Kenny’s declaration does not offer any support for the idea that Shao has anything to do with solar installations. Indeed, there is no mention of using the branch junction of Shao in any solar installation. Instead, Shao relates to branch cabling for indoor power distribution. Branch cabling is found “between the final overcurrent device protecting the circuit and the outlet.” *See* EX2005, 100 [definition of “Branch Circuit”]. Shao does not once suggest an application to a

solar environment or solar installation. Indeed, the word “solar” does not appear once in the disclosure.

119. Dr. Kenny does not offer any testimony or other support explaining why the field of the ’153 patent (solar energy installations) could be said to be in the same field as Shao (AC power distribution). The opposite is true: a POSA would conclude that Shao is not applicable to solar applications and a skilled artisan would not look to Shao to inform solar component design decisions for several reasons.

120. First, Shao discloses a device intended specifically for AC power distribution within a multistory building (e.g., vertically between floors of a building), which has nothing to do with DC power consolidation from wire harnesses as addressed by the ’153 patent.

121. Second, Shao concerns only AC power distribution. AC components generally have no applicability to design decisions within a DC power system, the environment of a solar power system, i.e., the types of systems at issue here. Typically, AC is a weaker rating than the ratings required for a DC power system. Thus, one skilled in the art would not look to a device in a weaker-rated AC context and determine that the device must have an application in the DC design context. It may be the case that a skilled artisan would look to a DC device for application in an AC design, but the reverse is not true. Therefore, one of skill in

the art would not look to Shao (an AC device) and use it in the context of solar power installations of the type described by the '153 patent (DC context).

122. Third, Shao is intended for AC power distribution within a building. This is in sharp contrast to solar components which are intended for outdoor use and subject to sometimes extreme environmental conditions. And, while Shao indicates that its design is moisture resistant (EX1004, 5), the moisture encountered by an indoor device, like Shao, is radically different from the moisture or water exposure that outdoor devices, like those described by the '153 patent, would be designed to endure.

123. In sum, Shao relates to branch cabling for power distribution; more specifically, AC power distribution within a building. On the other hand, the '153 patent is in the field of solar energy installations. Because Shao and the '153 patent are in drastically different fields of endeavor, Shao is not analogous art.

ii. The '153 patent and the Shao reference are directed to different problems.

124. Voltage's expert, Dr. Kenny, never directly addresses the question of whether the Shao reference is reasonably pertinent to the particular problem with which the inventor of the '153 patent was involved. In fact, Dr. Kenny never specifically articulates the problem addressed by the inventor of the '153 patent. Instead—and although his logic is not entirely clear—Voltage and Dr. Kenny appear to provide a smorgasbord of potential benefits to which the '153 patent may

apply—but no particular problem is articulated. Specifically, Voltage points to a number of benefits including: “providing reliable electrical connections”, “protecting electrical connections from environmental factors”, “providing the structures in a way that reduces cost”, and “simplify[ing] the assembly and maintenance of power facilities.” See Pet., 102–103; EX1003, [469]. However, to articulate whether a reference solves the same particular problem as the patent in question, the petitioner needs to articulate the particular problem.

125. The ’153 patent states the problem being solved: “there is a need for a device that renders a combiner box unnecessary.” EX1001, 1:55–56. The ’153 patent is focused on how to get power from solar panel arrays all the way over to an inverter without using a combiner box. EX1001, 2:9–17. The Shao patent focuses on enabling single-branch joints by combining them into a double-branch AC power distribution system between floors of a building. EX1008, 4. Shao is attempting to reduce the number of joints in its wiring apparatus in order to create a more compact structure that fits tighter within a building and, more specifically, between two floors of a building. *Id.* Two different problems.

126. In sum, Shao is in a different field of endeavor as compared to the ’153 patent; indeed Shao has nothing to do with the field of the ’153 patent (solar power installations). In addition, Shao is not reasonably pertinent to the problem solved by the ’153 patent (elimination of a combiner box). Therefore, Shao is not

analogous art and would therefore not be available to a POSA at the time of the invention of the '153 patent.

b. A POSA would not have had a reasonable expectation of success in the proposed Yamawaki – Shao combination because the combination is not technically viable.

127. Dr. Kenny's fundamental misread of Yamawaki—which may be due to his lack of institutional, solar knowledge—has led to several conclusions regarding the combination of Yamawaki and Shao that are simply untenable both as a technical matter and as a matter of common sense to a skilled artisan. Indeed, the combination of Yamawaki with Shao would foreclose the novelty provided by Yamawaki's wire harness. As such, Voltage has not shown a reasonable expectation of success in the combination.

128. Voltage proposes that one of ordinary skill would:

(1) Pre-manufacture the wire harnesses in Yamawaki to introduce the crimping and molding processes used to electrically connect the trunk and branch cables in Shao (Pet. at 103, 108–114; *see also*, EX2003, 1209:6–12);

(2) Increase the wire size of the trunk cable in Yamawaki (or decrease the size of the branch cables) thereby causing the alleged aperture sizes through the branch to be different (Pet. at 109–110; EX2003, 1205:12–17);
and,

(3) Add an additional alleged aperture through the branch junction (33) to accommodate a second drop line *Id.*

129. However, each modification to Yamawaki proposed by Voltage in light of Shao would eliminate the purpose and technical viability of Yamawaki. A POSA would not combine Yamawaki with Shao because ultimately the combination would break what Yamawaki is trying to teach.

130. First, a POSA would not pre-manufacture (or, using the terminology of Shao, “prefabricate”) the wire harnesses of Yamawaki like the Shao power cable and K-shaped branch because doing so would obviate the utility explicitly taught in Yamawaki; namely, the flexible and adaptable nature of the wire harnesses. EX1006, 4:1–4. Indeed, Yamawaki teaches a flexible wire harness, one in which the “lengths of the trunk and branch cables can be adjusted according to the layout or configuration of the photovoltaic modules or module units, and the photovoltaic modules can be increased for extension or rearranged with ease.” *Id.*

131. Voltage acknowledges—commensurate with Dr. Kenny’s testimony at the ITC—that Yamawaki provides a limited description of the interior structure of the branch junction (33), stating, for example, that Yamawaki “does not illustrate an electrical coupling between [the cables] at the connecting point.” Pet. at 107; EX2003, 1209:6–8. The figures of the branch junction 33, for example,

only illustrate dotted lines showing an apparent electrical connection between the trunk cables and the branch cable as shown, for example, below:

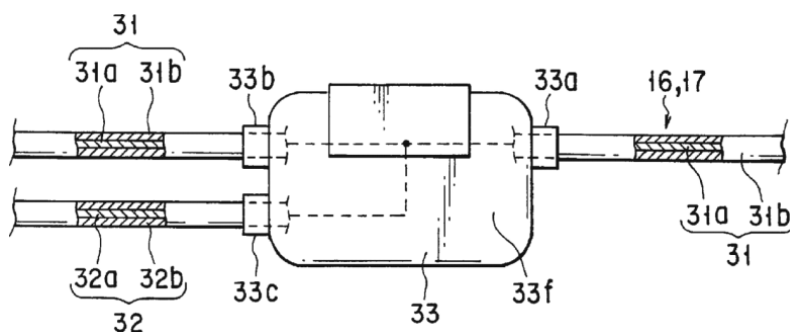
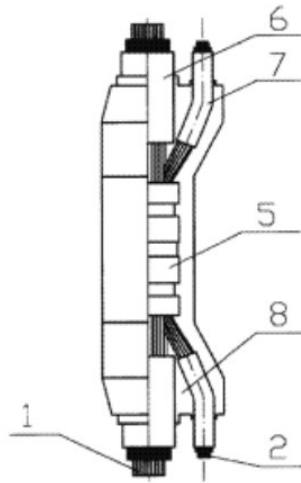


FIG. 9A

EX1006, FIG. 9A. Yamawaki teaches that each of the cables are cut to a desired length (in accordance with the layout of a given rooftop configuration) and then plugged into the respective branch cable connecting portions (33a), (33b), and (33c). EX1006, 10:27–33. Yamawaki teaches that this process is to occur on site to conform with the unique nature of each rooftop. EX1006, 14:53–68. Yamawaki teaches that one should show up with all your equipment, but field assemble it, because every rooftop is different. And, because every roof is different, an installer on a roof would need a flexible, adaptable wire harness to solve the residential problem.

132. By contrast, Shao teaches the “manufacturing all of the [K-shaped junctions] offsite in a manufacturing facility” which enables efficient installation of the junctions in buildings. EX1008 (“The power cable is premanufactured in a

factory and fast to lay and mount”). The K-shaped junction includes a trunk conductor and two branch conductors that are electrically connected using a crimp. EX1008, 5. Shao also teaches a molding over the conductors which is “described as a sheath made of injection molded material.” *Id.* The basic structure of the K-junction taught in Shao is shown, for example, below:



EX1008, FIG. 1. Aside from the issue of whether Shao is analogous art (it is not), using the crimped and molded structure of Shao in connection with Yamawaki would break the teachings and benefits of the flexible, customizable, create-as-you-go wire harness as taught in Yamawaki.

133. For example, if one crimped wires together at the branch junction (33) in Yamawaki, a crimped wire would fix branch junctions along the trunk which is contrary to the purpose of Yamawaki: to allow flexibility and adaptability of the branch junctions (33) along the trunk cables.

134. The same is true of the injection molding process that Voltage and Dr. Kenny insist one of ordinary skill would use. They state, for example, that “an injection molded sheath (i.e., an undermold) as taught by Shao, encases the exposed cables and metal clamp holding them together [provides] better protect[ion] from damage and/or exposure.” Pet. at 128. First, there is no indication in either Yamawaki or Shao that injection molding would necessarily provide “better protection” and, regardless, the use of injection molding would similarly fix the branch junctions (33) in place thereby compromising the flexible nature of the Yamawaki wire harness. Voltage’s proposed modification does not improve the interior structure of the Yamawaki branch junction (33); it renders it inoperable for its intended purpose.

135. In addition, one would be unable to insert the branch and trunk cables as taught by Yamawaki (EX1006, 10:27–33) if the branch junction (33) was prefabricated and injection molded over the branch and trunk cables. Therefore, not only would the crimping and molding in Shao eliminate many of the benefits of Yamawaki, crimping and molding the branch junction (33) flies directly in the face of what Yamawaki teaches which includes the insertion of cables into the branch junction 33. EX1006, 10:19–32.

136. Second, even if apertures were taught in Yamawaki—which they are not—a POSA would not look to Shao to increase (or decrease) the wire size and,

consequently, the aperture size of either the trunk cables or the branch cables in Yamawaki. Voltage supplies no evidence or support for its assertion that the differently sized cables in Shao would be obvious to use in Yamawaki. In addition, Voltage fails to consider in its analysis the context with which the wire harness in Yamawaki would be used—a residential solar installation. For residential solar installations, one would need a standardized product or service that can somehow morph or adapt to any kind of rooftop.

137. Indeed, the wire harness in Yamawaki seeks to standardize all the cables and make them smaller to improve, for example, flexibility around rooftops with tight corners and to get into buildings more efficiently. In fact, in the context of residential solar installations and Yamawaki, using larger wire would make the wire more difficult to bend and the larger wire would increase the size of the holes in the side of the house. The concept of increasing the cable sizes is not only absent from any discussion in Yamawaki, but it also does not make sense to a skilled artisan designing residential systems for many of the same reasons. A POSA using the Yamawaki wire harness would similarly look for the increased flexibility inherent in the design and would therefore not compromise that flexibility by needlessly increasing or decreasing the wire sizes relative to each other.

138. Third, a POSA would not look to Shao to introduce a second drop line and/or a third aperture to the branch junction (33) of Yamawaki as Voltage and Dr.

Kenny propose. Voltage asserts that one would add a second drop line and a third aperture to the branch junction (33) in Yamawaki because doing so would “reduc[e] the number of junctions needed for the assembly.” Pet. at 113–114. Again, Voltage fundamentally misunderstands that Yamawaki teaches a flexible, adjustable, and field-customizable wire harness. Shao is interested in the consolidation of two joints together whereas Yamawaki is interested in the distribution or proliferation of its joints or branch junctions (33).

139. Use of two branch, branch junctions, like the crimped and injection molded branch junctions (33), would eliminate the flexibility of the Yamawaki wire harness design. For example, if an installer could only install two-branch, branch junctions (33) (i.e., a branch junction 33 with two branch cables) one would have many longer branch cables in order that the branch cables reach to various solar modules around the rooftop. Long branch cables, however, are a problem, a problem of cost, difficult installation, increased chance of failure, etc. The problem of long branch cables was one of the many problems that Yamawaki meant to solve. Just like the crimping, the molding, and the increased wire sizes, creating a branch junction (33) with two or more branches defeats the flexibility and adaptability Yamawaki itself touts as part of its inventive concept.

140. Furthermore, even if one was to make the proposed combination, I am unsure how Dr. Kenny proposes that a POSA would physically connect portions of

Shao with Yamawaki. Voltage fails to confront this issue or to otherwise address whether a POSA would have had an expectation of success, and whether it would have been a reasonable expectation.

c. Even if there was a reason to combine Yamawaki and Shao, and even if a POSA would have a reasonable expectation of success in the combination, the combination still fails to teach many elements of the asserted claims in the '153 Patent.

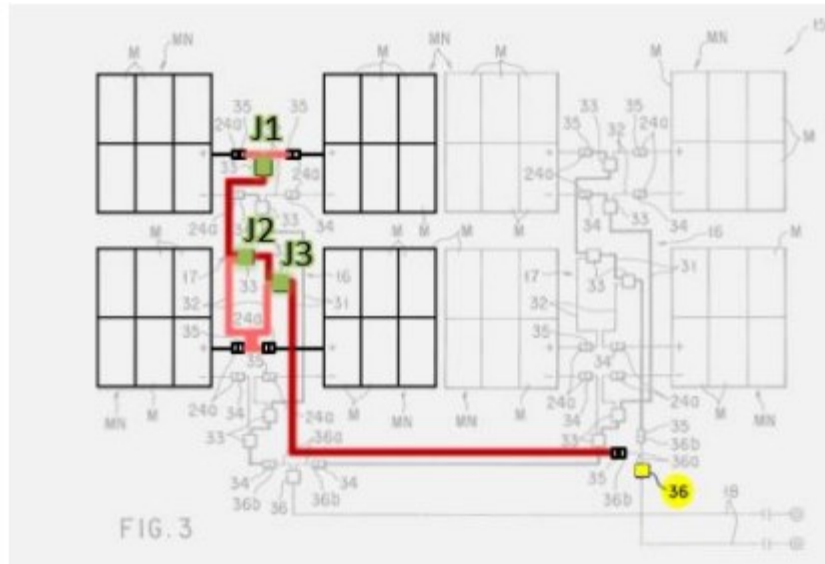
141. Even if Voltage identified a sufficient reason to combine Yamawaki with Shao (which it has not), the proposed Yamawaki/Shao combination still fails to teach many of the elements required by the asserted claims of the '153 patent. First, Yamawaki teaches a wire harness, not a lead assembly. Second, Yamawaki does not teach any apertures or molds (i.e., an undermold and/or an overmold) as recited in the asserted claims of the '153 Patent. Finally, Yamawaki (with or without Shao) does not teach drop lines, feeders, a nexus, 250 to 1000 MCM wire sizes, and many other elements of the claims of the '153 patent.

i. Yamawaki teaches a wire harness, not a lead assembly as required by the claims.

142. To begin, there is a difference between a wire harness and a lead assembly of the sort described in the '153 patent. A wire harness is designed to group the outputs of individual solar panels in a solar array whereas a lead assembly, as claimed, consolidates the power from wire harnesses. The definitions of a solar module, solar panel, and solar array are all strictly defined in the NEC and the definitions are consistent with how the '153 patent uses the terms. Broadly

speaking, a group of solar modules makes up a solar panel and a group of solar panels makes up a solar array. The distinction is made clear in the claims, which state that the drop line connector (associated with the lead assembly) is configured to connect to the central trunk of a wire harness and the wire harness has multiple branches where each branch is configured to electrically connect to a separate solar panel. EX1001, cl. 1.

143. Yamawaki discloses an adjustable wire harness (or “wiring apparatus”) for use in rooftop solar installations. Based on my experience designing thousands of rooftop solar installations, there are two characteristics of rooftops: (1) no two roofs are the same and (2) rooftops are messy; they can include dormers, skylights, vents, and all sorts of things that get in the way of a solar panel and the cabling corresponding thereto. In response to the difficulties inherent in rooftop solar installation, Yamawaki provides a streamlined solution for the residential market, one that provides a wire harness that can morph and adapt to any kind of rooftop. An example of the wire harness is shown in Yamawaki with respect to figure 3, an annotated version displaying one of the wire harnesses in figure 3 is shown below:



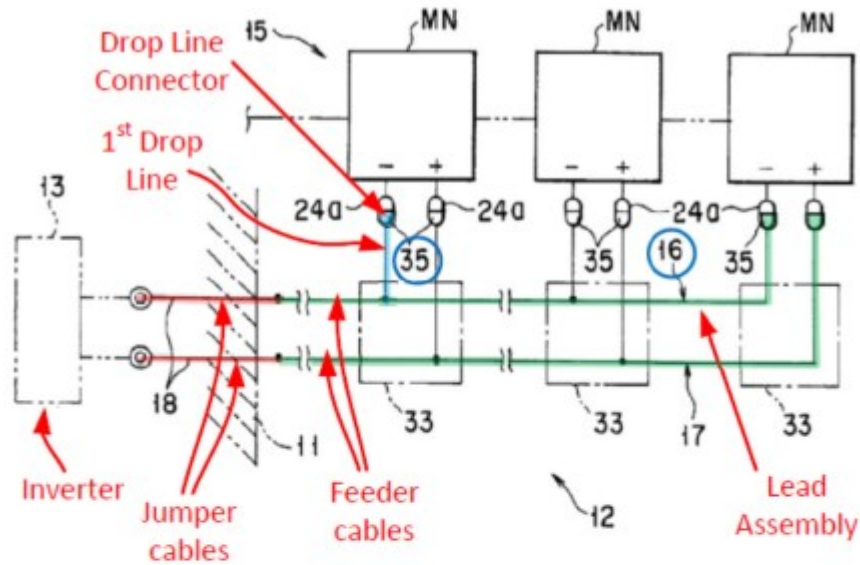
EX1006, Fig. 3 (annotated). The annotated figure 3 highlights one of the wire harnesses which includes a trunk cable (shown in dark red) and branch cables (shown in pink) where each of the branch cables connects to a separate output of four (4) solar panels (each denoted as ‘MN’). EX1006, 7:64–67. Each solar panel above includes six solar modules (i.e., the smaller rectangles grouped together to form solar panels and denoted at ‘M’). *Id.* The output from each individual solar panel is connected to a separate branch cable and then grouped to the trunk cable by way of branch junctions “J1”, “J2”, and “J3.”

144. The wire harness in Yamawaki is functionally equivalent to the wire harness shown, for example, in figure 2 of the ’153 patent. EX1001, Fig. 2. The difference in Yamawaki is that the wire harness is adjustable to conform to individual layouts of solar panels on individual rooftops. Otherwise, the

functionality of the wire harness in Yamawaki was already contemplated in the '153 patent as prior art. EX1001, Figs. 1 and 2.

145. Yamawaki acknowledges the functional equivalence to the wire harnesses in the '153 patent: “according to the present invention, there is provided a wiring apparatus, whereby the respective output terminals of a plurality of generating sections [solar panels], each including photovoltaic modules, are connected to one another . . . [so the] number of wiring apparatuses that extend from the terminals of the photovoltaic modules or module units into a building can be reduced.” EX1006, 3:16–37.

146. In contrast, Dr. Kenny—without describing any distinction between wire harnesses and lead assemblies—characterizes the wire harness in Yamawaki as a lead assembly by simply applying the terms of the '153 patent. For example, Dr. Kenny highlights the figures below with the green line indicating a “feeder cable” (actually a trunk line of a wire harness), the blue line indicating a “drop line” (actually a branch cable of a wire harness), and the connector indicating a “drop line connector” (actually a branch line connector of a wire harness connected to the output of a solar panel).



EX1006, FIG. 2 (1st-annotation)

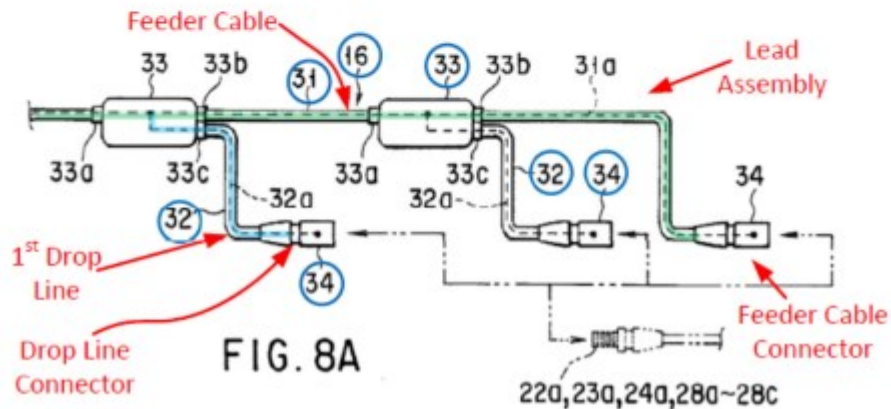


FIG. 8A

EX1006, FIG. 8A (1st-annotation)

Pet. at 104 (depicting EX1006, FIGS. 2 and 8 with annotations). As explained above with respect to the annotated version of figure 3, Yamawaki's wiring apparatus connects to individual solar panels (denoted as a collection of solar modules "M" connected to form solar panels "MN") just like the wire harness described in the '153 patent. *Cf.* EX1006, 7:64–67 with EX1001, Fig. 2. Dr. Kenny does not offer any support or explanation as to why he considers the wire harness a lead assembly given that the claims require that a lead assembly connect to wire harnesses, not solar

panels. Based on its design and function, the wiring apparatus in Yamawaki is a wire harness articulated as the first element of the first claim in the '153 patent, not a lead assembly. Therefore, Yamawaki cannot teach any of the elements of the asserted claims directed to a lead assembly. Because Yamawaki only discloses a wire harness, anything that a POSA does to modify Yamawaki with Shao is still working in the context of a wire harness, not a lead assembly as articulated in the '153 patent.

XI. GROUND 1 – SOLON 741 + YAMAWAKI

147. Voltage alleges that claims 1, 5–7, 11–14, 16, 17, and 21–24 of the '153 patent would have been obvious under 35 U.S.C. § 103 in view of the Solon '741 (U.S. Publication No. 2011/0209741) and Yamawaki (U.S. Patent No. 6,268,559.) Pet. at 17. Each of the challenged claims is valid over the asserted Solon '741 and Yamawaki combination for numerous reasons. First, Voltage and Dr. Kenny do not demonstrate that a POSA would have been motivated to modify Solon '741, or to combine Solon '741 with Yamawaki. Second, there is nothing in Solon '741 and/or Yamawaki that would support Voltage's conclusory motivations to combine the two references. And third, even if POSA was motivated to combine Solon '741 and Yamawaki, the combination still fails to teach key elements of the claims, including a "lead assembly" that is electrically connected to a "wire harness" by way of a "drop line"; an electrical connection between a feeder cable and at least two drop lines at a "nexus".

A. Nothing in Solon '741 or Yamawaki indicates that the “cover member 33f” in Yamawaki would provide additional moisture or damage protection.

148. Even if Voltage provided support for its conclusion that modifying Solon '741 with Yamawaki would provide additional moisture or damage protection (it does not), there is nothing in either Solon '741 or Yamawaki to support the conclusion. Indeed, there is no evidence that Yamawaki's branch junction (33) enjoys more moisture and damage protection than that already enjoyed by the joints taught in Solon '741.

149. Both Yamawaki and Solon '741 teach junctions that are sealed, but in different manners. Solon '741 relies on U.S. Patent No. 12/502,395 (“Solon '395”) to disclose details of the joints. EX1005, [0029]. Solon '395 represented an improvement directed to “low-leakage electrical joints and wire harnesses” for use in “solar energy utilities.” EX2004, 1:8–15. Solon '395 describes that joints are “coated in a synthetic rubber sealant” and “encased in a molded polypropylene material including a UV stabilizing agent.” EX2004, 2:1–5. Yamawaki, on the other hand, teaches very little about the branch junctions (33). The “overmold” cited by Voltage is described in Yamawaki as “cover member (33f)” as shown, for example, below:

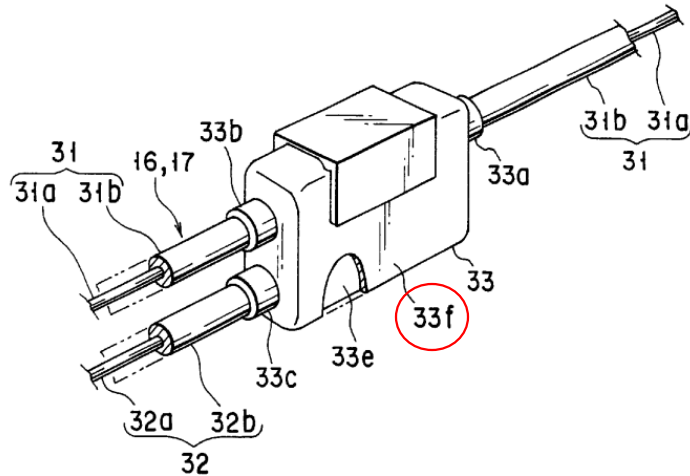


FIG. 9B

EX1006, FIG. 9B (annotated). The specification in Yamawaki describes portions of the cables 31 and 32 as being “inserted in the cable connecting portions 33a and 33b [and] thermowelded to the cover member 33f.” *Id.*, 10:35–40.

150. Voltage and Dr. Kenny appear to rely on the idea that two molds are always better than one. Pet. at 18. However, it is understood from the Solon ’395 disclosure that the engineering involved in a single mold joint is immense (EX2004, 1:27–57; 4:4–15); for example, the joint needs to be flexible without being prone to damage, strong enough to withstand installation and environmental conditions, weatherproof to resist expanding and contracting of the plastic material with weather and temperature cycles, etc. The addition of a mold does not necessarily lead to improved durability and moisture resistance as Voltage and Dr. Kenny appear to assert. Pet., 18–19. And there is nothing in Solon ’741 that would

motivate a POSA to modify the functioning, moisture-proof, low-electrical leakage design of Solon '741 with another—potentially compromising—layer.

151. Additionally, one of the benefits of the low leakage joint as described by Solon '395, is that the “novel construction [brings] substantial savings with respect to materials, know-how, and labor.” EX2004, 4:4–6. As such, a skilled artisan would not look to Yamawaki to add materials, know-how, and labor in the form of manufacturing steps and expertise to the process of constructing the joints taught in Solon '395. In other words, adding a second layer to the molded junction in Solon '741 needlessly adds to the time, expense, and expertise required to create the junctions. Nothing in Solon '741 indicates that a POSA would be motivated to add that second layer.

152. Furthermore, there is nothing to support that a POSA would have a reasonable expectation of success in modifying the joint in Solon '741 with another mold from Yamawaki. Voltage's assertion that Yamawaki would provide additional moisture or damage protection to the junctions in Solon '741 (*id.*), is not borne out by the teachings of Yamawaki. Yamawaki's discussion of moisture resistance is described not with respect to individual branch junctions (33) or the cover member (33f), but with respect to wiring apparatuses as a whole: “[The] reliability of wiring apparatuses 16 and 17 to resist penetration of water can be improved.” EX1006, 13:15–17. Yamawaki is silent with respect to additional

moisture and damage protection connected with the cover member (33f), and it is certainly not clear that the cover member (33f) would increase resistance to damage and moisture penetration already enjoyed by the junctions in Solon '741. Dr. Kenny does not offer any additional explanation and, without more, a POSA would not be motivated to add the cover member (33f) to the junctions taught in Solon '741.

B. A POSA would not look to Yamawaki's rooftop solar architecture to "simplify" the utility-scale architecture taught in Solon '741.

153. Voltage's concludes that Yamawaki's architecture "can simplify the design and construction of a solar array system." Pet., 18–19. The alleged simpler design is apparently "a hierarchical wiring design that collects power from multiple solar panels." *Id.* Voltage's assertion is unsupported and incorrect because Yamawaki discloses wiring apparatuses for use in residential rooftops and not utility-scale installations.

154. Yamawaki is designed for rooftop solar installations.² In contrast, Solon '741 describes a wire harness for use in utility-scale solar installations.

² Yamawaki's abstract includes a description of the location of solar modules by stating they "are arranged side-by-side on a roof of a building." EX1006, Abstract. Fig. 1 depicts a solar installation on a rooftop, and Yamawaki describes the solar

EX1005, ¶¶ 4–5. The difference in scale, regulatory considerations, manufacturing, levels of complexity, and design between residential and utility-scale solar installations cannot be overstated. As such, a POSA would not look to specific details in Yamawaki (e.g., the “hierarchical wiring design”) and assume that those design details would be transferrable to a utility-scale application. And Voltage does not provide any evidence or impetus for that assumption.

C. Even if there was a reason to combine Solon ’741 with Yamawaki, the combination still fails to teach many elements of the claims.

155. Even if Voltage identified a sufficient reason to combine Solon ’741 with Yamawaki (which it has not), the proposed Solon ’741/Yamawaki combination still fails to teach many of the elements required by the asserted claims of the ’153 patent. At a high level, each of Solon ’741 and Yamawaki teaches a wire harness, not a lead assembly. And any combination of the two wire

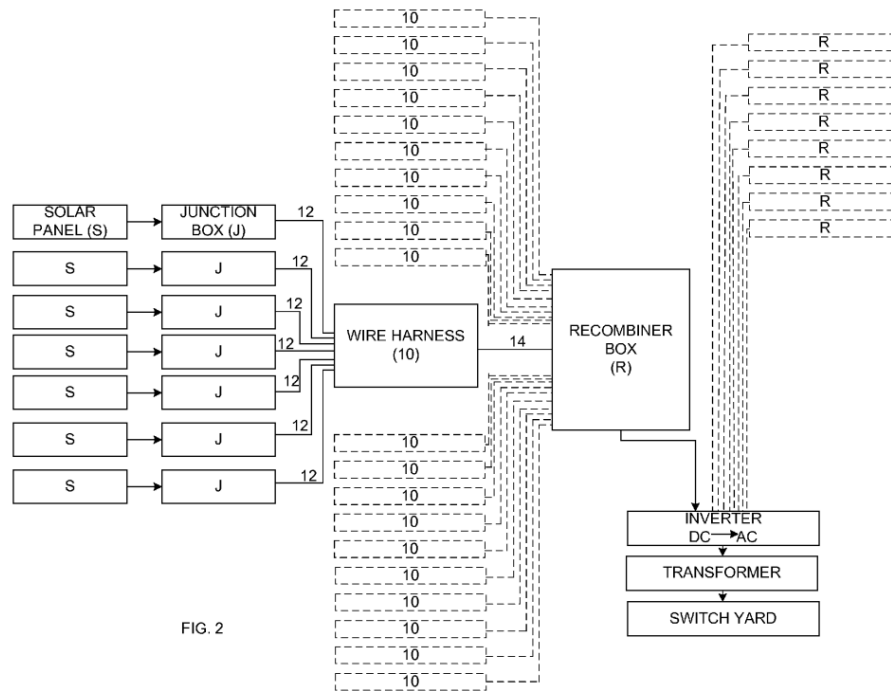
installations as being on a “roof” 13 different times in the specification. *See* EX1006. In addition, Mr. Weiner testified at the ITC hearing that Yamawaki “mentions house and building and how to get wires into a house more efficiently and in rooftop installations. I actually find it a really clever invention for residential rooftops. It addresses a real problem.” EX2003 at 1269:21–1270:4.

harnesses in Solon '741 and Yamawaki would result in another wire harness, not the lead assembly of the '153 patent.

156. Each of the independent claims of the '153 patent requires four different types of wires—branch, central trunk, drop line, and feeder cable—and two different types of electrical connections—junction and nexus. Branch and central trunk are wires associated with a wire harness (EX1001, 4:41–48), while drop line and feeder cable wires are associated with a lead assembly. *Id.* at 4:56–61. Each wire harness has a central trunk and multiple branches, each connected to a solar panel. *Id.* at 4:43–45. Each wire harness connects to the lead assembly via a drop line (*id.* at 4:46–47, 64–65), and each lead assembly can accommodate more than one drop line to allow connection to multiple wire harnesses. *Id.* at 5:2–6. The independent claims require this relationship of structures in the context of a solar power system having more than one solar array and more than one panel. *Id.* Again, the purpose of the '153 patent was not merely to simplify existing solar installation architectures; rather, the purpose of the lead assembly was to consolidate power from multiple wire harnesses without the need for a combiner box, which it achieved as discussed in greater detail above.

157. Solon '741, on the other hand, is just a wire harness. It has branches and a central trunk that meet at cross-joints, but no lead assembly and therefore no drop line to connect to the lead assembly, and no feeder cable associated with the

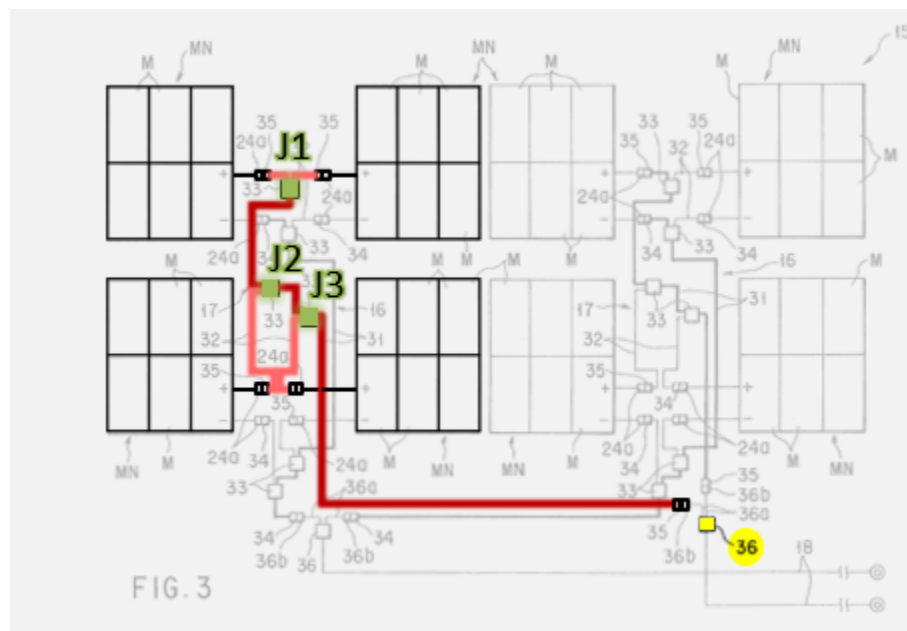
lead assembly. For example, Fig. 2 (shown below) illustrates wire harness (10) connected to individual junction boxes via branches (12) where each junction box is electrically coupled with an individual solar panel.



158. The description of Fig. 2 feeds into the description of Fig. 3 where Solon '741 states that each of those branches (12) “feed[] into one trunk (14)” (*id.* at ¶ 29), where the trunk groups power from multiple solar panels and sends the grouped power to the recombiner box. *Id.* at ¶ 27. Stated differently, Solon '741 teaches a wire harness as described by the '153 patent: branches and trunks

grouping power from individual solar panels to send to the combiner box (or recombiner box.)³ Solon '741 does not teach a lead assembly.

159. Yamawaki is functionally the same. Yamawaki discloses an adjustable wire harness (or “wiring apparatus”) for use in rooftop solar installations. Yamawaki’s wiring apparatus groups power from individual solar panels or groups of electrically connected solar modules. An example of the wire harness is shown in Yamawaki with respect to Fig. 3, an annotated version of Fig. 3 is shown below:



EX1006, Fig. 3 (annotated.) The annotated Fig. 3 highlights one of the wire harnesses which includes a trunk cable (shown in dark red) and branch cables (shown

³ Functionally, the wire harness in Solon '741 is the same as the wire harnesses depicted in the '153 patent.

in pink) where each of the branch cables connects to a separate output of four solar panels (each denoted as ‘MN’) EX1006, at 7:64–67. Each solar panel above includes six solar modules (*i.e.*, the smaller rectangles grouped together to form solar panels and denoted at ‘M’). *Id.* The output from each individual solar panel is connected to a separate branch cable and then grouped to the trunk cable by way of branch junctions “J1”, “J2”, and “J3.” EX2003, 1272:15–20.

160. The wire harness in Yamawaki is functionally equivalent to the wire harness shown, for example, in Fig. 2 of the ’153 patent. Cf. EX1006, Fig. 3 with EX1001, Fig. 2. The difference in Yamawaki is that the wire harness is adjustable to conform to individual layouts of solar panels on individual rooftops. EX2003, 1273:23–1274:1–5. Otherwise, the functionality of the wire harness in Yamawaki was already contemplated in the ’153 patent as prior art. EX1001, Figs. 1–2.

Yamawaki acknowledges as much: “according to the present invention, there is provided a wiring apparatus, whereby the respective output terminals of a plurality of generating sections [solar panels], each including photovoltaic modules, are connected to one another . . . [so the] number of wiring apparatuses that extend from the terminals of the photovoltaic modules or module units into a building can be reduced.” EX1006, at 3:16–37.

161. The same structure cannot satisfy both the branch limitation and the drop line limitation because the independent claims require different things from

each. The branch structures connect solar panels to a wire harness, but the drop line connects that same wire harness to a lead assembly. Similarly, the central trunk of the wire harness cannot simultaneously meet both the central trunk limitation and the feeder cable limitation. The independent claims treat them as distinct structures, connected by a drop line. *See, e.g.*, EX1001, cl. 1; 4:38–48.

162. Both Solon '741 and Yamawaki thus fail to teach the “feeder cable,” “drop line,” and “second drop line” structures required by the independent claims of the '153 patent, and therefore also fails to disclose all the structures that interact with them, including the “nexus” of elements b(iii) and b(iv) where the feeder cable and the two drop lines are electrically connected, the “primary mold” of elements b(iv)(1)–(3) that encases the nexus of feeder cable and drop lines, the “first aperture” of element b(iv)(1) through which the feeder cable extends, the “second aperture” of element b(iv)(2) into which the drop line partially extends, and the “third aperture” of element b(iv)(3) into which the second drop line extends.

163. To circumvent the apparent deficiencies in its argument, Voltage points to Yamawaki, Figs. 4, 5, and 6 and states:

Although Solon741 does not explicitly state that the drop line connectors from each drop line are connected to a central trunk of another wiring assembly (i.e., a wiring harness), Yamawaki teaches coupling wire harnesses to other wire harnesses and cable assemblies to pass current from multiple panels to a common connection.

Pet. at 21. However, Figs. 4, 5, and 6 similarly fail to disclose a wire harness connected to a lead assembly. Instead, Figs. 4, 5, and 6 demonstrate various ways of wiring a number of solar modules together to form a solar panel.⁴ EX1006, 6:10–21; 8:20–9:2. What Voltage analogizes to a “lead assembly” (i.e., wiring apparatuses 16 and 17) remain wire harnesses, they still just group outputs from individual solar panels. Nothing in Yamawaki teaches a wiring apparatus with a feeder cable and drop lines, where the drop lines connect to central trunks of wire harnesses, thereby consolidating power from multiple solar arrays.

164. Indeed, not only does Yamawaki fail to disclose a wiring apparatus consolidating power from multiple wire harnesses, connecting the wire harnesses of Yamawaki together would overload the wire harnesses and lead to failure. Yamawaki, an adjustable wire harness for rooftop systems, and Solon ’741, a wire harness with a maximum wire gauge size of eight (EX1005, ¶ 29), cannot handle current and voltage generated from multiple solar arrays. As such, a POSA would not look to combine Solon ’741 and Yamawaki to create the invention of the ’153

⁴ Figs. 4, 5, and 6 are each described as “a circuit diagram showing a wiring structure . . . having photovoltaic modules connected [in parallel/in series/by means of alternative wiring apparatuses].” EX1006, 6:10–21.

patent or even to solve the identified problem of the '153 patent—eliminating the combiner box—because doing so would certainly lead to overloading the cables, melting the harnesses, and causing fires in the solar installation.

165. In sum, even if a POSA did combine Solon '741 and Yamawaki, the combination would result in another wire harness, not a lead assembly. Further, if the combination was used to solve the problem solved by the lead assembly in the '153 patent, the resulting structure would fail under the currents and voltages consolidated from multiple solar arrays. Thus, the combination of Solon '741 and Yamawaki does not render obvious claims 1, 5–7, 11–14, 16, 17, and 21–24 of the '153 patent.

XII. FAILURE TO PROVE INDEFINITENESS AND WRITTEN DESCRIPTION (GROUND 8)

166. Voltage alleges that each of claims 1–24 is unpatentable under 35 U.S.C. § 112 both for failure to meet the written description requirement and as being indefinite. Pet. at 137. Voltage's written description argument hinges on whether the specification provides support for multiple drop lines extending "only partially" through the undermold/primary mold. Its definiteness argument focuses on whether a POSA would be able to determine—with reasonable certainty—whether the aperture extends only partially or completely through the undermold/primary mold. *Id.* at 15–16. The specification clearly supports various embodiments with multiple drop lines extending partially through the

undermold/primary mold. Based on the description included in the specification, a POSA would be able to determine whether an aperture extends partially or completely through the undermold.

A. The specification and prosecution history teach two drop lines made of a single wire.

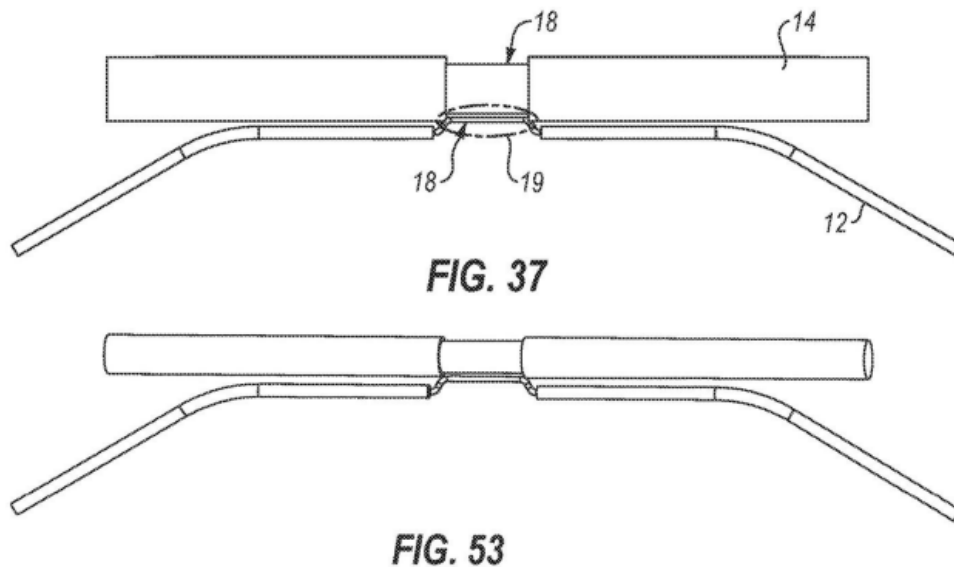
167. Voltage proposes a construction for the term “aperture” that is not supported by the specification and then asserts that there is no written description support for its proposed construction. *See* Pet. at 14; 141. Voltage’s claim construction is not consistent with the ALJ’s holding in the Markman order,⁵ nor is it consistent with the specification of the ’153 patent. Voltage’s construction of aperture requires, without citing to intrinsic evidence, that the aperture correspond

⁵The Markman Order construes “aperture” as: “entire pathway of the [**feeder cable or drop line**] within the [undermold or primary mold], when viewed as if the [*feeder cable or drop line*] were removed.” EX1017, p. 41 (emphasis added.) Indeed, as the Markman Order points out, as of the Markman hearing, at least, everyone agreed—including Voltage—that “multiple drop lines ... may ... be comprised of a single cable.” *Id.* at 49. Voltage’s new position is directly contrary to what they agreed to then.

to an entire “cable” or “wire” rather than associated drop lines/feeder cables as recited in the claims. *Cf.* Pet. at 14 *with* EX1001, cls. 1, 21, and 24.

168. Construed properly, there is no basis for asserting that the term “aperture”, “partially extending”, and “completely extending” lack written description support in the ’153 specification as shown, for example, below.

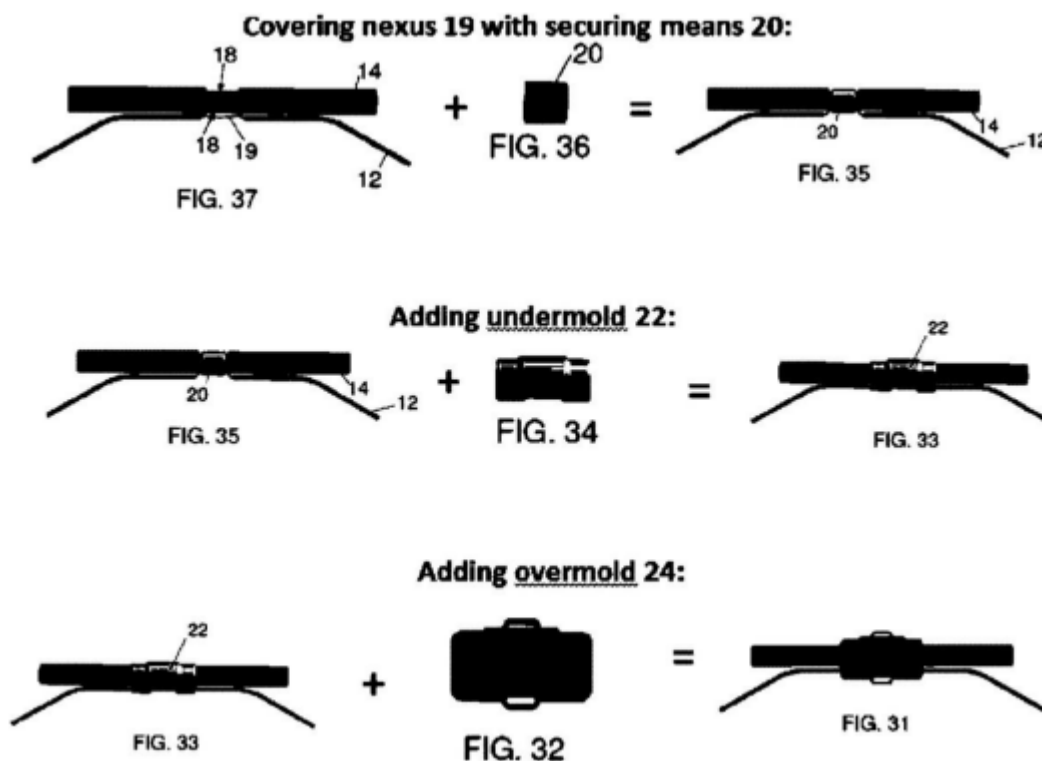
169. The ’153 patent explicitly makes clear that a single wire can form two drop lines, which is contrary to Voltage’s claim construction for “aperture.” For example, the ’153 patent describes both Figure 37 and Figure 53, reproduced below, as: “a dual drop lead assembly ... with wires exposed at nexus.”



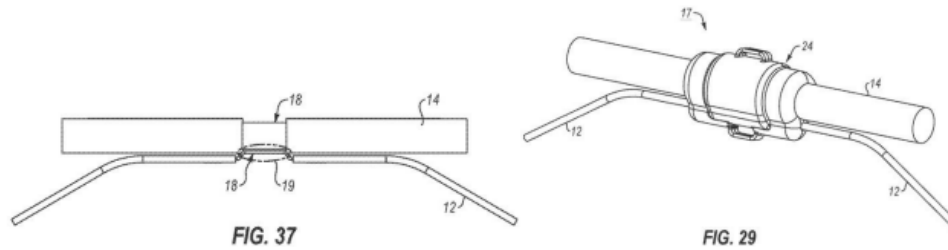
EX1001 at 3:16–17, 52–53. Indeed, during prosecution of the parent ’254 patent, the examiner observed that Figure 37 (among others) shows “two drop lines ... joined

to a feeder cable at the nexus.” EX1021 at 290. And both figures show a single wire forming the two drop lines.

170. The obvious progression was expressly shown during prosecution of the parent ’254 patent:



EX1021 at 233. The specification text makes clear that Figure 29 is an alternative view of the endpoint of that same progression. *See* EX1001 at 4:58–61 (“As shown in FIG. 35, the drop line and feeder cable are held together by compression lug 20, which is surrounded by undermold 22 (FIG. 33), which is surrounded by overmold 24 (FIG. 29).”) Thus Figure 37 becomes Figure 29 by successively adding compression lug 20, undermold 22, and overmold 24:



As noted above, the specification expressly describes Figure 29 as having “dual drop lines,” each of which is labeled “12” in the Figure. *Id.* at 5:4. And Figure 37 shows only one drop-line wire. Thus, the patent teaches two drop lines formed of a single wire.

171. In addition, the specification expressly articulates a one-to-one correlation between drop lines and solar array wire harness connections: “each drop line is connected to a solar array”; “each drop line includes a drop line connector for fast and easy connection to the wire harness”; “[e]ach drop line 12 terminates in drop line connector 13, which connects drop line 12 to wire harness connector 35.” EX1001, Abstract; 2:9–11; 4:64–65. The patent counts drop lines by counting the number of wire harness connections, with each connection corresponding to one drop line, not by counting the number of wires that the drop lines are made of. Further underscoring the distinction between wires/cables and the drop lines they form, during prosecution of the parent ’254 patent the examiner also repeatedly referred to “the wires/conductor used to form the drop lines and feeder cables.” EX1002 at 196, 201, 232, 289, 295.

172. Finally, the claim language expressly ties the second and third apertures to drop lines, not cables. Thus, claim 1 recites “a second aperture ... wherein the drop line extends from the second aperture” and “a third aperture ... wherein a second drop line extends from the third aperture”; claim 21 recites “a second ... wherein the drop line extends into the second aperture” and “a third aperture ... wherein the second drop line extends into the third aperture”; and claim 24 recites “a second aperture ... wherein the drop line extends into the second aperture” and “a second drop line ... wherein the second drop line extends into a third aperture.”

173. The intrinsic evidence conclusively establishes a firm distinction between wires/cables and the drop lines they form; and it demonstrates that a single wire may form two distinct drop lines—each with its own partially extending aperture. In contrast, Voltage’s construction of aperture⁶ lacks any support in the specification; indeed, the specification flatly contradicts Voltage’s proposed construction with several figures identifying two drop lines made from a single cable.

⁶ “A 3-D hole (i.e., the entire pathway for a cable in the [undermold/primary mold]) that exists when viewed as if the entire cable is removed.” Pet. at 14–15.

B. Voltage has not satisfied its burden to prove the claims invalid for indefiniteness.

174. Voltage also argues that each of the claims is invalid for indefiniteness based on supposed uncertainty about precisely where drop lines end. *See*, Pet. at 142–150. In support of its assertions, Voltage manufactures several “tests” which are meant to illustrate that the ’153 patent and prosecution history “leave a POSITA to speculate as to . . . whether an ‘aperture’ extends partially through (or completely through) the [undermold/primary mold].” *Id.* at 142.

175. Here, the claim construction of aperture, *supra*—which is the same as the construction from the ALJ in the ITC Markman Order (EX1017, p. 41)—provides reasonable certainty as to whether the drop-line apertures extend partially or completely through a mold. For the drop-line apertures, Shoals’ proposed construction (consistent with the ITC Markman Order) is: “the entire pathway of the drop line within the undermold or primary mold, when viewed as if the drop line were removed.” *Id.* Thus, the aperture extends no farther than the combination of mold and drop line; once either the mold or the drop line ends, so too does the aperture.

176. Furthermore, it is clear from the intrinsic record that the drop lines end somewhere within the mold. Multiple experts at the ITC hearing also agreed including, Mr. William Brooks (one of Shoals’ technical experts at the ITC) and Dr. Kimberly Cameron (one of Voltage’s experts at the ITC) who each testified

that the drop line ends somewhere within the nexus. EX2003 at 548:7–11 (Mr. Brooks testifying the ends of each drop lines is somewhere in the nexus); 1127:14–1128:4; 1158:13–1160:17 (Dr. Cameron, Voltage’s expert, indicating the drop lines end somewhere in the nexus.)

177. Whether or not the aperture—i.e., the drop-line pathway within the mold—stops where the nexus starts, it cannot continue farther than the drop line itself. Each drop line ends within the nexus and “does not go out the other side regardless of what the wire does.” EX2003 at 530:14–15. The nexus, in turn, is fully encased by the undermold (independent claim 1 and claims depending therefrom) or primary mold (independent claims 21 and 24, and dependent claim 23). It follows, inescapably, that the drop line does not extend completely through the mold; therefore, its pathway (aperture) cannot continue completely through the mold, either. Voltage’s expert, Dr. Cameron, made the point well: “So we already know that we have the drop line and the feeder cable that are electrically coupled at the nexus, and we know that we have an undermold that fully encases the nexus.” EX2003 at 1070:9–13.

178. Voltage’s only argument against this testimony is its theory that the drop line is the entire cable. As shown above, its contention is not correct. With that issue resolved, no dispute remains as to whether the drop line ends within the

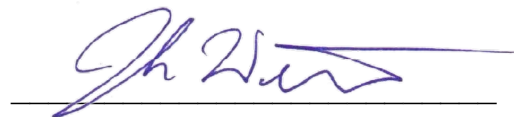
nexus. Once that is settled, there can be no dispute that the drop-line aperture extends only partially through the undermold.

179. In sum, with the proper construction of aperture and armed with expert agreement from both Voltage and Shoals at the ITC that the drop line ends somewhere within the nexus, the claims read in light of the specification provide a POSA with an understanding of the scope of the claims.

XIII. DECLARATION

I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

DATED: July 11, 2024



Joshua Weiner