



Petitioner's Demonstratives

**AFFORDABLE WIRE MANAGEMENT, LLC v.
CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND HANDICAPPED, INC.**

Case No. IPR2024-00178, U.S. Patent No. 11,349,291

January 22, 2025



DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

1

Agenda

- **Overview**
- Background
 - Instituted Grounds
 - Challenged Claims
 - Prior Art
- Claim Construction
- Grounds
 - Carr and Almy
 - Caveney
 - Caveney and Almy
- Secondary Considerations



Overview

- CAB's proposed claim constructions are irrelevant
- There is motivation to combine hanger prior art (Carr, Caveney) with solar plant messenger wire hanger system (Almy)
- Ground 3
 - Undisputed that combination of Carr and Almy discloses all limitations
- Grounds 1 and 2
 - Combination discloses or teaches the challenged limitations, including “messenger wire”
- Undisputed that all dependent claims are disclosed by the prior art
- No nexus for secondary considerations

Agenda

- Overview
- **Background**
 - Instituted Grounds
 - Challenged Claims
 - Technology Background & Prior Art
- Grounds
 - Carr and Almy
 - Caveney
 - Caveney and Almy
- Secondary Considerations



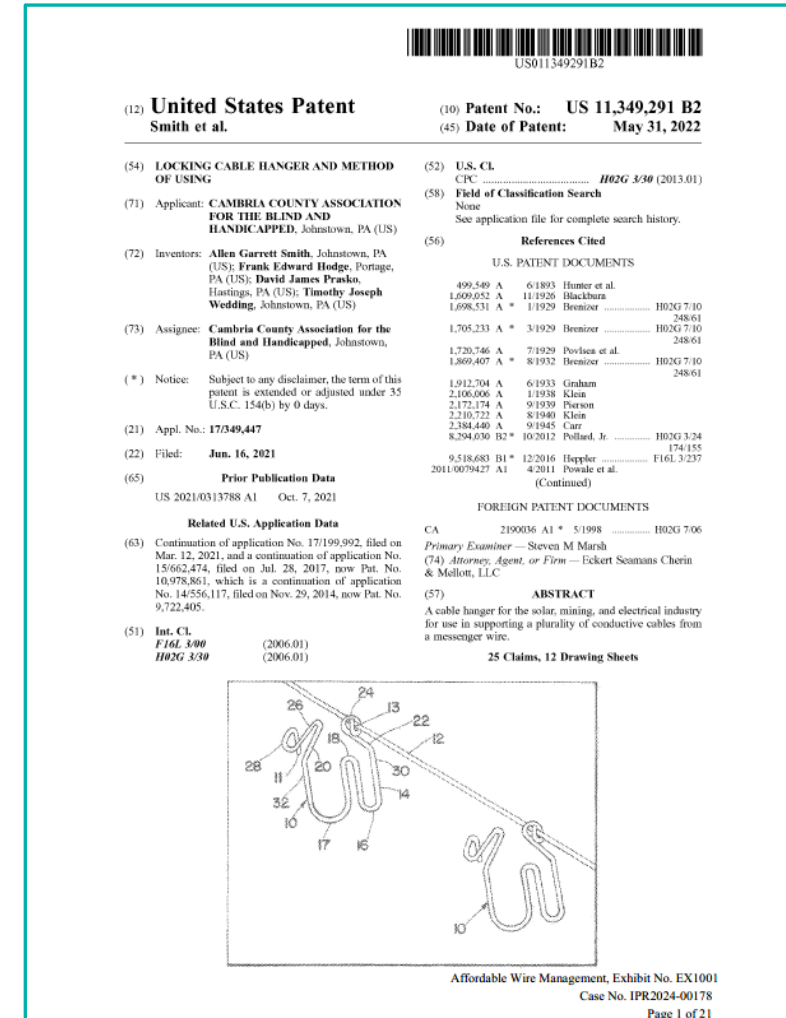
Instituted Grounds

'291 patent	Claim(s)	Basis
Ground 1	1-5, 9-10	§ 103 Obviousness over Caveney in view of the knowledge of a POSITA
Ground 2	14-18, 21-22	§ 103 Obviousness over Caveney and Almy in view of the knowledge of a POSITA
Ground 3	1–10, 14–22, 24, 25	§ 103 Obviousness over Carr and Almy in view of the knowledge of a POSITA



'291 Patent

- Priority date: November 29, 2014
- Discloses messenger wire based cable hanger systems for use in the solar, mining, and electrical industry to support electrical cables
- Independent claims:
 - A system for organizing electrical cables (AC, DC, and communications cables) comprising hangers disposed along and suspended from a messenger wire
- All independent claims (1, 6, 14, 19, and 24) challenged across all three grounds
- Dependent claims include limitations directed to orientation of cable carrier divider, and more
 - CAB does not dispute the additional limitations of the dependent claims are met

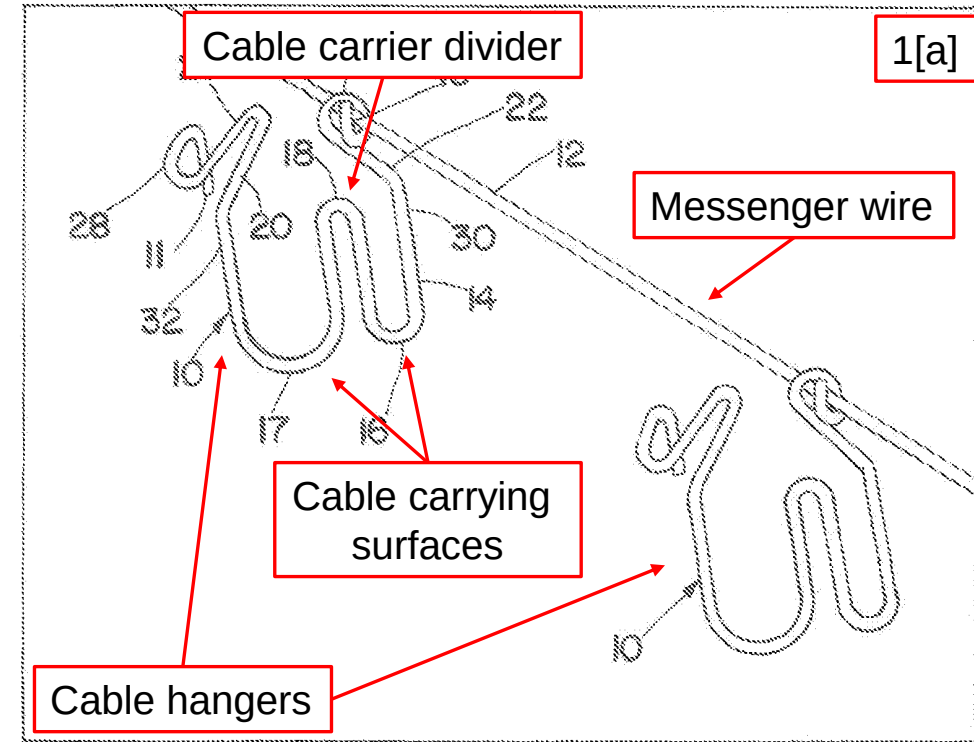


EX1001

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition 15-18

'291 Patent: Claim 1

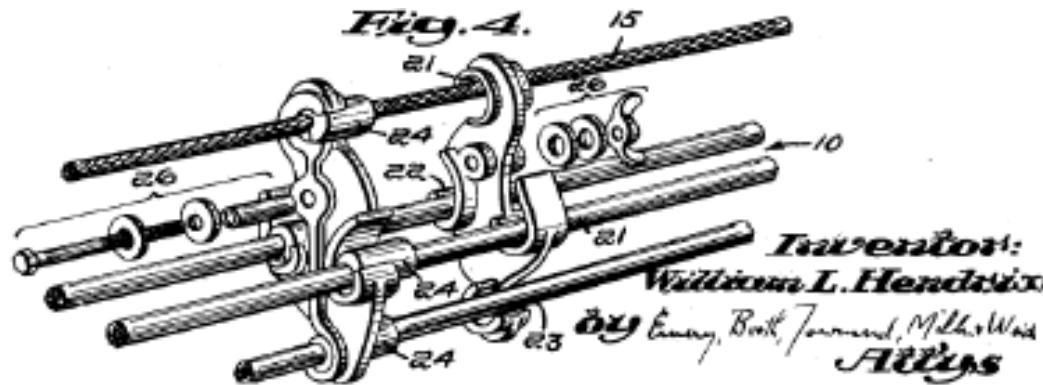
- 1[a] A system for organizing a plurality of electrical cables extending from a plurality of solar panels, the system comprising:
- 1[b] a messenger wire structured to be supported a distance above the ground; and
- 1[c] a plurality of cable hangers structured to be disposed along, and suspended from, the messenger wire, each cable hanger having a plurality of cable carrying surfaces, each cable carrying surface being structured to support at least one electrical cable of the plurality of electrical cables,
- 1[d] wherein adjacent cable carrying surfaces of the plurality of cable carrying surfaces are separated by a cable carrier divider.



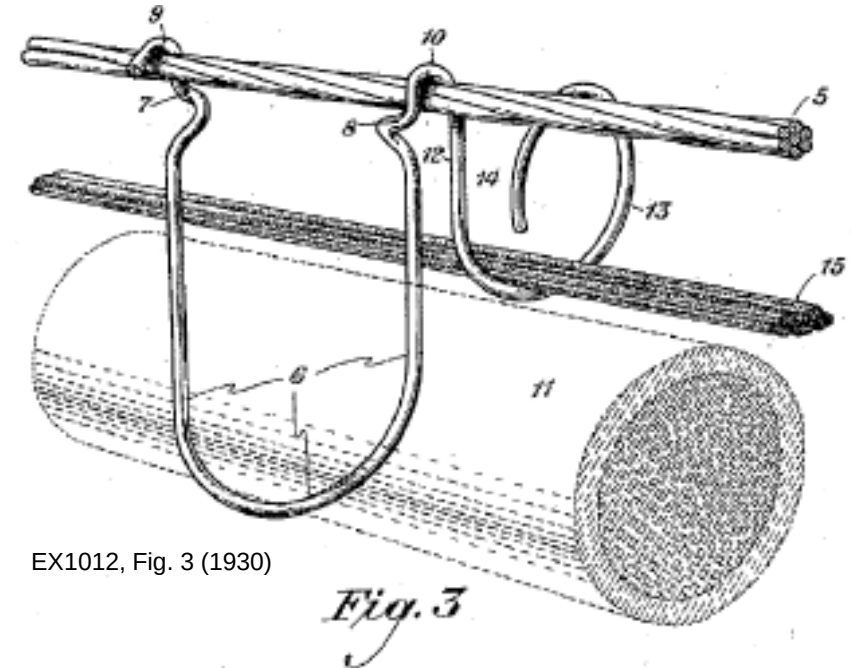
EX1001, Fig. 1 (annotated)

Technology Background

- CAB's technology is far from new
- For nearly a century, cable hangers and messenger wires have been used to support electrical cables in many industries



EX1013, Fig. 4 (1955)



EX1012, Fig. 3 (1930)

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Petition, 3-8

Technology Background

- Decades-old art taught that messenger wires with rings and saddles for conductor support should be used in solar arrays, were widely available, and cost effective

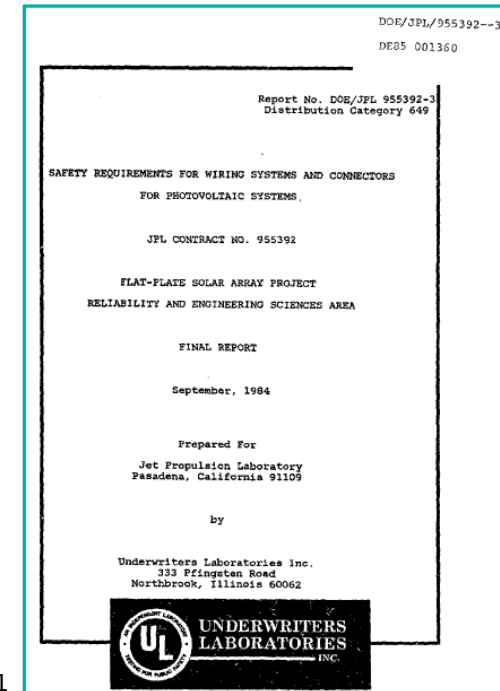
5.19 Article 321 - Messenger Supported Wiring

Messenger supported wiring is an exposed wiring support system using messenger wire to support insulated conductors by any one of the following: (1) a messenger with rings and saddles for conductor support; (2) a messenger with a field-installed lashing material for conductor support; (3) factory-assembled aerial cable; or (4) multiplex cables utilizing a bare conductor, factory-assembled and twisted with one or more insulated conductors such as duplex, triplex or quadruplex type of construction.

Messenger supported wiring is widely used as: (1) service-drop cable for the utility supply to commercial and residential properties; and (2) overhead runs between buildings. The materials used in messenger supported wiring systems are readily available and comparatively inexpensive.

A practical PV application of messenger supported wiring may be for terrestrial arrays located away from the building. For such installations located in areas where burial of the conductors is not easily accomplished (such as rocky terrain), messenger supported wiring could be utilized for the PV output circuit conductors.

EX1007, 39



EX1007, 1

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Petition, 3-8

Affordable Wire Management, Exhibit No. EX1060

Case No.: IPR2024-00178

Page 9 of 81

Technology Background

- Governing codes, such as the NEC, which “guide and constrain” a POSITA, taught the solar industry to use messenger supported wiring systems

ARTICLE 396 Messenger-Supported Wiring

I. General

396.1 Scope. This article covers the use, installation, and construction specifications for messenger-supported wiring.

396.2 Definition.

Messenger-Supported Wiring. An exposed wiring support system using a messenger wire to support insulated conductors by any one of the following:

- (1) A messenger with rings and saddles for conductor support
- (2) A messenger with a field-installed lashing material for conductor support
- (3) Factory-assembled aerial cable
- (4) Multiplex cables utilizing a bare conductor, factory assembled and twisted with one or more insulated conductors, such as duplex, triplex, or quadruplex type of construction

“PV system designers and installers, while seeking to lower both manufacturing and construction costs, **are guided and constrained** by these NEC safety codes as well as structural codes.” EX2038 ¶ 37 (Kern Declaration) (emphasis added).

ARTICLE 690 Solar Photovoltaic Systems

IV. Wiring Methods

690.31 Methods Permitted.

(A) Wiring Systems. All raceway and cable wiring methods included in this *Code* and other wiring systems and fittings specifically intended and identified for use on photovoltaic arrays shall be permitted. Where wiring devices with integral enclosures are used, sufficient length of cable shall be provided to facilitate replacement.

EX1009, 241)

EX1009, 579

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 3-8

10

Technology Background

- All experts agree that in 2014 there were increasing types of electrical cables and NEC changes led to greater focus on separating different types of cables

“Changes to the 2014 NEC, however, for the first time required that AC and DC cables be separated from each other in PV arrays. . . . With the increased size of solar power plants and the increased use of more sophisticated trackers came the increased need in solar installations for signal wiring and data cabling for monitoring and communicating data from the PV array.”

EX2038 ¶¶ 56-57 (Kern Decl.)

“[N]ew NEC requirements specifically require[ed] separation of AC and DC cables.”

EX2033 ¶ 47 (Brooks Decl.)

“[T]he 2014 NEC—which went into effect January 1, 2014—required AC and DC cables to be separated in a hanging or support system.”

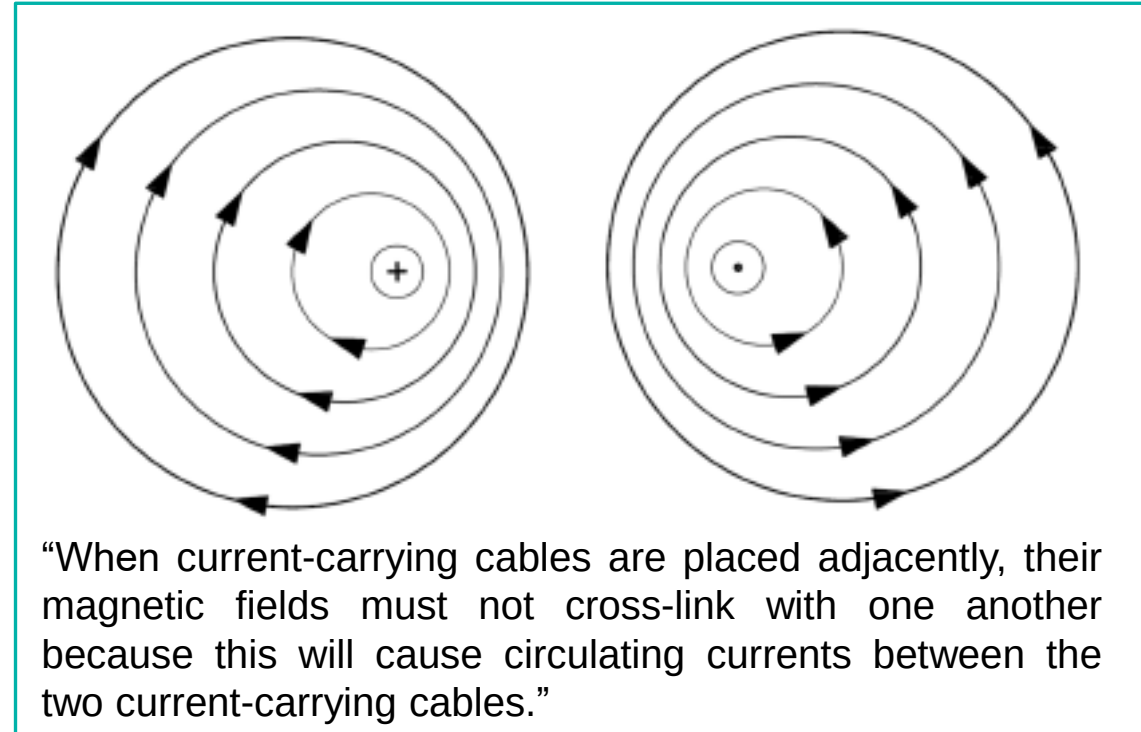
EX1002 ¶ 32 (Beik Decl.)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 3-8
Petitioner Reply, 10-11

11

Technology Background

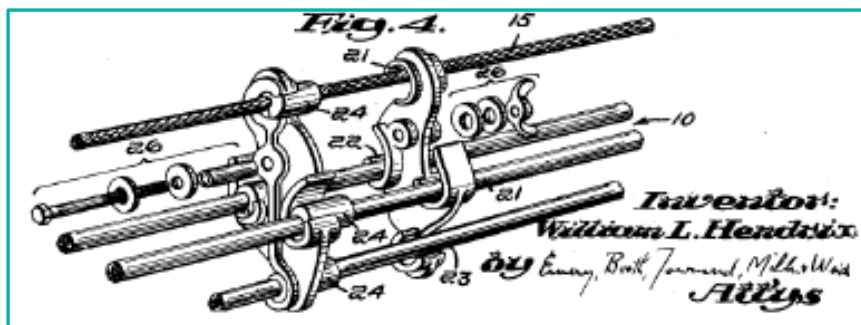
- These increasing numbers of cables presented a problem well known to a POSITA
- Long known in the field that bundling AC, DC, and data carrying cables together could cause problems, e.g., cross-induction



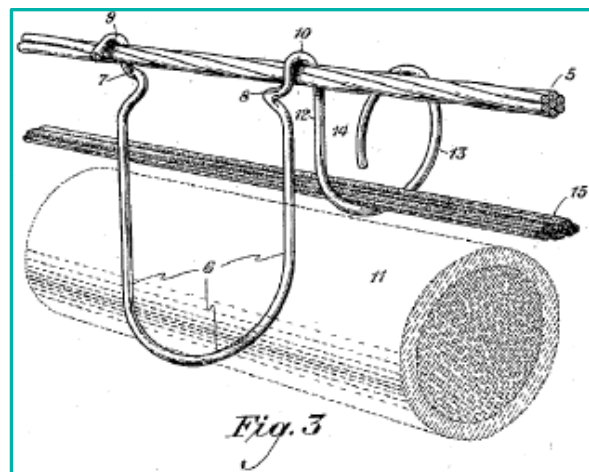
EX1002 ¶ 32 (Beik Decl.)

Technology Background

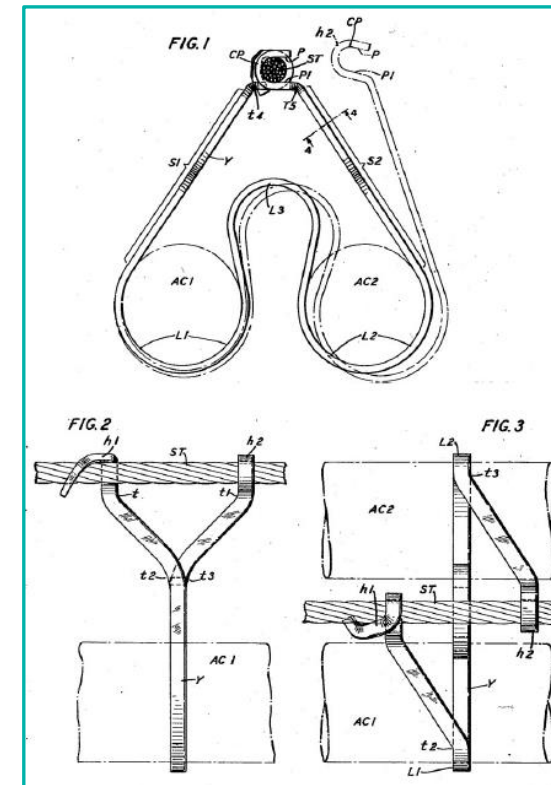
- For decades, related industries had addressed cross-induction using messenger supported systems of the kind claimed in the '291 patent



EX1013, Fig. 4



EX1012, Fig. 3



EX1005, Figs. 1-3

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 3-8

13

Technology Background

- Inventor got the idea to use messenger supported wiring systems, using cable rings and saddles to organize cables, from a customer

Q And why did you become involved in the solar industry in 2012?

A We had a phone call asking if we had a product line for the solar industry and up until that point, I never even thought about solar.

...

Q So they saw CAB's hangers and messenger and other cable supporting things and decided to call to see if you had anything that they could use in the solar industry; is that fair?

A Right.

...

Q ***Prior to getting that call from SunPower***, had CAB at all been considering entering the solar market?

A No.

Q So this call kind of kicked off CAB's move into the solar market?

A It started us looking at the solar market.

EX1028, 17:18-19:15 (Smith Dep.) (emphasis added)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 11-13

14

Prosecution History

- Against this backdrop, CAB proposed an allegedly new use (in solar) for known technology
- The claims were allowed for one reason, and one reason alone: one inventor declaration
- Without any support, the inventor told the PTO that messenger wire based cable hanger support systems were never used in solar as of the priority date

Prosecution History

Regarding claim 1, Applicant discloses that the prior art discloses a system for organizing a plurality of electrical cables extending from a plurality of solar panels; a messenger wire structured to be supported a distance above ground; and a plurality of cable hangers structured to be disposed along, and suspended from, the messenger wire (see pages 2 and 3 of the specification). The prior art does not disclose the cable hangers as comprising a plurality of cable carrying surfaces, each cable carrying surface being structured to support at least one electrical cable of the plurality of cables.

Because both the prior art disclosed by Applicant and Carr disclose cable hangers for supporting a plurality of cables on a messenger wire, it would have been obvious to one ordinary skill in the art at the effective filing date of the present invention, to substitute one cable hanger for the other, to achieve the predictable result of a plurality of cable hangers, each able to support a plurality of cables from a messenger wire in a side by side arrangement..

- Rejection based on Carr and applicant's disclosures of messenger wire based cable support systems in the specification

EX1015, 151–152

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 18-20

16

Prosecution History

4. I am an inventor of the subject matter claimed in the above-captioned patent application, and I have reviewed in detail, and am thus familiar with, the specification of the above-captioned patent application. I have also reviewed the Examiner's allegation on Page 3 of the Office Action of 12/16/2021 that "Applicant discloses that the prior art discloses a system for organizing a plurality of electrical cables extending from a plurality of solar panels; a messenger wire structured to be supported a distance above ground; and a plurality of cable hangers structured to be disposed along, and suspended from, the messenger wire (see pages 2 and 3 of the specification)." Such allegation made by the Examiner is incorrect. While the discussion provided in the BACKGROUND OF THE INVENTION section of the specification (which encompasses pages 2 and 3 of the specification as well as portions of pages 1 and 4) discusses "solar, mining, and electrical industries", the references contained in such section to any use of known/existing cable hanger systems (i.e., systems utilizing a messenger wire and hangers suspended therefrom) or portions thereof (i.e., messenger wire, hanger(s)) were to arrangements and/or components thereof used in the mining and/or electrical (i.e., utility pole to utility pole) industries. Whereas any references to the use of arrangements or portions thereof in regard to the solar industry were not to any publicly known/available arrangement by any other(s) as none existed at such time. Instead, such references were to CAB's own testing/development which were undertaken non-publicly/confidentially and/or within one year from the filing date of the patent application from which the present application claims priority.

- Inventor asserted that disclosures in specification regarding messenger wire based systems being used in solar were non-public testing and development by CAB

EX1015, 202

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 18-20

17

Prosecution History

- Applicant overcame objection by arguing that messenger wire based systems were never used in solar as of the priority date
 - This assertion was **wrong** and never corrected by the inventor or applicant
- Had the examiner been presented with the art in the petition, claims would not have issued

the specification).” It is respectfully submitted that such contention is incorrect. As discussed in the declaration from inventor Allen Garrett Smith submitted herewith, **no such system(s)/components related to solar applications existed in the art prior to Applicant’s development thereof.** As such, any portions of the specification that the Examiner has interpreted to refer to applications involving solar applications are incorrect or merely refer to the Applicant’s own activities that were either non-public developmental/testing activities and/or occurred less than one year from the priority date to which the present application is entitled. Hence, the Examiner’s contention that the Applicant has disclosed that “the prior art discloses a system for organizing a plurality of electrical cables extending from a plurality of solar panels; a messenger wire structured to be supported a distance above ground; and a plurality of cable hangers structured to be disposed along, and suspended from, the messenger wire” is incorrect.

EX1015, 211

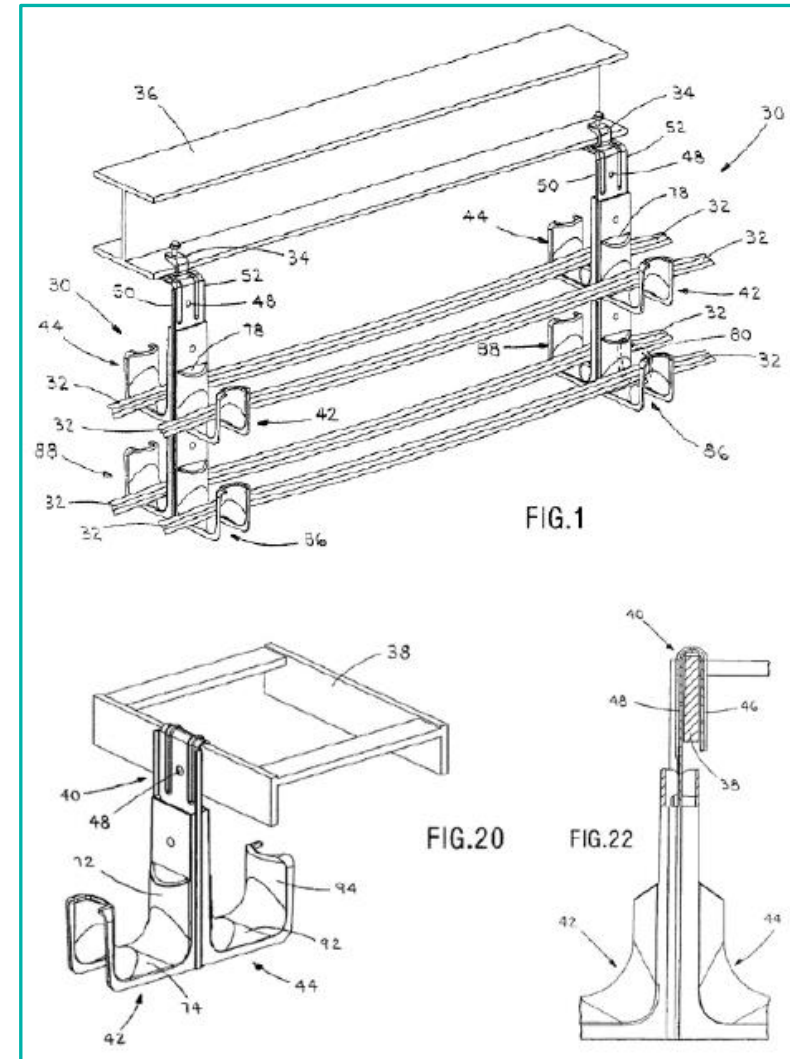
DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 18-20

18

Prior Art: Caveney (Ex. 1003)

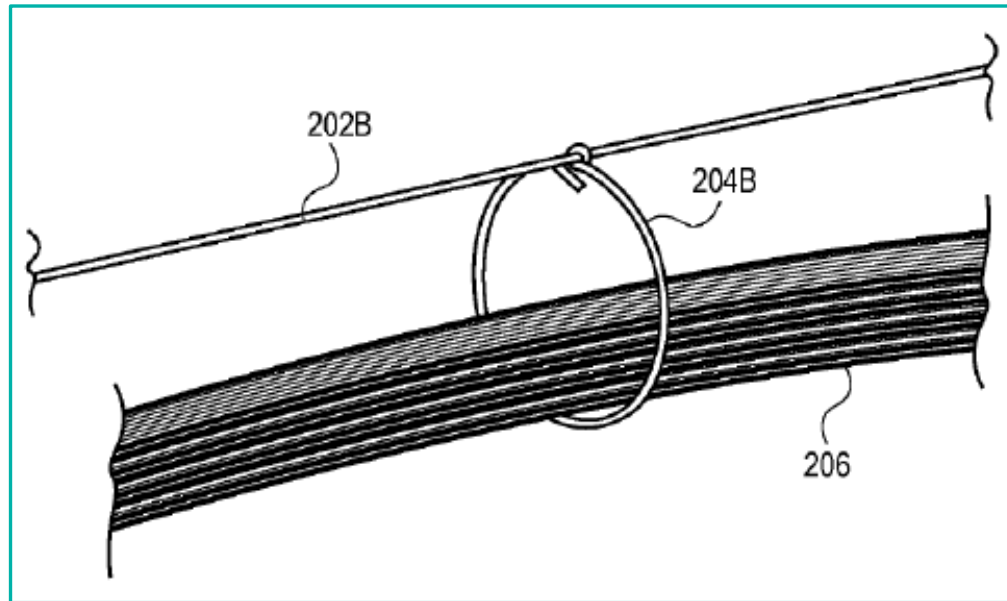
- Teaches a cable support and organization system comprising cable hangers suspended from a variety of structures
- Organizes and separates electrical cables
- Published June 17, 2004
- Not cited or considered during prosecution

EX1003, Figs. 1, 20, 22

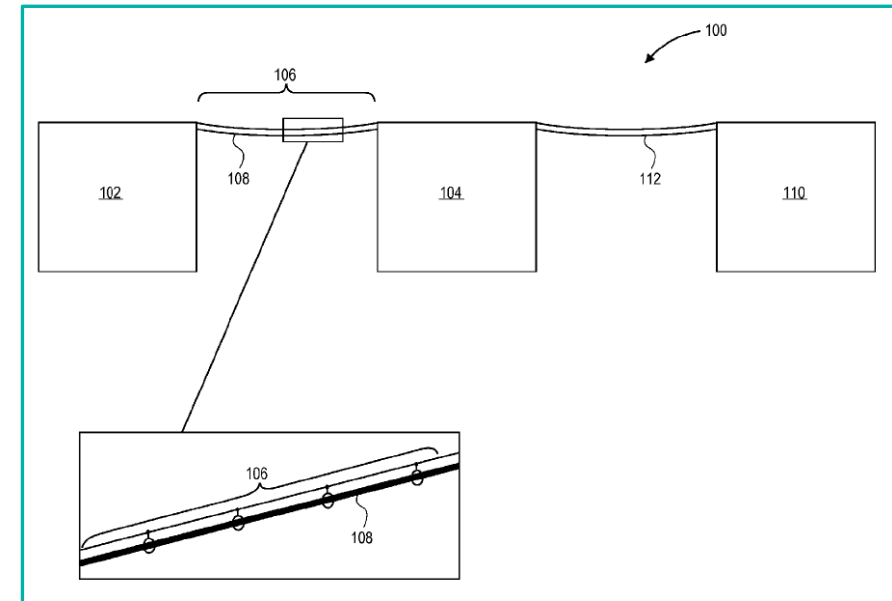


Prior Art: Almy (Ex. 1004)

- Discloses a messenger wire and cable hanger system for use with solar panels in solar plants
- Published June 10, 2010
- Not cited or considered during prosecution



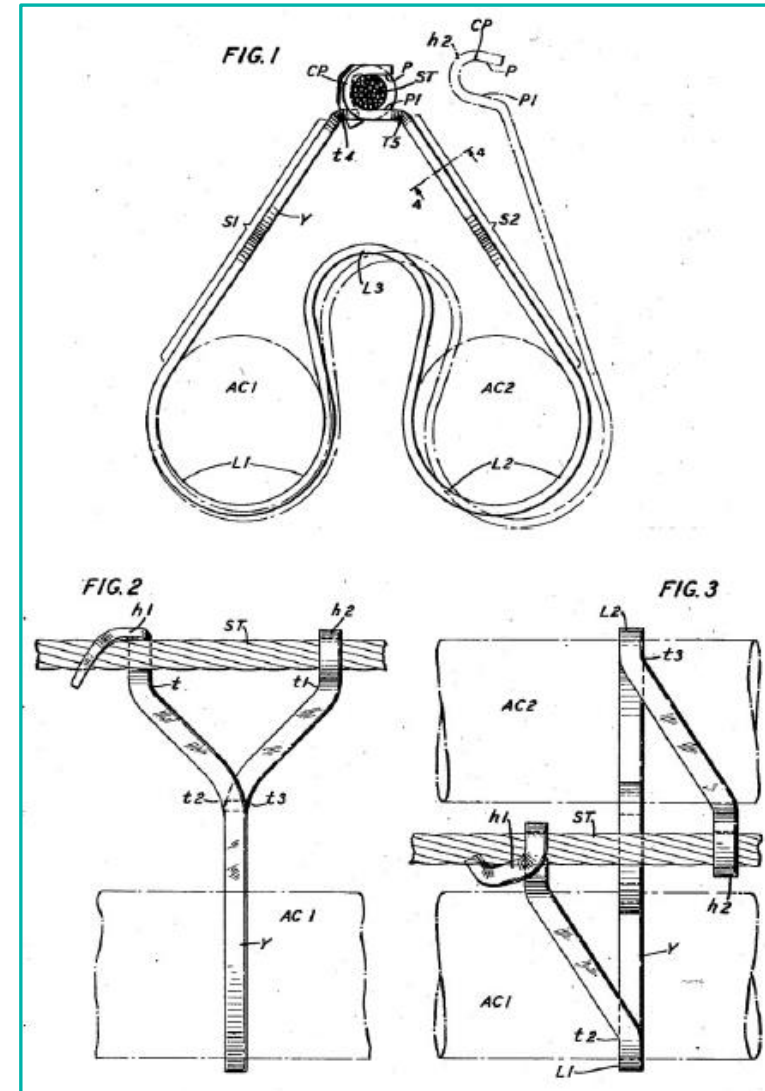
EX1004, Figs. 1, 2B



DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 13-15

Prior Art: Carr (Ex. 1005)

- Teaches a cable hanger for the suspension of conductor cables from a messenger wire
- Organizes and separates electrical cables
- Issued as U.S. Patent No. 2,384,440 on September 11, 1945



EX1005, Figs. 1-3

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 10-13

21

Agenda

- Overview
- Background
 - Instituted Grounds
 - Challenged Claims
 - Prior Art
- **Claim Construction**
- Grounds
 - Carr and Almy
 - Caveney
 - Caveney and Almy
- Secondary Considerations



Claim Construction

- CAB raises two claim construction issues:
 - Limiting preambles
 - Meaning of “organizing”
- Both proposed constructions are wrong
- More importantly, neither claim construction is relevant to deciding this IPR: CAB does not apply either construction
- CAB concedes that “electrical cables” are not limited to just AC and DC power cables

Claim Construction

- Preambles are not limiting
- The bodies of the claims disclose all structural elements, and the preambles merely define the surrounding environment
- “[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art’s functioning, does not render the old composition patentably new to the discoverer.” *Atlas Powder Co. v. IRECO Inc.*, 190 F.3d 1342, 1347 (Fed. Cir. 1999).

1[a] A system for organizing a plurality of electrical cables extending from a plurality of solar panels, the system comprising:

1[b] a messenger wire structured to be supported a distance above the ground; and

1[c] a plurality of cable hangers structured to be disposed along, and suspended from, the messenger wire, each cable hanger having a plurality of cable carrying surfaces, each cable carrying surface being structured to support at least one electrical cable of the plurality of electrical cables,

1[d] wherein adjacent cable carrying surfaces of the plurality of cable carrying surfaces are separated by a cable carrier divider.

EX1001, Claim 1

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 15-32

24

Claim Construction

- Regardless of stated use in preamble, prior art structures that are ***capable of performing the intended use*** meet the claim.

“Schreiber's contention that his structure will be used to dispense popcorn does not have patentable weight if the structure is already known, regardless of whether it has ever been used in any way in connection with popcorn.”

In re Schreiber, 128 F.3d 1473, 1477 (Fed. Cir. 1997).

- CAB agrees:

“For CAB’s system to practice the ‘291 invention, it is only necessary that each of the hangers’ cable-carrying surfaces be ***structured to*** support at least one electrical cable extending from solar panels. It is irrelevant whether the end-user underutilizes the claimed hanger.”

Regardless, the photograph shows that the carrying surfaces of the cable hangers are ***structured to support*** electrical cables extending from solar panels. It is not necessary that the photograph show that the cables are actually connected to the solar panels.

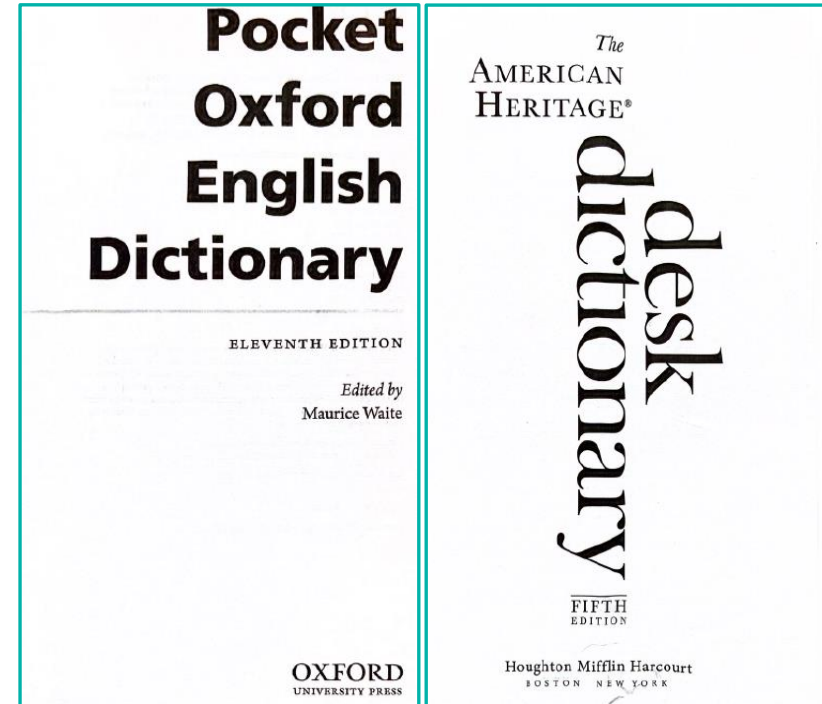
Patent Owner's Sur-Reply, 3, 15 (emphasis in original).

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 3-4

25

Claim Construction

- “Organizing” is not the same as “separating”
- Not a term of art – dictionary definitions are instructive
 - Organize means “1. To put together into an orderly, functional, structured whole. 2. To arrange in a coherent form; systematize.” EX1052, 3.
 - Organize means “arrange in an orderly way.” EX1053, 3.



EX1052, 1

EX1053, 1

Claim Construction

- “Organizing” is not the same as “separating”
- Dr. Kern acknowledges these common sense definitions of “organizing”: separating is just one way to organize

“I believe that in the context of extending from a plurality of solar panels pretty much defines the cables as being the DC power cables. And when you're dealing with DC power cables, as I said earlier, good practice is to organize. And one way to organize is to separate.”

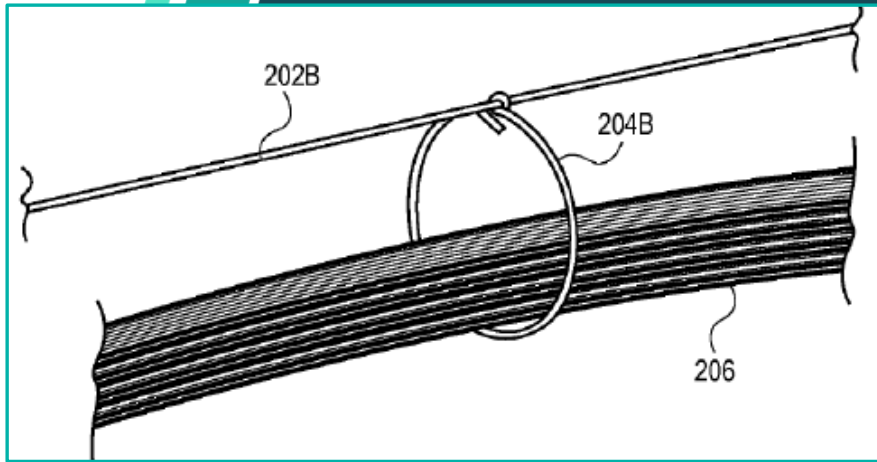
EX1047, 102:14-19 (Kern Dep.)

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 - Carr and Almy
 - Caveney
 - Caveney and Almy
- Secondary Considerations





Ground 3: Carr and Almy

- CAB's only apparent argument: motivation to combine
- CAB concedes all other issues
 - No dispute that Carr and Almy disclose all limitations of the challenged claims
 - No application of claim constructions

[REDACTED]

Ground 3: Carr and Almy

- Petitioner's proposed combination: obviousness over Carr and Almy in view of the knowledge of a POSITA
- Almy provides the missing link that was not before the examiner:
 - Messenger wire and hanger cable support system used in solar
- Two motivations to combine:
 - Organizing AC, DC, and data cables would have been required due to increasing amount of cabling and NEC change in 2014; and
 - Improving Almy's wire-based wire way with Carr's robust multi-saddle hanger would have been a natural (and obvious) step

Ground 3: Carr and Almy

- Industry developments at the time of the invention, and a POSITA's knowledge of them, confirm motivation at the priority date to improve the teachings of Almy with Carr's hangers
 - Increasing amount and types of cables in solar arrays
 - 2014 NEC changes

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Petition, 5-8, 42-49

Petitioner Reply, 11-13

32

Affordable Wire Management, Exhibit No. EX1060

Case No.: IPR2024-00178

Page 32 of 81

Ground 3: Carr and Almy

- Dr. Omid Beik, Assistant Professor, Colorado School of Mines
- Ph.D., electrical and computer engineering (McMaster University)
 - Focus: renewable energy systems and their integration to the electric power grid
- Co-author, “Wind and Solar Power Systems: Design, Analysis, and Operation”, CRC Press, 2021
- Research focus: power electronics and renewable energy systems



DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Petition, 21
EX1002 ¶¶ 6-18

33

Ground 3: Carr and Almy

- POSITA's knowledge of industry developments confirm motivation to improve the teachings of Almy with Carr's hangers:

Combining the teachings of Carr and Almy would have involved routine implementation, would have posed no technical risk given their complementary teachings, and would have achieved predicable benefits of improving wire runs in solar installations by separating conductors and implementing a more robust hanger. ... [W]ire loops are not able to provide the required distance between sets of cables for both current-carrying and non-current-carrying to prevent cross-linking as set forth by IEEE Standard 142, and NEC Rule 235G.

...
[A]s Carr teaches, there is a benefit to multi-surface hangers "to minimize the cross induction effect between the cables." EX1005, 1:27-34. The spaced multi-surface approach is also advantageous for separating data cables from current-conducting cables.

EX1002 ¶ 98-99 (Beik Decl.)

"With tracking came the need for both powering the mechanical tracking devices and for data signals from panel orientation, irradiance, wind speed, fault conditions such as ground faults, and temperature sensors within the array field, and for signals to the mechanical tracking devices to control their positioning. The increased use of tracking devices, therefore, resulted in the increased use of AC cables to power the devices, as well as the increased use of signal wiring, or data wiring, to monitor and communicate data within the PV solar array."

EX2038 ¶ 42 (Kern Decl.)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Petition, 45-47
Petitioner Reply, 11-13

34

Ground 3: Carr and Almy

- A POSITA would have been aware that messenger supported cable management systems were cost efficient and appropriate for solar

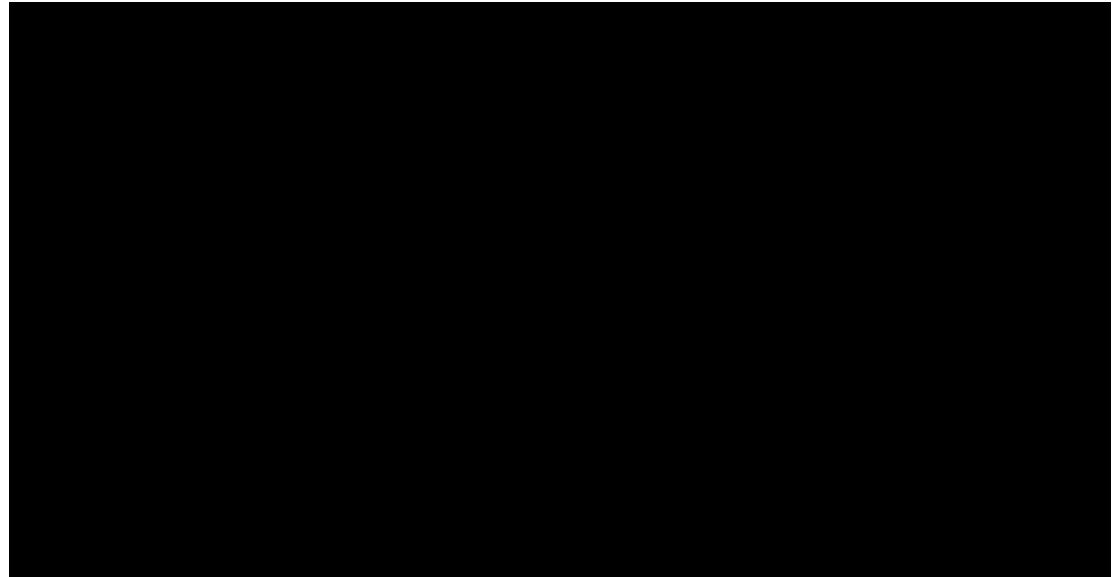
Messenger supported wiring is widely used as: (1) service-drop cable for the utility supply to commercial and residential properties; and (2) overhead runs between buildings. The materials used in messenger supported wiring systems are readily available and comparatively inexpensive.

A practical PV application of messenger supported wiring may be for terrestrial arrays located away from the building. For such installations located in areas where burial of the conductors is not easily accomplished (such as rocky terrain), messenger supported wiring could be utilized for the PV output circuit conductors.

EX1007, 39

“Because cable organization and support was a problem common to a variety of industries, a POSITA looking to organize a plurality of electrical cables extending from a plurality of solar panels would have also looked to cable management solutions in the electrical industry.”

EX1002 ¶ 101 (Beik Decl.)



EX2011, 5

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 45-47
Petitioner Reply, 11-13

35

Ground 3: Carr and Almy

- PV system designers and installers are “guided and constrained by these NEC safety codes as well as structural codes.” EX2038 ¶ 37 (Kern Declaration)
- The NEC motivated the combination

“Changes to the 2014 NEC, however, for the first time required that AC and DC cables be separated from each other in PV arrays. . . . With the increased size of solar power plants and the increased use of more sophisticated trackers came the increased need in solar installations for signal wiring and data cabling for monitoring and communicating data from the PV array.”

EX2038 ¶¶ 56-57 (Kern Decl.)

“[N]ew NEC requirements specifically require[ed] separation of AC and DC cables.”

EX2033 ¶ 47 (Brooks Decl.)

“[T]he 2014 NEC—which went into effect January 1, 2014—required AC and DC cables to be separated in a hanging or support system.”

EX1002 ¶ 32 (Beik Decl.)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 45-47
Petitioner Reply, 11-13

36

Ground 3: Carr and Almy

- Motivation to use messenger wire and hanger based cable support systems in solar is confirmed by the inventor
- Almy's correspondence address is SunPower

Q And why did you become involved in the solar industry in 2012?

A We had a phone call asking if we had a product line for the solar industry and up until that point, I never even thought about solar.

...

Q So they saw CAB's hangers and messenger and other cable supporting things and decided to call to see if you had anything that they could use in the solar industry; is that fair?

A Right.

...

Q **Prior to getting that call from SunPower**, had CAB at all been considering entering the solar market?

A No.

Q So this call kind of kicked off CAB's move into the solar market?

A It started us looking at the solar market.

EX1028, 17:18-19:15 (Smith Dep.) (emphasis added)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 11-13

37

Ground 3: Carr and Almy

- Improving Almy's wire-based wire way with Carr's robust multi-saddle hanger would have been a natural (and obvious) step
- Almy's hangers are loops made of the same material as the messenger wire, while Carr's hangers are an improvement over weaker hangers and made of "laminated steel" having considerable "hardness and resiliency" and able to withstand "relatively great tension" without "deformation"

"A POSITA would have recognized the disadvantages of using wire loops to suspend conductors from a messenger wire. Bundling cables with zip-ties, cable-ties, or other lashings such as wire loops provide temporary solutions but cannot be used permanently in power systems."

EX1002 ¶ 98 (Beik Decl.)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Petition, 42-47

Petitioner Reply, 11-13

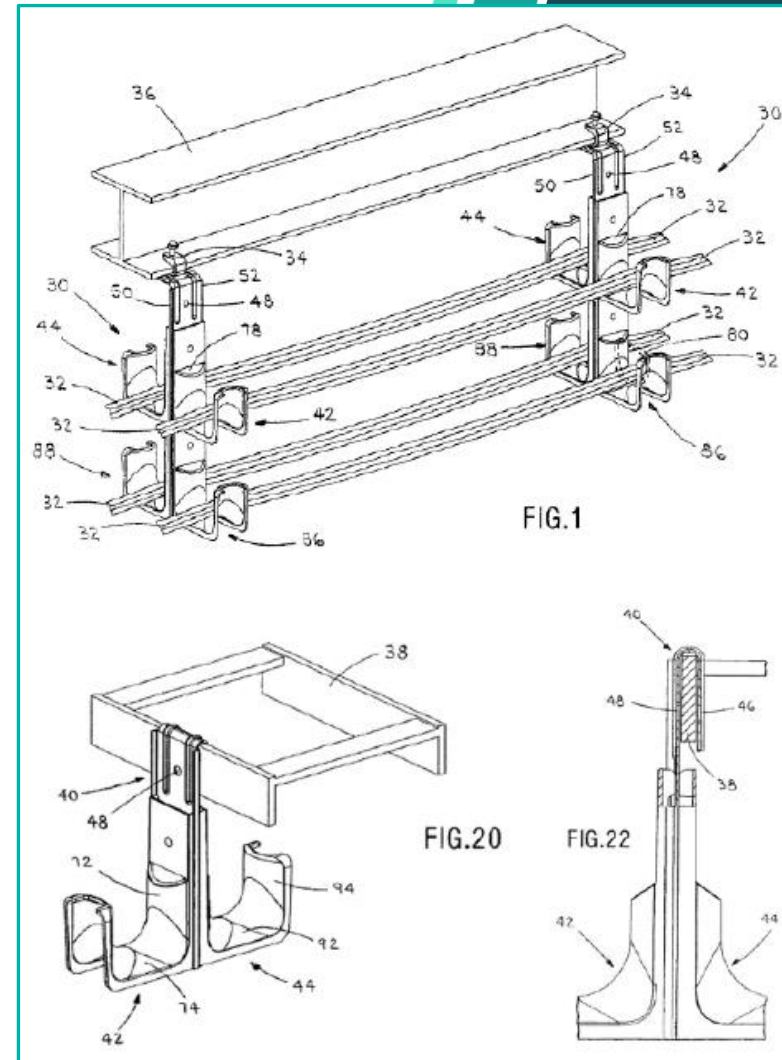
38

Affordable Wire Management, Exhibit No. EX1060

Case No.: IPR2024-00178

Page 38 of 81

Ground 1: Caveney



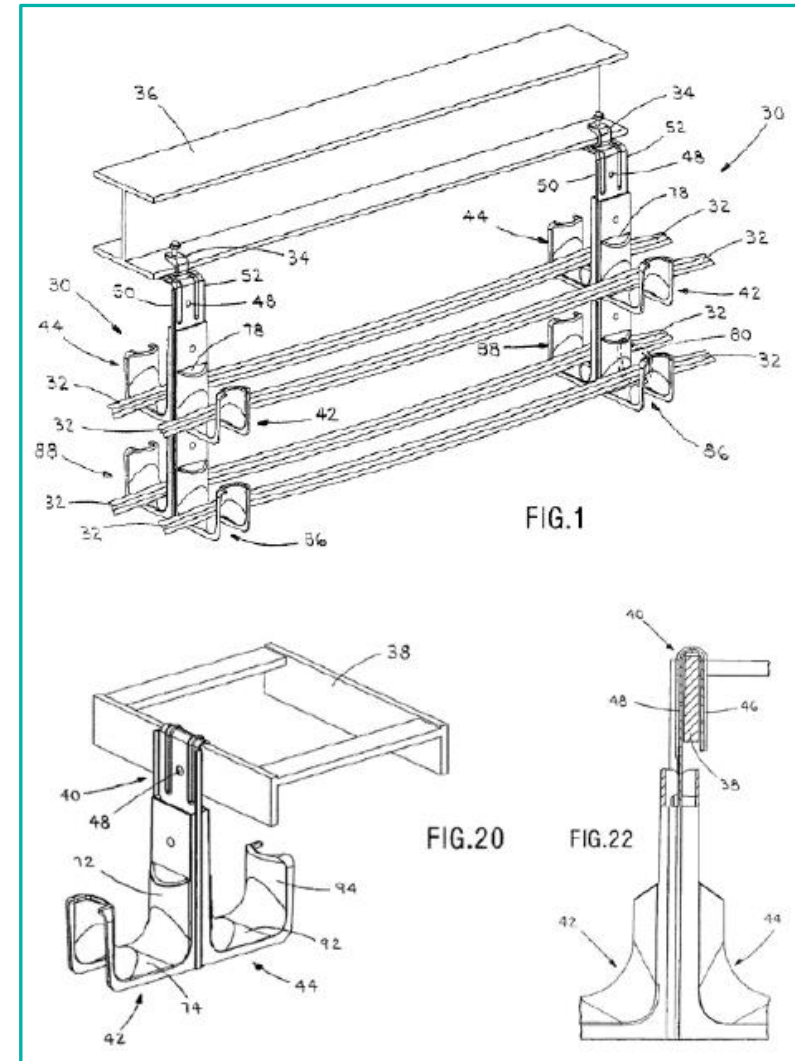
DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

39

Ground 1: Caveney

- Single reference obviousness based on Caveney
- CAB does not dispute that Caveney discloses nearly all elements of the claims
- CAB criticizes just two aspects of the ground
 - Motivation to use Caveney in solar
 - Disclosure of a “messenger wire”

EX1003, Figs. 1, 20, 22



Ground 1: Caveney

- CAB challenges motivation to use Caveney in solar because Caveney allegedly only teaches hangers that attach to pre-existing building structures
- Caveney discloses a “ladder rack” embodiment, which is not a pre-existing building structure—as Dr. Kern explained, it is a cable support system

“A ladder rack is a structure to support cables. It is not a structure to support the building itself.... The ladder rack is a cable support system.... Similar to a cable tray. And as a matter of fact, I'm not sure I can distinguish between ladder rack and cable tray.”

EX1047, 117:5-120:5 (Kern Dep.)

Ground 1: Caveney

- As discussed with respect to Ground 3, increased amounts and types of cables in solar arrays, as well as the 2014 NEC change, would have motivated a POSITA to choose hangers with multiple cable carrying surfaces
- Caveney is from a related industry and is readily adaptable for use with a messenger wire

The issue of cable management has long existed before the solar power system in the electrical power distribution. A POSITA looking to organize a plurality of cables in solar panels would have looked to cable management solutions in other electrical industries because cable organization and support was a problem common to a variety of electrical industries at the time of the invention.

EX1002, ¶ 55 (Beik Decl.)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petition, 21-35

42

Ground 1: Caveney

- Caveney is broadly directed to “supporting high-performance cables.”
- POSITA would have looked to prior art cable management systems such as Caveney to address the similar challenges of cable support and management in the solar industry.

57. The cable hanger taught by *Caveney* can be utilized to hang any kind of cable, including cables used with solar installations. *Caveney* is broadly directed to “supporting high-performance cables.” EX1003, 2:62-64. Using the *Caveney*’s cable hanger to organize cables extending from solar panels would have yielded predictable results and reasonable expectation of success because (i) *Caveney* offers a hanger and support system that is adjustable and thus allows a POSITA to move the hangers to satisfy the IEEE Standard 142 and National Safety Code Rule 235G for vertical spacing between conductive cables, (ii) it would have been obvious to a POSITA to use multiple cable hangers where there was a need for multiple sets of cables when paralleling solar panels, and (iii) solar power systems use cables that are common in the electrical power distribution industry.

EX1002 ¶ 57 (Beik Decl.)

Ground 1: Caveney

- CAB also challenges Caveney's disclosure of a "messenger wire"
- Caveney discloses "structures" as a broad and open-ended term
 - Discloses a "ladder rack" embodiment, which, like a messenger wire, is a cable support system
- Teaches that Caveney's hangers can directly attach to a wide variety of contemplated structures--in fact, ANY structure.
- This disclosure is clearly broad enough to encompass a messenger wire.

As shown in FIG. 20, cable support system 30 **may be attached directly to a structure, such as ladder rack 38**. However, it is likewise contemplated that cable support system 30 **may be secured directly to any** fastener or **structure, including but not limited to** a threaded rod, a screw-on beam clamp bracket, a hammer-on beam clamp bracket, a C-purlin bracket, a Z-purlin bracket, a drop wire bracket, a floor support post bracket, a ladder rack bracket, a joist, a ceiling or a wall.

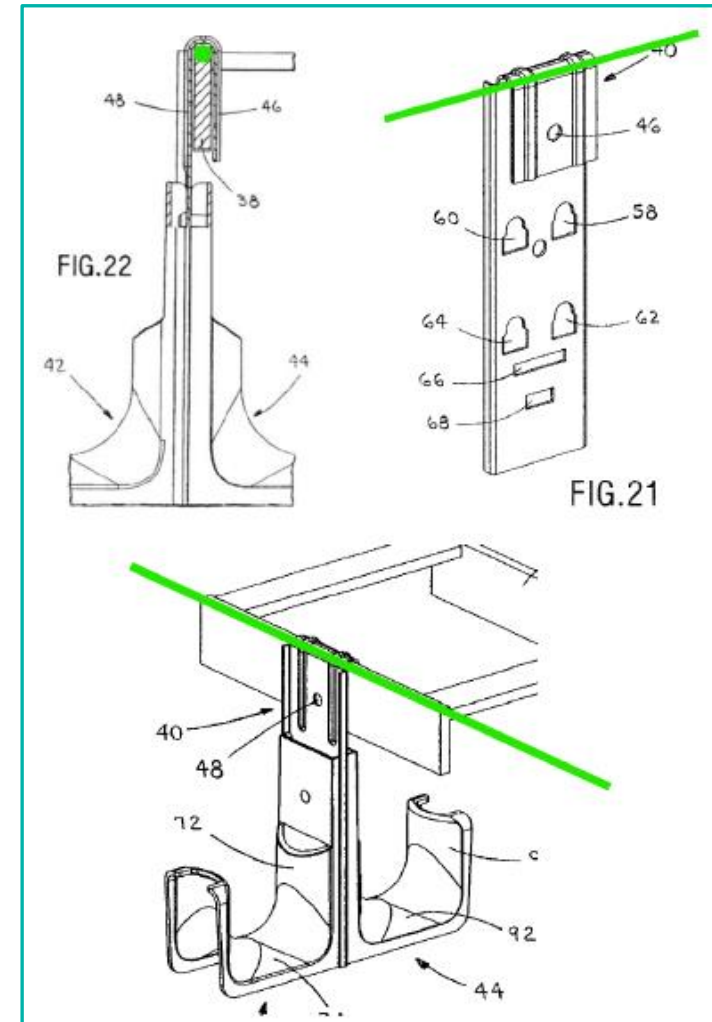
EX1003, 2:65-3:9 (emphasis added)

Ground 1: Caveney

- A POSITA would have understood that a “messenger wire” is a type of structure as disclosed by Caveney
- Evidenced by the ladder rack embodiment

“In other words, *Caveney’s* cable hanger can be easily adapted to attach to any number of structures and doing so would have been trivial to a POSITA. As just one example, a POSITA would understand that the ladder rack attachment disclosed in Figs. 20-22 would easily be configured to attach to a messenger wire.”

Petition, 26



EX1003, Figs. 1, 20, 22 (annotated)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Petition, 21-35

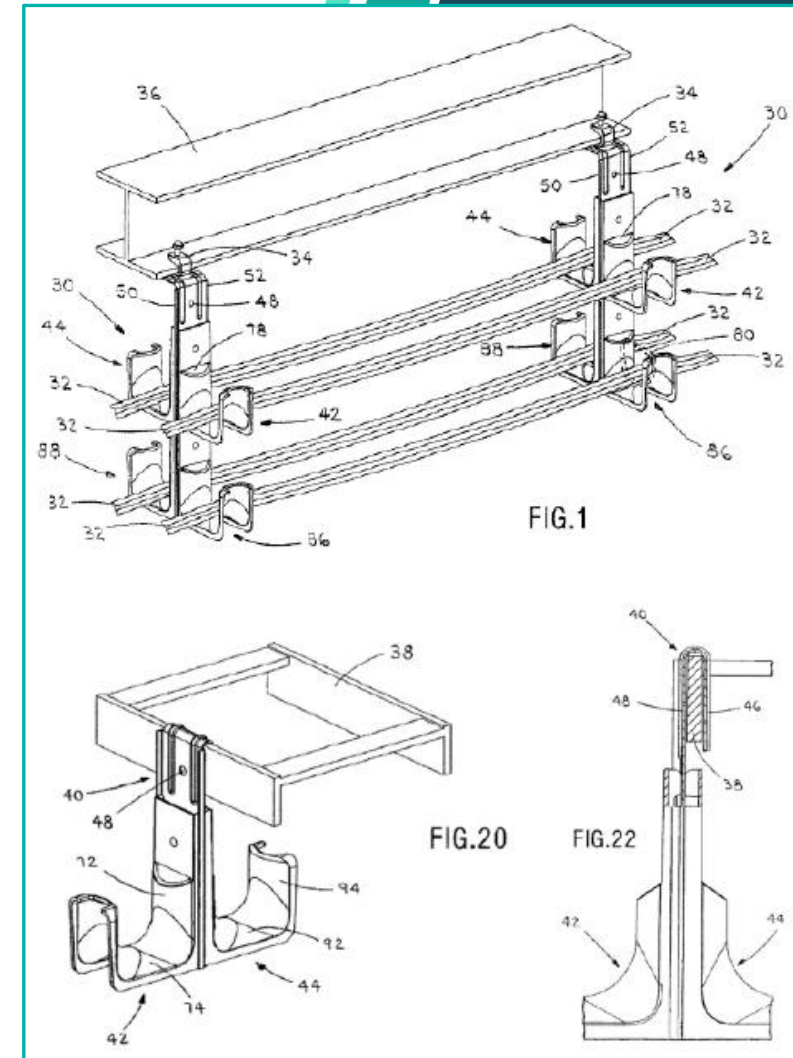
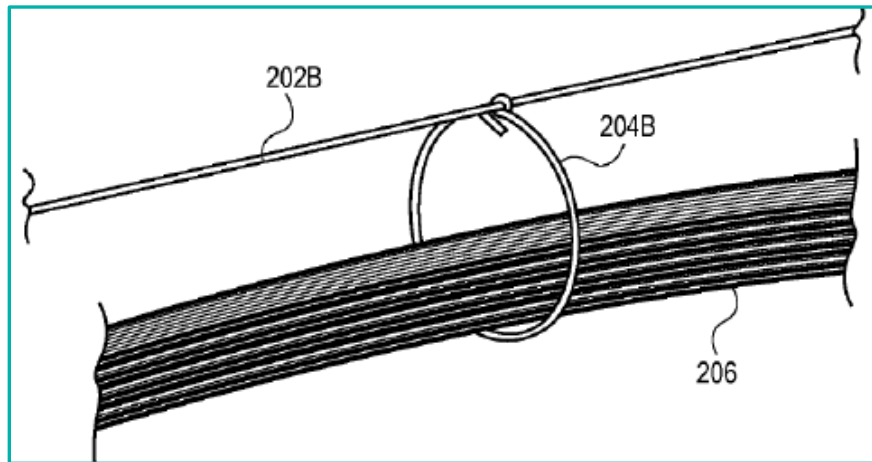
Petitioner Reply, 7-10

Affordable Wire Management, Exhibit No. EX1060

Case No.: IPR2024-00178

Page 45 of 81

Ground 2: Caveney and Almy



DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

46

Ground 2: Caveney and Almy

- CAB challenges motivation to combine because:
 - Almy allegedly only discloses supporting DC wires, and a POSITA would not have been motivated to replace Almy's loops with Caveney's multi-tiered hangers
 - Caveney allegedly only teaches hangers that attach to pre-existing building structures

Ground 2: Caveney and Almy

- As discussed regarding Ground 3, Caveney is not limited to hangers that attach to pre-existing building structures—e.g., the disclosed ladder rack embodiment is a cable support system
- A POSITA would have looked to Caveney to improve the already in-use messenger supported cable management systems

Combining the teachings of Caveney and Almy would have involved routine implementation, would have posed no technical risk given their complementary teachings, and would have achieved predicable benefits of improving wire runs in solar installations by separating conductors and implementing a more robust hanger. ... [A]s Caveney teaches, there is a benefit to multi-tiered hangers “to accommodate any number of cable support members.” EX1003, 4:46-53. The multi-tiered approach is also advantageous for separating data cables from current-conducting cables.

EX1002 ¶ 79 (Beik Decl.)

Agenda

- **Overview**
- Background
 - Instituted Grounds
 - Challenged Claims
 - Prior Art
- Claim Construction
- Grounds
 - Carr and Almy
 - Caveney
 - Caveney and Almy
- **Secondary Considerations**



Secondary Considerations

- Burden is on CAB to show a ***nexus*** between evidence of alleged secondary considerations of non-obviousness and the patented invention
- Pervasive failure of proof: no showing of nexus for any secondary consideration of non-obviousness

Secondary Considerations – Legal Framework

- For secondary considerations to be accorded substantial weight, ***the patentee bears the burden*** of establishing a nexus, or connection, between the evidence and the challenged claims

“In order to accord substantial weight to secondary considerations in an obviousness analysis, ‘the evidence of secondary considerations must have a ‘nexus’ to the claims, i.e., there must be ‘a legally and factually sufficient connection’ between the evidence and the patented invention.”

Fox Factory, Inc. v. SRAM, LLC, 944 F.3d 1366, 1373 (Fed. Cir. 2019) (quoting *Henny Penny Corp. v. Frymaster LLC*, 938 F.3d 1324, 1332 (Fed. Cir. 2019)).

Secondary Considerations – Legal Framework

- Patentee has the burden to distinguish between evidence attributable to the challenged claims and evidence attributable to unclaimed features and features claimed in other patents. *Fox Factory, Inc. v. SRAM, LLC*, 944 F.3d 1366, 1378 (Fed. Cir. 2019).

“Between these two proceedings, the Board presumed nexus between the independent claims of both patents and the secondary considerations evidence submitted by SRAM, ***even though (a) SRAM relies on essentially the same evidence of secondary considerations in both proceedings and (b) the '027 and '250 patent claims cover different inventions.***”

“The same evidence of secondary considerations cannot be presumed to be attributable to two different combinations of features. ***In such situations, the patentee retains the burden of proving the degree to which evidence of secondary considerations tied to a product is attributable to a particular claimed invention.*** ... [Patent Owner] will bear the burden of proving that the evidence of secondary considerations is attributable to the claimed combination of wide and narrow teeth with inboard or outboard offset teeth, as opposed to, for example, prior art features in isolation or unclaimed features.”

Secondary Considerations – No Technical Nexus

- Improper incorporation by reference: CAB only cited its expert’s testimony and offered no substantive argument
 - Subject of AWM’s motion to strike. See Paper 35.

1. CAB Is Entitled To A Presumption Of Nexus Between The Evidence And The Claimed Invention Because Its Commercial Products And Systems Are Coextensive With Claims 1 and 6

The Federal Circuit has held that “if the marketed product embodies the claimed features, and is coextensive with them, then a nexus is presumed and the burden shifts to the party asserting obviousness to present evidence to rebut the presumed nexus.” *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1130 (Fed. Cir. 2000). As Dr. Kern has analyzed in his declaration, CAB’s Standard System² is coextensive with at least claims 1 and 6 from the ‘291 Patent. EX2038, ¶¶180-197, App. A.

Patent Owner’s Response, 50

[REDACTED]

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE

Petitioner Reply, 15-16

Paper 35 (Petitioner’s Motion to Strike)

Affordable Wire Management, Exhibit No. EX1060

Case No.: IPR2024-00178

Page 53 of 81

Secondary Considerations – No Technical Nexus

- Even considering his arguments, Dr. Kern's declaration fails to show nexus for three reasons
 - Failure to identify and demonstrate which CAB products practice the challenged claims
 - Failure to analyze or acknowledge that multiple patents cover the allegedly practicing products
 - Vague claim charts that depict unknown products

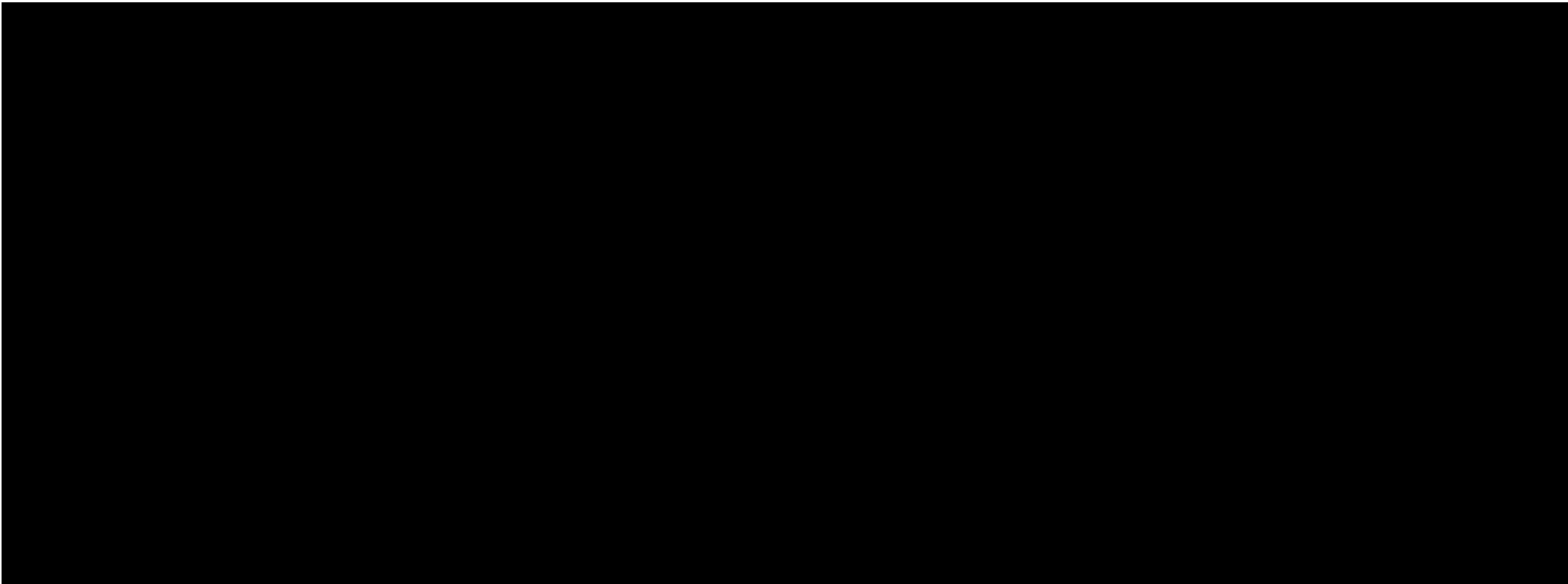
Secondary Considerations – No Technical Nexus

- Dr. Kern merely identifies six “exemplary” part numbers that are “included” in the Standard System—but CAB sells more than six part numbers within the generic categories he identifies
- His claim charts later characterizes these parts as “representative”

188. Exemplary CAB product part numbers that constitute its Standard System include [REDACTED] (messenger wire); [REDACTED] (end-pier attachment kit); [REDACTED] (mid-pier attachment kit); [REDACTED] and [REDACTED] (cable hangers).
EX2042.

Secondary Considerations – No Technical Nexus

- CAB sells components separately and in different combinations, not as a “standard system”



EX2056, 1

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 15-18

56

Secondary Considerations – No Technical Nexus

- Dr. Kern ***never explains*** how the parts are “exemplary” or “representative” and, worse, ***never performed*** that analysis

Q: Did you perform any of these analyses determining that specific part numbers are representative of groups of parts?

A: I never dealt in the detail of what the actual part number in the CAB accounting system relates to the common name given to the parts shown and discussed in this patent, in this proceeding, the patent.”

EX1047, 187:11-15 (Dr. Kern Deposition Transcript)

Q. Are you saying that the firm representing CAB drafted the section of this claim chart stating that [REDACTED] [REDACTED] are representative of the [REDACTED] [REDACTED]?

A. It was a collaborative process and they drafted it. And I did not check the detail.

EX1047, 179:5-12 (Dr. Kern Deposition Transcript)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 15-18

57

Secondary Considerations – No Technical Nexus

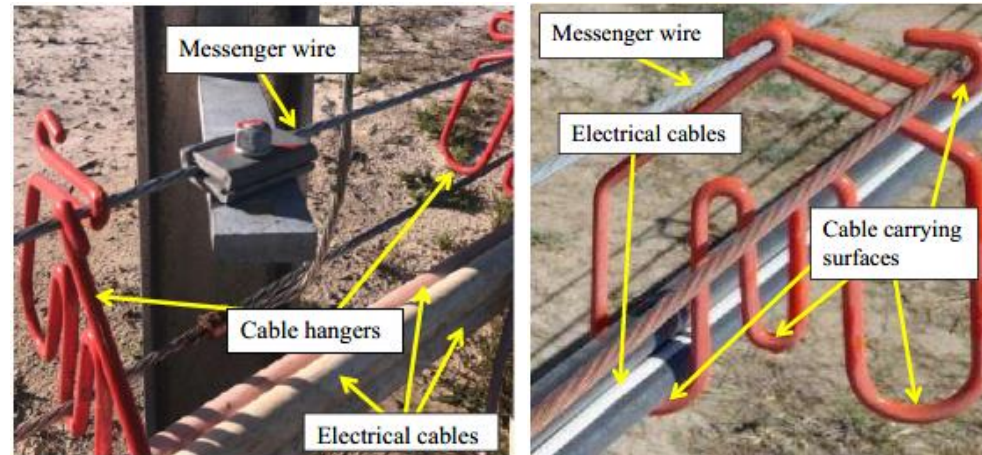
Q. In the figures on page A5, did these represent [REDACTED]?

A. I don't know. They do not appear to have part numbers printed on them in these photographs. The internal part number listings as opposed to the common names given to these parts in this proceeding, I relied on the common names, not the bill of materials names on various purchase orders in the accounting system of CAB.

Q. So looking at the pictures that you created on page A5 of your declaration, you don't know if the hangers depicted in these pictures are either [REDACTED]?

A. I do not.

EX1047, 174:6-21 (Dr. Kern Deposition Transcript)



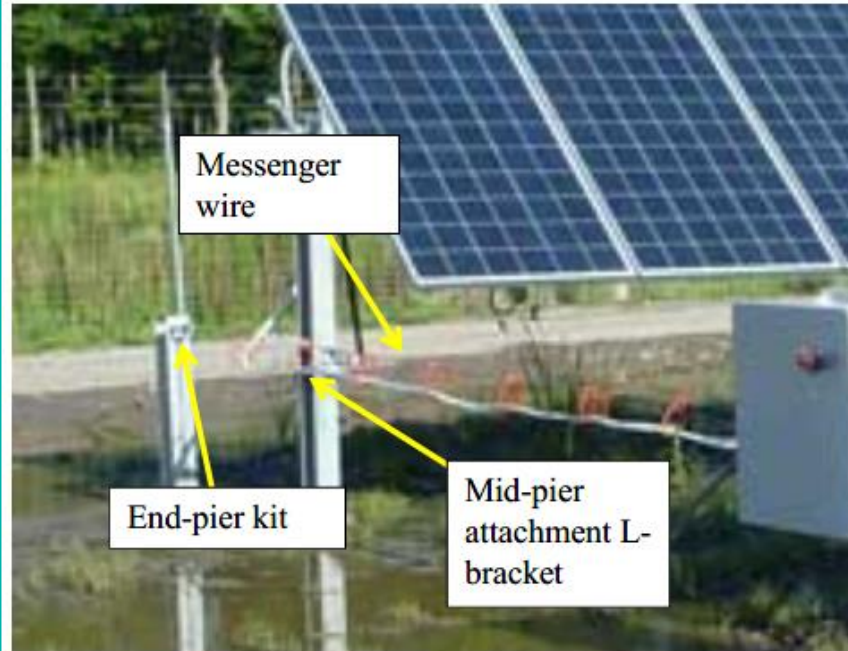
EX2038, 94 (Appendix A, A5)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 19

58

Secondary Considerations – No Technical Nexus

Part No. [REDACTED] corresponding to [REDACTED] diameter EHS messenger wire is representative of the messenger wire in CAB's Standard System. EX. 2042.



EX2038, 92 (Appendix A, A3)

Q. Did you perform any analysis to determine whether [REDACTED] is representative to the [REDACTED] [REDACTED]?

A. No.

EX1047, 180:10-14 (Dr. Kern Deposition Transcript)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 19-22

59

Secondary Considerations – No Technical Nexus

- No nexus because multiple CAB patents cover the allegedly practicing products—no analysis by CAB or Dr. Kern that the patents cover “generally the same invention”

Cognizant that in 2018 CAB introduced an above-ground cable hanger messenger supported cable management system that further incorporated an Integrated Grounding system, covered by U.S. Patent No. 10,177,551 (“the ‘551 patent”),⁴ Dr. Putnam concluded that “excess” CAB sales cannot be decomposed into separate causes attributed to each of the ‘291 and ‘551 patents. *Id.*, ¶56.

Patent Owner’s Response, 58

Secondary Considerations – No Technical Nexus

9/25/24, 6:09 PM

Patents - Cambria County Association for the Blind and Handicapped

CAB PRODUCTS

Cambria County Association for the Blind and Handicapped

CAB SOLAR

CAB Products

CAB Solar

Vision Services

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EXHIBIT

EXHIBIT

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This list was last updated on July 22nd, 2024

9137	HGR 2CH 3-EYE-1D 3/8CLK CTDL GR .SOL3	RE49,170; D798,138; 10,978,861; 11,349,291; 11,569,646; D913,493
9256	HGR 2CH 1.25D 1/4OLK .156 UNCTD .SOL2	9,800,028; D913,493; 11,437,790; D968,596; D968,597; D826,399; 11,349,291; 10,978,861
9257	HGR 2CH 1.25D 1/4OLK .156 PAR OR .SOL2	9,800,028; D913,493; 11,437,790; D968,596; D968,597; 10,978,861; 11,349,291; D826,399
9258	HGR 2CH 1.25D 1/4OLK .156 OR .SOL2	9,800,028; D913,493; 11,437,790; D968,596; D968,597; 10,978,861; 11,349,291; D826,399

EX1035, 1-2 (excerpted and annotated)

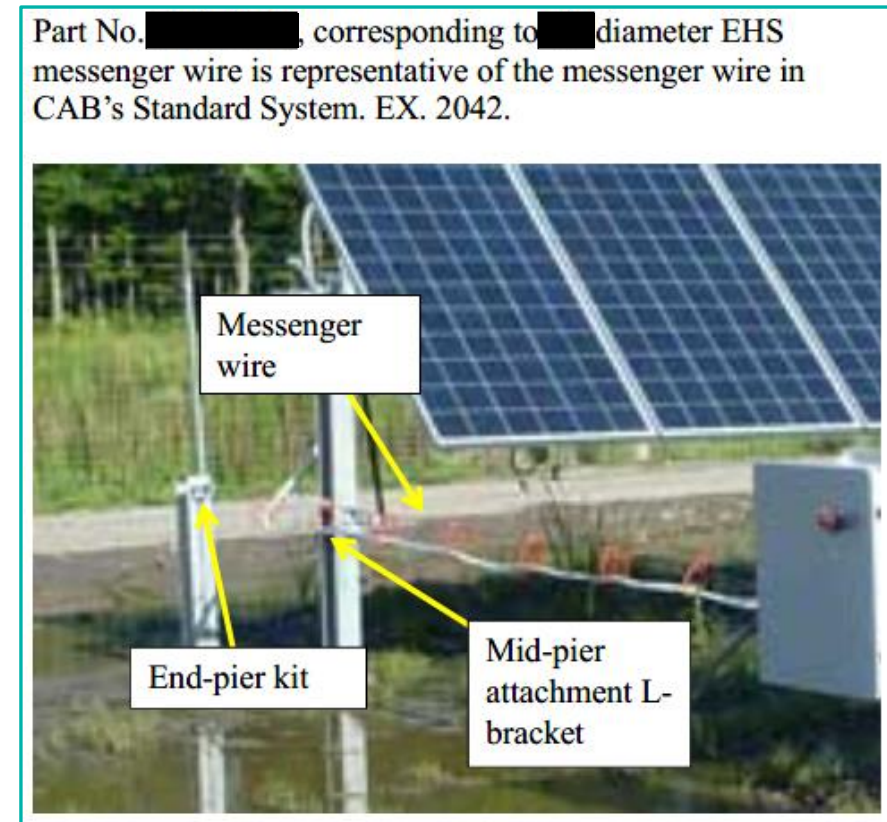
9137	HGR 2CH 3-EYE-1D 3/8CLK CTDL GR .SOL3	RE49,170; D798,138; 10,978,861; 11,349,291; 11,569,646; D913,493
9256	HGR 2CH 1.25D 1/4OLK .156 UNCTD .SOL2	9,800,028; D913,493; 11,437,790; D968,596; D968,597; D826,399; 11,349,291; 10,978,861
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DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 18-19

61

Secondary Considerations – No Technical Nexus

- Vague claim charts that do not identify allegedly practicing products or features
 - Identifies features not shown in the claims (end-pier kit, mid-pier attachment L-bracket)
 - Illegible pictures
 - Dr. Kern does not know which parts are depicted



EX2038, 92 (Appendix A, A3)

[REDACTED]

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 19-22

62

Secondary Considerations – No Technical Nexus

- Unable to determine that claim limitations are met, e.g., “extending from a plurality of solar panels”

“In order to confirm that they extend from solar panels, one would need to see more clearly where the terminations of these cables heading toward the solar panels in fact connect to the solar panels.”

-- Dr. Kern

EX1047, 187:11-15 (Dr. Kern Deposition Transcript)



EX2038, 91 (Appendix A, A2)

Secondary Considerations – No Technical Nexus

- Unable to determine that claim limitations are met, e.g., “extending from a plurality of solar panels”
- Dr. Kern struggled to identify the exact nature of the cables in his chart

Q. So if you'd go to page A2 of Appendix A to Exhibit 2038, does this represent, in the top picture, a string of modules?

A. It's unclear. It's impossible to tell by looking at the picture.

Q. Why is it impossible to tell by looking at the picture?

A. Because you cannot see the back side of the modules to see whether -- how they're interconnected.

EX1047, 60:1-10 (Dr. Kern Deposition Transcript)



EX2038, 91 (Appendix A, A2)

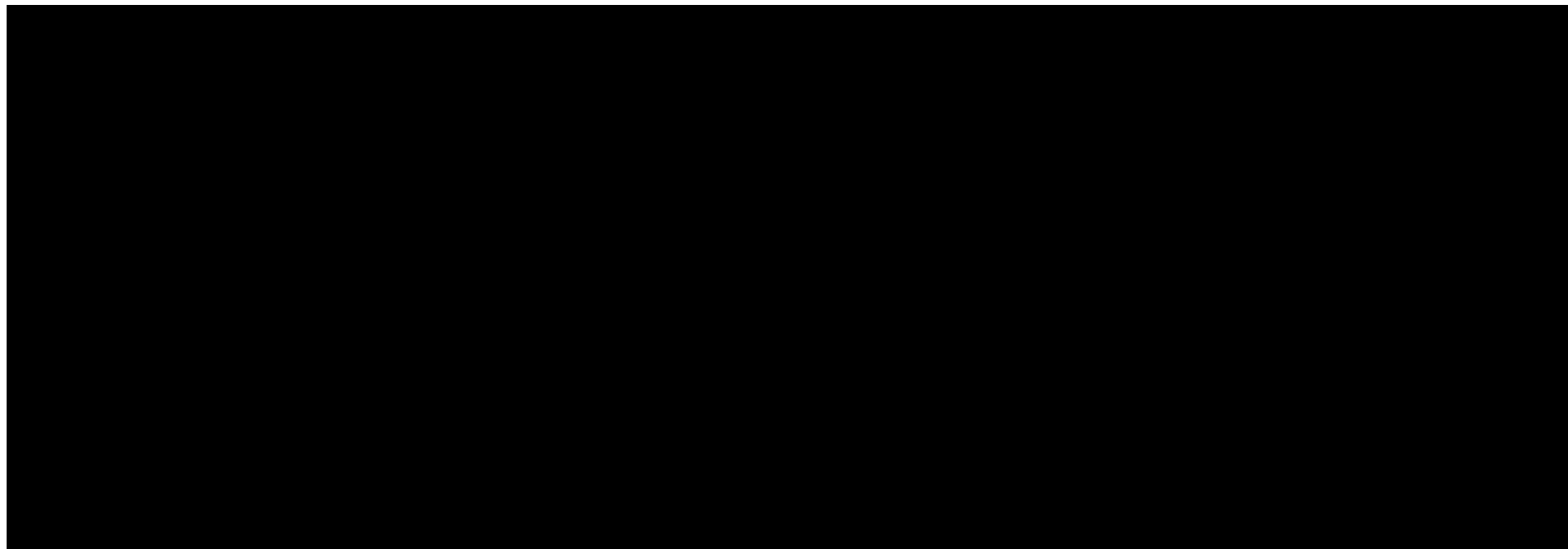
DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 19-22

64

Secondary Considerations – No Copying



- Mere assertion that CAB shared “proprietary designs,” “solar hangers,” and “hanger products”
- None of the cited emails include any representations of the designs allegedly shared
- [REDACTED] design is highly similar to Carr



EX2013, 2



DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 22-23

65

Secondary Considerations – No Commercial Success

- Dr. Putnam's opinions are fundamentally flawed:
 - Inappropriate market comparator (net new capacity growth)
 - Failure to adhere to his own analytical framework
 - Overinclusive sales analysis
 - Failure to attribute sales to the features embodying the challenged claims

Secondary Considerations – No Commercial Success



- Minh Doan
 - M.A., economics, Northwestern University
 - M.S., actuarial science, University of Iowa
 - B.A., mathematics and economics, Berea College
- 15 years' experience performing economic evaluations in IP matters, including analyzing lost sales, lost profits, reasonable royalties, and commercial success issues



Secondary Considerations – No Commercial Success

- Net new capacity growth is not an appropriate market comparator, and Dr. Putnam provided no support for his decision to use it
- Minh Doan: multiple reasons why dollar sales would not grow at the same rate as net new PV capacity, and Dr. Putnam considered **none**
 - Increased use of trackers
 - Pricing changes
 - Long lead times between sales and addition of new capacity

“Dr. Putnam has provided ***no evidence or analysis*** that supports the use of net new PV capacity growth as a benchmark for the dollar sales of a specific input (i.e., cable management) used in PV installations. As discussed below, ***there are multiple reasons for why dollar sales of cable management products, such as CAB’s sales, would not grow at the same rate as net new PV capacity.***”

EX1055 ¶ 50 (Doan Declaration)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 23-28

68

Secondary Considerations – No Commercial Success

- Dr. Putnam failed to evaluate CAB's profitability despite opining that it was "necessary"

As introduced above, *Dr. Putnam opined in his declaration that profits are "necessary (but not sufficient) evidence of commercial success, other things equal."* Despite this assertion, *Dr. Putnam did not discuss, let alone establish, CAB's profitability* in his declaration. Dr. Putnam's "excess sales" analysis is based on the growth in CAB's sales (i.e., revenues), not profits. Dr. Putnam did not review or evaluate CAB's prices, production costs, invested capital, or profits associated with its above-ground cable management products.

EX1055 ¶ 42 (Doan Declaration)

Secondary Considerations – No Commercial Success

- [REDACTED]
- [REDACTED]

[REDACTED]

EX1055 ¶ 57 (Doan Declaration)

[REDACTED]

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 25-26

70

Secondary Considerations – No Commercial Success

- Dr. Putnam asserts that the integrated system practices both the '291 patent and CAB's integrated grounding patent, 10,177,551 ('551 patent)
- Two fundamental errors:
 - No technical expert opined that the integrated system practices the '291 patent, so he has no basis to make that assertion
 - Failure to apportion and attribute the alleged commercial to success to each patent individually

Secondary Considerations – No Commercial Success

- Dr. Putnam could not determine whether and to what extent the '291 or '551 patents were driving sales

“I investigated whether the excess sales made possible by the '291 and '551 patents could be further decomposed into separate causes and quantified. I conclude that they cannot [T]he non-identification of the true share is problematic from a statistical point of view”

EX2044 ¶¶ 56, 62 (Putnam Declaration)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 27-28

72

Secondary Considerations – No Commercial Success

Q. Is there ***any evidence*** to support a 50-50 split between sales attributable to the '291 patent and sales attributable to the '551 patent?

A. **No.** And that's why I said in Paragraph 64 that it was for illustrative purposes only. I could have drawn it 60-40. I could have drawn it 40-60.

EX1048, 188:9-16 (Putnam Dep.) (emphasis added)

Secondary Considerations – No Commercial Success

“Dr. Putnam claims that the ‘non-identification of the true share [of claimed excess sales] is problematic from a statistical point of view,” but contends that from a “substantive point of view, indeterminacy is irrelevant.’ ***This claim is false, as without identifying the claimed excess sales attributable to the ’291 Patent, Dr. Putnam cannot determine that the ’291 Patent ‘caused CAB’s substantial commercial success.’*** Dr. Putnam’s ‘non-identification’ of the sales of CAB products attributable to each patent ***is nothing more than an admission that he has not established a nexus*** between claimed excess sales and the ’291 Patent, which he ought to have done.”

EX1055 ¶ 74 (Doan Declaration)

Secondary Considerations – No Technical Nexus

9/25/24, 6:09 PM Patents - Cambria County Association for the Blind and Handicapped

CAB PRODUCTS **Cambria County Association for the Blind and Handicapped** **CAB SOLAR**

CAB Products ▾ CAB Solar Vision Services ▾ Employment Services ▾ How to Buy CAB Library News

EXHIBIT
IPR 139 1049

EXHIBIT
IPR 178 1035

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- Worse, he fails to even acknowledge CAB's statements that other patents, including design patents, cover allegedly practicing products

EX1035, 1-2 (excerpted and annotated)

EX1035, 1-2 (excerpted and annotated)

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 25-26

75

Secondary Considerations – No Industry Praise

- Vague and self-promotional
- No link to the challenged claims
 - Failure to identify specific products
 - Failure to identify features of specific products



EX2009

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 28-29

76

Secondary Considerations – No Long Felt but Unmet Need

- CAB primarily relies on EX1011, a 2013 Solar Pro magazine article
- But the article largely addresses challenges entirely unrelated to the alleged invention, and the article predates the priority date by just a year

Secondary Considerations – No Long Felt but Unmet Need

- Article addresses wire management challenges entirely unrelated to the alleged invention:
 - Improper installation of cables, thermal fittings, and combiner boxes

The Consequences of Poor Wire Management

I have done quite a few fire investigations. While the specifics of many of these investigations are confidential, there are several types of problems where poor wire management contributed to failures. All of the following practices have caused fires in the field:

- Putting USE-2 string conductors in contact with sharp edges, creating undetected ground faults that end up short-circuiting the array
- Not properly identifying conductors and incorrectly polarizing combiner boxes, creating array short circuits and combiner box fires
- Improperly installing thermal expansion fittings, especially in runs that require multiple fittings
- Not properly accounting for thermal expansion and conductor weight, causing damage at roof edge fittings and boxes
- Not properly addressing thermal expansion of conductors inside raceways, causing damage at box fittings
- Improperly using stainless steel wire ties, putting too much stress on conductor insulation
- Not fully seating plug connectors
- Putting stress on junction box and plug connectors, causing them to fail and separate (which can cause an arc if under load)
- Using improper torque procedures on combiner box terminals (It is common for combiner box terminals to loosen over time due to improper torquing or thermal cycling and vibration on rooftops.)

New mistakes are invented every day.

EX1011, 2

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 30-31

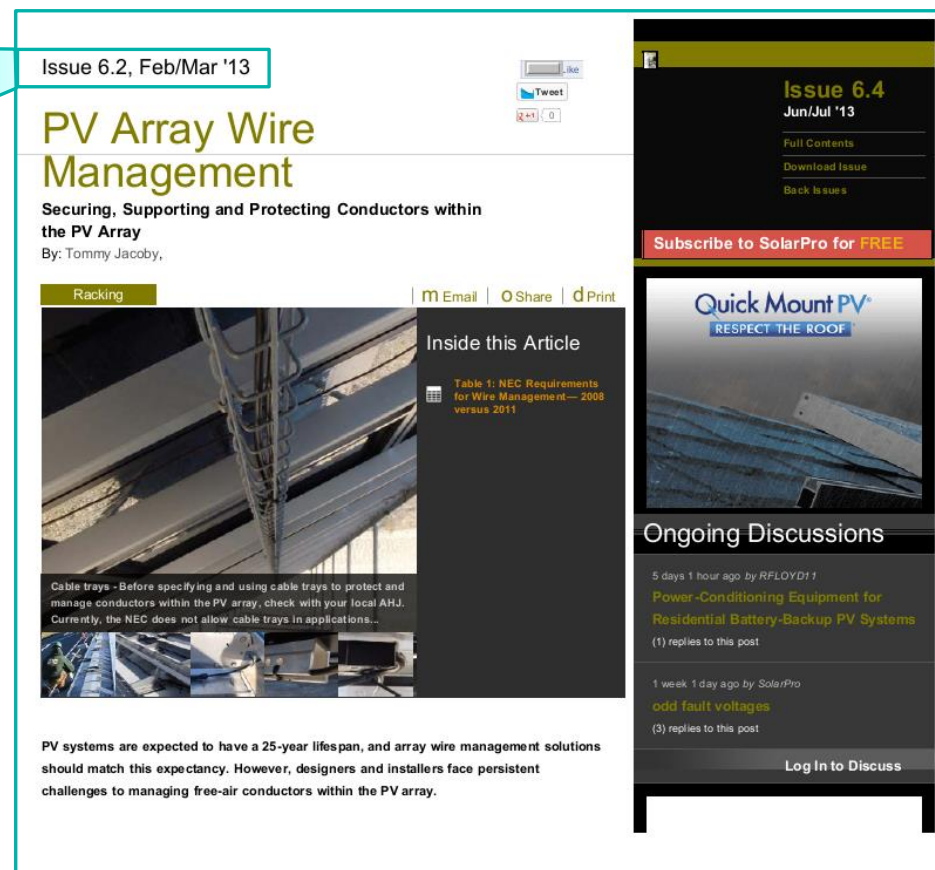
78

Secondary Considerations – No Long Felt but Unmet Need

Issue 6.2, Feb/Mar '13

“At best, the asserted ‘long-felt need’ here ... began just three years before the priority date of the patents-in-suit. This need, even if unmet, was not so long felt that it overcomes the strong case of obviousness”

Adapt Pharma Operations Ltd. v. Teva Pharms. USA, Inc.,
25 F.4th 1354 (Fed. Cir. 2022).



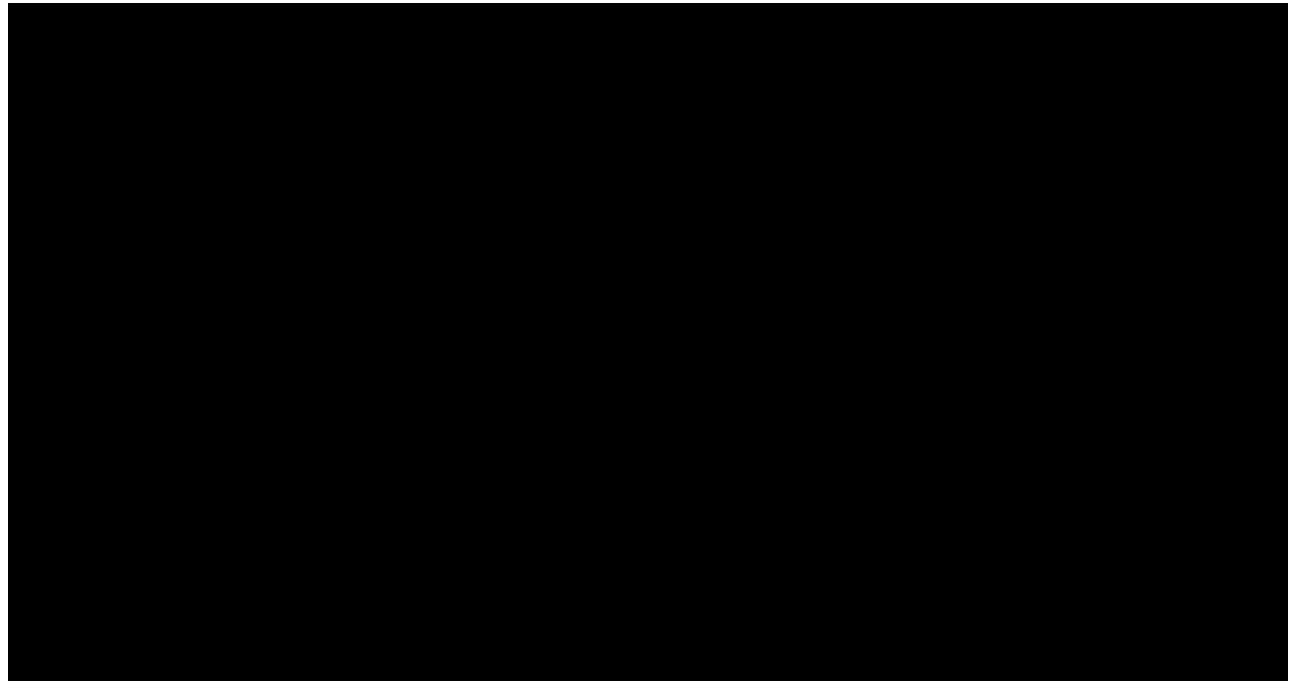
EX1011, 1

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE
Petitioner Reply, 30-31

79

Secondary Considerations – No Industry Skepticism

- Rapid adoption due to strong motivation to combine
 - William Brooks immediate agreement to draft promotional white paper. EX2006 ¶23.
 - SunEdison approval of system for use just months after first knowledge. EX2028 ¶¶35-40.
- General solar industry skepticism to new products is insufficient



EX2011, 5

Thank You

DEMONSTRATIVE EXHIBIT – NOT EVIDENCE