

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

AFFORDABLE WIRE MANAGEMENT, LLC,
Petitioner,

v.

CAMBRIA COUNTY ASSOCIATION FOR THE BLIND AND
HANDICAPPED, INC.,
Patent Owner.

IPR2024-00139
Patent 10,177,551 B1

PETITION FOR *INTER PARTES* REVIEW

TABLE OF CONTENTS

I.	INTRODUCTION	1
II.	GROUND FOR STANDING.....	1
III.	THE '551 PATENT.....	1
A.	Alleged Invention of the '551 Patent.....	1
B.	Prosecution History	4
IV.	BACKGROUND OF THE '551 PATENT	5
A.	Technology Overview	5
1.	Grounding Systems.....	5
2.	Support Systems	6
3.	Support Systems as Grounding Systems	10
B.	Prior Art.....	12
1.	Grushkowitz.....	12
2.	CAB Website and Whitepaper	14
3.	Petersen.....	20
4.	MacLean	21
V.	ORDINARY SKILL IN THE ART.....	23
VI.	CLAIM CONSTRUCTION	23
VII.	STATEMENT OF PRECISE RELIEF REQUESTED	24
VIII.	GROUND 1: Obviousness over <i>Grushkowitz</i>	25
A.	Claim-by-Claim Analysis	25
1.	Claim 1.....	25
2.	Claim 2.....	33
3.	Claim 3: “The grounding system of claim 2 wherein each said mounting body is one of a conductive body or a conductive body assembly.”	37
4.	Claim 4: “The grounding system of claim 3 wherein each said mounting body has a simplified shape.”	38
5.	Claim 5.....	38
6.	Claim 6: “The grounding system of claim 2 wherein each said multi- function line coupling is a clamping assembly.”	39

7. Claim 7: “The grounding system of claim 6 wherein each said multi-function line coupling includes one of a clam-shell assembly, a split bolt, a U-bolt, or a lay-in lug assembly.”	40
8. Claim 8.....	41
9. Claim 9: “The grounding system of claim 1 wherein said multi-function line assembly does not include any grounding splices.”	42
10. Claim 10: “The grounding system of claim 1 wherein said multi-function line assembly does not include any medial grounding splices.”	43
11. Claim 11: “The grounding system of claim 1 wherein said multi-function line includes one of a highly conductive body or a partially conductive body.”	43
12. Claim 12: “The grounding system of claim 1 wherein said multi-function line includes strands selected from the group consisting of: copper strands, copper-clad steel strands, galvanized strands, conductive alloy strands, partially conductive, alloy strands, or composite strands.”	44
13. Claim 18: “The grounding system of claim 1 wherein said multi-function line assembly includes a conductive terminal support.”	44
14. Claim 19.....	45
IX. GROUND 2: Obviousness over <i>the CAB Website</i> and <i>CAB Whitepaper</i>	46
A. Motivation and Reasonable Expectation of Success	47
B. Claim-by-Claim Analysis	48
1. Claim 1.....	48
2. Claim 2.....	56
3. Claim 3: “The grounding system of claim 2 wherein each said mounting body is one of a conductive body or a conductive body assembly.”	58
4. Claim 4: “The grounding system of claim 3 wherein each said mounting body has a simplified shape.”	58
5. Claim 5.....	59
6. Claim 6: “The grounding system of claim 2 wherein each said multi-function line coupling is a clamping assembly.”	60

7.	Claim 7: “The grounding system of claim 6 wherein each said multi-function line coupling includes one of a clam-shell assembly, a split bolt, a U-bolt, or a lay-in lug assembly.”	62
8.	Claim 8.....	62
9.	Claim 9: “The grounding system of claim 1 wherein said multi-function line assembly does not include any grounding splices.”	64
10.	Claim 10: “The grounding system of claim 1 wherein said multi-function line assembly does not include any medial grounding splices.”	64
11.	Claim 11: “The grounding system of claim 1 wherein said multi-function line includes one of a highly conductive body or a partially conductive body.”	65
12.	Claim 12: “The grounding system of claim 1 wherein said multi-function line includes strands selected from the group consisting of: copper strands, copper-clad steel strands, galvanized strands, conductive alloy strands, partially conductive, alloy strands, or composite strands.”	66
13.	Claim 13: “The grounding system of claim 12 wherein said multi-function line assembly terminal support includes a conductive thimble-eye.”	67
14.	Claim 14: “The grounding system of claim 13 wherein said multi-function line is structured to be operational with solar electrical equipment.”	67
15.	Claim 15: “The grounding system of claim 13 wherein said multi-function line assembly does not include any grounding splices.”	68
16.	Claim 16: “The grounding system of claim 13 wherein said multi-function line assembly does not include any medial grounding splices.”	68
17.	Claim 17: “The grounding system of claim 13 wherein said multi-function line includes one of a highly conductive body or a partially conductive body.”	68
18.	Claim 18: “The grounding system of claim 1 wherein said multi-function line assembly includes a conductive terminal support.”	68
19.	Claim 19.....	69
X.	GROUND 3: Obviousness over <i>Petersen</i>	70

A.	Claim-by-Claim Analysis	70
1.	Claim 1	70
2.	Claim 2	75
3.	Claim 3: “The grounding system of claim 2 wherein each said mounting body is one of a conductive body or a conductive body assembly.”	77
4.	Claim 4: “The grounding system of claim 3 wherein each said mounting body has a simplified shape.”	77
5.	Claim 5	78
6.	Claim 6: “The grounding system of claim 2 wherein each said multi-function line coupling is a clamping assembly.”	79
7.	Claim 7: “The grounding system of claim 6 wherein each said multi-function line coupling includes one of a clam-shell assembly, a split bolt, a U-bolt, or a lay-in lug assembly.”	80
8.	Claim 8	80
9.	Claim 9: “The grounding system of claim 1 wherein said multi-function line assembly does not include any grounding splices.”	81
10.	Claim 10: “The grounding system of claim 1 wherein said multi-function line assembly does not include any medial grounding splices.”	81
11.	Claim 11: “The grounding system of claim 1 wherein said multi-function line includes one of a highly conductive body or a partially conductive body.”	82
12.	Claim 12: “The grounding system of claim 1 wherein said multi-function line includes strands selected from the group consisting of: copper strands, copper-clad steel strands, galvanized strands, conductive alloy strands, partially conductive, alloy strands, or composite strands.”	82
13.	Claim 13: “The grounding system of claim 12 wherein said multi-function line assembly terminal support includes a conductive thimble-eye.”	82
14.	Claim 14: “The grounding system of claim 13 wherein said multi-function line is structured to be operational with solar electrical equipment.”	83

15.	Claim 15: “The grounding system of claim 13 wherein said multi-function line assembly does not include any grounding splices.”.....	83
16.	Claim 16: “The grounding system of claim 13 wherein said multi-function line assembly does not include any medial grounding splices.”	83
17.	Claim 17: “The grounding system of claim 13 wherein said multi-function line includes one of a highly conductive body or a partially conductive body.”	84
18.	Claim 18: “The grounding system of claim 1 wherein said multi-function line assembly includes a conductive terminal support.”	84
19.	Claim 19.....	85
XI.	GROUND 4: Obviousness over Petersen in view of Maclean.....	86
A.	Motivation and Reasonable Expectation of Success	86
B.	Claim-by-Claim Analysis	87
1.	Claim 13: “The grounding system of claim 12 wherein said multi-function line assembly terminal support includes a conductive thimble-eye.” ...	87
2.	Claims 14-17.....	89
XII.	GROUND 5: Obviousness in view of CAB Website in view of CAB Whitepaper and further in view of MacLean	89
A.	Motivation and Reasonable Expectation of Success	89
B.	Claim-by-Claim Analysis	90
1.	Claim 13: “The grounding system of claim 12 wherein said multi-function line assembly terminal support includes a conductive thimble-eye.” ...	90
2.	Claim 14-17	92
XIII.	THERE ARE NO UNEXPECTED RESULTS OR SECONDARY CONSIDERATIONS.....	92
XIV.	DISCRETIONARY DENIAL OF INSTITUTION WOULD BE IMPROPER	92
A.	35 U.S.C. §325(d).....	92
B.	<i>Fintiv</i>	93
XV.	MANDATORY NOTICES	94
A.	Real Party in Interest	95

Petition for *Inter Partes* Review of U.S. Patent No. 10,177,551 B1
Case No.: IPR2024-00139

B.	Related Matters	95
C.	Lead and Backup Counsel	95
D.	Service Information	96
XVI.	PAYMENT OF FEES	96
XVII.	CONCLUSION.....	96

TABLE OF AUTHORITIES

Cases

<i>Apple Inc. v. Fintiv, Inc.</i> , IPR2020-00019, Paper 11 (Mar. 20, 2020)	93
<i>Okajima v. Bourdeau</i> , 261 F.3d 1350 (Fed. Cir. 2001)	23
<i>Phillips v. AWH Corp.</i> , 415 F.3d 1303 (Fed. Cir. 2005)	23
<i>Pohl v. Mh Sub I, LLC</i> , 332 F.R.D. 713 (N.D. Fla. 2019)	15
<i>Sotera Wireless, Inc. v. Masimo Corp.</i> , IPR2020-01019, Paper 12 (Dec. 1, 2020)	93, 94
<i>Valve Corp. v. Ironburg Inventions Ltd.</i> , 8 F.4th 1364 (Fed. Cir. 2021)	15
<i>Veeam Software Corp. v. Symantec Corp.</i> , IPR2013-00142, Paper 11 (Aug. 7, 2013)	15

Statutes

35 U.S.C. §102	12, 16, 20, 22
35 U.S.C. §103	24
35 U.S.C. §282(b)	23
35 U.S.C. §311	24
35 U.S.C. §325(d)	92, 93

TABLE OF EXHIBITS

Exhibit	Description
1001	U.S. Patent No. 10,177,551 to Smith et al.
1002	Declaration of Dr. Beik and CV.
1003	U.S. Patent No. 10,003,298 to Grushkowitz et al. (“Grushkowitz”).
1004	U.S. Patent No. 3,001,749 to Petersen (“Petersen”).
1005	CAB Cable Rings and Saddles for Solar PV Arrays Website, Wayback Machine (February 4, 2015) (“CAB Website”).
1006	Cable Management in Solar PV Arrays: A Review of Requirements in the National Electrical Code and how CAB Cable Rings and Saddles Meet These Requirements, September 18, 2014 (“CAB Whitepaper”).
1007	National Fire Protection Association, “The National Electrical Code,” 2008 Edition.
1008	Zipse, “History of Grounding/Earthing Practices In The United States,” IEEE (PCIC-2017-25), 2017.
1009	U.S. Patent No. 231,552 to Finney.
1010	U.S. Patent No. 916,306 to Hall.
1011	U.S. Patent No. 2,201,472 to Browder.
1012	Mulqueen, “A Natural History of the Wooden Utility Pole,” California Public Utilities Commission, Policy and Planning Division, July, 2017.
1013	Water and Power Associates, “Early Power Distribution” available at < https://waterandpower.org/museum/Early_Power_Distribution.html >
1014	U.S. Patent No. 1,464,535 to McGivern.
1015	U.S. Patent No. 1,401,998 to Manz.
1016	U.S. Patent No. 1,448,141 to Manz.
1017	U.S. Patent No. 2,917,259 to Hill.
1018	U.S. Patent No. 3,042,351 to Du Bois.
1019	U.S. Patent No. 3,363,048 to Vaughn.
1020	U.S. Patent No. 1,754,924 to Williams.
1021	U.S. Patent No. 1,766,873 to Birch.

1022	Seo, Hun Chul, et al. “Applicability of Messenger Wire for Purpose of Lightning Protection.” <i>Journal of Electrical Engineering and Technology</i> , vol. 11, no. 1, 2016, pp. 167–174.
1023	Southwire, “Triplex Service Drop, Aluminum Conductors. Polyethylene or Crosslinked Polyethylene Insulation,” 2003.
1024	Seiler, “Hendrix Covered Conductor Manual,” Western Power, Rev 2 – August 8, 2013
1025	U.S. Patent Application Publication No. 2001/0038738 to Akasaka.
1026	Affidavit of Nathaniel E Frank-White – Authentication of EX1005 and EX1006.
1027	MacLean “Pole Line Hardware Catalog” was issued in May of 2010 (“MacLean”).
1028	IEEE Green Book 142, IEEE Recommended Practice for Grounding of Industrial and Commercial Power Systems, 2007.
1029	Jung, et al., “An In-depth Analysis for Optimal Cable Tray Support Span,” Sustainable Marine Structures, Volume 02, Issue 01, January 2020.
1030	“Steel Distribution Poles,” American Galvanizers Association, 1997 accessible at < https://galvanizeit.org/education-and-resources/publications/hdg-steel-distribution-poles-1997 >.
1031	National Electrical Safety Code, “National Electrical Safety Code Committee, Accredited Standards Committee C2 – Interpretation Section 23 Clearances,” July 31, 2001.
1032	National Fire Protection Association, “Volume II 1959 Advance Reports Proposed National Electrical Code,” 1959.
1033	Texas Department of Transportation, Fort Worth District, “Traffic Signal Support Structures Timber Pole Assemblies,” September, 2012.
1034	State of Tennessee Department of Transportation, “Span Wire and Messenger Cable Details,” July 29, 2004.
1035	Jacoby, “PV Array Wire Management, Securing, Supporting and Protecting Conductors within the PV Array,” SolarPro, Issue 6.2, Feb./Mar. 2013.

Petition for *Inter Partes* Review of U.S. Patent No. 10,177,551 B1
Case No.: IPR2024-00139

1036	United States Department of Agriculture, Rural Utilities Service, “Bulletin 1724E-153, RD-GD-2001-39: Electrical Distribution Line Guys and Anchors.” April 25, 2001.
1037	U.S. Patent 10,177,551 File History

I. INTRODUCTION

Petitioner Affordable Wire Management, LLC (“AWM” or “Petitioner”) respectfully requests *inter partes* review and cancellation of claims 1-19 of U.S. Patent No. 10,177,551 (the “’551 Patent”) (EX1001), assigned to Cambria County Association for the Blind and Handicapped, Inc. (“CAB” or “Patent Owner”). The purported invention of the ’551 Patent is a system comprised of common-place and well-known components of an electricity distribution system (e.g., a power grid, or solar power facility) to provide a path to ground for stray electrical current. The ’551 Patent admits these components (e.g., utility poles/piles, support cables, and brackets) were known in the art and widely used in the field. The *only* purported novel component claimed in the ’551 Patent is the “multi-function line,” which is nothing more than a rebrand of components employed in the art well before the ’551 Patent’s priority date—specifically messenger wires and cable trays.

II. GROUNDS FOR STANDING

Petitioner certifies that the ’551 Patent is available for IPR and Petitioner is not barred or estopped from requesting IPR on the grounds identified herein.

III. THE ’551 PATENT

A. Alleged Invention of the ’551 Patent

The ’551 Patent claims a system to ground electrical power lines (whether in a utility power grid, solar facility, mining installation, or any other electrical system)

using the utility poles and other components that keep electrical power lines elevated. EX1001, Abstract; 1:17-23. The '551 Patent asserts a need for an inexpensive and easily installed grounding system that avoids the use of splices. *Id.*, 2:13-18. The '551 Patent's solution to this need is using existing conductive power line support system components (utility poles, utility pole arms/brackets, and a tension member running between the utility poles) as the grounding system, taking advantage of the path to ground formed by these conductive components, and obviating the need for grounding splices. *Id.* 2:24-37.

The '551 Patent does not claim to have invented the century-old practice of stringing electrical cable between utility poles, or hanging electrical cable from a messenger wire. Instead, the '551 Patent purports to invent using support system components such as messenger wires, piles, and brackets—which were known in the art—to ground the power lines supported thereon using what the '551 Patent refers to as a “multi-function line.” *Id.*, 2:37-40. The '551 Patent defines the coined term:

Accordingly, as used herein, a “multi-function line” means **a tension member** that **supports current wires and/or cable hangers**, and which **is conductive**.

*Id.*¹ In other words, the multi-function line is something that is under tension, made of a material capable of conducting electricity (e.g. steel), and supports power lines or power line hangers.

In effect, the '551 Patent claims to have invented coupling a conductive tension member (i.e., a multi-function line) to a number of conductive mounting assemblies coupled to a conductive pile—that is, attaching metal components together to form a ground path. *Id.* 2:13-18.

The background section acknowledges that conductive (metal) utility poles, or piles, were known in the art. *Id.*, 2:6-10 (“[p]resently, [in the prior art] the grounding conductor is grounded by splicing a conductor, such as ... a copper wire ... and coupling the copper wire to a grounding cable ***or, if the piles are conductive, to each pile***”). The '551 Patent also acknowledges that attaching metal tension members, such as messenger wires, to metal piles was also known in the art. *Id.*, 1:31-32 (“[t]he messenger wire [in the prior art system] is coupled to the piles at an elevated location [on the pile]”). Further, the '551 Patent acknowledges that prior art messenger wires were used in prior art systems to support cable hangers and power lines. *Id.*, 1:32-35 (“cable hangers are then coupled to the messenger wire ... [and] are structured to support the supported [electrical] wires”).

¹ Emphases added here and elsewhere herein unless noted otherwise.

Accordingly, beyond the components and methods for grounding and supporting power lines that the '551 Patent admits were long known in the prior art, the alleged invention amounts to little more than using a “multi-function line.” As described in more detail below, this lone allegedly novel element is nothing more than a rebranded messenger wire or cable tray—both well known in the prior art.²

B. Prosecution History

During prosecution, the Applicant amended the claims to further require “a multi-function line” to overcome a rejection in view of US2012/0024563 (“Korman”), US7,057,103 (“Peabody”), and US2013/0244505 (“Hanson”). EX1037, 91-94, 104-105. The Applicant argued that the cited art does not disclose a multi-function line coupled to the other known components. *Id.*, 108-118.

The Examiner maintained the rejection and the Applicant appealed. *Id.*, 131, 137-154, 165-198. In later allowing the claims, the examiner noted that the “multi-function line” limitation “is neither taught nor disclosed in the prior art.” *Id.*, 209.

Thus, the only purported novelty is the claimed “multi-function line.”

² The '551 Patent asserts that “a messenger wire is not a ‘multi-function line,’” but fails to distinguish the two. EX1001, 2:40-41. As explained below, a conventional steel cable messenger wire meets the express definition of “multi-function line.”

IV. BACKGROUND OF THE '551 PATENT

A. Technology Overview

1. Grounding Systems

“Grounding” means connecting an electrical circuit to the earth in order to create a reliable pathway for stray electrical current, and was well-known in the art for over a century. EX1002, ¶¶35-36. Grounding an electrical system provides a safe path to the earth for stray energy resulting from fault currents, short circuits, and lightning strikes. *Id.*

The '551 Patent, which claims an October 5, 2017 priority date, does not purport to have invented grounding systems. This is because grounding electrical distribution systems have existed since at least as early as 1882, when Thomas Edison started his Pearl Street Central Generating Station. EX1008, 1; EX1002, ¶36. In his system, Edison connected a neutral return cable to pre-existing subterranean pipe systems, which “could be considered the first grounding electrode.” *Id.*

Standardized codes prescribing safe grounding practices proliferated in the early 20th century, including the National Electrical Code (“NEC”). EX1002, ¶37. Long before the purported invention and to this day, the NEC provided methodologies for effective electrical grounding. *Id.* For example, the 2008 NEC provides extensive regulations for grounding. *See, e.g.,* EX1007, 98 (“This article

covers general requirements for grounding and bonding [and] [m]ethods of grounding and bonding”).

The most conventional way to ground electrical systems is to couple metal components together. EX1002, ¶39. Due to the electric conductivity of the metal components, a path to ground is formed. *Id.*

(2) Grounding of Electrical Equipment. Normally non-current-carrying conductive materials enclosing electrical conductors or equipment, or forming part of such equipment, shall be connected to earth so as to limit the voltage to ground on these materials.

(3) Bonding of Electrical Equipment. Normally non-current-carrying conductive materials enclosing electrical conductors or equipment, or forming part of such equipment, shall be connected together and to the electrical supply source in a manner that establishes an effective ground-fault current path.

(4) Bonding of Electrically Conductive Materials and Other Equipment. Normally non-current-carrying electrically conductive materials that are likely to become energized shall be connected together and to the electrical supply source in a manner that establishes an effective ground-fault current path.

EX1007, 98 (250.4(A)(2)-(4)) (annotated); EX1002, ¶38.

2. Support Systems

Aerial cable support systems for electrical systems, typically comprise: (1) piles (or utility poles) comprised of metal, wood, concrete or composite materials;

(2) a tension member running between piles or between the pile and the ground or other electrical equipment (*e.g.*, messenger wire, catenary cable, or cable tray) comprised of galvanized steel or other metal; and (3) mounting structures for coupling the tension member to each pile (*e.g.*, an arm or bracket extending from and coupled to a pile) comprised of galvanized steel or other metal. EX1002, ¶42. To avoid subjecting the current-carrying cables to the tensile force of gravity, aerial cable support systems support the current-carrying cables. EX1002, ¶43. Absent the support, the current-carrying cable will deflect, which over time may weaken both the cable conductor and its insulation, which in turn can lead to short circuits and injury or death if a person contacts such a cable. *Id.*

a. Utility Poles or Piles

The '551 Patent does not purport to have invented utility poles or piles. Nor could it. Use of piles, or utility poles, proliferated in the 19th and 20th Centuries during the advent of the telegraph and telephone systems. EX1012, 5; EX1002, ¶44. Later, utility poles were also carrying electrical current-carrying wires. EX1012, 9. Steel utility poles were introduced as early as the 1930's due to their flame retardant properties, durable nature, and cheaper and easier installation. EX1013, 15; EX1002, ¶44.

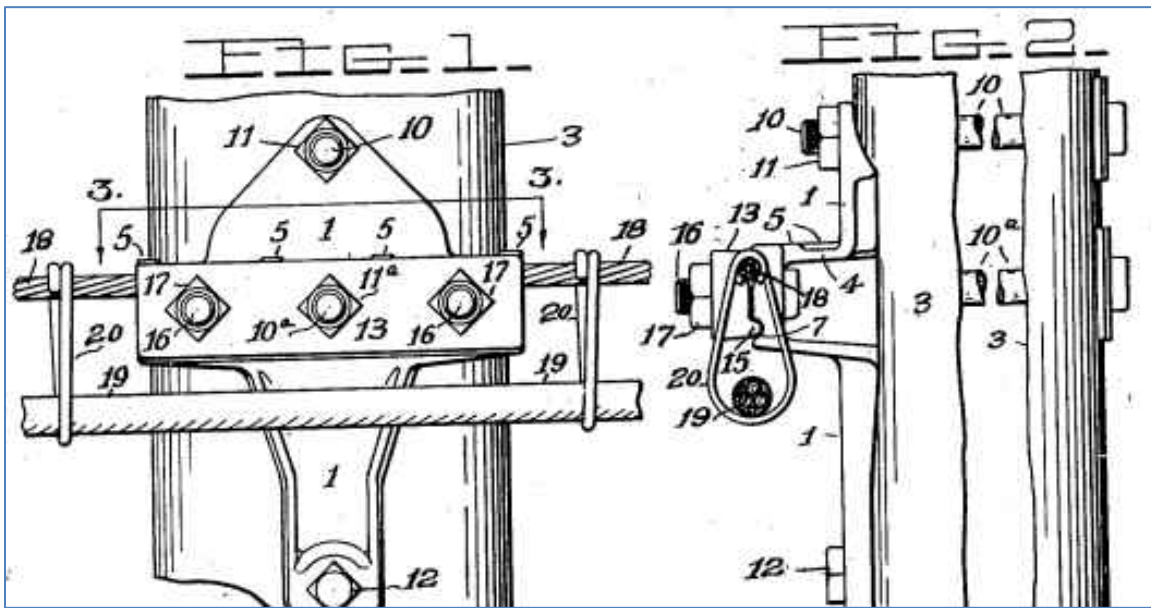
b. Tension Members

The '551 Patent does not purport to have invented tension members. Nor could it. Metal or steel tension members such as messenger cables or catenary cables were used to support current-carrying cables since the early 1900's. *See, e.g.*, EX1014, 2:105-107 (“...a conductor-supporting device, the combination with a messenger cable and a conductor[.]”); EX1015, 1:32-34 (“...suspending the trolley [conductive] wire from a messenger wire.”); EX1016, 1:9-12 (“[o]ur invention relates to a support for conductors and ... to the supporting of trolley wires from catenary or messenger cables.”); EX1002, ¶45.

Long before the priority date, other tension members—such as cable trays—were used to provide support to current-carrying cables. *See, e.g.*, EX1017, 1:15-21 (“[the] present invention relates to cable trays or shelves for use in electric generating plants ... to support large numbers of conductors such as cables, wires”); EX1018, 1:7-10 (“[t]his invention relates ... to the structure of cable trays for carrying electric power cables in suspended positions”); EX1019, 1:24-29 (“This invention relates to supporting members for cables ... or other conductors; and more particularly, to an improved cable supporting tray”). As explained by CAB, messenger-wire based support assemblies “perform as a high quality mini-cable tray system[.]” EX1005, 3.

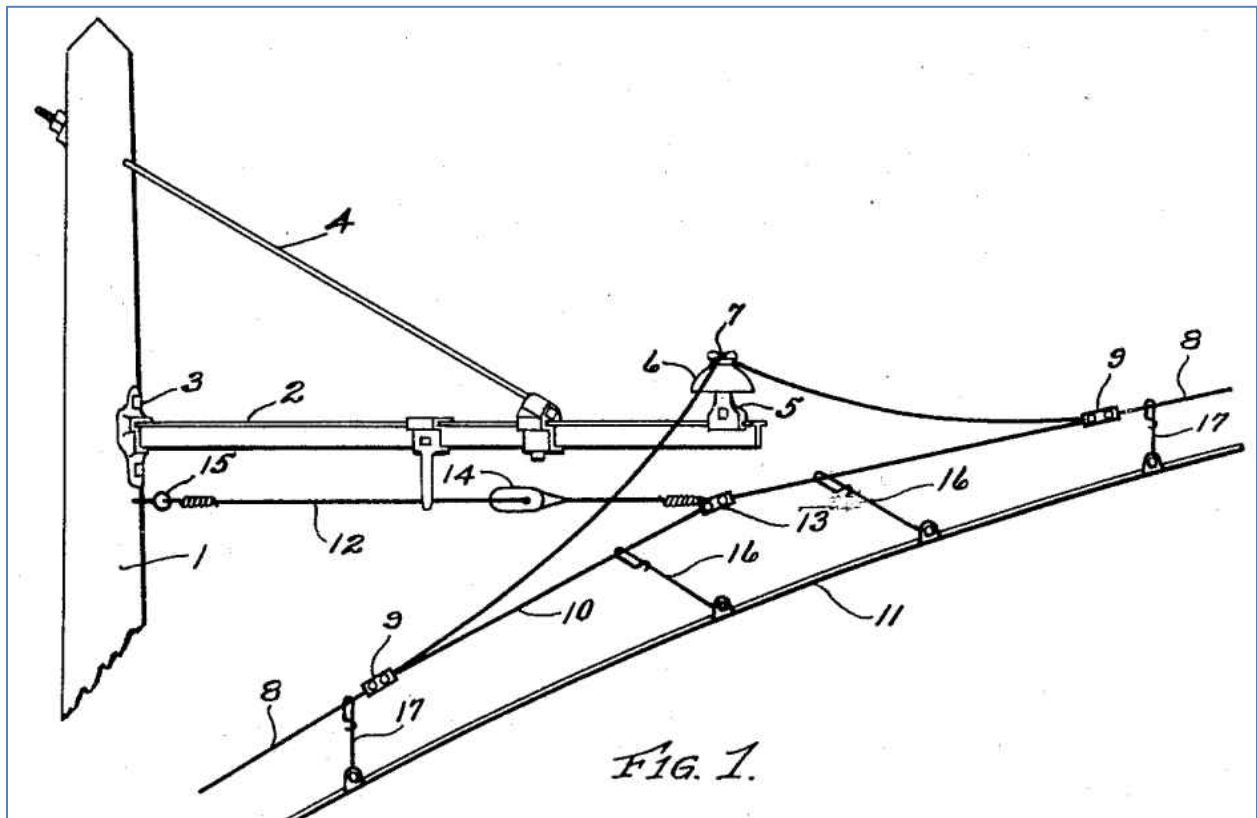
c. Mounting Structures

The '551 Patent does not purport to have invented mounting structures. Nor could it. Mounting structures have been used since the 19th Century to couple tension members to utilities poles. In 1930, Williams disclosed a “clamping plate” to secure a messenger to a pole for supporting current-carrying cables:



EX1020, Figs. 1-2. Williams provided for the use of metal components, and the use of a messenger cable that “is always grounded[.]” *Id.*, 1:7-13.

Alternatively, horizontal arms extending from pole were used as a mounting structure to couple tension members to poles. In 1929, Stromberger disclosed a pole with a horizontal arm for holding a messenger cable:



EX1021, 1:24-31; Fig. 1.

3. Support Systems as Grounding Systems

The '551 Patent coins the term “multi-function line,” defined as “**a tension member that supports current wires and/or cable hangers, and, which is conductive.**” EX1001, 2:37-40. However, that too was well-known in the art prior to the '551 Patent's 2017 priority date: a common, simple and cost effective method to create a ground path for electric distribution systems is to exploit the conductivity of various metal components in a support system, including the tension member, pole, and mounting structures. EX1002, ¶48. Using exclusively conductive materials

provides the support system a ready path to ground via each metal component in the structure. *Id.*

In 2008—almost a decade before the priority date—the NEC specifically provided that tension members, such as messenger wires, can be simultaneously used both as structural support for conductors and as the equipment grounding conductor itself. Chapter 3 of the NEC, which covers messenger cable supported wiring, provides that a messenger wire may be used as a grounding conductor:

396.30 Messenger.

(A) Support. The messenger shall be supported at dead ends and at intermediate locations so as to eliminate tension on the conductors. The conductors shall not be permitted to come into contact with the messenger supports or any structural members, walls, or pipes.

(B) Neutral Conductor. Where the messenger is used as a neutral conductor, it shall comply with the requirements of 225.4, 250.184(A), 250.184(B)(7), and 250.186(B).

(C) Equipment Grounding Conductor. Where the messenger is used as an equipment grounding conductor, it shall comply with the requirements of 250.32(B), 250.118, 250.184(B)(8), and 250.186(D).

EX1007, 241 (396.30).

In accordance with the NEC and the well-known benefit of using messenger cables as a grounding conductor, companies selling messenger cables have strengthened their capability to serve as grounding conductors. EX1002, ¶¶50-52; EX1023, 1 (Southwire sold a service drop cable that included a “neutral messenger”

in 2003); EX1024 (Hendrix sold a messenger wire that “acts as a lightning shield and as the system neutral” in 2010); EX1025, [0002]-[0003] (Akasaka disclosed a ground wire that is “electrically conductive as well as self-supporting” in 2001); EX1002, ¶50. Thus, the claimed “multi-function line” was known in the art.

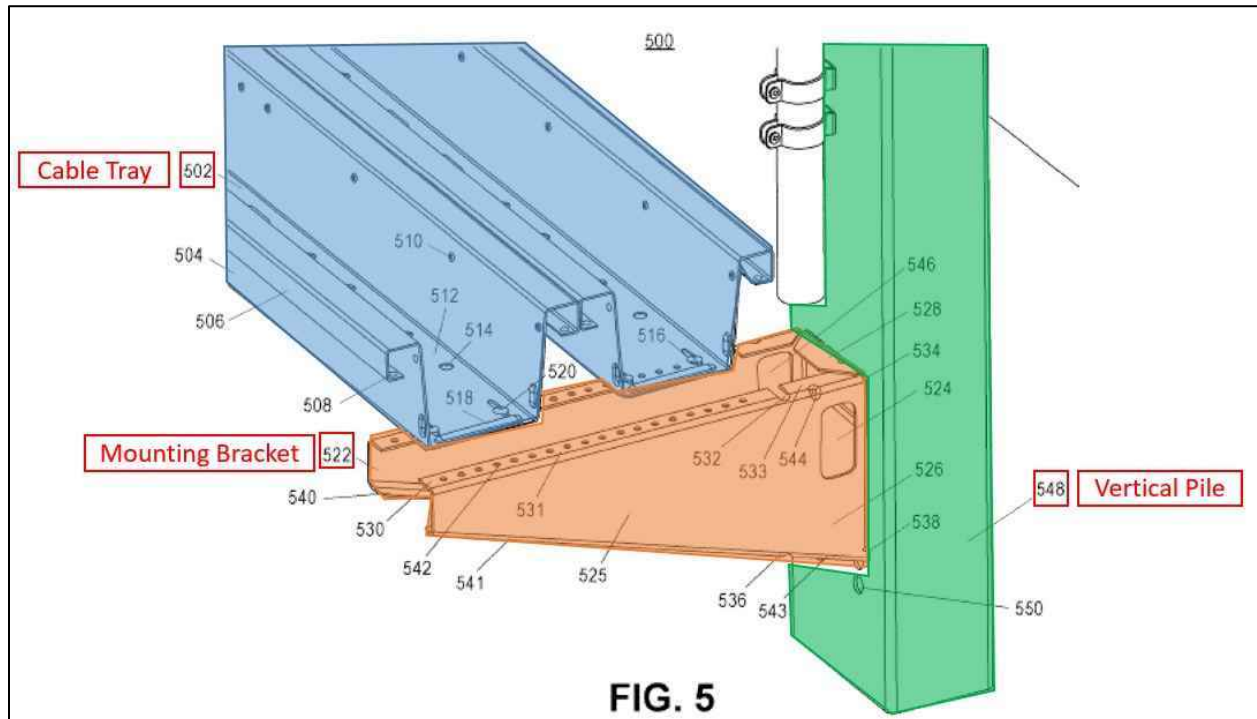
B. Prior Art

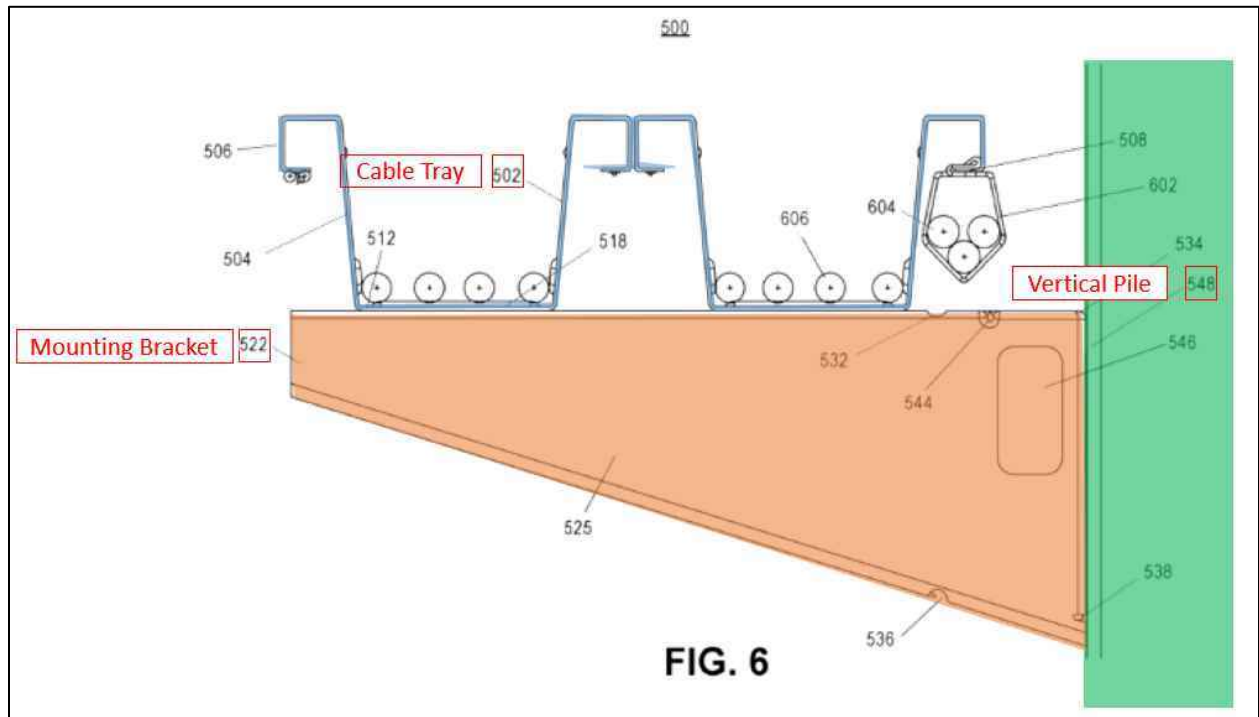
1. Grushkowitz

U.S. Patent No. 10,003,298 (“Grushkowitz” (EX1003)), entitled “Solar Collector Cable Support Tray and Support System,” was filed on March 1, 2016, published as U.S. Application Publication No. 2016/0261232 on September 8, 2016, and issued on June, 19, 2018. Grushkowitz claims priority to U.S. provisional application no. 62/127,256, filed March 2, 2015. Therefore, Grushkowitz is prior art pursuant to at least AIA 35 U.S.C. §102(a).

Grushkowitz teaches that “solar energy systems can be simplified so as to reduce component costs.” EX1003, 2:7-10. Grushkowitz discloses a support and grounding system that comprises a cable tray multi-function line, vertically-oriented piles, and mounting brackets that support current-carrying cables and “provide[] a ground path from a cable tray, to the mounting bracket, to the pile, and then to the ground to dissipate transient voltages” in a solar energy collection system. *Id.*, Abstract.

Like in the '551 Patent, Grushkowitz uses a support system comprised of conductive components (“(e.g. steel, aluminum, titanium, etc.) or other conductive material[s]”) in order to create “a continuous ground path” from the components to the earth. *Id.*, 10:63-11:8.





EX1003, Figs. 5 and 6 (annotated, with cable trays in blue, mounting brackets in orange, vertical piles in green).

2. CAB Website and Whitepaper

Patent Owner’s website, available at www.cabproducts.com, showcases CAB’s products, includes descriptions and images of CAB products in use, and contains links to download whitepapers and catalogues related to CAB products. As early as February 4, 2015, CAB’s website included a page titled “CAB Cable Rings and Saddles for Solar Cable Management.” EX1005 (“CAB Website”).³ The CAB

³ EX1026 is an affidavit authenticating all Internet Archive records cited in this Petition. For convenience, the cited records from EX1005 are also marked as separate exhibits. For example, the CAB Website appears at pages 6-24 of EX1026.

Website included a link to a whitepaper hosted on CAB’s website described as “Bill Brooks Engineering White Paper,” depicted the cover page, included several quotes, and stated that the whitepaper is dated “September 2014”. *Id.*, 4-5. Brooks Engineering prepared that whitepaper for CAB, titled “CAB Cable Rings and Saddles for Solar Cable Management,” and dated September 18, 2014. EX1006 (“CAB Whitepaper”). Comparing the cover page, quotes, dates, filenames, and URL filepaths confirms that the CAB Whitepaper is the same document linked from the CAB Website. *Compare* EX1006, *with* EX1005.

The Internet Archive’s Wayback Machine shows the public accessibility of the CAB Website on February 4, 2015 by preserving the CAB Website as it was “made available to the public” at that date. *Valve Corp. v. Ironburg Inventions Ltd.*, 8 F.4th 1364, 1374 (Fed. Cir. 2021) (recognizing “[E]xaminers use ‘The Wayback [M]achine’ to determine when a ‘reference was first made available to the public’”); *Veeam Software Corp. v. Symantec Corp.*, IPR2013-00142, Paper 11, *9-10 (Aug. 7, 2013) (considering webpages from the Wayback Machine even without declaration from Archive.org when granting institution); *Pohl v. Mh Sub I, LLC*, 332 F.R.D. 713, 717-718 (N.D. Fla. 2019) (discussing evidence sufficient to support a

and separately as EX1005. Additionally, the CAB Whitepaper appears at pages 27-41 of EX1026, and separately as EX1006.

finding that WayBack machine evidence is authentic); Ex. 1026, 1 (affidavit of a person with personal knowledge attesting that the Wayback Machine crawler operates to create a copy of a website as it existed at a particular point in time).

Therefore, the CAB Website and CAB Whitepaper are prior art pursuant to at least AIA 35 U.S.C. §102(a).

a. CAB Website

The CAB Website depicts a “Solar Cable Management” support and grounding system comprised of suspended rings and saddles that “provide safe, strong, and durable support for all types of solar power cables.” EX1005, 3. The CAB Website depicts cables supported by a support system, comprising a messenger wire tension member, metal brackets/clamps, and metal piles:





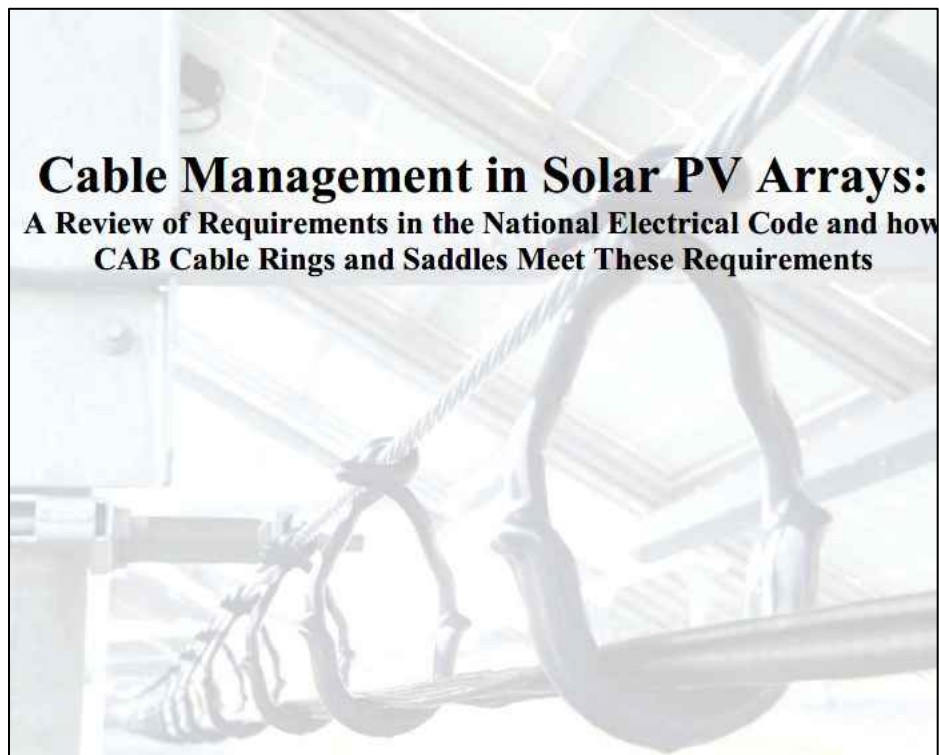
EX1005, 5, 13, 18.⁴

⁴ The CAB Website contained a dynamic image carrousel at the top which rotated through photographs of CAB's products. For convenience, EX1005 includes a snapshot of the CAB Website showing each of these images. EX1005, at 3, 8, 13, 18.

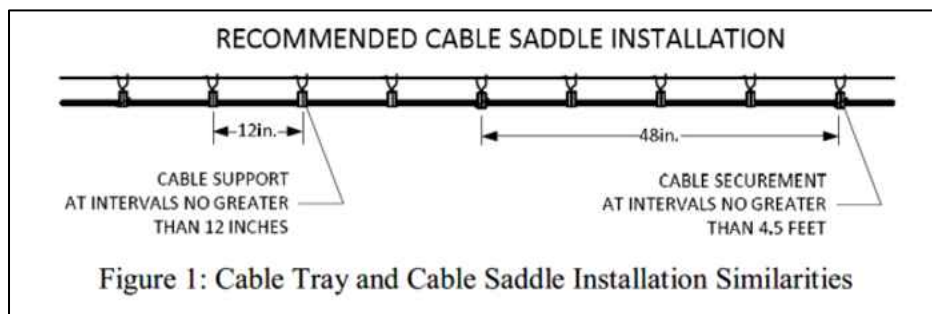
The CAB Website describes the system as “effectively operat[ing] as a mini cable tray system for a fraction of the cost of cable tray.” *Id.*, 5. The CAB Website shows both square or circular metal piles. *Id.*, 5, 18. Bolted to the piles with metal-to-metal contact is a clamp, which holds tight through metal-to-metal contact a bare metal messenger wire. *Id.* The CAB Website support system would function as a grounding system given its use of coupled conductive components, which create a path to ground where stray current would dissipate.

b. CAB Whitepaper

The CAB Whitepaper explains how CAB products can be used in compliance with the NEC. EX1006, 3. The CAB Whitepaper addresses developments in NEC regulation, including cable tray rung spacing, and bundling of current-carrying cables using cable hooks. *Id.*, *passim*. Additionally, the CAB Whitepaper addresses grounding systems, including the use of a tension member in the form of a “grounded steel messenger wire” that also supports current-carrying cables (i.e. the claimed “multi-function line”):



EX1006, 2 (depicting CAB's steel messenger wire, metal bracket and clamping mechanism, and metal pile, functioning to support current-carrying cables);





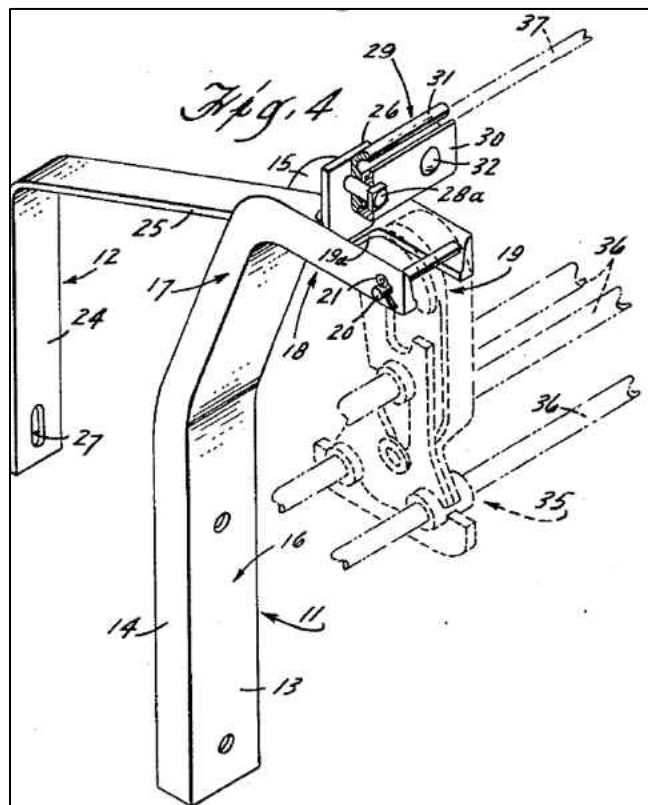
Id., 12, 14 (depicting the same). The CAB Whitepaper discloses that even if the insulation covering the current-carrying cable “were ever to be damaged, the cable rings and saddles [supporting the current-carrying cable] would stay at or near ground potential” due to the use of a grounded steel messenger wire—i.e., a “multi-function line.” *Id.*, 14.

3. Petersen

U.S. Patent No. 3,001,749 (“Petersen” (EX1004)), entitled “Pole Top Extension for Aerial Cable” was filed on February 25, 1959 and issued on September 26, 1961. Therefore, Petersen is prior art pursuant to at least AIA 35 U.S.C. §102(a).

Petersen “relates in general to pole top extensions for aerial cable and more particularly relates to a horizontally offset extension adapted to be attached to the

top of a utility pole[.]” EX1004, 1:9-12. Petersen discloses a support and grounding system that employs a “pole top extension bracket” that supports a tension member, in this case a “neutral messenger cable.” *Id.*, 1:53-55; 2:1-8. *Id.* “[P]ortion 26” of Petersen’s assembly comprises a “ground clamp means 29” which is comprised of “two clamping jaw members” that keep the neutral messenger wire in place and in grounded electrical communication. *Id.*, 2:34-50.



EX1005, Fig. 4.

4. MacLean

The MacLean “Pole Line Hardware Catalog” issued in May of 2010 (EX1027 “MacLean”). MacLean Power Systems is a well-known manufacturer of utility

power system and telecommunication equipment. EX1002, ¶63. MacLean discloses hundreds of products available as of 2010 for use in the power utility and telecommunication systems, including electrical grounding and cable support systems. *See generally*, EX1027. MacLean discloses terminal supports, including thimble-eye bolts, for terminating tension members, in particular, messenger cables:



EX1027, 14. MacLean was published in 2010 and therefore is prior art pursuant to at least AIA 35 U.S.C. §102(a).

V. ORDINARY SKILL IN THE ART

The level of ordinary skill in the art may be reflected by the prior art of record. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001). A person of ordinary skill in the art at the time of the purported invention (“POSITA”) would have had a bachelor’s degree in a pertinent discipline, such as electrical engineering, civil engineering, mechanical engineering or equivalent with 2-3 years of experience in electrical utility systems, planning, and design, with the understanding that the number of years of experience could be higher or lower given the level of education and vice versa.

VI. CLAIM CONSTRUCTION

Claims in an IPR are construed using the same standard used in civil actions under 35 U.S.C. §282(b), in accordance with the ordinary and customary meaning as understood by a POSITA and the prosecution history. 37 C.F.R. §42.100(b).

The term “multi-function line” is expressly defined in the ’551 Patent specification as “a tension member that supports current wires and/or cable hangers” and “is conductive.” *Id.*, 2:37-40. When “the specification ... reveals a special definition given to a claim term by the patentee that differs from the meaning it would otherwise possess ... the inventor’s lexicography governs.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1316 (Fed. Cir. 2005). Accordingly, Petitioner requests that

the term “multi-function line” be construed as the patent defined it: “a tension member that supports current wires and/or cable hangers and is conductive.”

VII. STATEMENT OF PRECISE RELIEF REQUESTED

In accordance with 35 U.S.C. §311, Petitioner requests institution of IPR and a finding that claims 1-19 of the '551 Patent are unpatentable as follows:

Ground	Claims	References	Basis ⁵
1	1-12, 18-19	<i>Grushkowitz</i> in view of the knowledge of a POSITA	§103
2	1-19	<i>CAB Website</i> and <i>CAB Whitepaper</i> in view of the knowledge of a POSITA	§103
3	1-19	<i>Petersen</i> in view of the knowledge of a POSITA	§103
4	13-17	<i>Petersen</i> and <i>MacLean</i> in view of the knowledge of a POSITA	§103
5	13-17	<i>CAB Website</i> , <i>CAB Whitepaper</i> , and <i>MacLean</i> , in view of the knowledge of a POSITA	§103

Sections VIII-XII detail statutory grounds of unpatentability for each of the challenged claims. Additional evidence is supplied in the accompanying Declaration of Dr. Beik (EX1002) and other supporting exhibits. The record establishes a reasonable likelihood of prevailing as to each ground of invalidity with respect to the Challenged Claims.

⁵ Because the '551 Patent has a priority date after March 16, 2023, the post-AIA statute applies.

VIII. GROUND 1: Obviousness over *Grushkowitz*

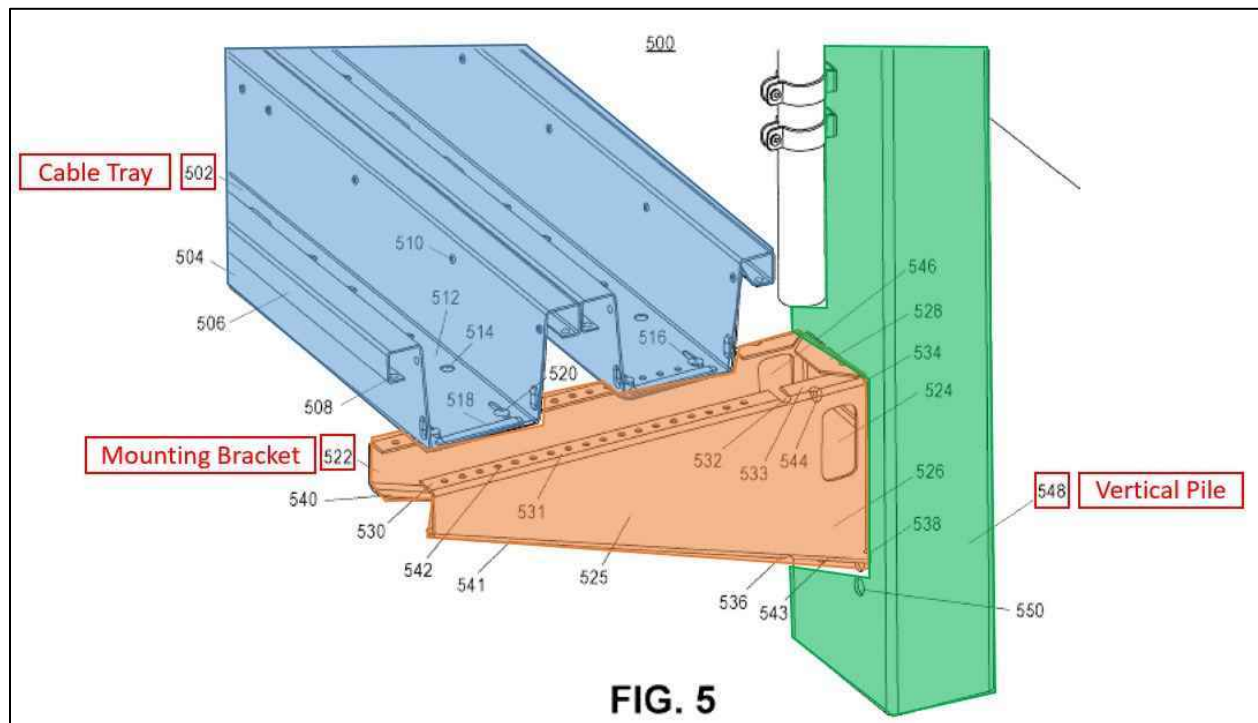
Grushkowitz alone, or in view of the knowledge of a POSITA renders obvious claims 1-12 and 18-19 of the '551 Patent. Accordingly, Petitioner requests cancellation of these claims.

A. Claim-by-Claim Analysis

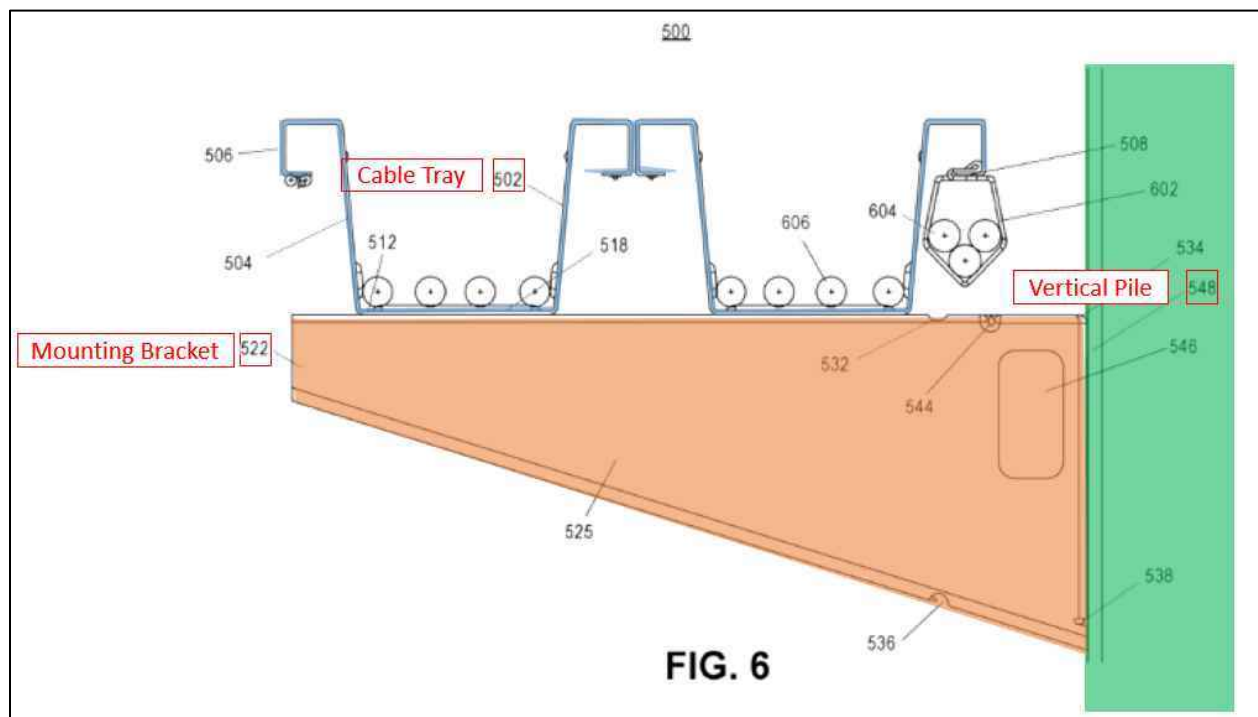
1. Claim 1

- a. 1[a]: “A grounding system structured to ground a number of cables supported by a support assembly, said support assembly including a plurality of spaced, conductive piles, said grounding system comprising”

To the extent the preamble is limiting, Grushkowitz discloses it. EX1002, ¶¶66-68. EX1003, Abstract. Grushkowitz discloses a grounding system to ground cables supported by a support system: “cable tray and *support system* [that] provides a continuous ... electrical *grounding path from the cable trays 502 to the vertically –oriented pile 548 the mounting bracket 522* [.]” EX1003, 7:67-8:3.

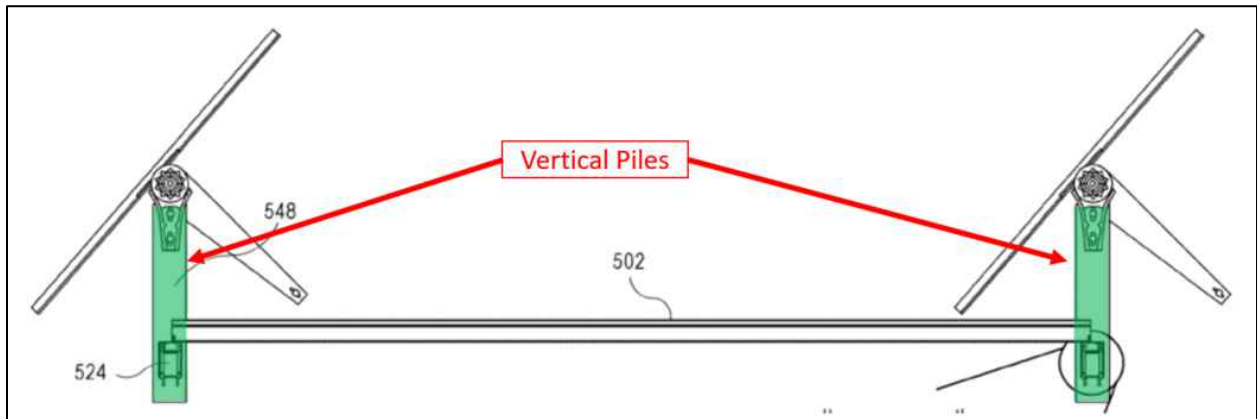


Id., Fig. 5 (annotated).



Id., Fig. 6 (annotated). Grushkowitz discloses cables 606 supported with the cable tray 502, as can be seen in Fig. 6 above. *Id.*, 11:27-31.

Grushkowitz discloses a plurality of spaced conductive piles. Grushkowitz discloses “vertically-oriented *piles* 548” that are spaced apart. *Id.*, 7:56-61.



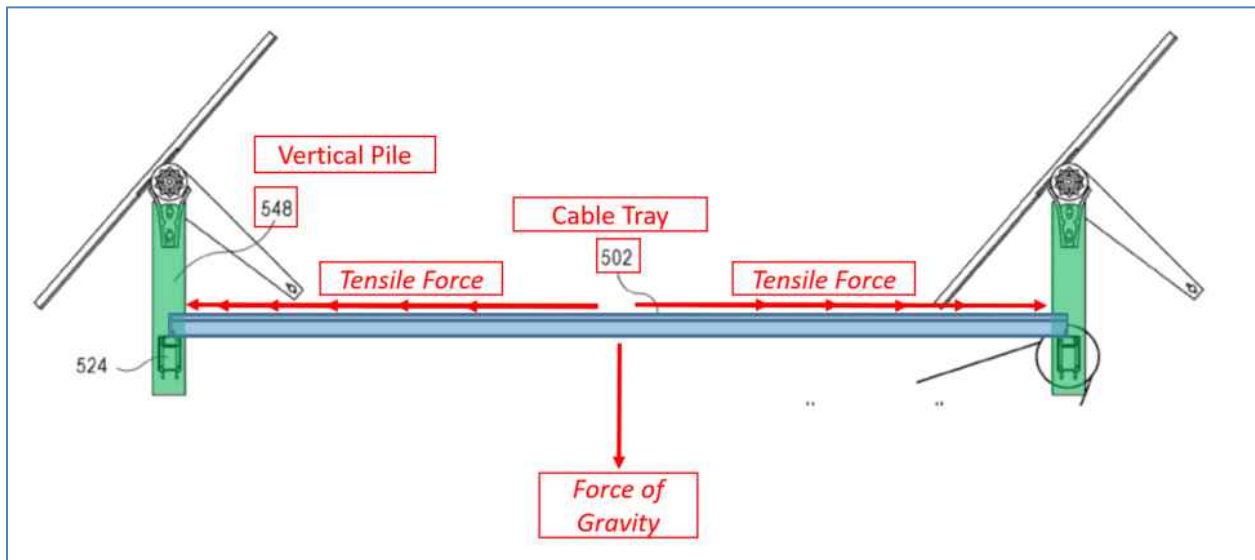
Id., Fig. 8A (annotated). Further, Grushkowitz teaches that “the cable tray 502, fastener 520, mounting bracket 522, fastener 804, and pile 548 all comprise metal (e.g., steel, aluminum, titanium, etc.) or other conductive material[s]” in order to form “a continuous ground path ... from the cable tray 502, to the fastener 520, to the mounting bracket 522, to the fastener 804, to the pile 548, and into the earth[.]” *Id.*, 11:4-8.

b. 1[b]: “a multi-function line assembly including a multi-function line;”

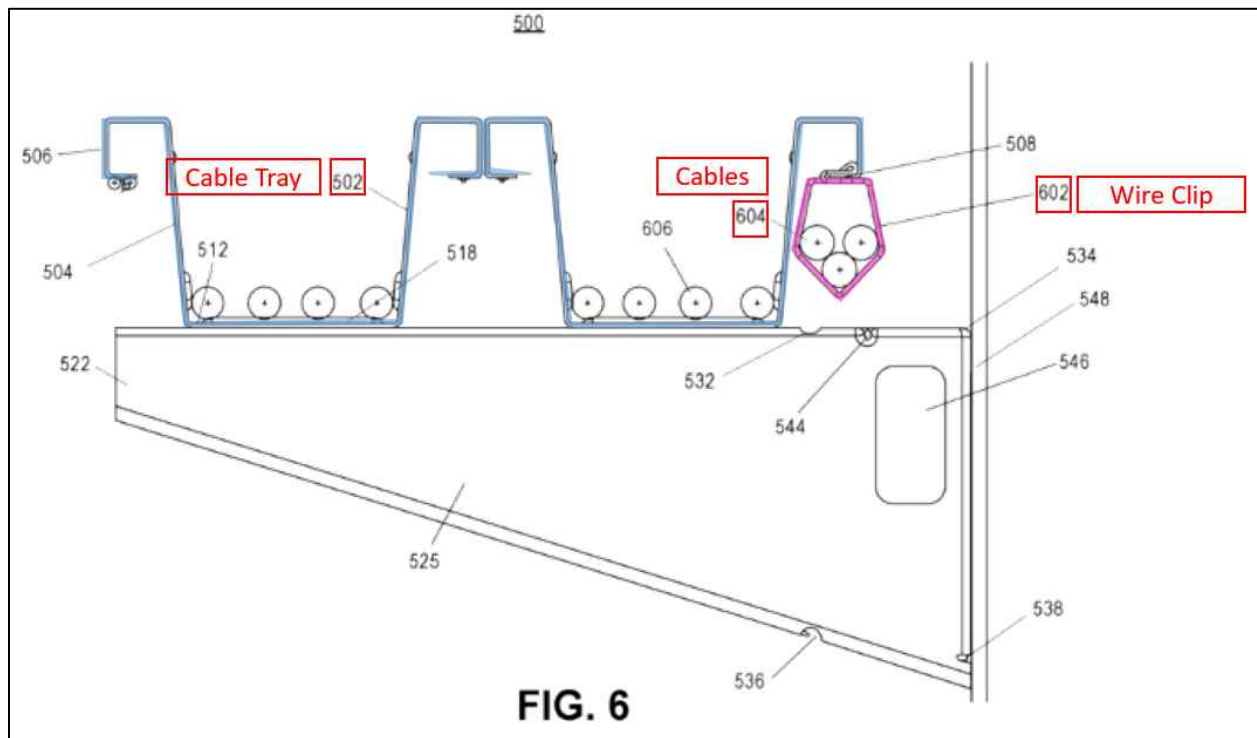
Grushkowitz discloses this claim limitation. The ’551 Patent does not define “multi-function line assembly,” but the claim requires the assembly includes a multi-function line, which is consistent with the specification. EX1001, claim 1, 7:17-24.

The '551 Patent defines “multi-function line” as a “tension member that supports current wires and/or cable hangers, and, which is conductive.” EX1001, 2:37-40. Grushkowitz’s cable tray 502 meets this lexicography and is thus a “multi-function line” because it is made of metal (conductive), terminates at its ends on mounting brackets, and supports current wires. EX1003 11:4-8. Indeed, Patent Owner’s own materials analogize cable trays to messenger-wire-based support systems. EX1005, 3 (explaining that a system suspended from a messenger cable “perform[s] as a high quality mini-cable tray.”)

The cable tray is a tension member because it is subjected to tensile forces as a result of gravity and the weight of current wires supported thereon:



EX1003, Fig. 8A (excerpted, annotated); EX1002, ¶69. Grushkowitz further discloses a multi-function line supporting cable hangers (wire clip 602), which also subjects cable tray 502 to tensile forces:



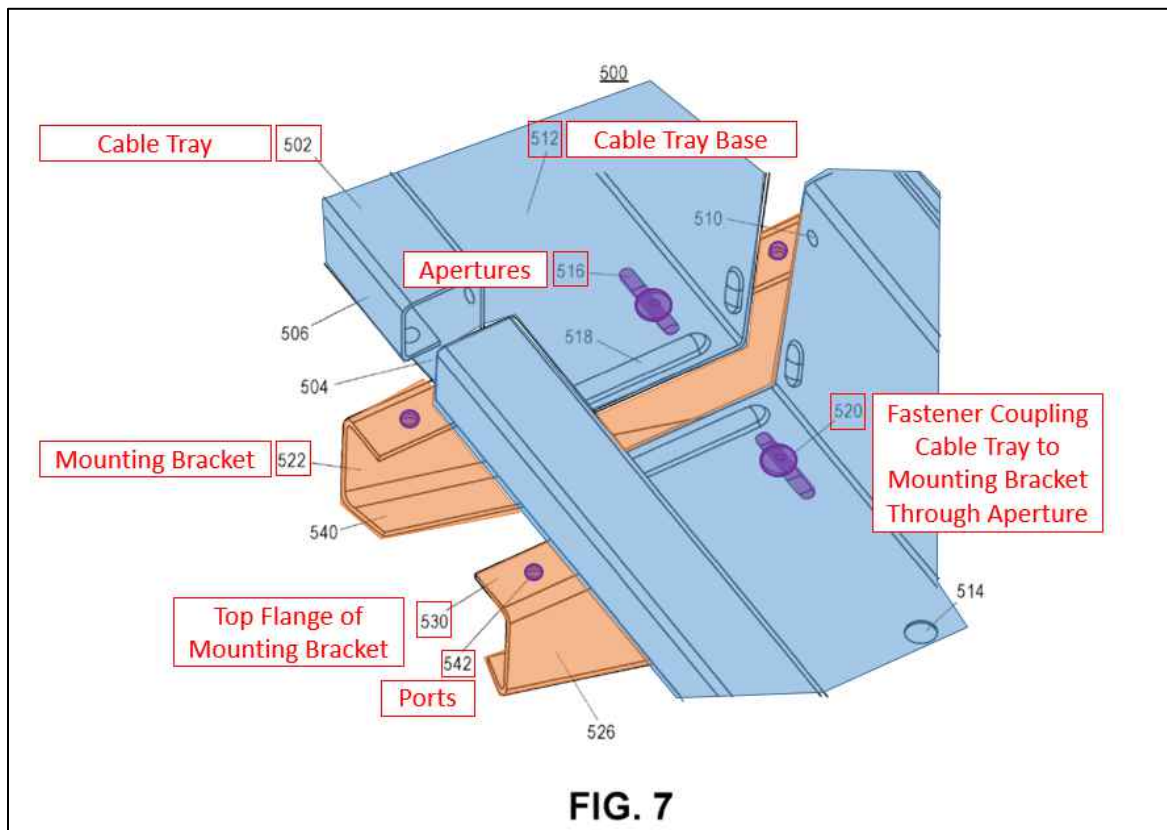
EX1003, Fig. 6 (annotated); 11:16-18 (“[c]oupled to the rim 508 on cable tray 502 ... is a wire clip 602” which “may be used to support cables 604.”); EX1002, ¶¶69-70. Accordingly, Grushkowitz discloses a multi-function line assembly that includes a cable tray, which under the express definition is a multi-function line. *Id.*

- c. **1[c]: “a number of conductive mounting assemblies, each said conductive mounting assembly structured to be coupled to said multi-function line and to a conductive pile; and”**

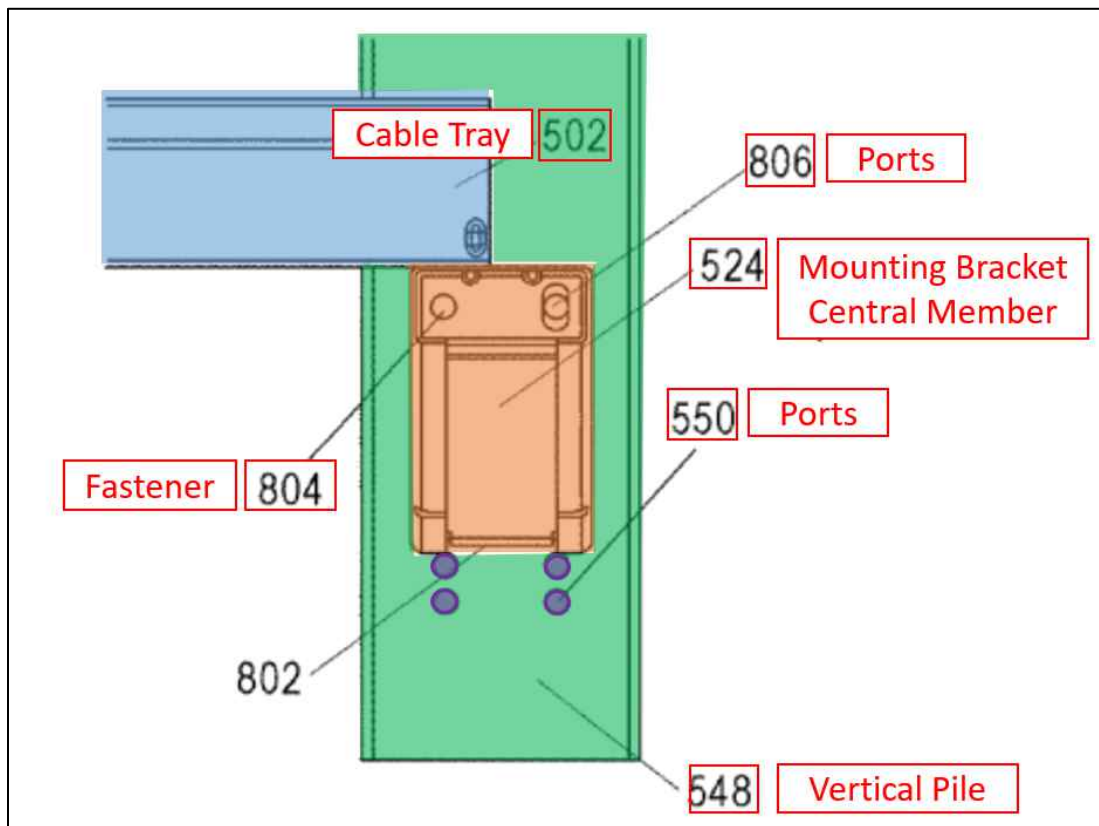
Grushkowitz discloses or renders this limitation obvious. Grushkowitz discloses fixing a cable tray to a mounting bracket made of conductive materials. EX1003, 7:50-54 (“cable tray 502 and the mounting bracket 522 may be made of galvanized steel[.]”). The ’551 Patent states that conductive materials include

galvanized steel. EX1001, 8:18-28, *see also* 8:46-50 (““cable tray 502 ... includes one or more apertures 516 in the base 512” of cable tray 502”), and 9:41-44 (ports 542 on the top flange of mounting bracket 522 which are “adapted to receive fastener 520, thus coupling the base 512 of the cable tray 502 to the top flange 530” of the mounting bracket 522). Accordingly, Grushkowitz discloses a number of conductive mounting assemblies structured to be coupled to said multi-function line. EX1002, ¶¶71-72.

Grushkowitz discloses conductive mounting assemblies structured to be coupled to a conductive pile. EX1002, ¶¶71-72. Grushkowitz teaches that the fasteners used to attach fasteners 520 and 804 are also made of conductive materials. EX1003, 10:66-11:3. Grushkowitz discloses that “pile 548 includes a plurality of ports 550 adapted to receive a fastener 804 ... to couple the mounting bracket 522 to the pile 548[.]” *Id.*, 8:14-18. Grushkowitz’s assembly is depicted in Figs. 7 and 8A:



EX1003, Fig. 7 (annotated, depicting conductive mounting bracket structured to be coupled to conductive cable tray (multi-function line) via conductive fasteners inserted through cable tray-apertures into mounting bracket ports); EX1002, ¶72.



EX1003, Fig. 8A (excerpted, annotated—depicting conductive mounting bracket structured to be coupled to conductive vertical pile via conductive fasteners inserted through mounting bracket-ports into vertical pile-ports).

- d. **1[d]: “wherein said multi-function line assembly is coupled to, and in electrical communication with, said number of conductive mounting assemblies.”**

Grushkowitz alone, or in view of the knowledge of a POSITA discloses or renders this limitation obvious. EX1002, ¶73. Grushkowitz discloses coupling the cable tray (multi-function line) to the number of mounting brackets, all of which are in electric communication with each other because they are comprised of conductive materials. EX1003, 10:63-11:13; §VIII.A.1.c. Grushkowitz teaches that such an

assembly creates “a continuous ground path ... from the cable tray 502, to the fastener 520, to the mounting bracket 522, to the fastener 804, to the pile 548, and into the earth at the site of the solar energy collector system 10” which a POSITA would have understood to mean that cable tray 502 is in electrical communication with mounting bracket 522. *Id.*, 10:67-11:8; EX1002, ¶73.

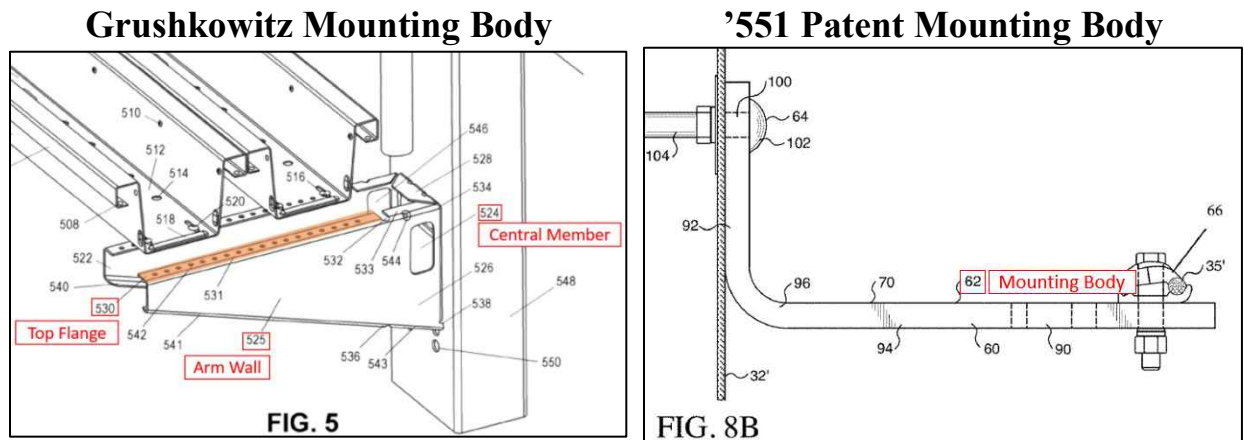
2. Claim 2

a. 2[a]: “The grounding system of claim 1 wherein:”

Grushkowitz alone or in view of a POSITA discloses or renders claim 1 obvious. §VIII.A.1.

b. 2[b]: “each said conductive mounting assembly includes a mounting body, a support coupling, and a number of multi-function line couplings; and”

Grushkowitz discloses or renders this limitation obvious. EX1002, ¶¶75-80. Grushkowitz’s mounting bracket is made of metal (conductive), and includes a mounting body in the form of top flange 530, which “extends outwardly from the arm wall 525 in a second direction toward the central member 524.” EX1003, 9:18-20. Figure 8B of the ’551 Patent depicts “mounting body 62” as a portion of the mounting assembly. EX1001, Fig. 8B.

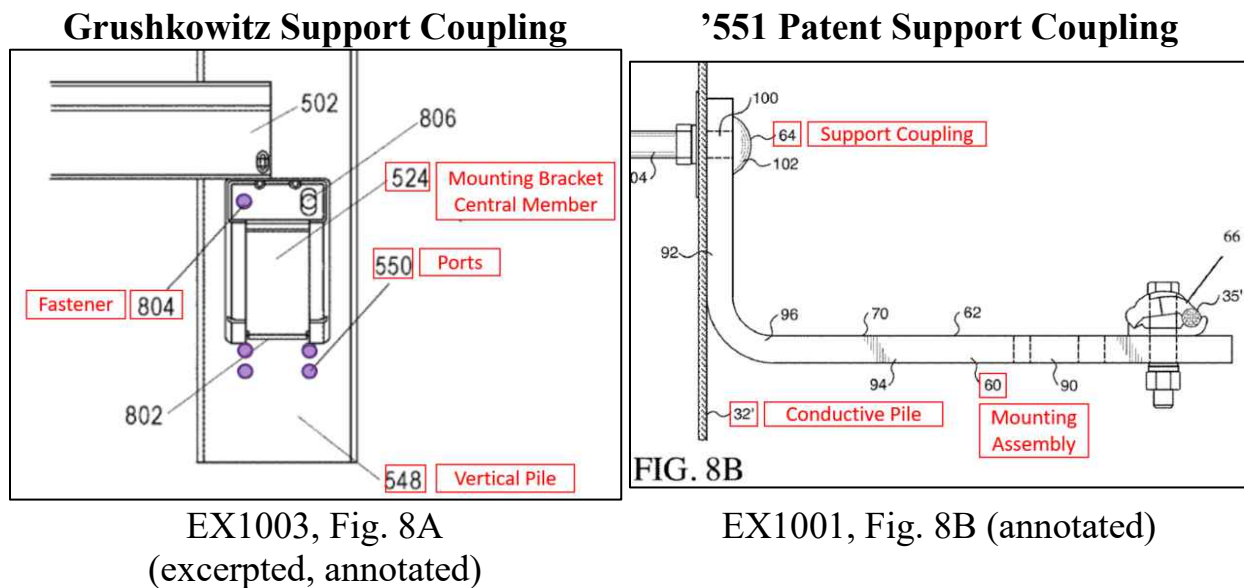


EX1003, Fig. 5 (excerpted, annotated)

EX1001, Fig. 8B (annotated)

Accordingly, Grushkowitz's conductive mounting assembly includes a mounting body.

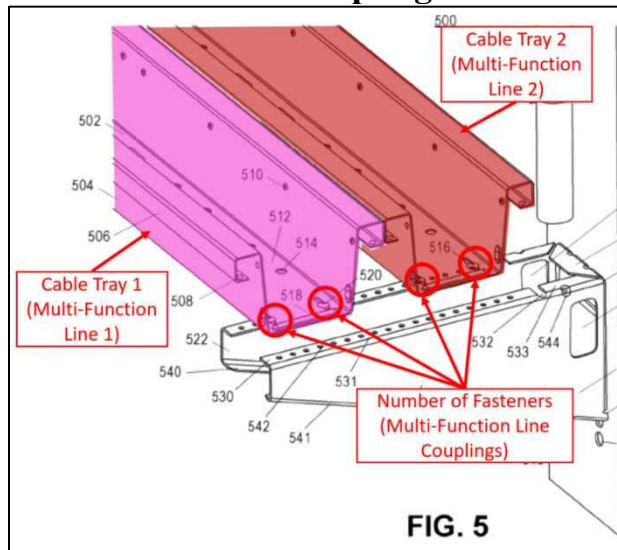
Grushkowitz's mounting bracket also discloses a support coupling. Grushkowitz discloses that “[t]he mounting bracket 522 is coupled to the vertically-oriented pile 548 **by one or more fasteners 804**” (EX1003, 7:56-58) and that “pile 548 includes a **plurality of ports 550 adapted to receive fastener 804 ... to couple the mounting bracket 522 to the pile 548[.]**” *Id.*, 8:14-18.



Accordingly, Grushkowitz discloses a conductive mounting assembly including a support coupling. EX1002, ¶¶75-78.

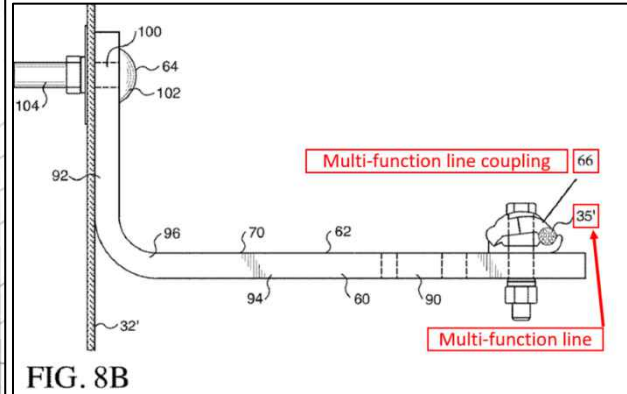
Grushkowitz's mounting bracket also includes a number of multi-function line couplings. Grushkowitz discloses a number of fasteners which couple cable trays 502 (multi-function lines) to mounting bracket 522 (mounting assembly):

Grushkowitz Multi-Function Line Coupling



EX1003, Fig. 5, excerpted, annotated;
§§VIII.A.1.c, d

'551 Patent Multi-Function Line Coupling



EX1001, Fig. 8B (annotated)

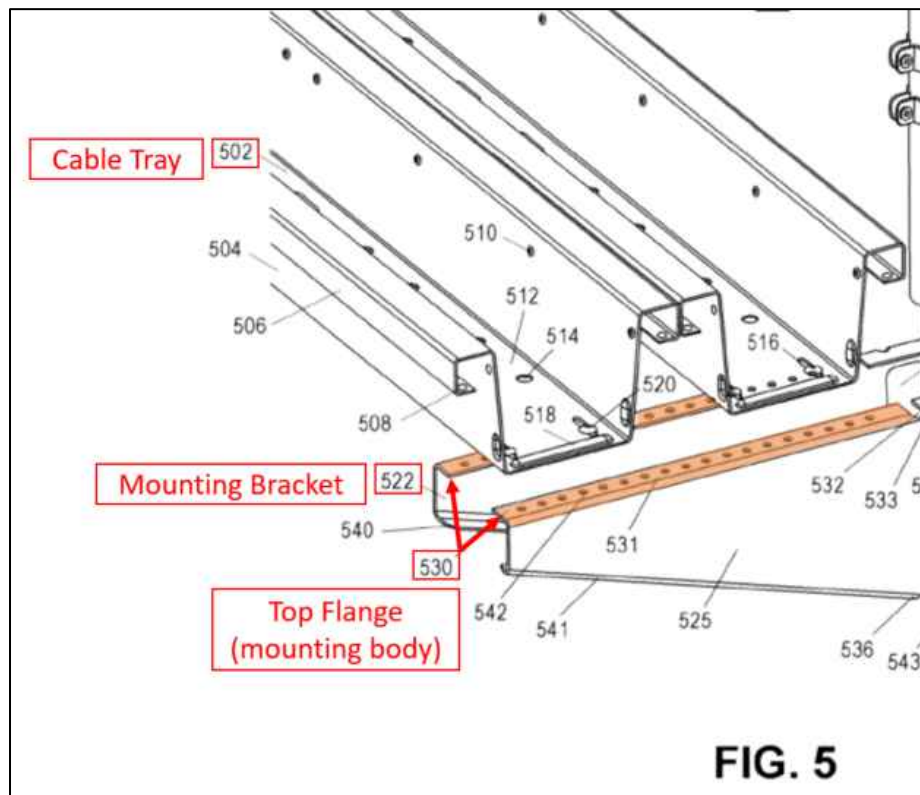
Accordingly, Grushkowitz discloses a conductive mounting assembly including a number of multi-function line couplings. EX1002, ¶¶75-80.

c. 2[c]: “each said multi-function line coupling defines a conductive path.”

Grushkowitz discloses that “the cable tray 502, fastener 520, mounting bracket 522, fastener 804, and pile 548 all comprise metal” resulting in “a **continuous ground path** ... from the cable tray 502, to the fastener 520, to the mounting bracket 522, to the fastener 804, to the pile 548, and into the earth at the site of the solar energy collector system 10.” EX1003, 10:67-11:8; §§VIII.A.1.c, d; EX1002, ¶81.

3. Claim 3: “The grounding system of claim 2 wherein each said mounting body is one of a conductive body or a conductive body assembly.”

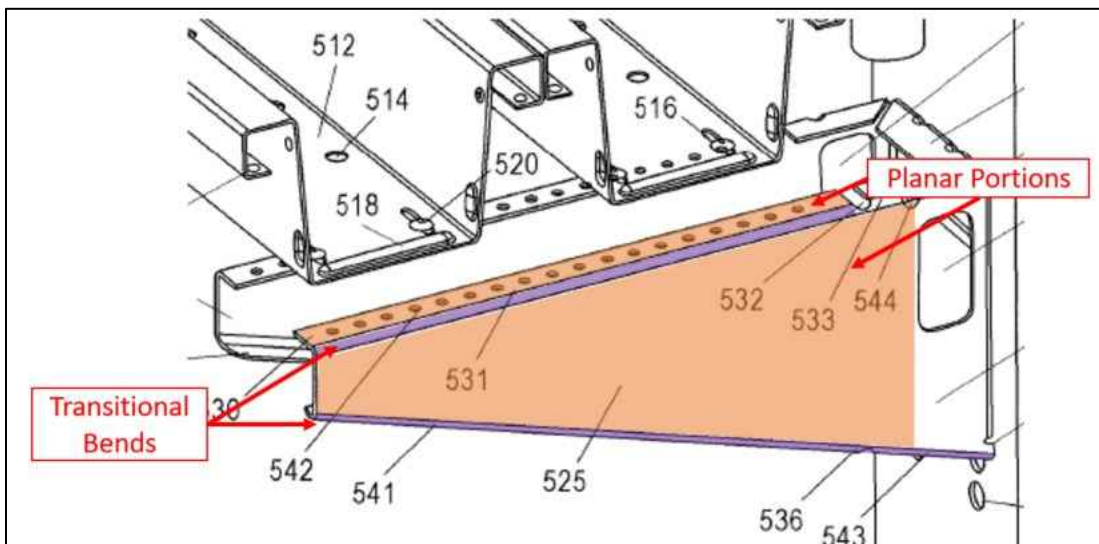
Grushkowitz alone or in view of a POSITA discloses or renders claim 2 obvious. §§VIII.A.1, 2. Grushkowitz’s mounting bracket 522 comprises top flange 530 which is a mounting body for cable tray 502:



EX1003, Fig. 5 (excerpted, annotated). Mounting bracket 522 (and accordingly top flange 530) is conductive, and therefore a conductive body or conductive body assembly. §§VIII.A.1.c, d, 2.c; EX1002, ¶82-83.

4. Claim 4: “The grounding system of claim 3 wherein each said mounting body has a simplified shape.”

Grushkowitz alone or in view of a POSITA discloses or renders claim 3 obvious. EX1002, ¶83. The '551 Patent defines “simplified shape” as “a body or assembly including generally planar portions and transitional bends or welds between the generally planar portions.” EX1001, 9:62-64. Grushkowitz’s mounting bracket 522 is a body or assembly that includes generally planar portions, and transitional bends between planar portions:



EX1003, Fig. 5 (excerpted, annotated); EX1002, ¶¶84-85. Accordingly, Grushkowitz discloses a mounting body that has a simplified shape.

5. Claim 5

a. 5[a]: “The grounding system of claim 2 wherein”

Grushkowitz alone or in view of a POSITA discloses or renders claim 2 obvious. §VIII.A.2.

b. 5[b]: “each said mounting body is a conductive body; and”

Grushkowitz discloses or renders this limitation obvious for the same reasons stated above for claim elements 1[c] and 2[b]. §§VIII.A.1.c, 2.b; EX1002, ¶87.

c. 5[c]: “each said mounting body conductive body is a partially conductive body.”

Grushkowitz discloses or renders this limitation obvious for the same reasons stated above for claim elements 1[c] and 2[b]. §§VIII.A.1.c, 2.b. The '551 Patent defines “partially conductive” as any material that “conducts electricity” including “galvanized steel[.]” EX1001, 8:18-28. Grushkowitz’s mounting body is made of galvanized steel. EX1003, 7:46-54; EX1002, ¶88.

6. Claim 6: “The grounding system of claim 2 wherein each said multi-function line coupling is a clamping assembly.”

Grushkowitz alone or in view of a POSITA discloses or renders claim 2 obvious. §VIII.A.2. The '551 Patent defines “clamping assembly” as “two elements acting in concert, i.e., together, as well as a bias device such as, but not limited to, a ... threaded rod.” EX1001, 10:50-53. Grushkowitz discloses that fasteners 520 couple cable tray 502 (multi-function line) to mounting bracket 522, “may be any of a rivet, nut and bolt, screw, etc.” EX1003, 8:53-54. Grushkowitz discloses a coupling (fastener 520) that is a clamping assembly because a nut and bolt assembly comprises two elements acting in concert (the nut and the head of a bolt) with a threaded rod bias device (the threaded length of a bolt). EX1002, ¶89.

7. Claim 7: “The grounding system of claim 6 wherein each said multi-function line coupling includes one of a clam-shell assembly, a split bolt, a U-bolt, or a lay-in lug assembly.”

Grushkowitz alone or in view of a POSITA discloses or renders claim 6 obvious. §VIII.A.6. Grushkowitz couples cable tray 502 (multi-function line) to mounting bracket 522 using a nut and bolt assembly, which includes a threaded rod passing through a threaded nut. *Id.* The '551 Patent defines a “split bolt assembly” as an assembly which “includes a threaded rod including a passage and a threaded passage, passage, and/or a nut.” EX1001, 10:56-58. Grushkowitz further discloses that that fasteners 520 (multi-function line couplings) are not limited to nut and bolt assemblies (i.e. “fasteners 520 may be any of a rivet, nut and bolt, screw, *etc.*” EX1003, 8:53-54), and can therefore be any assembly capable of coupling cable tray 502 to mounting bracket 522. EX1002, ¶¶90-91. Accordingly, Grushkowitz discloses a multi-function line coupling that includes one of a clam-shell assembly, a split bolt, a U-bolt, or a lay-in lug assembly. *Id.*

Couplings such as clam-shell assemblies, split bolts, U-bolts, and lay-in lug assemblies were known by POSITAs as viable assemblies of coupling together components of a grounding system and/or cable support system. *Id.*

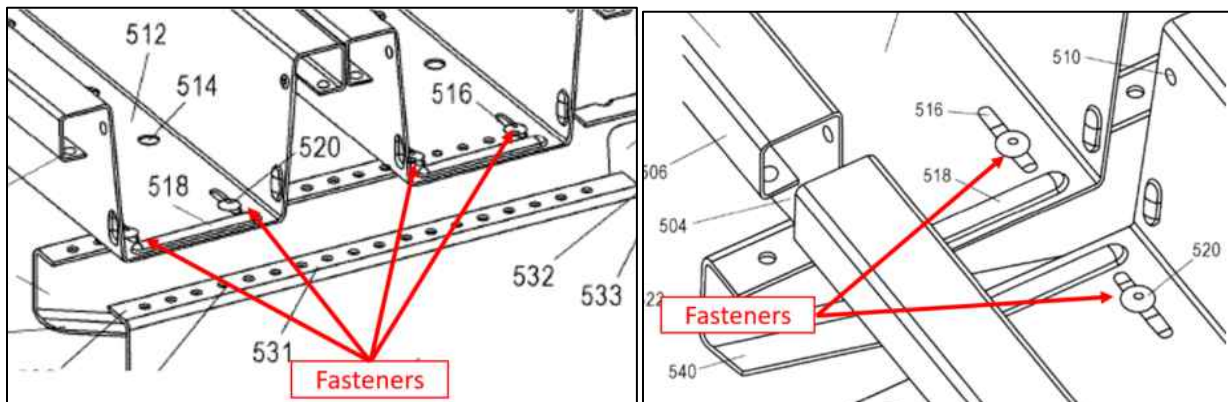
8. Claim 8

a. 8[a]: “The grounding system of claim 2 wherein”

Grushkowitz alone or in view of a POSITA discloses or renders claim 2 obvious. §VIII.A.2.

b. 8[b]: “said number of multi-function line couplings includes a plurality of multi-function line couplings; and”

Grushkowitz discloses or renders obvious this limitation. EX1002, ¶93. Grushkowitz utilizes multiple fasteners to couple the cable tray 502 to mounting bracket 522:



EX1003, Figs. 5, 7, respectively (excerpted, annotated).

c. 8[c]: “each said multi-function line coupling spaced one of a first effective distance, a second effective distance, or a third effective distance from another multi-function line coupling.”

Grushkowitz in view of the knowledge of a POSITA renders this limitation obvious. EX1002, ¶¶94-95. Grushkowitz teaches that “[t]he cable trays 502 installed on solar energy collector system 10 may vary in length” and that in some

embodiments, the cable trays 502 may be between 9 and 22 feet long, although it will be understood that other lengths may be used.” EX1003, 8:25-28. The ’551 Patent defines “first effective distance” as “between less than one foot to about one hundred feet apart,” “second effective distance” as “between one foot and about fifty feet apart,” and “third effective distance” as “between about five feet and about thirty feet apart.” EX1001, 11:2-7. Accordingly, Grushkowitz discloses multi-function line (cable tray 502) couplings (fasteners 520) a first effective distance, a second effective distance, or a third effective distance from another cable tray 502 fastener 520. EX1002, ¶¶94-95.

To the extent Grushkowitz does not expressly disclose a first, second, or third effective distance, such spacing-distances would have been obvious to a POSITA because such spacing distances were widely known in the art. EX1002, ¶95.

9. Claim 9: “The grounding system of claim 1 wherein said multi-function line assembly does not include any grounding splices.”

Grushkowitz alone or in view of a POSITA discloses or renders claim 1 obvious. §VIII.A.1. A grounding splice is a conductive element that is spliced into a conductive element, then electrically coupled to a pile or ground cable. EX1001, 2:6-12. Grushkowitz’s grounding system does not require a grounding splice because “the cable tray and support system 500 provides a continuous ... electrical

grounding path from the cable trays 502 to the vertically-oriented pile 548 ... without using jumpers.” EX1003, 7:67-8:3; EX1002, ¶¶96-97.

To the extent not expressly disclosed by Grushkowitz, it would have been obvious to a POSITA that the grounding system disclosed by Grushkowitz does not include, or require any grounding splices in order to provide a grounding connection. EX1002, ¶97.

10. Claim 10: “The grounding system of claim 1 wherein said multi-function line assembly does not include any medial grounding splices.”

Grushkowitz alone, or in view of the knowledge of a POSITA discloses or renders this claim obvious for the same reasons stated above for claim 9. §VIII.A.9; EX1002, ¶98.

11. Claim 11: “The grounding system of claim 1 wherein said multi-function line includes one of a highly conductive body or a partially conductive body.”

Grushkowitz alone or in view of a POSITA discloses or renders claim 1 obvious. §VIII.A.1. The ’551 Patent defines, “highly conductive” as a material “that has minimal resistance to electricity ... [f]or example, a copper wire” and “partially conductive” as a material “that conducts electricity, but with some resistance ... [f]or example, galvanized steel[.]” EX1001, 8:18-28. Grushkowitz’s “cable tray 502 ... may be made of galvanized steel[.]” EX1003, 7:50-54. Accordingly, Grushkowitz’s

multi-function line (cable tray 502) includes a partially conductive body (galvanized steel). EX1002, ¶99.

12. Claim 12: “The grounding system of claim 1 wherein said multi-function line includes strands selected from the group consisting of: copper strands, copper-clad steel strands, galvanized strands, conductive alloy strands, partially conductive, alloy strands, or composite strands.”

Grushkowitz alone or in view of a POSITA discloses or renders claim 1 obvious. §VIII.A.1. Grushkowitz states “cable tray 502 ... may be made of galvanized steel, although other materials may be used such as metals like aluminum, titanium, electrically conductive composite materials, or electrically conductive polymers” (EX1003, 7:50-54) which POSITAs would have understood to include copper, copper-clad steel, conductive alloys, partially conductive alloys, and composite materials because such materials were widely known in the art. EX1002, ¶100. Further, a POSITA would have understood that a cable tray consisting of such materials would result in a multi-function line that provides conductivity as well as the strength needed for a support assembly. *Id.*

13. Claim 18: “The grounding system of claim 1 wherein said multi-function line assembly includes a conductive terminal support.”

Grushkowitz in view of the knowledge of a POSITA renders this claim obvious. EX1002, ¶101. The '551 Patent states “[a]s used herein, a “conductive terminal support 44” that “is structured to couple a multi-function line 35 to a

support, draw the multi-function line 35 taut, and provide a current path between the multi-function line 35 and the support.” EX1001, 7:19-23. A POSITA would have understood that Grushkowitz’s grounding system would comprise a pile and mounting bracket at the end of the support system that would keep cable tray 502 adequately supported so as to maintain a taught assembly, and provide a current path between the cable tray 502 and pile 548. EX1003, 10:67-11:8; EX1002, ¶101.

14. Claim 19

- a. 19[a]: “A mounting assembly for a grounding system structured to ground a number of cables supported by a support assembly, said support assembly including a plurality of spaced, conductive piles, said grounding system including a multi-function line assembly with a multi-function line, said mounting assembly comprising:”**

To the extent the preamble is limiting, Grushkowitz discloses or renders it obvious for the same reasons stated above for claim element 1[a]. §VIII.A.1; EX1002, ¶102.

- b. 19[b]: “a mounting body, a support coupling, and a number of multi-function line couplings;”**

Grushkowitz alone, or in view of the knowledge of a POSITA, discloses or renders this limitation obvious for the same reasons stated above for claim element 2[b]. §VIII.A.2.b; EX1002, ¶103.

c. 19[c]: “each said multi-function line couplings structured to be coupled to said multi-function line;”

Grushkowitz alone, or in view of the knowledge of a POSITA, discloses or renders this limitation obvious for the same reasons stated above for claims 2 and 8. §§VIII.A.2, 8; EX1002, ¶104.

d. 19[d]: “each said support coupling structured to be coupled to a conductive pile; and”

Grushkowitz alone, or in view of the knowledge of a POSITA, discloses or renders this limitation obvious for the same reasons stated above for claim element 2[b]. §VIII.A.2.b; EX1002, ¶105.

e. 19[e]: “wherein, when said multi-function line assembly is coupled to, and in electrical communication with said multi-function line couplings, each said multi-function line coupling defines a conductive path.”

Grushkowitz alone, or in view of the knowledge of a POSITA, discloses or renders this limitation obvious for the same reasons stated above for claim elements 1[d]. §VIII.A.1.d; EX1002, ¶106.

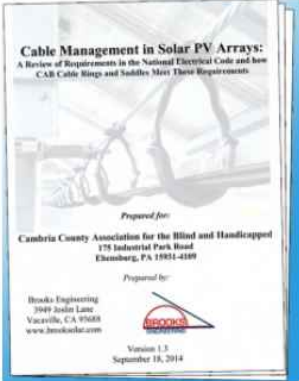
IX. GROUND 2: Obviousness over *the CAB Website* and *CAB Whitepaper*

The CAB Website and CAB Whitepaper, alone or in view of the knowledge of a POSITA, renders obvious claims 1-19 of the '551 Patent. Accordingly, Petitioner requests cancellation of these claims.

A. Motivation and Reasonable Expectation of Success

A POSITA would have been motivated to combine the teachings in the CAB Website with those in the CAB Whitepaper because both references are concerned with the same subject matter (cable management systems for solar arrays), discuss the same company's products, and because the CAB Website expressly references by name and date, excerpts from, provides a link to, and encourages CAB Website visitors to download the CAB Whitepaper:

Bill Brooks Engineering White Paper



"Cable management is critical to the safety and longevity of nearly every Solar PV System. This is primarily due to the extensive use of exposed cables in the PV array.

"Using purpose-built products like CAB Cable Rings and Saddles for exposed cable management in a PV array is well substantiated by NEC and industry installation standards.

"Multiple hanger sections, such as those in various configurations of CAB Cable Rings and Saddles, create effective separation of conductors that allow for dc, ac, and communications cables to be supported with a single ring type." – Bill Brooks, Brooks Engineering White Paper

CAB provides high quality, cost effective wire management solutions. We include here a September 2014 White Paper, published by Brooks Engineering, which reviews requirements of the 2014 updated NEC as it relates to CAB Cable Rings and Saddles.

[Click here to read this important White Paper.](#)

EX1005, 4-5; EX1002, ¶¶168-169. A POSITA would have a reasonable expectation of success in combining the teachings of the two references because both references are discussing the same cable management systems and corresponding components. *Id.* The CAB Website depicts the parts with a brief description. A POSITA was encouraged to refer to the CAB White paper to check further details and to ensure

that the CAB products satisfy NEC codes. *Id.* In fact, a POSITA would understand that CAB *intended* artisans to combine the two references.

B. Claim-by-Claim Analysis

1. Claim 1

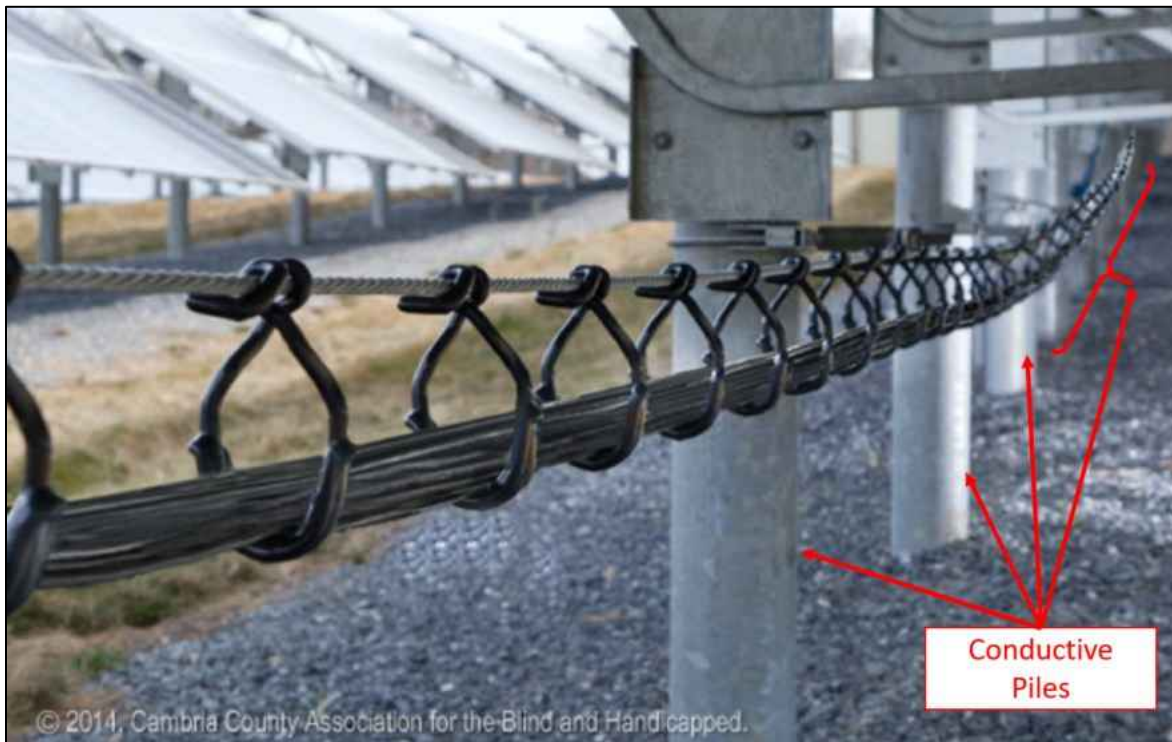
- a. 1[a]: “A grounding system structured to ground a number of cables supported by a support assembly, said support assembly including a plurality of spaced, conductive piles, said grounding system comprising:”**

To the extent the preamble is limiting, the CAB Website in view of the CAB White Paper discloses it or renders it obvious. The CAB Website discloses a grounding system structured to ground a number of cables supported by a support assembly. EX1002, ¶107. The CAB Website depicts a support assembly supporting current-carrying cables comprising a plurality of spaced conductive piles, mounting brackets, and a messenger wire (multi-function line):



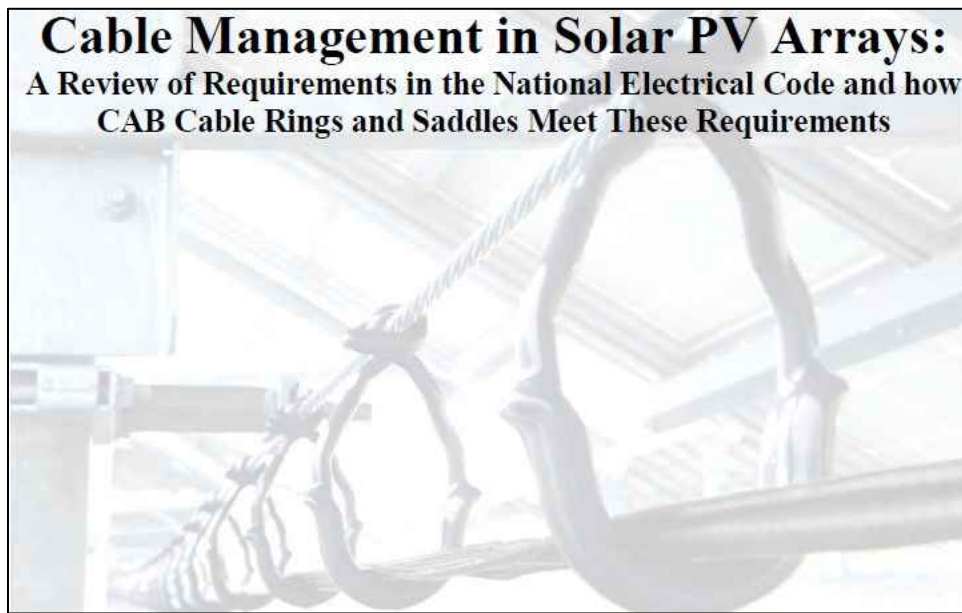
EX1005, 5, (annotated, depicting a messenger wire (red) supported by brackets (blue), with black current-carrying cables hung on the messenger wire). The support system disclosed by CAB Website functions as a grounding system because all of the support system components are made of conductive material (e.g. galvanized steel) which provides a continuous electrical path to the ground. EX1002, ¶108.

The CAB Website discloses a support assembly that includes a plurality of spaced metal piles, which a POSITA would understand to be conductive:



Id., 5 (annotated). EX1002, ¶¶109-110.

The CAB Whitepaper discloses the same grounding and support system structured to ground current conducting cables that are supported by a support assembly, as well as spaced conductive piles. *Id.*, ¶111. It depicts a messenger wire fixed to conductive piles with brackets, with black current-carrying cables supported on the messenger wire via cable hangers:



EX1006, 3. EX1002, ¶111.

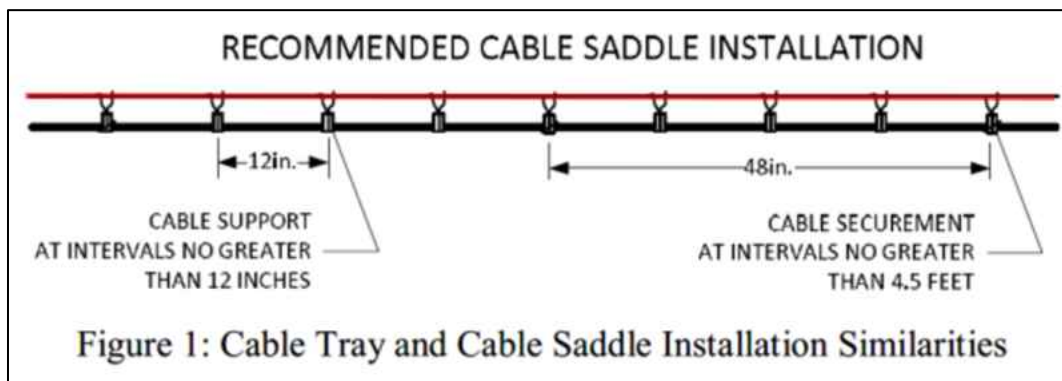
Accordingly, the CAB Website and CAB Whitepaper disclose a grounding system structured to ground a number of cables supported by a support assembly, said support assembly including a plurality of spaced, conductive piles. *Id.*, ¶¶107-112.

b. 1[b]: “a multi-function line assembly including a multi-function line;”

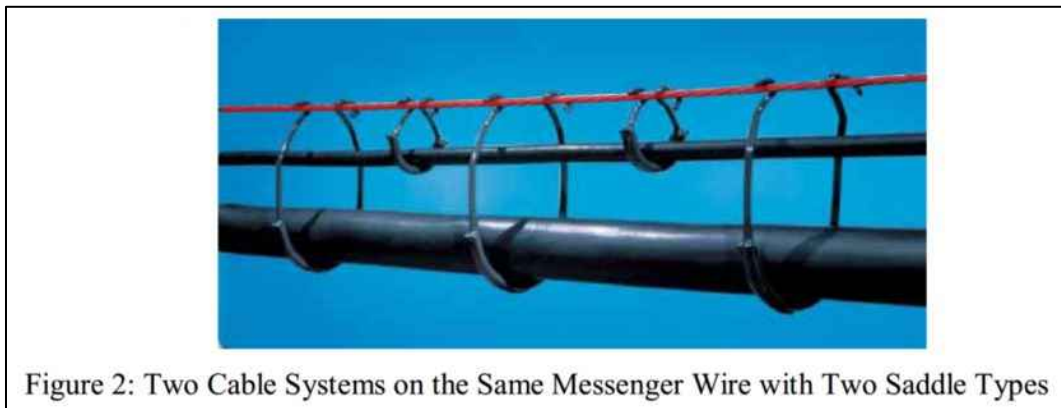
The CAB Website in view of the CAB Whitepaper discloses or renders obvious a multi-function line assembly that includes a multi-function line. The ’551 Patent defines a “multi-function line” as “a tension member that supports current wires and/or cable hangers” and “is conductive.” EX1001, 2:37-40. The CAB Website depicts a metal, and therefore conductive, messenger wire that supports current-carrying cables and hangers. EX1005, 5.



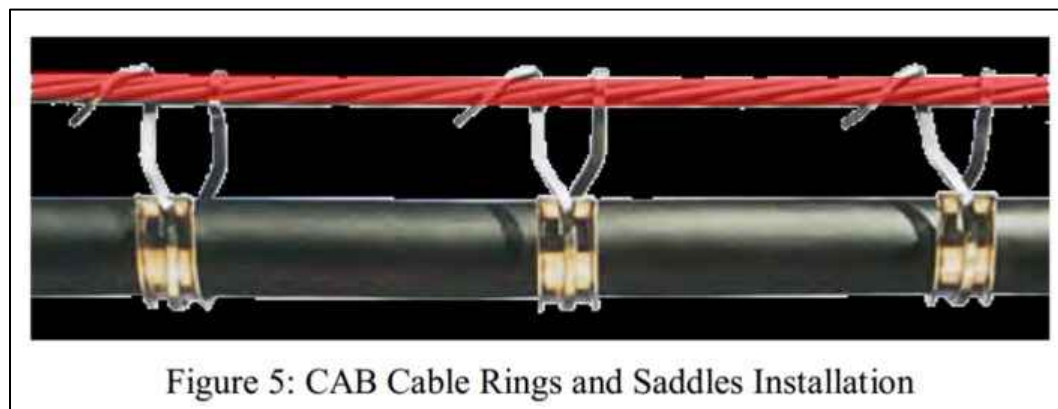
EX1005, 5, (annotated with multi-function line supporting current wires and/or cable hangers in red). EX1002, ¶113. Further, the CAB Whitepaper depicts a metal messenger wire attached to spaced piles supporting current-carrying cables and hangers:



EX1006, 6 (excerpted, annotated—messenger wire in red);



Id., 6 (annotated—messenger wire in red);



Id., 8 (annotated—messenger wire in red). A POSITA would have understood that the messenger wire depicted in the CAB Website and CAB Whitepaper is metal (i.e. conductive), and subjected to tensile forces from gravity and the weight current wires and/or cable hangers supported thereon. EX1002, ¶¶114-115. Though the CAB Website and CAB Whitepaper do not expressly disclose the terminal support portion of the multi-function line assembly, it would have been obvious to a POSITA that terminal supports are necessary in order for the assembly to be NEC compliant,

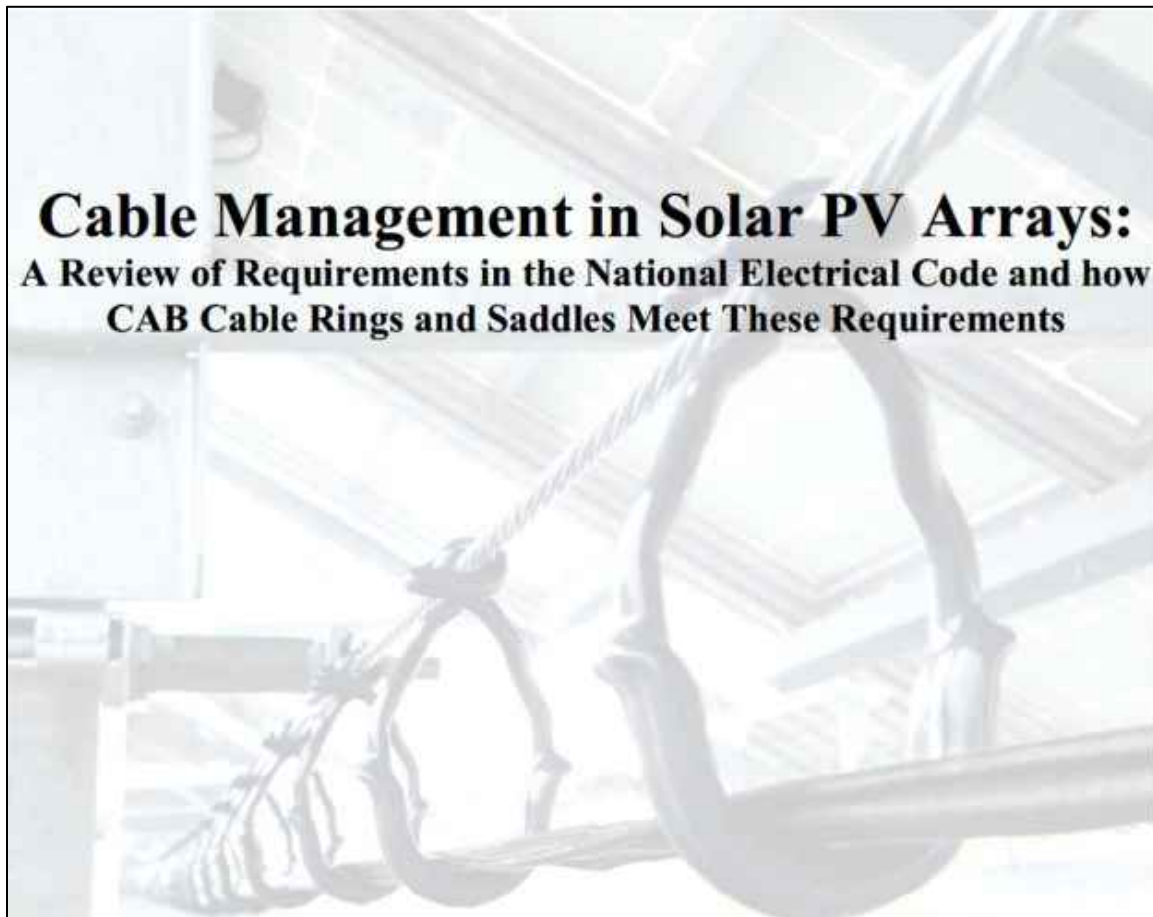
and provide adequate support for the weight of the multi-function line. EX1002, ¶115, 151.

- c. **1[c]: “a number of conductive mounting assemblies, each said conductive mounting assembly structured to be coupled to said multi-function line and to a conductive pile; and”**

The CAB Website in view of the CAB Whitepaper discloses or renders this limitation obvious. The CAB Website depicts mounting assemblies comprised of metallic (conductive) components structured to couple a multi-function line and to a metallic (conductive) pile:



EX1005, 5 (annotated). EX1002, ¶117. Furthermore, the CAB Whitepaper depicts a nearly identical photo of a conductive mounting assembly, albeit stylized in a desaturated black and white manner:



EX1006, 3 (excerpted). EX1002, ¶118. Accordingly, both the CAB Website and CAB Whitepaper disclose a number of conductive mounting assemblies, each structured to be coupled to said multi-function line and to a conductive pile. *Id.*, ¶119.

- d. **1[d]: “wherein said multi-function line assembly is coupled to, and in electrical communication with, said number of conductive mounting assemblies.”**

The CAB Website in view of the CAB Whitepaper discloses or renders this limitation. §IX.A.1.c. The CAB Website and CAB Whitepaper disclose a multi-function line assembly coupled to a conductive mounting assembly. *Id.* A POSITA

would have understood that connecting metallic (conductive) components would result in such components being in electrical communication with one another. EX1002, ¶120.

The CAB Whitepaper discloses utilizing a “grounded steel messenger wire” (EX1006, 14), which a POSITA would have understood to mean the messenger wire (multi-function line) is in electrical communication with the mounting assembly, and conductive pile. EX1002, ¶121. Accordingly, the CAB Website in view of the CAB Whitepaper disclose a multi-function line assembly coupled to, and in electrical communication with, a number of conductive mounting assemblies.

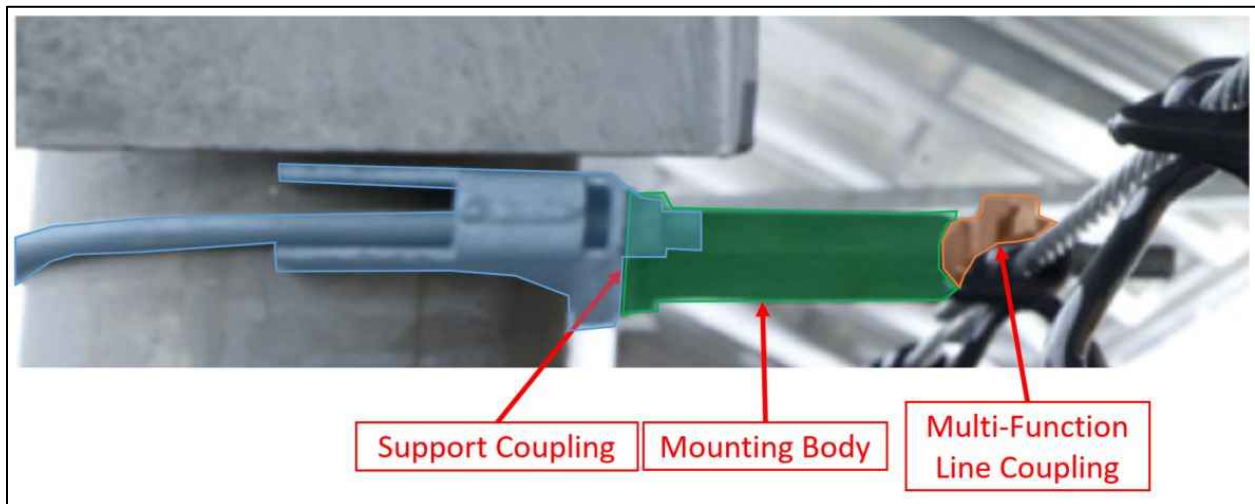
2. Claim 2

a. 2[a]: “The grounding system of claim 1 wherein:”

The CAB Website in view of the CAB Whitepaper disclose or render claim 1 obvious. §IX.B.1.

b. 2[b]: “each said conductive mounting assembly includes a mounting body, a support coupling, and a number of multi-function line couplings; and”

The CAB Website in view of the CAB Whitepaper disclose or render this limitation obvious. The CAB Website depicts a metal (conductive) mounting assembly that has a mounting body, a support coupling, and at least one multi-function line coupling:



EX1005, 5 (excerpted, annotated—support coupling in blue, mounting body in green, multi-function line coupling in orange). EX1002, ¶123. The CAB Whitepaper discloses the same metal (conductive) mounting assemblies on each conductive pile, each with a support coupling, mounting body, and multi-function line coupling. §IX.B.1.c.

A POSITA would have been motivated to extend the size of the mounting body disclosed by the CAB Website and CAB Whitepaper in order to facilitate coupling additional messenger wire couplings if a support assembly required more than one messenger, and would have understood that by using components made of metal, the assembly would be conductive. EX1002, ¶¶124-125.

c. 2[c]: “each said multi-function line coupling defines a conductive path.”

The CAB Website and CAB White Paper alone or in view of a POSITA’s knowledge, disclose or render this limitation obvious. The CAB Whitepaper teaches

using “a grounded steel messenger wire” (grounded steel multi-function line), which is the same messenger wire disclosed in the CAB Website. EX1006, 14; EX1005, 5. A POSITA would have understood that in order to be grounded, the messenger wire must be in electrical communication with the mounting assembly via the messenger wire coupling, and would therefor define a conductive path. EX1002, ¶¶126-127.

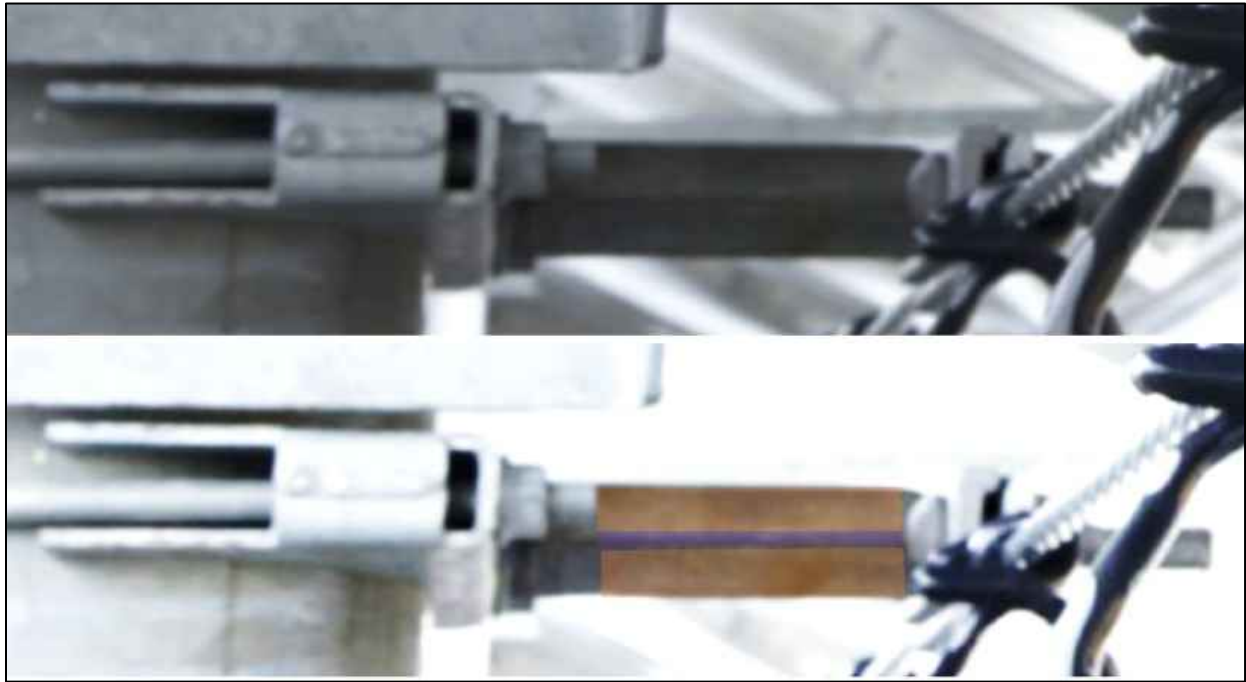
3. Claim 3: “The grounding system of claim 2 wherein each said mounting body is one of a conductive body or a conductive body assembly.”

The CAB Website in view of the CAB Whitepaper disclose or render obvious a conductive mounting body. The CAB Website depicts a mounting body made out of metal (conductive). §§IX.B.2.b, c. EX1002, ¶128. The CAB Whitepaper discloses the same assembly as the CAB Website, and that the steel messenger wire coupled to the mounting body is “grounded,” thereby teaching that the mounting body is a conductive body. EX1006, 14; EX1002, ¶129.

4. Claim 4: “The grounding system of claim 3 wherein each said mounting body has a simplified shape.”

The CAB Website discloses or renders this claim obvious. The ’551 Patent defines “simplified shape” as “a body or assembly including generally planar portions and transitional bends or welds between the generally planar portions.” EX1001, 9:62-64. The mounting body disclosed by the CAB Website and CAB

Whitepaper has generally planar portions, and transitional bends or welds between such generally planar portions:



EX1005, 5 (excerpted with original image of mounting body, and color corrected duplication of the original image, annotated with planar portions in orange, and transitional bend in purple). EX1002, ¶¶130-132.

5. Claim 5

a. 5[a]: “The grounding system of claim 2 wherein:”

The CAB Website in view of the CAB Whitepaper discloses or renders claim 2 obvious. §IX.B.2.

b. 5[b]: “each said mounting body is a conductive body; and”

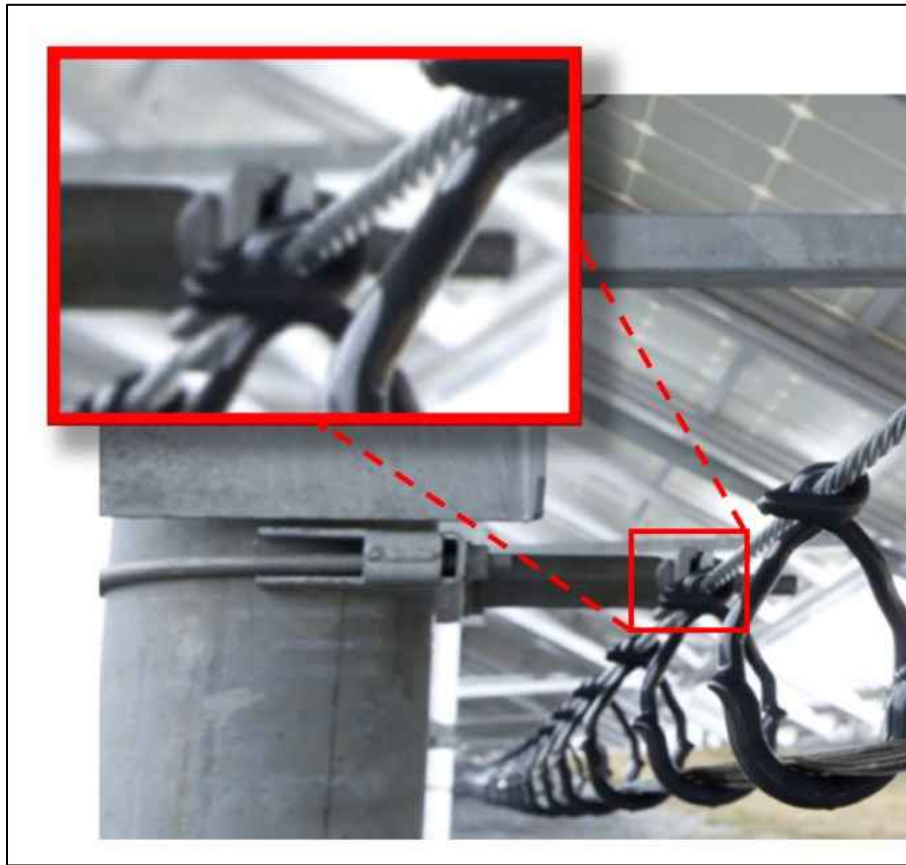
The CAB Website in view of the CAB Whitepaper discloses or renders this limitation obvious for the same reasons stated above for claim 2. §§IX.B.2.b, c; EX1002, ¶134.

c. 5[c]: “each said mounting body conductive body is a partially conductive body.”

The CAB Website in view of the CAB Whitepaper discloses or renders this limitation obvious for the same reasons stated above for claim 2. §§IX.B.2.b, c. The ’551 Patent defines “partially conductive” as any material that “conducts electricity” including “galvanized steel[.]” EX1001, 8:18-28. The mounting body disclosed by CAB Website and CAB Whitepaper is metal (conductive), and accordingly both references disclose a mounting body that is partially conductive. EX1005, 5; EX1006, 6, 8; EX1002, ¶135.

6. Claim 6: “The grounding system of claim 2 wherein each said multi-function line coupling is a clamping assembly.”

The CAB Website in view of the CAB Whitepaper discloses or renders this claim obvious for the same reasons stated above for claim 2. §§IX.B.2.b, c. Specifically the CAB Website (and CAB Whitepaper, §IX.B.1.c) depicts two different clam-shell type clamping assemblies for coupling a multi-function line:



EX1005, 5 (excerpted, annotated—showing magnified view of clam-shell type clamping assembly coupling multi-function line to mounting assembly). EX1002, ¶¶136-137.



EX1005, 18 (excerpted, annotated—showing clam-shell type clamping assembly coupling multi-function line to mounting assembly). EX1002, ¶¶136-137.

7. **Claim 7: “The grounding system of claim 6 wherein each said multi-function line coupling includes one of a clam-shell assembly, a split bolt, a U-bolt, or a lay-in lug assembly.”**

The CAB Website in view of the CAB Whitepaper discloses or renders this claim obvious for the same reasons stated above for claim 6. §IX.B.6; EX1002, ¶138.

8. **Claim 8**

- a. **8[a]: “The grounding system of claim 2 wherein:”**

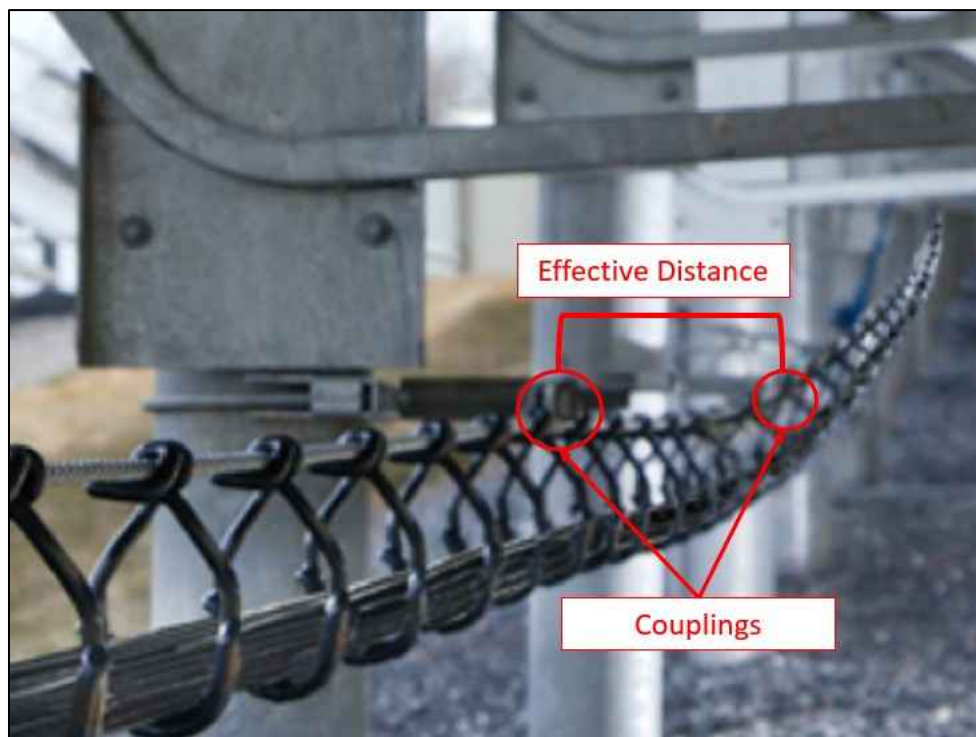
The CAB Website in view of the CAB Whitepaper discloses or renders Claim 2 obvious. §IX.B.2.

- b. **8[b]: “said number of multi-function line couplings includes a plurality of multi-function line couplings; and”**

The CAB Website in view of the CAB Whitepaper discloses or renders this limitation obvious for the same reasons stated above for claim element 2[b]. §IX.B.2.b; EX1002, ¶¶140-141.

- c. **8[c]: “each said multi-function line coupling spaced one of a first effective distance, a second effective distance, or a third effective distance from another multi-function line coupling.”**

The CAB Website in view of the CAB Whitepaper discloses or renders this limitation obvious. The CAB Website discloses spacing multi-function line couplings approximately ten to twenty apart:



EX1005, 5 (excerpted, annotated); EX1002, ¶142. The '551 Patent defines “first effective distance” as “between less than one foot to about one hundred feet apart,” “second effective distance” as “between one foot and about fifty feet apart,” and “third effective distance” as “between about five feet and about thirty feet apart.” EX1001, 11:2-7. A POSITA would have been motivated to space the multi-function

line couplings disclosed by the CAB Website a first, second, or third effective distance from each coupling because such distances were known in the art. EX1002, ¶¶143-144.

9. Claim 9: “The grounding system of claim 1 wherein said multi-function line assembly does not include any grounding splices.”

The CAB Website in view of the CAB Whitepaper, in view of a POSITA’s knowledge, discloses or renders this claim obvious. A POSITA would have understood that the grounding system disclosed by the CAB Website and CAB Whitepaper, would not require the addition of grounding splices because each mounting assembly disclosed by the CAB Website and CAB Whitepaper is grounded by virtue of coupling together conductive components. EX1002, ¶145.

10. Claim 10: “The grounding system of claim 1 wherein said multi-function line assembly does not include any medial grounding splices.”

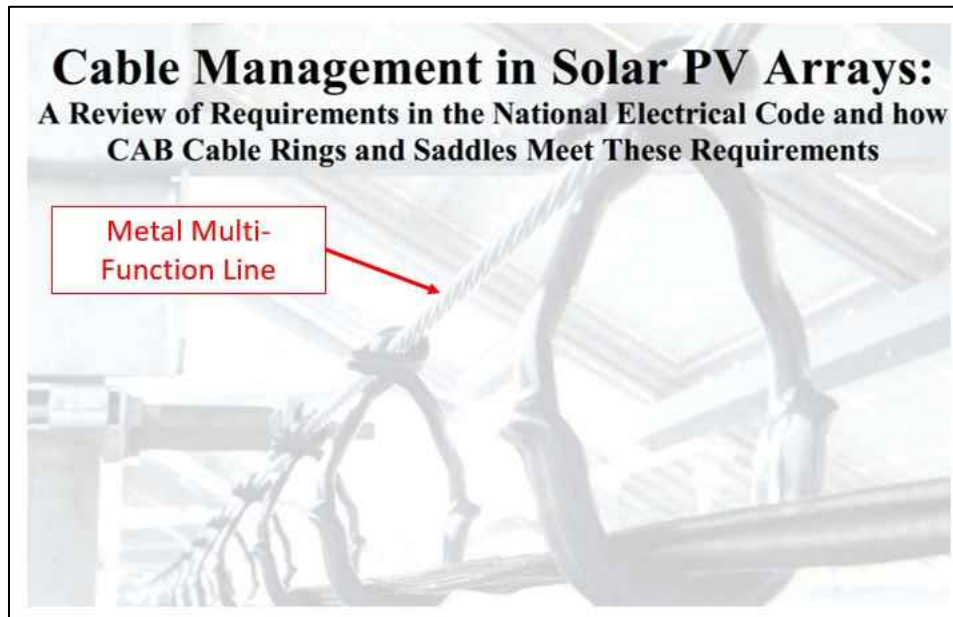
The CAB Website in view of the CAB Whitepaper, in view of a POSITA’s knowledge, discloses or renders this claim obvious for the same reasons stated above for claim 9. §IX.B.9; EX1002, ¶146.

11. Claim 11: “The grounding system of claim 1 wherein said multi-function line includes one of a highly conductive body or a partially conductive body.”

The CAB Website in view of the CAB Whitepaper discloses or renders this claim obvious. Both the CAB Website and CAB Whitepaper depict metal strand multi-function lines:



EX1005, 5 (annotated);



EX1006, 3 (annotated). EX1002, ¶147. The CAB Whitepaper discloses use of a “grounded steel messenger wire” which according to the ’551 Patent is “partially conductive.” EX1006, 14; EX1001, 8:26-28; EX1002, ¶¶148-149.

12. Claim 12: “The grounding system of claim 1 wherein said multi-function line includes strands selected from the group consisting of: copper strands, copper-clad steel strands, galvanized strands, conductive alloy strands, partially conductive, alloy strands, or composite strands.”

The CAB Website in view of the CAB Whitepaper discloses or renders this claim obvious. The grounding system disclosed by the CAB Website and CAB Whitepaper teach the use of multi-function lines comprised of strands of metal wrapped around each other. §IX.B.11. To the extent not expressly disclosed by the CAB Website or CAB Whitepaper, it would have been obvious to a POSITA to use a multi-function line that includes copper strands, copper-clad steel strands,

galvanized strands, conductive alloy strands, partially conductive, alloy strands, or composite strands because these materials were known in the art. EX1002, ¶150.

13. Claim 13: “The grounding system of claim 12 wherein said multi-function line assembly terminal support includes a conductive thimble-eye.”

The CAB Website in view of the CAB Whitepaper, and further in view of the knowledge of a POSITA, discloses or renders this claim obvious. A POSITA would have been motivated to combine the CAB system with a conductive thimble-eye in order to provide terminal support for a multi-function line because metal (i.e. conductive) thimble-eye couplings were known in the art, commonly utilized to couple multi-function lines to a terminal support, and were required to have an NEC-compliant system. EX1002, ¶¶151-153.

14. Claim 14: “The grounding system of claim 13 wherein said multi-function line is structured to be operational with solar electrical equipment.”

The CAB Website in view of the CAB Whitepaper discloses or renders this claim obvious. For instance, the CAB Website expressly provides that the ground system disclosed therein “deliver[s] safe, strong and durable support for all types of solar wiring.” EX1005, 3, 6. Further, the CAB Whitepaper is entirely directed to “[c]able [m]anagement in [s]olar PV [photovoltaic] [a]rrays[.]” EX1006, 3; EX1002, ¶¶154-155.

15. Claim 15: “The grounding system of claim 13 wherein said multi-function line assembly does not include any grounding splices.”

The CAB Website in view of the CAB Whitepaper discloses or renders this claim obvious for the same reasons stated above for claim 9. §IX.B.9; EX1002, ¶156.

16. Claim 16: “The grounding system of claim 13 wherein said multi-function line assembly does not include any medial grounding splices.”

The CAB Website in view of the CAB Whitepaper discloses or renders this claim obvious for the same reasons stated above for claim 10. §IX.B.10; EX1002, ¶157.

17. Claim 17: “The grounding system of claim 13 wherein said multi-function line includes one of a highly conductive body or a partially conductive body.”

The CAB Website in view of the CAB Whitepaper discloses or renders this claim obvious for the same reasons stated above for claim 11. §IX.B.11; EX1002, ¶¶158-160.

18. Claim 18: “The grounding system of claim 1 wherein said multi-function line assembly includes a conductive terminal support.”

The CAB Website in view of the CAB Whitepaper, and further in view of the knowledge of a POSITA discloses or renders this claim obvious for the same reasons stated above for claim 13. §IX.B.13; EX1002, ¶161. It would have been obvious to a POSITA to utilize a terminal support made of conductive material in order to

provide sufficient grounding means for each of the metal components utilized in the grounding system disclosed by the CAB Website and CAB Whitepaper. *Id.*

19. Claim 19

- a. 19[a]: “A mounting assembly for a grounding system structured to ground a number of cables supported by a support assembly, said support assembly including a plurality of spaced, conductive piles, said grounding system including a multi-function line assembly with a multi-function line, said mounting assembly comprising:”**

The CAB Website in view of the CAB Whitepaper discloses or renders this limitation obvious for the same reasons stated above for claim element 1[a]. §IX.B.1.a; EX1002, ¶162.

- b. 19[b]: “a mounting body, a support coupling, and a number of multi-function line couplings;”**

The CAB Website in view of the CAB Whitepaper discloses or renders this limitation obvious for the same reasons stated above for claim element 2[b]. §IX.B.2.b; EX1002, ¶¶163-164.

- c. 19[c]: “each said multi-function line couplings structured to be coupled to said multi-function line;”**

The CAB Website in view of the CAB Whitepaper discloses or renders this limitation obvious for the same reasons stated above for claim elements 1[c] and 2[b]. §§IX.B.1.c, 2.b; EX1002, ¶165.

d. 19[d]: “each said support coupling structured to be coupled to a conductive pile; and”

The CAB Website in view of the CAB Whitepaper discloses or renders this limitation obvious for the same reasons stated above for claim elements 1[c] and 2[b]. §§IX.B.1.c, 2.b; EX1002, ¶166.

e. 19[e]: “wherein, when said multi-function line assembly is coupled to, and in electrical communication with said multi-function line couplings, each said multi-function line coupling defines a conductive path.”

The CAB Website in view of the CAB Whitepaper discloses or renders this limitation obvious for the same reasons stated above for claim elements 1[d] and 2[c]. §§IX.B.1.d, 2.c; EX1002, ¶167.

X. GROUND 3: Obviousness over *Petersen*

Petersen alone, or in view of the knowledge of a POSITA renders obvious claims 1-19 of the '551 Patent. Accordingly Petitioner requests cancellation of these claims.

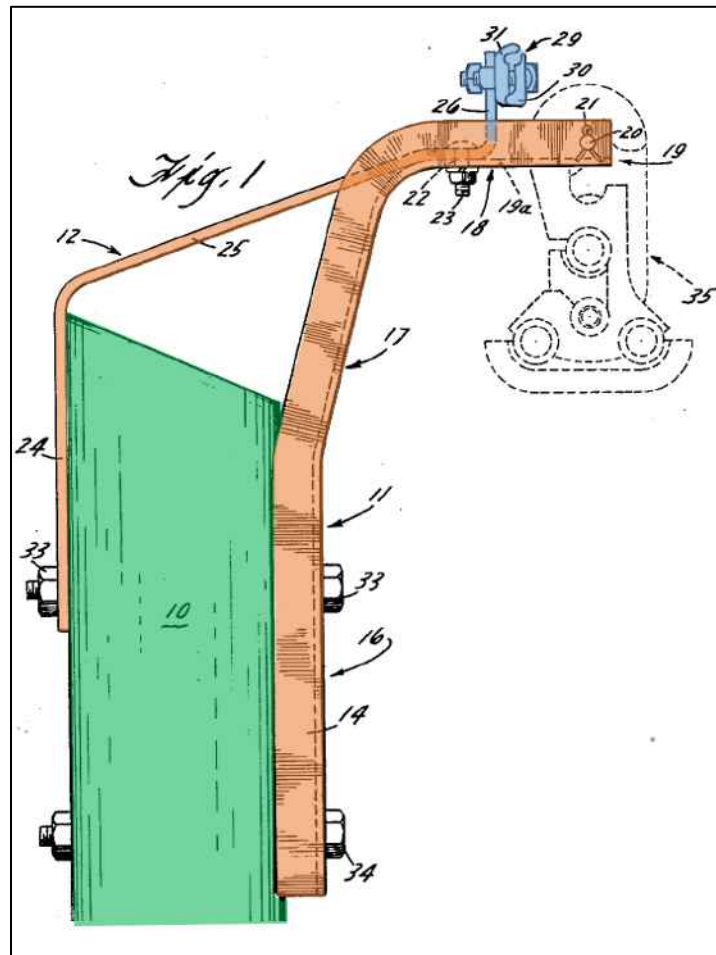
A. Claim-by-Claim Analysis

1. Claim 1

a. 1[a]: “A grounding system structured to ground a number of cables supported by a support assembly, said support assembly including a plurality of spaced, conductive piles, said grounding system comprising:”

To the extent the preamble is limiting, Petersen alone or in view of a POSITA, discloses or renders it obvious. EX1002, ¶¶170-172. Petersen discloses a grounding

system structured to ground a number of cables supported by a support assembly. *Id.*, ¶170. Petersen discloses “a [utility] pole top extension” that “is adapted to be attached to the top of the pole[.]” EX1004, 1:50-51. Petersen teaches “extending end portion 26 extends above the pole top extension” “for supportingly engaging [a] neutral messenger cable.” *Id.*, 2:1-8. Coupled to end portion 26 of Petersen’s assembly is “***a ground clamp means 29*** which is fixedly mounted ... and comprises two clamping jaw members 30 and 31 which upon tightening of suitable bolts confine and keep a neutral messenger cable 37 in tight supported engagement therewith.” *Id.*, 2:34-40. A POSITA would have understood “ground clamp means” to mean components creating a path to ground for stray electrical current. EX1002, ¶¶170-171.

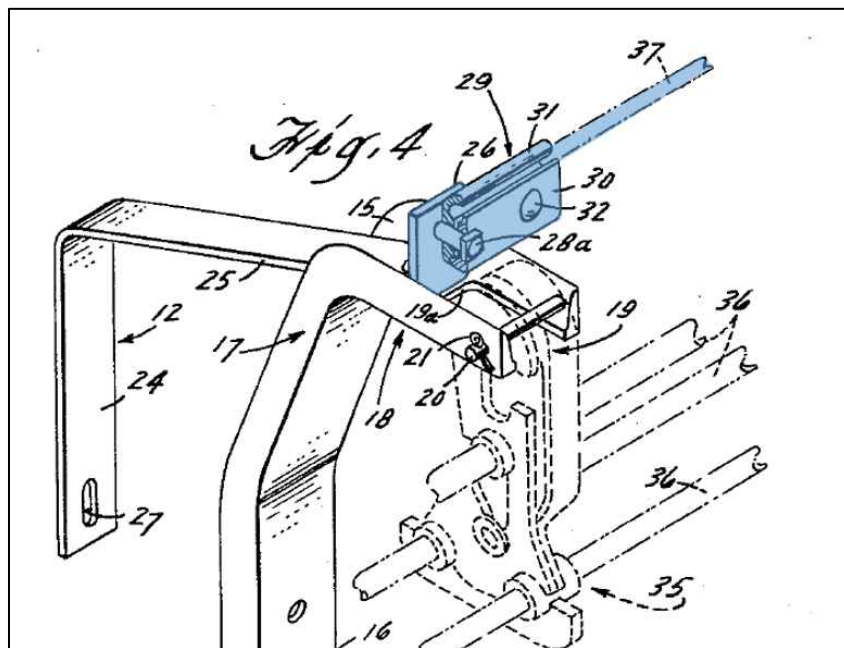


EX1004, Fig. 1 (excerpted, annotated—pile in green, support assembly in orange, end portion 26 with ground clamp means 29 for neutral messenger cable 37 in blue).

It would have been obvious to a POSITA that Petersen's system is intended to be used on a plurality of spaced poles or piles. EX1002, ¶172. Further, Petersen teaches that the parts of Petersen's assembly are "metallic" and therefore conductive. EX1004, 2:56-63; EX1002, ¶172.

b. 1[b]: “a multi-function line assembly including a multi-function line;”

Petersen discloses or renders this limitation obvious. A POSITA would have understood that Petersen’s “neutral messenger cable 37” is subjected to tensile forces as a result of gravity forces exerted on the mass of the current-carrying wires and cable hangers supported thereon. Petersen’s neutral messenger cable 37 is therefore a tension member, and a multi-function line. EX1002, ¶¶173-174; §VIII.A.1.b (’551 Patent definition of “multi-function line”).



EX1004, Fig. 4 (excerpted, annotated—multi-function line assembly (clamping means 29, vertical portion 26, and neutral messenger cable 37) in blue). Petersen is silent as to the means by which the neutral messenger (multi-function line) is terminated. However, as discussed *infra*, it would have been obvious to a POSITA

to include terminal supports in Petersen’s multi-function line assembly as all neutral messengers must be terminated at both ends in order to be NEC compliant. *Infra*, §X.A.13.

- c. **1[c]: “a number of conductive mounting assemblies, each said conductive mounting assembly structured to be coupled to said multi-function line and to a conductive pile; and”**

Petersen alone or in view of a POSITA’s knowledge, discloses or renders this limitation obvious. Petersen’s pole top extension (mounting assembly) is comprised of “metallic parts” which a POSITA would have understood to be conductive. §X.A.1.a; EX1002, ¶175.

Petersen’s pole top extension is structured to be coupled to said neutral messenger wire cable 37 (multi-function line) via portion 26 of the brace member 12 using two clamping jaw members. EX1004, 34-40. Petersen’s pole top extension mounting assembly is structured to be attached to the conductive pole with “[s]uitable through bolts 33 and 34 [which] extend through the pole and fixedly attach the brace member to the channel support member to the pole[.]” *Id.*, 2:28-33.

- d. **1[d]: “wherein said multi-function line assembly is coupled to, and in electrical communication with, said number of conductive mounting assemblies.”**

Petersen alone or in view of the knowledge of POSITA discloses or renders this limitation obvious. EX1002, ¶104. Petersen discloses coupling the neutral

messenger cable to the pole top extension assembly via “ground clamp means 29 which is fixedly mounted by a bolt 28a.” *Id.*, 2:34-36. A POSITA would have understood that a metallic messenger cable fixed to a metallic coupling, which is fixed to a metallic mounting assembly would result in the messenger cable, coupling, and mounting assembly being in electrical communication with each other. EX1002, ¶176.

2. Claim 2

a. 2[a]: “The grounding system of claim 1 wherein”

Petersen discloses or renders obvious claim 1. §X.A.1.

b. 2[b]: “each said conductive mounting assembly includes a mounting body, a support coupling, and a number of multi-function line couplings; and”

Petersen alone or in view of the knowledge of a POSITA discloses or renders this limitation obvious. EX1002, ¶¶178-179. Petersen discloses a metallic pole top extension which includes “end portion 26” for supporting “the neutral messenger cable.” EX1004, 2:1-8. End portion 26 acts as a mounting body on which the neutral messenger cable (multi-function line), is coupled. EX1002, ¶178. Further, Petersen discloses coupling the pole top extension to the pole with “[s]uitable through bolts 33 and 34 [which] extend through the pole and fixedly attach the brace member and channel support member [of the pole top extension] to the pole,” thereby supporting

the pole top extension. EX1004, 2:28-33. Petersen acknowledges that “many modifications ... are possible.” *Id.*, 2:67-69.

One such modification that could easily be made to Petersen’s system would have been the addition of a second ground clamping means 29 to facilitate an additional neutral messenger wire. EX1002, ¶179. Because there is a limit to the amount of load a messenger wire can support, it is common for mounting assemblies to be extended to facilitate multiple messenger wires. *Id.* One skilled in the art could modify Petersen’s system by welding or bolting additional brackets or clamps, or using a plurality of piles. *Id.* This could be accomplished, and the additional load could be supported by strengthening or substituting existing piles for wider-diameter piles. *Id.* Accordingly, it would have been obvious to provide additional ground clamps to facilitate coupling additional neutral messenger cables. *Id.*, ¶180.

c. 2[c]: “each said multi-function line coupling defines a conductive path.”

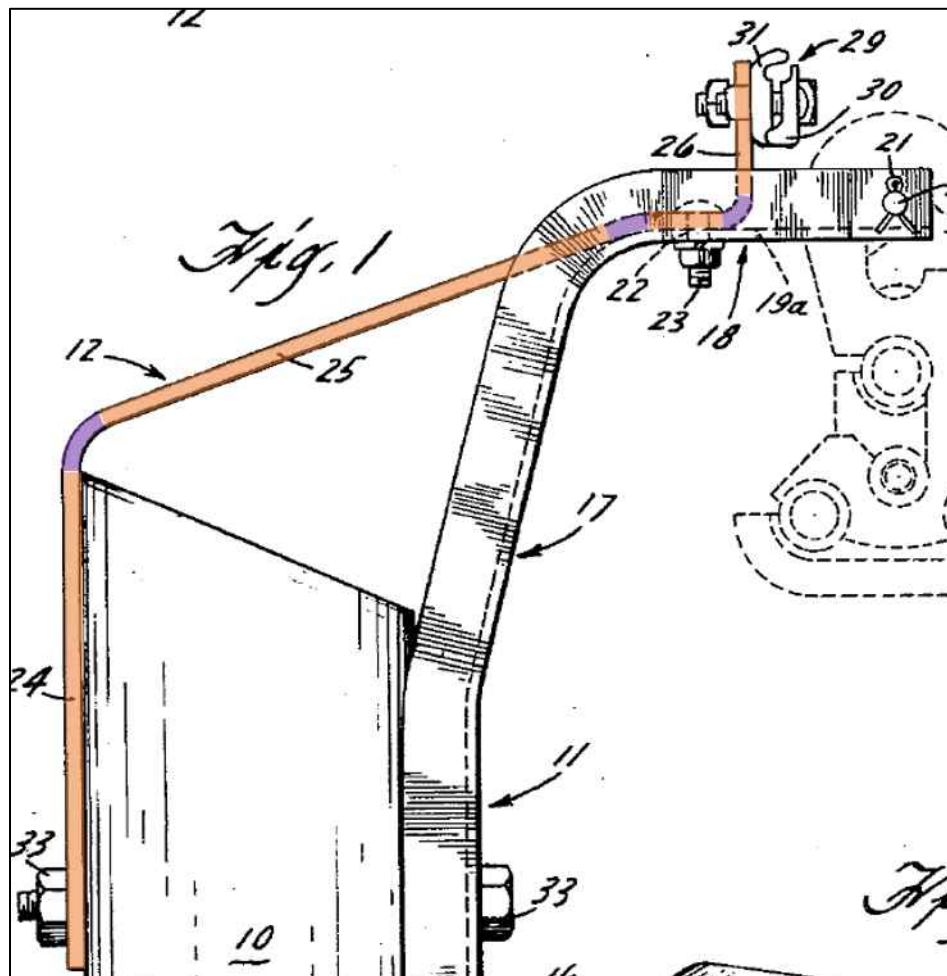
Petersen alone or in view of the knowledge of a POSITA discloses or renders this limitation obvious. EX1002, ¶181. Peterson discloses an assembly comprised of “metallic parts” which a POSITA would have understood to create a path to ground. EX1004, 2:56-63; EX1002, ¶¶176, 181.

3. Claim 3: “The grounding system of claim 2 wherein each said mounting body is one of a conductive body or a conductive body assembly.”

Petersen discloses or renders this claim obvious. Peterson discloses that the assembly is comprised of “metallic parts” a POSITA would have understood to conduct electricity. EX1004, 2:56-63; EX1002, ¶182.

4. Claim 4: “The grounding system of claim 3 wherein each said mounting body has a simplified shape.”

Petersen discloses or renders this claim obvious. EX1002, ¶¶183-184. The ’551 Patent defines “simplified shape” as “a body or assembly including generally planar portions and transitional bends or welds between the generally planar portions.” EX1001, 9:62-64. The pole top extension disclosed by Peterson comprises brace means 12, extending from which is vertical portion 26, which includes planar portions and transitional bends between such portions:



EX1004, Fig. 1 (excerpted, annotated—planar portions in orange, transitional bends in purple).

5. Claim 5

a. 5[a]: “The grounding system of claim 2 wherein”

Petersen alone or in view of a POSITA discloses or renders claim 2 obvious.

§X.A.2.

b. 5[b]: “each said mounting body is a conductive body; and”

Petersen discloses or renders this limitation obvious for the same reasons stated above for claim element 1[c]. §X.A.1.c; EX1002, ¶186.

c. 5[c]: “each said mounting body conductive body is a partially conductive body.”

Petersen discloses or renders this limitation obvious. The '551 Patent defines “partially conductive” as any material that “conducts electricity” including “galvanized steel[.]” EX1001, 8:18-28. Petersen utilizes metallic components (§X.A.1.c) which a POSITA would have understood to conduct electricity. EX1002, ¶187.

6. Claim 6: “The grounding system of claim 2 wherein each said multi-function line coupling is a clamping assembly.”

Petersen discloses or renders this claim obvious. §X.A.2. Petersen discloses “ground clamp means 29 which ... comprises two clamping jaw members 30 and 31 ... to keep a neutral messenger cable 37 in tight supported engagement therewith.” EX1004, 2:34-40. Accordingly, Petersen discloses a clamping assembly for coupling a multi-function line. EX1002, ¶188.

7. **Claim 7: “The grounding system of claim 6 wherein each said multi-function line coupling includes one of a clam-shell assembly, a split bolt, a U-bolt, or a lay-in lug assembly.”**

Petersen discloses or renders this claim obvious. §X.A.6. Petersen discloses “in portion 26 of the brace member 12 is a ground clamp means 29 which ... comprises two clamping jaw members 30 and 31” which a POSITA would have understood to be a clam-shell assembly for coupling the neutral messenger (multi-function line). EX1004, 2:34-40; EX1002, ¶¶189-190.

8. **Claim 8**

- a. **8[a]: “The grounding system of claim 2 wherein:”**

Petersen discloses or renders obvious claim 2. §X.A.2.

- b. **8[b]: “said number of multi-function line couplings includes a plurality of multi-function line couplings; and”**

Petersen in view of the knowledge of a POSITA renders this limitation obvious for the same reasons stated above for claim element 2[b]. §X.A.2.b; EX1002, ¶192.

- c. **8[c]: “each said multi-function line coupling spaced one of a first effective distance, a second effective distance, or a third effective distance from another multi-function line coupling.”**

Petersen in view of the knowledge of a POSITA renders this limitation obvious. EX1002, ¶¶193-194. The '551 Patent defines “first effective distance” as

“between less than one foot to about one hundred feet apart,” “second effective distance” as “between one foot and about fifty feet apart,” and “third effective distance” as “between about five feet and about thirty feet apart.” EX1001, 11:2-7. A POSITA would have been motivated to space a first pole top extension disclosed by Petersen a first, second, or third effective distance from a plurality of other pole top extensions because such distances were known and widely employed in the art. EX1002, ¶194.

9. Claim 9: “The grounding system of claim 1 wherein said multi-function line assembly does not include any grounding splices.”

Petersen discloses or renders this claim obvious. §X.A.1. Petersen discloses a grounding system comprised of metallic components, including a neutral messenger cable 37, each of which would provide for a system that does not require grounding splices. §X.A.1; EX1002, ¶195.

10. Claim 10: “The grounding system of claim 1 wherein said multi-function line assembly does not include any medial grounding splices.”

Petersen discloses or renders this claim obvious for the same reasons stated above for claim 9. §X.A.9; EX1002, ¶196.

11. Claim 11: “The grounding system of claim 1 wherein said multi-function line includes one of a highly conductive body or a partially conductive body.”

Petersen discloses or renders this claim obvious for the same reasons stated above for claim elements 1[b] and 1[c]. §§X.A.1.b, c; EX1002, ¶197.

12. Claim 12: “The grounding system of claim 1 wherein said multi-function line includes strands selected from the group consisting of: copper strands, copper-clad steel strands, galvanized strands, conductive alloy strands, partially conductive, alloy strands, or composite strands.”

Petersen in view of the knowledge of a POSITA renders this claim obvious. EX1002, ¶198. To the extent Petersen’s use of “metallic” components does not disclose this claim, a POSITA would have known that copper, copper-clad steel, galvanized metals, conductive alloys, and partially conductive alloys or composites are conductive and useful for use in grounding systems and as messenger wires. *Id.*; §§X.A.1.b, c.

13. Claim 13: “The grounding system of claim 12 wherein said multi-function line assembly terminal support includes a conductive thimble-eye.”

Petersen in view of the knowledge of a POSITA renders this claim obvious. EX1002, ¶¶199-201. A POSITA would have understood that conductive thimble-eye assemblies were widely and commonly used in terminal supports in order to prevent sagging of a messenger wire, and to maintain the conductive path of a grounding assembly. *Id.* Furthermore, though Petersen’s invention is silent as to how

the neutral messenger is terminated, the fact that all messenger wire must be secured by terminal supports to be NEC compliant, and the widespread use of thimble-eye terminal supports would motivate a POSITA to employ a conductive thimble-eye terminal support. *Id.*

14. Claim 14: “The grounding system of claim 13 wherein said multi-function line is structured to be operational with solar electrical equipment.”

Petersen in view of the knowledge of a POSITA renders this claim obvious. EX1002, ¶202. Petersen generally relates to efficient management of current-carrying cable, and a grounded support system, which a POSITA would have been motivated to apply in the field of solar electrical equipment. *Id.*

15. Claim 15: “The grounding system of claim 13 wherein said multi-function line assembly does not include any grounding splices.”

Petersen discloses or renders this claim obvious. Petersen discloses a grounding system comprised of metallic components, including a neutral messenger cable 37, each of which would provide for a system that does not require grounding splices. §X.A.1; EX1002, ¶203.

16. Claim 16: “The grounding system of claim 13 wherein said multi-function line assembly does not include any medial grounding splices.”

Petersen discloses or renders this claim obvious for the same reasons stated above for claim 15. §X.A.15; EX1002, ¶204.

17. Claim 17: “The grounding system of claim 13 wherein said multi-function line includes one of a highly conductive body or a partially conductive body.”

Petersen discloses or renders this claim obvious for the same reasons stated above for claim 11. §X.A.11; EX1002, ¶205.

18. Claim 18: “The grounding system of claim 1 wherein said multi-function line assembly includes a conductive terminal support.”

Petersen in view of the knowledge of a POSITA renders this claim obvious. In grounding systems, the terminal support must be conductive to ensure the ground path for the stray current is maintained. EX1002, ¶206. POSITAs used a variety of terminal supports, such as a bolt and nut system, joint, thimble-eye, or another wire, all of which provide a safe connection, and conducting path. *Id.* Nearly all aerial support assemblies using messenger wires need to have a terminal support in order to prevent sagging of the messenger wire that may occur over time, even when the messenger wire is coupled to support piles along the support assembly. *Id.*

19. Claim 19

- a. **19[a]: “A mounting assembly for a grounding system structured to ground a number of cables supported by a support assembly, said support assembly including a plurality of spaced, conductive piles, said grounding system including a multi-function line assembly with a multi-function line, said mounting assembly comprising:”**

To the extent the preamble is limiting, Petersen discloses or renders it obvious for the same reasons stated above for claim element 1[a]. §X.A.1; EX1002, ¶207.

- b. **19[b]: “a mounting body, a support coupling, and a number of multi-function line couplings;”**

Petersen in view of the knowledge of a POSITA renders this limitation obvious for the same reasons stated above for claim element 2[b]. §X.A.2.b; EX1002, ¶¶208-210.

- c. **19[c]: “each said multi-function line couplings structured to be coupled to said multi-function line;”**

Petersen discloses or renders this limitation obvious for the same reasons stated above for claims 2 and 8. §§X.A.2, 8; EX1002, ¶211.

- d. **19[d]: “each said support coupling structured to be coupled to a conductive pile; and”**

Petersen discloses or renders this limitation obvious for the same reasons stated above for claim element 2[b]. §X.A.2.b; EX1002, ¶212.

- e. **19[e]: “wherein, when said multi-function line assembly is coupled to, and in electrical communication with said multi-function line couplings, each said multi-function line coupling defines a conductive path.”**

Petersen discloses or renders this limitation obvious for the same reasons stated above for claim elements 1[d]. §X.A.1.d; EX1002, ¶213.

XI. GROUND 4: Obviousness over Petersen in view of Maclean

Petersen and MacLean, alone or in view of the knowledge of a POSITA renders obvious claims 13-17 of the '551 Patent. Accordingly, Petitioner requests cancellation of these claims.

A. Motivation and Reasonable Expectation of Success

A POSITA would have been motivated to combine Petersen’s teachings with MacLean’s thimble-eye terminal support because both references are concerned with the same subject matter (electrical distribution systems) and because Petersen leaves open how to terminate the neutral messenger. EX1004, *passim*; EX1027, *passim*; EX1002, ¶¶219-221. The NEC requires that all messenger supported electrical distribution systems to be supported at the dead ends of the support system, so a POSITA would be required to seek out terminal supports for messenger wires, like MacLean’s thimble-eye. EX1007, 214 (396.30(A)); EX1002, ¶¶214, 216, 219-221. Finally, a POSITA would have been motivated to review the product offerings

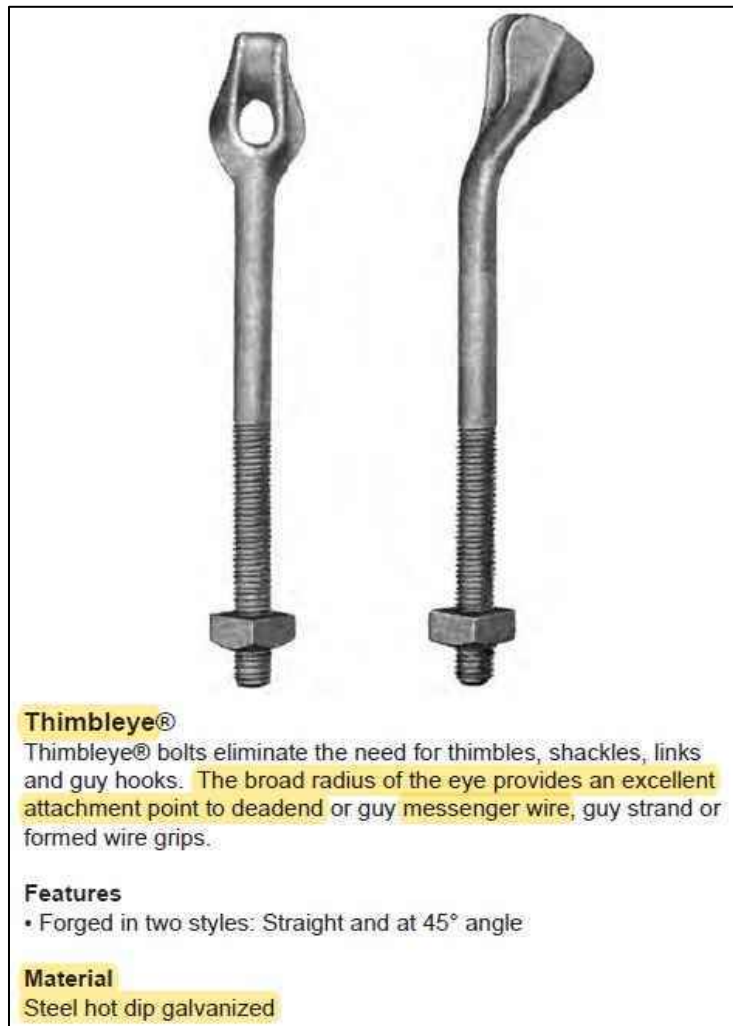
of MacLean because MacLean is widely known in the electrical distribution system industry. EX1002, ¶¶62, 216.

A POSITA would have a reasonable expectation of success in combining the teachings of the two references because both references concern electrical distribution support systems, Petersen disclosures the use of a messenger wire, and MacLean’s thimble-eye bracket is intended to support the dead end of a messenger wire. EX1004, *passim*; EX1027, 14; EX1002, ¶¶63, 217, 219-221.

B. Claim-by-Claim Analysis

1. Claim 13: “The grounding system of claim 12 wherein said multi-function line assembly terminal support includes a conductive thimble-eye.”

As discussed above, Petersen, alone or in view of a POSITA’s knowledge, discloses or renders obvious Claims 1 and 12, on which Claim 13 depends. §§X.A.1, 12. Petersen in view of MacLean disclose a multi-function line assembly terminal support that includes a conductive thimble-eye. EX1002, ¶214. All messenger supports must be supported at their ends. *Id.* Thimble-eye terminal supports were known in the art prior to the alleged invention as a cost effective and simple way to terminate a messenger cable. *Id.*, ¶215. MacLean discloses a thimble-eye bolt, made of galvanized steel, that “provides an excellent attachment point *to deadened ... messenger wire*[.]” EX1027, 14.



Id. (annotated).

A POSITA would have been motivated to combine the disclosures of Petersen with MacLean's thimble-eye terminal support, and have a reasonable expectation of success in doing so because messenger cables must be supported at their terminal ends, and the conductivity of MacLean's thimble-eye would maintain an electrical ground path. EX1002, ¶216. Accordingly, Petersen in view of MacLean and further in view of the knowledge of a POSITA renders obvious Claim 13.

2. Claims 14-17

Claims 14-17 depend from claim 13 and are rendered obvious by Petersen in view of MacLean and further in view of a POSITA's knowledge for the same reasons explained above. §§X.A.14-17; EX1002, ¶218.

XII. GROUND 5: Obviousness in view of CAB Website in view of CAB Whitepaper and further in view of MacLean

The CAB Website and CAB Whitepaper, alone or in view of the knowledge of a POSITA renders obvious claims 13-17 of the '551 Patent. Accordingly, Petitioner requests cancellation of these claims.

A. Motivation and Reasonable Expectation of Success

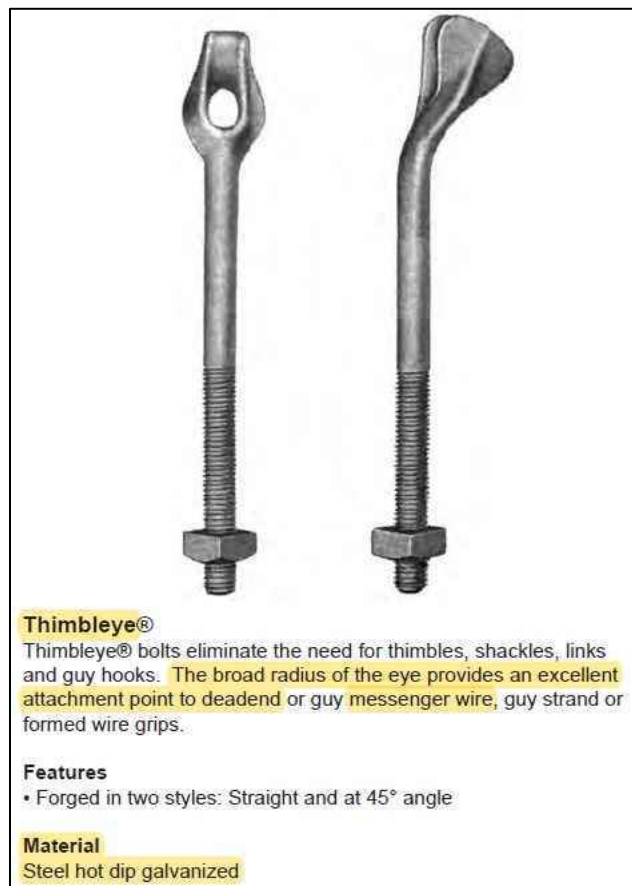
A POSITA would have been motivated to combine the CAB Website and CAB Whitepaper teachings with the components offered for sale by MacLean because the references are concerned with the same subject matter (electrical distribution systems), EX1005, *passim*; EX1006, *passim*; EX1027, *passim*; EX1002, ¶224. Further, the NEC requires that all messenger supported electrical distribution systems require the messenger to be supported at dead ends of a support system, so a POSITA would be required to seek out means to do so. EX1007, 241 (396.30(A)); EX1002, ¶¶224, 229-231. Finally, a POSITA would have been motivated to review the product offerings of MacLean because MacLean is widely known in the electrical distribution system industry. EX1002, ¶¶63, 224, 229-231.

A POSITA would have a reasonable expectation of success in combining the teachings of the two references because both references concern electrical distribution support systems, the CAB Website and CAB Whitepaper discloses the use of a messenger wire, and MacLean’s thimble-eye bracket is intended to support the dead end of a messenger wire. EX1005, *passim*; EX1006, *passim*; EX1027, 14; EX1002, ¶¶227, 229.

B. Claim-by-Claim Analysis

1. Claim 13: “The grounding system of claim 12 wherein said multi-function line assembly terminal support includes a conductive thimble-eye.”

As discussed above, the CAB Website and CAB Whitepaper, alone or in view of a POSITA’s knowledge, discloses or renders obvious Claims 1 and 12, on which Claim 13 depends. §IX.B.1, 12. The CAB Website and the CAB Whitepaper in view of MacLean disclose a multi-function line assembly terminal support that includes a conductive thimble-eye. EX1002, ¶¶222-223. All messenger supports must be supported at their ends. *Id.* Thimble-eye terminal supports were known in the art prior to the alleged invention as a cost effective and simple way to terminate a messenger cable. *Id.* MacLean discloses a thimble-eye bolt, made of galvanized steel, that “provides an excellent attachment point *to deadened ... messenger wire*[.]” EX1027, 14.



Id. (annotated)

A POSITA would have been motivated to combine the disclosures of the CAB Website and the CAB Whitepaper with MacLean's thimble-eye terminal support because messenger cables must be supported at their terminal ends, and the conductivity of MacLean's thimble-eye would maintain an electrical ground path. EX1002, ¶¶221-224. Accordingly, the CAB Website and CAB Whitepaper in view of MacLean and further in view of the knowledge of a POSITA renders obvious Claim 13.

2. Claim 14-17

Claims 14-17 depend from claim 13 and are rendered obvious by the CAB Website and CAB Whitepaper in view of MacLean and further in view of a POSITA's knowledge for the same reasons explained above. §§IX.B.14-17; EX1002, ¶228.

XIII. THERE ARE NO UNEXPECTED RESULTS OR SECONDARY CONSIDERATIONS

There is no evidence in the prosecution history of the '551 Patent or any related application that any arguments regarding secondary considerations exist, let alone that any such evidence could overcome the strong showing of obviousness set forth above or has a nexus to the Claims. *See generally* EX1037. Indeed, as demonstrated by the prior art referenced herein, any purported solutions to problems or unexpected results in the '551 were already well known. EX1002, ¶¶232-234.

XIV. DISCRETIONARY DENIAL OF INSTITUTION WOULD BE IMPROPER

A. 35 U.S.C. §325(d)

The grounds raised by this Petition are not the same or substantially the same as the art and arguments raised during prosecution. Grushkowitz, Petersen, the CAB Website, the CAB Whitepaper, and MacLean were not considered or cited during prosecution. Therefore, the Examiner did not consider the specific references or

combinations of references put forth herein. Accordingly, the Board should not exercise its discretionary power to deny institution of this Petition under §325(d).

B. *Fintiv*

The *Fintiv* framework favors institution of this proceeding. *Apple Inc. v. Fintiv, Inc.*, IPR2020-00019, Paper 11 at 6 (Mar. 20, 2020).

First: The early stage of the litigation and potential simplification (resulting from the Board invalidating all asserted claims of the '551 Patent) weighs strongly against the exercise of discretion.

Second: The scheduled trial date is at the end of December, 2025, which is eight months after the Board's projected deadline for a final written decision in April, 2025, and thus this factor supports institution.

Third: This factor heavily favors institution because investment in the Litigation is limited. *Sotera Wireless, Inc. v. Masimo Corp.*, IPR2020-01019, Paper 12, 16-17 (Dec. 1, 2020) (precedential). To date, Petitioner has not filed an answer to the complaint. The Court has not issued any substantive orders, and there has been no substantive discovery. No depositions have taken place, and none are scheduled. Furthermore, the *Markman* hearing is scheduled for September 2023, nearly a year after the filing of this Petition and long after the Board is expected to issue its institution decision.

Fourth: Although Patent Owner has not yet identified asserted claims in the Litigation, Petitioner challenges several claims of the '551 Patent that are likely to not be asserted. Thus there will be no overlap with respect to some of the challenged claims. Further, Petitioner hereby stipulates to that if this IPR proceeding is instituted, it will not pursue invalidity in the District Court Case on the same grounds raised in this Petition or any other ground that could have been reasonably raised in this Petition (i.e., any ground that could be raised under §§102 or 103 on the basis of prior art patents or printed publications). This stipulation mitigates concerns about duplicative efforts in the Litigation and this IPR proceeding. *Sotera Wireless, Inc.*, IPR2020-01019, Paper 12, 19 (precedential).

Fifth: This factor favors institution because Petitioner and Defendant in the Litigation are the same party, and CAB is the Plaintiff in the Litigation.

Sixth: Every element of the challenged claims is either expressly shown in the prior art or is obvious in view of well-known art. The strong merits of the grounds presented in this Petition further support institution.

XV. MANDATORY NOTICES

As set forth below and pursuant to 37 C.F.R. §42.8, the following mandatory notices are provided as part of this Petition.

A. Real Party in Interest

Affordable Wire Management, LLC is the real party in interest. Affordable Wire Management, LLC is not controlled by any other entity.

B. Related Matters

The '551 Patent is asserted against Petitioner in *Cambria County Association for the Blind and Handicapped, Inc. v. Affordable Wire Management, LLC*, No. 1-23-cv-00080 (D. Del.) (the "Litigation"). The Litigation was filed by CAB on January 23, 2023. In the Litigation, CAB also alleges Petitioner infringes U.S. Patent 11,349,291.

C. Lead and Backup Counsel

Petitioner designates the following individuals as its lead counsel and back-up counsel:

Lead Counsel: Serge Subach (Reg. No. 74,652) MINTZ, LEVIN, COHN, FERRIS, GLOVSKY AND POPEO, P.C. One Financial Center Boston, Massachusetts 02111 Email: SSubach@mintz.com ; CAB_AWM@mintz.com Phone: 617-348-1846 Fax: 617-542-2241	Back-Up Counsel: Williams S. Dixon (Reg. No. 78,346) MINTZ, LEVIN, COHN, FERRIS, GLOVSKY AND POPEO, P.C. One Financial Center Boston, MA 02111 Email: WSDixon@mintz.com ; CAB_AWM@mintz.com Tel: 617-348-1846 Fax: 617-542-2241
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D. Service Information

Please address all correspondence to the lead and backup counsel at the above address.

XVI. PAYMENT OF FEES

Pursuant to 37 C.F.R. §§42.103 and 42.15(a), the requisite filing fee of \$41,500 (*inter partes* review request fee of \$19,000 and *inter partes* review post-institution fee of \$22,500) for a Petition for *Inter Partes* Review is submitted herewith. Claims 1-19 of the '551 Patent are being reviewed as part of this Petition. The undersigned further authorizes payment from Deposit Account No. 50-0311 for any additional fees or refund that may be due in connection with the Petition.

XVII. CONCLUSION

Petitioner respectfully requests that *inter partes* review be instituted and that claims 1-19 of the '551 Patent be found unpatentable.

Dated: November 3, 2023

/Serge Subach/

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CERTIFICATE OF WORD COUNT

Pursuant to 37 C.F.R. §42.24(d), Petitioner hereby certifies, in reliance on the word count of the word-processing system (Microsoft Office Word 2016) used to prepare this response, that the number of words in this paper is 13,826. This word count excludes the tables of contents, tables of authorities, mandatory notices under 37 C.F.R. §42.8, certificate of word count, certificate of service, appendix of exhibits, and claim listing.

Dated: November 3, 2023

/Serge Subach/

Serge Subach (Reg. No. 74,652)

CERTIFICATE OF SERVICE

I certify that copies of the foregoing Petition for *Inter Partes* Review, all referenced exhibits, and the Petitioner's Power of Attorney were served via FedEx Priority Overnight on the Patent Owner at the correspondence address of record for the '551 Patent as indicated on the USPTO Patent Center:

ECKERT SEAMANS CHERIN & MELLOTT LLC

Attn:

Stephen Bucchianeri

Edward Flynn

Daniel Melman

Theodore McDonough

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Dated: November 3, 2023

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