

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

POLYGROUP LIMITED,
Petitioner,

v.

WILLIS ELECTRIC CO., LTD.,
Patent Owner.

Cases

IPR2016-01781

IPR2016-01782¹

Patent 8,974,072 B2

Before WILLIAM V. SAINDON, JEREMY M. PLENZLER, and
BARBARA A. PARVIS, *Administrative Patent Judges*.

SAINDON, *Administrative Patent Judge*, for the Board,
PLENZLER, *Administrative Patent Judge*, Dissenting.

FINAL WRITTEN DECISION

Finding No Challenged Claims Unpatentable
Denying Patent Owner's Motion to Exclude

¹ IPR2016-01782 is consolidated into IPR2016-01781. Paper 16, 2.

SAINDON, *Administrative Patent Judge*, for the Board:

I. INTRODUCTION

We have jurisdiction under 35 U.S.C. § 6. The evidentiary standard is a preponderance of the evidence. *See* 35 U.S.C. § 316(e); 37 C.F.R. § 42.1(d). This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

This proceeding is a consolidation of two Petitions filed by Petitioner challenging, *in toto*, claims 1–5, 7, 8, 11, 12, 15–18, and 21–27 of U.S. Patent No. 8,974,072 B2 (Ex. 1001, “the ’072 patent”).² We instituted an *inter partes* review on all challenged claims on all challenged grounds (Paper 16, “Dec. on Inst.”). During trial, Patent Owner filed a Response (Paper 28, “PO Resp.”) and Petitioner filed a Reply (Paper 33, “Pet. Reply”). An oral hearing was held on February 5, 2018 (Paper 44, “Tr.”).

This Decision also includes our decision on Patent Owner’s Motion to Exclude (Paper 37).

Reviewing the arguments and evidence before us, we determine that Petitioner has not established by a preponderance of the evidence that any of the challenged claims of the ’072 patent are unpatentable.

² The Petition in IPR2016-01781 is Paper 2 (hereinafter, “Pet.”) and challenges claims 1–5, 7, 8, 16–18, and 25–27. The Petition in IPR2016-01782 is also Paper 2 as filed in that proceeding (hereinafter, “’1782 Pet.”), and challenges claims 11, 12, 15, and 21–24. After consolidation in our Decision to Institute, all papers and exhibits were filed exclusively in IPR2016-01781, and all papers and exhibits cited herein are to be found in that proceeding unless otherwise noted.

A. Related Matters

Both parties have filed petitions and district court actions against the other party's patents. Beginning with Patent Owner's patents, the '072 patent (and pending U.S. App. No. 14/512,021) claim priority to U.S. Patent No. 8,454,186 ("the '186 patent"). The '072 and '186 patents, as well as patents covering related subject matter, U.S. Patent No. 8,454,187 ("the '187 patent"), U.S. Patent No. 9,044,056 ("the '056 patent"), U.S. Patent No. 9,066,617 ("the '617 patent"), and U.S. Patent No. 8,936,379 ("the '379 patent"), were asserted against Petitioner in district court, in a case styled *Willis Elec. Co. v. Polygroup Ltd.*, No. 0:15-cv-03443 (D. Minn.). Pet. 82. Petitioner had filed several petitions for *inter partes* review of those patents. See Pet. 81–84 (detailing the IPR history). Those petitions have reached a final written decision and are presently on appeal to the Court of Appeals for the Federal Circuit. In those final written decisions, a majority of this panel have:

upheld all challenged claims of the '186 patent (*Polygroup, Ltd. v. Willis Elec. Co.*, IPR2016-01610, Paper 187 (Feb. 26, 2018) (Plenzler, dissenting));

upheld all challenged claims of the '187 patent (*Polygroup, Ltd. v. Willis Elec. Co.*, IPR2016-01612, Paper 192 (Feb. 26, 2018) (Plenzler, dissenting));

upheld or granted the motion to amend all challenged claims of the '056 patent (*Polygroup, Ltd. v. Willis Elec. Co.*, IPR2016-01613, Paper 118 (Feb. 26, 2018) (Plenzler, dissenting-in-part)); and

upheld all challenged claims of the '379 patent (*Polygroup, Ltd. v. Willis Elec. Co.*, IPR2016-01615, Paper 94 (Feb. 26, 2018) (Plenzler, dissenting)).

Petitioner also challenged U.S. Patent No. 9,066,617 in IPR2016-01783, but that petition was denied institution. *Polygroup, Ltd. v. Willis Elec. Co.*, IPR2016-01783, Paper 15 (Apr. 13, 2017) (denying institution).

Lastly, an anonymous party filed *ex parte* reexaminations (90/020,073, 90/020,074) against the '186 and '187 patents, respectively. Pet. 81–82.

Regarding Petitioner's patents, Petitioner has asserted patents against Patent Owner in *Polygroup Macau Ltd (BVI) v. Willis Electric Co., Ltd.*, No. 3:15-cv-00552 (W.D.N.C.). Paper 13, 3. Patent Owner has filed petitions challenging U.S. Patent Nos. 8,863,416, 6,794,825, 9,119,495, and 8,959,810, owned by Petitioner, in IPR2017-00309, IPR2017-00330, IPR2017-00331, IPR2017-00332, IPR2017-00334, and IPR2017-00335. These proceedings, except IPR2017-00330, were instituted, and final written decisions are due in May of 2018.

B. The '072 Patent

The '072 patent "is directed to lighted artificial trees having separable, modular tree portions mechanically and electrically connectable between trunk portions." Ex. 1001, 1:16–18. Figures 2 and 3 of the '072 patent are exemplary, and are reproduced below.

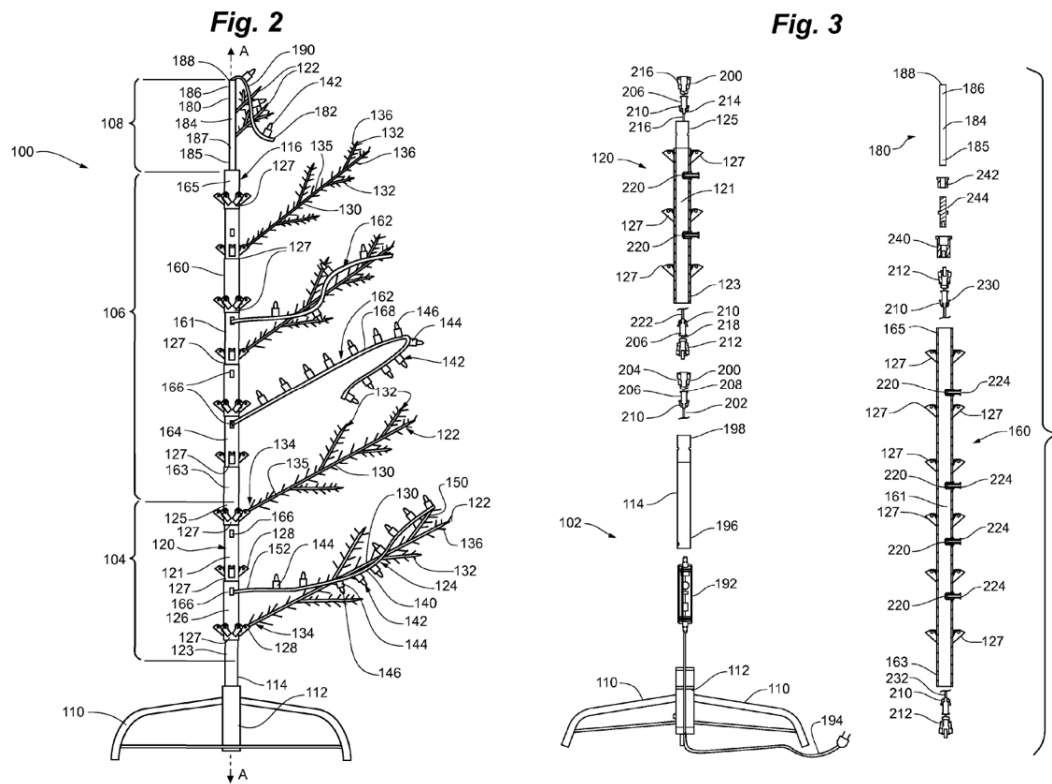


Figure 2 is a front view of a base and trunk assembly of a modular lighted artificial tree, and Figure 3 is an exploded view of Figure 2.

Modular tree 100 includes, for example, first and second tree portions 104, 106. *Id.* at 6:21–22. First tree portion 104 includes first trunk portion 120, branches 122, and light strings 124. *Id.* at 6:45–47. First trunk portion 120 houses trunk connector 200 and first trunk wiring harness 214. *Id.* at 9:31–33. The '072 patent explains that “[f]irst trunk wiring harness 214 when connected to trunk connector assemblies 200 and 212 extends through . . . the interior of first trunk portion 120” and “trunk connector assembly 212 includes head assembly 216 coupled to electrical connector 206 via a length of wiring 218.” *Id.* at 9:40–45. “[W]hen assembled, trunk connector assembly 200 is electrically connected to connector assembly 212 and light strings 124 through wiring harness 214.” *Id.* at 9:65–67.

Second tree portion 106 is adjacent to first tree portion 104 and, similar to first tree portion 104, includes second trunk portion 160, branches 122, and light strings 162. *Id.* at 7:41–44. Second trunk portion 260 includes trunk connector assembly 212, which is inserted into trunk connector 200, and second trunk wiring harness 230. *Id.* at 10:1–3. “Second trunk wiring harness 230 when connected to trunk connector assemblies 212 extends through . . . [second] trunk portion 160” and “may be generally similar to first trunk wiring harness 214.” *Id.* at 10:6–11.

The ’072 patent explains that light string 124 is connected to first trunk wiring harness 214, and consequently to connector assembly 200, and light string 162 is connected to second trunk wiring harness 230, and consequently connector assembly 212. *Id.* at 16:19–24, 17:62–66. When first and second trunk portions 120, 160 are joined, trunk connector 200 is coupled to trunk connector assembly 212 to provide electrical connection between first and second trunk wiring harnesses 214, 230 and, therefore, electrical connection between light strings 124, 162. *Id.* at 15:31–34, 16:14–18, 18:11–17.

C. Challenged Claims

As noted above, Petitioner challenges claims 1–5, 7, 8, 11, 12, 15–18, and 21–27 of the ’072 patent. Claims 1, 11, and 25 are independent claims, with claims 2–5, 7, 8, 12, 15–18, 21–24, 26, and 27 depending from claim 1, 11, or 25. Claims 1 and 11 are illustrative, and are reproduced below:

1. A lighted artificial tree, comprising:
 - a first tree portion including a first trunk portion, a first plurality of branches joined to the first trunk portion, and a first light string, the first trunk portion having a first trunk wall defining a first trunk interior, the first trunk wall forming a circular

edge at a first end, a first trunk connector including a non-conductive portion, a first electrical contact and a second electrical contact, and a first trunk wiring assembly, the first trunk wiring assembly electrically connected to the first light string and the first trunk connector, at least a portion of the first wiring assembly and a portion of the first trunk connector located within the first trunk interior, the non-conductive portion engaging the first trunk wall and including a first end portion and a second end portion, the first end portion having an outside diameter greater than an outside diameter of the second end portion, the first end portion of the non-conductive portion positioned closer to the circular edge of the first end of the first trunk wall than the second end portion of the non-conductive portion;

- a second tree portion connectable to the first tree portion and including a second trunk portion, and a second light string, the second trunk portion having a second trunk wall defining a second trunk interior, the second trunk wall forming a circular edge at a second end, a second trunk connector, and a second trunk wiring assembly, the second trunk wiring assembly electrically connected to the second lighting string and the second trunk connector, at least a portion of the second wiring assembly and a portion of the second trunk connector located within the second trunk interior;

wherein the circular edge of the first trunk wall does not include rotational alignment structure for rotationally aligning the first trunk wall relative the second trunk wall, and the circular edge of the second trunk wall does not include rotational alignment structure for rotationally aligning the second trunk wall relative the first trunk wall; and

wherein the second tree portion is mechanically and electrically connectable to the first tree portion by aligning the second trunk portion with the first portion along a common central axis such that the second trunk interior defined by the second trunk wall receives a portion of the first trunk wall causing an inside surface of the second trunk wall to be in contact with an outside surface of the first trunk wall, thereby forming a mechanical connection between the first trunk portion and the

second trunk portion, and the first electrical contact of the first trunk connector makes electrical connection with a first electrical contact of the second trunk connector, and the second electrical contact of the first trunk connector makes electrical connection with a second electrical contact of the second trunk connector, thereby forming an electrical connection between the first wiring assembly and the second wiring assembly.

Ex. 1001, 21:13–67.

11. A lighted artificial tree, comprising:

a first tree portion including a first trunk portion having a first trunk wall with a first circular edge at a first end, and a first trunk interior, a first trunk connector assembly and a first light string, at least a portion of the first trunk connector assembly housed within the first trunk interior and electrically connected to the first light string, the first trunk connector assembly of the first trunk portion including:

a first electrical contact and a second electrical contact;

a non-conductive portion having a first end portion and a second end portion, the second end portion of the non-conductive portion insertable into the first trunk interior, the first end portion defining an outer diameter that is greater than an outer diameter of the second end portion, the first end of the non-conductive portion proximal the circular edge of the first end of the first trunk wall, the second end portion of the non-conductive portion distal the circular edge of the first end of the first trunk wall; and

a second tree portion including a second trunk portion having a second trunk wall with a second circular edge at a second end, and a second trunk interior, at least a portion of the trunk connector assembly housed within the second trunk interior, the trunk connector assembly of the second trunk portion including:

a first electrical contact and a second electrical contact;

a non-conductive portion insertable into the first trunk body;

wherein the circular edge of the first trunk wall does not include rotational alignment structure for rotationally aligning the first trunk wall relative the second trunk wall, and the circular edge of the second trunk wall does not include rotational alignment structure for rotationally aligning the second trunk wall relative the first trunk wall; and

wherein the second tree portion is mechanically and electrically connectable to the first tree portion by coupling the first end of the first trunk portion to the second end of the second trunk portion along a common vertical axis, such that the first electrical contact of the first tree portion makes electrical connection with the first electrical contact of the second tree portion, the second electrical contact of the first tree portion makes electrical connection with the second electrical contact of the second tree portion, such that the first wiring assembly is electrically connected to the second wiring assembly and the second wiring assembly is electrically connected to the first light string.

Id. at 22:50–23:32.

D. Prior Art and Asserted Grounds

Petitioner contends that the challenged claims are unpatentable under 35 U.S.C. § 103 as set forth below (’1781 Pet. 16–80; ’1782 Pet. 13–55).

References	Claim(s) Challenged
Miller ³ , Yang ⁴ , and Patry ⁵	1, 2, 11, 12, 15–18, and 21–27
Miller, Yang, Patry, and Otto ⁶	3 and 4

³ U.S. Pat. No. 4,020,201, iss. Apr. 26, 1977 (Ex. 1007, “Miller”).

⁴ U.S. Pat. No. 7,132,139 B2, iss. Nov. 7, 2006 (Ex. 1011, “Yang”).

⁵ U.S. Pat. No. 3,602,531, iss. Aug. 31, 1971 (Ex. 1044, “Patry”).

⁶ DE 8436328.2, pub. Apr. 4, 1985 (Ex. 1008, “Otto”). Exhibit 1008 includes both the original German-language document, as well as the English translation.

References	Claim(s) Challenged
Miller, Yang, Patry, and Lessner ⁷	5
Miller, Yang, Patry, and Janning ⁸	7 and 8

Petitioner provides testimony from Mike Wood. Ex. 1006 (“the Wood Declaration”). Patent Owner provides testimony from Stuart B. Brown, Ph.D. Ex. 2002 (“the Brown Declaration”).

II. PENDING MOTIONS

A. Patent Owner’s Motion to Exclude

Patent Owner moves to exclude Exhibits 1105, 1106, 1108, 1110, 1153–1162, 1182–1191, 1193, and 1194. Paper 37 (“Mot.”). Each of these Exhibits were taken from a related proceeding and submitted in this one. Petitioner offers the prior testimony of Dr. Brown (Exhibit 1105); Johnny Chen (Exhibit 1106), Robert Braasch (Exhibit 1108), Winston Tan (Exhibit 1110), and a Declaration in support of Patent Owner’s Response in IPR2016-01610 (Ex. 1193). Mot. 4. Exhibits 1153–1162, 1182–1191, 1193, and 1194 were not cited by Petitioner in its briefs but were filed because they were exhibits cited in the aforementioned testimony. *Id.* at 14.

Patent Owner argues that this evidence is hearsay because the testimony is from a different proceeding and used to prove the truth of the matter asserted. *Id.* at 4–5. Patent Owner also argues that the evidence is not probative. *Id.* at 5–13.

⁷ U.S. Pat. No. 3,409,867, iss. Nov. 5, 1968 (Ex. 1066, “Lessner”).

⁸ U.S. Pub. No. 2007/0273296 A9, re-published Nov. 29, 2007 (Ex. 1067, “Janning”) (originally published on Aug. 11, 2005 as U.S. Pub. No. 2005/0174065 A1).

We deny Patent Owner’s Motion to Exclude as moot because we do not rely on any of the above-cited exhibits in this Decision.

B. Motions to Seal

Any motion to seal will be decided in a separate decision.

III. PATENTABILITY ANALYSIS

A. Claim Construction

We interpret the claims of an unexpired patent using the broadest reasonable interpretation in light of the specification of the patent. 37 C.F.R. § 42.100(b). Under that standard, a claim term generally is given its ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *See In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Although our claim interpretation cannot be divorced from the specification, *see Microsoft Corp. v. Proxyconn, Inc.*, 789 F.3d 1292, 1298 (Fed. Cir. 2015) (quoting *In re NTP, Inc.*, 654 F.3d 1279, 1288 (Fed. Cir. 2011)), we must be careful not to import limitations from the specification that are not part of the claim language, *see SuperGuide Corp. v. DirecTV Enters., Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004). Any special definition for a claim term must be set forth in the specification with reasonable clarity, deliberateness, and precision. *See In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

1. “Tree Portion”
(*Independent Claims 1, 11, 24*)

Patent Owner raised the issue of the construction of “tree portion” in its Response. PO Resp. 36–38. Patent Owner proposes a “tree portion” means “a mechanically and electrically connectable modular and unitary

portion of an artificial tree.” *Id.* at 36 (citing Ex. 2009 ¶¶ 71–75) (emphasis removed). Petitioner replies that it should mean “a part of a tree.” Pet. Reply 16–17 (citing Ex. 1100 ¶ 55; Ex. 1137, 3).

The ’072 patent issued from a continuation application of an application that is now the ’186 patent. Ex. 1001, (63). In our Final Written Decision addressing the ’186 patent, we agreed with and adopted Patent Owner’s proposed construction of “tree portion.” *Polygroup Ltd. v. Willis Electric Co., Ltd.*, Case IPR2016-01610, Paper 187, 12–21 (Final Written Decision, Feb. 26, 2018). Because the ’072 patent contains the same specification as the ’186 patent, we determine that a person of ordinary skill in the art reading the ’072 patent claims in light of the specification would arrive at the same construction for “tree portion” as we did for the ’186 patent. Petitioner agrees the extrinsic evidence before us here is the same as presented in IPR2017-01610, addressing the ’186 patent. Tr. 10:3–6. Petitioner asserts that, relative to our Final Written Decision in IPR2017-01610, a potential difference here is the structure of the claims. Tr. 9:13–20; *see also id.* at 8:1–9:6 (setting forth the discussion with Petitioner regarding whether the “tree portion” limitation should be construed the same as in IPR2016-01610). We address that argument below. Patent Owner asserts that the extrinsic evidence is the same relative to IPR2017-01610, but that this record includes additional citations to that evidence. *Id.* at 26:4–19, 27:1–28:2.

Petitioner’s argument regarding “tree portion” is found at pages 16 and 17 of its Reply. Petitioner argues that the claims themselves specify the relationship between the components of the tree portion. We addressed this argument already in the related IPR2016-01613 proceeding that concerned

the related '056 patent. In IPR2016-01613, we construed “tree portion” as we did in IPR2016-01610, even though the claim structure was slightly different. We recognized the claims there “omit an explicit recitation of the branches [but] ultimately a tree portion having lights must have branches.” *Polygroup Ltd. v. Willis Electric Co., Ltd.*, Case IPR2016-01613, Paper 118, 9 (Final Written Decision, Feb. 26, 2018); *see also id.* at 8–10 (setting forth our “tree portion” construction analysis).

In the present case, independent claims 1 and 25 of the '072 patent include a trunk, branches, and lights. However, independent claim 11 only recites a trunk and lights. But like in IPR2016-01613, it makes little sense to have a lighted artificial tree with lights but not branches. The claim omits explicitly reciting these limitations because it focuses on other structure, like the structure of the trunk. That does not change the “tree portion.”

Accordingly, we adopt Patent Owner’s construction of “tree portion” for the same reasons we expressed already in IPR2016-01610 and IPR2016-01613, which we adopt and incorporate herein. We construe “tree portion” to mean “a mechanically and electrically connectable modular and unitary portion of an artificial tree.”

2. Other Claim Terms

No remaining terms require construction for purposes of this decision. *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (only those terms that are in controversy need to be construed, and only to the extent necessary to resolve the controversy).

B. Person of ordinary skill in the art

Petitioner proposes that a person of ordinary skill in the art has:

(1) a degree in electrical engineering or an equivalent degree; (2) a minimum of one or two years of experience in electrical engineering or electronics, specifically lighting manufacturing and/or design; and (3) general knowledge of engineering that would include understanding of lighting design, construction, functions, attributes and processes used to implement such products.

'1781 Pet. 14 (citing Ex. 1006 ¶¶ 18–23); *accord* '1782 Pet. 11 (citing IPR2016-01782, Ex. 1006 ¶¶ 18–23).

Patent Owner offers the following description:

(1) a person with at least a bachelor's degree in mechanical engineering or electrical engineering and at least one to two years of experience in the development of mechanical and electrical products, or (2) a person with at least one to two years of experience working in product development, design, or manufacturing of lighted artificial trees.

PO Resp. 32–34 (citing Exs. 2010 ¶ 7; 2009 ¶ 67; 2013 ¶¶ 81, 82) (emphasis omitted).

We also consider the level of skill implied by the disclosures of the prior art references. *Okajima v. Bourdeau*, 261 F.3d. 1350, 1355 (Fed. Cir. 2001) (the prior art itself can reflect the appropriate level of skill in the art).

Reviewing the parties' proposed definitions, we find Petitioner's to be the more appropriate, with one caveat discussed later. Petitioner's proposed level of skill would allow that person to understand the prior art in this proceeding and make and/or use it. On the other hand, Patent Owner's proposed level of skill is too low, and includes persons not involved in the design or creation of the product, such as a person tangentially involved with the product in the manufacturing phase; people who would not know how to

make and/or use the relevant art. We agree with Petitioner, arguing in its Reply, that a person of ordinary skill in the art requires the technical skills and knowledge to be able to understand, e.g., the electrical connections involved in artificial trees. Pet. Reply 2–6. As to Patent Owner’s argument that Petitioner’s requirement that a person of ordinary skill has an engineering degree and two year’s practical experience is unduly high (PO Resp. 33–34), we note that the person of ordinary skill is a hypothetical person, and that less education can be offset by more experience—in other words, we do not interpret Petitioner’s list as having a strict requirement for an engineering degree, but rather to set forth the idea that a person of ordinary skill in the art is typified by someone with the knowledge of a person with an engineering degree.

We do not completely adopt Petitioner’s proposed definition, however, because it is broadly directed to “lighting design.” Although we are persuaded that a person of ordinary skill in the art would have broader knowledge outside of lighted artificial trees, we are not persuaded that a person who spends her time on any given form of “lighting design,” e.g. stadium lighting, has ordinary skill in the claimed subject matter dealing with artificial trees. Granted, with her knowledge and skills, she would likely readily become such a person with experience, but she would need some time to become familiar with the particularities of the design of lighted artificial trees. *See, e.g.*, Pet. Reply 2–3 (highlighting a need for consideration of safety standards for consumer products); Ex. 1100 ¶ 12 (same). Accordingly, we adopt Petitioner’s level of skill with the modification that the person of ordinary skill in the art have: “(2) a minimum of one or two years of experience in electrical engineering or

electronics, specifically ~~lighting~~ lighted artificial tree manufacturing and/or design.” This reflects the reality that a person of ordinary skill in the art would at least have exposure to working with lighted artificial trees at a technical level.

*C. Claims 1, 2, 11, 12, 15–18, and 21–27
(Miller, Yang, and Patry)*

1. Petitioner’s Ground

Petitioner proposes to combine the artificial tree of Miller, in which there are male and female plugs inside the tree trunk that allow electricity to travel between trunk sections, and to instead couple the electricity between trunk sections as shown in the artificial tree in Yang. Pet. 22. The electrical connectors between trunk sections in Yang are securely fitted inside the trunk sections using locating protrusions. Ex. 1011, 2:31–49. Thus, when the two trunk sections are mated, the electrical connection is also made. *Id.* at 3:4–16. Petitioner proposes that a person of ordinary skill in the art “would have recognized that *Yang*’s snap-fitted connector would make it ‘easy to assemble’ and disassemble *Miller*’s tree.” Pet. 22. An excerpt of Figure 2 of Miller, and Figure 1 of Yang are reproduced below:

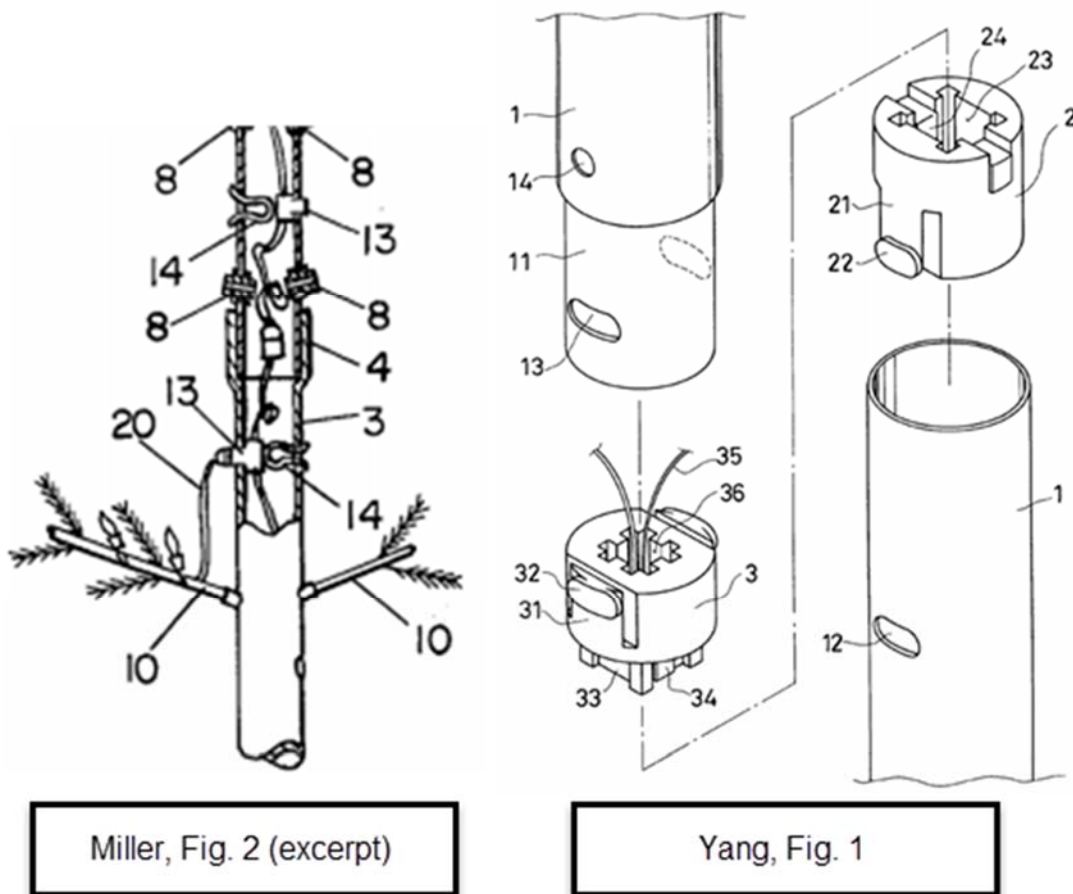
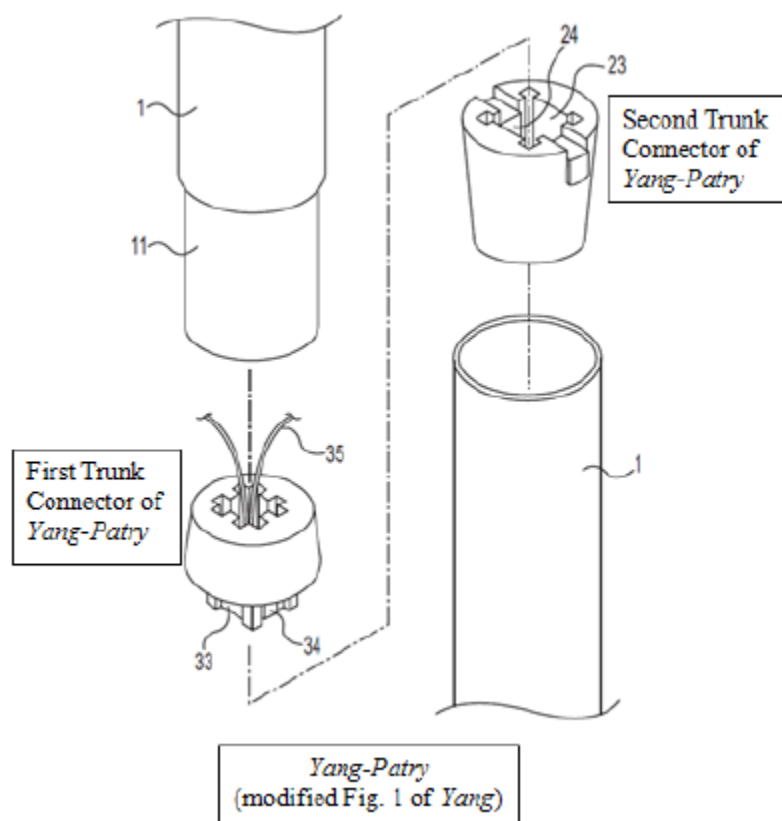


Figure 2 of Miller depicts a cutaway view of the inside of lower trunk member 3 and upper trunk member 5. Ex. 1007, 1:63–65. Main double conductor wire 22 (not labeled) extends lengthwise in between, with electrical plugs (not labeled, to the left of item 4) mated to allow for a disassemble-able electrical connection between the trunk members. It is these electrical plugs Petitioner proposes to replace with Yang’s electrical connectors. Pet. 21. Figure 1 of Yang depicts an exploded view of first and second connecting members 2, 3, each having flexible plates and locating protrusions (21, 22 and 31, 32, respectively) and accompanying electrical terminals. Ex. 1011, 2:31–49. Unlike the artificial tree in Miller, which must have the loose electrical plugs connected prior to connecting the

trunks, Yang's design provides for a concurrent mechanical and electrical connection to be made. Ex. 1006 ¶¶ 154–155.

Petitioner then proposes to eliminate the snap-fitting portion of the connector of Yang, just incorporated, and convert it into a “compression-fitted tapered connector” as allegedly taught in Patry. Pet. 22–23. Petitioner depicts its proposed modification of Yang's electrical connector in view of Patry as the following:



The figure above was made by Petitioner and depicts Yang's electrical connectors from Figure 1 modified to have a taper shape. Pet. 27.

Patry itself teaches a cast metal tubing coupler for securely and permanently coupling two tubes in applications such as “lampposts, flagpoles, and the like.” Ex. 1044, 1:31–32, 38–42, 3:6–10 (describing the

invention as providing “a permanent coupling”). The coupler of Patry has sharp tapered ribs and a tapered body to help obtain a friction fit. *See id.* at 1:67–75, 2:26–57. Figure 2 of Patry is reproduced below:

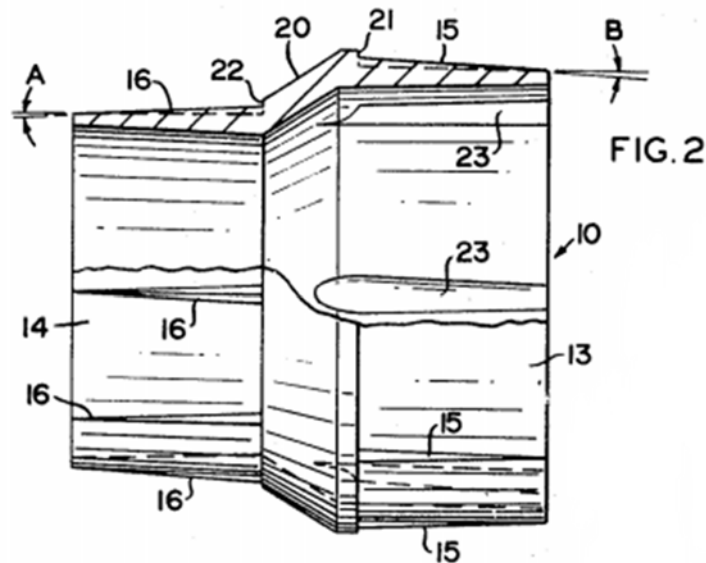


Figure 2 of Patry depicts a partial cross-section of its tubing coupler. Tubes would be slid over ends 13 and 14 of the coupler to provide a permanent connection between the two tubes. *Id.* at 2:20–25, 3:6–10. Axially extending ribs 15 and 16 have sharp ends to facilitate the force fit. *Id.* at 1:67–75, 2:26–31. There is no discussion in Patry of using the connector to connect something inside a tube, for tubes intended to be disassembled, or for electrical connections.

Petitioner asserts that “there were numerous but finite designs to enable a secure fit of an electrical connector in a tube” and that a compression fit is one of them. Pet. 23. Petitioner asserts, relying on Volum, that a person of ordinary skill in the art would consider a compression-fit connection because they “ease manufacturing while maintaining resilience in the mounting of the connection” and that “the tapered configuration promotes insertion into the tubular sections and allows

the connector to be compressed into the same.” *Id.* (citing Ex. 1068, 1:5–15, 2:39–51, 4:60–75, Fig. 5).⁹ Petitioner also asserts that “compression-fit connectors were known alternatives to Yang’s snap-fit connectors.” *Id.*; *see also id.* at 24 (listing without further explanation several rationales that effectively restate and summarize the above-discussed rationale).

Volum, cited by Petitioner as evidence for motivation and for teaching ease of manufacture and promotion of insertion, is a snap fit connector for “a wide variety of items such as, but not limited to, shelf supports, tables, chairs, cabinets, shoe racks, merchandise stands in stores, sign supports, animal cages, barricades and the like without the need of any tools, hardware, glue or additional supplies.” Ex. 1068, 1:48–59. Figure 1 of Volum is reproduced below:

⁹ Petitioner’s citations are to “*id.*” but the prior-cited reference at this location in the Petition is Exhibit 1004, the expert declaration, rather than Volum. Pet. 23. Further, the citations to particular line numbers are difficult to line up to relevant disclosures.

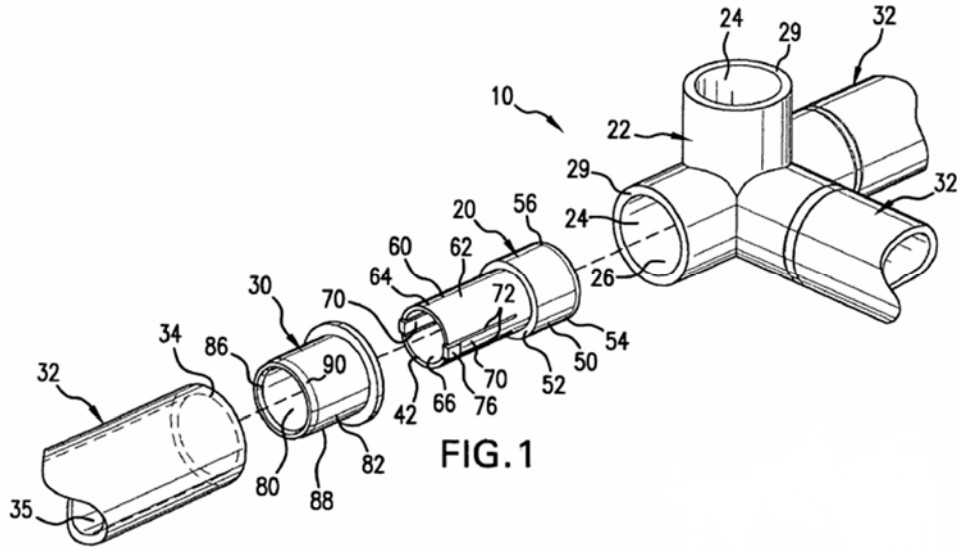


Figure 1 of Volum depicts an exploded view of a two-piece snap connector, with 4-way fitting 22 connected to pipe section 32 (e.g., PVC pipe) via the connector formed by female coupling 30 and male coupling 20. *Id.* at 3:36–58. Male coupling 20 is press-fit, glued, or integrally molded into 4-way fitting 22. *Id.* at 4:1–10. Similarly, female coupling 30 is press-fit, glued, or integrally molded into pipe 32. *Id.* at 4:34–52. Then, when male and female couplings are joined, heads 76 on prongs 70 of male coupling 20 interface with the edge of female portion 30 to form a locked connection. *Id.* at 4:61–5:26. There is no discussion in Volum of using the connector to connect something inside a tube or for electrical connections.

2. Analysis: Tree Portion

Each of the independent claims challenged includes a “tree portion” limitation. Petitioner relies on Miller to teach this limitation. Pet. 28, 37–38, 54, 57; ’1782 Pet. 26. As we discussed in IPR2016-01610, which we adopt and incorporate herein, Miller does not teach a tree portion. IPR2016-01610, Paper 187, 33–34. In that decision, we explained that, although

Miller's tree has a trunk, branches, and lights, for example, those structures are not "a mechanically and electrically connectable modular and unitary portion of an artificial tree." For instance, the branches are not structured as a module along with the trunk—they are completely independent.

Accordingly, none of the challenged grounds meet this limitation, and we determine that Petitioner has not shown, by a preponderance of the evidence, that the subject matter of claims 1–5, 7, 8, 11, 12, 15–18, and 21–27 would have been obvious under any of the grounds presented.

3. Analysis: Rationale

Reviewing Petitioner's ground, the problem with Petitioner's rationale, in our view, is that even if it was known to provide tapered connectors *between tubes*, Petitioner has not provided sufficient evidence that it was known in the art to provide tapered connections in the context proposed—tapered *electrical* connectors *inside* tubes.¹⁰ Petitioner is not proposing to use the Patry or Volum connector in the context described in Patry or Volum. Those connectors serve to connect two tubes (permanently, in Patry), not to connect things inside two already connected tubes (let alone electrical connectors inside already connected tubes). *See* Ex. 1044, 1:4–7, 3:7–10; Ex. 1068, 1:48–59; Ex. 2009 ¶ 123. The connectors in Yang that Petitioner proposes to modify are not connecting the two trunk sections—they are connecting the electrical components within those trunk sections,

¹⁰ We see no meaningful difference between connectors described as being secured using a compression fit, taper fit, or press fit, and we consider these connectors the same as the connector structure required by the claims having one end larger in diameter than the other end. We use the terms interchangeably.

which are connected, in turn, in an abutting fashion. *See* Ex. 1011, Fig. 1 (noting the electrical connectors are each inside the tubes, with connector 2 well within the tube), Fig. 3 (showing the tubes are connected via an abutting relationship rather than by the electrical connectors within them). Thus, Petitioner’s use of the prior art connectors is meaningfully different in the proposed application.

a. Not a Known Alternative

We are not persuaded by Petitioner’s argument that a tapered electrical connector inside a tube is a known alternative to the snap-fit electrical connector inside a tube of Yang—there is no credible evidence that such a connection was actually known in the art. *See* Pet. 22–24 (arguing that “a compression-fitted tapered connector [is] one of many known conventional connectors”, “[a] POSA would have known there were numerous but finite designs to enable a secure fit”, “compression-fit connectors were known alternatives”, and characterizing the proposed combination “a substitution of one known element for another” and “obvious to a POSA to try”); *see also* Pet. Reply 32–33 (making similar arguments). Petitioner’s argument relies heavily on its expert, who in turn cites ten references that, to the extent they represent the state of the art, prove that no one thought to use press-fit electrical connectors in a tube, let alone consider them alternatives to snap-fit electrical connectors. Ex. 1006 ¶¶ 90–100. Instead, these references use terms like taper, press-fit, or the like in different contexts for different reasons, not relevant to the present

context of *securing* an electrical connector *inside a tube at a certain location* by providing a connector having two different diameters.¹¹

In particular, Fitzgerald describes lamp body 30 that is tapered on either end, where the purpose of one end being tapered is to provide for finger grips 38, 40 (i.e., a physical gripping point for a person's finger), and where another purpose of the taper is to eliminate molding (manufacturing) problems. Ex. 1043, Fig. 1, 2:21–35. The tapers here are not to fix the body in a tube. Frei describes an electrical connector that precludes axial movement of socket shell 50 relative to grommet 10 in part by a conical portion of the shell. Ex. 1013, Fig. 1 (noting end portion 51 is fit into a conical portion of shell 50), Fig. 2 (noting sleeve 60 is reduced at 66 to seat in conical retainer 67). The taper here is used to help physically obstruct further rearward movement rather than provide a press-fit configuration as in the proposed modification. Korengold describes an electrical connector in the end of a tube, wherein axial movement is obstructed by an annular shoulder. Ex. 1046, Fig. 1 (noting annular shoulder 2 to obstruct connector 3 and a similar structure to obstruct connector 4). Petitioner's expert directs us to McLeish but it is not clear what teaching he believes is relevant here. See Ex. 1006 ¶ 94 (discussing McLeish, Exhibit 1012). In any event, McLeish describes no press-fit connector. Randolph describes an interlocking snap fit, not a press fit, between locating surfaces 26 and 27 for

¹¹ Because Petitioner's proposed modification to Yang is simply to remove the locating snap-fit structures, Petitioner's proposed modification necessarily requires that the press-fit be sufficiently tight to positively maintain the location of the electrical connectors inside the tubes as they are plugged and unplugged.

use in a through-wall electrical connector. Ex. 1049, 1:11–13, 2:20–24. Roeser describes another through-wall electrical connector described as having a taper, but that taper has nothing to do with a press fitting and instead is merely the shape of the object, which is secured via threads. Ex. 1048, Fig. 2. Petitioner’s expert cites Gust as evidence that a tapered surface “prevent[s] dust or dirt from contaminating the inside of the connector’s tube.” Ex. 1006 ¶ 99. But Petitioner and its expert do not explain, nor do we see, how the problem of dirt intrusion past a hermetic seal is relevant to the proposed combination. See Pet. 23 (arguing that tapered connectors provide a seal). Further, Petitioner and its expert do not explain, nor do we see, how it is the taper instead of the crenellations that provide such a seal, if such a seal were relevant. See Ex. 1045, Fig. 3 (depicting crenellations interfacing near item numbers 20 and 22). Ha discloses the use of physical obstructions in the form of shoulders to prevent the electrical connector from sliding in too far in an artificial tree trunk. Ex. 1042, Fig. 5, 3:13–18. These references all belie Petitioner’s assertions and its expert’s opinions that it was known to use a taper-fit electrical connector in the manner proposed in the combination; based on the evidence of record, we find that use of a compression-, press- or taper-fit electrical connector was not a known alternative to Yang’s snap connectors. Pet. 23 (asserting “compression-fit connectors were known alternatives to *Yang*’s snap-fit connectors”).¹²

¹² We will discuss further below, but it is evident from the review of the prior art thus far, that the prior art consistently teaches to use shoulders, tabs, or some similar physical obstruction to prevent the connector from being pushed too far down the tube.

b. Not Easier to Manufacture

Petitioner's arguments that the connectors would be easier to manufacture if appropriate teachings were applied from Volum's tapered connectors are similarly without persuasive evidentiary support. Pet. 23 ("Volum explains that tapered connectors advantageously ease manufacturing while maintaining resilience in the mounting of the connection."); *id.* at 24 ("A POSA would have recognized that if a trunk member is manufactured slightly too large or too small, Patry's compression-fit would still allow for an effective insertion, would assist with tooling tolerance, and eliminate the need to perfectly align Yang's tabs with its locating holes."). We do not find Volum to discuss the taper providing easy manufacture or resilience; it is not clear to us from the citations and explanation provided why Petitioner believes that to be true based on Volum. The tapers in Volum appear to provide for the prongs to flex for insertion and connection of the connectors, not for manufacturing reasons. Ex. 1068, 2:44–51 (stating the prongs are "tapered to promote insertion"), 4:11–13 (same), 2:56–60 (stating the other end of the prong is "angled so that a sufficient outward pulling force . . . will result in inward flexing of the prongs and release"), 4:40–44 (stating the female end is tapered "to promote insertion" with the pipe); Ex. 2009 ¶ 113 (Patent Owner's expert explaining that the taper on the prongs is to facilitate insertion of Volum's snap-fit prongs). Petitioner's evidence on manufacturability appears to be based on the testimony of its expert, which discusses how plastic components are often tapered to facilitate extraction from a mold. Ex. 1006 ¶¶ 101–103. It is not clear to us how this is relevant in the particular context here. Petitioner's expert states that tapers are used in molded components, but the

tapering described in the expert opinion is a *de minimis* amount of taper (e.g., 0.5 degrees) to facilitate extraction from a plastic mold. *Id.* ¶ 103. Even taking this as true, it does not teach to make a *press-fit connection* by tapering plastic components, it merely teaches to impart some degree of taper to a given shape.

Further, Petitioner does not provide sufficient evidence or technical reasoning explaining how the connector of Yang could be successfully converted into a press-fit type connector made of plastic. Certainly, Patry would not teach that; Patry is metal. Ex. 1044, 2:53–57. The '072 patent, for its part, points out that its tapered plug is “a non-conductive plastic material with elastic properties allowing sides 282 and 284, and to a certain extent, ribs 286 to bend or flex slightly.” Ex. 1001, 11:45–48. Thus, the '072 patent acknowledges that material and shape considerations must be made to make the tapered connector work. Petitioner addresses none of these concerns, even though the '072 patent teaches to a person of ordinary skill in the art that some care and consideration is required to accomplish a press-fit type of connector.

Even if the combination were made, i.e., that Yang were modified to be a press-fit plug of a workable material and physical configuration, it is not clear how manufacturing concerns would drive the change. Petitioner asserts that a press fit avoids manufacturing tolerance issues, but provides no credible evidence or technical analysis. Pet. 24. It would seem logical that manufacturing tolerance issues would affect a press fit just as much as a snap fit because such tolerances could make it too difficult or too easy to push in the connector. *See* Ex. 2009 ¶ 121 (Patent Owner's expert stating that, in a press fit, “[t]he difference between the two parts . . . must be

precise”). Press-fit plugs, along those lines, would seem to be susceptible to manufacturing tolerances because it is the size difference itself that causes press-fit plugs to be secured in the tube.

Similarly, to the extent Yang is a plastic molded component and a taper assists in ejecting components from a plastic mold, it is not clear that there would be any benefit to entirely re-designing the *type of connector* into a press-fit design when the small, e.g. 0.5 degree, taper suggested by Petitioner’s expert as assisting in mold ejection would do. Ex. 1006 ¶ 103 (suggesting that a half degree of taper is sufficient). At best, Petitioner suggests that it is possible to make the Yang connector tapered, or that such a connector would work once made, but neither of these facts, even if true, tends to support a finding that there is an articulated reason for the combination in the first place. In conclusion, we find that Petitioner’s suggestion that manufacturing concerns motivate or otherwise provide a reason for the combination are not grounded in sufficient evidence or technical reasoning to support a reason for combination.

c. Not Easier to Assemble

Petitioner also asserts that using a compression fit connector would provide easy assembly. Pet. 23 (arguing “*Volum* further explains that the tapered configuration promotes insertion into the tubular sections” and that “compression-fit connectors . . . were also easier to insert into a tube”), *id.* at 24 (arguing a compression fit provides “a more convenient connector for . . . assembly”). These assertions are unpersuasive. Even if we were to accept that a taper makes it easier to insert one object into another, that gives no reason to convert Yang’s snap-fit connector into an entirely new type of connector—a press-fit electrical connector—not described in the art before

us. One could simply apply a “taper” teaching to Yang’s existing snap-fit connector by beveling or tapering the insertion end of the connector.¹³

There is a difference between providing a taper to a connector and making a connector a press-fit type of connector. That tapers exist is not sufficient evidence establishing the obviousness of an entirely new mode of axially fixing the connector using a taper, as Petitioner proposes here.

Even if press-fit, tapered connectors were known, Petitioner gives no reason why the hypothetical press-fit connector would be easier to insert in a tube over Yang’s connector. It is apparent that Yang’s connector requires some degree of rotational precision to align the tabs with the holes, but there is no indication regarding the difficulty in overcoming the outward force of the tabs against the inside of the tube during insertion. In any event, the axial and rotational security of that connector rests in the fact that the tab pops into, and is captured by, the aperture. On the other hand, for Petitioner’s hypothetical press-fit connector, during insertion one must overcome the force of the compression of the connector during the entire insertion procedure, which in and of itself must be strong enough to maintain the axial location. There is no credible evidence or technical reasoning to support this being any easier.¹⁴

¹³ Petitioner appears to concede that one may take advantage of a taper in a snap-fit connector. Pet. Reply 32 (“Tapering a component to assist with any fit is well within a POSA’s purview.”); Ex. 1100 ¶ 94; Ex. 1068, 4:40–44 (suggesting a “tapered [shape] promote[s] insertion of [a] female coupling” of a snap-fit connector).

¹⁴ At best, Petitioner cites its expert, which in turn reiterates the unpersuasive points made in the Petition and unpersuasively direct us to the various references discussed previously as not showing press-fit connectors. See, e.g., Ex. 1006 ¶¶ 160–162.

d. The Prior Art Teaches a Divergent Path

Furthermore, as a reason severable and in addition to the reasons above, it is readily apparent to us that there is a concern in the cited art with what we will call “push through.” Of necessity, a friction-fit plug must be pushed into its tube, and in the claimed context the plug must be pushed into the tube a certain distance in order to accommodate a secure electrical connection with the opposite plug (*see, e.g.*, Ex. 1001, Fig. 14b, noting the electrical connection is made inside tube 120). The concern apparent to us is that one plug may be pushed further back into the tube (*e.g.*, due to the force of mating the electrical plugs) and no longer be properly located to permit the electrical connection. The prior art before us addresses this concern in several ways. For example, in Yang the tabs serve to locate positively the axial position of the connector. Ex. 1011, Fig. 3 (noting locating tabs 32 is captured in locating holes 13, and locating tabs 22 captured in locating holes 12), 3:4–6 (“the . . . connecting members . . . are securely fitted in the respective hollow [tubes]”). Petitioner also cites us to Frei (Ex. 1013), Gust (Ex. 1045), and Ha (Ex. 1042). Frei precludes axial movement by having the connector fit back into a conical portion. Ex. 1013, Fig. 1 (noting end portion 51 is fit into a conical portion of shell 50), Fig. 2 (noting sleeve 60 is reduced at 66 to seat in conical retainer 67). Gust precludes axial movement by matching crenellations. Ex. 1045, Fig. 3, 4:21–34. Ha precludes axial movement by necking down the tube. Ex. 1042, Fig. 2 (near raised portion 30, boss 31), Fig. 4 (near end retainer 63), Fig. 5 (near end retainer 63), 3:4–22. Patry and Volum teach flanges to prevent push through. Ex. 1044, 2:66–72; Ex. 1068, 2:41–44. Accordingly, the cited prior art as a whole suggests recognition in the art that some form of physical obstruction is

required to prevent whatever is inside the tube from being displaced. Given that the ability to positively retain the connector at a certain location is critical to providing electrical connection, it makes sense for the art to be so concerned. However, Petitioner's proposal to use a press-fit connector without such an obstruction diverges from the art. Petitioner's failure to provide a clear reason for why it would have been obvious to take the art in a new direction is a further indication that the proposed combination would not have been obvious.

e. Conclusion Regarding Rationale

Knowledge that a taper may be used to cause a friction fit between two concentric objects does not inevitably lead to a conclusion that use of a friction fit would have been an obvious modification of the prior art relied on by the Petitioner in this case. Reviewing the evidence of record and Petitioner's rationales, we determine that Petitioner's proposed modification of Miller to include Yang's connector but then to modify Yang's connector to instead include a tapered, press-fit type electrical connector was made in a hindsight attempt to reproduce the claimed invention because Petitioner has not articulated a reason why a person of ordinary skill in the art would have considered doing so. Petitioner has not shown such tapered electrical connectors to be known alternatives in the particular context of the proposed modification, and has not shown sufficiently that manufacturing or assembly concerns would lead a person of ordinary skill in the art to a press-fit connector. The cited prior art allegedly teaching tapers (Patry and Volum) teach tapers in the context of joining tubes, not in the context of fixing an electrical connector inside a tube—Petitioner does not explain this incongruence. Further, the cited art that connects tubes all provide structural

features indicating a concern for push through, which also casts doubt on Petitioner's conclusion that a person of ordinary skill in the art would consider obvious such a connection without such features (at least, without further explanation). We find that Petitioner has not established sufficiently by fact or technical explanation a rationale to modify Miller and/or Yang to have a tapered, press-fit connection in the manner proposed in the ground.¹⁵

4. *Conclusion Regarding Claims 1, 2, 11, 12, 15–18, and 21–27*

Petitioner's ground for each of independent claims 1, 11, and 25 rely on the insufficient rationales discussed above. Pet. 22–24 (addressing rationale for each of the claims as a group); '1782 Pet. 20–22. The ground for the dependent claims is deficient for the same reasons. Accordingly, we determine that Petitioner has not established by a preponderance of the evidence that the subject matter of claims 1, 2, 11, 12, 15–18, and 21–27 would have been obvious to a person of ordinary skill in the art at the time of invention in view of Miller, Yang, and Patry.

D. Remaining Grounds

The remaining grounds each include a combination of the teachings of Miller, Yang, and Patry, and reason for combining that we found deficient

¹⁵ We recognize that we instituted *inter partes* review based on largely the same evidence discussed above. We note that institution does not create a presumption or expectation that a petitioner necessarily has satisfied the ultimate 35 U.S.C. § 316(e) evidentiary standard, or that new evidence must be proffered by a patent owner in order to succeed. *In re Magnum Oil Tools Intern., Ltd.*, 829 F.3d 1364, 1376 (Fed. Cir. 2016) (“our precedent holding that the decision to institute and the final written decision are ‘two very different analyses,’ and each applies a ‘qualitatively different standard.’”) (citing *TriVascular, Inc. v. Samuels*, 812 F.3d 1056, 1068 (Fed. Cir. 2016)).

above. Pet. 63 (asserting, for the Miller, Yang, Patry, Otto ground that “[t]he rationale for combining Miller, Yang, and Patry is discussed above.”), 71 (similar, for the Miller, Yang, Patry, and Lessner ground), 77 (similar, for the Miller, Yang, Patry, and Janning ground). Accordingly, each of these asserted grounds, which rely on that insufficient rationale, is not supported by a preponderance of the evidence.

IV. ORDER

In view of the foregoing, it is hereby:

ORDERED that claims 1–5, 7, 8, 11, 12, 15–18, and 21–27 of U.S. Patent No. 8,974,072 B2 have not been shown to be unpatentable;

FURTHER ORDERED that Patent Owner’s Motion to Exclude in (Paper 37) is denied as moot; and

FURTHER ORDERED that this is a Final Written Decision, and any party to the proceeding seeking judicial review of the decision must comply with the notice and service requirements of 37 C.F.R. § 90.2.

V. DISSENT

PLENZLER, *Administrative Patent Judge*, DISSENTING:

I disagree with the majority’s claim construction and corresponding determination that Miller fails to teach a “tree portion,” as well as the determination that Petitioner has failed to establish sufficiently that one skilled in the art would have found it obvious to modify Miller’s teachings in view of the teachings from Yang and Patry. For at least these reasons, I do not join the majority decision, and respectfully dissent.

With respect to the construction of “tree portion” and the teachings of Miller, the basis for my disagreement is similar to that previously set forth in IPR2016-01610. *See Polygroup Ltd. v. Willis Electric Co., Ltd.*, Case IPR2016–01610, slip op. 67–77 (PTAB Feb. 26, 2018) (Paper 187).

As for the combination of the teachings from Yang and Patry with those of Miller, I am persuaded by Petitioner’s contentions, which we found persuasive at institution. I appreciate that at trial, Petitioner must establish unpatentability by a preponderance of the evidence, rather than the reasonable likelihood required for institution. Nevertheless, Petitioner provides persuasive evidence supporting its contentions and that evidence is largely un rebutted. For example, there is no dispute regarding the teachings of Yang, Patry, and the knowledge of one skilled in the art in connection the taper/friction fit connection. *See, e.g.*, PO Resp. 46–75 (Patent Owner’s arguments directed to Yang and Patry only address whether the references are analogous art and whether sufficient rationale has been provided for the proposed combination). Nor is there any real dispute as to the rationale provided by Petitioner.

Petitioner explains, for example, that “Yang suggests the desirability of tubular trunk sections of an artificial Christmas tree that include electrical and mechanical connectors fitted into the trunk sections of the tree,” as well as “the advantages of a connection between trunk sections of an artificial tree that enables simultaneous electrical and mechanical connections.” ’1781 Pet. 22 (citing Ex. 1006 ¶ 129; Ex. 1011, 1:39–57). Petitioner reasons that “[a] POSA would have recognized that Yang’s snap-fitted connector would make it ‘easy to assemble’ and disassemble Miller’s tree.” *Id.* (citing Ex. 1011, 1:7–12; Ex. 1006 ¶¶ 147–67). With respect to Patry, Petitioner explains, for example, that “Patry teaches a compression-fitted tapered connector—one of many known conventional connectors.” *Id.* (citing Ex. 1044, 1:63–75). Petitioner reasons that “[i]t would have been obvious to a POSA to modify the shape of Yang’s electrical connector to improve the fit of the connector inside Miller’s tree trunk portion by incorporating the compression-fitted tapered connector of Patry” because “there were numerous but finite designs to enable a secure fit of an electrical connector in a tube, including detents (like Yang), glue, screws, or tapering for a compression fit.” *Id.* at 23 (citing Ex. 1006, ¶¶ 44–50, 88–104). Petitioner further reasons that “tapered/multi-diameter configurations for connectors” provide “a more convenient connector for manufacturing and assembly” and “[a] POSA would have recognized that . . . Patry’s compression-fit would . . . eliminate the need to perfectly align Yang’s tabs with its locating holes.” *Id.* at 24 (citing Ex. 1006 ¶¶ 88–104).

Rather than addressing Petitioner’s contentions, Patent Owner mainly focuses on economic considerations when arguing why one skilled in the art would not have made the proposed combination. See PO Resp. 62–70

(discussing the inexpensive design of Miller and the added expense from the connector modification proposed by Petitioner). Obviousness, as a determination of unpatentability, is not a question of commercial viability as a practical business determination. *See Orthopedic Equip. Co. v. United States*, 702 F.2d 1005, 1013 (Fed. Cir. 1983) (“[T]he fact that the two [prior art disclosures] would not be combined by businessmen for economic reasons is not the same as saying that it could not be done because skilled persons in the art felt that there was some technological incompatibility that prevented their combination. Only the latter fact is telling on the issue of nonobviousness.”).

Based on the record before us, the preponderance of the evidence, which is largely unrebutted and unchanged since our Decision to Institute, supports Petitioner’s contentions.

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