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Paper 211
Date: October 8, 2020

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

POLYGROUP LIMITED MCO,
Petitioner,

v.

WILLIS ELECTRIC CO., LTD.,
Patent Owner.

IPR2016-01610 (Patent 8,454,186 B2[1])
IPR2016-01612 (Patent 8,454,187 B2[2])

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

PLENZLER, *Administrative Patent Judge*.

JUDGMENT
Final Written Decision on Remand
Determining Some Challenged Claims Unpatentable
Granting-In-Part Patent Owner's Contingent Motion to Amend
35 U.S.C. §§ 144, 318(a)

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[1] The grounds raised in IPR2016-00800 and IPR2016-01609 are consolidated with IPR2016-01610.
[2] The grounds raised in IPR2016-00801 and IPR2016-01611 are consolidated with IPR2016-01612.

I. INTRODUCTION

A. Background and Summary

IPR2016-01610 is a consolidation of Petitioner's challenges in three petitions directed to claims 1, 3, 4, 6–11, 15–22, 25, 26, and 28 of U.S. Patent No. 8,454,186 B2 ("the '186 patent").[3] IPR2016-01612 is a consolidation of Petitioner's challenges in three petitions directed to claims 1–15 of U.S. Patent No. 8,454,187 B2 ("the '187 patent").[4]

Our Final Written Decision was issued on February 26, 2018 as a consolidated decision addressing both IPR2016-01610 and IPR2016-01612. Paper 187 ("Original Decision").[5] The Original Decision determined that Petitioner had not established unpatentability of any of the challenged claims of the '186 patent or the '187 patent. Original Decision 63.

On appeal, the U.S. Court of Appeals for the Federal Circuit vacated our Original Decision in part and remanded the cases for further proceedings. *Polygroup Ltd. MCO v. Willis Elec. Co., Ltd*, 759 F. App'x 934 (Fed. Cir. 2019).

After conferring with the parties, we permitted additional briefing to address the issues on remand from the Federal Circuit. Paper 196.

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[3] As used herein, "Petition I" or "Pet. I" refers to the petition originally filed in IPR2016-00800, now Paper 28. "Petition II" or "Pet. II" refers to the petition originally filed in IPR2016-01609, now Paper 34. "Petition III" or "Pet. III" refers to the petition originally filed in IPR2016-01610, Paper 2.

[4] Citations to the record are to the IPR2016-01610 proceeding unless preceded by a "'1612" prefix to designate reference to the IPR2016-01612 proceeding. As used herein, "'1612 Petition I" or "'1612 Pet. I" refers to the petition originally filed in IPR2016-00801, now Paper 28. "'1612 Petition II" or "'1612 Pet. II" refers to the petition originally filed in IPR2016-01611, now Paper 34. "'1612 Petition III" or "'1612 Pet. III" refers to the petition originally filed in IPR2016-01612, Paper 2.

[5] The procedural history is summarized in the Original Decision.

Petitioner filed an opening brief (Paper 197 ("Pet. Remand Br.")), followed by a responsive brief from Patent Owner (Paper 203 ("PO Remand Resp.")). Petitioner then filed a reply (Paper 204 ("Pet. Remand Reply")), followed by a sur-reply from Patent Owner (Paper 205 ("PO Remand Sur-Reply")). After further conferring with the parties, an additional round of briefing was filed to address argument waiver. Paper 208; Paper 209.

This is a consolidated Final Written Decision on Remand addressing the patentability of the challenged claims in both the IPR2016-01610 proceeding and the IPR2016-01612 proceeding[6], and is entered in each of those proceedings. For the reasons discussed below, we determine that Petitioner has shown by a preponderance of the evidence that claims 1, 3, 4, 6, 8, and 9 of the '186 patent are unpatentable, but has failed to show by a preponderance of the evidence that claims 7, 10, 11, 15–22, 25, 26, and 28 of the '186 patent are unpatentable. Petitioner has failed to show by a preponderance of the evidence that any claims of the '187 patent are unpatentable. This decision does not address claim 15 of the '186 patent or claims 4, 10, and 13 of the '187 patent because the Federal Circuit affirmed the Original Decision with respect to those claims. *See* 759 F. App'x at 942-944. As explained below, the Federal Circuit affirmed the Original Decision's determination that those claims were not shown to be unpatentable by a preponderance of the evidence. Thus, those claims are not the subject of this remand decision and the affirmed determinations with respect to those claims in the Original Decision remain untouched.

[6] As discussed below, an issue addressed in our discussion of IPR2016-01610 is dispositive to the resolution of IPR2016-01612 on remand. IPR2016-01612 will be discussed in a separate Section III after our analysis for the IPR2016-01610 proceeding.

Because we find some of Patent Owner's claims unpatentable, we also address Patent Owner's Contingent Motion to Amend. Paper 149 ("Mot. To Amend"). Specifically, Patent Owner proposes replacing claim 1 with replacement claim 29 if claim 1 is found unpatentable and replacing claim 8 with replacement claim 30 if claim 8 is found unpatentable. Mot. To Amend 1–3, 22–23. For the reasons discussed below, Petitioner's Motion to Amend is granted in part.

B. Related Matters

Petitioner and Patent Owner identify a number of proceedings, both in district court and before the Patent Trial and Appeal Board related to the '186 patent and the '187 patent, including a district court proceeding specifically directed to these patents with Petitioner as a party, as summarized in our Original Decision. *See* Original Decision 3–4.

C. The '186 and '187 Patents

The '186 patent is directed to a modular artificial tree (e.g., a Christmas tree) with electrical connectors in the trunk. Ex. 1001, (54), (57). An electrical connection runs up the trunk of the tree to provide a source of electricity for light strings draped over the branches. *See id.* at Figs. 2–4. Physically connecting the trunk sections during assembly of the tree also electrically connects the trunk sections. *Id.* at (57), Fig. 4. The '187 patent is similar.

D. Illustrative Claims

Claims 1 and 10 of the '186 patent are illustrative for this decision on remand for IPR2016-01610 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 defining a first trunk interior and having a first trunk electrical connector and a first trunk wiring assembly, the first trunk wiring assembly electrically connectable to the first light string and the first trunk electrical connector, and wherein at least a portion of the first trunk wiring assembly is located within the first trunk interior;

a second tree portion including a second trunk portion, a second plurality of branches joined to the second trunk portion, and a second light string, the second trunk portion defining a second trunk interior and having a second trunk electrical connector and a second trunk wiring assembly, the second trunk wiring assembly electrically connectable to the second lighting string and the second trunk electrical connector, and wherein at least a portion of the second wiring assembly is located within the second trunk interior; and

wherein the second tree portion is mechanically coupleable to the first tree portion about a central vertical axis, and the second tree portion is electrically connectable to the first tree portion such that a portion of the first trunk electrical connector of the first trunk portion contacts a portion of the second trunk electrical connector of the second trunk portion, thereby creating an electrical connection between the first wiring assembly and the second wiring assembly;

wherein an end of the second trunk portion is configured to couple with an end of the first trunk portion in at least four different rotational alignments of the first trunk portion relative the second trunk portion about the central vertical axis, and the electrical connection between the first and second tree portions are made independent of the rotational alignments of the first trunk portion relative the second trunk portion about the central vertical axis when the lower end of the second trunk portion is coupled to the upper end of the first trunk portion.

Ex. 1001, 21:15–53.

10. 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 body and

> a trunk connector, at least a portion of the trunk connector housed within the first trunk body and electrically connected to the first light string;
>
> a second tree portion including a second trunk portion, a second plurality of branches joined to the second trunk portion, and a second light string, the second trunk portion having a trunk body and a trunk connector, at least a portion of the trunk connector housed within the second trunk portion and electrically connected to the second light string; and
>
> wherein the second tree portion is mechanically and electrically connectable to the first tree portion by coupling a lower end of the second trunk body to an upper end of the first trunk body along a common vertical axis at a rotational orientation of the first trunk portion relative the second trunk portion about the common vertical axis, thereby causing the trunk connector of the first trunk portion to make an electrical connection with the trunk connector of the second trunk portion within an interior of the lighted artificial tree, the electrical connection being made independent of the rotational orientation of the first trunk portion relative the second trunk portion about the common vertical axis.

Id. at 22:33–60.

Claim 1 of the ’187 patent is illustrative for this decision on remand for the IPR2016-01612 proceeding and is 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 affixed to a portion of the first plurality of branches, the first trunk portion having a first trunk wall defining a first trunk interior, a first trunk electrical connector and a first trunk wiring assembly, the first trunk electrical connector including a first electrical contact and a second electrical contact, the first trunk wiring assembly electrically connectable to the first light string and the first trunk electrical connector, and wherein at least a portion of the first trunk wiring assembly is located within the first trunk interior;

a second tree portion including a second trunk portion, a second plurality of branches joined to the second trunk portion, and a second light string affixed to a portion of the second plurality of branches, the second trunk portion having a second trunk wall defining a second trunk interior, a second trunk electrical connector and a second trunk wiring assembly, the second trunk electrical connector including a first electrical contact and a second electrical contact, the second trunk wiring assembly electrically connectable to the second lighting string and the second trunk electrical connector, and wherein at least a portion of the second wiring assembly is located within the second trunk interior; and

wherein the second tree portion is mechanically coupleable to the first tree portion about a central vertical axis, and the second tree portion is electrically connectable to the first tree portion such that a portion of the first trunk electrical connector of the first trunk portion contacts a portion of the second trunk electrical connector of the second trunk portion when the first tree portion and the second tree portion are mechanically coupled, and the second electrical contact of the first trunk connector makes an electrical connection with the second electrical contact of the second trunk connector at a point along the central vertical axis, and the first electrical contact of the trunk connector of the first tree portion makes an electrical connection with the first electrical contact of the trunk connector of the second tree portion, thereby creating an electrical connection between the first wiring assembly and the second wiring assembly;

wherein the lower end of the second trunk portion is configured to couple the upper end of the first trunk portion in at least four different rotational orientations of the first trunk portion relative the second trunk portion about the central vertical axis, and the electrical connection between the first electrical contacts of the first and second tree portions and the electrical connection between the second electrical contacts of the first and second tree portions are made independent of the rotational orientations of the first trunk portion relative to the second trunk portion about the central vertical axis when the

> lower end of the second trunk portion is coupled to the upper end of the first trunk portion.

'1612 Ex. 1001, 21:9–64.

E. Prior Art and Asserted Grounds Relevant to IPR2016-01610 Remand

On remand, Petitioner asserts that claims 1, 3, 4, 6–11, 16–22, 25, 26, and 28 of the '186 patent would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 10, 20 (Pet. I) 3, 4, 6, 8, 9, 21, 25 (Pet. II) 11, 16 (Pet. III)	103	Miller[7]
28 (Pet. I)	103	Miller, Pan[8]
7, 22 (Pet. II)	103	Miller, Lessner[9]
26 (Pet. II) 18, 19 (Pet. III)	103	Miller, Janning[10]
17 (Pet. III)	103	Miller, Yang[11]

F. Prior Art and Asserted Grounds Relevant to IPR2016-01612 Remand

On remand, Petitioner asserts that claims 1–3, 5–9, 11, 12, 14, and 15 of the '187 patent would have been unpatentable on the following grounds:

Claim(s) Challenged	35 U.S.C. §	Reference(s)/Basis
1, 7 ('1612 Pet. I) 2, 3, 5, 6 ('1612 Pet. II) 8, 9, 11, 12, 14 ('1612 Pet. III)	103	Miller, Pan
12, 15 ('1612 Pet. III)	103	Miller, Pan, Janning

[7] U.S. Patent No. 4,020,201, issued Apr. 26, 1977 (Ex. 1007).
[8] U.S. Patent No. 6,752,512 B2, issued June 22, 2004 (Ex. 1010).
[9] U.S. Patent No. 3,409,867, issued Nov. 5, 1968 (Ex. 1063).
[10] U.S. Pub. No. 2007/0273296 A9, re-published Nov. 29, 2007 (Ex. 1054) (originally published on Aug. 11, 2005 as U.S. Pub. No. 2005/0174065 A1).
[11] U.S. Patent No. 7,132,139 B2, issued Nov. 7, 2006 (Ex. 1011).

G. CAFC Remand

On appeal, the Federal Circuit "affirm[ed] the Board's determination that [Petitioner] failed to establish the unpatentability of claim 15 of the '186 patent[and] claims 4, 10, and 13 of the '187 patent . . . because [Petitioner] failed to establish a motivation to combine the asserted prior art references."[12] *Polygroup*, 759 F. App'x at 944. Accordingly, those claims are not subject to this remand decision. Nor are the challenges of any claims relying on the combination of teachings from Jumo[13] and Otto[14] subject to this remand decision. The Federal Circuit "vacate[d] the Board's obviousness determinations of all remaining challenged claims of the '186 [and] '187 . . . patents . . . because the Board failed to consider whether those claims are unpatentable in view of . . . Miller . . . alone."[15] *Id.* The Federal Circuit held that "[Petitioner]'s petitions explicitly argued that Miller alone teaches every element of the challenged claims of the '186 . . . patent[] in its limitation-by-limitation analysis except for claim 15 of the '186 patent." *Id.* at 942.

The Federal Circuit also "f[ou]nd that the Board erred in its construction of both 'tree portion' and 'modular lighted artificial tree.'" *Id.*

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[12] Because the Original Decision did not address Petitioner's rationale to combine the teachings of Pan, Lessner, Janning, or Yang with those of Miller, we do not read the Federal Circuit's decision as making any determination with respect to those particular combinations.
[13] French Patent No. 1,215,214, issued Nov. 16, 1959 (translated copy) (Ex. 1009). The inventor is not listed on the face of the patent and instead lists Société Nouvelle des Établissements Jumo.
[14] German Utility Model Patent G 84 36 328.2, published Apr. 4, 1985 (translated copy) (Ex. 1008).
[15] We understand the Federal Circuit's characterization of "Miller alone" as Miller without the additional teachings from Otto and Jumo.

at 939. The Federal Circuit "f[ou]nd nothing in the specification . . . that supports limiting 'tree portion' to an embodiment with non-detachable branches." *Id.* at 940. The Federal Circuit found that "Miller . . . disclose[s] artificial trees with branches attached to hollow trunk members" and does not "require[] the trunk members to be connected before adding the branches." *Id.* The Federal Circuit determined that "the branches and lights can first be attached to the trunk members, resulting in a modular trunk-light-branch structure" and "[t]hat the branches are removable from the trunk members is of no moment under a proper construction of 'tree portion.'" *Id.* The Federal Circuit also "f[ou]nd [Petitioner]'s proposed construction, 'an artificial tree with elements capable of being easily joined or arranged with other parts or units,' . . . represent[s] the broadest reasonable interpretation of 'modular lighted artificial tree' in view of the '186 patent's specification." *Id.* at 941.

II. ANALYSIS (IPR2016-01610)

A. Claim 1

Petitioner cites Miller as teaching each element of claim 1. Pet. I 44–50. Figure 2 from the '186 patent (left) and Figure 2 from Miller (right) are each reproduced below.

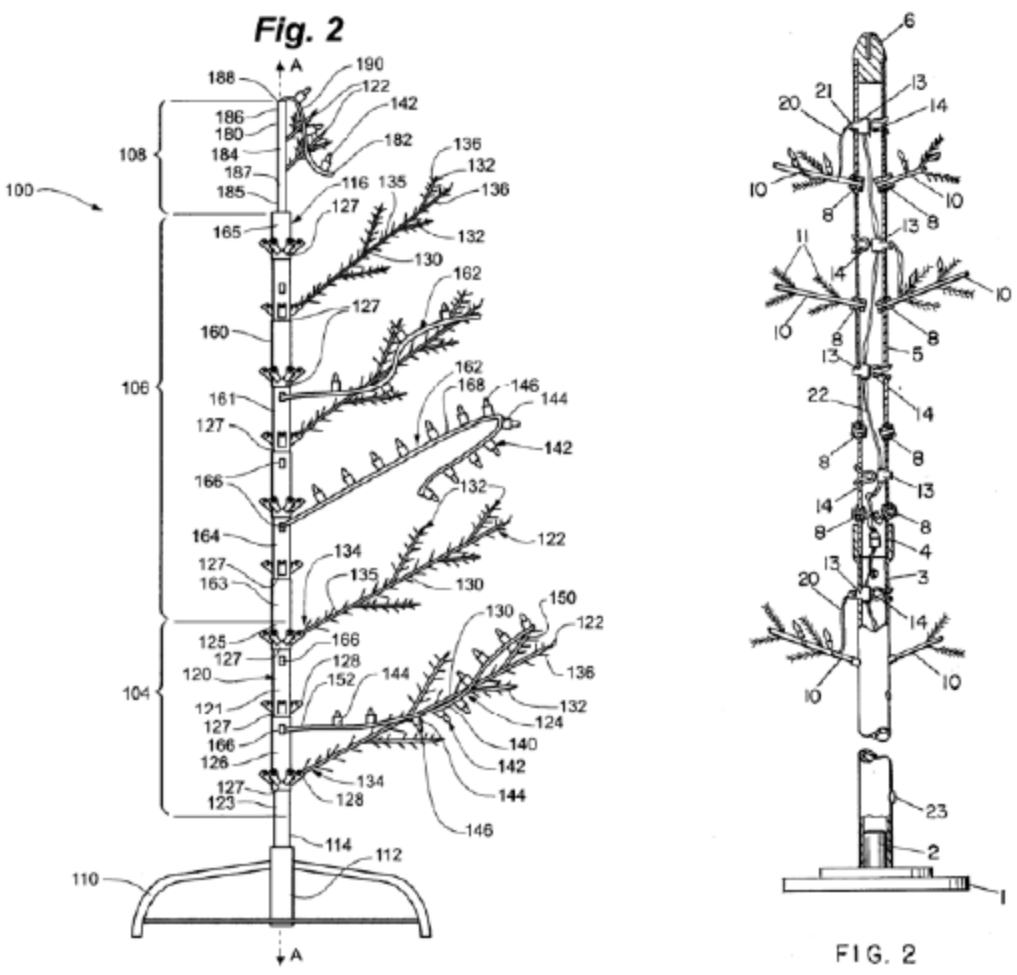


Figure 2 from the ’186 patent is a front view of its artificial tree in a partially assembled state. Ex. 1001, 5:21–22. Figure 2 of Miller is a front, partial section view of its artificial tree. Ex. 1007, 1:38–40.

The trees in the ’186 patent and Miller each include multiple trunk portions that can be disassembled from one another, electrical connectors/conduits in those trunk portions, branches that are removable from those trunk portions, and light strings that can be located on the branches and connected to the electrical connectors. Patent Owner acknowledges that Miller discloses a tree with these various separate and removable components. Paper 59 (“PO Resp.”) 82.

One difference between the trees is the connection between the branches and the trunk portions and how the lights are located on the branches. Both trees, however, include branches that are removably attached to the trunk portions and lights that are removably secured on the branches. The '186 patent explains that "[t]runk ends of branches 122 may be bent or otherwise formed to define a loop or circular opening such that trunk end 134 of branch 122 may be secured to branch receiver 128 by way of a pin (not depicted) extending through branch receiver 128" and "[f]irst light string 124 is affixed to one or more branches 122 of lighted tree portion 104 via multiple clips 150." Ex. 1001, 7:1–5, 19–21. Miller includes "apertures 7 . . . around trunk members 3 and 5 [that] receive cylindrical limb sockets 8 . . . of some suitable flexible material, such as rubber or plastic, to enable each socket to be inserted through each aperture" with limbs 10 (and branches 11) located in the sockets 8. Ex. 1007, 2:3–18. Miller includes lights 20 wrapped around its limbs 10/branches 11.

Although acknowledging that "Miller . . . has loose light strings that must be separately added and wound around the tree," Patent Owner contends that Miller does not teach a "lighted artificial tree" as recited in the preamble of claim 1. PO Remand Resp. 12. Patent Owner contends that the preamble requires lighting that is integral to the tree in some unspecified manner. *Id.* at 11–12. The Original Decision did not reach whether Miller taught a "lighted artificial tree," but to the extent the preamble is limiting, we agree with Petitioner that Miller teaches "a lighted artificial tree," and see no support for Patent Owner's assertions regarding an integral requirement for the lighting. *See* Pet. I 44; *see also* Pet. Remand Reply 8–9. There is no dispute that Miller teaches an artificial tree having lights thereon. Moreover, Patent Owner's contentions are not consistent with the Federal

Circuit's determinations regarding claim 28's recitation of "[a] modular lighted artificial tree." *See Polygroup*, 759 F. App'x at 941.

Claim 1 requires that the tree has "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" and "a second tree portion including a second trunk portion, a second plurality of branches joined to the second trunk portion, and a second light string." Patent Owner acknowledges that "the Federal Circuit held that 'Miller . . . disclose[s] artificial trees with branches attached to hollow trunk members' and therefore disclosed such tree portions." PO Remand Resp. 3 (citing *Polygroup*, 759 F. App'x at 940).

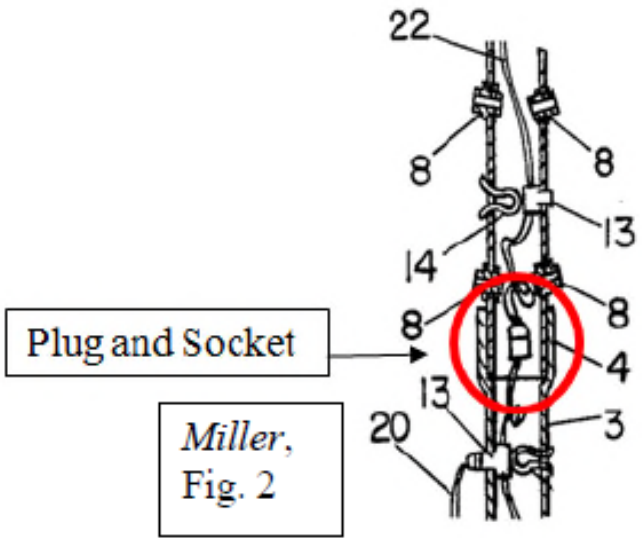
Patent Owner contends that "[t]he remainder of the PTAB's 'tree portion' ruling, including whether the trunk connectors, branches, lights, and wiring must function as a modular unit, remains undisturbed." PO Remand Resp. 3. As noted above, the Federal Circuit found, however, that "Miller . . . disclose[s] artificial trees with . . . a modular trunk-light-branch structure." *Polygroup*, 759 F. App'x at 940.

The only thing left for Patent Owner to dispute regarding Petitioner's contentions related to Miller's teachings are the mechanical and electrical connections required by the claim. Many of the contentions presented by Patent Owner, however, are not commensurate with the scope of claim 1. *See, e.g.*, PO Remand Resp. 6–12. For example, Patent Owner contends that "[u]nlike the easily-assembled tree portions of the '186 Patent, the Miller tree requires the separate steps of making an electrical connection between the first and second trunk members and making a mechanical connection between the trunk members." PO Remand Resp. 7 (citing PO Resp. 27). Patent Owner contends that "the claimed elements mean . . . that 'when' the

mechanical connection is made, an electrical connection is also made." *Id.* at 8–9.

Claim 1 does not require structure that provides mechanical and electrical connection in a single step (e.g., "'when' the mechanical connection is made, an electrical connection is also made") as Patent Owner alleges. Rather, claim 1 requires "a first trunk electrical connector" and "a second trunk electrical connector" with "the second tree portion [being] electrically connectable to the first tree portion such that a portion of the first trunk electrical connector of the first trunk portion contacts a portion of the second trunk electrical connector of the second trunk portion." Although the claim also requires that "the second tree portion is mechanically coupleable to the first tree portion about a central vertical axis," the claim permits that mechanical connection to be independent of the electrical connection. Giving claim 1 its proper reading, there is no dispute that Miller teaches first and second trunk electrical connectors or that its tree portions are coupleable about a central vertical axis as outlined in the Petition. *See* Pet. I 45–48.

Patent Owner additionally contends that Miller's electrical connector is not connectable independent of the rotational orientation of the trunk portions. PO Remand Resp. 10–11 (citing PO Resp. 18). Later in its Remand Response, however, Patent Owner acknowledges that Miller provides a rotationally independent electrical connection. *See id.* at 12 ("Miller[has a] non-discrete, continuous trunk structure."). Indeed, Miller teaches this feature, as made clear in the Petition. *See* Pet. I 29–30 (referenced by Petitioner in its mapping of claim 1's elements and providing an annotated portion of Miller's Figure 2, shown below, along with an explanation of Miller's teachings).



The figure reproduced above is a portion of Miller's Figure 2, which is a front, partial section view of its artificial tree, along with Petitioner's annotations noting Miller's electrical connections (circled in red). Pet. I 29. As explained in the Petition, and seen in the annotated figure above, Miller's plug and socket connection with wires 22 allows for rotationally independent connection. *See id.* at 29.

Referring to claim 1's requirement that "an end of the second trunk portion is configured to couple with an end of the first trunk portion in at least four different rotational alignments," Patent Owner further contends that "Miller does not disclose four different rotational alignments." PO Remand Resp. 12 (emphasis omitted). Patent Owner contends that "[t]his limitation is directed to discrete mechanical orientations between the first trunk portion and the second trunk portion that are four or greater in number." *Id.* That is, Patent Owner contends that this portion of the claim requires a fixed number of orientations, rather than allowing any rotational orientation (i.e., what Patent Owner refers to as "continuous trunk structure"). This contention is not commensurate with the scope of claim 1.

Contrary to Patent Owner's assertions, claim 1 does not specify "discrete mechanical orientations." As noted above, Patent Owner acknowledges that Miller provides any number of rotational orientations (a "continuous trunk structure"), which includes "at least four different rotational alignments."

For at least these reasons, Petitioner has established by a preponderance of the evidence that Miller teaches each feature recited in claim 1.

B. Claims 3, 4, 6, 8, and 9

Claims 3, 4, 6, 8, and 9 each depend from claim 1. Petitioner cites Miller as teaching each element of these claims. Pet. II 43–54. Patent Owner does not dispute Petitioner's challenges to claims 3, 4, 8, and 9. For claim 6, Patent Owner contends that Petitioner's challenge lacks sufficient specificity. PO Remand Resp. 12–13. We agree with Petitioner that Miller teaches each element recited in claims 3, 4, 6, 8, and 9.

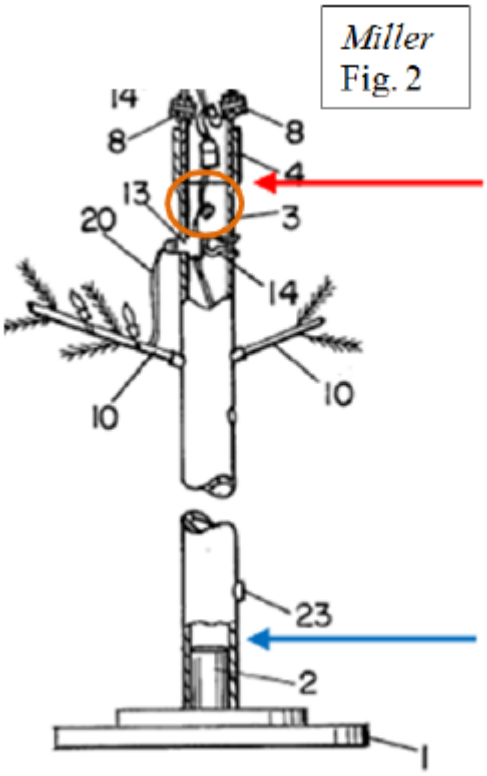
Claim 3 further recites that "the first trunk electrical connector of the first trunk portion is housed within the first trunk interior and the second trunk electrical connector of the second trunk portion is housed within the second trunk interior." Claim 4 specifies that "a male portion of the first trunk electrical connector of the first trunk portion includes a male portion insertable into a female portion of the second trunk electrical connector of the second trunk portion." Petitioner cites the structure circled in red in the annotated version of Miller's Figure 2 reproduced above, which shows the features recited in claims 3 and 4. Pet II. 44, 47.

Claim 6 further recites that

> the first trunk wiring assembly includes a first wire and a second wire, each of the first wire and the second wire in electrical communication with the first trunk electrical connector of the first trunk portion and extending between a first end of the first

trunk portion and a second end of the first trunk portion, and providing power to the first light string.

Petitioner contends that "*Miller* teaches that the plug and socket connectors between trunk sections 3, 5 are electrically connected to first and second wires 22. Ex. 1007, 2:40–3:10, Fig. 2 (below, with wires 22 in the orange circle, but not separately numbered)." Pet. II 50. The portion of Miller's Figure 2 referenced by Petitioner is reproduced below.



The figure reproduced above is a portion of Miller's Figure 2, which is a front, partial section view of its artificial tree, along with Petitioner's annotations noting Miller's wires (circled in orange). Miller's Figure 3, reproduced below, illustrates wires 22 in greater detail.

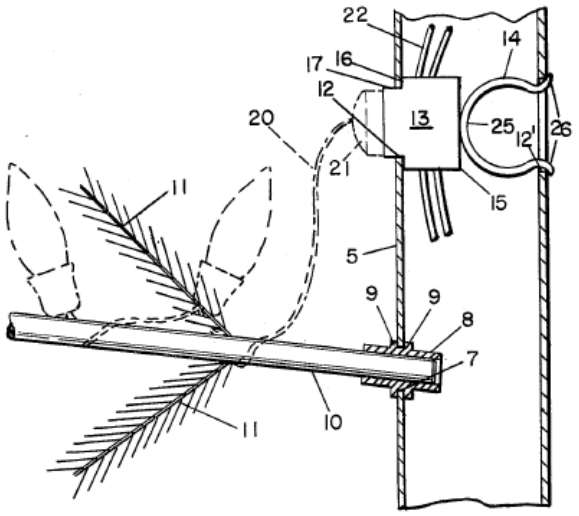


FIG. 3

Miller's Figure 3 "is an enlarged view, partly in section, of a trunk member, showing a wiring socket and a spring holding clip, a limb socket and limb therein, and the wiring extending from the wiring socket with a bulb arranged on the limb." Miller 1:41–45. Based on Petitioner's contentions, in combination with the figures reproduced above, and without further dispute from Patent Owner, we fail to see what structure is missing from Miller to meet the limitations of claim 6.

Claim 8 further recites that

> a portion of the first trunk wiring assembly includes a light string connector attached to a first trunk wall, and the first light string at a trunk end includes a connector for detachably connecting to the light string connector such that the first light string is detachably connected to the first trunk wall and the first trunk wiring assembly.

As identified by Petitioner (Pet. II 51–53), Miller includes electrical connector 13 attached to its trunk wall with light string 20 detachably connecting to electrical connector 13, as seen in Miller's Figure 3 reproduced above.

Claim 9 further recites that "the first tree portion comprises a base portion." Petitioner contends that "*Miller* teaches a first tree portion (i.e., trunk member 3 with limbs 10 and lights 20) with tubular hollow lower trunk 3. Ex. 1007, 1:57–2:18, 2:28–33, Fig. 2 (below)" and "[t]his first tree portion can include 'a flat base 1 having an upstanding centrally arranged stub shaft 2.'" Pet. II 53. This is consistent with Miller's teachings as seen at the blue arrow in Petitioner's annotated version of Miller's Figure 2 reproduced above in connection with the discussion of claim 6.

C. Claim 7

Claim 7 depends from claim 6 and further requires that "the first wire and the second wire are detachably connected to the first trunk electrical connector of the first trunk portion." Petitioner acknowledges that "*Miller* does not expressly teach that the wiring assembly is 'modular' or 'separably connected.'" Pet. II 65. Petitioner contends that "assemblies for providing a detachable connection between electrical contact sets and wiring harnesses were well-known in the art." *Id.* (citing Ex. 1006 ¶¶ 261–67). Petitioner contends that "*Lessner* teaches a 'quick-disconnect electrical connector for receiving and releasably retaining a male tab connector' and a [person of skill in the art (POSA)] would recognize that it may be used to create detachable connections between the electrical contacts of a connector or plug, and the wires of a wiring assembly." *Id.* (citing Ex. 1008, 1:10–11; Ex. 1006 ¶¶ 261–67).

Petitioner contends that one skilled in the art would have modified Miller's teachings based on those from Lessner. Pet. II 65–70. Petitioner reasons, for example, that "[i]t would have been obvious . . . to enhance the mechanical and electrical connections between the electrical contacts sets and wiring assemblies of *Miller*[] with the detachable electrical connectors

of *Lessner*" for "ease and speed of assembly and disassembly." *Id.* at 65–66 (citing Ex. 1006 ¶¶ 261–67). Petitioner further reasons that "the detachable connectors of *Lessner* provide a quick-connect engagement allowing the builder to easily and quickly attach the wires to the terminals on the trunk connector during assembly," which "also allows for easy separation of the wires from the trunk connectors, as needed for repair or replacement of parts." *Id.* at 66.

Petitioner's contentions as to why one skilled in the art would have modified Miller's teachings are unpersuasive. As discussed above, Petitioner cited Miller's plug and socket connectors as corresponding to the recited trunk connectors. Petitioner's proposed modification in the Miller alone challenge adds an additional connection point in Miller's plug and socket connectors, further complicating assembly, rather than providing greater "ease and speed of assembly and disassembly" as alleged. Petitioner's additional reasoning that the proposed modification "also allows for easy separation of the wires from the trunk connectors, as needed for repair or replacement of parts" is equally unpersuasive. The only difference resulting from the modification is that the plug and socket connectors could be removed from their respective wiring assemblies. That is, it provides for removal of one connector by providing yet another connector, which fails to provide a benefit because Miller's plug and socket connectors are loose, rather than fixed within the trunk portions like Patent Owner's connectors.

For at least these reasons, Petitioner has failed to establish unpatentability of claim 7 of the '186 patent by a preponderance of the evidence.

D. Secondary Considerations

As explained in the Original Decision, Patent Owner provides evidence related to non-obviousness of the claims. Original Decision 43–60. Considering that evidence, as explained in the Original Decision, relative to the fact that Miller alone teaches each element of these claims in a single embodiment[16], we determine that Patent Owner's evidence does not outweigh Petitioner's case of obviousness for claims 1, 3, 4, 6, 8, and 9.

For the reasons set forth above, Petitioner has established by the preponderance of the evidence that claims 1, 3, 4, 6, 8, and 9 are unpatentable. Petitioner has failed to establish by the preponderance of the evidence that claim 7 is unpatentable.

E. Claims 10, 20, and 28

Claims 10, 20, and 28 are independent. Critically distinguishing these claims from independent claim 1 is that they require that the mechanical connection between the tree/trunk portions results in the electrical connections. The relevant portions of claims 10, 20, and 28 are reproduced below, with emphasis added.

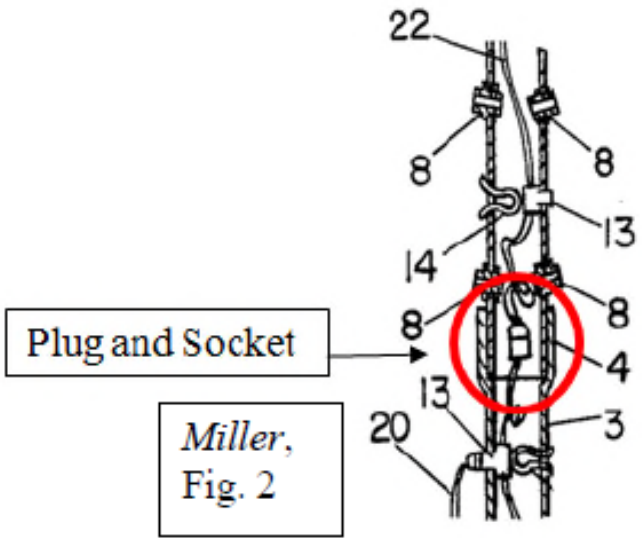
Claim 10 requires

> wherein *the second tree portion is mechanically and electrically connectable to the first tree portion by coupling a lower end of the second trunk body to an upper end of the first trunk body* along a common vertical axis at a rotational orientation of the first trunk portion relative the second trunk portion about the common vertical axis, *thereby causing the trunk connector of the*

[16] Rather than requiring a combination of teachings, which was the basis for the analysis weighing the secondary considerations evidence relative to the challenge in the Original Decision, here, we rely on a single reference, which presents a much stronger case of obviousness. Indeed, the challenges based on Miller alone effectively amount to an anticipation challenge labeled as obviousness.

> *first trunk portion to make an electrical connection with the trunk connector of the second trunk portion* within an interior of the lighted artificial tree, the electrical connection being made independent of the rotational orientation of the first trunk portion relative the second trunk portion about the common vertical axis.
>
> Claim 20 requires
>
> 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 axis such that a portion of the first trunk wall is coupled to a portion of the second trunk wall to form a first mechanical connection in one of a plurality of rotational alignments of the first trunk portion to the second trunk portion, and *a first portion of the first connector is received by the second connector, thereby forming a second mechanical connection between the first trunk portion and the second trunk portion and forming an electrical connection between the first wiring assembly and the second wiring assembly* the electrical connection being made independent of the plurality of rotational alignments of the first tree portion relative to the second tree portion.
>
> Claim 28 requires
>
> wherein *the second trunk portion is mechanically and electrically connectable to the first trunk portion by coupling the first end of the second trunk body to a second end of the first trunk body* along a common vertical axis at a rotational orientation of the first trunk portion relative the second trunk portion about the common vertical axis, *thereby causing the trunk connector of the first trunk portion to make an electrical connection with the trunk connector of the second trunk portion* within an interior of the lighted artificial tree, the electrical connection being made independent of the rotational orientation of the first trunk portion relative the second trunk portion about the common vertical axis.

Petitioner's annotated version of a portion of Miller's Figure 2 is reproduced again below.



The figure reproduced above is a portion of Miller's Figure 2, which is a front, partial section view of its artificial tree, along with Petitioner's annotations noting Miller's electrical connections (circled in red). Pet. I 29. As seen above, Petitioner cites Miller's plug and socket connection as the electrical connection recited in the claims. *See* Pet. I 33 ("*Miller* also teaches that wires 22 of trunks 3, 5 are electrically connectable via plug and socket connectors of Fig. 2."), 42, 57–58 (presenting similar contentions for claims 20 and 28).

The problem with Petitioner's contentions that rely on Miller alone is that the electrical connection in Miller is independent of the mechanical connection of tree portions (i.e., the mechanical connection does not result in the electrical connection in the manner claimed). For at least this reason, Petitioner's challenges to claims 10, 20, and 28 based on Miller alone fail.

Petitioner presents additional contentions related to whether it had "notice and opportunity to be heard on [Patent Owner Preliminary Response]-only arguments." Paper 208, 1. There is no notice issue here. *See Fanduel, Inc. v. Interactive Games LLC*, 966 F.3d 1334, 1341–42 (Fed.

Cir. 2020) (citations omitted) ("the burden of proving invalidity in an IPR remains on the petitioner throughout the proceeding" and "the IPR regulations do not require a patent owner to submit *any* response to the petition, either before or after institution"). Because "a patent owner carries no obligation to raise any objection to the petitioner's challenges at all . . . a patent owner's response, alone, does not define the universe of issues the Board may address in its final written decision." *Id.* at 1342 (citations omitted). "[I]n an IPR, 'the *petitioner's* contentions . . . define the scope of the litigation all the way from institution through to conclusion.'" *Id.*

F. Claims 11, 16–19, 21, 22, 25, and 26

Claims 11 and 16–19 depend from claim 10. Claims 21, 22, 25, and 26 depend from claim 20. The deficiency in the challenge to claims 10 and 20 results in the failure of Petitioner's challenges to these dependent claims as well.

III. ANALYSIS (IPR2016-01612)

A. Claims 1 and 7

Similar to claims 10, 20, and 28 of the '186 patent, claims 1 and 7 of the '187 patent each requires that the mechanical connection between the tree portions results in the electrical connections. The relevant portions of claims 1 and 7 of the '187 patent are reproduced below.

Claim 1 requires

> wherein the second tree portion is mechanically coupleable to the first tree portion about a central vertical axis, and the second tree portion is electrically connectable to the first tree portion such that a portion of the first trunk electrical connector of the first trunk portion contacts a portion of the second trunk electrical connector of the second trunk portion when the first tree portion and the second tree portion are mechanically coupled.

Claim 7 requires

> wherein the second tree portion is mechanically and electrically connectable to the first tree portion by coupling a lower end of the second trunk body to an upper end of the first trunk body along a common vertical axis at a rotational orientation of the first trunk portion relative the second trunk portion about the common vertical axis, thereby causing the trunk connector of the first trunk portion to make an electrical connection with the trunk connector of the second trunk portion within a trunk interior defined by the first trunk body and the second trunk body, the electrical connection being made when the lower end of the second trunk body is coupled to the upper end of the first trunk body, the electrical connection being independent of the rotational orientation of the first trunk portion relative the second trunk portion about the common vertical axis.

Petitioner relies on the same plug and socket connection from Miller as discussed above relative to the IPR2016-01610 proceeding to teach the electrical connection in claims 1 and 7 of the '187 patent. *See* '1612 Pet. I 27–44.

Again, the problem with Petitioner's contentions that rely on Miller alone is that the electrical connection in Miller is independent of the mechanical connection of the tree portions. For at least this reason, Petitioner's challenge to claims 1 and 7 based on Miller alone fails.

B. Claims 2, 3, 5, 6, 8, 9, 11, 12, 14, and 15

Claims 2, 3, 5, and 6 depend from claim 1. Claims 8, 9, 11, 12, 14, and 15 depend from claim 7. The deficiency in the challenge to claims 1 and 7 results in the failure of Petitioner's challenges to these dependent claims as well.

IV. PATENT OWNER'S CONTINGENT MOTION TO AMEND (IPR2016-01610)

Patent Owner filed a Contingent Motion to Amend, proposing to substitute claims 29–36 for original claims 1, 8, 10, 15, 16, 20, 25, and 28 of the '186 patent, respectively. Mot. To Amend 22–28. Because Patent Owner's Motion to Amend is contingent upon us finding claims unpatentable, and, of those original claims, we only find claims 1 and 8 unpatentable, we reach Patent Owner's Motion to Amend only as it relates to substitute claims 29 and 30.

A. Statutory and Regulatory Requirements

In an *inter partes* review, amended claims are not added to a patent as of right, but rather must be proposed as a part of a motion to amend. 35 U.S.C. § 316(d). "Before considering the patentability of any substitute claims, . . . the Board first must determine whether the motion to amend meets the statutory and regulatory requirements set forth in 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121." *Lectrosonics, Inc. v. Zaxcom, Inc.*, IPR2018-01129, Paper 15 at 4 (PTAB Feb. 25, 2019) (precedential). We must, therefore, consider whether: (a) the amendment proposes a reasonable number of substitute claims; (b) the proposed claims are supported in the original disclosure; (c) the amendment responds to a ground of unpatentability involved in the trial; and (d) the amendment does not seek to enlarge the scope of the claims of the patent or introduce new subject matter. *See* 35 U.S.C. § 316(d); 37 C.F.R. § 42.121.

Proposed substitute claims 29 and 30 are reproduced below.

[29.P] A <u>modular</u> lighted artificial tree, comprising:

[29.1] a first <u>modular</u> tree portion including

[29.2] a first trunk portion,

[29.3] a first plurality of branches pivotally joined to the first trunk portion, and

[29.4] a first light string positioned on and external to the first plurality of branches,

[29.5] the first trunk portion defining a first trunk interior and having a first trunk electrical connector and a first trunk wiring assembly, the first trunk wiring assembly electrically connectable to the first light string and the first trunk electrical connector, and

[29.6] wherein at least a portion of the first trunk wiring assembly is located within the first trunk interior; and

[29.7] a second modular tree portion including

[29.8] a second trunk portion,

[29.9] a second plurality of branches pivotally joined to the second trunk portion, and

[29.10] a second light string positioned on and external to the second plurality of branches,

[29.11] the second trunk portion defining a second trunk interior and having a second trunk electrical connector and a second trunk wiring assembly, the second trunk wiring assembly electrically connectable to the second light string and the second trunk electrical connector, and

[29.12] wherein at least a portion of the second trunk wiring assembly is located within the second trunk interior; and

[29.13] wherein the second modular tree portion is mechanically coupleable to the first modular tree portion about a central vertical axis, and

[29.14] the second modular tree portion is electrically connectable to the first modular tree portion such that a portion of the first trunk electrical connector of the first trunk portion contacts a portion of the second trunk electrical connector of the second trunk portion, thereby creating an electrical connection between the first trunk wiring assembly and the second trunk wiring assembly within the modular lighted artificial tree, and [[;]]

> [29.15] wherein an end of the second trunk portion is configured to couple with an end of the first trunk portion in at least four ~~different~~ discrete rotational alignments of the first trunk portion relative to the second trunk portion about the central vertical axis, and
>
> [29.16] wherein the electrical connection between the first trunk wiring assembly and the second trunk wiring assembly of the respective first and second modular tree portions ~~are~~ is made independent of any one discrete rotational alignment of the at least four discrete rotational alignments of the first trunk portion relative to the second trunk portion about the central vertical axis when ~~the~~ a lower end of the second trunk portion is coupled to ~~the~~ an upper end of the first trunk portion.
>
> [30.P] The modular lighted artificial tree of claim ~~1~~ 29,
>
> [30.1] wherein a portion of the first trunk wiring assembly includes a light string connector attached to a the first trunk wall, and the first light string at a trunk end includes a connector for detachably connecting to the light string connector such that the first light string is detachably connected to the first trunk wall and the first trunk wiring assembly.

Mot. To Amend 22–23. The underlining and strikethrough represents the changes relative to original claims 1 and 8.

1. reasonable number of substitute claims

Patent Owner proposes to substitute one claim (claim 29) for original claim 1 and one claim (claim 30) for original claim 8, which we determine is a reasonable number of substitute claims.

2. support in the original disclosure

Patent Owner cites support for proposed substitute claims 29 and 30 in the original disclosure. *See* Mot. To Amend 10–15, 18–19 (mapping proposed substitute claims 29 and 30 to support from original disclosure). Petitioner's only dispute in this regard concerns the meaning of the term "discrete" in claim 29, contending that Patent Owner's proposed

construction of that term is not supported. Paper 157 ("Pet. Opp.") 5–6, 67–70.

Patent Owner contends that "[d]iscrete is intended to clarify a more limited claim directed toward a multitude, but less than an infinite, number of possible mechanical alignments between the tree portions for final assembly." Mot. To Amend 4. Petitioner explains that Patent Owner "replaces 'different' with 'discrete' to describe the rotational alignments between the ends of the trunk portions" and "[a] POSA would not consider this to change the meaning of the original claim, as a POSA would have found that, under BRI, 'discrete' and 'different' are sufficiently synonymous as to have the same basic meaning." Pet. Opp. 5 (citing Ex. 1501, 3). Exhibit 1501 is a dictionary definition, which defines "discrete" as "separate and different from each other" and provides an example as "a number of discrete steps." Ex. 1501, 3 (emphasis omitted).

Patent Owner's proposed construction is consistent with both the Specification of the '186 patent and the plain and ordinary meaning of "discrete" advanced by Petitioner. Patent Owner identifies the discussion of a square arrangement for ends of tree portions as supporting the addition of "discrete rotational alignments" to substitute claim 29, as opposed to a circular arrangement providing a continuously variable alignment. Mot. To Amend 15 (citing Ex. 2264, 28:17–20). Petitioner's proposed construction would make no distinction between "discrete" and "continuous." As implied by the example in the definition provided by Petitioner, although discrete may require things to be separate and different from one another, it also requires that there be a fixed number (i.e., *a number* of discrete steps). Moreover, if orientations are continuous, as Petitioner proposes, that removes the separation required by its own definition of "discrete." As

discussed in the original application resulting in the '186 patent, Patent Owner provides an example of a square arrangement having a number (i.e., four) of different orientations as an alternative to continuously variable orientations. *See* Ex. 2264 28:17–20. For the reasons set forth above, we accept Patent Owner's proposed meaning of "discrete."

Although Petitioner does not present a challenge to proposed substitute claim 29 as indefinite, in the discussion of the term "discrete," Petitioner contends that under Patent Owner's proposed meaning, one skilled in the art would have no way to know how many different orientations "discrete" requires, and "[f]or this reason, PO's proposed construction of 'discrete' lacks written description support and, if accepted, would render Substitute Claim 29 indefinite." Paper 173 ("Pet. MTA Sur-Reply") 6–7. The claim requires "at least four discrete rotational alignments," consistent with the square example discussed above. Based on the record before us, we have no reason to believe the claim language to be indefinite. To the extent Petitioner alleges indefiniteness because there is no upper limit, one skilled in the art would understand that practical upper limits exist for structures providing a fixed number of rotational alignments based on the simplicity of the structure involved.

Based on our construction of "discrete," we determine that Patent Owner has set forth written description support for proposed substitute claims 29 and 30 in the original disclosure. *See* Mot. To Amend 10–15, 18–19 (mapping proposed substitute claims 29 and 30 to support from original disclosure).

3. amendment responds to a ground of unpatentability

Petitioner contends that the amendment to "Substitute Claim 29 [that] replaces the 'different' rotational alignments in Challenged Claim 1 with

'discrete' rotational alignments" fails to "distinguish[] the claim from any asserted Ground" because "each Ground in the IPR relies on art (e.g., *Jumo*) having discrete rotational alignments under any proffered definition." Pet. Opp. 72. That is not a correct characterization of the challenge because, as the Federal Circuit held, Miller alone also was set forth by Petitioner to challenge claim 1. Miller does not teach discrete rotational alignments. Accordingly, the proposed amendment is responsive to the Miller alone ground. Claim 30 depends from claim 29, and is essentially a reproduction of original claim 8, modified for consistency with the preamble of substitute claim 29 (adding "modular") and for antecedent basis.

4. amendment does not enlarge the scope of the claims

Finally, there is no dispute that the amendments do not seek to enlarge the scope of the claims. We determine that they do not. *See* Mot. To Amend 4–6.

5. additional considerations

Petitioner additionally contends that "the *reduction* of a burden signaled by the *Aqua Product*s en banc decision is hardly a justification for allowing the Patent Owner to revise its substitute claims after being apprised of all of Petitioner's arguments." Pet. Opp. 75. We disagree, as set forth in our order authorizing Patent Owner's filing of revised substitute claims.[17] Paper 143.

B. Patentability

The Board must assess the patentability of proposed substitute claims "without placing the burden of persuasion on the patent owner." *Aqua Prods., Inc. v. Matal*, 872 F.3d 1290, 1328 (Fed. Cir. 2017) (en banc); *see*

[17] Petitioner did not file a request for rehearing of that order.

Lectrosonics, Paper 15 at 3–4. After the issuance of *Aqua Products*, the Federal Circuit issued a decision in *Bosch Automotive Service Solutions, LLC v. Matal*, 878 F.3d 1027 (Fed. Cir. 2017) ("*Bosch*"), as well as a follow-up Order amending that decision on rehearing. *See Bosch Auto. Serv. Sols., LLC v. Iancu*, Order on Petition for Panel Rehearing, No. 2015-1928 (Fed. Cir. Mar. 15, 2018).

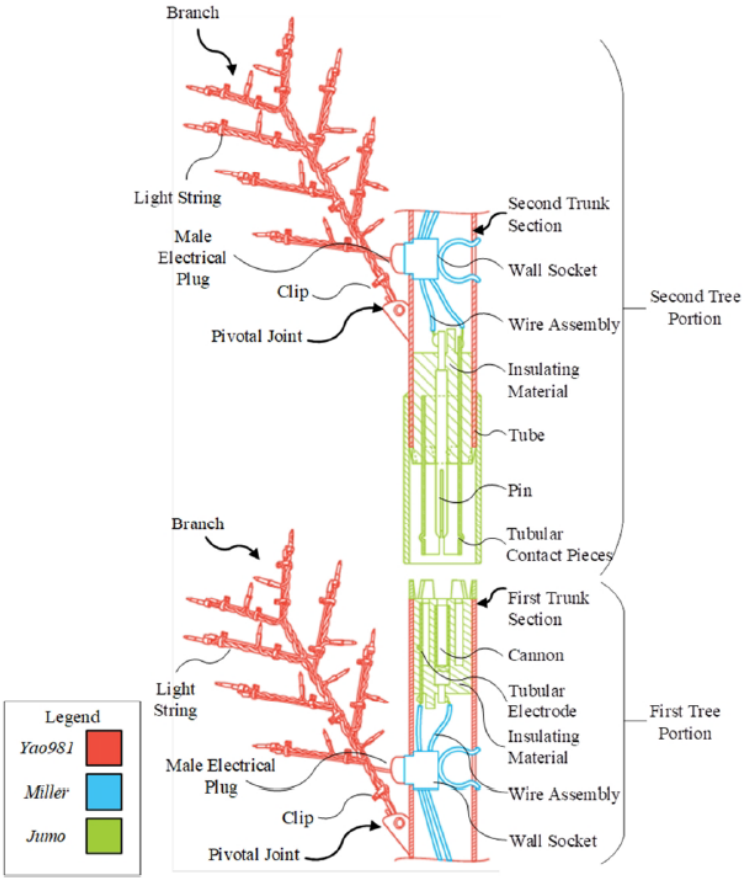
In accordance with *Aqua Products*, *Bosch*, and *Lectrosonics*, Patent Owner does not bear the burden of persuasion to demonstrate the patentability of the substitute claims presented in the motion to amend. Rather, ordinarily, "the petitioner bears the burden of proving that the proposed amended claims are unpatentable by a preponderance of the evidence." *Bosch*, 878 F.3d at 1040 (as amended on rehearing). *See Lectrosonics*, Paper 15 at 3–4. In determining whether a petitioner has proven unpatentability of the substitute claims, the Board focuses on "arguments and theories raised by the petitioner in its petition or opposition to the motion to amend." *Nike, Inc. v. Adidas AG*, 955 F.3d 45, 51 (Fed. Cir. 2020). The Board determines whether substitute claims are unpatentable by a preponderance of the evidence based on the entirety of the record, including any opposition made by the Petitioner. "[T]he opposition to a motion to amend typically should guide the contours of the motion to amend patentability analysis." *Hunting Titan, Inc. v. Dynaenergetics Europe Gmbh*, IPR2018-00600, Paper 67 at 11 (PTAB July 6, 2020) (precedential).

Petitioner's Opposition provides two challenges to substitute claim 29. Pet. Opp. 6–23, 38–53. As seen above, claim 29 requires that "an end of the second trunk portion is configured to couple with an end of the first trunk portion in at least four discrete rotational alignments of the first trunk portion relative to the second trunk portion about the central vertical axis."

As discussed below each of Petitioner's challenges fails because of the reliance on a combination of teachings including those from Jumo, which is non-analogous art. *See* 759 F. App'x at 942.

1. Yao981[18] Challenge

Petitioner's first challenge proposes modifying the teachings of Yao981. Pet. Opp. 6–23. Petitioner provides an illustration of the proposed modifications, which is reproduced below.



The figure reproduced above is Petitioner's modified version of Yao981's tree based on the teachings of Miller and Jumo. Pet. Opp. 15. As seen in the figure reproduced above, Petitioner relies on Jumo's electrical connectors (in

[18] U.S. Patent No. 7,055,981, issued June 6, 2006 (Ex. 1143).

green) to provide both the mechanical and electrical connections between the tree portions.

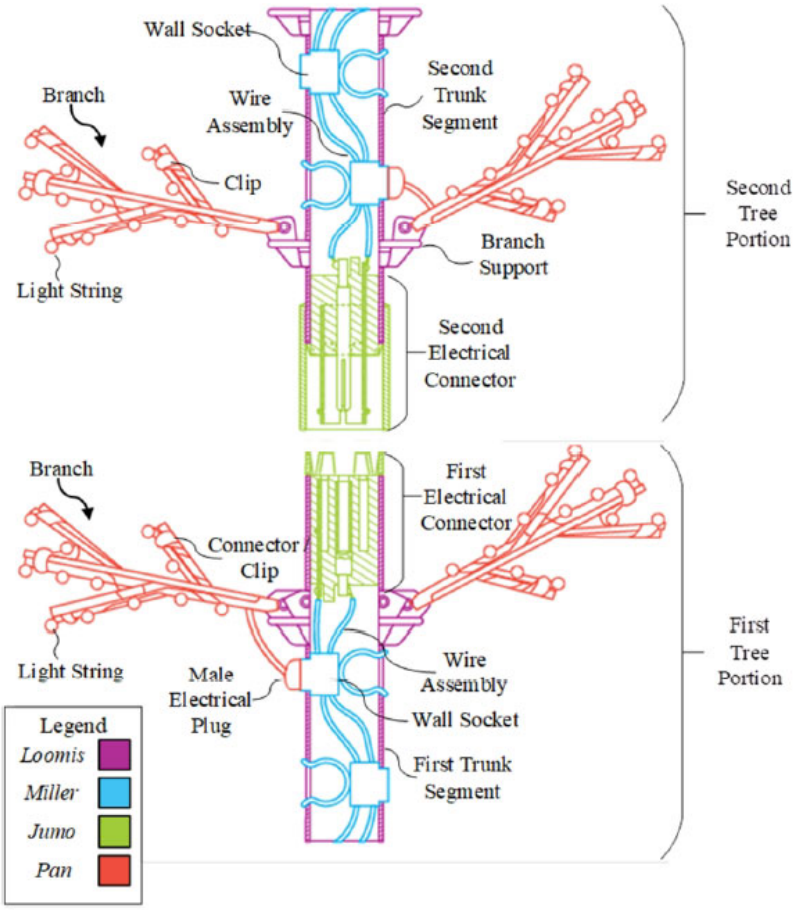
With respect to the "four discrete rotational alignments," Petitioner states that "[t]he combined teachings of *Yao981-Otto-Jumo-Miller* (as described *supra* Part III.A.1) teaches this element," which is not helpful, because the discussion referenced by Petitioner does not address the specific limitation noted above. Pet. Opp. 22. To the extent that discussion can be read as not relying on Jumo for the "four discrete rotational alignments," it is deficient in that it does not map to any structure from the other cited references teaching the "four discrete rotational alignments" limitation.

The discussion on page 22 of Petitioner's Opposition makes clear that Jumo is required for the challenge to meet the "four discrete rotational alignments" limitation. Because Jumo is non-analogous art, the challenge to substitute claims 29 and 30 fails. *See* 759 F. App'x at 942.

2. Loomis[19] Challenge

Petitioner's second challenge proposes modifying the teachings of Loomis. Pet. Opp. 38–53. Petitioner provides an illustration of the proposed modifications, which is reproduced below.

[19] U.S. Patent No. 8,053,042, issued Nov. 8, 2011 (Ex. 1028).



The figure reproduced above is Petitioner's modified version of Loomis's tree based on the teachings of Miller, Jumo, and Pan. *Id.* at 43. In the figure reproduced above, Petitioner again relies on Jumo's electrical connectors (in green) to provide both the mechanical and electrical connections between the tree portions.

Petitioner initially alleges that "*Loomis* arguably teaches all elements of the Substitute Claims." Pet. Opp. 38. Loomis, however, does not teach the recited "four discrete rotational alignments." Petitioner explains that "*Loomis* teaches that the first and second trunk segments rotate relative to one another about a central vertical axis 'until the guide slot and detent are properly aligned, ensuring that the plug prongs will then slide straight into the socket holes.'" *Id.* at 52 (citing Loomis 3:57–63). In its Opposition,

however, Petitioner never explains how Loomis actually meets the "four discrete rotational alignments" required by the claim. Instead, Petitioner again refers us back to its earlier general discussion of the references. *See id.* ("The combined teachings of *Loomis-Otto-Jumo-Miller-Pan* (as described *supra* Part III.B.1) teach this element.").

To the extent Petitioner relies on Loomis teaching the recited "four discrete rotational alignments," that challenge fails because Loomis teaches a single rotational alignment, as made clear by Petitioner's own discussion of that reference. *See* Pet. Opp. 39. Figure 2 from Loomis is reproduced below.

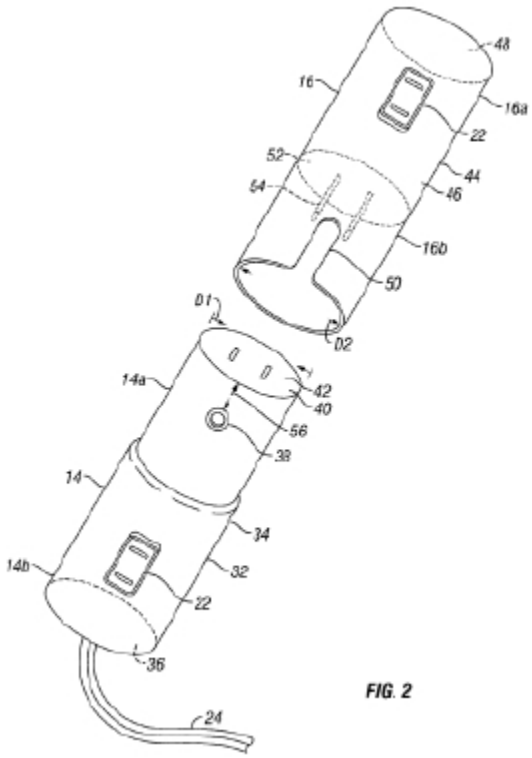


FIG. 2

Figure 2 of Loomis is a perspective view of its trunk segments. As Petitioner explains, "[t]he second trunk segment 16 has a lower portion having a notch or guide slot 50 in the outside wall 46 of the trunk segment, and a recessed end face 52 bearing an electrical connector such as plug 54,"

and "connection with the corresponding socket 42 of the first trunk segment is only possible when the detent on the first trunk segment has been aligned with the guide slot on the second trunk segment." *Id.* (citing Loomis, 6:21–50, Abstract, Figs. 1, 2). That is, detent 38 and guide slot 50 allow only a single rotational orientation.

To the extent Petitioner relies on Jumo teaching the recited "four discrete rotational alignments," again, we note that challenge to substitute claims 29 and 30 fails because Jumo is non-analogous art. *See* 759 F. App'x at 942.

The challenge to substitute claims 29 and 30 fails for at least the reasons set forth above.

C. Conclusion

Patent Owner's Motion to Amend is granted with respect to substitute claims 29 and 30.

V. CONCLUSION[20]

On remand, we determine that Petitioner has established by a preponderance of the evidence that claims 1, 3, 4, 6, 8, and 9 of the '186 patent are unpatentable, but has failed to establish that claims 7, 10, 11, 16–

[20] Should Patent Owner wish to pursue amendment of the challenged claims in a reissue or reexamination proceeding subsequent to the issuance of this decision, we draw Patent Owner's attention to the April 2019 *Notice Regarding Options for Amendments by Patent Owner Through Reissue or Reexamination During a Pending AIA Trial Proceeding. See* 84 Fed. Reg. 16,654 (Apr. 22, 2019). If Patent Owner chooses to file a reissue application or a request for reexamination of the challenged patent, we remind Patent Owner of its continuing obligation to notify the Board of any such related matters in updated mandatory notices. *See* 37 C.F.R. § 42.8(a)(3), (b)(2).

22, 25, 26, and 28 of the '186 patent are unpatentable.[21] Petitioner has failed to establish by a preponderance of the evidence that claims 1–3, 5–9, 11, 12, 14, and 15 of the '187 patent are unpatentable.[22] Petitioner has failed to establish by a preponderance of the evidence that proposed substitute claims 29 and 30 are unpatentable.

The following summarizes the outcome on remand:

'186 Patent Claims	**35 U.S.C. §**	**Reference(s)**	**Claims Shown Unpatentable**	**Claims Not Shown Unpatentable**
1, 3, 4, 6, 8–11, 16, 20, 21, 25	103	Miller	1, 3, 4, 6, 8, 9	10, 11, 16, 20, 21, 25
28	103	Miller, Pan		28
7, 22	103	Miller, Lessner		7, 22
18, 19, 26	103	Miller, Janning		18, 19, 26
17	103	Miller, Yang		17
Overall Outcome			1, 3, 4, 6, 8, 9	7, 10, 11, 16–22, 25, 26, 28
'187 Patent Claims	**35 U.S.C. §**	**Reference(s)**	**Claims Shown Unpatentable**	**Claims Not Shown Unpatentable**
1–3, 5–9, 11, 12, 14	103	Miller, Pan		1–3, 5–9, 11, 12, 14
12, 15	103	Miller, Pan, Janning		12, 15
Overall Outcome				1–3, 5–9, 11, 12, 14, 15

Motion to Amend Outcome	**'186 Patent Claim(s)**
Substitute Claims Proposed in the Amendment	29–36

[21] As noted above, claim 15 of the '186 patent is not subject to the remand.
[22] As noted above, claims 4, 10, and 13 of the '187 patent are not subject to the remand.

Substitute Claims: Motion to Amend Granted	29, 30
Substitute Claims: Not Reached	31–36

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that,

Petitioner has established by a preponderance of the evidence that claims 1, 3, 4, 6, 8, and 9 of the '186 patent are unpatentable;[23]

Petitioner has failed to establish by a preponderance of the evidence that claims 7, 10, 11, 16–22, 25, 26, and 28 of the '186 patent are unpatentable;

Petitioner has failed to establish by a preponderance of the evidence that claims 1–3, 5–9, 11, 12, 14, and 15 of the '187 patent are unpatentable;[24]

Patent Owner's Contingent Motion to Amend is *granted* with respect to substitute claims 29 and 30; and

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

[23] The Federal Circuit affirmed the Original Decision's determination that claim 15 was not shown to be unpatentable by a preponderance of the evidence. *Polygroup*, 759 F. App'x at 944.

[24] The Federal Circuit affirmed the Original Decision's determination that claims 4, 10, and 13 were not shown to be unpatentable by a preponderance of the evidence. *Polygroup*, 759 F. App'x at 944.

IPR2016-01610 (Patent 8,454,186 B2)
IPR2016-01612 (Patent 8,454,187 B2)

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