

UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA

Willis Electric Co., Ltd.,

Case No. 15-cv-3443 (WMW/DTS)

Plaintiff,

ORDER

v.

Polygroup Macau Limited (BVI), Polytree
(H.K) Co. Ltd., and Polygroup Trading
Limited,

Defendants.

In this patent-infringement action, Plaintiff alleges that certain products sold by Defendants infringe claims in five United States patents owned by Plaintiff. This matter is now before the Court on the parties' cross-motions to exclude expert testimony and for summary judgment. (Dkts. 648, 657, 666, 675 and 689.) For the reasons addressed below, the Court grants in part and denies in part the parties' motions.

BACKGROUND

Plaintiff Willis Electric Co., Ltd. (Willis Electric) and Defendants Polygroup Macau Limited (BVI), Polytree (H.K) Co. Ltd. and Polygroup Trading Limited (collectively, Polygroup) are competitors in the field of artificial holiday trees. Manufacturers in this field compete based on price, product quality and product innovation. Willis Electric began manufacturing holiday lights in 1993 and expanded its business to include pre-lit artificial holiday trees in 2008.

In 2009, Jason Loomis, an expert in the field of decorative lighting, designed an artificial holiday tree for GKI/Bethlehem Lighting Company. Loomis's design had multiple trunk segments that included internal trunk wiring to provide electrical power to light strings attached to the branches. Loomis filed a non-provisional patent application on July 14, 2010, which issued as United States Patent No. 8,053,042 (Loomis Patent) on November 8, 2011. The Loomis Patent describes trunk segments that mechanically and electrically connect using a conventional plug and socket connector. In mid-2010, GKI/Bethlehem produced and sold trees embodying the technology described in the Loomis Patent (GKI Tree).

Willis Electric alleges that, until 2010, its pre-lit holiday trees were "typical of the industry," as they were "big, bulky, complex, and difficult to assemble." But in 2010, Willis Electric began selling a "One Plug Tree." The One Plug Tree design involves "coaxially coupling" tree trunk portions. Willis Electric filed patent applications pertaining to the One Plug Tree and other related pre-lit artificial holiday tree designs. Subsequently, Polygroup began selling an alleged "knockoff design" and applied for its own patents.

Willis Electric commenced this patent-infringement lawsuit against Polygroup in August 2015 and filed a first amended complaint in December 2015. The first amended complaint alleges that Polygroup has infringed five of Willis Electric's United States patents pertaining to pre-lit artificial holiday trees.¹ Four of the asserted patents pertain

¹ Willis Electric also alleged infringement of a sixth patent, United States Patent No. 9,044,056, which Willis Electric no longer asserts at the time of this motion.

to Willis Electric's One Plug Tree design: United States Patent No. 8,454,186 (the '186 Patent); United States Patent No. 8,454,187 (the '187 Patent); United States Patent No. 8,936,379 (the '379 Patent); and United States Patent No. 8,974,072 (the '072 Patent) (collectively, the One Plug Tree Patents). A fifth asserted patent, United States Patent No. 9,066,617 (the '617 Patent), pertains to Willis Electric's multi-positional locking artificial tree trunk design.

The Court stayed these proceedings in November 2016 pending *inter partes* review (IPR) proceedings before the Patent Trial and Appeal Board (PTAB). In those proceedings, Polygroup filed more than a dozen IPR petitions challenging the validity of the One Plug Tree Patents. In several of its IPR petitions, Polygroup referenced the Loomis Patent. And Polygroup retained Loomis as a consultant and technical expert in the IPR proceedings.

After the conclusion of IPR proceedings, Willis Electric filed the now-operative second amended complaint in May 2019. The second amended complaint alleges that Polygroup has infringed and continues to infringe the One Plug Tree Patents and the '617 Patent.² In a December 2021 Order, the Court construed 10 disputed terms in the asserted patent claims: five terms that appear in the One Tree Plug Patents and five terms that appear in the '617 Patent.

The parties now cross-move to exclude expert testimony and for summary judgment. The Court addresses each motion in turn.

² The second amended complaint also includes counts alleging anticompetitive conduct, all of which have been dismissed. Only the counts alleging patent infringement remain in dispute.

ANALYSIS

I. Cross-Motions to Exclude Expert Testimony

The parties cross-move for the exclusion of expert testimony. The admissibility of expert testimony is an issue of law for the district court to decide and is governed by Federal Rule of Evidence 702 and *Daubert v. Merrell Dow Pharmaceuticals, Inc.*, 509 U.S. 579 (1993). Rule 702 provides:

A witness who is qualified as an expert by knowledge, skill, experience, training, or education may testify in the form of an opinion or otherwise if:

- (a) the expert’s scientific, technical, or other specialized knowledge will help the trier of fact to understand the evidence or to determine a fact in issue;
- (b) the testimony is based on sufficient facts or data;
- (c) the testimony is the product of reliable principles and methods; and
- (d) the expert has reliably applied the principles and methods to the facts of the case.

Fed. R. Evid. 702. “An expert may base an opinion on facts or data in the case that the expert has been made aware of or personally observed.” Fed. R. Evid. 703. “If experts in the particular field would reasonably rely on those kinds of facts or data in forming an opinion on the subject, they need not be admissible for the opinion to be admitted.” *Id.*

“The proponent of expert testimony must prove its admissibility by a preponderance of the evidence.” *Lauzon v. Senco Prods., Inc.*, 270 F.3d 681, 686 (8th Cir. 2001). “Rule 702 reflects an attempt to liberalize the rules governing the admission of expert testimony” and favors admissibility over exclusion. *Id.* (internal quotation

marks omitted). Determinations as to the admissibility of expert testimony are within a district court's discretion. *See Arkwright Mut. Ins. Co. v. Gwinner Oil, Inc.*, 125 F.3d 1176, 1182 (8th Cir. 1997).

A district court must ensure that testimony admitted under Rule 702 “is not only relevant, but reliable.” *Daubert*, 509 U.S. at 589. When making this reliability determination, a court may evaluate whether the expert's method has been tested or subjected to peer review and publication, the method's known or potential rate of error and the method's general acceptance. *Presley v. Lakewood Eng'g & Mfg. Co.*, 553 F.3d 638, 643 (8th Cir. 2009) (citing *Daubert*, 509 U.S. at 593–94). These factors are not exhaustive, and a court must evaluate the reliability of expert testimony based on the facts of the case. *Id.* A court also may consider “whether the expertise was developed for litigation or naturally flowed from the expert's research; whether the proposed expert ruled out other alternative explanations; and whether the proposed expert sufficiently connected the proposed testimony with the facts of the case.” *Sappington v. Skyjack, Inc.*, 512 F.3d 440, 449 (8th Cir. 2008) (internal quotation marks omitted). When weighing these factors, a district court must function as a gatekeeper to separate “expert opinion evidence based on ‘good grounds’ from subjective speculation that masquerades as scientific knowledge.” *Glastetter v. Novartis Pharms. Corp.*, 252 F.3d 986, 989 (8th Cir. 2001).

Expert testimony is not admissible if it is “speculative, unsupported by sufficient facts, or contrary to the facts of the case,” *Marmo v. Tyson Fresh Meats, Inc.*, 457 F.3d 748, 757 (8th Cir. 2006), such that it is “so fundamentally unsupported that it can offer no

assistance to the jury,” *Minn. Supply Co. v. Raymond Corp.*, 472 F.3d 524, 544 (8th Cir. 2006) (internal quotation marks omitted). But disputes about the factual basis of an expert’s testimony ordinarily implicate the credibility—not the admissibility—of the testimony. *See Sappington*, 512 F.3d at 450; *Minn. Supply Co.*, 472 F.3d at 544. The Court addresses, in turn, each challenged expert witness.

A. Julie L. Davis

Willis Electric moves to exclude the opinions and testimony of Polygroup’s damages expert, Julie L. Davis. Polygroup intends to offer Davis to rebut the opinions of Willis Electric’s damages expert and to opine about the damages, if any, suffered by Willis Electric if Willis Electric prevails on its patent-infringement claims. In particular, Davis opines that Willis Electric cannot prove that it is entitled to lost profits and that Willis Electric’s total damages based on a reasonable royalty, hypothetically negotiated in 2013 and continuing until 2019, should be no more than \$1,062,370.

If patent infringement is proved, “the court shall award the [patentee] damages adequate to compensate for the infringement.” 35 U.S.C. § 284. The phrase “damages adequate to compensate” in Section 284 “includes any foreseeable lost profits the patent owner can prove.” *Grain Processing Corp. v. Am. Maize-Prods. Co.*, 185 F.3d 1341, 1349 (Fed. Cir. 1999). If a patentee cannot prove lost profits, the statute sets “a reasonable royalty” as the damages floor. *See* 35 U.S.C. § 284. A reasonable royalty typically is established “based on a hypothetical negotiation between the patentee and the infringer when the infringement began.” *Unisplay, S.A. v. Am. Elec. Sign Co.*, 69 F.3d 512, 517 (Fed. Cir. 1995). The hypothetical negotiation is intended “to ascertain the

royalty upon which the parties would have agreed had they successfully negotiated an agreement just before infringement began.” *VirnetX, Inc. v. Cisco Sys., Inc.*, 767 F.3d 1308, 1326 (Fed. Cir. 2014) (internal quotation marks omitted).

A hypothetical reasonable royalty is calculated using the fifteen *Georgia-Pacific* factors. *ResQNet.com, Inc. v. Lansa, Inc.*, 594 F.3d 860, 869 (Fed. Cir. 2010) (citing *Georgia-Pacific Corp. v. U.S. Plywood Corp.*, 318 F. Supp. 1116, 1120 (S.D.N.Y. 1970)). Notably, the United States Court of Appeals for the Federal Circuit has recognized that the *Georgia-Pacific* factors are “comprehensive (but unprioritized and often overlapping).” *Id.* Courts “do not require that witnesses use any or all of the *Georgia-Pacific* factors when testifying about damages in patent cases.” *Whitserve, LLC v. Comput. Packages, Inc.*, 694 F.3d 10, 31 (Fed. Cir. 2012). And failing to consider every relevant *Georgia-Pacific* factor is distinct from presenting weak evidence in support of a *Georgia-Pacific* factor, because the latter circumstance tends to implicate weight and credibility. *Cf. Wallace Comput. Servs., Inc. v. Uarco Inc.*, 887 F.2d 1095, 1 (Fed. Cir. 1989).

Here, when determining a reasonable royalty rate, Davis analyzed multiple licensing arrangements pertaining to the Loomis Patent and product designs involving the technology protected by the Loomis Patent. In doing so, Davis reviewed and considered, among other evidence, deposition transcripts and exhibits, expert reports, documents produced by the parties and publicly available information. Davis’s reasonable royalty analysis also includes an extensive analysis of the *Georgia-Pacific* factors.

Willis Electric argues that Davis’s reasonable royalty opinions nonetheless should be excluded as unreliable because they predominantly rely on an agreement between Loominocity, Inc. (Loominocity), and Belgravia Wood Limited (Belgravia), a Polygroup subsidiary. Pursuant to that agreement, Belgravia would pay Loominocity an ongoing royalty of \$0.075 for each tree sold which contains a pole that practices the invention of the Loomis Patent. According to Willis Electric, the 2020 agreement between Loominocity and Belgravia is not comparable to the license agreement that Polygroup and Willis Electric hypothetically would have entered in 2013. Moreover, Willis Electric contends, Davis rejects as *incomparable* the license agreements between Loominocity and two other licensees—namely, GKI/Bethlehem Lighting Company (GKI) and Boston Warehouse Trading Corporation (Boston Warehouse). Davis’s rejection of the GKI and Boston Warehouse agreements is contrary to the record, Willis Electric maintains.

Willis Electric’s arguments largely implicate to the second *Georgia-Pacific* factor, which involves evaluating “the rates paid by the licensee for the use of other patents comparable to the patent in suit.” *Lucent Techs., Inc. v. Gateway, Inc.*, 580 F.3d 1301, 1325 (Fed. Cir. 2009) (internal quotation marks omitted). When a party relies on other licenses to establish a reasonable royalty, those other licenses must be “sufficiently comparable to the hypothetical license at issue.” *VirnetX*, 767 F.3d at 1330 (internal quotation marks omitted). As such, the party relying on comparable licenses must “account for differences in the technologies and economic circumstances of the contracting parties.” *Id.* “Sufficient comparability is a threshold requirement for licenses to be admissible.” *Apple Inc. v. Wi-LAN Inc.*, 25 F.4th 960, 971–72 n.5 (Fed. Cir. 2022).

When determining whether licenses are comparable, the Federal Circuit has “never required identity of circumstances; on the contrary, [the Federal Circuit has] long acknowledged that any reasonable royalty analysis necessarily involves an element of approximation and uncertainty.” *VirnetX*, 767 F.3d at 1330 (internal quotation marks omitted). Allegedly comparable licenses may be insufficient if they demonstrate “no relationship to the claimed invention,” show no “discernible link to the claimed technology,” involve “vastly different situations” or pertain to “subject matter . . . [that is] not even ascertainable from the evidence.” *Id.* (internal quotation marks and brackets omitted). But absent such circumstances, “the degree of comparability of the license agreements” may instead be “a factual issue best addressed by cross examination and not by exclusion.” *Id.* at 1331 (internal quotation marks and brackets omitted).

Willis Electric first argues that Davis’s reasonable royalty analysis is flawed because it ignores the date—and the relevance of that date—of the hypothetical negotiation. The parties agree, and Davis opines, that the hypothetical negotiation would have occurred in or about June 2013. As such, Willis Electric’s contention that Davis “ignores” the hypothetical negotiation date is contrary to the record. Nonetheless, Willis Electric argues that Davis improperly relies on a purportedly comparable agreement between Loominocity and Belgravia from 2020, more than six years after the date of the hypothetical negotiation.

“The key element in setting a reasonable royalty . . . is the necessity [to] return to the date when the infringement began.” *Wang Labs., Inc. v. Toshiba Corp.*, 993 F.2d 858, 870 (Fed. Cir. 1993) (internal quotation marks omitted). However, “the hypothetical

negotiation analysis permits and often requires a court to look to events and facts that occurred thereafter and that could not have been known to or predicted by the hypothesized negotiators.” *Lucent*, 580 F.3d at 1333 (internal quotation marks omitted). Although a reasonable royalty analysis requires “consideration of a hypothetical negotiation on the date of first infringement,” the analysis does not “automatically exclud[e] evidence of subsequent events.” *Harris Corp. v. Ericsson Inc.*, 417 F.3d 1241, 1257 (Fed. Cir. 2005).

Under the “book-of-wisdom doctrine,” evaluation of a hypothetical negotiation may involve “looking to future events to avoid undercompensating patentees.” *Spectralytics, Inc. v. Cordis Corp.*, 650 F. Supp. 2d 900, 913 (D. Minn. 2009), *vacated in part on other grounds by* 649 F.3d 1336 (Fed. Cir. 2011). And “the purpose of looking at future events is ‘to bring out and expose to light the elements of value that were there from the beginning.’ ” *Id.* (quoting *Sinclair Refin. Co. v. Jenkins Petroleum Process Co.*, 289 U.S. 689, 698 (1933)). As such, a jury may be “told that the hypothetical negotiators would have employed the ‘book of wisdom,’ looking forward in time from the date of the first hypothetical negotiation to account for all information that would have been relevant to the parties in coming to and arriving at a deal.” *Comcast IP Holdings I LLC v. Sprint Commc’ns Co.*, 850 F.3d 1302, 1314 (Fed. Cir. 2017) (internal quotation marks omitted).

Here, Davis ties the 2020 agreement between Loominocity and Belgravia to the June 2013 hypothetical negotiation by asserting that certain facts underlying the 2020 agreement would have been known and relevant to Polygroup during a hypothetical negotiation in 2013. Specifically, Davis opines that the 2020 agreement represents the

amount that would be paid for a “bare patent license” of the patented technology, as opposed to unpatented features. Davis relies on evidence that product features unrelated to Willis Electric’s patented technology are the primary factors that impact purchasing decisions with respect to artificial holiday trees. Davis also reasons that, at the time of the hypothetical negotiation, Polygroup had the ability to implement—at a cost of \$100,000 to \$200,000—a non-infringing design that Polygroup began selling in 2019. For these reasons, according to Davis, the amount that Polygroup would have been willing to pay in 2013 is comparable to the amount that Belgravia actually paid as part of its 2020 agreement with Loominocity to avoid the effort and costs associated with a re-design. On this record, there is a factual basis to support Davis’s opinion that the 2020 agreement is probative of the reasonable royalty that the parties hypothetically would have negotiated in June 2013.³ Willis Electric’s disagreement with Davis’s opinion reflects a dispute about the weight and credibility of the facts underlying her opinion. For these reasons, exclusion of Davis’s opinions on this basis is unwarranted.

Willis Electric also argues that Davis’s reliance on the 2020 agreement between Loominocity and Belgravia is improper because Davis “ignored the litigation taint underlying” that agreement. According to Willis Electric, the 2020 agreement is a “sham” transaction that is not comparable to the hypothetical negotiation because it occurred after this litigation commenced and conferred no benefit on Polygroup, which had already acquired the Loomis Patent. But potentially comparable licensing

³ Notably, Willis Electric’s damages expert also relies on three purportedly comparable agreements that post-date the hypothetical negotiation.

agreements “are almost never perfectly analogous to the infringement action,” and “the fact that a license is not perfectly analogous generally goes to the weight of the evidence, not its admissibility.” *Ericsson, Inc. v. D-Link Sys., Inc.*, 773 F.3d 1201, 1227 (Fed. Cir. 2014). Absent specific circumstances, the degree of comparability between license agreements typically is a factual issue to be addressed by cross-examination. *See VirnetX*, 767 F.3d at 1330–31. Willis Electric’s arguments do not suggest that the 2020 agreement involved unrelated technology or vastly different business considerations. To the contrary, the 2020 agreement involved the same licensee (Polygroup, via a subsidiary) agreeing to license similar patented technology. Any material differences between the circumstances of the 2020 agreement and the circumstances of the hypothetical negotiation in 2013 can be addressed through cross-examination and the presentation of contrary evidence, and the jury can “hear the expert testimony and decide for itself what to accept or reject.” *Id.* at 1331 (internal quotation marks omitted). As such, exclusion of Davis’s opinions on this basis is unwarranted.

Willis Electric also contends that Davis’s reasonable royalty analysis improperly rejects comparable license agreements that Loominocity entered with GKI and Boston Warehouse. In her report, Davis characterizes these agreements as having “little relevance” to Polygroup’s hypothetical negotiation with Willis Electric because the GKI and Boston Warehouse agreements involved “licenses to an entire tree design as opposed to licenses covering bare patent rights.” With respect to the GKI agreement, Willis Electric identifies no evidence that fundamentally undermines the reliability of Davis’s opinion that the GKI agreement is not comparable. The 2008 GKI agreement predates

the 2009 provisional application for the Loomis Patent. And the record reflects that the 2008 GKI agreement and the 2010 amendment to that agreement involved the licensing of “Product Designs,” including but not limited to patented technology. The Boston Warehouse agreement, by comparison, provides for a royalty on products that would infringe the Loomis Patent. But the Boston Warehouse agreement nonetheless contemplates royalties based on “each Licensed Product sold,” as opposed to royalties tied directly to the Loomis Patent or limited to patented features. The Boston Warehouse agreement also reflects that the royalty calculation was intended to “mirror[]” the royalties calculated under the GKI agreement, which involved the licensing of tree designs. Davis’s opinions distinguishing the GKI agreement and the Boston Warehouse agreement have support in the record. Because the parties’ disagreement about the comparability of the GKI agreement and the Boston Warehouse agreement are factual disputes, exclusion of Davis’s opinions on this basis is unwarranted.

Willis Electric also argues that Davis should be precluded from offering any opinion about non-infringing alternatives. Davis opines that, “[a]t the time of the hypothetical negotiation, Polygroup had the ability to implement its new non-infringing design using the [Loomis Patent] that it began selling in October 2019.” This opinion has no factual support, according to Willis Electric, because Loominocity had already granted GKI an exclusive license to the Loomis Patent. However, as addressed above, the 2008 GKI agreement predates the 2009 provisional application for the Loomis Patent. And both the 2008 GKI agreement and the 2010 amendment to that agreement involved the exclusive licensing of particular “Product Designs,” not the licensing of the Loomis

Patent itself. Moreover, Davis's analysis considers other purportedly non-infringing alternatives that Polygroup could have adopted at the time of the hypothetical negotiation. For these reasons, Willis Electric has not established that exclusion of Davis's opinions on this basis is warranted.

In summary, Davis's report reflects that she expressly considered the date of the hypothetical negotiation and the relevant *Georgia-Pacific* factors, including the existence of comparable license agreements and the possible availability of non-infringing alternatives. Davis's opinions as to these factors are tethered to evidence in the record, and Willis Electric's disagreement with these aspects of Davis's opinions implicate the weight and credibility of her opinions rather than their admissibility. Because any purported flaws in Davis's reasonable-royalty analysis can be addressed through cross-examination and the presentation of contrary evidence, exclusion of Davis's expert opinions is unwarranted.

Accordingly, the Court denies Willis Electric's motion to exclude the opinions and testimony of Polygroup's damages expert.

B. Michele Riley

Polygroup moves to exclude the opinions and testimony of Willis Electric's damages expert, Michele Riley. Polygroup argues that Riley's opinions as to lost profits and a reasonable royalty are unreliable and untethered to the facts of the case.

To recover lost profits as opposed to a reasonable royalty, "a patent owner must prove a causal relationship between the infringement and its loss of profits." *BIC Leisure Prods., Inc. v. Windsurfing Int'l, Inc.*, 1 F.3d 1214, 1218 (Fed. Cir. 1993). In other

words, “[t]he patent owner must show that ‘but for’ the infringement, [the patent owner] would have made the infringer’s sales.” *Id.* The Federal Circuit has adopted the four-factor *Panduit* test as one method for a patentee to establish entitlement to lost profits damages. *Rite-Hite Corp. v. Kelley Co., Inc.*, 56 F.3d 1538, 1545 (Fed. Cir. 1995) (citing *Panduit Corp. v. Stahlin Bros. Filore Works Inc.*, 575 F.2d 1152 (6th Cir. 1978)). This test requires the patentee to establish (1) demand for the patented product, (2) the absence of acceptable non-infringing alternatives, (3) the patentee’s manufacturing and marketing capability to exploit the demand, and (4) the amount of profit that the patentee would have made. *Id.* If a patentee does not prove entitlement to lost profits, the patentee is entitled to a reasonable royalty, typically established based on a hypothetical negotiation. *Unisplay*, 69 F.3d at 517. The Court addresses Polygroup’s challenges to Riley’s lost profits and reasonable-royalty opinions in turn.

1. Lost Profits Opinions

Polygroup argues that Riley’s lost profits analysis fails to properly account for available non-infringing alternatives.

When considering the *Panduit* factors, the “requirement that patentees prove demand for the product as a whole and the absence of non-infringing alternatives ties lost profit damages to specific claim limitations and *ensures that damages are commensurate with the value of the patented features.*” *Mentor Graphics Corp. v. EVE-USA, Inc.*, 851 F.3d 1275, 1288 (Fed. Cir. 2017) (emphasis added). “Products lacking the advantages of the patented invention can hardly be termed a substitute acceptable to the customer who wants those advantages.” *Id.* at 1285–86 (internal quotation marks and brackets omitted).

Determining whether a party has proven the absence of acceptable non-infringing alternatives typically is a fact question for the jury to resolve. *See id.* at 1287.

In a two-supplier market, “it is reasonable to assume, provided the patent owner has the manufacturing and marketing capabilities, that it would have made the infringer’s sales.” *State Indus., Inc. v. Mor-Flo Indus., Inc.*, 883 F.2d 1573, 1578 (Fed. Cir. 1989). Under the two-supplier market test, a patentee must show (1) that the relevant market contains only two suppliers, (2) that the patentee had the manufacturing and market capability to make the sales that were diverted to the infringer and (3) the amount of profit the patentee would have made from these diverted sales. *Micro Chem., Inc. v. Lextron, Inc.*, 318 F.3d 1119, 1124 (Fed. Cir. 2003). “In essence, the two-supplier market test collapses the first two *Panduit* factors into one ‘two suppliers in the relevant market’ factor.” *Id.*

The Federal Circuit has recognized other appropriate methods for proving lost profits, including the market-share approach. *State Indus.*, 883 F.2d at 1577. Under this approach, a patentee recovers lost profits on a percentage of infringing sales that is equal to the patentee’s market share. *Id.* at 1578. If a patentee can establish its share of the market, combined with the other *Panduit* factors, the absence of acceptable substitutes may become a “neutral factor.” *Id.*

Riley’s lost profits analysis addresses the *Panduit* factors, and she limits her calculation to four specific customers. Applying the market-share approach, Riley’s analysis accounts for sales lost to market competitors based on relative market share. But the market-share approach cannot be applied automatically, because a patentee must

prove both its market share and that it would have captured the infringing sales. *See Slimfold Mfg. Co. v. Kinkead Indus., Inc.*, 932 F.2d 1453, 1458 (Fed. Cir. 1991) (affirming district court’s refusal to award lost profits damages based on market-share approach because patentee failed to prove that consumers “specifically want a [product] having the advantages of the [asserted] patent”). To prove market share, a patentee must present “sound economic proof of the nature of the market and likely outcomes with infringement factored out of the economic picture.” *Grain Processing*, 185 F.3d at 1350.

Polygroup argues that Riley, when assessing non-infringing alternatives under the *Panduit* test, erroneously defines acceptable non-infringing alternative designs as designs that are “easily and quickly assembled.” The market for a patented product typically “includes other devices or substitutes similar in physical and functional characteristics to the patented invention,” but excludes “alternatives with disparately different prices or significantly different characteristics.” *Micro Chem.*, 318 F.3d at 1124 (internal quotation marks omitted). According to Polygroup, ease of assembly is not an advantage of Willis Electric’s patented features and, therefore, Riley’s definition of acceptable alternatives (and, by extension, the relevant market) is incorrect. However, Riley provides detailed opinions, based on her examination of specific evidence, demonstrating a connection between ease of assembly and Willis Electric’s patented inventions. Because this is a factual dispute for the jury to resolve, exclusion of Riley’s opinions on this basis is unwarranted.

Polygroup seeks to avoid this result by framing this factual dispute as a legal error. According to Polygroup, on appeal from PTAB’s final written decision in the IPR

proceedings, the Federal Circuit determined that ease of assembly is *not* a patented advantage of Willis Electric's patents. But Polygroup's argument is flawed for several reasons.

First, the Federal Circuit's decision in Polygroup's IPR appeal did not address the same patent claims that are asserted in this case. *See generally Polygroup Ltd. MCO v. Willis Elec. Co.*, 2021-1401, 2021-1402, 2022 WL 1183332 (Fed. Cir. Apr. 20, 2022). As each patent claim involves different features (and combinations thereof) that could impact the ease of assembling an artificial tree, the Federal Circuit's determinations do not necessarily apply to the patent claims at issue in this case. Indeed, the Federal Circuit affirmed PTAB's conclusion that Polygroup failed to establish the unpatentability of several patent claims that are asserted in this case. *See Polygroup Ltd. MCO v. Willis Electric Co.*, 759 F. App'x 934, 944 (Fed. Cir. 2019); *see also id.* at 936 (addressing patent claims with features that "simplify tree assembly").

Second, the Federal Circuit applied the "broadest reasonable interpretation" standard when concluding that certain claims in the '186 Patent and the '187 Patent "permit the mechanical and electrical connections" between trunk portions to be "made independently" in two separate steps. *Polygroup Ltd. MCO*, 2022 WL 1183332, at *4–5. By contrast, district courts "do not assign terms their broadest reasonable interpretation." *PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC*, 815 F.3d 734, 740 (Fed. Cir. 2016) (citing *Phillips v. Awtl Corp.*, 415 F.3d 1303 (Fed. Cir. 2005) (en banc)). Instead, district courts "seek out the correct construction—the construction that most accurately delineates the scope of the claimed invention—under the framework laid out

in *Phillips*.” *Id.* In the claim construction order, this Court applied *Phillips* when construing the disputed claim terms and observed that “an electrical connection can be made ‘independent of’ the rotational orientation of the trunk portions if, regardless of which of multiple rotational orientations is used to mechanically connect the tree trunk portions, an electrical connection is made.” Unlike the Federal Circuit’s “broadest reasonable interpretation” analysis in the IPR appeal, under this Court’s claim construction, Willis Electric’s patented invention requires an electrical connection and a mechanical connection to occur in a single step, which could impact the ease of assembling an artificial tree.

Third, the parties’ respective damages experts agree that the patented features at issue provide ease-of-assembly benefits, and the experts disagree only as to the degree of those benefits. For instance, Polygroup’s damages expert opines that “the limited benefits provided by the accused feature provide only minimal contribution to the success of the accused products” and “only seconds are saved when assembling” artificial trees with such features. These disagreements reflect factual disputes that implicate the weight and credibility, not the admissibility, of Riley’s lost profits opinions.

Polygroup also contends that Riley’s lost profits opinions fail to demonstrate that, but for any alleged infringement, Willis Electric would have captured Polygroup’s profits at a rate equal to Willis Electric’s proportionate market share. According to Polygroup, other factors—including Willis Electric’s performance as a supplier, retailer-driven price competition and financial incentives to design around patents and economic conditions such as labor shortages—would impact Willis Electric’s annual sales and profit margin.

But Riley's report accounts for various market conditions when purporting to reconstruct the relevant market "but for" Polygroup's alleged infringement. Polygroup's disagreement with Riley's analysis implicates the weight and credibility of the evidence rather than its admissibility.

For all of these reasons, the Court denies Polygroup's motion to exclude Riley's lost profits opinions and testimony.

2. Reasonable Royalty Opinions

Polygroup also argues that Riley's reasonable royalty opinions are unreliable and untethered to the facts of this case.

As addressed above, if a patentee does not prove entitlement to lost profits, the patentee is entitled to a reasonable royalty, typically established based on a hypothetical negotiation. *Unisplay*, 69 F.3d at 517. The "hypothetical negotiation" is intended "to ascertain the royalty upon which the parties would have agreed had they successfully negotiated an agreement just before infringement began." *VirnetX*, 767 F.3d at 1326 (internal quotation marks omitted). This hypothetical reasonable royalty is calculated using the fifteen *Georgia-Pacific* factors. *ResQNet.com*, 594 F.3d at 869.

"When the accused infringing products have both patented and unpatented features, measuring this value requires a determination of the value added by such features." *Ericsson*, 773 F.3d at 1226. "The essential requirement is that the ultimate reasonable royalty award must be based on the incremental value that the patented invention adds to the end product." *Id.* "A patentee is only entitled to a reasonable royalty attributable to the infringing features," and a reasonable royalty must be

“apportioned between the infringing and non-infringing features of the product.” *Power Integrations, Inc v. Fairchild Semiconductor Int’l, Inc.*, 904 F.3d 965, 977 (Fed. Cir. 2018). As such, when “multi-component products are accused of infringement, the royalty base should not be larger than the smallest salable unit embodying the patented invention.” *Id.*

Here, Riley opines that Polygroup’s accused product is “the smallest saleable patent-practicing unit” and, consequently, Riley calculates a royalty base on a per-tree basis. Polygroup does not dispute this characterization, and there is no evidence that sub-components of an artificial holiday tree are sold separately. Nonetheless, Polygroup contends that Riley’s analysis fails to further apportion value between the patented and unpatented features of the accused products.

When a patentee’s “damages theory relies on the smallest salable unit as the basis for calculating the royalty, the patentee must estimate what portion of that smallest salable unit is attributable to the patented technology when the smallest salable unit itself contains several non-infringing features.” *Id.* at 977. But because it may be difficult to assign value to a feature that might not ever have been individually sold, “it is well-understood that this process may involve some degree of approximation and uncertainty.” *Virnetx*, 767 F.3d at 1328. The Federal Circuit has held that “apportionment can be addressed in a variety of ways, including by careful selection of the royalty base to reflect the value added by the patented feature” or “by adjustment of the royalty rate so as to discount the value of a product’s non-patented features.” *Exmark Mfg. Co. v. Briggs & Stratton Power Prods. Grp., LLC*, 879 F.3d 1332, 1348 (Fed. Cir. 2018).

Riley’s analysis purports to account for apportionment using the latter approach—namely, by isolating the profit premium that Willis Electric and Polygroup obtained for artificial trees with the patented features in comparison to similar trees without the patented features. Polygroup disagrees with Riley’s apportionment analysis largely because Polygroup disputes the scope of the advantages of the patented features and the extent to which the patented features are the driving force behind the purported profit premium that Riley identifies. But apportionment involves “some degree of approximation and uncertainty.” *Virnetx*, 767 F.3d at 1328. Polygroup’s disagreement with Riley’s apportionment analysis implicates the weight and credibility of the evidence, not its admissibility. Moreover, as addressed above, Polygroup’s contention that “ease of assembly” is not an advantage of the patented features is a factual dispute that is best resolved by the jury.

The value of patented features also can be derived from an evaluation of comparable licenses that accounts for differences in the technologies involved and the economic circumstances of the contracting parties. *Commonwealth Sci. & Indus. Rsch. Org. v. Cisco Sys., Inc.*, 809 F.3d 1295, 1303 (Fed. Cir. 2015) (observing that, when “the licenses employed are sufficiently comparable, this method is typically reliable because the parties are constrained by the market’s actual valuation of the patent”). Riley employs a market approach by considering other purportedly comparable licensing agreements, including licensing and manufacturing agreements between Willis Electric and other third parties. This approach, also, presents disputed fact issues that implicate weight and credibility rather than admissibility.

Polygroup's arguments additionally implicate the thirteenth *Georgia-Pacific* factor, which pertains to the "portion of the realizable profit that should be credited to the invention as distinguished from non-patented elements, the manufacturing process, business risks, or significant features or improvements added by the infringer." 318 F. Supp. at 1120. Notably, the Federal Circuit has recognized that the *Georgia-Pacific* factors are "unprioritized and often overlapping," *ResQNet.com, Inc.*, 594 F.3d at 869, and witnesses are not required to "use any or all of the *Georgia-Pacific* factors when testifying about damages in patent cases," *Whitserve, LLC*, 694 F.3d at 31. Moreover, failing to consider every relevant *Georgia-Pacific* factor is distinct from presenting weak evidence in support of a specific *Georgia-Pacific* factor, because the latter circumstance tends to implicate weight and credibility. *Cf. Wallace Comput. Servs., Inc.*, 887 F.2d at 1.

Here, in addition to Riley's quantitative-apportionment and market-approach analyses addressed above, Riley extensively considers the *Georgia-Pacific* factors. In doing so, Riley acknowledges that "under the hypothetical license agreement, Polygroup would bear the business risk of manufacturing, marketing, and selling the Accused Products" and, therefore, Riley concludes that the thirteenth *Georgia-Pacific* factor "has a downward impact on the negotiated royalty rate."

In summary, Polygroup's disagreement with these aspects of Riley's opinions implicate the weight and credibility of her opinions rather than their admissibility. Because any purported flaws in Riley's analysis can be addressed through cross-examination and the presentation of contrary evidence, exclusion of Riley's reasonable royalty opinions is unwarranted.

Accordingly, the Court denies Polygroup's motion to exclude the opinions and testimony of Willis Electric's damages expert.

C. Dr. James Dickens

Polygroup moves to exclude the opinions and testimony of Willis Electric's technical expert, Dr. James Dickens. According to Polygroup, Dr. Dickens misapplies or ignores the relevant law and facts as to several issues. The Court addresses each of Polygroup's arguments.

1. Non-Infringing Alternatives and Secondary Considerations

Polygroup first argues that Dr. Dickens's opinions about non-infringing alternatives and secondary considerations of non-obviousness are based on an incorrect premise—namely, that a key advantage of Willis Electric's patented invention is the ease of assembling a pre-lit artificial holiday tree. Polygroup contends that this premise is foreclosed by the Federal Circuit's 2022 decision in the IPR proceedings. *See Polygroup Ltd.*, 2022 WL 1183332, at *4–5.

As addressed in Part I.B.1. of this Order, Polygroup's arguments as to this issue are unavailing for several reasons. Moreover, the parties and their experts present competing factual evidence and opinions pertaining to acceptable non-infringing alternatives and secondary considerations of non-obviousness. These disagreements reflect factual disputes that implicate the weight and credibility, not the admissibility, of Dr. Dickens's opinions.

For these reasons, the Court denies Polygroup's motion to exclude these aspects of Dr. Dickens's opinions.

2. Application of “Independent of” Claim Construction

Polygroup next argues that Dr. Dickens misapplies the Court’s construction of the “independent of” claim limitation.

During claim construction, the parties disputed the meaning of the phrase “the electrical connection being made independent of the rotational orientation of the first tree/trunk portion relative to the second tree/trunk portion.” Variations of this disputed phrase appear in the ’186 Patent (asserted claims 1, 10, 20 and 28) and the ’187 Patent (asserted claims 1 and 7). The Court rejected Polygroup’s proposed construction of this phrase and adopted Willis Electric’s proposed construction—namely, “an electrical connection that can be made at any available arrangement of the first tree/trunk portion relative to the second tree/trunk portion about a common vertical axis between the tree-trunk portions.”

Polygroup contends that Dr. Dickens’s opinions misapply the Court’s claim construction by suggesting that “any available arrangement” of tree trunk portions means only those arrangements in which both a mechanical and electrical connection are made. But Dr. Dickens’s opinions are consistent with this Court’s claim construction. Although the Court did not separately define the phrase “any available arrangement,” the Court observed in the claim construction order that “an electrical connection can be made ‘independent of’ the rotational orientation of the trunk portions if, regardless of which of multiple rotational orientations is used to mechanically connect the tree trunk portions, an electrical connection is made.” Polygroup’s technical expert similarly interprets the

phrase “any available arrangement” to mean “any rotational orientation of the first and second tree/trunk portions *in which a mechanical connection can be made between them.*”

As the parties’ summary judgment briefing reflects, Polygroup’s dispute as to this issue pertains to whether “any available arrangement” of tree trunk portions includes an arrangement in which the plastic “fins” of one trunk connector are positioned precisely to rest on top of the “fins” of another trunk connector. Polygroup’s technical expert advocates for this position, but Dr. Dickens repeatedly testified that this scenario does not involve an “available” connection as there is “not a mechanical connection just because [the trunk connectors] touch.” And Dr. Dickens opines that, if the fins of one connector rest on top of the fins of another connector, this arrangement will not form a stable connection because the lower fins will yield. These disagreements reflect factual disputes that implicate the weight and credibility, not the admissibility, of Dr. Dickens’s opinions.

For these reasons, the Court denies Polygroup’s motion to exclude this aspect of Dr. Dickens’s opinions.

3. Analysis of “Interference Fit” Claim Limitation

Polygroup argues that Dr. Dickens’s opinions about the “interference fit” claim limitation ignore critical facts and do not reflect reliable scientific methods.

The asserted claims of the ’186 Patent and the ’379 Patent require that the trunk connector “forms an interference fit” with the trunk body when inserted therein. The Court did not construe this term, but the parties agreed in their joint claim construction statement that an “interference fit” is “an engineered connection where two components

or parts to be connected are manufactured to be of different dimensions such that when one component is pressed into the other, they interfere and deform to force a connection.”

Dr. Dickens opines in his report and deposition testimony that, when he tested the accused products, he had to push and exert force to slide the connector in and out of the trunk body. Dr. Dickens also observed discoloration, markings and scratches on the component parts that, in his opinion, demonstrate that the connectors in some of Polygroup’s accused products have an “interference fit” with the trunk portions. And Dr. Dickens testified that there are protrusions on the plastic connector that may cause an interference fit with the trunk portion.

Polygroup contends that Dr. Dickens ignored Polygroup’s engineering drawings, which provide the dimensions for the connectors and trunk bodies on Polygroup’s products and, according to Polygroup, irrefutably establish that no interference fit occurs between these components. But Polygroup misrepresents the record. Dr. Dickens considered the engineering drawings and testified as to why, in his opinion, the drawings do not prove the absence of an interference fit. Although Polygroup suggests that Dr. Dickens did not use reliable scientific methods, the record reflects that Dr. Dickens based his opinions on his own expertise and observations, including his physical testing and observations of the accused products. *See Shuck v. CNH Am., LLC*, 498 F.3d 868, 875 (8th Cir. 2007) (observing that a qualified expert’s “observations coupled with expertise generally may form the basis of an admissible expert opinion”). Polygroup’s disagreements implicate the weight and credibility, not the admissibility, of Dr. Dickens’s opinions.

The Court, therefore, denies Polygroup's motion to exclude this aspect of Dr. Dickens's opinions.

4. Analysis of "Detachably Connected" Claim Limitation

Polygroup contends that Dr. Dickens's opinions about the "detachably connected" claim limitation should be excluded because they are based on an incorrect legal standard.

Polygroup's accused products must have wiring that is "detachably connected" to infringe claim 7 of the '186 Patent, claim 32 of the '379 Patent and claim 5 of the '072 Patent. According to Polygroup, after its accused products are assembled prior to sale, the wiring is no longer "detachable" without first disassembling the product. Dr. Dickens does not dispute this fact. Instead, Dr. Dickens relies on his ability to detach the wiring after cutting the trunk bodies in half. According to Willis Electric and Dr. Dickens, a product can infringe the "detachably connected" claim limitation even if the wiring is detachable only before the product is assembled and sold to a consumer.

A "device does not infringe simply because it is possible to alter it in a way that would satisfy all the limitations of a patent claim." *High Tech Med. Instrumentation, Inc. v. New Image Indus., Inc.*, 49 F.3d 1551, 1555 (Fed. Cir. 1995). In *High Tech*, the patent claim at issue was directed to a device comprising a camera "being rotatably coupled" to a "body member" of the device. *Id.* at 1553. The district court found infringement because the accused product had a camera that could be "rotatably coupled to the body member when the set screws [were] loosened or removed." *Id.* at 1555 (internal quotation marks omitted). The Federal Circuit reversed because the accused camera was "not rotatable within its housing unless [it was] altered, at least to the extent of removing

or loosening the set screws that secure the camera to the housing.” *Id.* at 1556. “The question is not what a device might have been made to do, but what it was intended to do and did do,” and the fact that “a device could have been made to do something else does not of itself establish infringement.” *Id.* at 1555 (internal quotation marks and brackets omitted).

Here, it is undisputed that Polygroup did not design its accused products to have the internal wiring detached by a consumer during operation. Nor is there any evidence in the record suggesting that any functional purpose would be served by a consumer dismantling Polygroup’s artificial trees or that any consumer has done so. To the contrary, the evidence shows that Dr. Dickens had to *permanently destroy* Polygroup’s artificial tree, by cutting the trunk body open, to detach the wiring assemblies. The circumstances in this case are identical to the circumstances in *High Tech* in all material respects. *See id.* at 1556 (observing that the alleged infringer did not design its camera to rotate during operation and nothing in the record demonstrated that removing the set screws would serve a functional purpose or that any user had done so during actual use). The undisputed facts establish, contrary to Dr. Dickens’s opinion, that Polygroup’s accused products do not contain “detachably connected” wiring as required by claim 7 of the ’186 Patent, claim 32 of the ’379 Patent and claim 5 of the ’072 Patent.

Because Dr. Dickens’s opinions about the “detachably connected” claim limitation are contrary to law, the Court grants Polygroup’s motion to exclude this aspect of Dr. Dickens’s opinions.

5. Analysis of “Insertable” and “Securable” Claim Limitations

Polygroup argues that Dr. Dickens’s opinions about the “insertable into” and “securable to” claim limitations should be excluded because they are based on an incorrect legal standard.

Similar to the detachability of the wiring assemblies addressed above, Polygroup argues that the trunk connectors in its accused products are inserted and secured into the trunk bodies during assembly before they are sold and, therefore, are not designed to be inserted or secured by a consumer. Willis Electric and Dr. Dickens do not dispute this fact and instead rely on evidence that the trunk connectors in Polygroup’s accused products are capable of being inserted and secured into the trunk bodies during assembly.

The Federal Circuit has distinguished between a claim that requires a particular structure—such as “a camera ‘rotatably coupled’ to a body member”—and a claim that only requires a capacity to perform a function—such as magnetic members “capable of engaging” other magnetic members. *Revolution Eyewear, Inc. v. Aspex Eyewear, Inc.*, 563 F.3d 1358, 1369 (Fed. Cir. 2009) (distinguishing *High Tech*). The “rotatably coupled” claim language in *High Tech* described a structure with a particular characteristic, and the accused product in that case did not possess that characteristic unless the structure was altered in an unintended manner. *See id.* By contrast, the “capable of engaging” claim language in *Revolution Eyewear* described a product’s capacity to perform a function, and that functional capacity was inherent in the accused product regardless of whether the product was intended to perform that function and regardless of whether any customer ever performed the function. *See id.* In the latter circumstance, because the accused

product had the capacity to perform the claimed function, the Federal Circuit affirmed the district court's decision to grant summary judgment as to infringement. *Id.* at 1370.

Here, the claim language at issue requires a “trunk connector insertable into the first trunk body . . . and securable to the first trunk body.” Unlike the “detachably connected” claim language addressed above, claim 12 of the '379 Patent does not describe the characteristics of a structure. Rather, this claim describes a capability—namely, the capacity to be inserted into and secured to a trunk body. There is no dispute that the trunk connectors in Polygroup's accused products possess that functional capability, even if no consumer ever performs that function. These circumstances are akin to the circumstances in *Revolution Eyewear*. *See id.* at 1369–70 (observing that, when a claim requires the capacity to perform a function, it is “irrelevant” that the accused products “are not actually used” in that manner so long as they possess the functional capability).

However, in *Revolution Eyewear*, the Federal Circuit recognized a second factual distinction with *High Tech*—namely, whether the accused product must be “altered in any way” for it to be capable of the claimed function. *Id.* at 1370. In *Revolution Eyewear*, no alteration of the accused product was necessary because the accused product was “capable of engaging” magnetic members “*as made and sold.*” *Id.* It is undisputed here that the trunk connectors in Polygroup's accused products, after they are made and sold, are no longer “insertable into” or “securable to” a trunk body without first disassembling the products. For this reason, this case is factually distinguishable from *Revolution Eyewear*. The undisputed facts establish, contrary to Dr. Dickens's opinion,

that Polygroup's accused products, as made and sold, do not contain trunk connectors that are "insertable into" or "securable to" trunk bodies as required by claim 12 of the '379 Patent.

Because Dr. Dickens's opinions about the "insertable into" and "securable to" claim limitations are contrary to law, the Court grants Polygroup's motion to exclude these aspects of Dr. Dickens's opinions.

6. Doctrine-of-Equivalents Opinions

Polygroup next argues that Willis Electric has waived any doctrine-of-equivalents argument as to claims 4 and 10 of the '187 Patent because Willis Electric failed to assert this theory in its final infringement claim charts. Consequently, Polygroup argues, Dr. Dickens's doctrine-of-equivalents opinions must be excluded.

Claim charts are "designed specifically to require parties to crystallize their theories of the case early in the litigation so as to prevent the shifting sands approach to claim construction." *O2 Micro Int'l Ltd. v. Monolithic Power Sys., Inc.*, 467 F.3d 1355, 1364 (Fed. Cir. 2006) (internal quotation marks omitted). "These disclosures must contain enough information to provide notice of the party's infringement contentions and defenses" *QXMédical, LLC v. Vascular Sols., LLC*, 408 F. Supp. 3d 996, 1016 (D. Minn. 2019) (internal quotation marks omitted). If a plaintiff violates a scheduling order by failing to disclose the requisite infringement or invalidity contentions, the plaintiff may be precluded from asserting the improperly disclosed theory on a motion for summary judgment. *See id.* at 1016–17 (collecting cases).

In this case, the Court issued a pretrial scheduling order on March 21, 2016. That order, among other things, required Willis Electric to disclose a claim chart that identifies “(1) which claim(s) of the patents they allege are being infringed; (2) which specific products . . . allegedly infringe each claim; and (3) where each element of each claim listed in (1) is found in each product listed in (2), including the basis for each contention that the element is present.” The pretrial scheduling order also provides:

If any party contends that there is infringement of any claims under the doctrine of equivalents, that party shall separately identify this on the Claim Chart and, in addition to the information required for literal infringement, that party shall also explain each function, way, and result that is allegedly equivalent, and why it contends that any differences are not substantial.

Subsequently, after the stay in this case was lifted, the magistrate judge amended the pretrial scheduling order several times. As relevant here, on November 16, 2020, the magistrate judge imposed a deadline by which Willis Electric was required to disclose its “Final Claim Chart.” That order amended several deadlines but expressly preserved all other requirements of the original March 21, 2016 pretrial scheduling order, “including limitations on discovery and guidance regarding how it should be conducted.”

Pursuant to the magistrate judge’s November 16, 2020 Order, Willis Electric disclosed its “Final Infringement Claim Charts” in December 2020. The claim charts and accompanying contentions identify several categories of Polygroup’s accused products, labeled Group I, Group II, and Group III. Willis Electric’s contentions do not assert that the Group I or Group II products literally infringe claim 4 or claim 10 of the ’187 Patent, nor do Willis Electric’s contentions assert a doctrine-of-equivalents theory of

infringement as to these claims. Indeed, Willis Electric's contentions disavow any such theory, stating that "Willis Electric does not currently believe that the appropriate construction of any terms of any asserted claims necessitates a showing of infringement under the doctrine of equivalents, as opposed to literal infringement." Willis Electric did not seek leave to amend these contentions thereafter. Contrary to Willis Electric's infringement contentions, Willis Electric's expert, Dr. Dickens, subsequently provided an infringement opinion for claim 4 and claim 10 of the '187 Patent as to the Group I and Group II accused products.

A court may preclude a patentee from relying on an infringement theory that was not disclosed in its infringement contentions as required by a scheduling order. *See, e.g., Teashot LLC v. Green Mountain Coffee Roasters*, 595 F. App'x 983, 987 (Fed. Cir. 2015) (excluding doctrine-of-equivalents theory of infringement because it was not disclosed in infringement contentions); *O2 Micro*, 467 F.3d at 1367–70 (affirming summary judgment of noninfringement after ruling that district court did not err by excluding evidence disclosed in violation of pretrial scheduling order); *SanDisk Corp. v. Memorex Prods., Inc.*, 415 F.3d 1278, 1292 (Fed. Cir. 2005) (affirming a district court's exclusion of evidence pertaining to theories of infringement that were not disclosed as required by the local patent rules and the court's scheduling order); *QXMédical*, 408 F. Supp. 3d at 1016–17 (precluding party from presenting invalidity argument that had not been disclosed as required by scheduling order). In addition, a district court may impose sanctions on a party that fails to obey a discovery order, including by "prohibiting the disobedient party from supporting or opposing designated claims or defenses, or from

introducing designated matters in evidence.” Fed. R. Civ. P. 37(b)(2)(A)(ii). District courts also have inherent power “to impose sanctions short of dismissal for violations of court orders.” *State Farm Fire & Cas. Co. v. United States ex rel. Rigsby*, 580 U.S. 39, 49 (2016); *accord Nick v. Morgan’s Foods, Inc.*, 270 F.3d 590, 594 n.2 (8th Cir. 2001). It is within a district court’s “wide discretion” to select the appropriate sanction to impose. *Nick*, 270 F.3d at 595.

Here, it is undisputed that Willis Electric failed to disclose its doctrine-of-equivalents theory of infringement—or *any* theory of infringement—as to claim 4 and claim 10 of the ’187 Patent with respect to the Group I and Group II accused products. Moreover, Willis Electric expressly *disavowed* such a theory of infringement. On this record, Willis Electric’s evidence in support of this theory of infringement warrants exclusion.

Willis Electric attempts to avoid this result by arguing that Polygroup should have remedied this situation by bringing a non-dispositive motion. But Willis Electric’s reliance on *Bombardier Recreational Products Inc. v. Arctic Cat Inc.* in support of this effort, is misplaced. In *Bombardier*, the magistrate judge concluded that the patentee’s expert’s report “did not constitute a change in infringement theory.” Civ. No. 12-2706 (JRT/LIB), 2017 WL 690186, at *4 (D. Minn. Feb. 21, 2017). Similarly, in *Arctic Cat, Inc. v. Bombardier Recreational Products Inc.*, the district court observed that, if the defendant “considered Arctic Cat’s doctrine of equivalents contentions deficient, the proper remedy would have been non-dispositive motion practice.” Civ. No. 12-2692 (JRT/LIB), 2018 WL 654218, at *6 n.13 (D. Minn. Jan. 2, 2018). But in *Arctic Cat*, the

district court concluded that the plaintiff had provided a doctrine-of-equivalents infringement contention that was “broad, but sufficient.” *Id.* at *6.

The decisions in *Bombardier* and *Arctic Cat* involve circumstances that are factually distinguishable from this case. Here, not only did Willis Electric provide *no* doctrine-of-equivalents infringement contention, Willis Electric also expressly *disavowed* any such infringement theory. Polygroup had no basis to know that Willis Electric’s December 2020 infringement contentions were incomplete until after Willis Electric served Dr. Dickens’s expert report in 2022. Moreover, the burden was not on Polygroup to guess that Willis Electric might seek to assert a new theory of infringement that it had previously disavowed. Rather, the burden was on Willis Electric to seek leave to amend its infringement contentions if Willis Electric wished to add new theories of infringement after the deadline for disclosing such theories. *See, e.g., Dane Techs., Inc. v. Gatekeeper Sys., Inc.*, Civ. No. 12-2730 ADM/JJK, 2015 WL 12819180, at *5 (D. Minn. Jan. 20, 2015) (observing that “an expert report cannot introduce new infringement theories without leave to amend on showing good cause”). Willis Electric’s arguments are unavailing.

Accordingly, the Court grants Polygroup’s motion to exclude this aspect of Dr. Dickens’s opinions.

7. GKI Tree Cumulativeness Opinions

Polygroup argues that Dr. Dickens's opinions about the GKI Tree product being "cumulative" of the Loomis Patent should be excluded as contrary to law.

Dr. Dickens opines that the features of the GKI Tree product are cumulative of the invention disclosed by the Loomis Patent. Willis Electric argues that these opinions are relevant to the applicability of IPR estoppel. As addressed below in Part II.A.1. of this Order, IPR estoppel cannot bar Polygroup from advancing invalidity theories of anticipation or obviousness on the GKI Tree because a physical product is *not* a type of prior art reference that can be raised in IPR proceedings. Because IPR estoppel is inapplicable to this case, Dr. Dickens's opinions pertaining to cumulativeness are not relevant to this issue.

Willis Electric argues in the alternative that, even if IPR estoppel does not apply, Dr. Dickens's cumulativeness opinions are relevant to whether certain asserted claims of the One Plug Tree Patents are invalid as obvious in light of the GKI Tree. A jury "may be instructed to evaluate whether the evidence [of invalidity] before it is materially new, and if so, to consider that fact when determining whether an invalidity defense has been proved by clear and convincing evidence." *Microsoft Corp. v. i4i Ltd.*, 564 U.S. 91, 111 (2011). Here, the Loomis Patent is identified in the One Plug Tree Patents as a prior art reference that the PTO considered during prosecution. As such, to the extent that Dr. Dickens opines about the similarities between the Loomis Patent and the GKI Tree, these opinions may be relevant to rebuffing Polygroup's invalidity defense based on the GKI Tree. Polygroup does not dispute the relevance of this evidence, but contends that

Dr. Dickens's opinions fail to address "whether the GKI Tree discloses materially more than the disclosure of the" Loomis Patent. This argument implicates the weight and credibility of Dr. Dickens's cumulativeness opinions, however, not their admissibility.

Accordingly, the Court denies Polygroup's motion to exclude these aspects of Dr. Dickens's opinions.

II. Cross-Motions for Summary Judgment

The parties also cross-move for summary judgment. Summary judgment is proper when the record before the district court establishes that there is "no genuine dispute as to any material fact" and the moving party is "entitled to judgment as a matter of law." Fed. R. Civ. P. 56(a). A genuine dispute as to a material fact exists when there is evidence that, if believed, would permit a reasonable jury to return a verdict for the nonmoving party. *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986). When considering a motion for summary judgment, a district court construes the evidence in the light most favorable to the nonmoving party and draws all reasonable inferences in that party's favor. *See Windstream Corp. v. Da Gragnano*, 757 F.3d 798, 802–03 (8th Cir. 2014). The party asserting that a fact is genuinely disputed must cite "particular parts of materials in the record" that support the assertion. Fed. R. Civ. P. 56(c)(1)(A); *accord Krenik v. County of Le Sueur*, 47 F.3d 953, 957 (8th Cir. 1995).

Willis Electric seeks partial summary judgment as to Polygroup's invalidity defense. Polygroup seeks summary judgment as to invalidity, non-infringement and lost profits. The Court addresses each motion in turn.

A. Willis Electric's Motion for Summary Judgment

Willis Electric contends that Polygroup's invalidity defenses, as asserted with respect to the One Plug Tree Patents, fail as a matter of law.⁴

Issued patents are “presumed valid.” 35 U.S.C. § 282(a). “The burden of establishing invalidity of a patent or any claim thereof shall rest on the party asserting such invalidity.” *Id.* A party asserting that a patent is invalid must establish invalidity by clear-and-convincing evidence. *Microsoft Corp.*, 564 U.S. at 111. In doing so, the party asserting invalidity “bears a heavy burden of persuasion.” *Id.* at 101 (internal quotation marks omitted).

Polygroup contends that the One Plug Tree Patents are invalid on four bases: obviousness under 35 U.S.C. § 103, anticipation under 35 U.S.C. § 102, claiming abstract ideas under 35 U.S.C. § 101 and indefiniteness under 35 U.S.C. § 112. Willis Electric argues that Polygroup is estopped from asserting invalidity defenses of anticipation and obviousness based on the GKI Tree. Willis Electric also argues that Polygroup's “abstract ideas” defense has been waived or, in the alternative, fails as a matter of law. And Willis Electric contends that Polygroup has presented insufficient evidence to support its indefiniteness defense. Each argument is addressed in turn.

⁴ Willis Electric's motion pertains to—and the Court's analysis of that motion is limited to—the following asserted claims of the One Plug Tree Patents: claims 15 and 17 of the '186 Patent; claims 4, 10 and 13 of the '187 Patent; claims 12, 15 and 32 of the '379 Patent and claim 5 of the '072 Patent.

1. Anticipation or Obviousness (35 U.S.C. §§ 102, 103)

Willis Electric argues that statutory and common law estopp Polygroup from arguing that the asserted claims of the One Plug Tree Patents are anticipated or obvious based on the GKI Tree because these defenses reasonably could have been raised during IPR proceedings.

“A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention.” *Schering Corp. v. Geneva Pharms., Inc.*, 339 F.3d 1373, 1377 (Fed. Cir. 2003); *accord* 35 U.S.C. § 102(a)(1) (providing that a person is not entitled to a patent if “the claimed invention was patented, described in a printed publication, or in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention”). A patent is invalid for obviousness “if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.” 35 U.S.C. § 103(a).

A petitioner in IPR proceedings “may request to cancel as unpatentable [one] or more claims of a patent only on a ground that could be raised under section 102 or 103 and only on the basis of prior art consisting of patents or printed publications.” 35 U.S.C. § 311(b). A petitioner in IPR proceedings “may not assert . . . in a civil action . . . that the [patent] claim is invalid on any ground that the petitioner raised or reasonably could have raised during that inter partes review.” 35 U.S.C. § 315(e)(2); *accord Cal. Inst. of Tech. v. Broadcom Ltd.*, 25 F.4th 976, 989 (Fed. Cir. 2022).

Willis Electric contends that Polygroup reasonably could have challenged the validity of the One Plug Tree Patents on anticipation and obviousness grounds based on the Loomis Patent during the IPR proceedings and, therefore, Polygroup is estopped from asserting these invalidity defenses in this case based on the GKI Tree, which is an embodiment of the Loomis Patent. Polygroup does not dispute that it reasonably could have raised anticipation or obviousness grounds for invalidity on the basis of the Loomis Patent during the IPR proceedings. Nor does Polygroup dispute that it knew or reasonably could have known about the GKI Tree when Polygroup petitioned for IPR. But Polygroup contends that it could not have relied on the GKI Tree as prior art during the IPR proceedings because the GKI Tree is a physical product as opposed to a patent or printed publication.

Undisputedly, physical products “cannot be raised during IPR proceedings.” *Wasica Fin. GmbH v. Schrader Int’l, Inc.*, 432 F. Supp. 3d 448, 453 (D. Del. 2020); accord 35 U.S.C. § 311(b) (providing that validity challenges in IPR proceedings may be asserted “only on the basis of prior art consisting of patents or printed publications”). For this reason, some district courts have concluded that “IPR estoppel does not apply to device art, because a petitioner cannot use an IPR to challenge the validity of a patent claim . . . based on prior art *products* or *systems*.” *IOENGINE, LLC v. PayPal Holdings, Inc.*, ___ F. Supp. 3d ___, 2022 WL 2800861, at *31 (D. Del. 2022) (emphasis added) (internal quotation marks omitted). “However, some [district] courts have estopped defendants from asserting device art when ‘the physical product is entirely cumulative’ of

the prior art raised in the IPR, i.e., when the product is ‘materially identical’ to the prior art reference raised in the IPR.” *Id.* (quoting *Wasica*, 432 F. Supp. 3d at 454–55).

Neither the Supreme Court of the United States nor the Federal Circuit has resolved the division among the district courts that have considered this question. *See Chemours Co. FC, LLC v. Daikin Indus., Ltd.*, Civ. No. 17-1612 (MN), 2022 WL 2643517, at *2 (D. Del. July 8, 2022) (recognizing the split in persuasive decisions from district courts as to this issue and the absence of binding appellate precedent). Absent any binding precedent, some courts have relied on statutory interpretation to resolve this issue. *See, e.g., Medline Indus., Inc. v. C.R. Bard, Inc.*, No. 17 C 7216, 2020 WL 5512132, at *3–4 (N.D. Ill. Sept. 14, 2020). This Court will follow suit so as to rationally tether its analysis to the text of the applicable statute.

Under Section 315(e)(2), IPR estoppel applies to any invalidity “ground that the petitioner raised or reasonably could have raised during” the IPR. 35 U.S.C. § 315(e)(2) (emphasis added). The Patent Act does not define the term “ground.” *See* 35 U.S.C. § 100 (defining terms). Black’s Law Dictionary defines “ground,” when used as a noun, as the “reason or point that something (as a legal claim or argument) relies on for validity.” Black’s Law Dictionary 819 (10th ed. 2014).

Consistent with this definition, the Federal Circuit repeatedly has characterized specific prior art references (or combinations thereof) as distinct “grounds” that may be asserted in IPR proceedings. *See, e.g., Cal. Inst. of Tech.*, 25 F.4th at 991 (observing that “the *prior art references* that [defendants] sought to raise in the district court” were “contested *grounds* [that] reasonably could have been included in . . . the IPR” and

affirming district court’s decision barring defendants “from raising invalidity challenges based on *these prior art references*” (emphasis added)); *Koninklijke Philips N.V. v. Google LLC*, 948 F.3d 1330, 1335–36 (Fed. Cir. 2020) (observing that PTAB “instituted inter partes review on three grounds of unpatentability,” and characterizing each “ground” as a distinct prior art reference or combination of prior art references).

For these reasons, the Court interprets the term “ground” in the IPR estoppel provision of 35 U.S.C. § 315(e) to mean a specific prior art reference or combination thereof. *See, e.g., Medline Indus.*, 2020 WL 5512132, at *4 (reaching same conclusion based on analysis of statutory text). Under this interpretation, IPR estoppel applies to any specific prior art reference or combination of such references that the IPR petitioner “raised or reasonably could have raised during” the IPR. 35 U.S.C. § 315(e)(2). Because a physical product is *not* a type of prior art reference that can be raised in IPR proceedings, IPR estoppel cannot bar Polygroup from advancing invalidity theories of anticipation or obviousness based on the GKI Tree.

Willis Electric seeks to avoid this result, arguing that this Court should apply the district court’s reasoning in *Wasica Financial GmbH v. Schrader International, Inc.* In *Wasica*, the district court applied IPR estoppel to prevent the defendant from relying on a physical product that was “materially identical” to and “entirely cumulative” of a patent or printed publication that the defendant could have raised during the IPR proceeding. 432 F. Supp. 3d at 453, 455. The court in *Wasica* reasoned that “the Patent Act distinguishes between grounds and evidence” and, therefore, IPR estoppel “applies to *grounds* . . . even if the *evidence* used to support those grounds was not available to be

used in the IPR.” *Id.* at 454. But, as the court in *Medline Industries, Inc. v. C.R. Bard, Inc.* observed, “such an interpretation stretches the meaning of the term ‘ground’ in the IPR estoppel provision too far,” because “[i]f Congress had wanted to estop an IPR petitioner from pursuing invalidity grounds that relied upon a physical product in a particular situation, . . . it could have provided language to that effect.” 2020 WL 5512132, at *4. Moreover, the court in *Wasica* did not engage in a close analysis of the statutory text and, for this reason, other courts have rejected the holding in *Wasica* and instead followed the holding in *Medline* and other decisions “that have adhered more closely to the statutory language.” *Chemours Co.*, 2022 WL 2643517, at *2. For these reasons, the Court declines to follow the reasoning in *Wasica*.⁵

Willis Electric argues, in the alternative, that the common-law doctrines of claim preclusion and issue preclusion should bar Polygroup from asserting an invalidity defense based on anticipation or obviousness in light of the GKI Tree. Res judicata, also known as claim preclusion, “precludes the relitigation of a claim on grounds that were raised or

⁵ Even if this Court were to apply the reasoning in *Wasica*, Willis Electric would fare no better. In *Wasica*, the district court held that IPR estoppel could apply to a physical product *only if* the product is “materially identical” to and “entirely cumulative” of a patent or printed publication. 432 F. Supp. 3d at 453, 455. The patent owner who invokes IPR estoppel has the burden to demonstrate that estoppel applies. *See Ironburg Inventions Ltd. v. Valve Corp.*, 418 F. Supp. 3d 622, 630 (W.D. Wash. 2019). Here, Willis Electric has not demonstrated that the GKI Tree is materially identical to or entirely cumulative of the Loomis Patent. Although Willis Electric cites evidence vaguely suggesting that the GKI Tree *embodies* the Loomis Patent, that fact alone does not establish that the GKI Tree is *materially identical* to the Loomis Patent. For instance, a product may embody a patented invention yet also include additional *unpatented* features that are material to an invalidity analysis. *Cf. Fox Factory, Inc. v. SRAM, LLC*, 813 F. App’x 539, 542 (Fed. Cir. 2020) (observing that “a product is not coextensive with a claimed invention simply because it falls within the scope of the claim”).

could have been raised in the prior action.” *Lane v. Peterson*, 899 F.2d 737, 741 (8th Cir. 1990).⁶ Issue preclusion bars a party from relitigating an issue that was actually adjudicated in previous litigation between the same parties. *Sandy Lake Band of Miss. Chippewa v. United States*, 714 F.3d 1098, 1102 (8th Cir. 2013). But neither preclusion doctrine will bind a party that did not have a full and fair opportunity to litigate the matter in the earlier proceeding. *See Simmons v. O’Brien*, 77 F.3d 1093, 1095–96 (8th Cir. 1996); *Plough v. W. Des Moines Cmty. Sch. Dist.*, 70 F.3d 512, 517 (8th Cir. 1995). As addressed above, Polygroup did not have a full and fair opportunity to litigate the issue of invalidity based on the GKI Tree in the IPR proceedings because an IPR petitioner cannot rely on a physical product as a prior art reference in such proceedings. For this reason, the Court rejects Willis Electric’s alternative argument based on claim preclusion and issue preclusion.

Accordingly, the Court denies Willis Electric’s motion for summary judgment as to Polygroup’s invalidity defense based on anticipation and obviousness.

2. Abstract Ideas (35 U.S.C. § 101)

Willis Electric next argues that Polygroup waived its defense that the asserted claims of the ’186 Patent and the ’187 Patent are invalid under 35 U.S.C. § 101 for claiming abstract ideas. According to Willis Electric, Polygroup waived this defense by

⁶ Issues unique to patent cases are governed by Federal Circuit precedent. *Aspex Eyewear, Inc. v. Zenni Optical Inc.*, 713 F.3d 1377, 1380 (Fed. Cir. 2013). However, with respect to procedural issues that are not unique to the Federal Circuit’s exclusive jurisdiction over patent matters, such as issue preclusion, the law of the regional circuit applies. *Dana v. E.S. Originals, Inc.*, 342 F.3d 1320, 1323 (Fed. Cir. 2003).

failing to include this defense in its pleadings. In the alternative, Willis Electric argues that this defense fails as a matter of law.

The Patent Act defines the subject matter that is eligible for patent protection: “Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.” 35 U.S.C. § 101. The Supreme Court has “long held that this provision contains an important implicit exception: Laws of nature, natural phenomena, and abstract ideas are not patentable.” *Alice Corp. Pty. Ltd. v. CLS Bank Int’l*, 573 U.S. 208, 216 (2014) (internal quotation marks omitted).

A defendant “must affirmatively state any avoidance or affirmative defense” in its answer to a complaint. Fed. R. Civ. P. 8(c)(1). The Patent Act requires that any invalidity defense, including an invalidity defense under Section 101, “shall be pleaded.” 35 U.S.C. § 282(b). And the Federal Circuit has characterized an invalidity defense under Section 101 as an affirmative defense. *See, e.g., Intell. Ventures I LLC v. Erie Indem. Co.*, 850 F.3d 1315, 1324 (Fed. Cir. 2017). “Generally, failure to plead an affirmative defense results in a waiver of that defense.” *First Union Nat’l Bank v. Pictet Overseas Tr. Corp.*, 477 F.3d 616, 622 (8th Cir. 2007) (citing Fed. R. Civ. P. 8(c)). But if “an affirmative defense is raised in the trial court in a manner that does not result in unfair surprise, . . . technical failure to comply with Rule 8(c) is not fatal.” *Id.* (internal quotation marks omitted).

Polygroup does not dispute that it failed to plead an invalidity defense under Section 101 in its answers to Willis Electric's complaint, first amended complaint and second amended complaint. Polygroup argues that it should be excused from this technical failure because Polygroup put Willis Electric on notice of this defense in Polygroup's September 2016 prior art statement. In that document, which is more than 1,100 pages long, Polygroup included one vague statement about invalidity under Section 101: "In addition, or in the alternative, some or all of the Asserted Claims may fail to satisfy the requirements for patentability under 35 U.S.C. § 101" Thereafter, in February 2020, Polygroup filed an answer to Willis Electric's second amended complaint, but again failed to plead an invalidity defense under Section 101. In these circumstances, Polygroup has not demonstrated that it raised this defense in a manner that would not result in unfair surprise to Willis Electric. A single vague and equivocal reference to Section 101 in a lengthy prior art statement, which Polygroup seemingly abandoned in a subsequent pleading and did not mention again until serving expert reports, is insufficient to put Willis Electric on fair notice of this defense. As such, Polygroup has not established that it should be excused from its failure to plead this affirmative defense.

The Court grants Willis Electric's motion for summary judgment as to Polygroup's invalidity defense under 35 U.S.C. § 101 based on Polygroup's waiver of that defense.

3. Indefiniteness (35 U.S.C. § 112)

Willis Electric next argues that Polygroup has presented insufficient evidence to establish that the asserted claims of the '186 Patent and the '187 Patent are invalid as indefinite under 35 U.S.C. § 112.

A patent specification must “contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains . . . to make and use the same.” 35 U.S.C. § 112(a). “Whether a patent claim is supported by an adequate written description is a question of fact.” *Vasudevan Software, Inc. v. MicroStrategy, Inc.*, 782 F.3d 671, 682 (Fed. Cir. 2015) (internal quotation marks omitted). A patent specification also must “conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the inventor . . . regards as the invention.” 35 U.S.C. § 112(b). “[A] patent is invalid for indefiniteness if its claims, read in light of the specification delineating the patent, and the prosecution history, fail to inform, with reasonable certainty, those skilled in the art about the scope of the invention.” *Nautilus, Inc. v. Biosig Instruments, Inc.*, 572 U.S. 898, 901 (2014). “[A] patent must be precise enough to afford clear notice of what is claimed, thereby appris[ing] the public of what is still open” to the public. *Id.* at 909 (internal quotation marks omitted).

It is a defendant’s burden to overcome the presumption of patent validity and prove invalidity by clear-and-convincing evidence. 35 U.S.C. § 282(a); *Microsoft Corp.*, 564 U.S. at 111. And a party opposing summary judgment may not “rest on mere allegations or denials but must demonstrate on the record the existence of specific facts

which create a genuine issue for trial.” *Krenik*, 47 F.3d at 957 (internal quotation marks omitted).

Willis Electric contends that Polygroup has no evidence to demonstrate that any specific term in the asserted claims of the '186 Patent and the '187 Patent are invalid under Section 112. Polygroup counters that these claims include functional language—namely, the “independent of” claim limitation—that lacks a corresponding structure for performing the claimed function. In support of this argument, Polygroup relies on the patents and the opinions of Polygroup’s invalidity expert, Dr. Martens. Willis Electric counters that Dr. Martens’s analysis of this issue is not legally sound.

Apparatus patent claims “are not necessarily indefinite for using functional language.” *UltimatePointer, L.L.C. v. Nintendo Co.*, 816 F.3d 816, 826 (Fed. Cir. 2016) (quoting *Microprocessor Enhancement Corp. v. Tex. Instruments Inc.*, 520 F.3d 1367, 1375 (Fed. Cir. 2008)). “If an apparatus claim is clearly limited to an apparatus possessing the recited structure and *capable* of performing the recited functions, then the claim is not invalid as indefinite.” *Id.* (internal quotation marks and brackets omitted). When determining whether an apparatus claim possesses a structure capable of performing the recited functions, the claim language is viewed in light of the written description. *See Med. Instrumentation & Diagnostics Corp. v. Elekta AB*, 344 F.3d 1205, 1211 (Fed. Cir. 2003).

In his expert report, Dr. Martens opines that “the generic ‘trunks’ and ‘connectors’ identified in the claims do not provide adequate corresponding structure that explains or limits how these generic structures perform the claimed function”—that function being,

namely, the ability to make an electrical connection “independent of” the rotational orientation of the trunk portions. The Court construed this disputed functional language in its claim construction order as follows:

The Court rejects Polygroup’s proposed construction of this phrase and adopts Willis Electric’s proposed construction of this phrase—namely, “an electrical connection that can be made at any available arrangement of the first tree/trunk portion relative to the second tree/trunk portion about a common vertical axis between the tree-trunk portions.”

According to Dr. Martens, the asserted patent claims fail to provide a corresponding structure to perform this function.

Significantly, Dr. Martens’s indefiniteness opinion does not address the terms “coaxial trunk connectors” and “coaxial electrical contact set,” which appear in claim 15 of the ’186 Patent and claims 4, 10 and 13 of the ’187 Patent.⁷ The Court construed these terms in its claim construction order as follows:

The Court adopts Willis Electric’s proposed construction of “coaxial trunk connectors”—namely, “connectors capable of making an electrical connection between trunk sections and that include a set of electrical contacts that permit the electrical connection to be made about a common vertical axis of the trunk sections.” And the Court adopts Polygroup’s proposed construction of “coaxial contact sets”—namely, “a set of electrical contacts that share a common vertical axis.”

The Court also construed the related claim terms “trunk electrical connector/trunk connector” and “trunk connector assembly” as follows:

⁷ Dr. Martens briefly references the “coaxial trunk connectors” term in his report, but he does not opine that this term is indefinite or insufficiently describes a structure capable of performing the claimed function.

The Court construes the terms “trunk electrical connector,” “trunk connector,” and “trunk connector assembly” to mean “an assembly that is capable of making an electrical connection between trunk/tree portions.”

Both the '186 Patent and the '187 Patent include multiple figures and written descriptions of these physical structures—namely, trunk connectors, coaxial trunk connectors and coaxial contact sets. For instance, the figures and specifications depict and describe “male” and “female” counterpart connectors and contact sets that form coaxial electrical connections when two trunk portions are mechanically coupled along a common vertical axis. Willis Electric’s technical expert, Dr. Dickens, opines that an “electrical contact set [is] of a coaxial nature when it has an electrical contact generally at a center point of the connector and another contact at a location around the center point such that the electrical contacts mate . . . no matter at what rotational orientation the [mechanical] connectors mate.” Dr. Martens opines that the asserted patents describe “generic” structures involving “conventional parts arranged in conventional ways.” But, as Dr. Dickens counters, the asserted patents describe a “novel combination or arrangement” of trunk portions that contain “electrical connectors *of the described coaxial nature* that allow for an electrical connection to be made at any rotational orientation at which a mechanical connection is made without having to separately align and connect electrical prongs to create [an] electrical connection.” The only evidence on which Polygroup relies for its indefiniteness argument—namely, the asserted patents and the anticipated opinion testimony of Dr. Martens—does not establish that the asserted patents fail to disclose a structure capable of performing the recited functions.

In summary, although it is Polygroup's burden to overcome the presumption of patent validity and prove invalidity by clear-and-convincing evidence, Polygroup has not presented clear-and-convincing evidence establishing that the asserted claims of the '186 Patent or the '187 Patent are invalid as indefinite under 35 U.S.C. § 112. Accordingly, the Court grants Willis Electric's motion for summary judgment as to Polygroup's invalidity defense based on alleged indefiniteness under 35 U.S.C. § 112.

B. Polygroup's Motion for Summary Judgment

Polygroup moves for summary judgment as to invalidity, non-infringement and lost profits. Polygroup also seeks dismissal of two named defendants, arguing that these defendants are holding companies that do not sell any products accused of infringement. The Court addresses each argument in turn.

1. Invalidity

Polygroup argues that certain asserted claims of the One Plug Tree Patents are invalid as obvious in light of a prior art product—namely, the GKI Tree. Polygroup also argues that both asserted claims of the '617 Patent are invalid as anticipated by a prior art product—namely, the Wesley Pine Tree.

a. Invalidity for Obviousness (35 U.S.C. § 103).

Polygroup contends that certain asserted claims of the One Plug Tree Patents are invalid as obvious in light of the GKI Tree. Specifically, Polygroup argues that the following asserted patent claims are invalid as obvious: claims 7, 15 and 17 of the '186 Patent; claims 4, 10 and 13 of the '187 Patent; claims 12, 15 and 32 of the '379 Patent and claim 5 of the '072 Patent.

A patent is invalid for obviousness “if the differences between the claimed invention and the prior art are such that the claimed invention as a whole would have been obvious before the effective filing date of the claimed invention to a person having ordinary skill in the art to which the claimed invention pertains.” 35 U.S.C. § 103. Determining whether a patent is invalid for obviousness requires considering “the scope and content of the prior art,” any “differences between the prior art and the claims at issue,” “the level of ordinary skill in the pertinent art” and “[s]uch secondary considerations as commercial success, long felt but unsolved needs, [and] failure of others.” *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007) (internal quotation marks omitted). Other relevant considerations include the “the effects of demands known to the design community or present in the marketplace” and “background knowledge possessed by a person having ordinary skill in the art.” *Id.* at 418. The party seeking to invalidate a patent based on obviousness must establish this affirmative defense by clear-and-convincing evidence. *Microsoft Corp.*, 564 U.S. at 96–97.

The initial considerations in the obviousness analysis are “the scope and content of the prior art” and, relatedly, any “differences between the prior art and the claims at issue.” *KSR Int’l*, 550 U.S. at 406. These considerations are factual inquiries. *Circuit Check Inc. v. QXQ Inc.*, 795 F.3d 1331, 1335 (Fed. Cir. 2015). Willis Electric’s expert Dr. Dickens opines that the GKI Tree is materially different from the inventions claimed in One Plug Tree Patents because the GKI Tree lacks coaxial trunk connectors, an “interference fit” between certain components, detachable wiring and coaxial contact sets. To be sure, some of Dr. Dickens’s opinions about the differences between the GKI Tree and the

inventions claimed in the One Plug Tree Patents involve discrediting Polygroup's contrary evidence, including the opinions of Dr. Martens. But the burden to prove invalidity by clear-and-convincing evidence rests with Polygroup. *Microsoft Corp.*, 564 U.S. at 96–97. A jury reasonably could believe Dr. Dickens, and disbelieve Dr. Martens, about the similarities and differences between the GKI Tree and the inventions claimed in the One Plug Tree Patents.

In addition, it is undisputed that the GKI Tree is materially different from the inventions claimed in the One Plug Tree Patents in at least one way: the GKI Tree undisputedly did not have coaxial contact sets. Polygroup contends that it would have been obvious for a person skilled in the art to substitute the DC connector in the GKI Tree with a coaxial AC connector. A party seeking to invalidate a patent based on obviousness must establish, by clear-and-convincing evidence, that “a skilled artisan would have been motivated to combine the teachings of the prior art references to achieve the claimed invention, and that the skilled artisan would have had a reasonable expectation of success in doing so.” *InTouch Techs. Inc. v. VGO Commc'ns, Inc.*, 751 F.3d 1327, 1347 (Fed. Cir. 2014) (internal quotation marks omitted). An expert's testimony as to obviousness must provide more than “a conclusory statement that a person of ordinary skill in the art would have known . . . how to combine any number of [prior art] references to achieve the claimed inventions.” *ActiveVideo Networks, Inc. v. Verizon Commc'ns, Inc.*, 694 F.3d 1312, 1327 (Fed. Cir. 2012). Because such a

conclusory statement is “fraught with hindsight bias,” an expert must provide a factual basis for such a conclusion.⁸ *Id.*

Dr. Martens opines that a person of ordinary skill in the art would have reason modify the GKI Tree to include a coaxial electrical connector. In support of this opinion, Dr. Martens observes that such connectors were widely known and available and that a person “of skill with this knowledge would find it obvious that . . . one connector could be replaced by another.” In addition to the availability of the component parts, a skilled artisan “may have other reasons” for making such a modification to the GKI Tree, such as “improving ease of manufacturing and mitigating mechanical wear-and-tear.” In short, Dr. Martens’s opinions about motivation to combine are based on the facts that the component parts were known and readily available, and that the modification would improve the manufacturing process and reduce mechanical wear-and-tear.

In response, Dr. Dickens does not dispute that “a wide range of various types of electrical connectors were available and known.” But he opines that implementing such a modification to the GKI Tree “would have required experimentation” and would not be as simple as Dr. Martens suggests, because the components “must be physically and electrically compatible with the other components.” According to Dr. Dickens, a skilled artisan “would have had to go through numerous steps to attempt to design, create, and

⁸ An expert can “guard against this hindsight bias by appropriately considering all objective evidence of nonobviousness,” including but not limited to the commercial success of the patentee’s product or service, industry praise or licenses. *InTouch Techs.*, 751 F.3d at 1352. Both Dr. Dickens and Dr. Martens address these factors in their respective expert reports. As such, a genuine issue of material fact exists as to these factors.

manufacture a custom coaxial connector that could work for that type of tree,” which could have required “months of work and time, and hundreds of thousands of dollars to complete.” And Dr. Dickens details the complexity of this process, opining that a skilled artisan would not have been motivated to undertake such a process. Dr. Dickens also explains in detail why he disagrees with Dr. Martens’s opinion that improving the manufacturing process and reducing mechanical wear-and-tear would have been significant motivating factors. These competing opinions present a genuine dispute of material fact as to whether a person of ordinary skill in the art would have been motivated to modify the GKI Tree and whether that person would have had a reasonable expectation of success in doing so.

In addition, Dr. Dickens and Dr. Martens present competing opinions as to the secondary considerations for an obviousness analysis. These objective secondary considerations include commercial success, long felt but unsolved needs and the failure of others. *KSR Int’l*, 550 U.S. at 406. A court must always consider such evidence, when presented, as part of the obviousness analysis. *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340, 1349 (Fed. Cir. 2012). “Objective evidence of no obviousness is an important component of the obviousness inquiry because evidence of secondary considerations may often be the most probative and cogent evidence in the record,” and such evidence “may often establish that an invention appearing to have been obvious in light of the prior art was not.” *Id.* (internal quotation marks omitted). Dr. Dickens opines about the commercial success of products embodying the One Plug Tree Patents, industry adoption, industry praise and the failure

of and copying by others. In addition, Willis Electric's damages expert opines about commercial success, licensing and industry praise. And Willis Electric cites evidence from fact witnesses, such as buyers for retailers, pertaining to these factors. For these reasons, there are genuine disputes of material fact as to the secondary considerations for the obviousness analysis.

In summary, because numerous disputes of material fact exist, the Court denies Polygroup's motion for summary judgment as to invalidity based on obviousness under 35 U.S.C. § 103.

b. Invalidity for Anticipation (35 U.S.C. § 102)

Polygroup contends that claims 4 and 11 of the '617 Patent are anticipated by a prior art product—the Wesley Pine Tree—and, therefore, invalid under 35 U.S.C. § 102.

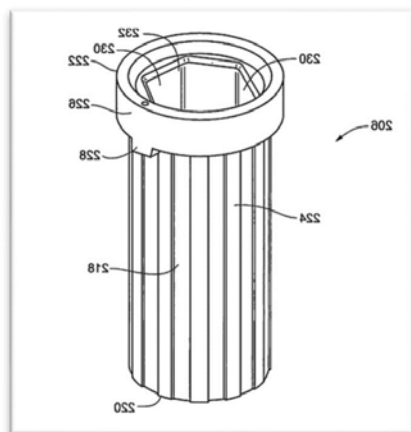
“A patent is invalid for anticipation if a single prior art reference discloses each and every limitation of the claimed invention.” *Schering Corp.*, 339 F.3d at 1377. The disclosure of a claim limitation in a prior art reference may be either express or inherent. *SRI Int'l, Inc. v. Cisco Sys., Inc.*, 930 F.3d 1295, 1306 (Fed. Cir. 2019). Whether a patent claim is invalid based on anticipation “is a question of fact.” *ClearValue, Inc. v. Pearl River Polymers, Inc.*, 668 F.3d 1340, 1343 (Fed. Cir. 2012).

As an initial matter, Willis Electric argues that the Wesley Pine Tree is not prior art because Polygroup relies on photographs and illustrations of this product that were created in 2016, after the effective filing date of the '617 Patent.⁹ A physical product is

⁹ It is undisputed that the critical date of the '617 Patent is in 2011, when the patentee filed the provisional patent application.

prior art if it was “in public use, on sale, or otherwise available to the public before the effective filing date of the claimed invention.” 35 U.S.C. § 102(a)(1). A patent challenger must prove, by clear-and-convincing evidence, that alleged prior art predates the patent’s effective filing date. *ATEN Int’l Co. v. Uniclass Tech. Co.*, 932 F.3d 1364, 1368 (Fed. Cir. 2019). Willis Electric argues that photographs and illustrations of the Wesley Pine Tree were created after the effective filing date of the ’617 Patent. But these photographs and illustrations are not the prior art on which Polygroup relies. Rather, Polygroup contends that the Wesley Pine Tree—the physical product itself—is the prior art that anticipates the ’617 Patent. Polygroup presents undisputed evidence that the Wesley Pine Tree was sold in 2008 and 2009, before the effective filing date of the ’617 Patent. And Polygroup presents evidence that the photographs on which it relies depict the same structure as the Wesley Pine Tree products sold in 2008 and 2009. As such, there is no genuine dispute as to whether the Wesley Pine Tree is prior art.

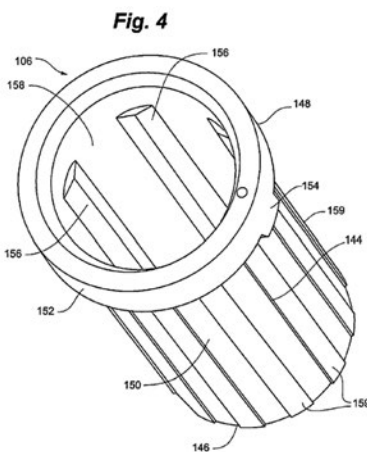
To invalidate the ’617 Patent, the Wesley Pine Tree must disclose “each and every limitation of the claimed invention.” *Schering Corp.*, 339 F.3d at 1377. Here, the parties dispute whether the Wesley Pine Tree discloses a “plurality of ribs.” Asserted claims 4 and 11 of the ’617 Patent depend on claim 1, which requires that “the inner wall” of the coupling mechanism “further compris[es] a plurality of ribs.” The parties’ dispute pertains to whether the Wesley Pine Tree discloses the same “plurality of ribs” depicted in Figure 9 of the ’617 Patent, as shown below:



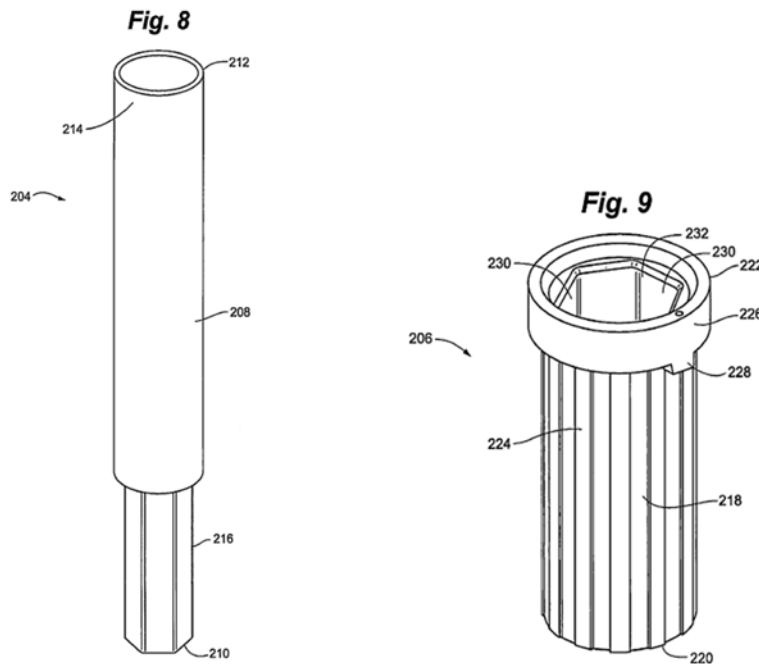
'617 Patent, Fig. 9

Wesley Pine Tree coupling mechanism

The Court did not construe the claim term “plurality of ribs.” A commonly understood meaning of “rib” is “an elongated ridge.” *See* Merriam-Webster’s Collegiate Dictionary 1071 (11th ed. 2014); *see also id.* at 1072 (defining “ridge” as “an elevated body part or structure,” “an elongated crest or linear series of crests,” or “a raised strip”). Consistent with this commonly understood meaning, the '617 Patent describes “ribs” or “rib-like projections” that form channels in the coupling mechanism that mirror the shape of corresponding “ridges” in another trunk portion. And figures in the '617 Patent clearly depict ribs as ridges or raised strips, such as the ribs labeled in Figure 4 with numbers 156 and 159, as shown below:



Polygroup maintains that the internal hexagonal surfaces of the coupling mechanism in the Wesley Pine Tree can be considered a “plurality of ribs” because they are identical to the internal hexagonal surfaces of the coupling mechanism in Figure 9 of the ’617 Patent. But Dr. Dickens disagrees. At his deposition, Dr. Dickens testified that “Figure 9 . . . has these structures coming in a double line,” meaning that the corners of the hexagonal shape do not come to a “point,” but instead the inside surface is “sticking out inward.” Indeed, the specification of the ’617 Patent describes Figure 9 as having “radially-extending ribs **230** that are substantially flat along the inner surface **232**, *but form channels that mirror the shape of the vertices of the edges around second trunk portion **204** in a hexagonal shape.*” As shown below, and consistent with Dr. Dickens’s testimony, the corners of this hexagonal shape do not come to a point on either the insertable portion of Figure 8 or the inner cavity of Figure 9:



In contrast, it is undisputed that the flat surfaces of the hexagonal inner cavity of the Wesley Pine Tree's coupling mechanism meet at points:



For this reason, Willis Electric has presented evidence from which a jury reasonably could find that the Wesley Pine Tree does not disclose every limitation of asserted claims 4 and 11 of the '617 Patent.

Accordingly, the Court denies Polygroup's motion for summary judgment as to invalidity based on anticipation under 35 U.S.C. § 102.

2. Non-Infringement

Polygroup moves for summary judgment of non-infringement as to the asserted claims of the One Plug Tree Patents and the '617 Patent.

Whoever “without authority makes, uses, offers to sell, or sells any patented invention, within the United States . . . during the term of the patent,” infringes that patent. 35 U.S.C. § 271(a). A district court employs a two-step analysis when making a patent-infringement determination. *See Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 976 (Fed. Cir. 1995). First, the district court construes the asserted claims of the patent to ascertain their meaning and scope. *Id.* Second, the fact finder compares the

construed claims to the accused product. *Id.* Because the Court previously construed the disputed claim terms in this case, only step two is now at issue. Summary judgment of non-infringement is appropriate if, after resolving all reasonable factual inferences in favor of the patentee, “no reasonable jury could find infringement.” *Absolute Software, Inc. v. Stealth Signal, Inc.*, 659 F.3d 1121, 1130 (Fed. Cir. 2011).

“A patentee may prove infringement by any method of analysis that is probative of the fact of infringement, and circumstantial evidence may be sufficient.” *Am. Med. Sys. v. Laser Peripherals, LLC*, 712 F. Supp. 2d 885, 895 (D. Minn. 2010) (quoting *Martek Biosciences Corp. v. Nutrinova, Inc.*, 579 F.3d 1363, 1372 (Fed. Cir. 2009)). As such, a “district court should approach a motion for summary judgment on the fact issue of infringement with great care.” *Cole v. Kimberly-Clark Corp.*, 102 F.3d 524, 528 (Fed. Cir. 1996).

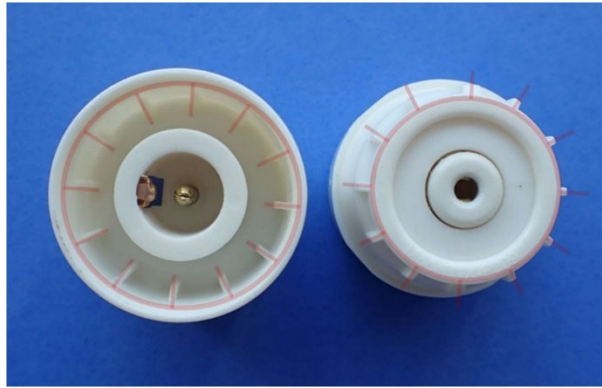
According to Polygroup, the undisputed evidence establishes that its accused products do not infringe the asserted patents because the accused products lack seven features claimed in the asserted patents. Willis Electric counters that genuine disputes of material fact exist as to each of these issues. The parties also dispute whether Willis Electric waived its doctrine-of-equivalents theory of infringement as to claims 4 and 10 of the '187 Patent. The Court addresses each argument in turn.

a. Electrical Connection Independent of Rotational Orientation

The parties first dispute whether Polygroup’s accused products have “an electrical connection that can be made at any available arrangement of the first tree/trunk portion

relative to the second tree-trunk portion,” as required by several asserted claims of the ’186 Patent and the ’187 Patent.

It is undisputed that Polygroup’s accused products have trunk connectors that include twelve plastic “fins” around their perimeter, as depicted below:



Polygroup contends that, in its accused products, an electrical connection *cannot* be made at “any available arrangement” of two trunk portions because if the “fins” of one connector are positioned precisely to rest on top of the “fins” of another connector, the two trunk portions will be mechanically coupled but *not* electrically connected. In other words, there are available arrangements of the trunk portions in Polygroup’s products that do not permit an electrical connection to be made. In support of this argument, Polygroup relies on the opinions of its expert, Dr. Martens.

Willis Electric counters this argument by relying on the opinions of its expert, Dr. Dickens. He repeatedly testified that the fins in the connectors of Polygroup’s accused products *prevent* a mechanical connection from occurring if one set of fins is resting on top of another set of fins, and that it is “not a mechanical connection just because they touch.” Dr. Dickens explained that “those ribs are quite flimsy” and “there

is no way the plastic on that section is going to handle [the] weight” of the tree. For this reason, according to Dr. Dickens, if the fins of one connector rest on top of the fins of another connector it will not form a stable connection, the lower fins will yield and the top portion will slide down into place and form an electrical connection. Polygroup characterizes this opinion as factually unsupported speculation. But a qualified expert’s “observations coupled with expertise generally may form the basis of an admissible expert opinion.” *Shuck v. CNH Am., LLC*, 498 F.3d 868, 875 (8th Cir. 2007). Dr. Dickens’s testimony reflects that he relied on his expertise and observations, including his experience assembling similar artificial trees. As such, there is a genuine dispute of material fact as to whether Polygroup’s accused products have “an electrical connection that can be made at any available arrangement of the first tree/trunk portion relative to the second tree-trunk portion.”

For this reason, the Court denies Polygroup’s motion for summary judgment of non-infringement on this basis.

b. Coupling of Trunk Bodies/Trunk Walls

The parties next dispute whether “coupling” occurs between the trunk bodies or the trunk walls of Polygroup’s accused products, as required by the asserted claims of the ’186 Patent, the ’187 Patent and the ’072 Patent.

In its accused products, Polygroup argues, “the coupling or connection between trunk portions occurs at the connectors, not between the trunk bodies or trunk walls.” In support of this contention, Polygroup relies on the opinions of Dr. Martens and design

drawings, which reflect that the trunk portions do not physically touch but instead have a gap of at least 0.25 millimeters.

As an initial matter, it is unclear why Polygroup believes that “coupling” trunk portions requires the trunk portions to be touching or in physical contact. The term “coupling” is commonly understood to mean “the act of bringing or coming together” or “a device that serves to connect the ends of adjacent parts or objects.” *See* Merriam-Webster’s Collegiate Dictionary 286 (11th ed. 2014). The plain meaning of “coupling” does not require physical contact or touching. Consistent with this plain meaning, the Court construed “coupling mechanism” to mean, in part, a “hollow structure *for joining two trunk portions.*” And the Court rejected a construction that would require a coupling mechanism to create a “snug” or “secure” fit between trunk portions. Polygroup has identified nothing in the specifications of the asserted patents suggesting that “coupling” requires physical contact or touching. Indeed, the word “touch” appears nowhere in the asserted patents.

Even if physical touching or contact were required, Dr. Dickens provides three reasons why, in his opinion, the trunk bodies in Polygroup’s accused products satisfy this claim limitation. Based on his review of the relevant design drawings, his physical inspection of the products, and his expertise, Dr. Dickens opines that the trunk bodies “touch, absolutely,” because “necking occurs at the top of the first trunk portions, the alleged gap on which Dr. Martens relies does not account for paint and surface finishing, and trunk bodies cannot remain perfectly vertical as would be required to maintain a gap as small as 0.25 millimeters.” Polygroup again characterizes this opinion as factually

unsupported speculation. But a qualified expert may rely on “observations coupled with expertise,” which Dr. Dickens has done here. *Shuck*, 498 F.3d at 875. As such, a genuine dispute of material fact exists as to this issue.

Accordingly, the Court denies Polygroup’s motion for summary judgment of non-infringement on this basis.

c. Interference Fit

The parties next dispute whether the connectors in Polygroup’s accused products have an “interference fit” with the trunk portions, as required by the asserted claims of the ’186 Patent and the ’379 Patent.

The asserted claims of the ’186 Patent and the ’379 Patent require that the trunk connector “forms an interference fit” with the trunk body when inserted therein. The Court did not construe this term, but the parties agreed in their joint claim construction statement that an “interference fit” is “an engineered connection where two components or parts to be connected are manufactured to be of different dimensions such that when one component is pressed into the other, they interfere and deform to force a connection.” According to Polygroup, when a connector is inserted into the trunk of Polygroup’s accused products, “a gap exists and there is neither interference nor deformation to force a connection.” In support of this argument, Polygroup relies on declarations from Dr. Martens and a Polygroup engineer. Dr. Martens bases his opinions on his review of the engineering drawings and measurements as well as his inspection of an example of the product.

Contrary to Polygroup's evidence, Dr. Dickens opines in his report and deposition testimony that, when he tested the accused products, he had to push and exert force to slide the connector in and out of the trunk body. Dr. Dickens also observed discoloration, markings and scratches on the component parts that, in his opinion, demonstrate that the connectors in some of Polygroup's accused products have an "interference fit" with the trunk portions. And Dr. Dickens testified that there are protrusions on the plastic connector that may cause an interference fit with the trunk portion. Polygroup vigorously disagrees with Dr. Dickens's observations and opinions. But Polygroup's disagreements implicate the weight and credibility of Dr. Dickens's opinions. It is the role of the jury, not the Court, to make credibility determinations and weigh the evidence. On this record, there is a genuine dispute of material fact as to whether the connectors in some of Polygroup's accused products have an "interference fit" with the trunk portions.

Accordingly, the Court denies Polygroup's motion for summary judgment of non-infringement on this basis.

d. Detachably Connected Wiring

The parties next dispute whether the wiring in Polygroup's accused products are "detachably connected," as required by claim 7 of the '186 Patent, claim 32 of the '379 Patent and claim 5 of the '072 Patent.

According to Polygroup, after its accused products are assembled prior to sale, the wiring is no longer "detachable" without first disassembling the product. Willis Electric does not dispute this fact and relies on evidence that the wiring in Polygroup's accused products is detachable *before* the wiring is inserted into the trunk portion during assembly

and remains detachable after assembly if the trunk portion is disassembled. According to Willis Electric, a product can infringe the “detachably connected” claim limitation even if the wiring is detachable only before the product is assembled and sold to a consumer.

As addressed above in Part I.C.4. of this Order, a “device does not infringe simply because it is possible to alter it in a way that would satisfy all the limitations of a patent claim.” *High Tech*, 49 F.3d at 1555. “The question is not what a device might have been made to do, but what it was intended to do and did do,” and the fact that “a device could have been made to do something else does not of itself establish infringement.” *Id.* (internal quotation marks and brackets omitted).

Here, it is undisputed that Polygroup did not design its accused products to have the internal wiring detached by a consumer during operation. Nor is there any evidence in the record suggesting that any functional purpose would be served by a consumer dismantling Polygroup’s artificial trees or that any consumer has done so. To the contrary, Willis Electric had to *permanently destroy* Polygroup’s artificial tree, by cutting the trunk body open, to detach the wiring assemblies. The circumstances in this case are identical to the circumstances in *High Tech* in all material respects. *See id.* at 1556 (observing that alleged infringer did not design its camera to rotate during operation and nothing in the record demonstrated that removing the set screws would serve a functional purpose or that any user had done so during actual use). The undisputed facts establish that Polygroup’s accused products do not contain “detachably connected” wiring as required by claim 7 of the ’186 Patent, claim 32 of the ’379 Patent and claim 5 of the ’072 Patent.

Accordingly, the Court grants Polygroup's motion for summary judgment of non-infringement as to claim 7 of the '186 Patent, claim 32 of the '379 Patent and claim 5 of the '072 Patent on this basis.

e. Insertable/Securable Trunk Connectors

The parties next dispute whether the trunk connectors in Polygroup's accused products are "insertable" or "securable" into the trunk bodies, as required by claim 12 of the '379 Patent.

Similar to the detachability of the wiring assemblies addressed above, Polygroup argues that the trunk connectors in its accused products are inserted and secured into the trunk bodies during assembly before they are sold and, therefore, are not designed to be inserted or secured by a consumer. Willis Electric does not dispute this fact and relies solely on evidence that the trunk connectors in Polygroup's accused products are capable of being inserted and secured into the trunk bodies during assembly.

The Federal Circuit has distinguished between a claim that requires a particular structure—such as “a camera ‘rotatably coupled’ to a body member”—and a claim that only requires a capacity to perform a function—such as magnetic members “capable of engaging” other magnetic members. *Revolution Eyewear*, 563 F.3d at 1369 (distinguishing *High Tech*). The “rotatably coupled” claim language in *High Tech* described a structure with a particular characteristic, and the accused product in that case did not possess that characteristic unless the structure was altered in an unintended manner. *See id.* By contrast, the “capable of engaging” claim language in *Revolution Eyewear* described the capacity to perform a function, and that functional capacity was

inherent in the accused product regardless of whether the product was intended to perform that function and regardless of whether any customer ever performed the function. *See id.* In the latter circumstance, because the accused product had the capacity to perform the claimed function, the Federal Circuit affirmed the district court’s decision to grant summary judgment as to infringement. *Id.* at 1370.

Here, the claim language at issue requires a “trunk connector insertable into the first trunk body . . . and securable to the first trunk body.” Unlike the “detachably connected” claim language addressed above, claim 12 of the ’379 Patent does not describe the characteristics of a structure. Rather, this claim language describes a capability—namely, the capacity to be inserted into and secured to a trunk body. There is no dispute that the trunk connectors in Polygroup’s accused products possess that functional capability, even if no consumer ever performs that function. These circumstances are akin to the circumstances in *Revolution Eyewear*. *See id.* at 1369–70 (observing that, when a claim requires the capacity to perform a function, it is “irrelevant” that the accused products “are not actually used” in that manner so long as they possess the functional capability).

However, in *Revolution Eyewear*, the Federal Circuit recognized a second factual distinction with *High Tech*—namely, whether the accused product must be “altered in any way” for it to be capable of the claimed function. *Id.* at 1370. In *Revolution Eyewear*, no alteration of the accused product was necessary because the accused product was “capable of engaging” magnetic members “*as made and sold.*” *Id.* It is undisputed here that, after they are made and sold, the trunk connectors in Polygroup’s accused

products are no longer “insertable into” or “securable to” a trunk body without first disassembling the products. For this reason, this case is factually distinguishable from *Revolution Eyewear*. The undisputed facts establish that Polygroup’s accused products do not contain trunk connectors that are “insertable into” or “securable to” trunk bodies as required by claim 12 of the ’379 Patent.

Accordingly, the Court grants Polygroup’s motion for summary judgment of non-infringement as to claim 12 of the ’379 Patent on this basis.

f. Wires that Extend Between Ends of First Trunk Portion

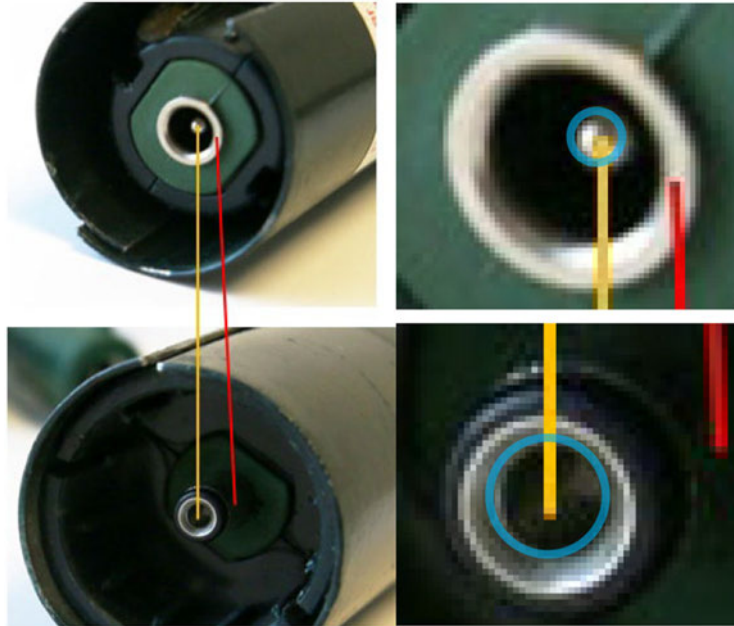
The parties next dispute whether the wires in Polygroup’s accused products “extend[] between a first end of the first trunk portion and a second end of the first trunk portion,” as required by claim 7 of the ’186 Patent. In light of the Court’s conclusion in Part II.B.2.d. of this Order, the Court need not address this issue because Willis Electric cannot establish infringement of claim 7 of the ’186 Patent as a matter of law.

g. Electrical Connection Along the Central Vertical Axis

The parties next dispute whether Polygroup’s accused products have electric contacts that make “an electrical connection . . . at a point along the central vertical axis,” as required by claim 4 of the ’187 Patent.

According to Polygroup, its accused products have electrical contacts that make an electrical connection off-center as opposed to making the connection along the central vertical axis. In support of this argument, Polygroup relies on the declaration of Dr. Martens, who opines that “[b]ecause the centermost cylindrical electrical contact of the first trunk portion is located off the central vertical axis, it cannot make contact with

the center pin electrical contact of the second trunk portion at a point along the central vertical axis.” Dr. Martens relies on the following images to depict how the electrical connection (annotated in blue) occurs off-center:



According to Willis Electric, the opinions of Dr. Martens conflate physical contact with electrical connection. As Dr. Dickens testified, “[e]lectrical connection is not—does not mean contact. Electrical connection is any structure that allows the current to flow through it.” As such, Dr. Dickens opines that although the physical contact might be off-center, “the [electrical] current is allowed to flow right in, right into the middle and right up through the—the center of it. And that is an electrical connection that’s made when you allow the electrons to flow through that entirety of metal structure.” Although the parties did not seek a construction of the claim term “electrical connection,” Dr. Dickens’s testimony is consistent with the specification of the ’187 Patent, which

depicts electrical contacts akin to those depicted in Dr. Martens's declaration. On this record, there is a genuine dispute of material fact as to this issue.

Accordingly, the Court denies Polygroup's motion for summary judgment of non-infringement on this basis.

h. Doctrine of Equivalents

Polygroup next argues that Willis Electric has waived any doctrine-of-equivalents argument as to claims 4 and 10 of the '187 Patent because Willis Electric failed to assert this theory in its final infringement claim charts. The Court agrees for the reasons addressed in Part I.C.6. of this Order. Accordingly, the Court grants Polygroup's motion for summary judgment of non-infringement as to claim 4 and claim 10 of the '187 Patent with respect to the Group I and Group II accused products.

3. Lost Profits

Polygroup next argues that Willis Electric cannot prove that it is entitled to lost profits damages.

If patent infringement is proved, "the court shall award the [patentee] damages adequate to compensate for the infringement." 35 U.S.C. § 284. The phrase "damages adequate to compensate" in Section 284 "includes any foreseeable lost profits the patent owner can prove." *Grain Processing*, 185 F.3d at 1349. If a patentee cannot prove lost profits, the statute sets "a reasonable royalty" as the damages floor. *See* 35 U.S.C. § 284.

To recover lost profits as opposed to a reasonable royalty, "a patent owner must prove a causal relationship between the infringement and its loss of profits." *BIC Leisure*, 1 F.3d at 1218. In other words, "[t]he patent owner must show that 'but for' the

infringement, it would have made the infringer's sales." *Id.* The Federal Circuit has adopted the four-factor *Panduit* test as one method for a patentee to establish entitlement to lost profits damages. *Rite-Hite*, 56 F.3d at 1545 (citing *Panduit Corp.*, 575 F.2d at 1152). This test requires the patentee to establish (1) demand for the patented product, (2) the absence of acceptable non-infringing alternatives, (3) the patentee's manufacturing and marketing capability to exploit the demand, and (4) the amount of profit that the patentee would have made. *Id.*

When considering the *Panduit* factors, the "requirement that patentees prove demand for the product as a whole and the absence of non-infringing alternatives ties lost profit damages to specific claim limitations and *ensures that damages are commensurate with the value of the patented features.*" *Mentor Graphics*, 851 F.3d at 1288 (emphasis added). "Products lacking the advantages of the patented invention can hardly be termed a substitute acceptable to the customer who wants those advantages." *Id.* at 1285–86 (internal quotation marks and brackets omitted). Determining whether a party has proven the absence of acceptable non-infringing alternatives typically is a fact question for the jury to resolve. *See id.* at 1287.

Polygroup argues that Willis Electric's damages expert, when assessing non-infringing alternatives under the *Panduit* test, erroneously defines acceptable non-infringing alternative designs to be designs that are "easily and quickly assembled." According to Polygroup, ease of assembly is not an advantage of Willis Electric's patented features and, therefore, Willis Electric's definition of acceptable alternatives is incorrect. However, Willis Electric's damages expert provides detailed opinions, based

on her examination of evidence, demonstrating a connection between ease of assembly and the patented inventions. Because this is a factual dispute for the jury to resolve, summary judgment as to this issue is unwarranted.

Polygroup tries to avoid this result by framing this factual dispute as a legal error. According to Polygroup, on appeal from PTAB's final written decision in the IPR proceedings, the Federal Circuit determined that ease of assembly is not a patented advantage of Willis Electric's patents. But, as addressed in Part I.B.1. of this Order, Polygroup's arguments as to this issue are unavailing for several reasons. And these disagreements reflect factual disputes that preclude summary judgment.

The Court, therefore, denies Polygroup's motion for summary judgment as to lost profits.

4. Holding Company Defendants

Finally, Polygroup seeks summary judgment as to Defendants Polygroup Macau Limited (BVI) and Polytree (H.K) Co. Ltd., arguing that there is no evidence that these holding companies engaged in any infringing conduct.

Willis Electric's second amended complaint alleges two types of indirect infringement: induced infringement and contributory infringement. "Whoever actively induces infringement of a patent shall be liable as an infringer." 35 U.S.C. § 271(b). An induced-infringement claim requires the defendant to know that the induced acts result in patent infringement. *Global-Tech Appliances, Inc. v. SEB S.A.*, 563 U.S. 754, 765–66 (2011). In addition, the plaintiff must establish that it was the defendant's specific intent to encourage another's infringement. *DSU Med. Corp. v. JMS Co.*, 471 F.3d 1293, 1306

(Fed. Cir. 2006). Liability for contributory infringement “requires proof that (1) the defendant had knowledge of the patent in suit, (2) the defendant had knowledge of patent infringement, and (3) the accused product is not a staple article or commodity of commerce suitable for a substantial noninfringing use.” *Bio-Rad Labs., Inc. v. Int’l Trade Comm’n*, 998 F.3d 1320, 1335 (Fed. Cir. 2021) (quoting *Commil USA, LLC v. Cisco Sys., Inc.*, 575 U.S. 632, 639 (2015)); accord 35 U.S.C. § 271(c).

When moving for summary judgment, the “moving party bears the burden of bringing forward sufficient evidence to establish that there are no genuine issues of material fact and that the movant is entitled to judgment as a matter of law.” *Shelter Ins. Cos. v. Hildreth*, 255 F.3d 921, 924 (8th Cir. 2001). Polygroup’s failure to address the elements of induced or contributory infringement does not satisfy this burden. Moreover, Willis Electric identifies evidence that senior officers at the Polygroup holding companies knew about the asserted patents and the alleged infringement of those patents. As such, genuine disputes of material fact exist with respect to this issue.

Accordingly, the Court denies Polygroup’s motion for summary judgment on this basis.

ORDER

Based on the foregoing analysis and all the files, records and proceedings herein,

IT IS HEREBY ORDERED:

1. Plaintiff Willis Electric Co., Ltd.’s motion to exclude the expert testimony of Julie L. Davis, (Dkt. 648), is **DENIED**.

2. Plaintiff Willis Electric Co., Ltd.'s motion for summary judgment, (Dkt. 657), is **GRANTED IN PART AND DENIED IN PART** as addressed in Part II.A. of this Order.

3. Defendants Polygroup Limited (Macao Commercial Offshore), Polygroup Macau Limited (BVI), Polytree (H.K.) Co. Ltd. and Polygroup Trading Limited's motion to exclude the expert testimony of Michele Riley, (Dkt. 666), is **DENIED**.

4. Defendants Polygroup Limited (Macao Commercial Offshore), Polygroup Macau Limited (BVI), Polytree (H.K.) Co. Ltd. and Polygroup Trading Limited's motion to exclude the expert testimony of Dr. James Dickens, (Dkt. 675), is **GRANTED IN PART AND DENIED IN PART** as addressed in Part I.C. of this Order.

5. Defendants Polygroup Limited (Macao Commercial Offshore), Polygroup Macau Limited (BVI), Polytree (H.K.) Co. Ltd. and Polygroup Trading Limited's motion for summary judgment, (Dkt. 689), is **GRANTED IN PART AND DENIED IN PART** as addressed in Part II.B. of this Order.

Dated: January 5, 2023

s/Wilhelmina M. Wright
Wilhelmina M. Wright
United States District Judge