

NOTE: This disposition is nonprecedential.

**United States Court of Appeals
for the Federal Circuit**

PPC BROADBAND, INC.,
Appellant

v.

**ANDREI IANCU, UNDER SECRETARY OF
COMMERCE FOR INTELLECTUAL PROPERTY
AND DIRECTOR OF THE UNITED STATES
PATENT AND TRADEMARK OFFICE,**
Intervenor

2017-1362, 2017-1363, 2017-1364

Appeals from the United States Patent and Trade-
mark Office, Patent Trial and Appeal Board in Nos.
IPR2013-00340, IPR2013-00345, IPR2013-00346.

Decided: July 3, 2018

J. MICHAEL JAKES, Finnegan, Henderson, Farabow,
Garrett & Dunner, LLP, Washington, DC, argued for
appellant. Also represented by ROBERT L. BURNS, II,
Reston, VA; JUSTIN A. HENDRIX, Palo Alto, CA.

LORE A. UNT, Office of the Solicitor, United States
Patent and Trademark Office, Alexandria, VA, argued for

intervenor. Also represented by NATHAN K. KELLEY, MAI-TRANG DUC DANG, THOMAS W. KRAUSE, FARHEENA YASMEEN RASHEED.

Before DYK, MOORE, and O'MALLEY, *Circuit Judges*.

O'MALLEY, *Circuit Judge*.

The three *inter partes* review (“IPR”) proceedings that gave rise to this consolidated appeal were previously considered in *PPC Broadband, Inc. v. Corning Optical Communications RF, LLC (PPC I)*, 815 F.3d 734 (Fed. Cir. 2016). In *PPC I*, we vacated the Patent Trial and Appeal Board’s (“Board”) determination that the following claims are unpatentable and remanded for further proceedings: claims 8, 16, and 31 of U.S. Patent No. 8,287,320 (“the ’320 patent”), claims 1–9 of U.S. Patent No. 8,323,060 (“the ’060 patent”), and claims 7–27 of U.S. Patent No. 8,313,353 (“the ’353 patent”). In particular, we criticized the Board (1) for not making sufficient factual findings to support its conclusion that the combination of two prior art references would have made the limitations of these claims obvious; (2) for improperly concluding that patent owner PPC Broadband, Inc. (“PPC”) did not establish that its “SignalTight” connectors met all of the elements of the challenged claims for the purpose of giving rise to a presumption of commercial success; and (3) for failing to give due weight to PPC’s un rebutted evidence of copying and failure of others.

The Board repeated these same errors on remand. We therefore *vacate* the Board’s determination that claims 8, 16, and 31 of the ’320 patent, claims 1–9 of the ’060 patent, and claims 7–27 of the ’353 patent are unpatentable, and *remand* once more for further proceedings.

I. BACKGROUND

An overview of the patents and technical background is provided in *PPC I*. In relevant part, the '320 patent family discloses coaxial cable connectors having a connector body 50, a post 40, a nut 30 (also called a “coupler”), and a “continuity member” that contacts the post and the nut so that electrical grounding continuity is extended through the post and the nut. '320 patent, col. 2, ll. 3–6, 15–19, 37–41. The claims at issue in this appeal include limitations that require the continuity member to “maintain electrical continuity” during certain specified periods of operation of the connector. *PPC I*, 815 F.3d at 743. Independent claim 1 of the '060 patent, for example, recites:

1. A connector for coupling an end of a coaxial cable, . . . the connector comprising:

* * *

a continuity member disposed only rearward of the forward facing lip surface of the internal lip of the coupler, the continuity member having a continuity base portion extending between the continuity post engaging surface of the post and the continuity body engaging surface of the connector body, and a continuity contact surface configured to be biased against the rearward facing lip surface of the internal lip of the coupler *so as to maintain electrical continuity between the coupler and the post when the coupler is in the partially tightened position on the interface port, even when the coupler is in the fully tightened position on the interface port, and even when the post moves relative to the coupler.*

'060 patent, col. 20, l. 57–col. 21, l. 39 (emphases added). Independent claims 7 and 20 of the '353 patent recite methods of assembling a coaxial cable connector, the

method comprising “positioning an electrical continuity member so as to . . . maintain electrical continuity between the post and the nut when the post pivots relative to the nut.” ’353 patent, col. 22, ll. 12–48; *id.* at col. 23, l. 43–col. 24, l. 24. Finally, dependent claims 8, 16, and 31 of the ’320 patent require the continuity member to “maintain electrical continuity when the nut is in both the partially tightened position on the interface port and in the fully tightened position on the interface port.” ’320 patent, col. 21, ll. 48–52; *id.* at col. 22, ll. 63–67; *id.* at col. 24, ll. 40–44.

Corning Optical Communications RF, LLC (“Corning”) filed petitions requesting IPR of claims 1–32 of the ’320 patent, claims 1–9 of the ’060 patent, and claims 7–27 of the ’353 patent on grounds that these claims were unpatentable as obvious over the combination of U.S. published patent application 2006/0110977 (“Matthews”) and Japanese published patent application JP 2002–015823 (“Tatsuzuki”), among certain other grounds not at issue in this appeal.¹ Corning principally relied on the

¹ Corning participated in the appeal in *PPC I* and in the proceedings on remand, but withdrew as a party to this appeal after it reached a settlement with PPC. *See* Corning’s Unopposed Mot. to Withdraw (June 30, 2017), ECF No. 23; Order (July 10, 2017), ECF No. 24. The United States Patent and Trademark Office (“PTO”) intervened. At oral argument, PPC and the PTO stated that they waive any right to seek a remand for the Board to institute on all grounds challenged in Corning’s IPR petitions under *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018), and further stated they were not aware of Corning ever having made such a request. *See* Oral Arg. 11:40–12:20, 27:54–28:15, available at <http://oralarguments.cafc.uscourts.gov/default.aspx?fl=2017-1362.mp3>. In *PGS Geophysical AS v. Iancu*, 891

declaration of its expert, Dr. Robert S. Mroczkowski, while PPC relied on the declaration of its expert, Dr. Charles A. Eldering. The Board instituted these IPR proceedings, and, after the parties' experts were deposed, the Board issued final written decisions in which it determined that all challenged claims would have been obvious over the combination of Matthews and Tatsuzuki. *PPC I*, 815 F.3d at 739.

In these decisions, the Board construed the “continuity member” limitation to require that the continuity member “make contact with the coupler/nut and the post to establish an electrical connection there,” but did not separately construe the “maintain electrical continuity” limitations. *Id.* at 740–45. The Board then relied on a proposed modification of Matthews with Tatsuzuki’s “disc-shaped spring” advanced by Dr. Mroczkowski to explain how the two references could be combined. *See* J.A. 1215–16, 1276–77, 1330–31. Finally, although the Board found that Corning both failed to manufacture connectors with a continuity member that could be sold to customers and copied PPC’s SignalTight connectors—factors that weighed in favor of non-obviousness—it concluded that, because PPC did not present persuasive evidence of commercial success, the collective objective indicia evidence did not outweigh the “strong evidence of obviousness.” *PPC I*, 815 F.3d at 746–47.

Corning appealed the Board’s decisions to this court. We affirmed the Board’s unpatentability determinations

F.3d 1354 (Fed. Cir. 2018), we held that partial-grounds institution is a waivable error on which we need not act “in the absence of an appropriate request for relief on that basis.” *Id.* at 1362 (citation omitted). We, thus, decline to vacate and remand solely for the Board to issue final written decisions addressing other grounds challenged in Corning’s IPR petitions.

as to the claims that lacked the “maintain electrical continuity” limitation, and we vacated the Board’s unpatentability determinations as to the “maintain electrical continuity” claims and remanded for further proceedings. We construed these claims to “require [that] the continuity member maintain electrical continuity when the coupler is in a certain position or during certain modes of operation,” and stated that “[m]aintaining electrical continuity requires consistent or continuous contact” under any relevant claim construction standard. *Id.* at 744. We observed that, “[n]owhere in its decisions did the Board find that the combination of Matthews and Tatsuzuki maintains electrical continuity during the specific positions or modes of operation required by these limitations,” and noted that the Board’s decisions in fact “suggest the opposite.” *Id.* In other words, we concluded that the Board’s decisions assumed that merely making contact on a non-continuous or intermittent basis would satisfy the relevant claim limitations, a conclusion we found inconsistent with the claims themselves. We then rejected Corning’s argument that we should nevertheless affirm the Board’s unpatentability determination as to these claims because the combination of Matthews and Tatsuzuki otherwise teaches these limitations, recognizing that the “Board did not make any such fact findings.” *Id.*

We also took issue with the Board’s objective indicia analysis. First, we clarified that Corning’s failure to manufacture connectors with a continuity member that could be sold to consumers and its decision to, instead, copy PPC’s SignalTight connectors weighed in favor of a finding of non-obviousness. *Id.* at 746. We then explained that, because the evidence shows that the SignalTight connectors are “the invention disclosed and claimed in the patent,” we presume that any commercial success of these products is due to the patented invention. *Id.* at 747 (quoting *J.T. Eaton & Co. v. Atl. Paste & Glue Co.*,

106 F.3d 1563, 1571 (Fed. Cir. 1997)). We expressly rejected the Board’s unexplained belief that “commercial success is not established where a product has a very large market share if that product was replacing the same party’s earlier version which likewise enjoyed a high market share,” noting “that it would be wrong to conclude that a product with a high market share is not commercially successful *solely* because it is replacing a similarly successful earlier version of the product produced by the same company.” *Id.* at 747 n.3. Finally, we criticized the Board’s failure to weigh PPC’s un rebutted evidence of failed attempts by Corning to design a prototype coaxial cable with a continuity member and Corning’s copying. *Id.* at 746.

On remand, the Board, after determining that no additional evidence was required, issued the three Decisions on Remand, again holding each of the claims reciting “maintain electrical continuity” limitations unpatentable over Matthews and Tatsuzuki. Relying solely on disclosures in Tatsuzuki and portions of Dr. Mroczkowski’s declarations—which did not address our construction of the maintain electrical continuity limitations—the Board found that Tatsuzuki’s disc-shaped spring 13, when positioned in the manner depicted in Exhibit 2007, “would maintain electrical connection between Matthews’s coupler/nut 30 and post 40 during [the] specified periods of operation of coaxial cable connector 100” required by the claim limitations. J.A. 25, 65, 98. It then criticized several aspects of PPC’s evidence of commercial success, purported to reweigh the objective indicia evidence, and once again concluded that the proffered objective indicia evidence was insufficient to overcome “Corning’s strong evidence of obviousness.” J.A. 33, 74, 106.

PPC appeals. We have jurisdiction under 28 U.S.C. § 1295(a)(4).

II. DISCUSSION

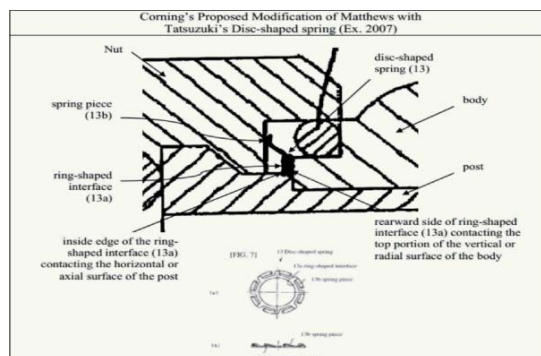
Obviousness is a question of law with underlying issues of fact. *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013). We review the Board’s legal decisions de novo and its underlying factual determinations for substantial evidence. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1378 (Fed. Cir. 2015). A finding is supported by substantial evidence if a reasonable mind might accept the evidence to support the finding. *In re Jolley*, 308 F.3d 1317, 1320 (Fed. Cir. 2002). “In reviewing the record for substantial evidence, this court takes into account evidence that both justifies and detracts from the factual determinations.” *In re Glatt Air Techniques, Inc.*, 630 F.3d 1026, 1029 (Fed. Cir. 2011). Finally, the Board, in reaching its decisions, must “make the necessary findings and have an adequate ‘evidentiary basis for its findings.’” *In re Nuvasive*, 842 F.3d 1376, 1382 (Fed. Cir. 2016) (quoting *In re Lee*, 277 F.3d 1338, 1344 (Fed. Cir. 2002)).

A.

We conclude that the Board has not sufficiently explained its finding that Tatsuzuki’s disc-shaped spring 13, if located within Matthews’s connector in the manner proposed by Dr. Mroczkowski, “would maintain electrical connection between Matthews’s coupler/nut 30 and post 40 during [the] specified periods of operation of coaxial cable connector 100” required by the claim limitations. J.A. 25, 65, 98. None of the evidence cited by the Board, which does not include Dr. Mroczkowski’s deposition testimony, supports a finding that the continuity member in the modified coaxial cable connector would make *consistent* contact with the post during these periods of operation.

A comparison of the Board’s original final written decisions with its Decisions on Remand is instructive. In its first set of final written decisions, the Board relied on a

modification of Matthews with Tatsuzuki proposed by Dr. Mroczkowski to explain why the combined coaxial cable connector would meet the broader “continuity member” limitations. According to Dr. Mroczkowski, this modification entails placing Tatsuzuki’s disc-shaped spring 13 (the continuity member) inside the coaxial cable connector disclosed in Figure 1 of Matthews so that a portion of the spring “contacts the rearward facing surface H2 of the internal lip 36 of the coupler 30 and also extends between the continuity post engaging surface of the post 40 and the continuity body engaging surface of the body 50.” J.A. 3185 ¶ 92. This proposed modification is depicted in PPC’s annotated Exhibit 2007, reproduced below:



J.A. 1216 (IPR2013-00340 final written decision). The Board offered the following rationale to support its finding that the “continuity member” limitation would be met by this proposed combination:

In considering the proposed incorporation of Tatsuzuki’s disc-shaped spring 13 into Matthews’s connector 100 shown in the illustration reproduced above, we are satisfied that it establishes a continuity member positioned to make contact with surfaces of Matthews’s coupler/nut 30 and post 40 in the manner required by independent claim 1. In that regard, we conclude that Tatsuzuki’s disc-shaped spring 13, when positioned in

the manner depicted, would extend between, and facilitate electrical connection among, surfaces of a coupler/nut and a post of a coaxial cable connector. Furthermore, we also credit Dr. Mroczkowski's testimony to that effect. *See, e.g.*, Ex. 1007, ¶¶ 92, 93.

J.A. 1216–17.

In its Decisions on Remand, the Board determined that the *narrower* “maintain electrical continuity” limitations of the claims at issue would be met by the *same* proposed modification on the *same* evidence. The Board began by taking “th[e] opportunity to clarify” that findings in each of its original final written decisions were intended to “refer to maintaining electrical continuity between Matthews’s coupler/nut 30 and post 40 during specified periods of operation of coaxial cable connector 100 that are required by” claims containing these limitations—perplexing “clarifications” given that the “maintain electrical continuity” limitations were not separately construed or analyzed in any of the Board’s final written decisions. J.A. 23, 62, 96. The Board went on to state that, “[i]n any event, taking into account the Federal Circuit’s guidance, and for the sake of completeness, we now make explicit fact findings as to how the combination of Matthews and Tatsuzuki teaches the ‘maintain electrical continuity’ limitation.” *Id.*

The fact-finding and reasoning in the Board’s Decisions on Remand are substantially similar to that contained in its first set of final written decisions, except that the three sentences reproduced in the block quote above are modified as follows:

That is, we find that Tatsuzuki’s disc-shaped spring 13, when positioned in the manner depicted above, would maintain electrical connection between Matthews’s coupler/nut 30 and post 40 during certain specified periods of operation of co-

axial cable connector 100, such as when the coupler/nut is tightened partially or fully on interface port 20, and even when the post moves relative to the coupler/nut. Our finding in this regard is reinforced further by the stated objective of Tatsuzuki's disc-shaped spring 13, which is to provide an electrical connection even in a loosened state. Ex. 1002 ¶¶ 7, 17. We also credit Dr. Mroczkowski's testimony on this issue, particularly his statement that Corning's proposed combination "would . . . maintain[] electrical continuity from the interface port to the coaxial cable." Ex. 1007 ¶ 93.

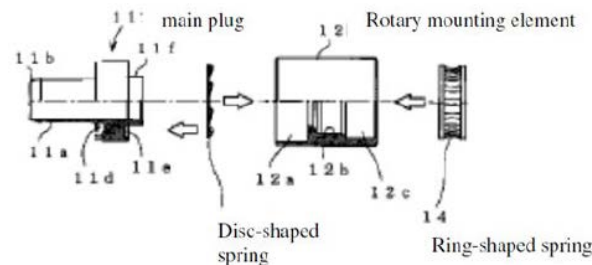
J.A. 25 (IPR2013-00340 Decision on Remand). The only material differences between the Board's fact-finding in its original final written decision and its Decision on Remand in IPR2013-00340 are that the latter (1) recites the language of the claim limitation at issue rather than the phrase "in the manner required by claim 1"; (2) describes the stated objective of Tatsuzuki's disc-shaped spring as "provid[ing] an electrical connection even in a loosened state"; and (3) includes a "particularly" credited statement from Dr. Mroczkowski that his proposed combination "would . . . maintain[] electrical continuity from the interface port to the coaxial cable." The Decisions on Remand in the other IPR proceedings contain similar alterations.

These minor, stylistic alterations are insufficient to rescue the Decisions on Remand, because the Board failed to offer a reasoned explanation why the proposed modification meets the "maintain electrical continuity" limitations—which require that the continuity member have "consistent or continuous contact" with the post. *PPC I*, 815 F.3d at 744.

We begin with Tatsuzuki. This reference discloses a disc-shaped spring 13 with an inner ring-shaped interface

portion 13a that is sized to slide over curling processed part 11f of main plug 11 during assembly so that it can be “accommodated” or “contained” in spring storage groove 11e:

[FIG. 2]



J.A. 1519 ¶¶ 17, 1526–27. The disc-shaped spring therefore connects the radial surface of rotary mounting element 12 (the “nut”) and the radial surface of spring storage groove 11e to form an electrical path between the two, acting as a spring in the horizontal (or axial) direction such “that even if the rotary mounting element is loosened, it prevents connection of grounding from becoming incomplete.” *Id.* 1518 ¶¶ 11, 13. The Board’s finding that Tatsuzuki discloses a disc-shaped spring that is “purposed specifically to provide ‘electrical connection’ between plug body 11 and rotary mounting element 12 of the connector” is consistent with these disclosures. J.A. 23–24.

The Board’s findings vis-à-vis the “maintain electrical continuity” limitations fail to consider sufficiently either Tatsuzuki’s disclosures or the experts’ testimony. Dr. Mroczkowski testified at his deposition that Tatsuzuki does *not* disclose a disc-shaped spring “in constant contact with the post,” agreeing with PPC that it is instead “accommodated in the groove.” J.A. 1957:21–25. He testified, moreover, that Tatsuzuki only teaches “constant

contact between the nut and the *body*.” J.A. 1958:2–9 (emphasis added). PPC’s expert, Dr. Eldering, similarly concluded that Tatsuzuki’s disc-shaped spring would not provide continuous contact with the post, but instead would provide only intermittent contact. J.A. 2988–89 ¶¶ 82–83. Notwithstanding this undisputed evidence, the Board relied on Tatsuzuki’s “stated objective” of providing an electric connection even in a loosened state” to support its finding that the combination would include a continuity member that “maintains electrical continuity” with the post during the specified periods of operation. J.A. 25 (citations omitted).

The Board also relied on Dr. Mroczkowski’s opinion that his proposed combination “would . . . maintain[] electrical continuity from the interface port to the coaxial cable,” J.A. 25, but this opinion does not withstand scrutiny. First, Dr. Mroczkowski offered this opinion in his initial declaration accompanying Corning’s IPR petitions, without the benefit of our construction of the “maintain electrical continuity” limitations. Second, to the extent one could plausibly interpret Dr. Mroczkowski’s opinion as evidence that the proposed modification would maintain “consistent or continuous contact” between the continuity member and the post during the modes of operation recited in the claims, *PPC I*, 815 F.3d at 743–44, the Board would have been required to explain how it reached this conclusion, see *In re Lee*, 277 F.3d 1338, 1346 (Fed. Cir. 2002) (holding that agency tribunals “must make findings of relevant facts, and present its reasoning in sufficient detail that the court may conduct meaningful review of the agency action”).

At his deposition, Dr. Mroczkowski attempted to cure the aforementioned deficiencies in Tatsuzuki by theorizing that its disc-shaped spring “could” be “press fit onto the post.” J.A. 1953:9:11, 1958:22–25, 1960:14–18. None of the Board’s Decisions on Remand cite any of Dr. Mroczkowski’s deposition testimony, nor do they include

any discussion of this “press fit” theory. Because the viability of this “press fit” theory is all that arguably could support the Board’s findings that the combination teaches the “maintain electrical continuity” limitations, the Board was required to “examine the relevant data and articulate a satisfactory explanation for its action including a rational connection between the facts found and the choice made.” *Nuvasive*, 842 F.3d at 1382 (quoting *Motor Vehicle Mfrs. Ass’n v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 43 (1983)). It failed to do so.²

Dr. Mroczkowski, moreover, was cross-examined at length about this theory, during which he conceded a number of points relevant to his “press fit” theory, including, among others, that (1) “press fitting” is not disclosed in Tatsuzuki, J.A. 1958:10–18; (2) he did not mention “press fitting” in any of his declarations, J.A. 2318:9–22319:5; (3) Tatsuzuki describes its disc-shaped spring as being made of a “thin piece of metal,” J.A. 1959:17–1962:11; and (4) he had never done any press fit designs and would not know how “thin” the disc-shaped spring could be for it to be press fit onto the post, J.A. 1959:1–16. The Board did not address this testimony.

The need to consider the merits of Dr. Mroczkowski’s “press fit” theory becomes even more relevant when one considers that Tatsuzuki expressly teaches that its disc-

² To the extent the PTO relies in its brief on factual findings not made by the Board, such as that “Tatsuzuki’s Figure 3 shows the inner circumference of its continuity member positioned in direct contact with the post portion of its unitary body and post, without any indication of gaps or intermittent contact,” Intervenor Br. 41–42 (footnote omitted), we may not “accept appellate counsel’s *post hoc* rationalization for agency action,” *In re Lee*, 277 F.3d 1338, 1345 (Fed. Cir. 2002) (quoting *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962)).

shaped spring “is not pressed to the point of becoming crushed flat and does not lose its spring operation.” J.A. at 1519 ¶ 17. Dr. Eldering testified both that Tatsuzuki “teaches away from such a press-fitting modification” and that press fitting Tatsuzuki’s disc-shaped spring onto the post “would substantially change [its] intended use and operation.” J.A. 2977 ¶ 54. Yet the Board did not consider either this disclosure in Tatsuzuki or *any* of Dr. Eldering’s opinions or challenges to Dr. Mroczkowski’s proposed modification in its Decisions on Remand. As such, the Board failed to point to evidence that a person of ordinary skill would have known that Tatsuzuki’s disc-shaped spring could be “press fit” onto the post, that a skilled artisan would have been motivated to pursue this modification, or that a skilled artisan could have succeeded in making this modification. “[T]he Board cannot simply reach conclusions based on its own understanding or experience—or on its assessment of what would be basic knowledge or common sense,” but instead “must point to some concrete evidence in the record in support of these findings.” *In re Zurko*, 258 F.3d 1379, 1386 (Fed. Cir. 2001). The Board also must, consistent with its obligations under the Administrative Procedure Act (“APA”), consider all evidence of record, including that which opposes its conclusions. *See Princeton Vanguard, LLC v. Frito-Lay N. Am., Inc.*, 786 F.3d 960, 970 (Fed. Cir. 2015) (explaining that substantial evidence review “requires an examination of the record as a whole, taking into account both the evidence that justifies and detracts from an agency’s opinion” (quoting *Falkner v. Inglis*, 448 F.3d 1357, 1363 (Fed. Cir. 2006))).

As noted above, moreover, the Board chose not to permit additional discovery on remand, notwithstanding that we construed the “maintain electrical continuity” limitations for the first time on appeal in *PPC I*. This is particularly salient given none of Dr. Mroczkowski’s testimony—on which the Board almost exclusively re-

lied—was offered with the benefit of our claim construction.

In *PPC I*, we concluded that the Board “did not make any” factual findings that the combination of Matthews and Tatsuzuki teaches the “maintain electrical continuity” limitations. 815 F.3d at 744. On remand, the Board sought to circumvent its fact-finding obligations. Where, as here, “the Board’s action is ‘potentially lawful but insufficiently or inappropriately explained,’ we have consistently vacated and remanded for further proceedings.” *In re Van Os*, 844 F.3d 1359, 1362 (Fed. Cir. 2017) (quoting *In re Lee*, 277 F.3d at 1346). The same result is warranted here.

B.

Vacatur is alternatively proper based on the Board’s treatment of PPC’s evidence concerning objective indicia of non-obviousness. PPC first argues that the Board erred in rejecting the evidence of commercial success, claiming the Board ignored our instruction in *PPC I* not to reject such evidence “solely on th[e] ground” that the Signal-Tight connectors were a replacement for PPC’s earlier connectors that did not practice the claims. Appellant Br. 40. It also claims that the Board erred in stating that it could not discern whether PPC’s other connectors had been discontinued and replaced by the new connectors, as the evidence clearly answered that question in the negative. *Id.* at 44. We agree.

“The objective indicia of non-obviousness play an important role as a guard against the statutorily proscribed hindsight reasoning in the obviousness analysis.” *WBIP, LLC v. Kohler Co.*, 829 F.3d 1317, 1328 (Fed. Cir. 2016). Indeed, we have held that such evidence “may often be the most probative and cogent evidence in the record.” *Id.* (quoting *Stratoflex, Inc. v. Aeroquip Corp.*, 713 F.2d 1530, 1538 (Fed. Cir. 1983)). “A determination of whether a patent claim is invalid as obvious under § 103 requires

consideration of all four *Graham* factors, and it is error to reach a conclusion of obviousness until all those factors are considered.” *Id.* (citing *In re Cyclobenzaprine Hydrochloride Extended-Release Capsule Patent Litig.*, 676 F.3d 1063, 1075 (Fed. Cir. 2012)).

To prove commercial success as an objective indicator of non-obviousness, any commercial success of the product embodying the claims must “result[] from the claimed invention . . . beyond what was readily available in the prior art.” *J.T. Eaton & Co., Inc. v. Atl. Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997). Moreover, if a patentee in an IPR can demonstrate commercial success—often shown by significant sales in a relevant market—and that the successful product is the invention disclosed and claimed in the patent, it is presumed that the commercial success is due to the patented invention. *PPC I*, 815 F.3d at 747; *Ecolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1378 (Fed. Cir. 2000). If the patentee meets these hurdles, the burden shifts to the challenger to prove that the commercial success is instead due to other factors, such as advertising or superior workmanship. *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1311-13 (Fed. Cir. 2006) (holding that evidence that success was due to prior art features rebutted the presumption).

The Board failed to apply these principles properly. It claimed that it presumed a “nexus” between the claims and the SignalTight connectors, but determined that PPC failed to prove that these connectors were commercially successful. It reached this determination in the face of undisputed evidence that (1) PPC sold approximately 181 million of these connectors in 2013 alone, generating nearly \$50 million in revenue, J.A. 2934 ¶ 18; (2) in 2013, SignalTight connectors comprised 67% of the total connector market, with another 15% captured by Corning’s UltraShield connectors that copied PPC’s patented continuity member; J.A. 2939 ¶ 25; and (3) SignalTight con-

nectors were “priced at a premium to non-continuity and other connectors available on the market,” J.A. 2936 ¶ 20.

The Board found ways to discount this evidence, but none of its reasons pass muster. First, it inappropriately discounted PPC’s evidence that its SignalTight connectors were sold at a premium vis-à-vis its unpatented connectors. The Board’s reasoning is contrary to our decision in *Transocean Offshore Deepwater Drilling, Inc. v. Maersk Drilling USA, Inc.*, 699 F.3d 1340 (Fed. Cir. 2012). There, the district court rejected a jury finding that commercial success supported non-obviousness, writing that the success of Transocean’s products was “due primarily to various litigation[s],” and thus they “are not a result of a free market.” 699 F.3d at 1349–50. The prevailing party also had argued that “Transocean failed to tie its commercial success evidence to the claimed combination of two advancing stations with a pipe transfer assembly,” and “that unclaimed features of Transocean’s rigs, such as increased size and capacity, are responsible for any commercial success.” *Id.* at 1350. We disagreed on all fronts, writing that “Transocean needed to show both commercial success and that a nexus exists between that success and the merits of the claimed invention,” and that it presented sufficient evidence of both. *Id.* (citation omitted). Specifically, we wrote that Transocean showed “that its dual-activity drilling rigs *commanded a market premium* over single-activity rigs” by “point[ing] to two contracts it signed on the same day . . ., one for a dual-activity drilling rig” for which it “charged a roughly 12% premium,” and “one for a single-activity rig.” *Id.* It also introduced other contracts that provided for reduced daily rates if the dual-activity feature on the rig was not available, and its damages expert “testified that the average reduction in this circumstance is 10%.” *Id.* Furthermore, it “presented evidence that some customers expressly require dual-activity rigs.” *Id.* “From this evidence,” we found that “a reasonable jury could conclude that Transocean’s dual-

activity rigs have been a commercial success and that this success has a nexus to the features claimed in the patents.” *Id.*

Here, as we explained in *PPC I*, because Corning did not dispute that PPC’s products practiced the claimed limitations and because PPC offered evidence of the commercial success of those products, the nexus we discussed in *Transocean* should have been presumed, and, in the absence of evidence overcoming that presumption submitted by Corning, should have established conclusively the fact of commercial success. Though the Board gave lip service to the presumption we instructed it to apply, it then ignored it. Corning offered no evidence attacking PPC’s claim of commercial success; instead, it simply argued that, even if established, that success did not bar a finding of obviousness.

Rather than treat this evidentiary failure for what it was and find that PPC had, indeed, made a sufficient showing of commercial success, it placed the burden on PPC (as it had in its original final written decisions) to show more. That was error.

Putting aside this structural error, moreover, the Board misunderstood and, thus, gave insufficient weight to PPC’s evidence of commercial success. PPC presented evidence that customers chose to purchase its *more expensive*, patented SignalTight connectors than its unpatented EX connectors, and did so while maintaining PPC’s overall share of the connector market. The Board wrote that “[t]his price premium comparison, however, is not sufficiently meaningful as an objective indicator of non-obviousness in the absence of more information or evidence regarding increase in market share,” J.A. 32, but did not explain why this should be the case. To the extent the Board required PPC to show that it obtained a *higher* market share after introducing the SignalTight connector than it had prior to such introduction, there is no authori-

ty for such a proposition. Maintaining market share with a price premium is also meaningful.

The evidence instead suggests that PPC convinced customers to pay approximately 16% more for SignalTight connectors than they would have paid for “comparable EX non-continuity connectors,” and did so in the face of customers’ “extreme skepticism” about whether the “SignalTight® connectors would solve the loose connector continuity problem that had plagued the industry for many years.” J.A. 2934 ¶ 17. Other coaxial cables existed in the market, including PPC’s non-continuity EX connectors and Corning’s non-continuity and (copied) continuity connectors, all of which customers could have purchased instead of PPC’s patented SignalTight connectors. Yet a significant number of buyers—67% of the total market—decided to purchase SignalTight connectors.

The Board committed a second fundamental error in criticizing PPC’s evidence of overall market share. The Board reasoned that PPC’s data “suggests that *at least a portion* of the purported commercial success appears *due to PPC’s pre-existing market share* in the connector market, which seemingly provided a commercial advantage for any promotion of a new product, such as the SignalTight connectors.” J.A. 30–31 (emphases added). As support, it cited *Geo. M. Martin Co. v. Alliance Machine Sys. Int’l ILC*, 618 F.3d 1294, 1304 (Fed. Circ. 2010), for our statement that Alliance, the accused infringer, “conclusively established that much of George Martin’s commercial success was due to Martin’s pre-existing market share in the stacker market, which, according to Martin’s president, gave it a ‘huge advantage’ in selling *other* products because it allowed Martin to sell a ‘single-source system,’” and that as a result, “this factor carries little weight.” *Id.* at 31. The reasoning of *Martin* therefore does not apply to the situation here, in which PPC’s evidence suggests a transition away from its unpatented

EX connectors to its more expensive, patented SignalTight connectors.

Moreover, although it is certainly possible that PPC's pre-existing market share from its EX connectors contributed to sales of PPC's more expensive SignalTight connectors, the burden rested with *Corning*, as the IPR petitioner, to make this showing. Indeed, in *Martin*, we determined in relevant part that the "commercial success" of George Martin's stackers "carrie[d] little weight" because "*Alliance* conclusively established that much of George Martin's commercial success was due to Martin's pre-existing market share in the stacker market." 618 F.3d at 1304 (emphasis added). *Corning*, however, did not introduce *any* evidence, much less "conclusive" evidence, that "much" of the success of PPC's SignalTight connectors was due to its earlier foothold in the marketplace. Viewed in this light, PPC's un rebutted evidence that it was able to sell its SignalTight connectors at a premium above its EX connectors while maintaining its overall market share strongly supports the conclusion that customers valued the patented continuity member in its SignalTight connectors.

At bottom, it appears that the Board repeated the same error on remand that it had committed in its final written decisions: concluding that PPC's SignalTight connectors, which have a high market share, are "not commercially successful solely because [they are] replacing a similarly successful earlier version of the product produced by the same company." *PPC I*, 815 F.3d at 747 n.3. And, it did so without giving proper weight to the presumption of commercial success we instructed it to employ. As we explained in *ClassCo, Inc. v. Apple, Inc.*, 838 F.3d 1214, 1222 (Fed. Cir. 2016), where a patent owner "present[s] un rebutted evidence that its products experienced some, albeit limited, commercial success, and that those products embodied the claimed features," such

evidence must be weighed in the obviousness analysis and a “blanket dismissal of it” is error.

PPC’s other arguments regarding objective indicia of non-obviousness pertain to the Board’s failure to properly consider PPC’s evidence of Corning’s failed attempts to manufacture coaxial cables with a continuity member that could be sold to consumers and its copying of PPC’s patented design. In its initial final written decisions, the Board determined that, although some of Corning’s efforts to design connectors with continuity members “failed” tests and although Corning “did not sell such connectors to customers for whatever reason,” it was “not persuaded” by PPC’s evidence of failed attempts by Corning because other prototype connectors passed these same tests. J.A. 1231–32, 1239. It also determined that, although it was persuaded that Corning copied PPC’s SignalTight design, because “a showing of copying is only equivocal evidence of non-obviousness in the absence of more compelling objective indicia of other secondary considerations,” this evidence was insufficient to overcome “Corning’s strong evidence of obviousness.” J.A. 1234, 1239–40 (quoting *Ecolochem*, 227 F.3d at 1378).

On appeal, we clarified that Corning’s failure to manufacture connectors with a continuity member that could be sold to consumers *weighed in favor* of non-obviousness, as did the evidence of Corning’s copying. *PPC I*, 815 F.3d at 746. On remand, however, the Board stated only that it “t[ook] note of [its] prior assessment of the evidence presented by PPC in connection with purported long-felt but unresolved need, purported failed attempts by Corning, and copying by Corning,” and found “once again” that such evidence did not outweigh “Corning’s strong evidence of obviousness.” J.A. 33. Putting aside questions of how evidence of obviousness and non-obviousness interact, the Board simply ignored our directive to give due weight to these indicia of non-obviousness in its obviousness analysis and the evidence that prompted it. It also appears

that the Board failed to reconsider the weight it initially gave PPC's evidence of copying. Since it is now clear that such evidence does not stand alone, this evidence must be considered in conjunction with PPC's showing of commercial success and Corning's failure to manufacture connectors with a continuity member that could be sold to consumers. On remand, the Board must consider PPC's objective indicia evidence anew and consider this evidence, which "may often be the most probative and cogent evidence in the record," *WBIP*, 829 F.3d at 1328, along with its consideration of the other three *Graham* factors.

III. CONCLUSION

For the foregoing reasons, we *vacate* the Board's determination that claims 8, 16, and 31 of the '320 patent, claims 1–9 of the '060 patent, and claims 7–27 of the '353 patent are unpatentable, and *remand* for further proceedings

VACATED AND REMANDED

COSTS

Costs to PPC Broadband, Inc.