

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

CORNING OPTICAL COMMUNICATIONS RF, LLC,
Petitioner,

v.

PPC BROADBAND, INC.,
Patent Owner.

Case IPR2013-00340
Patent 8,323,060 B2

Before JAMESON LEE, JOSIAH C. COCKS, and MICHAEL R. ZECHER,
Administrative Patent Judges.

ZECHER, *Administrative Patent Judge.*

DECISION ON REMAND
35 U.S.C. § 144 and 37 C.F.R. § 42.5(a)

I. BACKGROUND

We address this case on remand after a decision by the U.S. Court of Appeals for the Federal Circuit in *PPC Broadband, Inc. v. Corning Optical Commc'ns RF, LLC*, 815 F.3d 734, 740–47 (Fed. Cir. 2016) (“*PPC Broadband*”).

As background, Petitioner, Corning Optical Communications RF, LLC¹ (“Corning”), filed an amended Petition requesting an *inter partes* review of claims 1–9 of U.S. Patent No. 8,323,060 B2 (Ex. 1001, “the ’060 patent”). Paper 5 (“Pet.”). Patent Owner, PPC Broadband, Inc. (“PPC”), did not file a Preliminary Response. We determined that the information presented in the Petition demonstrated that there was a reasonable likelihood that Corning would prevail in challenging claims 1–9 as unpatentable under 35 U.S.C. § 103(a). Pursuant to 35 U.S.C. § 314, we instituted this proceeding on November 26, 2013, on the ground that claims 1–9 are unpatentable under § 103(a) over the combination of Matthews² and Tatsuzuki.³ Paper 18 (“Dec. on Inst.”).

During the course of trial, PPC filed unredacted and redacted versions of a Patent Owner Response (Papers 32 and 33, “PO Resp.”), a Revised Motion to Seal and proposed Protective Order (Paper 42), and three

¹ Petitioner filed an updated mandatory notice indicating that Corning Gilbert Inc., the original Petitioner entity in this proceeding, changed its name to Corning Optical Communications RF, LLC. Paper 26, 1.

² Matthews, U.S. Patent App. Pub. No. 2006/0110977 A1, published May 25, 2006 (Ex. 1004).

³ Tatsuzuki, JP Patent App. Pub. No. 2002-015823, published Jan. 18, 2002 (Ex. 1033) (English translation Ex. 1002).

additional Motions to Seal (Papers 45, 61, 71), each of which is subject to the same proposed Protective Order. Corning filed a Response to PPC's Revised Motion to Seal (Paper 43), its own Motion to Seal (Paper 47), and a Substitute Reply to the Patent Owner Response (Paper 54, "Pet. Reply").

PPC filed a Motion to Exclude seeking to exclude portions of a Declaration and deposition testimony of Mr. Donald Burris, Development and IP Manager at Corning, that were relied upon by Corning in its Substitute Reply to the Patent Owner Response. Paper 57. Corning filed an Opposition to PPC's Motion to Exclude. Paper 63. PPC filed a Reply to Corning's Opposition. Paper 67.

We held a consolidated oral hearing on July 24 and 25, 2014, in relation to this proceeding and the following four other related proceedings involving the same parties: (1) Case IPR2013-00342; (2) Case IPR2013-00345; (3) Case IPR2013-00346; and (4) Case IPR2013-00347. Transcripts of the entire consolidated oral hearing are included in the record. Papers 76–78. In particular, Paper 77 ("Tr.") corresponds to the transcript from the first session of the consolidated oral hearing, held the morning of July 24, 2014, and pertains to this proceeding and Case IPR2013-00345.

On November 21, 2014, we issued a Final Written Decision in this proceeding in accordance with 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. Paper 79 ("Final Dec."). We concluded that Corning had demonstrated by a preponderance of the evidence that claims 1–9 of the '060 patent are unpatentable under § 103(a) over the combination of Matthews and Tatsuzuki. Final Dec. 54. We also *denied* PPC's Motion to Exclude; we *granted-in-part* PPC's Revised, Second, and Third Motions to Seal; and we *dismissed* both Corning's Motion to Seal and PPC's Fourth Motion to Seal.

Id. PPC appealed the Final Written Decision to the Federal Circuit. Paper 81.

The Federal Circuit determined the following: (1) although our construction of “continuity member” as not requiring temporal continuity constitutes the broadest reasonable interpretation of this claim phrase in light of the ’060 patent’s claims and specification, we nonetheless did not make specific findings as to whether the combination of Matthews and Tatsuzuki accounts for other claims limitations that require such temporal continuity, particularly “maintain[ing] electrical continuity” during specific positions or modes of operation, as required by independent claim 1; and (2) we erred in assessing PPC’s evidence of commercial success. *PPC Broadband*, 815 F.3d at 740–47. Consequently, the Federal Circuit vacated our determination of obviousness as to claims 1–9 of the ’060 patent and remanded this case back to us for further proceedings. *Id.* at 747. The Federal Circuit’s mandate issued on April 15, 2016. Paper 87.

On May 20, 2016, we issued an Order instructing the parties to meet and confer to determine what matters should be reconsidered or reassessed on remand, and to determine whether additional briefing or submission of new evidence was needed for such matters. Paper 82, 2. If the parties were unable to reach an agreement on these issues, we authorized them to file separate papers outlining their respective positions. *Id.* at 3. In accordance with this Order, the parties filed separate papers setting forth their responses to the issues identified above. Papers 83, 84. Upon considering the separate papers filed by the parties, and taking into account that neither party indicated that further briefing regarding the *patentability* issue must be

submitted and considered, we issued an Order denying the parties' requests for further briefing. Paper 85, 4.

We have reconsidered the record developed during trial anew by reviewing the parties' positions in light of the Federal Circuit's guidance regarding the "maintain electrical continuity" limitation of independent claim 1, and its guidance regarding PPC's evidence of commercial success. For the reasons that follow, we maintain that Corning has demonstrated by a preponderance of the evidence that claims 1–9 of the '060 patent are unpatentable under § 103(a) over the combination of Matthews and Tatsuzuki.

A. The '060 Patent

The '060 patent generally relates to coaxial cable connectors having electrical continuity members that extend continuity of an electromagnetic interference shield from a cable through the connector. Ex. 1001, 1:18–22. Figure 1 of the '060 patent, reproduced below, illustrates a cut-away view of the elements of coaxial cable connector 100 having electrical continuity member 70. *Id.* at 2:53–56, 5:66–6:1.

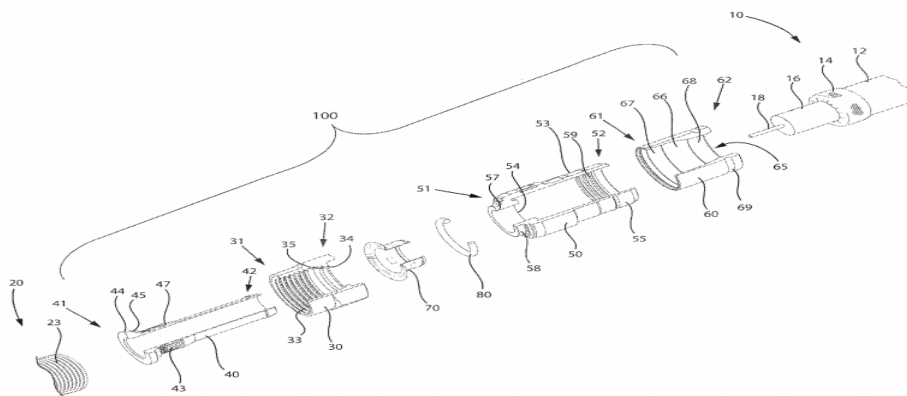


FIG. 1

As shown in Figure 1 of the '060 patent, coaxial cable connector 100 may be affixed, or functionally attached, to coaxial cable 10 that includes

protective outer jacket 12, conductive grounding shield 14, interior dielectric 16, and center conductor 18. Ex. 1001, 6:1–5. Coaxial cable connector 100 also may include threaded nut 30, post 40, connector body 50, fastener member 60, continuity member 70 formed of conductive material, and connector body sealing member 80, e.g., a body O-ring configured to fit around a portion of connector body 50. *Id.* at 7:10–16.

The '060 patent discloses that post 40 includes first forward end 41, opposing second rearward end 42, and flange 44 located at first forward end 41. Ex. 1001, 8:5–10. Post 40 also may include surface feature 47, such as a lip or protrusion, which engages a portion of connector body 50 to secure axial movement of post 40 relative to connector body 50. *Id.* at 8:17–21. Connector body 50 includes first end 51, opposing second end 52, and post mounting portion 57 proximate or otherwise near first end 51 that is configured to locate securely connector body 50 relative to a portion of the outer surface of post 40. *Id.* at 8:66–9:9. The internal surface of post mounting portion 57 includes an engagement feature, which facilitates the secure location of continuity member 70 with respect to connector body 50 and/or post 40, by engaging physically continuity member 70 when assembled within coaxial cable connector 100. *Id.* at 9:9–14.

The '060 patent further discloses that threaded nut 30 includes first forward end 31, opposing second rearward end 32, and internal lip 34, e.g., an annular protrusion, located proximate to second rearward end 32. Ex. 1001, 7:17–26. In one embodiment, continuity member 70 includes first end 71, axially opposing second end 72, and post contact portion 77. *Id.* at 11:4–8. When coaxial cable connector 100 is assembled, post contact portion 77 makes physical and electrical contact with post 40, which, in turn,

helps facilitate the extension of electrical ground continuity through post 40.
Id. at 11:8–11.

B. Illustrative Claim

Of the challenged claims, claim 1 is the only independent claim. Claims 2–9 directly or indirectly depend from independent claim 1. Independent claim 1 is illustrative of the challenged claims and is reproduced below:

1. A connector for coupling an end of a coaxial cable, the coaxial cable having a center conductor surrounded by a dielectric, the dielectric being surrounded by a conductive grounding shield, the conductive grounding shield being surrounded by a protective outer jacket, the connector comprising:

a post including a forward post end, a rearward post end, and a flange having a forward facing flange surface, a rearward facing flange surface, a lip surface extending from the rearward facing flange surface, and a continuity post engaging surface extending from the lip surface, wherein the rearward post end is configured to be inserted into an end of the coaxial cable around the dielectric and under at least a portion of the conductive grounding shield thereof to make electrical contact with the conductive grounding shield of the coaxial cable;

a connector body having a forward body end, a rearward body end, and a continuity body engaging surface configured to fit the continuity post engaging surface of the flange of the post when the connector body is positioned around a portion of the post;

a coupler configured to rotate relative to the post and the connector body, the coupler including a forward coupler end configured for fastening to an interface port and to move between a partially tightened coupler position on the interface port and a fully tightened coupler position on the interface port, a rearward coupler end, and an internal lip having a forward facing lip surface facing the forward coupler end and configured to rotate relative to the rearward facing flange surface of the post and

allow the post to pivot relative to the coupler, a rearward facing lip surface facing the rearward coupler end, and an intermediate surface between the forward facing lip surface and the rearward facing lip surface, the intermediate surface configured to fit the lip surface of the flange of the post that extends from the rearward facing flange surface of the flange of the post; and

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.

Ex. 1001, 20:57–21:39.

II. ANALYSIS

A. *Final Written Decision*

In the Final Written Decision, we began our analysis by addressing the parties’ arguments regarding claim construction. Final Dec. 7–15. Of particular importance to this Decision on Remand, we addressed the alternative constructions proposed by each party for the claims phrases “continuity member” and “configured to fit.” *Id.* at 8–13.

Beginning with the claim phrase “continuity member,” we summarized the parties’ position regarding this claim phrase and noted that we agreed with Corning’s proposed construction. Final. Dec. 9. We explained that PPC did not allege that the inventors of the ’060 patent acted as their own lexicographer and provided a special definition for the claim

phrase “continuity member” that was different from its ordinary and customary meaning. *Id.* at 9–10. Absent such a special definition, we declined PPC’s invitation to import limitations into the construction of this claim phrase “that would require the ‘continuity member’ to make ‘consistent contact’ with the coupler/nut and the post such that it maintains a ‘continuous electrical connection’ between these components.” *Id.* at 10. Indeed, we noted that “the claimed ‘continuity member’ does not cease to be a continuity member, as would be understood by one of ordinary skill in the art, simply because the contact made between the coupler/nut and post may not be consistent to maintain a continuous electrical connection between these components.” *Id.*

Next, we agreed with Corning that the claim phrase “continuity member” should not be construed to require temporal continuity, i.e., an electrical connection that is uninterrupted over a period of time. *See* Final Dec. 10. We explained that requiring such temporal continuity “would interject ambiguity into the determination of claim scope.” *Id.* Applying the broadest reasonable interpretation standard, we construed the claim phrase “continuity member” to require that “the continuity member need only make contact with the coupler/nut and the post to establish an electrical connection there-between.” *Id.*

Turning to the claim phrase “configured to fit,” we summarized the parties’ position regarding this claim phrase and noted that it did not appear in the specification of the ’060 patent outside independent claim 1. Final Dec. 11. We recognized that, although the specification of the ’060 patent described embodiments in which particular portions of a coaxial cable connector included “opposing complimentary surfaces,” the specification

did not associate such a configuration with the characteristic of being “configured to fit,” as asserted by PPC. *Id.* at 11–12. Relying on a dictionary definition for “fit” provided by PPC, as well as the testimony from both parties’ expert witnesses, we explained “that surfaces are ‘configured to fit’ one another if the surfaces are of an appropriate size and shape with respect to each other, and are dimensioned to abut one another.” *Id.* at 12. We then noted that the parties’ dispute “centers on whether the surfaces, in being configured to fit each other, must ‘face’ one another in a manner that excludes abutment of surfaces that are perpendicular.” *Id.*

Taking into account certain embodiments in the specification of the ’060 patent identified by PPC in which surfaces of a post and body were arranged parallel to one another, together with an argument advanced by PPC’s counsel during oral argument, we determined that the broadest reasonable interpretation of the claim phrase “configure to fit” did not mandate a single arrangement of surfaces that satisfied this claim phrase, but instead included various positional interrelationships of the surfaces. Final Dec. 12–13. Based on the totality of record that was before us, we concluded that “components or surfaces that are ‘configured to fit’ one another are sized and dimensioned to abut one another, but that such meaning does not categorically exclude an arrangement of the components in which they are situated perpendicularly with respect to one another.” *Id.* at 13.

After stating the principles of law that generally apply to a ground of unpatentability based on obviousness, determining the knowledge level of a person of ordinary skill in the art, and providing brief overviews of Matthews and Tatsuzuki, we addressed whether Corning demonstrated by a

preponderance of the evidence that the combination of Matthews and Tatsuzuki accounts for all the limitations recited in claims 1–9 of the '060 patent. Final Dec. 15–38. In particular, consistent with our construction of the claim phrase “continuity member,” we agreed with Corning that the incorporation of Tatsuzuki’s disc-shaped spring 13 into Matthews’s coaxial cable connector 100 established a “continuity member” positioned to make contact with the surfaces of Matthews’s coupler/nut 30 and post 40 in the manner required by independent claim 1. *Id.* at 22–27. In addition, consistent with our construction of the claim phrase “configured to fit,” we agreed with Corning that, when Tatsuzuki’s disc-shaped spring 13 was incorporated into Matthews’s coaxial cable connector 100, the particular horizontal and vertical surfaces marked on Matthews’s flange 46 of post 40 and connector body 50 were understood reasonably as constituting surfaces that configured to fit one another, as required by independent claim 1. *Id.* at 27–30.

PPC offered evidence that purportedly showed the following: (1) long-felt but unsolved need; (2) failed attempts by Corning; (3) copying by Corning; and (4) commercial success. PO Resp. 36–60. After weighing Corning’s strong evidence of obviousness and PPC’s evidence of non-obviousness, on balance, we concluded that a preponderance of evidence supported a conclusion that claims 1–9 of the '060 patent would have been obvious over the combination of Matthews and Tatsuzuki. Final Dec. 39–50.

B. Federal Circuit Decision

On appeal to the Federal Circuit, PPC argued that we erred in construing the claim phrase “continuity member” to require “that the

continuity member need only make contact with the coupler/nut and the post to establish an electrical connection there[-between],” without requiring that contact to be consistent or continuous in time. *PPC Broadband*, 815 F.3d at 740. PPC then asserted that, if this claim phrase was construed correctly, we would not have found that the combination of Matthews and Tatsuzuki teaches consistent and continuous contact with the coupler/nut and post. *Id.*

The Federal Circuit noted that claim construction in an *inter partes* review proceeding is governed by the broadest reasonable interpretation consistent with the specification. *Id.* at 742. Applying the broadest reasonable interpretation standard, the Federal Circuit upheld our construction of the claim phrase “continuity member” as not requiring consistent or continuous contact through the post and coupler/nut. *Id.* at 742–43.

The Federal Circuit then explained that, although the broadest reasonable interpretation of the claim phrase “continuity member” does not require temporal continuity, as asserted by PPC, several claims do require such temporal continuity by virtue of other limitations, e.g., the “maintain electrical continuity” limitation recited in independent claim 1 of the ’060 patent. *Id.* at 743. According to the Federal Circuit, this limitation identified in independent claim 1 requires the continuity member to “maintain electrical continuity” during certain specified periods of operation of the coaxial cable connector. *Id.* The Federal Circuit determined that “[n]owhere in its decision[] did the Board find that the combination of Matthews and Tatsuzuki maintains electrical continuity during the specific positions or modes of operation required by [independent claim 1].” *Id.* at 744.

The Federal Circuit also acknowledged Corning’s arguments that we did not ignore the “maintain electrical continuity” limitation, but considered it as part of our claim construction analysis of the claim phrase “continuity member,” and Corning’s argument that it should nonetheless affirm our decision because the combination of Matthews and Tatsuzuki teaches this limitation. *Id.* at 744. The Federal Circuit, however, was not persuaded by Corning’s arguments in this regard and, therefore, vacated our determination that claims 1–9 of the ’060 patent were unpatentable. *Id.* The Federal Circuit also directed us to make explicit fact findings as to whether the combination of Matthews and Tatsuzuki teaches the “maintain electrical continuity” limitation recited in independent claim 1. *Id.*

Next, the Federal Circuit indicated that, although PPC did not dispute that the plain meaning of “fit” as being “an object is the proper size and shape,” PPC argued that this plain meaning required the two surfaces that were shaped or configured to fit one another to be somewhat parallel—namely, that one surface “has a complementary size and shape as, *and faces*” the other surface. *Id.* at 745. In other words, PPC argued that components whose surfaces do not face one another cannot be “configured to fit” one another, as required by independent claim 1. *Id.* PPC then asserted that the Federal Circuit should vacate and remand our determination as to claims 1–9 of the ’060 patent because, according to PPC, we would not have found that the combination of Matthews and Tatsuzuki teaches the “configured to fit” limitation recited in independent claim 1. *Id.*

The Federal Circuit held that, under the broadest reasonable interpretation standard, we correctly construed the claim phrase “configured to fit.” *Id.* at 745–46. The Federal Circuit stated that, “[b]ecause [PPC’s]

argument that the combination of Matthews and Tatsuzuki does not disclose this limitation is entirely predicated on [adopting] its claim construction, we *affirm* the Board’s decision.” *Id.* at 746. The Federal Circuit further stated that, “although we vacate the Board’s determination that claims 1–9 of the ’060 patent . . . are unpatentable because of the ‘maintain electrical continuity’ limitation, the Board correctly found that the prior art teaches the . . . ‘configured to fit’ limitation in these claims.” *Id.*

Lastly, the Federal Circuit addressed the parties’ dispute regarding our findings with respect to various indicia of nonobviousness, including long-felt but unresolved need, failed attempts by Corning, copying by Corning, and PPC’s evidence of commercial success. *Id.* at 746. With the exception of PPC’s evidence of commercial success, the Federal Circuit determined that substantial evidence supported our conclusions regarding these various indicia of nonobviousness. *Id.*

Turning to PPC’s evidence of commercial success, the Federal Circuit held that we erred in concluding that PPC had not established that its SignalTight connectors met all the limitations of the challenged claims. *Id.* at 746. In particular, the Federal Circuit noted that PPC presented multiple declarations supporting its allegation that its SignalTight connectors are commercial embodiments of the connectors recited in the challenged claims, and Corning did not present arguments to the contrary. *Id.* at 746–47. The Federal Circuit then stated that, “[w]hen the patentee has presented undisputed evidence that its product is the invention disclosed in the challenged claims, it is error for the Board to find to the contrary without further explanation.” *Id.* at 747. The Federal Circuit noted that, because we did not explain why the SignalTight connectors fail to embody the claimed

features, let alone what claimed features in particular were missing from the SignalTight connectors, substantial evidence did not support our findings in this regard. *Id.*

The Federal Circuit concluded its analysis regarding our assessment of PPC's evidence of commercial success as follows:

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. *J.T. Eaton & Co. v. Atl. Paste & Glue Co.*, 106 F.3d 1563, 1571 (Fed. Cir. 1997). This is true even when the product has additional, unclaimed features. *See, e.g., Ecolochem, Inc. v. S. Cal. Edison Co.*, 227 F.3d 1361, 1378 (Fed. Cir. 2000) (applying presumption even through [sic] commercial embodiment had unclaimed mobility feature); *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1312 (Fed. Cir. 2006) (holding that evidence that commercial success was due to unclaimed or non-novel features of device “clearly rebuts the presumption that [the product’s] success was due to the claimed and novel features”).

PPC Broadband, 815 F.3d at 747.

C. Obviousness Based on the Combination of Matthews and Tatsuzuki

In its Petition, Corning contends that claims 1–9 are unpatentable under § 103(a) over the combination of Matthews and Tatsuzuki. Pet. 38–57. In support of this asserted ground, Corning relies upon claim charts to explain how the proffered combination purportedly teaches the subject matter of each of these challenged claims. *Id.* Corning also relies on the Declaration of Dr. Robert S. Mroczkowski to support its positions. Ex. 1007 ¶¶ 70–125.

In its Patent Owner Response, PPC presents two arguments that are pertinent to the Federal Circuit’s guidance regarding the “maintain electrical continuity” limitation of independent claim 1, and its guidance regarding PPC’s evidence of commercial success. Those arguments are listed as follows: (1) the combination of Matthews and Tatsuzuki does not teach that the continuity member makes consistent contact with the coupler/nut and the post to maintain a continuous electrical connection between those two components, as required by independent claim 1; and (2) evidence of secondary considerations outweighs the evidence supporting Corning’s asserted grounds of unpatentability based on Matthews and Tatsuzuki. PO Resp. 16–20, 54–60. PPC relies upon, among other things, the Declaration of Charles A. Eldering, Ph.D., to support its positions. Ex. 2074 ¶¶ 71–86, 116–18.

We begin our analysis with brief overviews of Matthews and Tatsuzuki, then we address the parties’ arguments as to whether the combination of Matthews and Tatsuzuki teaches the “maintain electrical continuity” limitation of independent claim 1, and finally we address PPC’s evidence of secondary considerations in light of the Federal Circuit’s guidance.

1. Matthews

Matthews generally relates to a coaxial cable connector that includes at least one conductive member. Ex. 1004 ¶ 1. Figure 1 of Matthews, reproduced below, illustrates a sectional side view of coaxial cable connector 100. *Id.* ¶¶ 16, 26.

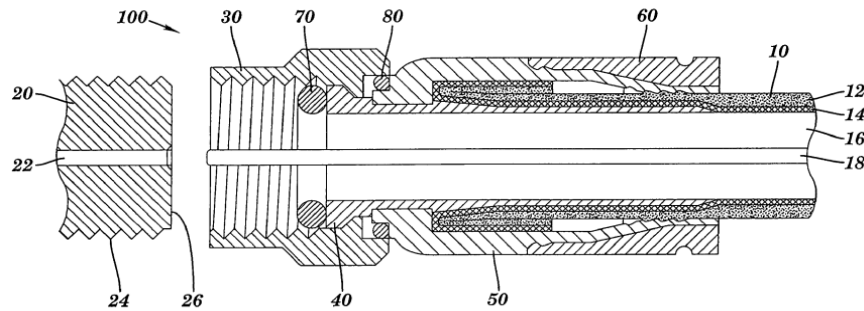


FIG. 1

As shown in Figure 1 of Matthews, coaxial cable connector 100 includes coaxial cable 10 that has protective outer jacket 12, conductive grounding shield 14, interior dielectric 16, and center conductor 18. Ex. 1004 ¶ 26. Coaxial cable connector 100 also may include threaded nut 30, post 40, connector body 50, fastener member 60, mating edge conductive member, e.g., O-ring 70, a connector body conductive member, e.g., O-ring 80, and a means for sealing and coupling connector body 50 and threaded nut 30. *Id.* ¶ 28.

Figure 3 of Matthews, reproduced below, illustrates a sectional side view of post 40. Ex. 1004 ¶¶ 18, 30.

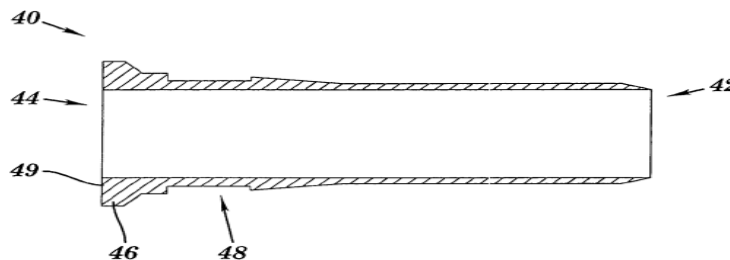


FIG. 3

As shown in Figure 3 of Matthews, post 40 includes first end 42, opposing second end 44, and flange 46 configured to contact internal lip 36 of threaded nut 30 (illustrated in Figure 2), thereby facilitating the prevention of axial movement of post 40 beyond contacted internal lip 36.

Ex. 1004 ¶ 30. Post 40 also includes surface feature 48, e.g., a shallow recess, detent, cut, slot, or trough, and mating edge 49 configured to make physical and/or electrical contact with interface port 20 or mating edge member, e.g., O-ring 70 (illustrated in Figure 1). *Id.* In one embodiment, post 40 may be inserted into an end of coaxial cable 10, around interior dielectric 16 and under protective outer jacket 12 and conductive grounding shield 14. *Id.* Accordingly, substantial physical and/or electrical contact with conductive grounding shield 14 may be accomplished, thereby facilitating grounding through post 40. *Id.*

Figure 4 of Matthews, reproduced below, illustrates a sectional side view of connector body 50. Ex. 1004 ¶¶ 19, 31.

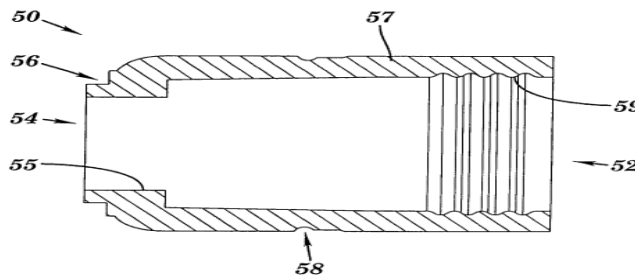


FIG. 4

As shown in Figure 4 of Matthews, connector body 50 includes first end 52, opposing second end 54, and internal annular lip 55 configured to engage surface feature 48 of post 40. Ex. 1004 ¶ 31.

Figure 2 of Matthews, reproduced below, illustrates a sectional side view of threaded nut 30. Ex. 1004 ¶¶ 17, 29.

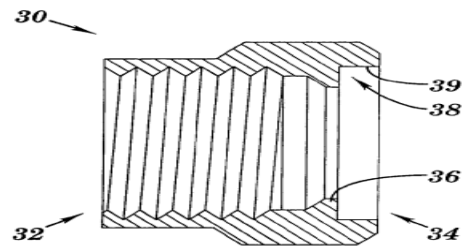


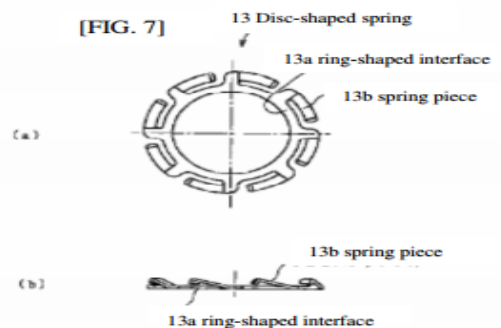
FIG. 2

As shown in Figure 2 of Matthews, threaded nut 30 includes first end 32, opposing second end 34, and internal lip 36 located proximate to second end 34 that is configured to hinder the axial movement of post 40. Ex. 1004 ¶ 29. Threaded nut 30 may be formed of conductive materials, thereby facilitating grounding through threaded nut 30. *Id.*

2. Tatsuzuki

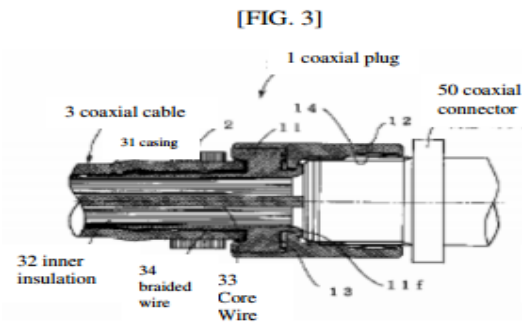
Tatsuzuki generally relates to a coaxial plug installed at the tip of a coaxial cable. Ex. 1002 ¶ 1. Tatsuzuki discloses installing a coaxial cable connector in reception devices, such as television satellite broadcasting tuners. *Id.* ¶ 2. Reception signals are inputted into these reception devices by fixing a coaxial plug installed at the tip of a coaxial cable to the coaxial cable connector. *Id.*

Figures 7(a) and 7(b) of Tatsuzuki, reproduced below, illustrate disc-shaped spring 13, and related side-view diagram, respectively. Ex. 1002 ¶ 17.



As shown in Figures 7(a) and 7(b) of Tatsuzuki, disc-shaped spring 13 is formed by stamp cutout processing of a thin metal plate possessing elasticity, e.g., phosphor bronze. Ex. 1002 ¶ 17. Disc-shaped spring 13 includes spring piece 13b and ring-shaped joining part 13a. *Id.* Spring piece 13b includes eight bent spring pieces, which are formed integrally by ring-shaped joining part 13a. *Id.*

Figure 3 of Tatsuzuki, reproduced below, illustrates a cross-section view of coaxial plug 1 securely installed in coaxial cable connector 50. Ex. 1002 ¶ 12.



As shown in Figure 3 of Tatsuzuki, coaxial plug 1 includes plug body 11 and rotary mounting element 12, which is fixed in a rotatable manner to plug body 11. Ex. 1002 ¶ 13. The electrical connection between ring-shaped part 11c of plug body 11 and rotary mounting element 12 is facilitated by disc-shaped spring 13 interposed there between. *Id.* ¶ 17. Disc-shaped spring 13 is located within housing channel 11e (illustrated in Figure 2) and, therefore, is not pressed to the point of becoming flat, i.e., it does not lose its spring operation. *Id.*

3. Claim 1

In its Petition, Corning presents detailed claim charts, along with supporting evidence, demonstrating how Matthews teaches most of the limitations of independent claim 1. In particular, Corning explains how

Matthews's coaxial cable connector 100 includes connector body 50, post 40 configured to engage the body, the post having an external annular protrusion (flange 46) and a rearward end (first end 42), and nut 30 including a forward nut end portion (first nut end 32), a rearward nut end (second end 34) and internal lip 36, and that those components correspond to the "connector body," "post," and "nut" features required by independent claim 1. Pet. 38–46. According to Corning, however, certain limitations of independent claim 1 directed to the required "continuity member," including its orientation during certain specified periods of operation of the connector, are not disclosed expressly in Matthews. *Id.* at 44–46. Specifically, as relevant to this case on remand, independent claim 1 recites:

a continuity member . . . 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.

Ex. 1001, 21:27–39 ("the 'maintain electrical continuity' limitation").

Corning contends that Matthews and Tatsuzuki collectively teach the "maintain electrical continuity" limitation recited in independent claim 1. Pet. 44–46 (citing Ex. 1004 ¶¶ 28, 34–36, Figs. 1, 7; Ex. 1002 ¶¶ 1, 2, 16, Figs. 3, 7; Ex. 1007 ¶¶ 84–87, 94, 95). In particular, Corning acknowledges that, although Matthews discloses that coaxial cable connector 100 includes connector body conductive member 80, Matthews does not indicate that connector body conductive member 80 directly contacts post 40 so as to extend electrical grounding through post 40 and nut 30. *Id.* at 44 (citing Ex. 1004 ¶ 28, Fig. 1). Corning then points to Tatsuzuki's disc-shaped spring 13 as providing an electrical connection between relevant components of coaxial cable connector 50. *Id.* at 44–46 (citing Ex. 1002, Figs. 3, 7).

Based on these cited disclosures, Corning asserts that both Matthews's connector body conductive member 80 and Tatsuzuki's disc-shaped spring 13 are positioned rearward of the forward facing lip surface of the internal lip of the nut. Pet. 50 (citing Ex. 1007 ¶ 88). Corning further asserts that both Matthews's connector body conductive member 80 and Tatsuzuki's disc-shaped spring 13 maintain conductivity between components of a connector. *Id.* Corning, therefore, contends that, because Matthews's connector body conductive member 80 and Tatsuzuki's disc-shaped spring 13 are positioned in the same general location to perform the same function (*id.*), it would have been obvious to one with ordinary skill in the art to modify Matthews's coaxial cable connector 100 by incorporating Tatsuzuki's disc-shaped spring 13 (Pet. 51 (citing Ex. 1004, Figs. 1, 7; Ex. 1007 ¶ 91)).

In its Patent Owner Response, apart from advocating that the required "continuity member" should be construed to require a continuous and consistent connection, which, as we explained above, the Federal Circuit rejected as the broadest reasonable interpretation, PPC did not address separately Corning's explanation and supporting evidence as to how the combination of Matthews and Tatsuzuki taught the "maintain electrical continuity" limitation. *See generally* PO Resp. 16–20. Although PPC did not put the issue as to whether the combination of Matthews and Tatsuzuki taught the "maintain electrical continuity" limitation squarely before us, in our Final Written Decision we stated the following: "[i]n considering the proposed incorporation of Tatsuzuki's disc-shaped spring 13 into Matthews's [coaxial cable] connector 100, we are satisfied that it establishes a continuity member positioned to make contact with surfaces of

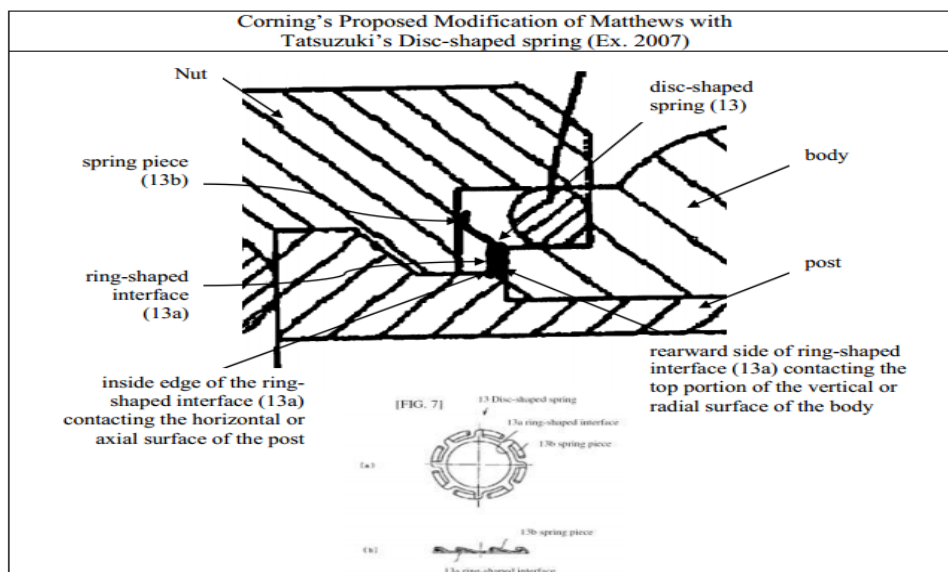
Matthews's coupler/nut 30 and post 40 *in the manner required by independent claim 1.*" Final Dec. 26 (emphasis added). We take this opportunity to clarify that we intended the statement identified above to refer to maintaining electrical continuity between Matthews's coupler/nut 30 and post 40 during certain specified periods of operation of coaxial cable connector 100 that are required by independent claim 1—namely, “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.” *See id.*

In 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. As we explained previously, under the broadest reasonable interpretation standard, the Federal Circuit upheld our construction of the claim phrase “continuity member” as requiring “that the continuity member need only make contact with the coupler/nut and the post to establish an electrical connection there[-between],” without requiring that contact to be consistent or continuous in time. *PPC Broadband*, 815 F.3d at 740–43. With this construction in mind, we turn to the merits of Corning's position regarding the “maintain electrical continuity” limitation.

Tatsuzuki discloses coaxial cable connector 50 that includes disc-shaped spring 13 that provides “electrical connection” between plug body 11 and rotary mounting element 12 of the connector. Ex. 1002, Abstract, ¶ 17. Tatsuzuki further characterizes the overall “objective” of its disclosed invention as being “to provide a coaxial plug without deterioration of insertion loss characteristics and reflection loss characteristics even in the

state when the coaxial plug is loosened.” *Id.* ¶ 7. Corning explains that Tatsuzuki’s disc-shaped spring 13 constitutes a continuity member because it promotes electrical connection between components of coaxial plug 1, particularly plug body 11 and mounting element 12. Pet. 50. That explanation is supported by Corning’s expert witness, Dr. Mroczkowski. Ex. 1007 ¶ 86.

During the course of trial, Dr. Mroczkowski explained possible approaches, from the perspective of one of ordinary skill in the art, in combining the teachings of the prior art so as to incorporate Tatsuzuki’s disc-shaped spring 13 into Matthews’s coaxial cable connector 100 in order to harness the electrical connection benefits of the disc-shaped spring. PPC focused on one such approach, which is encompassed by a sketch provided by Dr. Mroczkowski during depositions taken in connection with this trial. An illustration of this sketch is reproduced below as it has been presented in the Patent Owner Response.



PO Resp. 12 (PPC presents an annotated version of Ex. 2007), 19 (PPC presents a clean version of Ex. 2007 with no annotations).

As offered by PPC, the illustration reproduced above depicts an opinion of Dr. Mroczkowski as to an implementation of Tatsuzuki's disc-shaped spring 13 positioned with respect to coupler/nut 30 and post 40 of Matthews's coaxial cable connector 100. PO Resp. 18–19. In considering this proposed incorporation of Tatsuzuki's disc-shaped spring 13 into Matthews's coaxial cable connector 100, 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. 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 coaxial 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.

Although our guidance from the Federal Circuit was to address the “maintain electrical continuity” limitation recited in independent claim 1, an obviousness evaluation requires us to assess the claimed invention “as a whole.” 35 U.S.C. § 103(a). Consequently, we have reviewed Corning's explanations and supporting evidence as to how the combination of Matthews and Tatsuzuki teaches the remaining limitations recited in

independent claim 1, and we agree with and adopt Corning’s analysis. *See* Pet. 38–43, 50–54. We also maintain our determination in the Final Written Decision that Corning provides a sufficient rationale to combine the teachings of Matthews and Tatsuzuki. Final. Dec. 30–34. Based on the record developed during trial, Corning has demonstrated by a preponderance of the evidence that the combination of Matthews and Tatsuzuki accounts for all the limitations recited in independent claim 1.

4. *Claims 2–9*

As we explained previously, claims 2–9 directly or indirectly depend from independent claim 1. After evaluating dependent claims 2–9 anew, and in light of our determination that the combination of Matthews and Tatsuzuki teaches the “maintain electrical continuity” limitation recited in independent claim 1, we agree with and adopt Corning’s analysis as to how this proffered combination teaches the limitations recited in these dependent claims. *See* Pet. 46–49, 54–57. Based on the record developed during trial, Corning has demonstrated by a preponderance of the evidence that the combination of Matthews and Tatsuzuki accounts for all the limitations recited in dependent claims 2–9.

5. *Secondary Considerations of Non-Obviousness*

In its Patent Owner Response, PPC argues that certain secondary considerations, including long-felt but unsolved need (PO Resp. 40–42), failed attempts by Corning (*id.* at 42–47), copying by Corning (*id.* at 38–40, 47–54), and commercial success (*id.* at 54–60), “clearly establish the non-obviousness of the claims at issue.” *Id.* at 38. In our Final Decision, we concluded the following:

We have considered the entirety of the evidence, both Corning's strong evidence of obviousness and PPC's purported evidence of non-obviousness. On balance, we determine that a preponderance of the evidence supports a conclusion that claims 1–9 of the '060 patent would have been obvious over the combination of Matthews and Tatsuzuki.

Final Dec. 50.

In remanding this case, the Federal Circuit found no error in our evaluation of the evidence of purported long-felt need, purported failed attempts by Corning, or copying by Corning. *PPC Broadband*, 815 F.3d at 746. The Federal Circuit instructs us, however, to reassess specifically PPC's evidence of commercial success in light of its guidance. *Id.* at 747. Accordingly, although we remain mindful of all of PPC's evidence of non-obviousness, we re-consider and re-address specifically the noted evidence of commercial success.⁴

PPC contends that its “flagship Signal Tight series connectors” are commercial embodiments of the coaxial connectors recited in the challenged claims, citing the Declarations by Mr. Jackson and Dr. Eldering. PO Resp. 55–56 (citing Ex. 2072 ¶¶ 12, 13, 26–28; Ex. 2074 ¶ 116). In addition, PPC contends that “Corning's UltraShield connectors constitute a copy of PPC's SignalTight connectors in all material respects.” *Id.* at 56 (citing Ex. 2072 ¶¶ 22, 23, 26–28; Ex. 2074 ¶ 117). Given the undisputed evidence that the SignalTight connectors are the invention covered in the challenged claims of

⁴ In support of its argument regarding commercial success, PPC relies on the Declarations of Mr. David Jackson, Vice President, General Manager of PPC (Exs. 2072 (unredacted version), 2073 (redacted version)), the Declaration of Dr. Eldering (Ex. 2074), and other evidence.

the '060 patent, and following the Federal Circuit's guidance, we presume that the SignalTight connectors are encompassed by those claims. *See PPC Broadband*, 815 F.3d at 746–47 (“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.” (citation omitted)).⁵

In relation to evidence of commercial sales and market share, PPC discusses sales of PPC's SignalTight connectors, Corning's UltraShield connectors, and PPC's “non-continuity EX connectors.” PO Resp. 58–60. In this context, PPC asserts that “[i]n only three years, the percentage of non-continuity EX connectors sold by PPC has decreased steadily and dramatically – 93% of PPC's connector sales are now of SignalTight connectors.” *Id.* at 58. PPC contends that SignalTight's market share has grown from 0% to approximately 67%. *Id.* PPC also contends that SignalTight connectors are sold at a premium, i.e., “have been sold for approximately 16% more than PPC's comparable, non-continuity EX connectors.” *Id.* at 59.

Based on the totality of the record, we are not persuaded that the evidence establishes sufficient commercial success for the covered connectors. It is difficult to ascribe substantial weight to PPC's commercial success because PPC has failed to provide data for the connector market as a whole. For example, PPC's “SignalTight's Market Share” graph seems to imply that PPC's relevant connector market share before 2009 was zero, i.e.,

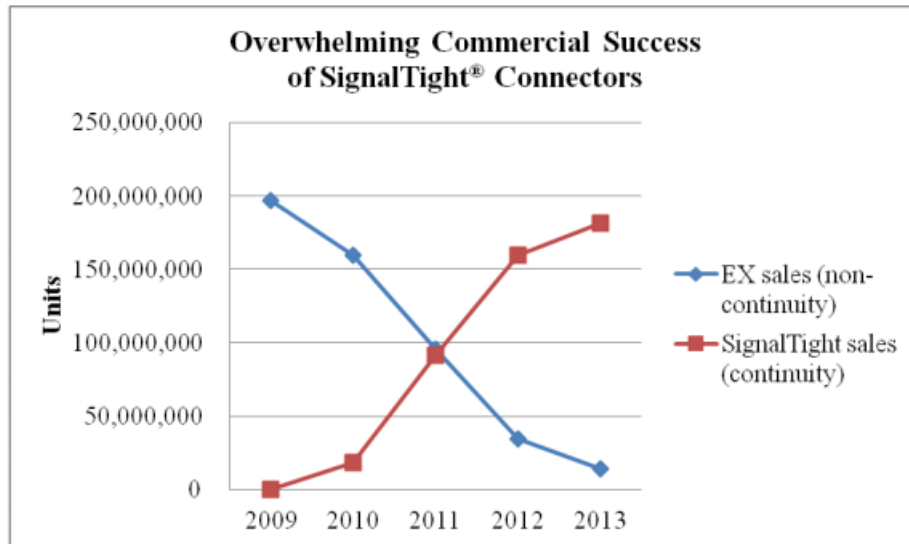
⁵ In considering the record evidence of commercial success, we presume also that Corning's UltraShield connectors are encompassed by the challenged claims of the '060 patent.

that PPC did not sell a relevant coaxial cable connector to anyone before 2009. PO Resp. 58–59 (emphasis omitted); Ex. 2072 ¶¶ 18–21. It is apparent from the record, however, that the relevant “market” includes connectors that do not have a continuity member as required by the challenged claims. Indeed, PPC’s Declarant, Mr. Jackson, assesses PPC’s market share by including percentages and product sales for products that do not have a continuity member, such as the EX connectors. *See* Ex. 2072 ¶¶ 18–21. Thus, the pre-existing market share of PPC connectors that do not have a continuity member must be considered in appropriately inquiring into PPC’s commercial success for the SignalTight connectors. In that regard, to the extent that sales of SignalTight connectors constitute 67% of the market, it must be viewed in light of the market share PPC already possessed prior to the introduction of the SignalTight connectors. On this record, and as detailed below, PPC’s pre-existing market share appears to be greater than 67%. *See* Ex. 2072 ¶ 19 (chart reproduced below).⁶ Consequently, we determine that PPC’s market share, as a whole, has not increased subsequent to the introduction of its SignalTight connectors covered by the challenged claims.

In reaching this determination, we further reason that it is informative to consider sales information of PPC’s own EX connectors, which are not covered by the challenged claims of the ’060 patent, with sales of PPC’s SignalTight connectors. In that respect, one would expect reasonably that PPC’s assertions of commercial success would demonstrate that PPC has

⁶ It is apparent from the chart appearing at Exhibit 2072, paragraph 19, that PPC sold more EX Connectors in 2009 than SignalTight connectors in 2013, which, as noted above, PPC represents attained a market share of 67%.

attained increased market share through sales of the SignalTight connectors as compared with EX connectors. PPC's Declarant, Mr. Jackson, presents a chart depicting sales of EX connectors and SignalTight connectors between 2009 and 2013. We reproduce that chart below.



Ex. 2072 ¶ 19.

The chart above compares the sales of EX connectors, which do not have a continuity member, with the sales of SignalTight connectors, which do have a continuity member. As discussed above, that the EX connectors have no continuity member means that they do not fall within the scope of the challenged claims of the '060 patent. As can be seen from the chart reproduced above, in 2009, PPC sold a given number of EX connectors, and in 2013, PPC sold slightly less than that number of SignalTight connectors. Indeed, at the oral argument conducted with respect to related Cases IPR2013-00346 and IPR2013-00347, PPC represented that the market share of its "EX product" and its SignalTight connector was "about the same." Paper 76, 102:15. The data presented 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. *See Geo. M. Martin Co. v. Alliance Machine Sys. Int'l LLC*, 618 F.3d 1294, 1304 (Fed. Circ. 2010) (“Here, Alliance 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.’ Thus, this factor carries little weight.”).

We also discern that it is not apparent from the record before us whether the SignalTight connectors acted as a true alternative product to the EX connectors throughout the 2009–2013 time frame, or whether it was the case that the EX connectors were discontinued over the same time frame. Indeed, the answer to that question is paramount to a reasoned appreciation of the evidence that PPC provides. To that end, if the SignalTight connectors were made available to consumers as replacements for EX connectors that were being discontinued, such a scenario tells us little about commercial success of the covered connectors. Consistent with that understanding, the record before us conveys that PPC actively “transitioned” its customers from using EX connectors to using SignalTight connectors. Ex. 2072 ¶ 17. This transition suggests that the SignalTight connectors were offered to its customers in lieu of EX connectors, and does not aid in the strength of PPC’s contention of commercial success.

We observe that PPC also provides market share information in connection with Corning’s UltraShield connectors. PO Resp. 59 (contending that the market share of Corning’s UltraShield connectors “is

now approximately 15%”). Ex. 2072 ¶ 24. The market share information presented in connection with Corning’s UltraShield connectors, however, does not indicate the pre-existing market share that Corning enjoyed with respect to non-covered connectors prior to introducing the UltraShield connectors, or what became of those non-covered connectors. The lack of such information is significant and cannot be disregarded in light of the market share situation of PPC’s transitioning its customers from non-covered connectors, i.e., EX connectors, to covered connectors, i.e., SignalTight connectors. As such, we cannot conclude the proffered evidence of Corning’s UltraShield connectors should be given substantial weight.

Lastly, we recognize that PPC represents that its SignalTight connectors were sold at a 16% premium as compared with PPC’s own EX connectors. PO Resp. 59 (citing Ex. 2072 ¶ 20). This 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.

To the extent PPC’s Declarant, Mr. Jackson, also asserts that the SignalTight connectors are priced at a premium with respect to other connectors on the market (Ex. 2072 ¶ 20), he does not provide underlying facts or data to support this assertion. *See* 37 C.F.R. § 42.65(a) (“Expert testimony that does not disclose the underlying facts or data on which the opinion is based is entitled to little or no weight.”) Without such facts or data, it is unclear how much weight, if any, we should attribute to PPC’s price premium argument.

In summary, although we recognize that PPC provides evidence that it and Corning commercially sold SignalTight and UltraShield connectors, respectively, and that sales of such products increased after their introduction to the market in 2009–2010 time frame, we are not persuaded that PPC’s evidence of commercial success provides persuasive support of objective indicia of non-obviousness in relation to the challenged claims.

We have reevaluated PPC’s proffered evidence of commercial success in light of the Federal Circuit’s guidance. We also take note of our 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. *See* Final Dec. 39–44. We once again have considered the entirety of the evidence, both Corning’s strong evidence of obviousness and PPC’s evidence of non-obviousness. On balance, we determine that a preponderance of the evidence supports a conclusion that claims 1–9 of the ’060 patent would have been obvious over the combination of Matthews and Tatsuzuki.

III. CONCLUSION

Upon reviewing the record developed during trial anew, and in light of the Federal Circuit’s guidance, we maintain that Corning has demonstrated by a preponderance of the evidence that claims 1–9 of the ’060 patent are unpatentable under § 103(a) over the combination of Matthews and Tatsuzuki.

IV. ORDER

In consideration of the foregoing, it is
ORDERED that claims 1–9 of the '060 patent are held to be
unpatentable; and

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

IPR2013-00340
Patent 8,323,060 B2

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