

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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CORNING OPTICAL COMMUNICATIONS RF, LLC,  
Petitioner,

v.

PPC BROADBAND, INC.,  
Patent Owner.

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Case IPR2013-00345  
Patent 8,313,353 B2

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

ZECHER, *Administrative Patent Judge.*

FINAL WRITTEN DECISION  
*35 U.S.C. § 318(a) and 37 C.F.R. § 42.73*

## I. INTRODUCTION

Petitioner, Corning Optical Communications RF, LLC<sup>1</sup> (“Corning”), filed an amended Petition requesting an *inter partes* review of claims 7–27 of U.S. Patent No. 8,313,353 B2 (Ex. 1001, “the ’353 patent”). Paper 5 (“Pet.”). Patent Owner, PPC Broadband Inc. (“PPC”), did not file a preliminary response. The Board determined that the information presented in the Petition demonstrated that there was a reasonable likelihood that Corning would prevail in challenging claims 7–27 as unpatentable under 35 U.S.C. § 103(a). Pursuant to 35 U.S.C. § 314, the Board instituted this proceeding on December 5, 2013, on the ground that those claims are unpatentable under 35 U.S.C. § 103(a) over Matthews<sup>2</sup> and Tatsuzuki.<sup>3</sup> Paper 15 (“Dec.”).

During the course of this proceeding, PPC filed unredacted and redacted versions of a Patent Owner Response (Papers 29 and 30, “PO Resp.”), along with a Revised Motion to Seal and proposed Protective Order (Paper 39), and three additional Motions to Seal, each with the same proposed Protective Order (Papers 42, 58, and 68). Corning filed a Response to PPC’s Revised Motion to Seal (Paper 40), a Motion to Seal

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<sup>1</sup> During the course of this proceeding, Petitioner filed an updated mandatory notice indicating that Corning Gilbert Inc., the original Petitioner in this proceeding, changed its name to Corning Optical Communications RF, LLC. Paper 23, 1.

<sup>2</sup> Matthews, US 2006/0110977 A1, published May 25, 2006 (Ex. 1004).

<sup>3</sup> Tatsuzuki, JP 2002-015823, published Jan. 18, 2002 (Ex. 1030) (English translation Ex. 1002).

(Paper 45), as well as a Substitute Reply to the Patent Owner Response (Paper 51, “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 54, “Mot. to Exclude.” Corning filed an Opposition to PPC’s Motion to Exclude. Paper 60. PPC filed a Reply to Corning’s Opposition. Paper 64.

A consolidated oral hearing was held on July 24 and 25, 2014, in relation to this proceeding and the following four other related proceedings involving the same parties: (1) IPR2013-00340; (2) IPR2013-00342; (3) IPR2013-00346; and (4) IPR2013-00347. Transcripts of the entire consolidated hearing are included in the record as Papers 73–75. Paper 74 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 IPR2013-00340 in particular.

We have jurisdiction under 35 U.S.C. § 6(c). This Decision is a Final Written Decision under 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73 as to claims 7–27 of the ’353 patent. For the reasons discussed below, Corning has demonstrated by a preponderance of the evidence that those claims are unpatentable under 35 U.S.C. § 103(a). PPC’s Motion to Exclude is denied.

*A. Related Matters*

Corning indicates that PPC asserted the '353 patent against it in *PPC Broadband, Inc. v. Corning Gilbert Inc.*, 5:12-cv-0911-GLS-DEP, which PPC filed in the U.S. District Court for the Northern District of New York. Pet. 1. In addition, Corning filed five other petitions seeking *inter partes* review of the following patents owned by PPC: the '353 patent (IPR2013-00343); U.S. Patent No. 8,323,060 B2 (IPR2013-00340 and IPR2013-00342); and U.S. Patent No. 8,287,320 B2 (IPR2013-00346 and IPR2013-00347). *Id.* at 1–2.

On April 15, 2014, we granted PPC's request in IPR2013-00343 to cancel claims 1–6 of the '353 patent, i.e., all claims at issue in that proceeding, as well as PPC's request for entry of adverse judgment against it in that case. IPR2013-00343, Paper 27.

*B. The '353 Patent (Ex. 1001)*

The '353 patent relates generally 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 '353 patent is reproduced below.

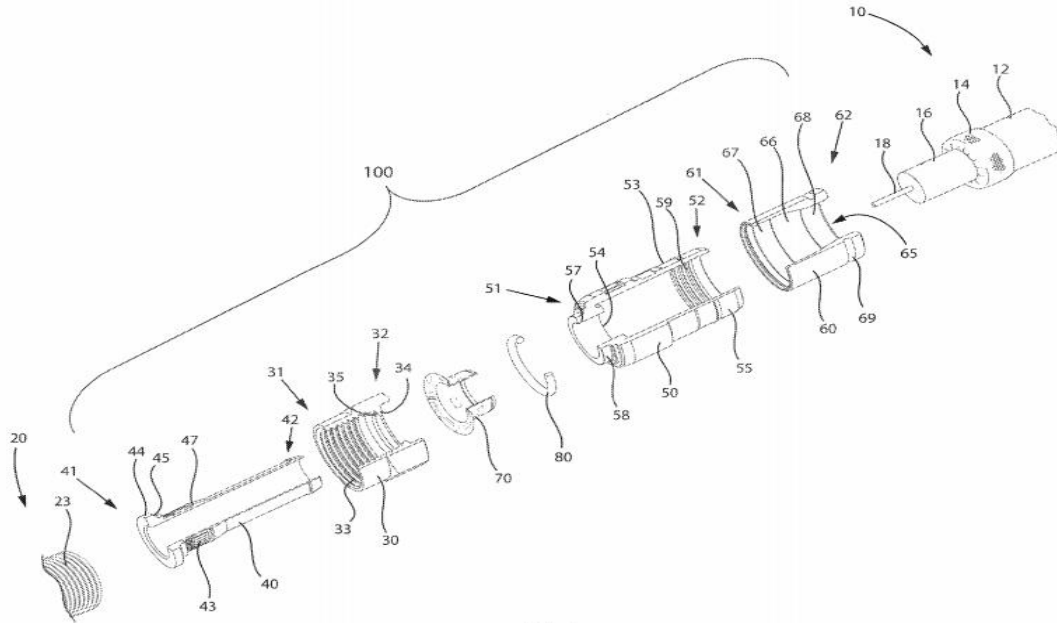


FIG. 1

Figure 1 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. Connector 100 may be affixed, or attached functionally, to coaxial cable 10 that includes protective outer jacket 12, conductive grounding shield 14, interior dielectric 16, and center conductor 18. *Id.* at 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 '353 patent discloses that post 40 includes first forward end 41, opposing second rearward end 42, and flange 44 located at first forward end 41. *Id.* at 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 '353 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. *Id.* at 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 11:5–8. 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.

Figure 7 of the '353 patent is reproduced below, with an arrow added.

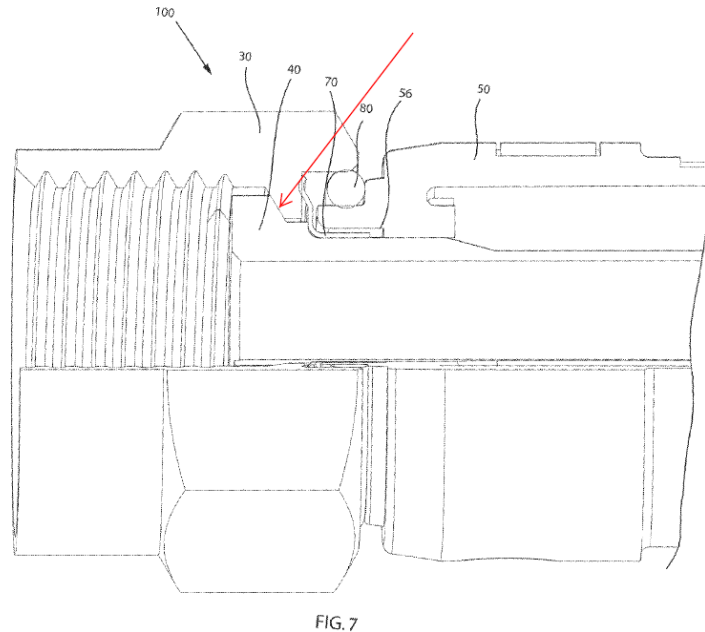


Figure 7 depicts a perspective cut-away view of a portion of assembled coaxial cable connector 100 comprising nut 30, post 40, and continuity member 70. *Id.* at 3:9–12; 12:13–33. The added arrow in the figure points to a forward facing surface of inward lip 34 of nut 30 and a rearward facing surface of flange 44 of post 40.

Method claims 7 and 20 are independent. Claims 8–19 depend, directly or indirectly, from claim 7, which is reproduced below:

7. A method of assembling a coaxial cable connector for a coaxial cable, the coaxial cable having a center conductor surrounded by a dielectric, the dielectric surrounded by a conductive grounding shield, the conductive grounding shield surrounded by a protective outer jacket, the method comprising:  
providing a connector body;

providing a post having a forward end and a rearward end, the forward end including a flange having a forward facing surface configured to face an interface port when the connector is coupled to the interface port and a rearward facing surface facing the rearward end of the post, wherein the rearward end of the post is configured to contact at least a portion of the conductive grounding shield of the coaxial cable when the cable is attached to the connector;

arranging a portion of a post within a portion of the connector body;

positioning a nut so as to be rotatable relative to the post and the connector body, the nut including an inward lip, wherein the inward lip of the nut has a forward facing surface, a rearward facing surface, and an innermost portion extending between the forward facing surface and the rearward facing surface;

positioning an electrical continuity member so as to contact the rearward facing surface of the inward lip of the nut, extend between a portion of the post and a portion of the connector body, electrically couple the post to the nut at a position other than between the rearward facing surface of the flange of the post and the forward facing surface of the lip of the nut, and maintain electrical continuity between the post and the nut when the post pivots relative to the nut; and

rotating the forward facing surface of the inward lip of the nut about the rearward facing surface of the flange of the post.

*Id.* at 22:11–48.



Claims 21–27 depend, directly or indirectly, from claim 20, which is reproduced below:

20. A method assembling a coaxial cable connector for a coaxial cable, the coaxial cable having a center conductor surrounded by a dielectric, the dielectric surrounded by a conductive grounding shield, the conductive grounding shield surrounded by a protective outer jacket, the method comprising:

providing a post having a forward end and a rearward end, the forward end including a flange having a forward facing surface configured to face an interface port when the connector is coupled to the interface port and a rearward facing surface facing the rearward end of the post, the rearward end of the post being arranged so as to be inserted into an end of the coaxial cable around the dielectric and under at least a portion of the conductive grounding shield so as to form an electrical connection with the conductive grounding shield;

providing a connector body having a forward end and a rearward end configured to receive a portion of the coaxial cable, the connector body being configured to engage the post when the connector is assembled;

positioning a portion of the post within the connector body;

providing a nut having a forward end configured for engaging the interface port, a rearward end, and an inward lip, wherein the inward lip of the nut has a forward facing surface facing the forward end of the nut, a rearward facing surface facing the rearward end of the nut, and an intermediate portion between the forward facing surface and the rearward facing surface;

positioning the nut so as to be axially rotatable relative to the post and the connector body;

rotating the forward facing surface of the inward lip of the nut about the rearward facing surface of the flange of the post; and

positioning an electrical continuity member so as to extend between a portion of the post and a portion of the connector body, contact the post, contact the rearward facing surface of the inward lip of the nut, electrically connect the post and the nut at a position other than between the rearward facing surface of the flange of the post and the forward facing surface of the lip of the nut, and maintain electrical continuity between the post and the nut when the post rotates relative to the nut.

*Id.* at 23:43–24:24.

## II. ANALYSIS

### A. Claim Construction

We construe claims in an unexpired patent by applying the broadest reasonable interpretation in light of the specification. 37 C.F.R. § 42.100(b). Claim terms also are given their ordinary and customary meaning, as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). However, a “claim term will not receive its ordinary meaning if the patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history.” *CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366 (Fed. Cir. 2002).

#### 1. Claim Phrases Construed in the Decision to Institute

In its Petition, Corning provides constructions for a number of claim phrases recited in the ’353 patent. Pet. 5–6. In our Decision to Institute, we adopted the claim constructions proposed by Corning—namely, in relation

to “pivot” (claim 7), “the rearward facing end of the post” (claim 13), “reward” (claim 20), and “a cable shielding” (claims 18 and 26). Dec. 11–14. We also construed the phrases “rotatable,” “rotating,” “axially rotatable,” and “rotates” (claims 7 and 20). *Id.* at 9–11. PPC does not propose alternative claim constructions for those claim phrases in its Patent Owner Response, nor did Corning challenge our constructions in its Reply. We discern no reason to alter our claim constructions in any respect for this Final Written Decision. For convenience, our claim constructions are reproduced in the table below.

<b>Claim(s)</b>	<b>Claim Phrase</b>	<b>Claim Construction</b>
7 and 20	“rotatable,” “rotating,” “axially rotatable,” and “rotates”	“encompassing the axial rotation of a nut or a post, whichever the case may be, in relation to the axial line of the overall connector”
7	“pivots”	“including axial rotational movement”
13	“the rearward facing end of the post”	“the rearward end of the post,” as recited in claim 7
18 and 26	“a cable shielding”	“encompassing a conductive grounding shield in a coaxial cable,” as recited in claims 7 and 20
20	“reward”	“rearward”

2. “*electrical continuity member*”

As noted above, independent claims 7 and 20 each include a feature pertaining to an “electrical continuity member.” The feature, as it appears in claim 7, reads:

positioning an electrical continuity member so as to contact the rearward facing surface of the inward lip of the nut, extend

between a portion of the post and a portion of the connector body, electrically couple the post to the nut at a position other than between the rearward facing surface of the flange of the post and the forward facing surface of the lip of the nut, and maintain electrical continuity between the post and the nut when the post pivots relative to the nut.

The feature, as it appears in claim 20, reads:

positioning an electrical continuity member so as to extend between a portion of the post and a portion of the connector body, contact the post, contact the rearward facing surface of the inward lip of the nut, electrically connect the post and the nut at a position other than between the rearward facing surface of the flange of the post and the forward facing surface of the lip of the nut, and maintain electrical continuity between the post and the nut when the post rotates relative to the nut.

In its Patent Owner Response, PPC contends that the pertinent claim limitation should be construed to require that “the continuity member makes *consistent contact* with the nut and the post to maintain a *continuous electrical connection* between the nut and the post.” PO Resp. 19. To support its claim construction, PPC directs us to various portions of the Specification of the ’353 patent, a dictionary definition of “continuity,” and the testimony of its expert witness, Dr. Charles A. Eldering. *Id.* at 18–19 (citing portions of Ex. 1001; Ex. 2071, 6; Ex. 2074 ¶¶ 75–78).

In reply, Corning contends that PPC “construes the claims to require a direct ground path between the continuity member and the post,” without identifying claim language that gives rise to such a construction. Pet. Reply 6. According to Corning, a “ground path passing through the continuity member, to the body, to the post” satisfies the limitation. *Id.* at 6–7 (citing

Ex. 1001, 9:44–49, 9:22–28, Fig. 50). Corning argues that PPC’s proposed claim construction improperly imports limitations from the specification into the claims. *Id.* at 7–8. Corning also argues that, when applying the broadest reasonable construction standard, “the term ‘continuity’ does not require some undefined level of consistency, reliability, or robustness of an electrical connection over some undefined period of time.” *Id.* at 8–9.

We agree with Corning. We must be careful not to read limitations from a particular embodiment appearing in the specification into the claim if the claim language is broader than that embodiment. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993). If a feature in the disclosure is not necessary to give meaning to what the inventor means by a claim term, it would be “extraneous” and should not be read into the claim. *Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1249 (Fed. Cir. 1998); *E.I. du Pont de Nemours & Co. v. Phillips Petroleum Co.*, 849 F.2d 1430, 1433 (Fed. Cir. 1988).

PPC does not allege that the inventors of the ’353 patent acted as their own lexicographer and provided a special definition in the Specification of the ’353 patent for the claim term “electrical continuity member” that is different from its recognized meaning to one of ordinary skill in the art. Absent a special definition set forth in the Specification in the ’353 patent, we decline to import limitations into the disputed claim limitations that would require the “electrical continuity member” to make “consistent contact” with the nut and the post such that it maintains a “continuous electrical connection” between these components. Indeed, the claimed

“electrical continuity member” does not cease to be an electrical continuity member, as would be understood by one of ordinary skill in the art, simply because the contact made between the nut and post may not be “consistent” to maintain a “continuous electrical connection” between these components.

We also agree with Corning that the term “continuity” does not require some undefined level of consistency, reliability, or robustness of an electrical connection between the nut and post over some undefined period of time. PPC does not direct us to a well-defined or otherwise recognizable standard for making an objective determination as to how long an electrical continuity member must make “consistent contact” with a nut and post to maintain “continuous electrical connection” between these components. If we were to read the requirements of “consistent contact” and a “continuous electrical connection” into the disputed claim limitation, that would interject ambiguity into the determination of claim scope because of the uncertainty arising from the meaning of “consistent” and “continuous.”

Applying the broadest reasonable interpretation standard, we construe the disputed claim limitations in connection with the “electrical continuity member” to require that the continuity member need only make contact with the nut and the post to establish an electrical connection between the nut and the post.

3. “*shaped to fit*”

Claims 16 and 24 ultimately depend from claims 7 and 20, respectively. Claims 16 and 24 include the limitation that “the portion of the post comprises an outer surface *shaped to fit* the portion of the connector

body.” According to PPC, the phrase “shaped to fit” in that regard should be construed as requiring that one surface “has a complementary size and shape as, and faces” the other surface. PO Resp. 24. During oral argument, counsel for PPC elaborated that, in requiring components that “face” one another, “shaped to fit” excludes surfaces that are perpendicular to one another, i.e., arranged at a right angle or 90 degree angle to one another. *E.g.*, Paper 74, 57–59. Counsel for PPC further represented that “shaped to fit” does not require surfaces that are “perfectly parallel” (*id.* at 56–57), but, in response to queries from the panel, was unable to convey the extent of variation from parallel that is encompassed or permitted such that surfaces remain “shaped to fit” one another, yet not parallel (*id.* at 57–64).

Corning challenges PPC’s position as to the meaning of “shaped to fit.” To that end, pointing in-part to the testimony of its expert witness, Dr. Robert S. Mroczkowski, Corning contends that “‘shaped to fit’ encompasses both (1) perpendicular surfaces that abut each other . . . , and (2) parallel surfaces that face each other.” Pet. Reply 9–10.

We observe that the term “shaped to fit” does not appear in the Specification of the ’353 patent. Although, as noted by both parties, the Specification describes embodiments of the disclosed invention in which particular portions of a coaxial cable connector include “opposing complimentary surfaces,” (e.g., Ex. 1001, 12:56–59), contrary to PPC’s argument (PO Resp. 24), the Specification does not associate such a configuration with the characteristic of being “shaped to fit.” Both PPC and Corning have pointed to dictionary definitions of “fit” as meaning to be a

“proper size and shape” for (*Id.*; Pet. Reply 10). Both PPC’s expert witness, Dr. Eldering, and Corning’s expert witness, Dr. Mroczkowski, also explain that surfaces shaped to fit one another “need to be dimensioned to abut each other.” Ex. 1036, 158:20–159:12; Ex. 2074 ¶ 93.<sup>4</sup>

In that vein, we understand that surfaces are “shaped 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. As noted above, the parties have differing views as to what extent surfaces, in being sized appropriately and dimensioned to abut, also must be recognized as facing each another. In that regard, the dispute centers on whether the surfaces, in being shaped to fit each other, must “face” one another in a manner that excludes abutment of surfaces that are perpendicular.

It is not apparent to us that surfaces that abut one another, yet are perpendicular, do not “face” each other to some extent. To that end, surfaces that abut and touch, but are arranged at a 90-degree angle, while not directly opposed from one another, are nevertheless in a configuration in which the faces of the surfaces are exposed to each other. Put another way, surfaces that are perpendicular to one another are not separated by an obtuse

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<sup>4</sup> Although both Dr. Eldering and Dr. Mroczkowski refer to “configured” to fit in the noted portions of Exhibits 1036 and 2074, it is apparent on the record before us that the terms “shaped” and “configured” are used interchangeably in the context of the ’353 patent. Indeed, at oral argument, counsel for PPC expressed that “shaped to fit” and “configured to fit” are synonymous. Paper 74, 55. Corning has expressed no disagreement in that regard.



angle so as to be regarded as diverging from one another. As noted above, although the Specification of the '353 patent depicts embodiments of the invention in which surfaces corresponding to those of the claims appear parallel to one another, it does not use the phrase “shaped to fit,” or otherwise intrinsically associate such an arrangement as the sole configuration constituting surfaces that “fit” one another. That the Specification of the '353 patent depicts embodiments in which portions of a post and body are arranged parallel to one another does not, itself, mandate that singular arrangement as the sole configuration presenting surfaces that are “shaped to fit.” The broadest reasonable construction of the term includes various positional interrelationships of the surfaces. As noted above, although PPC maintains that perpendicular surfaces are excluded from fitting one another, during oral argument, PPC’s counsel was unable to express cogently how “shaped to fit” encompasses surfaces arranged in a manner that deviates from parallel, but necessarily excludes perpendicular surfaces.

In considering the totality of the record before us, we conclude that components or surfaces that are “shaped to fit” one another are sized and dimensioned to abut one another, but that such meaning does not exclude categorically an arrangement of the components in which they are situated perpendicularly with respect to one another.

*B. Ground of Unpatentability Based on Matthews and Tatsuzuki*

In its Petition, Corning contends that claims 7–27 are unpatentable over Matthews and Tatsuzuki. Pet. 38–59. In support of that proposed

ground of unpatentability, Corning relies upon claim charts to explain how the proffered combination teaches the claimed subject matter recited in each of those challenged claims, as well as the Declaration of Dr. Mroczkowski (Ex. 1005) to support its positions. *Id.* PPC disagrees that claims 7–27 are unpatentable over the prior art. PO Resp. 14–34. We consider the respective positions of the parties in light of the record before us.

*1. Principles of Law*

A claim is unpatentable under § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including: (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). We also recognize that prior art references must be “considered together with the knowledge of one of ordinary skill in the pertinent art.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994) (citing *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)).

*2. Level of Skill in the Art*

In determining the level of skill in the art, various factors may be considered, including “type of problems encountered in the art; prior art solutions to those problems; rapidity with which innovations are made;

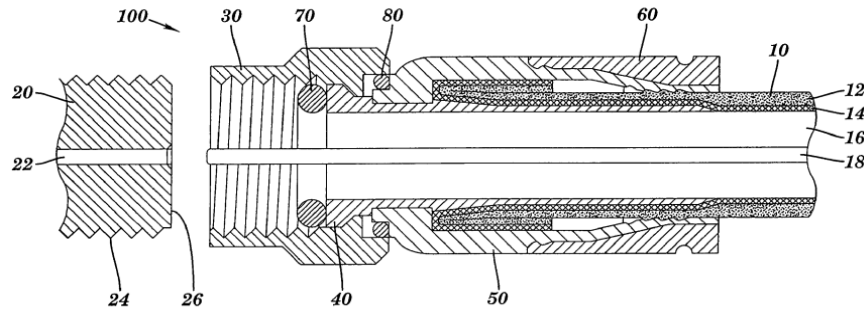
sophistication of the technology; and educational level of active workers in the field.” *In re GPAC, Inc.*, 57 F.3d 1573, 1579 (Fed. Cir. 1995) (citing *Custom Accessories, Inc. v. Jeffrey-Allan Indus., Inc.*, 807 F.2d 955, 962 (Fed. Cir. 1986)).

There is evidence in the record before us that reflects the knowledge level of a person with ordinary skill in the art. Corning’s expert, Dr. Mroczkowski, attests that a person with ordinary skill in the art would be an individual who possesses a bachelor’s degree in engineering and several years of experience in the cable and telecommunications industry relating to the design and manufacture of coaxial cable connectors. Ex. 1005 ¶ 15. Dr. Mroczkowski also attests that ten or more years of experience in the art could be a substitute for a bachelor’s degree in engineering. *Id.* PPC’s expert, Dr. Eldering, generally agrees with Dr. Mroczkowski’s assessment of the knowledge level of a person with ordinary skill in the art. Ex. 2074 ¶ 10. Furthermore, the prior art of record in this proceeding also is indicative of the level of ordinary skill in the art. *See Okajima v. Bourdeau*, 261 F.3d 1350, 1355 (Fed. Cir. 2001); *GPAC*, 57 F.3d at 1579; *In re Oelrich*, 579 F.2d 86, 91 (CCPA 1978).

3. *Matthews (Ex. 1004)*

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

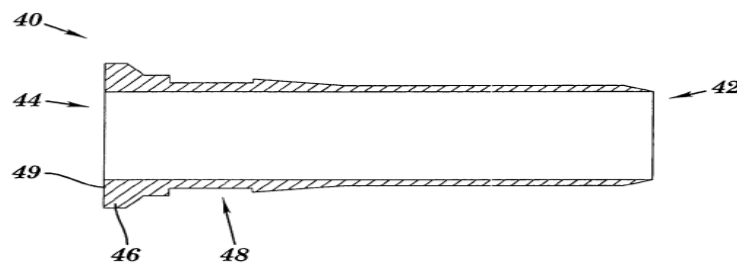
Figure 1 of Matthews is reproduced below:



**FIG. 1**

As shown in Figure 1, 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. *Id.* ¶ 26. Coaxial cable connector 100 also may include threaded nut 30, post 40, connector body 50, fastener member 60, a mating edge conductive member, e.g., O-ring 70, and a connector body conductive member, e.g., O-ring 80, as a means for sealing and coupling connector body 50 and threaded nut 30. *Id.* ¶ 28.

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

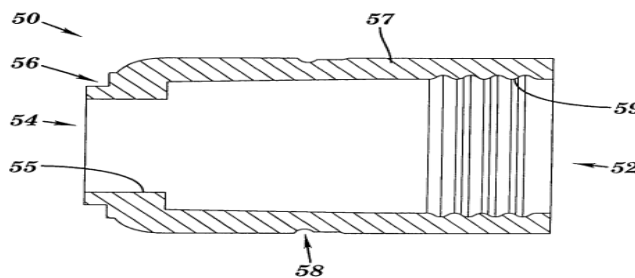


**FIG. 3**

As shown in Figure 3, post 40 includes first end 42, opposing second end 44, and flange 46. *Id.* ¶ 30. Flange 46 is configured to contact internal

lip 36 of threaded nut 30 (neither shown in Figure 3), thereby facilitating the prevention of axial movement of the post beyond contacted internal lip 36. *Id.* 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 illustrates a sectional side view of connector body 50. Ex. 1004 ¶¶ 19, 31. Figure 4 of Matthews is reproduced below:

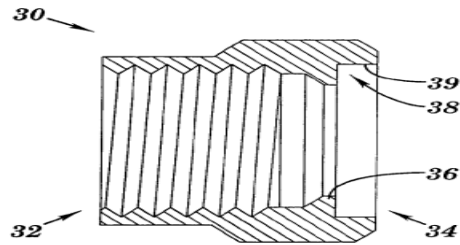


**FIG. 4**

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

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

Figure 2 of Matthews is reproduced below:



**FIG. 2**

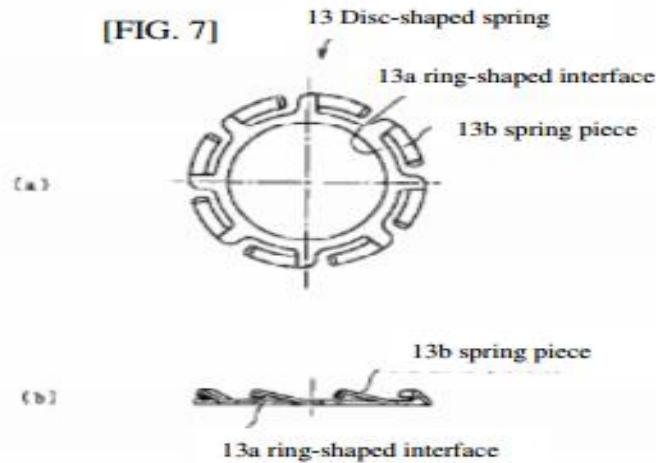
As shown in Figure 2, threaded nut 30 includes first end 32, opposing second end 34, and internal lip 36 located proximate to second end 34 that is configured to hinder the axial movement of post 40. *Id.* ¶ 29. Threaded nut 30 may be formed of conductive materials, thereby facilitating grounding through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

4. *Tatsuzuki (Ex. 1030) (English translation Ex. 1002)*

Tatsuzuki generally discloses 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 illustrate disc-shaped spring 13, and related side-view diagram, respectively. Ex. 1002 ¶ 17.

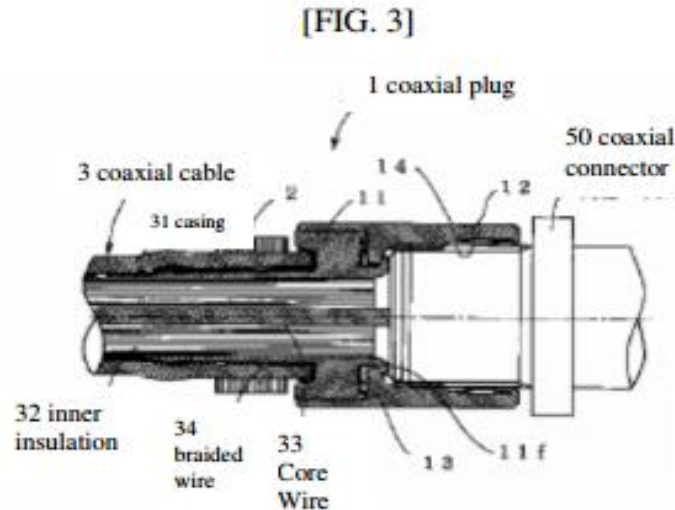
Figures 7(a) and 7(b) of Tatsuzuki are reproduced below:



As shown in Figures 7(a) and 7(b), disc-shaped spring 13 is formed by stamp cutout processing of a thin metal plate possessing elasticity, e.g., phosphor bronze. *Id.* ¶ 17. The 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 illustrates a cross-section view of coaxial plug 1 securely installed in coaxial cable connector 50. *Id.* ¶ 12.

Figure 3 of Tatsuzuki is reproduced below:



As shown in Figure 3, 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 performed by disc-shaped spring 13 interposed there-between. *Id.* ¶ 17. The disc-shaped spring 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.*

#### 5. Corning's Contentions

In its Petition, Corning presents detailed claim charts and relies on supporting evidence demonstrating how Matthews teaches most of the limitations of independent claims 7 and 20. In particular, Corning explains how Matthews's coaxial cable connector 100 includes connector body 50, post 40 with flange 46 engaged with the connector body, and nut 30 with



internal lip 36, and that those components correspond to the connector body, post, and nut features required by claims 7 and 20. Pet. 38–43, 48–51. According to Corning, however, certain limitations of claims 7 and 20 directed to the required “electrical continuity member” are not disclosed in Matthews.

Although Matthews discloses “conductive member” 70 and “connector body conductive member” 80 (Ex. 1004, Fig. 1, ¶ 28), which act as continuity members in connector 100, Corning acknowledges that Matthews does not disclose a continuity member in contact with the rearward surface of the inward lip of the nut. Pet. 55. In relation to this requirement in claims 7 and 20, Corning relies on Tatsuzuki. *Id.* at 55–58.

As discussed above, Tatsuzuki discloses coaxial connector 1 that incorporates disc-shaped spring 13. That spring is positioned between “plug body 11” and “rotary mounting element 12” so as to maintain an electrical connection between those components. Ex. 1002, Abstract. Corning contends that Tatsuzuki’s plug body 11 (portions B and C) and rotary mounting element 12 correspond to the claimed post, body, and nut, as well as post 40, body 50, and nut 30 set forth in Matthews. Pet. 41–43, 50–51.

Corning reasons that 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. *Id.* at 55. In that regard, Corning contends that such a modification would “promote electrical continuity from the coaxial cable to the interface port” between Matthews’s nut 30 and post 40, and also “provides electrical continuity between the post

40 and the nut 30 through direct electrical contact with the connector body 50, which is in electrical contact with the post 40.” *Id.* at 57; *see, e.g., id.* at 55–56 (citing Ex. 1005 ¶¶ 148–150, 211–213). Corning further maintains that such a modification would result in a continuity member that is “positioned to electrically connect the post 40 and the nut 30 at a position other than between the rearward facing surface of the flange 46 of the post 40 and the forward facing surface of the lip 36 of the nut 30.” *Id.* at 57 (citing Ex. 1005 ¶¶ 152, 217). That continuity member would contact body 50, post 40, and the rearward facing surface of inward lip 36 of nut 30, and maintain “electrical continuity between the post 40 and the nut 30 when the post 40 pivots or rotates relative to the nut 30.” *Id.* at 57–58.

Corning, thus, asserts that claims 7 and 20 would have been obvious in light of the teachings of Matthews and Tatsuzuki. Corning also describes in its Petition where it contends all the features of dependent claims 8–19 and 21–27 are present in the prior art such that those claims also would have been obvious in light of the teachings of Matthews and Tatsuzuki.

#### 6. PPC’s Contentions

PPC disagrees with Corning’s assessment of the obviousness of claims 7–27. To that end, PPC contends that the continuity member required by the claims is absent from the collective teachings of Matthews and Tatsuzuki. PO Resp. 17–34. More specifically, PPC is of the view that arranging Tatsuzuki’s disc-shaped spring 13 between nut 30 and post 40 of Matthews’s coaxial connector 100 would not result in the formation of a continuity member that makes consistent contact with the nut and the post to

maintain continuous electrical connection between those components. *Id.* at 19–21.

PPC further contends that claim 16 and 24’s requirement that the outer surface of a post be “shaped to fit” a portion of the connector body is lacking in the prior art. *Id.* at 22–36. In that respect, PPC urges that Corning’s proposed grounds of unpatentability should be limited to a single arrangement of Tatsuzuki’s disc-shaped spring 13 between Matthews’s post 40 and body 50 at a position in which the pertinent post surface and body portion are perpendicular, i.e., not “opposing compl[e]mentary surfaces,” thereby failing to constitute components that are “shaped to fit” one another. *Id.* at 25–34.

Lastly, PPC challenges the combination of Matthews and Tatsuzuki under the premise that such a combination as proposed by Corning during the course of this proceeding rests on “pure speculation” and “hindsight reconstruction of the prior art to fit PPC’s claims” that is “impermissible,” and prohibits an assessment of obviousness of those claims based on the prior art. *Id.* at 26–33.

#### 7. *Analysis*

In evaluating Corning’s contentions of obviousness, we consider the claims in two groupings: (1) claims 7–15, 17–23, and 25–27, and (2) claims 16 and 24.

##### a. Claims 7–15, 17–23, and 25–27

As set forth above, we disagree with PPC’s proposed interpretation of the “continuity member” feature of the above-noted claims of the ’353

patent. *See* PO Resp. 19. In particular, we are not persuaded that the claims require a continuity member that makes contact between a nut and a post in a manner that is “consistent” and facilitating only electrical connection that is “continuous,” to the exclusion of other contact implementations. As explained above, in affording the claims their broadest reasonable construction, we conclude that the continuity member need only make contact with the nut and the post to establish an electrical connection therebetween.

Tatsuzuki describes a coaxial plug including disc-shaped spring 13, which is purposed specifically to provide “electrical connection” between plug body 11 and rotary mounting element 12 of the connector. Ex. 1002, Abstract. Tatsuzuki further characterizes the overall “object” 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.

In its Petition, Corning explains that Tatsuzuki’s disc-shaped spring 13, in establishing electrical connection with plug body 11 and mounting element 12 in the manner described, is understood reasonably as constituting a continuity member. Pet. 44–45. Corning also contends that modifying Matthews’s connector 100 by incorporating Tatsuzuki’s disc-shaped spring 13 would create an arrangement that promotes electrical continuity by providing an alternative ground path directly between Matthews’s nut 30 and post 40 so that connector body 50 may be made of non-conductive material. *Id.* at 55–58. Corning relies upon the testimony of Dr.

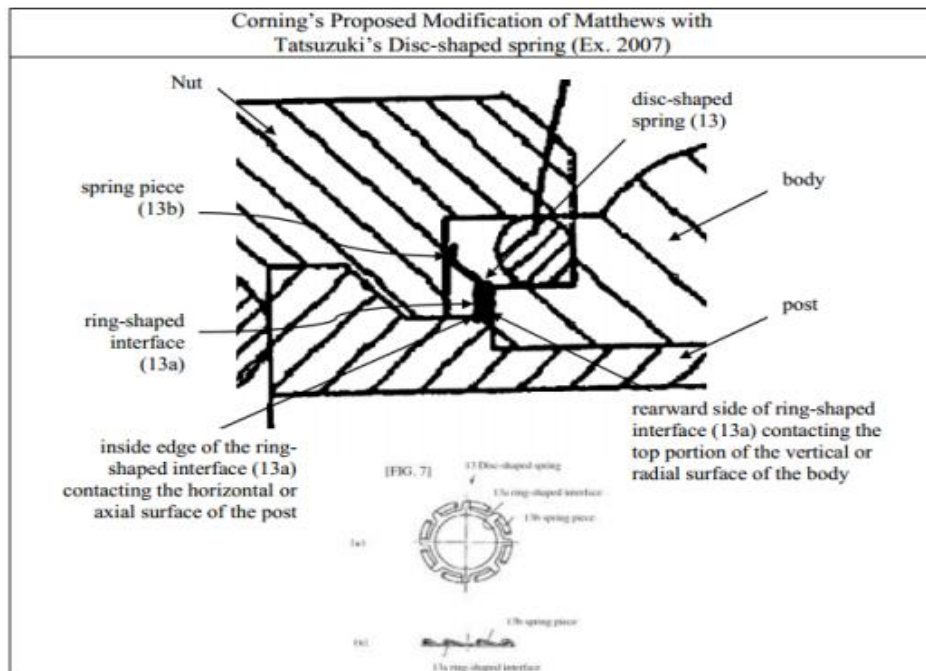
Mroczkowski to support its argument that a person with ordinary skill in the art at the time of the invention would have recognized such benefit, and, therefore, would have been motivated to make such a modification. *Id.* at 56–57 (citing Ex. 1005 ¶¶ 148, 149, 211, 212).

In its Patent Owner Response, PPC relies upon the cross-examination testimony of Dr. Mroczkowski, including the sketches he produced during the course of his testimony that represent possible approaches for combining the teachings of Matthews and Tatsuzuki, to support its argument that Dr. Mroczkowski engaged in impermissible hindsight reconstruction to render the challenged claims unpatentable. PO Resp. 13–34 (citing Exs. 2005–2008, 2013, 1036, 1037).

In its Reply, Corning relies upon Dr. Mroczkowski’s testimony to support its argument that one of ordinary skill in the art would have recognized that there are multiple ways to incorporate Tatsuzuki’s disc-shaped spring 13 into Matthews’s connector 100. Pet. Reply 2 (citing Ex. 1005 ¶¶ 147–150, 210–213. Corning argues that, in one approach, Tatsuzuki’s disc-shaped spring 13 may be positioned on the outer surface of Matthews’s post 40. *Id.* (citing Exs. 2005–2007). Corning argues that, in a second approach, Tatsuzuki’s disc-shaped spring 13 may be sandwiched between Matthews’s post 40 and connector body 50. *Id.* (citing Ex. 1034; Ex. 1039; Ex. 2008). With respect to the second approach, Corning asserts that even PPC’s own expert witness, Dr. Eldering, admits that sandwiching a continuity member between a post and a body is a well-known technique for incorporating the continuity member into a connector, as evidenced by

Figure 6A of U.S. Patent No. 7,114,990 (“the ’990 Bence patent”).<sup>5</sup> *Id.* at 4–5 (citing Ex. 2076, 190:10–21).

An illustration of the above-noted sketch produced by Dr. Mroczkowski in connection with the first approach is reproduced below, as it has been presented in Patent Owner’s Response:



PO Resp. 13.

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 nut, post, and body surfaces of

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<sup>5</sup> When PPC filed its Patent Owner Response, it entered the ’990 Bence patent into the record as Exhibit 2024. When Corning filed its initial Reply to the Patent Owner Response, it also entered the ’990 Bence patent into the record as Exhibit 1038.

Matthews's connector. *Id.* at 13–14. According to PPC, our assessment of obviousness of the claims of the '353 patent should be limited to evaluation solely of the above-noted illustration, and PPC asserts that the illustration does not depict a continuity member positioned as required by the claims. *Id.*

In considering the proposed implementation of Tatsuzuki's teachings onto Matthews's connector shown in the illustration above, contrary to PPC's assertion, the illustration encompasses the features laid out in the claims. The illustration depicts Tatsuzuki's disc-shaped spring 13 positioned with respect to portions of Matthews's connector identifiable as nut 30, post 40, and connector body 50. We are satisfied that the noted implementation conveys a continuity member positioned to contact a rearward surface of the nut and extend between the post and connector body. Tatsuzuki's disc shaped spring 13, when positioned in the manner depicted, would extend between, and facilitate electrical connection among, surfaces of the nut, post, and body, as is required by the claims. Furthermore, we credit Dr. Mroczkowski's testimony to that effect. *See, e.g.*, Ex. 1005 ¶¶ 147–150, 210–213.<sup>6</sup>

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<sup>6</sup> We are not persuaded by PPC's argument that Dr. Mroczkowski's opinions should be accorded "little to no weight," because Dr. Mroczkowski has indicated that his experience is not directed specifically to the design and operation of the particular connectors associated, in some respect, with PPC's patents. *See* PO Resp. 11. The record reflects that Dr. Mroczkowski has considerable background and experience relevant to the connector industry. *See, e.g.*, Ex. 1006. There is no requirement that a witness must

In any event, we also are not persuaded by PPC's contention that our obviousness evaluation here requires that we consider only the approach presented in the illustration reproduced above in combining the teachings of the prior art, without recourse to any other assessment of the skill of a person of ordinary skill's viewpoint in so combining the teachings. *See* PO Resp. 33–34. A person of ordinary skill in the art is a person of ordinary creativity, not an automaton. *KSR*, 550 U.S. at 421. A person of ordinary skill and creativity would have recognized that combining the teachings of the prior art, in particular Matthews and Tatsuzuki, does not mandate a singular technique for combining those references that precludes consideration of other techniques. Indeed, the evidence of record reflects that a person of ordinary skill in the art knew of other techniques for positioning a continuity member between a body and post of a coaxial connector. For instance, as noted above, upon being questioned about the '990 Bence patent during cross-examination, Dr. Eldering testified that it was known in the art that a continuity member may be “sandwiched” between such a body and post. Ex. 2076, 190:16–21.

Although the '990 Bence patent is not a reference that has been offered by Corning as forming a part of a proposed ground of unpatentability instituted in this proceeding, it is a reference providing evidence of the level

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have personal familiarity with a particular product to provide meaningful testimony as to the perspective of one of ordinary skill in a particular art or technological field. *See, e.g., SEB S.A. v. Montgomery Ward & Co.*, 594 F.3d 1360, 1373 (Fed. Cir. 2010).



of ordinary skill in the art. “The person of ordinary skill in the art is a hypothetical person who is presumed to know the relevant prior art.” *GPAC*, 57 F.3d at 1579 (citing *Custom Accessories, Inc.*, 807 F.2d at 962). As noted above, the level of ordinary skill in the art is reflected by the prior art of record. What is described by the ’990 Bence patent is indicative of the level of ordinary skill in the art. Furthermore, “the knowledge of such an artisan is part of the store of public knowledge that must be consulted when considering whether a claimed invention would have been obvious.” *Randall Mfg. v. Rea*, 733 F.3d 1355, 1362 (Fed. Cir. 2013).

According to the Supreme Court, “[w]hen there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill has good reason to pursue the known options within his or her technical grasp.” *KSR*, 550 U.S. at 421. In this case, there is a design need to solve a problem, i.e., Tatsuzuki provides evidence that its disc-shaped spring 13 operates to establish electrical connection between components in a coaxial cable connector as a part of an arrangement that is intended to address “deterioration of insertion loss characteristics and reflection loss characteristics even in the state when the coaxial plug is loosened.” Ex. 1002 ¶ 7. There also is a finite number of identified, predictable solutions, i.e., the ’990 Bence patent, Matthews, and Tatsuzuki provide evidence that one of ordinary skill in the art would have known that there is not a sole position or location recognized for positioning a continuity member in a coaxial cable connector; however, there are a limited number of

possible positions for such a continuity member. Exs. 2024, 1004, 1002. As such, an ordinarily skilled artisan would have good reason to pursue known options within his or her technical grasp when contemplating where, and how, to position Tatsuzuki's disc-shaped spring 13 in Matthews's connector 100.

In considering the entirety of the record, we are persuaded that Tatsuzuki's disc-shaped spring 13 forms a "continuity member" as required by the claims of the '353 patent. We also are satisfied that one of ordinary skill in the art would have appreciated reasonably that such a spring may be arranged in the coaxial connector of Matthews so as to form a continuity member or electrical continuity member positioned to contact nut, post, and body components of a coaxial cable connector in the manner required by the claims. In that respect, instead of presenting reasoning that is speculative or based on impermissible hindsight, as is argued by PPC, Corning has articulated reasoning with rational underpinnings in urging that an ordinarily skilled artisan would have incorporated Tatsuzuki's disc-shaped spring 13 into Matthews's connector 100 so as to harness the electrical connectivity benefits attributed to Tatsuzuki's spring arrangement.

Based on the record before us, Corning presents sufficient evidence to support a finding that the elements of independent claims 7 and 20 are taught or suggested by the combination of Matthews and Tatsuzuki. In addition, based on our review of the evidence and argument in the Petition, we also are persuaded that Corning presents sufficient evidence to support a finding that the combination also teaches or suggests the elements of dependent

claims 8–15, 17–19, 21–23, and 25–27. Pet. 43–48, 52–59.

*b. Claims 16 and 24*

As discussed above, claims 16 and 24 ultimately depend from claims 7 and 20, respectively, and each add a feature that a portion of the post includes an outer surface “shaped to fit” a portion of the connector body. Also as discussed above, we disagree with PPC’s construction of the “shaped to fit” requirement so as to exclude categorically surfaces that are configured in a perpendicular relationship.

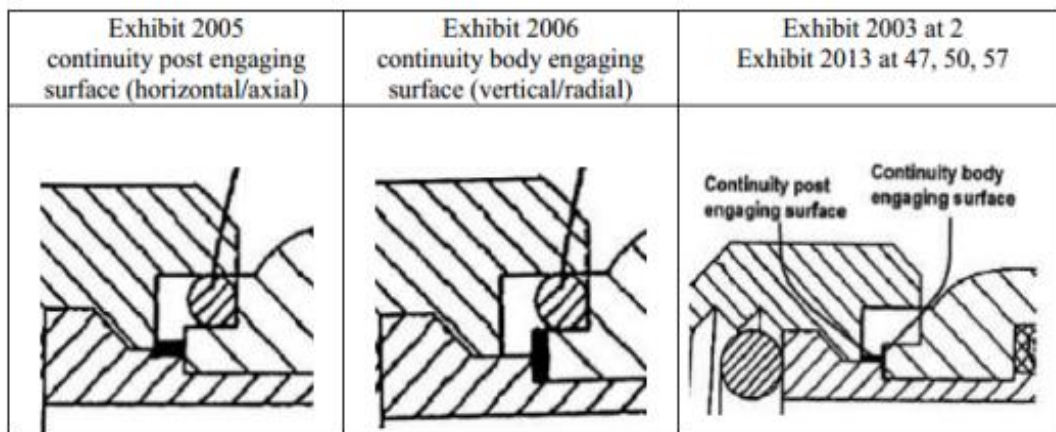
Corning contends that the “shaped to fit” requirement set forth in claims 16 and 24 is satisfied by corresponding portions of Tatsuzuki’s corresponding post (B) and connector body (C), shown, for instance in Tatsuzuki’s Figure 3.<sup>7</sup> Pet. 46–47, 53. Corning further argues that in the connector of Matthews, “provided with the continuity member of Tatsuzuki, the portion of the post comprises an outer surface shaped to fit the portion of the connector body.” *Id.* at 46–47. Thus, Corning indicates that the “shaped to fit” requirement also is satisfied by the corresponding portions of Matthews’s post 40 and connector body 50, shown, for instance, in

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<sup>7</sup> We note that Corning refers to Tatsuzuki’s Figure 1 when it cites “Ex. 1002, Fig. 1” on pages 46–47 and 53 of the Petition, discussing claim 16 and 24 of the ’353 patent. Pet. 46–47, 53. Those same pages, however, also refer to a prior discussion in the Petition with respect to claims 7 and 20. *Id.* Regarding claim 7, Corning discusses and includes an “annotated” reproduction of Figure 3 in Tatsuzuki. *Id.* at 42. Regarding claim 20, Corning again refers to that “annotated” reproduction of Figure 3 in Tatsuzuki. *Id.* at 51.

Matthews's Figures 1 and 7.

In response, PPC points out that in connection with this proceeding, Dr. Mroczkowski generated sketches during deposition testimony explaining how, in one context, Matthews's post and body incorporate corresponding surfaces that are shaped to fit one another. PO Resp. 25–26. Illustrations of those sketches are reproduced below, as they appear in PPC's Patent Owner Response:



*Id.* at 25.

Although there are no figure numbers or reference characters presented in the illustrations above, those illustrations are recognizable as depicting portions of Matthews's Figures 1 and 7, in which a horizontal line has been marked on a surface of post 40 and a vertical line has been marked along a surface of connector body 50. *See also* Ex. 1004 ¶ 28; Ex. 1036, 5:17–6:7; 111:16–112:4; 115:8–19 (indicating that reproduced Exhibits 2003, 2005, and 2006, shown above, depict marked up enlarged views of annotated Figures 1 and 7 in Matthews).

PPC contends that the marked horizontal and vertical portions form

surfaces that are not shaped to fit. PO Resp. 25–26. PPC bases its contention, however, on the premise that perpendicular surfaces cannot constitute portions that are shaped to fit one another. As noted above in our claim construction section, we understand that surfaces are shaped to fit one another if they are sized and dimensioned to abut one another, and that such association does not preclude a perpendicular arrangement of two surfaces. Here, we are persuaded that the adjoining and abutting horizontal and vertical surfaces of the post and body, respectively, in Matthews’s cable connector are shaped to fit one another.

Furthermore, at oral argument, counsel for PPC expressed that abutting vertical surfaces of the post and body of Matthews’s connector are configured or shaped to fit one another. Paper 73, 65:1–4. As discussed above in connection with the “continuity member” feature of the claims, the record conveys that a person of ordinary skill in the art would have appreciated reasonably that a continuity member may be positioned in other locations with respect to a post and connector body, including one in which the member is sandwiched between those components. In that scenario, there is no dispute that the surface of the post and the portion of the connector body between which a continuity member extends, as pertinent to claims 16 and 24, would be shaped to fit one another.

We also note that Corning persuades us that Tatsuzuki, in combination with Matthews, suggests a post (B) comprising an outer surface “shaped to fit” a portion of a separate connector body (C), as shown in Corning’s annotated version of Figure 3 in Tatsuzuki. Pet. 46, 42, 53, 51.

Dr. Mroczkowski testifies that “Tatsuzuki discloses that the electrical continuity member 13 extends between structure corresponding to a portion of the post (B) and structure corresponding to a portion of the connector body (C).” Ex. 1005 ¶ 183. Moreover, in a modified connector, where post (B) and body (C) are separate components, as taught in Matthews, “the outer surface of structure B extends to and abuts structure C.” *Id.* We are persuaded that “[i]n the modified connector, the portion of the post comprises an outer surface shaped to fit the portion of the connector body.” *Id.*

For the reasons given above, and in light of the record before us, Corning has presented sufficient evidence to support a finding that the elements of dependent claims 16 and 24 are taught or suggested by the combination of Matthews and Tatsuzuki.

### *C. Secondary Considerations*

In its Patent Owner Response, in addition to the contentions discussed above, PPC argues that secondary considerations, including long-felt but unsolved need (PO Resp. 38–39), failed attempts by Corning (*id.* at 39–45), copying by Corning (*id.* at 36–38, 45–52), and commercial success (*id.* at 52–57), “clearly establish the non-obviousness of the claims at issue.” *Id.* at 35. In support of this argument, PPC relies on, *inter alia*, the Declaration and cross-examination testimony of Mr. Burris (Exs. 2019, 2020), as well as Declarations of Mr. David Jackson, Vice President, General Manager of PPC (Exs. 2072 (unredacted), 2073 (redacted)), and Dr. Eldering (Ex. 2074), among other evidence.

*1. Long-felt But Unsolved Need*

PPC contends that the problem addressed by its patents “is that ‘often connectors are not properly tightened or otherwise installed to the interface port and proper electrical mating of the connector with the interface port does not occur.’” PO Resp. 38 (quoting Ex. 1001, 1:45–48). PPC contends that it “solved this problem such that continuity was established even if the connector was only loosely connected to the port.” *Id.* (citing Ex. 2074 ¶ 112). PPC further contends that Corning’s expert witness, Dr. Mroczkowski, acknowledged that the problem existed for decades before 2009, and that Mr. Burris indicated that he spent several years working unsuccessfully on a continuity member design for Corning’s UltraRange connector (lacking a continuity member), before he developed Corning’s UltraShield connector (including a continuity member) in 2010. *Id.* at 39, 36–38.

Based on the record before us, we are persuaded that coaxial connectors known in the art before 2009 had “solved” PPC’s asserted “long-felt” need for connector continuity “even if the connector was only loosely connected to the port.” For example, the Bence ’990 patent (Ex. 1038, Ex. 2024), which issued in 2006, disclosed a connector having a “grounding member,” i.e., a continuity member, placed between a coupler/nut and post. Ex. 1038, Abstract; *see* Ex. 2076, 190:16–21. As noted by Corning (Pet. Reply 16), in relation to such a connector, the ’990 Bence patent states that an “electrical grounding path is maintained between the coupler and the tubular post whether or not the coupler is tightly fastened to the appliance.”

Exs. 1038, 2024, Abstract. Likewise, as discussed above, Tatsuzuki, which published in 2002, disclosed a connector that included disc-shaped spring 13, which provided an “electrical connection” between plug body 11 and rotary mounting element 12 of the connector. Ex. 1002, Abstract, ¶ 17; Ex. 1005 ¶¶ 38–40. Tatsuzuki states that it provides “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.

## 2. Failed Attempts by Corning

PPC contends that from September 2008 until March 2010, Corning’s Mr. Burris attempted, but failed, “to incorporate a continuity member into the UltraRange connector.” PO Resp. 40. During this time, according to PPC, Corning developed a number of different concept designs for providing a continuity member in the UltraRange connector, but either Corning did not move forward with such designs, or did not pursue the designs commercially, or the designs “failed” Corning’s continuity test. *Id.* at 41–43. PPC contends that prior to March 2010, Mr. Burris was aware of Matthews, his own Bence ’990 patent (Ex. 2024; Ex. 1038), and the UltraEase continuity member design, but nonetheless “still went through dozens of failed and widely differing concepts for several years.” *Id.* at 44. According to PPC, in March 2010, it was “only after seeing PPC’s design that Mr. Burris was able to design the copied UltraShield connector.” *Id.* at 43–44.

Corning responds that PPC relies only on Corning’s alleged research and development efforts, not efforts by any other industry participant.



Corning also contends that it chose not to implement a number of Mr. Burris' designs from 2008 to 2010 for reasons unrelated to a "failure" of design, such as manufacturing costs. In addition, Corning contends that a certain number of Mr. Burris' designs "failed" Corning's test (the "Argentina" test), which measured noise, and not necessarily continuity, citing deposition testimony by PPC's expert witness, Dr. Eldering. Pet. Reply 16–17 (citing Ex. 2078, 60:25–61:15).

The record before us indicates that Corning prepared connectors with continuity members that maintained electrical continuity in the September 2008 to March 2010 time frame, even if Corning did not sell such connectors to customers for whatever reason. Although some designs may have "failed" the "Argentina" test, as PPC notes, evidence cited by PPC indicates that other designed connectors passed the test. PO Resp. 41 (referring to Corning's "fifteen different concepts for providing a continuity member in the UltraRange connector," citing Ex. 2036, 2); *see* Ex. 2036, 2 (indicating that some passed and some failed the Argentina test). For example, contrary to PPC's contention that "RC-1350-1 Rev 01" failed (PO Resp. 41), the cited "Test Matrix" chart indicated that this design presented "[s]ome impr[ovement] over current prod[uct]" during the test. Ex. 2036, 2. In addition, the same evidence indicates that designs, such as "RC-1350-50 Rev 02," "RC-1350-70," and "RC-1350-80," among others, passed the Argentina test in 2009. *Id.*; *see also* Ex. 2034, 25 (stating that RC-1350-50 "did well" in the Argentina test in August 2009), 31 (stating that RC-1350-90 "yielded acceptable results" in the Argentina test and that "connector was

‘well behaved’” in October 2009), 37 (stating that RC-1350-150 “performed well clear up until it threaded off the mating port” in November 2009).

Thus, although evidence indicates failure of some Corning connector designs including a continuity member developed before April 2010, some designs did work as connectors, even if Corning did not pursue those designs commercially for reasons such as “production expense” or “difficulty in turning the nut” (Pet. Reply 17).

### 3. *Copying by Corning*

PPC contends that Mr. Burris copied PPC’s product, i.e., PPC’s EX Plus SignalTight design, when designing Corning’s UltraShield connector. PO Resp. 45–52. Specifically, PPC contends that Mr. Burris knew of PPC’s design when he developed the UltraShield connector in April-June 2010. *Id.* at 46. PPC contends that in initial designs, Mr. Burris “placed the continuity member on the forward side of the internal lip of the nut as it had been in the UltraEase connector.” *Id.* at 47. Thereafter, when that “continuity member failed,” “Mr. Burris claims that he moved the continuity member for the first time to the rearward side of the lip of the nut in the May-June 2010 timeframe as part of the project RC-1350-350.” *Id.*

According to PPC, “Mr. Burris admitted that he had seen the PPC EX Plus with Signal Tight design in an email prior to April 2010, directly contradicting his earlier sworn declaration,” citing a transcript from a deposition of Mr. Burris (Ex. 2019, 179:3–180:8, 191:6–192:2), as well as a March 1, 2010, e-mail sent by a Corning sales representative to Corning executive David Johnson and Mr. Burris’s co-inventor Mr. Lutz (Ex. 2048).

PO Resp. 47–48. PPC also cites a March 31, 2010, e-mail sent by Mr. Johnson to Mr. Burriss and Mr. Lutz attaching a “new ad showing the PPC Continuity Connector” (Ex. 2053). PO Resp. 48–49. PPC contends that “Mr. Burriss agreed” that the ad showed the continuity member as located between the post and body on the rearward side of the internal lip of the nut, as eventually implemented in Corning’s UltraShield connector. *Id.* at 49 (citing Ex. 2019 189:16–191:5; Ex. 2053; Ex. 2074 ¶ 114).

According to PPC, Mr. Burriss also admitted during cross-examination that he and others at Corning would obtain PPC connector samples, and then test, cross-section, and/or disassemble the connectors to “see how the connector is designed” and “to see what they’re doing.” *Id.* at 50 (citing Ex. 2019, 25:20–28:8). PPC further contends that on June 1, 2010, Mr. Lutz sent an e-mail to Mr. William McDade, copying Mr. Burriss, requesting the testing of PPC EX Plus connector samples obtained by Mr. Lutz. PO Resp. 49 (citing Ex. 2054). PPC also contends that in an e-mail dated June 21, 2010, Corning’s salesperson indicated that other PPC EX Plus connectors were being sent overnight to Mr. Lutz. *Id.* at 51 (citing Ex. 2052).

Thereafter, on June 25, 2010, according to PPC, “Mr. Burriss reported completing the design of the RC-1350-350 design which led to the UltraShield design.” *Id.* at 51. Based on such evidence, PPC contends that “Mr. Burriss admitted that it was likely that he did see samples of the PPC’s embodiment of the PPC patents in June 2010,” before he designed Corning’s UltraShield connector. *Id.* at 50 (citing Ex. 2019, 194:15–198:13; Ex. 2061, 49:12–24, 51:1–52:15).

Corning responds that PPC does not establish copying because Corning's "UltraShield connector is fundamentally different from [PPC's] SignalTight connector in numerous respects." Pet. Reply 17–18. In addition, Corning suggests that the evidence fails to establish that Mr. Burris saw the SignalTight connector before he designed the UltraShield connector. *Id.* at 18. Also, even assuming Mr. Burris saw the PPC advertisement for the EX Plus Signal Tight Connector, Corning contends that PPC's expert witness, Dr. Eldering, "admitted that '[i]t would be hard to draw an accurate drawing of that continuity member'" from the figure in the advertisement. *Id.* (citing Ex. 2077, 273:5–10; Ex. 2053).

Based on the record before us, we are persuaded that there is sufficient evidence indicating that developers at Corning, including Mr. Burris, saw and studied PPC EX Plus products just before Corning developed its final design, RC-1350-350, in April 2010. There also is sufficient evidence indicating that Corning later sold its final design as the UltraShield connector, which included a continuity member between the post and body on the rearward side of the internal lip of the nut. We are persuaded that PPC has provided some evidence of copying by Corning of PPC's EX Plus SignalTight design, in relation to the challenged claims.

#### *4. Commercial Success*

PPC contends that its "flagship Signal Tight series connectors" are commercial embodiments of the coaxial connectors recited in the challenged

claims, citing Declarations by Mr. Jackson (Ex. 2072) and Dr. Eldering (Ex. 2074). PO Resp. 53 (citing Ex. 2072 ¶¶ 12–13, 26–28; Ex. 2074 ¶ 116). Specifically, PPC and its witnesses state that the SignalTight connectors use a continuity member that “(a) makes consistent contact with the post and the nut of the connector while extending between a portion of the post and a portion of the body to maintain or extend electrical continuity between the post and the nut on the rearward side of the internal lip of the nut,” and/or “(b) extends between a portion of the post that is configured or shaped to fit the portion of the body and makes consistent contact with the post to maintain or extend electrical continuity between the post and the nut,” as recited in certain elements of the challenged claims. *Id.* at 53 (citing Ex. 2072 ¶ 27; Ex. 2074 ¶ 116).

In addition, PPC contends that “Corning’s UltraShield connectors constitute a copy of PPC’s SignalTight connectors in all material respects.” PO Resp. 54 (citing Ex. 2072 ¶¶ 22–23, 26–28; Ex. 2074 ¶ 117). In more specific support, PPC cites Mr. Jackson’s Declaration, which presents photographs of a SignalTight connector and an UltraShield connector, with added arrows pointing to the continuity member in each connector. Ex. 2072 ¶ 22. Thus, as with its own product, PPC infers that Corning’s UltraShield connectors use a continuity member that contacts and/or maintains electrical continuity between the post, nut, and body as recited in certain elements of the challenged claims. PO Resp. 54.

Such statements and evidence, even if accurate, however, do not show sufficiently that PPC’s SignalTight connectors or Corning’s UltraShield

connectors meet *all* elements of the challenged claims at issue here. Thus, the evidence cited by PPC fails to show that a relevant marketed product embodies all claimed features at issue. *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F. 3d 1120, 1130 (Fed. Cir. 2000) (stating the presumption that commercial success is due to the patented invention applies “if the marketed product embodies the claimed features, and is coextensive with them”); *Ormco Corp. v. Align Tech., Inc.*, 463 F.3d 1299, 1312 (Fed. Cir. 2006). Consequently, we cannot presume nexus between any asserted commercial success and what is recited in the challenged claims. *Demaco Corp. v. F. Von Langsdorff Licensing Ltd.*, 851 F.2d 1387, 1392 (Fed. Cir. 1988) (stating that a “prima facie case of nexus is generally made out when the patentee shows both that there is commercial success, and that the thing (product or method) that is commercially successful is the invention disclosed and claimed in the patent”).

In addition, 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. 55–57. 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 56 (referring to \$50 million in revenue in 2013). PPC contends that “SignalTight’s Market Share” has grown from 0% to approximately 67%. *Id.* at 56. 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 57. In addition, PPC contends that the “market share of Corning’s UltraShield connectors has similarly grown, and is now approximately 15%.” *Id.* Thus, according to PPC, the total market share of “products constituting commercial embodiments of the PPC patents has gone from zero to 82% in only three years.” *Id.*

Even assuming such statements and comparisons are accurate, we are not persuaded that PPC presents sufficient evidence of the market share of PPC’s SignalTight and Corning’s UltraShield connectors in relation to all relevant connectors commercially sold in the time frame discussed by PPC. For example, PPC’s “SignalTight’s Market Share” graph seems to imply that PPC’s relevant connector market share before 2009 was zero. PO Resp. 56–57; Ex. 2072 ¶¶ 18–21. That implication, however, is clearly undermined by evidence cited by PPC. Ex. 2072 ¶ 19 (presenting a chart depicting sales of EX connector units in 2009 as higher than sales of SignalTight units in 2013).

Furthermore, it is apparent from the record that the relevant “market” includes connectors that do not have a continuity member. Indeed, PPC’s own expert, Mr. Jackson, assesses market share by including percentages and product sales for products that do not have a continuity member, i.e., the EX connectors. *See, e.g.*, Ex. 2072 ¶¶ 18–21. In that respect, and as noted above, Mr. Jackson testifies that PPC sold the same, if not more, EX connectors in 2009, before PPC’s SignalTight connector was introduced, than the number of SignalTight connectors sold in 2013. *Id.* ¶ 19. Thus, as

between EX connectors and SignalTight connectors, PPC's market share either remained the same, or slightly decreased from 2009 to 2013.

Likewise, when discussing percentage of sales, or how SignalTight connectors "are sold at a premium," PPC only considers a comparison to one product, PPC's own EX connector, which lacks a continuity member. PPC provides no evidence regarding sale percentages or sales "at a premium" in relation to all coaxial connectors (with or without a continuity member, and regardless of position of the continuity member, if present) purchased by multiple system operators from 2009 to 2013, for example. The cited evidence does not show adequately a significant market share relative to all competing connectors sold, i.e., the overall relevant market. *In re Applied Materials, Inc.*, 692 F.3d 1289, 1300 (Fed. Cir. 2012) ("An important component of the commercial success inquiry in the present case is determining whether Applied had a significant market share relative to *all* competing pads based on the merits of the claimed invention, which Applied did not show"). Moreover, we cannot tell from the record before us whether the asserted "commercial success" of PPC's SignalTight connectors (or Corning's UltraShield connectors) might have been due to a pre-existing market share in the coaxial connector market, providing an advantage when promoting newer products over existing ones.

Similarly, PPC does not explain how an e-mail exchange between Corning sales employees and buyers (e.g., Comcast) establishes that Corning's UltraShield connector "was different from and superior to its non-continuity UltraRange connector" for any reason beyond the fact that



Corning's UltraShield connector included a continuity member at all, while Corning's pre-existing UltraRange connector lacked one at any location. PO Resp. 54–55 (citing Ex. 2056). Again, PPC's contentions and cited evidence in this regard do not address adequately commercial sales or market share relative to all competing connectors sold, i.e., the overall relevant market, as relevant to a product assembled according to methods coextensive with the challenged claims.

In addition, PPC's contentions and cited evidence do not explain sufficiently the nexus between the subject matter of the challenged claims and the asserted commercial success of the SignalTight and UltraShield connectors. Even assuming such connectors enjoyed commercial success over connectors that lacked a continuity member, PPC does not clarify how that commercial success was due to features recited in the challenged claims (e.g., a continuity member in a specific location) rather than features (e.g., a continuity member) expressly described in the prior art, such as in Matthews, Tatsuzuki, and the Bence '990 patent. “[I]f the commercial success is due to an unclaimed feature of the device,” or “if the feature that creates the commercial success was known in the prior art, the success is not pertinent.” *Ormco*, 463 F.3d at 1312.

Thus, 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, we are not persuaded that PPC's contentions and cited evidence of commercial success provide persuasive

support of objective indicia of non-obviousness in relation to the challenged claims.

*5. Discussion—All Asserted Evidence of Secondary Considerations*

For the reasons discussed above, we are not persuaded by PPC’s contentions and cited evidence regarding a long-felt but unsolved need, or failed attempts by Corning. Likewise, PPC’s contentions and evidence regarding commercial success are less than persuasive. PPC’s strongest position regarding secondary considerations pertains to copying by Corning of at least one relevant aspect of PPC’s SignalTight connectors. As noted by the Federal Circuit, however, “a showing of copying is only equivocal evidence of non-obviousness in the absence of more compelling objective indicia of other secondary considerations.” *Ecolochem, Inc. v. S. California Edison Co.*, 227 F.3d 1361, 1380 (Fed. Cir. 2000).

We have considered the entirety of the evidence, both Corning’s strong evidence of obviousness and PPC’s purported objective evidence of non-obviousness. On balance, we determine that a preponderance of the evidence supports a conclusion that claims 7–27 of the ’353 patent would have been obvious over Matthews and Tatsuzuki.

*D. Motion To Exclude*

In its Motion to Exclude, PPC seeks to exclude certain portions of the deposition testimony of Mr. Burris, Ex. 2019, 180:5–8, 189:22–23, 235:12–16, as well as certain portions of Mr. Burris’s Declaration, Ex. 2020 ¶¶ 4, 16, because these statements made by Mr. Burris constitute hearsay, in violation of Federal Rule of Evidence 802. Mot. to Exclude 1. As we indicated

previously, Corning opposes PPC's Motion to Exclude, and PPC filed a Reply to Corning's Opposition to its Motion to Exclude.

At the outset, we observe that the content that PPC seeks to exclude was introduced into this proceeding by PPC. Paper 41, 4. The fact that PPC introduced and relied on Mr. Burris's deposition testimony means PPC may not bar similar use of that evidence by Corning. In any event, when determining whether Corning copied PPC's EX Plus SignalTight design, i.e., the coaxial cable connector embodied in the challenged claims, we only relied upon Exhibit 2019 to the extent it was asserted by PPC—not by Corning. With respect to Exhibit 2020, we did not rely upon it when addressing PPC's arguments regarding long-felt but unsolved need, failed attempts by Corning, copying by Corning, and commercial success. Accordingly, we deny PPC's Motion to Exclude.

*E. Motions to Seal*

On March 26, 2014, PPC filed unredacted and redacted versions of its Patent Owner Response (Papers 29 and 30), along with an initial Motion to Seal (Paper 27). After multiple discussions between the parties and the panel regarding what materials, if any, should be subject to a Motion to Seal, we withdrew PPC's initial Motion to Seal, authorized PPC to file a Revised Motion to Seal, and authorized Corning to file a Response to the Revised Motion to Seal. Paper 37. On April 17, 2014, PPC filed a Revised Motion to Seal (Paper 39) that seeks to seal certain portions of its Patent Owner Response, as well as certain portions of the supporting evidence PPC relied upon in its Patent Owner Response (Exs. 2019, 2020, 2025, 2026, 2030,

2031, 2034–2039, 2042, 2044, 2045, 2047, 2048, 2050–2054, 2056, and 2072). On April 21, 2014, Corning filed a Response to the Revised Motion to Seal that seeks to explain why certain portions of the evidence relied upon by PPC in its Patent Owner Response contain Corning’s confidential information. Paper 40.

On May 16, 2014, PPC filed a Second Motion to Seal that seeks to seal certain portions of Exhibit 2075 and 2079. Paper 42. Exhibit 2079 includes the transcript of Dr. Eldering’s deposition taken on April 25, 2014, and Exhibit 2075 includes a timeline of facts that purportedly are undisputed regarding how Corning copied the coaxial cable connector embodied in the claims at issue in this proceeding. Also on May 16, 2014, Corning filed redacted and unredacted versions of its initial Reply to the Patent Owner Response, along with a Motion to Seal that seeks to seal certain portions of its initial Reply and certain portions of the supporting evidence Corning relied upon in its initial Reply. Paper 45. On June 23, 2014, based on a joint proposal from the parties, we dismissed Corning’s Motion to Seal. Paper 48. We expunged the redacted and unredacted versions of its initial Reply, along with the supporting evidence relied upon therein that Corning originally requested to be sealed. *Id.* We also authorized Corning to file a substitute Reply to the Patent Owner Response and substitute exhibits. *Id.*

On July 9, 2014, PPC filed a Third Motion to Seal that seeks to seal Exhibits 2084 and 2085. Paper 58. Exhibits 2084 and 2085 include mechanical drawings of PPC’s coaxial cable connector embodied in the patent claims at issue in this proceeding. On July 21, 2014, PPC filed a

Fourth Motion to Seal that seeks to seal certain portions of Exhibit 2092. Paper 68. Exhibit 2092 included PPC's demonstrative exhibits that it intended to use at oral argument. On July 23, 2014, we dismissed PPC's Fourth Motion to Seal. Paper 71. We explained that the oral argument in this proceeding is open to the public and, therefore, no confidential information should be included in the demonstrative exhibits filed by either Corning or PPC. *Id.* We expunged Exhibit 2092 and authorized PPC to file a new set of demonstrative exhibits. *Id.*

There is a strong public policy in favor of making information filed in an *inter partes* review open to the public, especially because the proceeding determines the patentability of claims in an issued patent and, therefore, affects the rights of the public. Under 35 U.S.C. § 316(a)(1) and 37 C.F.R. § 42.14, the default rule is that all papers filed in an *inter partes* review are open and available for access by the public; a party, however, may file a concurrent motion to seal and the information at issue is sealed pending the outcome of the motion. It is, however, only "confidential information" that is protected from disclosure. 35 U.S.C. § 316(a)(7); *see* Trial Practice Guide, 77 Fed. Reg. at 48,760. The standard for granting a motion to seal is "for good cause." 37 C.F.R. § 42.54(a). The party moving to seal bears the burden of proof in showing entitlement to the requested relief, and must explain why the information sought to be sealed constitutes confidential information. 37 C.F.R. § 42.20(c). Before PPC filed its initial Motion to Seal, we reminded the parties that confidential information filed under a

motion to seal will become public if identified in this Final Written Decision. Paper 26, 3 (citing Trial Practice Guide, Fed. Reg. 48,761).

We have reviewed the unredacted version of the Patent Owner Response (Paper 29), as well as Exhibits 2019, 2020, 2025, 2026, 2030, 2031, 2034–2039, 2042, 2044, 2045, 2047, 2048, 2050–2054, 2056, 2072, 2075, 2079, 2084, and 2085, and we are persuaded that good cause exists to have some, but not all, of these documents remain under seal. The redacted portions of the Patent Owner Response and the aforementioned Exhibits contain confidential information pertaining to either PPC’s business or Corning’s business, and are narrowly tailored to redact only confidential information. However, in the Secondary Considerations section above, we discuss Exhibits 2019, 2034, 2036, 2048, 2052–2054, 2056, and 2072. For instance, we substantively rely on Exhibits 2034 and 2036 to refute PPC’s contentions regarding failed attempts by others, Exhibits 2019, 2048, and 2052–2054 when favorably considering PPC’s contentions regarding copying by Corning, and Exhibits 2056 and 2072 to refute PPC’s contentions regarding commercial success.

Consequently, the unredacted version of the Patent Owner Response and Exhibits 2020, 2025, 2026, 2030, 2031, 2035, 2037–2039, 2042, 2044, 2045, 2047, 2050, 2051, 2075, 2079, 2084, and 2085 will be maintained under seal under the terms of the Protective Order entered in this proceeding. *See* Paper 42, Appendix A. Consistent with our guidance that confidential information filed under a motion to seal will become public if identified in this Final Written Decision (Paper 26, 3), as well as the public’s interest in

maintaining a complete and understandable record, Exhibits 2019, 2034, 2036, 2048, 2052–2054, 2056, and 2072 will not be maintained under seal under the terms of the protective order entered in this proceeding.

### III. CONCLUSION

Corning has demonstrated by a preponderance of the evidence that claims 7–27 of the '353 patent are unpatentable under 35 U.S.C. § 103(a) over the combination of Matthews and Tatsuzuki.

### IV. ORDER

In consideration of the foregoing, it is

ORDERED that Corning has shown by a preponderance of the evidence that claims 7–27 of the '353 patent are unpatentable;

FURTHER ORDERED that PPC's Motion to Exclude is *denied*;

FURTHER ORDERED that PPC's Revised Motion to Seal (Paper 39), Second Motion to Seal (Paper 42), and Third Motion to Seal (Paper 58) are *granted-in-part*. The unredacted version of the Patent Owner Response and Exhibits 2020, 2025, 2026, 2030, 2031, 2035, 2037–2039, 2042, 2044, 2045, 2047, 2050, 2051, 2075, 2079, and 2084 will be kept under the terms of the Protective Order entered in this proceeding. *See* Paper 42, Appendix A. Exhibits 2019, 2034, 2036, 2048, 2052–2054, 2056, and 2072 will not be maintained under seal under the terms of the protective order entered in this proceeding.

FURTHER ORDERED that PPC's Fourth Motion to Seal (Paper 68) and Corning's Motion to Seal (Paper 45) are *dismissed*; and

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

Certain documents have been sealed in this proceeding, but have not been relied upon in this Final Written Decision. *See supra* Section II.E. The record will be maintained undisturbed pending the outcome of any appeal taken from this decision. At the conclusion of any appeal proceeding, or if no appeal is taken, the documents will be made public. *See* Trial Practice Guide, 77 Fed. Reg. at 48,760–61. Further, either party may file a motion to expunge the sealed documents from the record pursuant to 37 C.F.R. § 42.56. Any such motion will be decided after the conclusion of any appeal proceeding or the expiration of the time period for appealing.



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