

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 IPR2013-00346
Patent 8,287,320 B2

Before JAMESON LEE, JOSIAH C. COCKS, and
JACQUELINE WRIGHT BONILLA, *Administrative Patent Judges*.

COCKS, *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, LLC¹ (“Corning”), filed an amended Petition requesting an *inter partes* review of claims 1–8, 10–16, and 18–31 of U.S. Patent No. 8,287,320 (Ex. 1001, “the ’320 patent”). Paper 6 (“Pet.”) Patent Owner, PPC Broadband, Inc. (“PPC”), did not file a Preliminary Response. The panel determined that the information presented in the Petition demonstrated that there was a reasonable likelihood that Corning would prevail in challenging claims 1–8, 10–16, and 18–31 as unpatentable under 35 U.S.C. § 103(a). Pursuant to 35 U.S.C. § 314, the panel instituted this proceeding on November 26, 2013, as to those claims of the ’320 patent. Paper 15 (“Dec.”). In that regard, the panel instituted an *inter partes* review of claims 1–8, 10–16, and 18–31 on the following grounds: claims 1–8 and 10–16 are unpatentable under 35 U.S.C. § 103(a) over Matthews², Tatsuzuki³, and Montena⁴; and claims 18–31 as unpatentable under 35 U.S.C. § 103(a) as over Matthews and Tatsuzuki.

During the course of this proceeding, PPC timely filed unredacted and redacted versions of a Patent Owner Response (Papers 29 and 30, “PO

¹ During trial, 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.

² US 2006/0110977 A1 published May 25, 2006 (Ex. 1004).

³ JP 2002-015823 published Jan. 18, 2002 (Ex. 1022) (English translation Ex. 1002).

⁴ US 6,558,194 B2 issued May 6, 2003 (Ex. 1003).

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 timely filed a Response to PPC’s Revised Motion to Seal (Paper 40), a Motion to Seal (Paper 44), 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 52, “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, 2015, in relation to this proceeding and the following four other related proceedings involving the same parties: (1) IPR2013-00340; (2) IPR2013-00342; (3) IPR2013-00345; and (4) IPR2013-00347. Transcripts of the entire consolidated oral hearing are included in the record. Papers 73–75. In particular, Paper 73 corresponds to the transcript from the second session of the consolidated oral hearing, held the morning of July 25, 2014, and pertains to this proceeding and IPR2013-00347.

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 the patentability of claims 1–8, 10–16, and 18–31 of the ’320 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 the '320 patent was asserted against it in *PPC Broadband, Inc. v. Corning Gilbert Inc.*, 5:12-cv-0911-GLS-DEP, which was filed in the U.S. District Court for the Northern District of New York. Pet. 1. Corning also filed five other petitions seeking *inter partes* review of the following patents owned by PPC: the '320 patent (IPR2013-00347); U.S. Patent No. 8,323,060 (IPR2013-00340 and IPR2013-00342); and U.S. Patent No. 8,313,353 (IPR2013-00343 and IPR2013-00345). *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 '320 Patent (Ex. 1001)

The invention of the '320 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, 1:14–18. Figure 1 of the '320 patent is reproduced below:

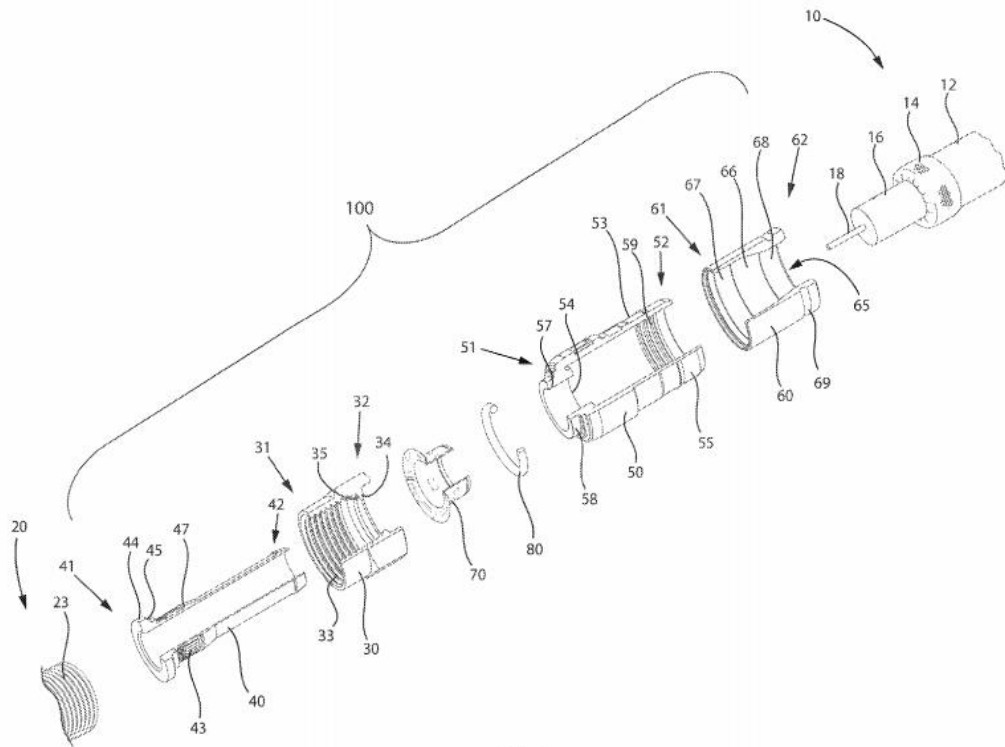


FIG. 1

Figure 1 of the '320 patent depicts a cut-away view of the elements of coaxial cable connector 100 having electrical continuity member 70. *Id.* at 2:49–52, 5:62–64. 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. *Id.* at 5:64–6:1. 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 7:6–12.

The '320 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 8:1–6. 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 8:13–17.

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 8:62–9:5. Internal surface of post mounting portion 57 includes engagement feature 54, 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 9:5–10.

The '320 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 7:13–22. In one embodiment, continuity member 70 includes first end 71, axially opposing second end 72, and post contact portion 77. *Id.* at 10:65–11:3. 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 11:3–6.

Claims 1, 10, and 18 are independent. Claims 2–8, 11–16, and 19–31 ultimately depend from one of the independent claims. Claim 1 is illustrative and is reproduced below:

1. A coaxial cable connector comprising:
a connector body;

a post engaged with the connector body, wherein the post includes a flange;

a nut, axially rotatable with respect to the post and the connector body, the nut having a first end configured for coupling to an interface port, and an opposing second end, wherein the nut includes an internal lip, and wherein the second end portion of the nut starts at a side of the lip of the nut facing the first end of the nut and extends rearward to the second end of the nut;

a continuity member disposed only rearward of the start of the second end portion of the nut and contacting the post and the nut, so that the continuity member extends electrical grounding continuity through the post and the nut; and

wherein the nut does not touch the connector body, and the continuity member is configured to contact a rearward facing surface of the lip of the nut and extend between a portion of the post and a portion of the connector body.

Ex. 1001, 20:55–21:7.

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).

Here, Corning does not offer an explicit construction of any claim term, and generally contends that the terms should be given their broadest reasonable interpretation that is consistent with the Specification of the '320 patent. Pet. 5. Although PPC seemingly agrees that all involved terms should be afforded their broadest reasonable interpretation, it is apparent from the record at hand that the meaning of certain claim phrases should be made explicit – namely, those concerning (1) a “continuity member” (claim 1) or “electrical continuity member” (claims 10 and 18); and (2) components that are “shaped to fit” (claim 28).

1. *“continuity member” or “electrical continuity member”*

As noted above, claims 1, 10, and 18 all include a feature pertaining to a “continuity member.” The feature, as it appears in claim 1, reads:

a continuity member disposed only rearward of the start of the second end portion of the nut and contacting the post and the nut, so that the continuity member extends electrical grounding continuity through the post and the nut; and

wherein the nut does not touch the connector body, and the continuity member is configured to contact a rearward facing surface of the lip of the nut and extend between a portion of the post and a portion of the connector body.

The feature, as it appears in claim 10, reads:

an electrical continuity member disposed axially rearward of a surface of the internal lip of the nut that faces the flange and the first end of the nut, wherein the continuity member electrically contacts both the nut and the post; and

wherein . . . the continuity member is configured to contact the rearward facing surface of the lip of the nut and extend between a portion of the post and a portion of the connector body.

Lastly, the feature, as it appears in claim 18, reads:

an electrical continuity member positioned to contact the post, and the nut, wherein the electrical continuity member contacts and electrically couples 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;

wherein . . . the continuity member is configured to contact the rearward facing surface of the lip of the nut and extend between a portion of the post and a portion of the connector body.

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 ’320 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 the claims of the ’320 patent do not require “consistent contact” and a “continuous electrical connection.” Pet. Reply 6–7 (citing Ex. 1001, 20:55–24:44). Corning argues that PPC’s proposed claim construction improperly imports limitations from the specification into the claims. *Id.* at 7. 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.

We agree with Corning in both respects. 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 ’320 patent acted as their own lexicographer and provided a special definition in the Specification of the ’320 patent for the claim term “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 ’320 patent, we decline to import limitations into the disputed claim limitations that would require the “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 “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 nut and post may not be “consistent” to maintain a “continuous electrical connection” between these components.

We 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 a 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 “continuity member” to require that the continuity member makes contact with the nut and the post to establish an electrical connection between the nut and the post.

2. “*shaped to fit*”

Claim 28 depends from claim 27, which, in turn, depends from claim 18. Claim 28 includes 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 the outer surface “has a complementary size and shape as, and faces” the portion of the connector body. 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 strictly perpendicular to one another, i.e., arranged at a right angle or 90 degree angle to one another. *E.g.*, Paper 73, 60–64. Counsel for PPC further represented that “shaped to fit” does not require surfaces that are “perfectly parallel” (*id.* at 71), 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 66–72).

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 Mroczowski, 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.

We observe that the term “shaped to fit” does not appear in the Specification of the ’320 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, 12:52–53), 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 ¶ 93.⁵

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

⁵ 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 ’320 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.

each other, and are dimensioned to abut one another. As noted above, the parties have differing views as to what extent surfaces that, 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 angle so as to be regarded as diverging from one another. As noted above, although the Specification of the ’320 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 ’320 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. Grounds of Unpatentability

In its Petition, Corning contends that claims 1–8 and 10–16 are unpatentable over the combination of Matthews, Tatsuzuki, and Montena, and claims 18–31 are unpatentable over Matthews and Tatsuzuki. Pet. 37–60. In support of those proposed grounds of unpatentability, Corning relies upon claim charts to explain how the proffered combination teaches the claimed subject matter recited in each of these challenged claims, as well as the Declaration of Dr. Mroczkowski (Ex. 1006) to support its positions. *Id.* PPC disagrees that claims 1–8, 10–16, and 18–31 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. 1006 ¶ 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:

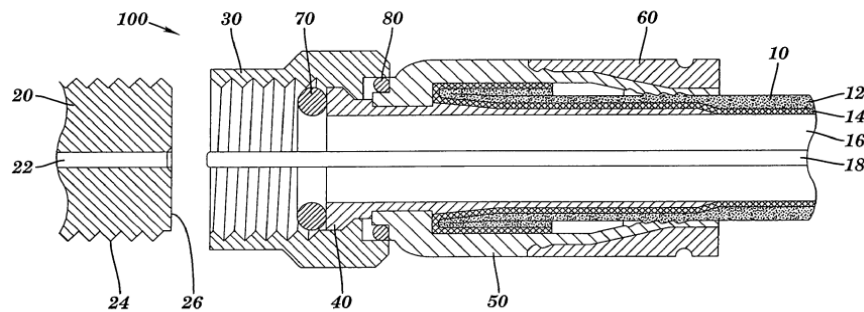


FIG. 1

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. The 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:

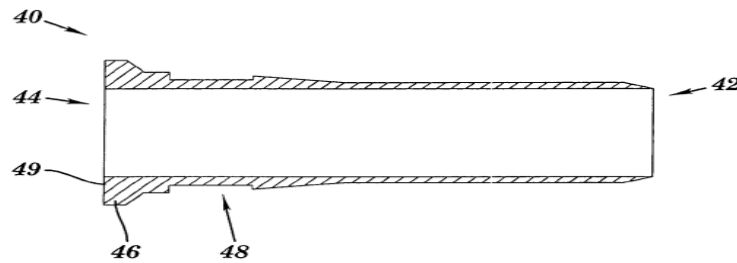


FIG. 3

As shown in Figure 3, post 40 includes first end 42, opposing second end 44, and flange 46. *Id.* ¶ 30. The flange 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:

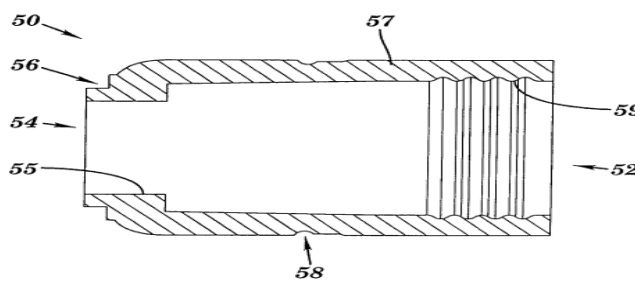


FIG. 4

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:

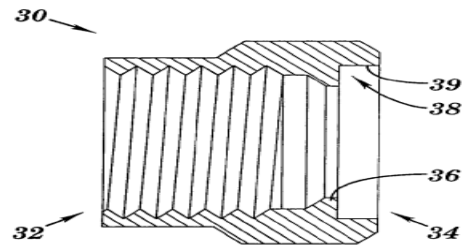


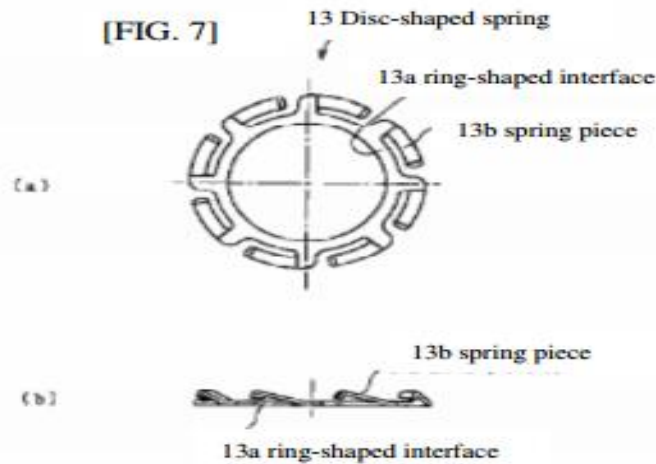
FIG. 2

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. 1022) (English translation Ex. 1002)*

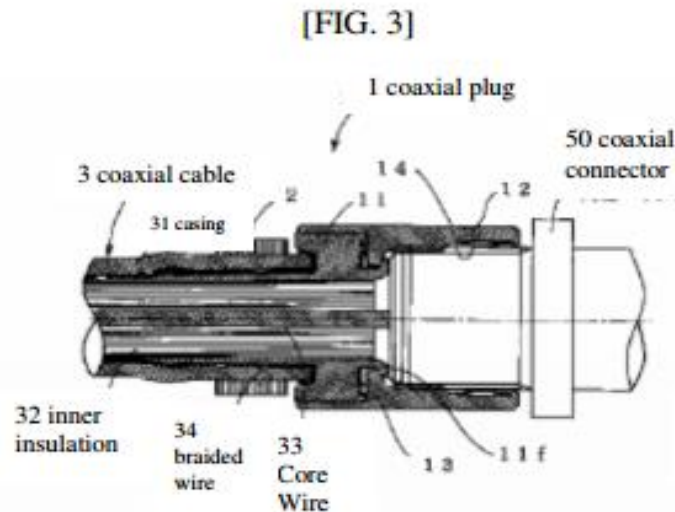
Tatsuzuki generally discloses a coaxial plug installed at the tip of a coaxial cable. Ex. 1002 ¶ 1. Tatsuzuki discloses installing a coaxial cable connector in reception devices, such as television-satellite broadcasting tuners. *Id.* ¶ 2. Reception signals are inputted into these reception devices by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

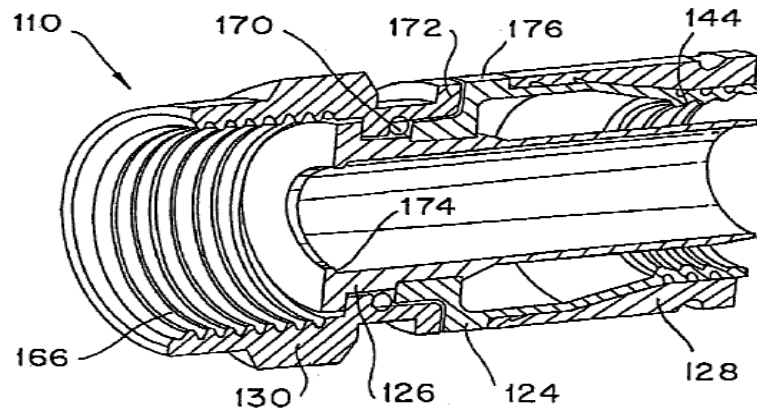
Figure 3 of Tatsuzuki illustrates a cross-section view of coaxial plug 1 securely installed in coaxial cable connector 50. *Id.* ¶ 12. Figure 3 of Tatsuzuki is reproduced below:



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 therebetween. *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. *Montena (Ex. 1003)*

Montena generally discloses a connector for coupling a coaxial cable to a terminal device. Ex. 1003, Abstract. Montena's Figure 13 depicts an embodiment of its invention showing connector 110. Ex. 1003, 5:54–56. Figure 13 of Montena is reproduced below:



As shown in Figure 13, connector 110 includes nut member 130, post member 126, and connector body 124. Ex. 1003, 10:18–22. O-ring seal 170 is seated between the post member, the connector body, and the nut member to serve as a moisture barrier. *Id.* at 10:22–24.

6. Corning's Contentions

In its Petition, Corning presented detailed claim charts and relies on supporting evidence demonstrating how Matthews teaches most of the limitations of independent claims 1, 10, and 18. In particular, Corning explained how Matthews's coaxial cable connector 100 includes connector body 50, post 40 with flange 46 engaged with the connector body, and nut member 30 with internal lip 36, and that those components correspond to the connector body, post, and nut features required by claims 1, 10, and 18. Pet. 38–49. According to Corning, however, certain limitations of claims 1 and 10 directed to the required “continuity member” (claim 1) or “electrical continuity member” (claims 10 and 18), and to the configuration of the nut with respect to the connector body, are not disclosed in Matthews.

Although Matthews discloses “connector body conductive member” 80 (Ex. 1004 ¶ 0035), Corning acknowledges that conductive member 80

may not contact directly post 40 so as to extend electrical grounding continuity through post 40 and nut 30. *See, e.g.*, Pet. 45–46. In accounting for the “continuity member” requirement of claims 1, 10, and 18, Corning relies on Tatsuzuki.

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 and rotary mounting element 12 correspond to the claimed post and nut, and to post 40 and nut 30 set forth in Matthews. Pet. 41, 43, 46. 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. In that regard, Corning contends that such modification would “promote electrical continuity by providing an alternate ground path” between Matthews’s nut 30 and post 40, and also “enable the connector body 50 to be made from a non-conductive material if desired while still maintaining electrical continuity.” *E.g.*, Pet. 42–46 (citing Ex. 1006 ¶¶ 211–215, 217, 267, and 268). Corning further maintains that such modification would result in a continuity member that contacts a rearward facing surface of the lip of Matthews’s nut 30 and extending between a portion of post 40 and connector body 50. *Id.*

In connection with the requirement of claims 1 and 10 that the “nut does not touch the connector body,” Corning relies on the teachings of Montena. In particular, although Matthews may disclose that its nut 30 touches connector body 50, Corning contends that Montena is evidence that

it was known in the art that such components need not touch one another. To that end, Corning relies on Montena's Figure 13 (reproduced *supra*) and contends the following:

The O-ring seal 170 is present between the nut 130 and body 124 to serve as a moisture barrier. Ex. 1003, col. 10, ll. 21-23. The O-ring seal 170 contacts the surface of the first shoulder of the nut which faces the end of the connector which engages the cable. As illustrated in Fig. 13, a space exists between the second shoulder 172 of the nut 130 and the connector body 124.

Pet. 40.

In support of its contention, Corning also points to Dr. Mroczkowski's declaration testimony. Pet. 41, 46. Dr. Mroczkowski testifies that "non-contact between the nut and connector body facilitates rotation of the nut during coupling onto an interface port by minimizing friction between the nut 130 and the connector body 124." Ex. 1006 ¶ 220. We understand Dr. Mroczkowski's testimony as also conveying that the pursuit of minimized friction would have provided an adequate reason for a skilled artisan to implement Montena's teachings with Matthew's connector. *See id.* ¶ 222.

Corning, thus, asserts that claims 1, 10, and 18 would have been obvious in light of the teachings of Matthews, Tatsuzuki, and Montena. Corning also describes in its Petition where it contends all the features of dependent claims 2-8, 11-16, and 19-31 are present in the prior art such that those claims also unpatentable as obvious over Matthews, Tatsuzuki, and Montena.

7. PPC's Contentions

PPC disagrees with Corning's assessment of the obviousness of claims 1-8, 10-16, and 18-31. To that end, PPC contends that the

continuity member required by the claims is absent from the collective teachings of Matthews, Tatsuzuki, and Montena. PO Resp. 17–33. 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.

PPC further contends that claim 28’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. 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 22–26.

Lastly, PPC challenges the combination of Matthews and Tatsuzuki under the premise that such combination as proposed by Corning during the course of this *inter partes* review 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.

8. Discussion – Grounds of Unpatentability

In evaluating Corning’s contentions of obviousness, we consider the claims in two groupings: (1) claims 1–8, 10–16, 18–27, and 29–31, and (2) claim 28.

a. Claims 1–8, 10–16, 18–27, and 29–31

As set forth above, in construing claims 1–8, 10–16, and 18–27, and 29–31, we disagree with PPC’s proposed interpretation of the “continuity member” feature of the above-noted claims of the ’320 patent. 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 there-between.

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

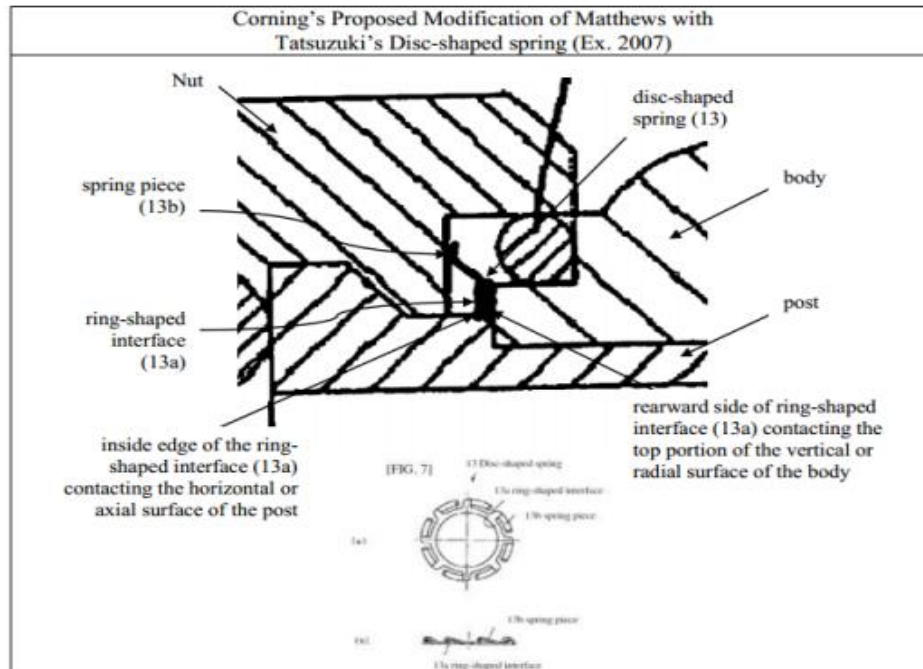
material. Pet. 45–46. Corning relies upon the testimony of Dr. Mroczkowski to support its argument that a person with ordinary skill in the art at the time of the invention would have recognized such benefit, and, therefore, would have been motivated to make the modification. *Id.* at 46 (citing Ex. 1006 ¶ 214).

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 and 1034).

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. 1006 ¶¶ 214–215. 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 connector, as evidenced by Figure

6A of U.S. Patent No. 7,114,990 (“Bence ’990 patent”).⁶ *Id.* at 4 (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 Matthews’s connector. *Id.* at 13–14. According to PPC, our assessment of obviousness of the claims of the ’320 patent should be limited to evaluation

⁶ When PPC filed its Patent Owner Response, it entered the Bence ’990 patent into the record in this proceeding as Exhibit 2024. When Corning filed its initial Reply to the Patent Owner Response, it also entered the Bence ’990 patent into the record of this proceeding as Exhibit 1038.

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, 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. 1006 ¶¶ 214–217.⁷

⁷ We are not persuaded by PPC's argument that Dr. Mroczkowski's opinions should be accorded "little to no weight," because Dr. Mroczkowski 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. 1007. There is no requirement that a witness must 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., Inc.*, 594 F.3d 1360, 1373 (Fed. Cir. 2010).

In any event, we also reject 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 Bence '990 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 Bence '990 patent is not a reference that has been offered by Corning as forming a part of a proposed ground of unpatentability in this proceeding, it is a reference providing evidence of the level 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.” *In re GPAC*, 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)). As noted above, the level of ordinary skill in the art is reflected by the prior art of record. What is described by the Bence '990 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 (2007). 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 Bence ’990 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, and 1022). As such, an ordinarily skilled artisan would have had 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 ’320 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 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.

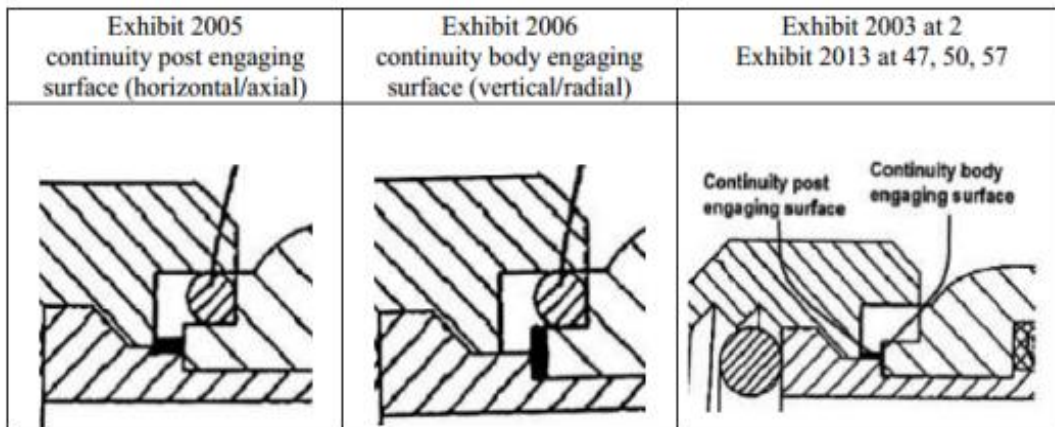
With further regard to claims 1 and 10, these claims also require that "the nut does not touch the connector body." Corning relied on Montena as disclosing that it is known in the art that connector cables may be configured such that a nut is separated from a connector body. Pet. 40–42. PPC does not dispute that such configuration was known in the art. We are persuaded that one of ordinary skill in the art would have understood from the teachings of the prior art, including Montena, that a nut of a connector, such as Matthews's nut 30, may be configured such that it does not touch or contact a connector body, such as Matthews's connector body 50.

Based on the record before us, Corning has presented sufficient evidence to support a finding that the features of independent claims 1 and 10 are taught by the combination of Matthews, Tatsuzuki, and Montena, and that the features of independent claim 18 are taught by the combination of Matthews and Tatsuzuki. In addition, we also are persuaded that the features of dependent claims 2–8, 11–16, and 19–27 and 29–31 also are taught by the combination of those references.

b. Claim 28

As discussed above, claim 28 ultimately depends from claim 18 and adds 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 claim 28 is satisfied by corresponding portions of Matthews’s post 40 and connector body 50, shown, for instance, in Matthews’s Figures 1 and 7. Pet. 52. In connection with this *inter partes* review 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. Illustrations of those sketches are reproduced below, as they appear in PPC’s Patent Owner Response:



PO Resp. 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. Dr. Mroczkowski testified that those horizontal and vertical portions constitute surfaces that are shaped to fit one another. *E.g.*, Ex. 1006 ¶ 362.

PPC disagrees that the marked portions form surfaces that are shaped to fit. PO Resp. 25–26. PPC bases its disagreement, however, on the premise that perpendicular surfaces cannot constitute portions that are shaped to fit one another. As noted above in our claim construction, 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 by Corning and Dr. Mroczkowski 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, and pertinent to claim 28, would be shaped to fit one another.

For the reasons given above, and in light of the record before us, Corning has presented sufficient evidence to support a finding that the

features of claim 28 are taught 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, PPC relies on, *inter alia*, 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 1:41–44). 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. Exs. 1038, 2024, Abstract; Ex. 2076, 190:16–21. As noted by Corning (Pet. Reply 16), in relation to such a connector, the Bence ’990 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; *see* Ex. 1006 ¶ 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.” Ex. 1002 ¶ 7.

2. Failed Attempts by Corning

PPC contends that from September 2008 until March 2010, Mr. Burris, an employee of Corning, 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 either 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. 1038; Ex. 2024) 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’s designs from 2008 to 2010 for reasons unrelated to a “failure” of design, such as manufacturing costs. In addition, Corning contends that certain of Mr. Burris’s 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 Argentina test in August 2009), 31 (stating that RC-1350-90 "yielded acceptable results" in 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. Burriss 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. Burriss 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. Burriss "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. Burriss 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. Burris and Mr. Lutz attaching a “new ad showing the PPC Continuity Connector” (Ex. 2053). *Id.* at 48–49. PPC contends that “Mr. Burris 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. Burris 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 William McDade, copying Mr. Burris, 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 (Ex. 2052). Thereafter, on June 25, 2010, according to PPC, “Mr. Burris 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. Burris 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.*; 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 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 the 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, i.e., that PPC did not sell a relevant axial connector to anyone before 2009. PO Resp. 56–57; Ex. 2072 ¶¶ 18–21. That implication, however, is 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 connector 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 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

altogether. 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 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.

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). For the reasons discussed above, we determine the record before us lacks sufficient evidence in relation to other asserted objective indicia of non-obviousness. 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 1–8, 10–16, and 18–31 of the '320 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. Burriss (Ex. 2019, 180:5–8, 189:22–23, 235:12–16), as well as certain portions of a Declaration from Mr. Burriss (Ex. 2020 ¶¶ 4, 16), because these statements made by Mr. Burriss allegedly 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. *See* Paper 38, 4. The fact that PPC introduced and relied on Mr. Burriss'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 redacted and unredacted 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 contains 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 44. 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 33), 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 shown by a preponderance of the evidence that (1) claims 1–8 and 10–16 of the '320 patent are unpatentable under 35 U.S.C. § 103(a) over Matthews, Tatsuzuki, and Montena, and (2) claims 18–31 are unpatentable under 35 U.S.C. § 103(a) over Matthews and Tatsuzuki.

IV. ORDERS

After due consideration of the record before us, it is

ORDERED that claims 1–8, 10–16, and 18–31 of the '320 patent are held 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 44) 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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