

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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PANDUIT CORP.,  
Petitioner,

v.

CORNING OPTICAL COMMUNICATIONS LLC,  
Patent Owner.

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Case IPR2017-01074  
Patent RE45,482 E1

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Before JENNIFER S. BISK, DANIEL J. GALLIGAN, and  
JOHN A. HUDALLA, *Administrative Patent Judges*.

HUDALLA, *Administrative Patent Judge*.

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

Petitioner, Panduit Corp. (“Petitioner”), filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 15, 16, 18–24, 49, 50, 63–68, and 71 of U.S. Patent No. RE45,482 E1 (Ex. 1001, “the ’482 patent”) pursuant to 35 U.S.C. §§ 311–319. Patent Owner, Corning Optical Communications LLC (“Patent Owner”), filed a Preliminary Response (Paper 8, “Prelim. Resp.”) to the Petition. Taking into account the

arguments presented in Patent Owner’s Preliminary Response, we determined that the information presented in the Petition established that there was a reasonable likelihood that Petitioner would prevail in challenging claims 15, 16, 18–24, 49, 50, 63–68, and 71 of the ’482 patent under 35 U.S.C. § 103(a) on certain grounds of unpatentability presented. Pursuant to 35 U.S.C. § 314, we instituted this proceeding on October 2, 2017, as to claims 15, 16, 18–24, 49, 50, 63–68, and 71 of the ’482 patent. Paper 9 (“Dec. on Inst.”).

During the course of trial, Patent Owner filed a Patent Owner Response (Paper 14, “PO Resp.”), and Petitioner filed a Reply to the Patent Owner Response (Paper 27<sup>1</sup>, “Pet. Reply”). An oral hearing was held on June 27, 2018, and a transcript of the hearing is included in the record. Paper 39 (“Tr.”).

Petitioner filed a Declaration of Casimer DeCusatis, Ph.D. (Ex. 1003) with its Petition. Patent Owner filed Declarations of Brandon Barnes (Ex. 2002), Sean Kelly (Ex. 2003), and Eric Pearson (Ex. 2004) with its Response. The parties also filed transcripts of the depositions of Dr. DeCusatis (Ex. 2005), Mr. Barnes (Exs. 1023<sup>2</sup>, 2019<sup>3</sup>), Mr. Kelly (Exs. 1021<sup>2</sup>, 2018<sup>3</sup>), and Mr. Pearson (Ex. 1022<sup>1</sup>).

In light of the U.S. Supreme Court’s decision in *SAS Institute, Inc. v. Iancu*, 138 S. Ct. 1348 (2018), we modified the Institution Decision to

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<sup>1</sup> These papers were unsealed pursuant to our Order of June 21, 2018. Paper 37.

<sup>2</sup> These papers are sealed pursuant to our Order of June 21, 2018. Paper 37.

<sup>3</sup> These papers are public versions pursuant to our Order of June 21, 2018. Paper 37.

institute on all of the grounds presented in the Petition. Paper 29. Subsequently, the parties filed a joint motion to limit the Petitions to the grounds that were originally instituted. Paper 31. We granted the motion. Paper 32. As a result, the remaining instituted grounds are the same as they had been at the time of the Institution Decision. *See id.* at 2.

We have jurisdiction under 35 U.S.C. § 6. This decision is a Final Written Decision under 35 U.S.C. § 318(a) as to the patentability of claims 15, 16, 18–24, 49, 50, 63–68, and 71 of the ’482 patent. For the reasons discussed below, Petitioner has demonstrated by a preponderance of the evidence that claims 15, 16, 18–24, 49, 50, 63–68, and 71 of the ’482 patent are unpatentable.

## I. BACKGROUND

### A. *Related Proceedings*

The parties identify the following district court case related to the ’482 patent (Pet. 1; Paper 4, 1):

*Corning Optical Comms. LLC v. Panduit Corp.*, No. 1:16-cv-00268-GMS (D. Del. filed Apr. 15, 2016).

We also instituted an *inter partes* review of claims 25, 32–34, 36, and 43 of the ’482 patent in co-pending Case IPR2017-01073.

### B. *The ’482 patent*

The ’482 patent is a reissue of U.S. Patent No. RE42,094, which in turn is a reissue of U.S. Patent No. 6,816,661 (“the ’661 patent”). Ex. 1001, [64], 1:29–34. The application that led to the ’661 patent was filed on March 22, 2000. *Id.* As discussed below, Petitioner establishes that, at a

minimum, its asserted references qualify as prior art relative to that March 22, 2000, filing date.

The '482 patent relates to “multifiber connectors, installation tools and associated methods for validating optical fiber continuity during the connectorization process.” *Id.* at 1:39–42. Figure 1 of the '482 patent is reproduced below.

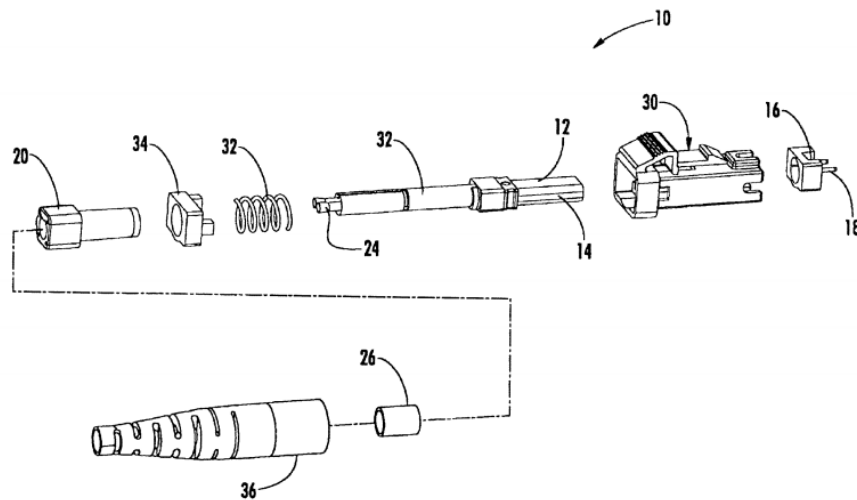


FIG. 1

Figure 1 depicts a multifiber connector 10 (specifically, the MT-RJ UNICAM fiber optic connector) having multifiber ferrule 12, through which a number of optical fiber stubs extend and by which these optical fiber stubs are secured. *Id.* at 7:62–63, 8:41–45. Multifiber connector 10 also includes sleeve/ferrule holder 22, which defines a passageway for at least partially receiving ferrule 12.<sup>4</sup> *Id.* at 9:6–9. Multifiber connector 10 additionally includes splice components positioned proximate the rear face of the multifiber ferrule for aligning optical field fibers with respective optical fibers stubs. *Id.* at 6:17–21. Cam member 20 is adapted to actuate the splice

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<sup>4</sup> Sleeve/ferrule holder 22 appears to be mismarked with reference numeral 32 in Figure 1.

components by urging the splice components toward one another as the cam member is rotated relative to ferrule holder 22. *Id.* at 9:59–10:1.

Figure 6 of the '482 patent is reproduced below.

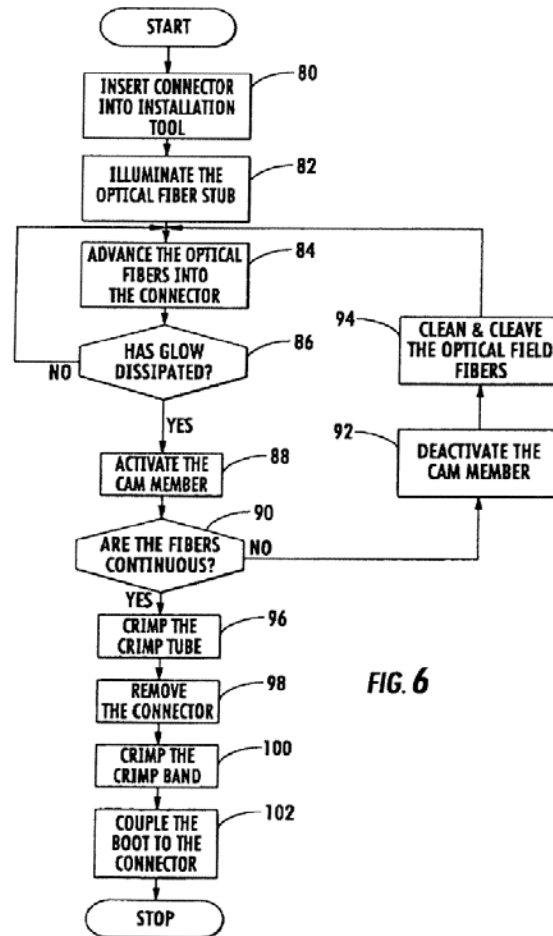


Figure 6 is a flowchart illustrating the operations performed to validate the continuity of optical field fibers with their respective optical fiber stubs. *Id.* at 8:12–15. At block 82, a light source is introduced into the optical fiber stub in each optical fiber stub–optical field fiber pair. *Id.* at 12:58–60. While the optical fiber stubs and optical field fibers are apart, a glow emanates from the end portions of the optical fiber stubs within the splice components. *Id.* at 13:29–33. The optical fiber stubs and optical field fibers are advanced into the connector in block 84. *Id.* at 13:21–25. When the

glow has dissipated sufficiently to indicate optical contact between the optical fiber stubs and optical field fibers in block 86, the cam member is actuated to secure the optical field fibers in position relative to the optical fiber stubs in block 88. *Id.* at 13:52–58. Then, at block 90, fiber optic connector 10 is evaluated to determine if the glow that previously emanated from the optical fiber stub completely disappears, thereby indicating that the optical field fiber and the optical fiber stubs are continuous. *Id.* at 14:1–7. “[C]ontinuity is presumed to have been established once the glow dissipates.” *Id.* at 4:39–40.

If the glow has not been extinguished, the cam member is deactivated at block 92. *Id.* at 14:7–9. Then, the optical field fibers may be recleaved and cleaned (block 94) prior to reinsertion and repositioning in fiber optic connector 10. *Id.* at 14:12–20. The cam member is then reactivated to secure the optical field fibers in position relative to the optical fiber stubs, and continuity can again be tested. *Id.* at 14:26–32. Repositioning and retesting can be repeated as many times as necessary until acceptable continuity is achieved. *Id.* at 14:32–36.

### *C. Illustrative Claims*

Of the challenged claims, claims 15 and 18 of the '482 patent are independent. Claims 16 and 63–68 depend from claim 15. Claims 19–24, 49, 50, and 71 depend directly or indirectly from claim 18. Claims 15 and 18 are illustrative of the challenged claims and recite:

15. An optical fiber connector comprising:

a ferrule extending lengthwise between opposed front and rear faces for receiving an optical fiber stub;

splice components disposed proximate the rear face of said ferrule for aligning a field fiber to the optical fiber stub;

a sleeve in which said splice components are disposed;

a cam mechanism for activating said splice components together to operably interconnect the aligned field fiber and the optical fiber stub, said cam mechanism disposed about said sleeve, wherein movement of the cam mechanism relative to said sleeve aligns the field fiber and the optical fiber stub; and

wherein the cam mechanism and at least one of the splice components are translucent such that a glow emanating from therewithin is indicative of a discontinuity between the field fiber and optical fiber stub.

18. A method of validating the continuity of one or more optical fibers upon which a fiber optic connector is mounted comprising:

providing a fiber optic connector including a ferrule defining at least one bore extending between opposed front and rear faces, an optical fiber stub at least partially disposed within the bore and having an end portion extending beyond the rear face of the ferrule, and at least one splice component;

securing an end portion of an optical field fiber relative to the end portion of the optical fiber stub within the at least one splice component;

evaluating the continuity of the optical field fiber and the optical fiber stub;

repositioning and re-securing the end portion of the optical field fiber relative to the end portion of the optical fiber stub when the continuity of the optical field fiber and the optical fiber stub is unacceptable; and

re-evaluating the continuity of the optical field fiber and the optical fiber stub after repositioning and re-securing the end

portion of the optical field fiber relative to the end portion of the optical fiber stub.

*D. The Prior Art*

Petitioner relies on the following prior art:

de Jong et al., U.S. Patent No. 5,040,867, filed Mar. 21, 1990, issued Aug. 20, 1991 (Ex. 1004, “de Jong”);

Knecht et al., U.S. Patent No. 4,787,704, filed July 27, 1987, issued Nov. 29, 1988 (Ex. 1005, “Knecht”);<sup>5</sup>

Takizawa et al., U.S. Patent No. 6,179,482 B1, PCT application filed Jan. 16, 1998, issued Jan. 30, 2001 (Ex. 1006, “Takizawa”);

*Siecor<sup>®</sup> CamLite™ Connector Laser Assembly Aid Instructions*, Siecor Recommended Procedure SRP-006-046, Siecor Corporation, Issue 1, April 1991 (Ex. 1007, “CamLite”);

*Siecor CamSplice Assembly Manual*, Siecor Recommended Procedure SRP-006-038, Siecor Corporation, Issue 6, July 1994 (Ex. 1008, “CamSplice”);

Dean, U.S. Patent No. 4,923,274, filed June 26, 1989, issued May 8, 1990 (Ex. 1009, “Dean”); and

*Siecor UniCam™ SC/ST<sup>®</sup>/FC Connector Assembly Instructions*, Siecor<sup>®</sup> Recommended Procedure SRP-006-277, Siecor Corporation, Issue 1, February 1996 (Ex. 1010, “UniCam”).

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<sup>5</sup> Although Knecht is not asserted expressly in the enumerated grounds of unpatentability below, Panduit contends Knecht is incorporated by reference in de Jong and Dean. *See, e.g.*, Pet. 8 (citing Ex. 1004, 2:15–29, 2:64–65, Fig. 2), 21 (citing Ex. 1009, 1:9–10). Patent Owner does not dispute this contention. Based on the disclosure in de Jong and Dean, we agree with Panduit’s contention and treat the cited portions of Knecht as if they were a part of de Jong and Dean.

*E. Remaining Instituted Grounds*

The following instituted grounds remain at issue in this case (Pet. 41; Paper 32, 2):

| References                                      | Basis              | Claims Challenged |
|-------------------------------------------------|--------------------|-------------------|
| de Jong, CamLite, and Takizawa                  | 35 U.S.C. § 103(a) | 15, 16, and 64–68 |
| de Jong, CamLite, Takizawa, Dean, and CamSplice | 35 U.S.C. § 103(a) | 63                |
| CamSplice, CamLite, and de Jong                 | 35 U.S.C. § 103(a) | 18, 20–24, and 49 |
| CamSplice, CamLite, de Jong, and Dean           | 35 U.S.C. § 103(a) | 18, 20–24, and 49 |
| CamSplice, CamLite, de Jong, and Takizawa       | 35 U.S.C. § 103(a) | 50 and 71         |
| CamSplice, CamLite, de Jong, Dean, and Takizawa | 35 U.S.C. § 103(a) | 50 and 71         |
| CamSplice, CamLite, de Jong, and UniCam         | 35 U.S.C. § 103(a) | 19                |
| CamSplice, CamLite, de Jong, Dean, and UniCam   | 35 U.S.C. § 103(a) | 19                |

*F. Claim Interpretation*

In an *inter partes* review, we construe claims by applying the broadest reasonable interpretation in light of the specification. 37 C.F.R. § 42.100(b); *see Cuozzo Speed Techs., LLC v. Lee*, 136 S.Ct. 2131, 2144–46 (2016). Under the broadest reasonable interpretation standard, and absent any special definitions, claim terms 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. *See In re Translogic Tech. Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). Any special definitions for claim terms or phrases must be set forth “with reasonable clarity, deliberateness, and precision.” *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

The parties did not propose any claims for construction, and we determine that no terms require explicit construction. *See Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999) (“[O]nly those terms need be construed that are in controversy, and only to the extent necessary to resolve the controversy”).

## II. ANALYSIS

### A. *Obviousness Ground Based on de Jong, CamLite, and Takizawa*

Petitioner contends claims 15, 16, and 64–68 would have been obvious over de Jong, CamLite, and Takizawa. Pet. 23–47. Petitioner also relies on Knecht based on Knecht’s incorporation into de Jong by reference. *Id.* at 36.

#### 1. *Principles of Law*

A claim is unpatentable under 35 U.S.C. § 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. *See 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. *See Graham v. John Deere Co. of Kansas City*, 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 at 1480 (citing *In re Samour*, 571 F.2d 559, 562 (CCPA 1978)). We analyze Petitioner’s obviousness grounds with the principles identified above in mind.

## 2. *Level of Skill in the Art*

Citing testimony from Dr. DeCusatis, Petitioner contends a person of ordinary skill in the art would have had “(a) a Bachelor’s Degree in Mechanical Engineering or similar, with at least 5 years of experience designing or installing fiber optic equipment; or (b) a Master’s Degree in Mechanical Engineering or similar, with at least 3-5 year[s] of experience designing or installing fiber optic equipment.” Pet. 6–7 (citing Ex. 1003 ¶¶ 9–19). Patent Owner cites Mr. Pearson’s testimony and contends an ordinarily skilled artisan would have had “a bachelor’s degree in mechanical engineering, materials science, or a related field; and 2 years of experience in fiber optic equipment.” PO Resp. 1 (citing Ex. 2004 ¶¶ 12–14). In particular, Mr. Pearson cites Dr. DeCusatis’s statement that “the level of sophistication in this field” is not “particularly high” as supporting a lower level of practical experience. Ex. 2004 ¶ 14 (quoting Ex. 1003 ¶ 15).

Mr. Pearson is correct that the basis for Dr. DeCusatis’s opinion requiring 3–5 years of experience is unclear. Ex. 2004 ¶ 14. Instead, we credit Mr. Pearson’s statement that “2 years is sufficient for a person to

obtain an understanding of cam design and structure typical of those in the field.” *Id.* This also comports with Dr. DeCusatis’s testimony about the level of sophistication in the field. *See* Ex. 1003 ¶ 15. Accordingly, we apply Patent Owner’s proposed level of ordinary skill for purposes of this Decision. We are satisfied the Patent Owner’s proposal comports with the qualifications a person would have needed to understand and implement the teachings of the ’482 patent and the prior art of record.

3. *De Jong*

De Jong is a patent directed to a fiber optic connector designed for use in the field with which “the steps to complete connectorization are similar to those for installing a mechanical splice.” Ex. 1004, 1:7, 1:31–36. Figures 1 and 2 of de Jong are reproduced below.

FIG.1

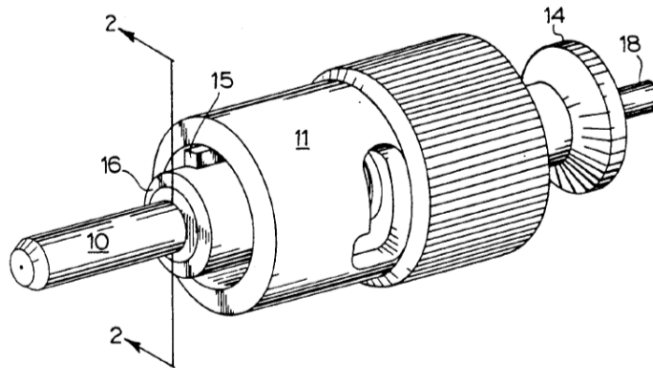
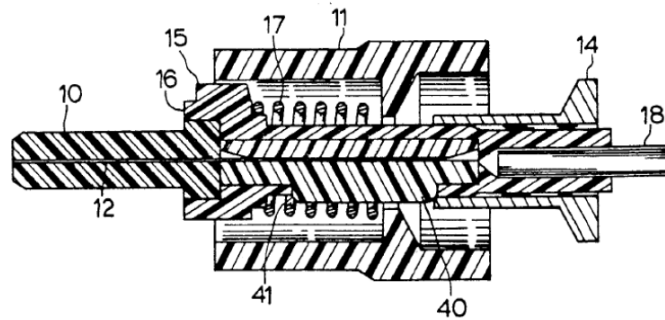


FIG 2



Figures 1 and 2 depict, respectively, perspective and sectional views of the disclosed connector having housing 11. *Id.* at 1:49–54. Optical fiber 12 is placed in ferrule 10. *Id.* at 2:8–9. The centering assembly of Knecht (described below) is placed in housing 16, and first rib 40 is inserted in housing 16 through slot 41. *Id.* at 2:15–18, 2:21–29.

Figure 7 of de Jong is reproduced below.

FIG 7

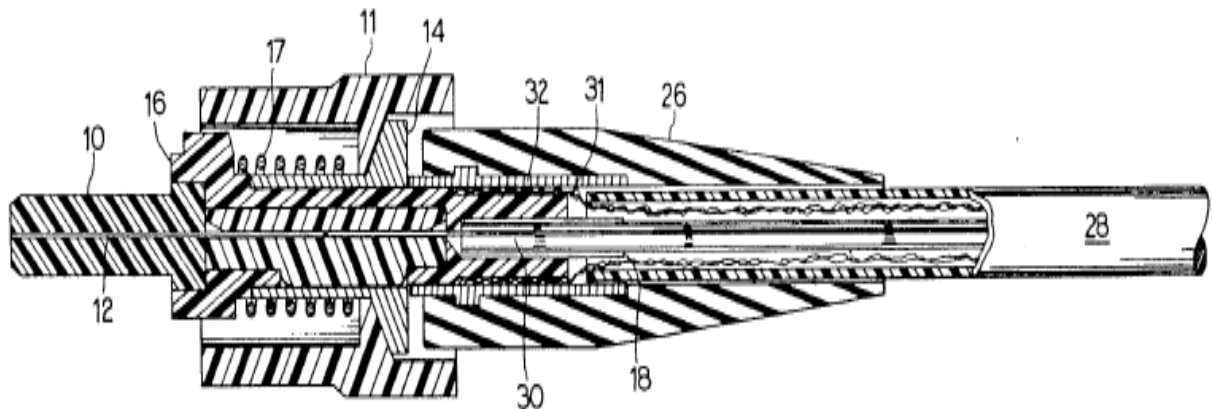


Figure 7 depicts a sectional view of a completed connector. *Id.* at 1:65–66. Prior to completion of the connector, cable 28 is inserted through boot 26 and crimp ring 32. *Id.* at 2:52–53. The end portion of cable 28 is stripped away, revealing buffered optical fiber 30. *Id.* at 2:58–60. Optical fiber 30 is stripped, cleaved, and loaded through crimp tube 18 until it meets the terminal end of optical fiber 12. *Id.* at 2:60–62. Using a tool, slider/locking member 14 is “urged inward to slide to the second position over tab 40, urging tab 40 radially inward through slot 41 to center the connector.” *Id.* at 2:62–65. Crimp ring 32 is then crimped. *Id.* at 3:2.

Petitioner contends de Jong qualifies as prior art under 35 U.S.C. § 102(b) based on its issue date of August 20, 1991. Pet. 8. We agree. De Jong’s issue date of August 20, 1991, is more than one year before the earliest possible effective filing date for the challenged claims of the ’482 patent, which is March 22, 2000. *See* Ex. 1001, [64]; Ex. 1004, [45].

4. *CamLite*

The CamLite reference from Siecor Corporation relates to the installation of the CamLite connector, which “incorporates a mechanical splice and a fiber stub within the connector.” Ex. 1007, 1. The installation process includes “cleaving the field fiber, inserting it into the connector until its cleaved end contacts the end of the fiber stub in the connector, and crimping it in place.” *Id.*

The CamLite reference also “describes the use of a helium neon laser as an assembly aid for the CamLite multimode connector.” *Id.* “The laser gives the installer visual feedback when the fibers are successfully butted in the connector.” *Id.* According to this reference, there will be very little light visible at the rear of the connector housing if the connector has been installed correctly. *Id.* at 7. On the other hand, if there is a bright glow, then the fibers are not touching inside the connector, which will result in high attenuation. *Id.* In the latter scenario, the CamLite reference advises the installer to cut off the connector and to begin again. *Id.*

Petitioner contends “CamLite is a printed publication dated April 1991” that “constitutes prior art to the ’482 Patent under at least 35 U.S.C. § 102(b).” Pet. 14 (citing Ex. 1007, 1, 8). Petitioner notes CamLite includes a 1991 copyright date and is identified on an Information Disclosure Statement from the prosecution of U.S. Patent No. 5,261,020 (“the ’020 patent”). Pet. 14–15 n.1 (citing Ex. 1010, 1; Ex. 1011, 28, 52–59); *see also* Ex. 1011, 1 (CamLite listed as a reference cited on the ’020 patent, which issued on November 9, 1993). Citing testimony from Alan J. McFarland, Petitioner contends CamLite is a “Siecor Recommended Procedure[]” that was “widely disseminated . . . upon publication” and

included “with each unit of product sold covered by such a manual,” which made CamLite “freely available without restriction to distributors, customers, and potential customers.” *Id.* (citing Ex. 1013 ¶¶ 9–10). Patent Owner does not dispute the prior art status of CamLite.

Based on Petitioner’s evidence, we determine that CamLite qualifies as a prior art printed publication under 35 U.S.C. § 102(b). Petitioner’s evidence establishes that CamLite was publicly disseminated more than one year before the earliest possible effective filing date for the challenged claims of the ’482 patent, which is March 22, 2000. *See* Ex. 1001, [64].

#### 5. *Knecht*

Knecht is a patent directed to optical fiber splicing. Ex. 1005, 1:12. Knecht discloses “an optical splice having a frame with a channel; two rods each having a resilient exterior surface disposed in the channel; and a lid adapted to be received on the frame over the channel.” *Id.* at Abstract. Figure 1 of Knecht is reproduced below.

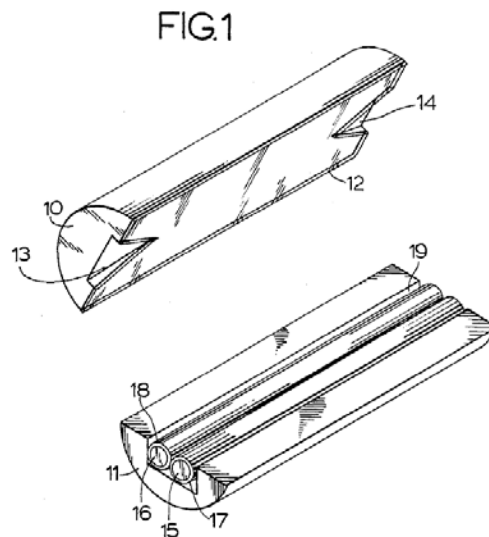


Figure 1 depicts a perspective view of the frame, lid, and rods of an optical splice. *Id.* at 2:67–68; 3:51–52. Plastic lid 10 fits over plastic frame 11, which contains rectangular channel 19. *Id.* at 3:52–54. Glass rods 15 and 16, which are covered by resilient coatings 17 and 18, respectively, rest in channel 19. *Id.* at 3:54–56. Lid 10 also has a resilient coating 12. *Id.* at 3:58.

“In use, two optical fiber terminal end portions are disposed in the groove delimited by the coated rods, the optical fibers being in end wise abutting relationship with each other.” *Id.* at 1:43–46. The frame and lid are compressed into a mating relationship, whereupon pressure from the frame and lid compresses the optical fiber terminal ends within the coated portion of the lid and the coated rods. *Id.* at 1:53–55, 2:10–14. This centers the optical fibers, which may be of different diameters, with each other. *Id.* at 2:14–15.

Knecht is incorporated by reference in de Jong and Dean. Ex. 1004, 2:15–18; Ex. 1009, 1:9–10.

## 6. *Takizawa*

### a. *Overview*

Takizawa is a U.S. patent directed to an optical connector that can be assembled easily and quickly at a field connection site. Ex. 1006, 1:36–39. Takizawa describes the need to check the connection condition for a pair of optical fibers after they are joined in an optical connector. *Id.* at 4:30–34. With reference to a Japanese patent application, Takizawa describes a member/component section for clamping an optical fiber in a connection mechanism that has “transparent or suitably translucent properties so that the

accommodation condition and connection condition of the optical fiber can be verified.” *Id.* at 4:35–41. Specifically, “when a visible light ray is input to the optical fiber after completion of the optical fiber connection, then preferably the leakage light from the connection point of the pair of optical fibers can be observed by eye from outside of the connection mechanism.” *Id.* at 4:41–45. Minimal light leakage is correlated with “positional displacement between the cores of the connected optical fiber pairs [being] within a permissible range,” whereas significant light leakage is correlated with “positional displacement [being] outside of the permissible range.” *Id.* at 4:50–55.

*b. Status of Takizawa as Prior Art*

Petitioner contends Takizawa qualifies as prior art under 35 U.S.C. § 102(e). Pet. 13. Petitioner notes that Takizawa arose from a PCT application, and that its corresponding U.S. national stage application was filed on October 6, 1999. *Id.* That date is before March 22, 2000, the filing date of the earliest application to which the ’482 patent claims priority. *See supra* § I.B. Notwithstanding, Patent Owner contends Takizawa does not qualify as prior art because Patent Owner can antedate Takizawa. PO Resp. 26–27. As such, we must consider whether the claims of the ’482 patent are entitled to a priority date earlier than October 6, 1999, based on the evidence produced by Patent Owner.

Petitioner has met its initial burden to show Takizawa is prior art, so the burden of production shifts to Patent Owner to argue or produce evidence that the asserted reference is not prior art. *Dynamic Drinkware, LLC v. Nat’l Graphics, Inc.*, 800 F.3d 1375, 1380 (Fed. Cir. 2015). If Patent

Owner meets that burden of production, the burden shifts back to Petitioner. *Id.* We emphasize that the ultimate burden of establishing unpatentability always remains with Petitioner.

An inventor can swear behind a reference by proving the inventor conceived the invention before the effective filing date of the reference and was diligent in reducing the invention to practice after that date. *Apator Miitors ApS v. Kamstrup A/S*, 887 F.3d 1293, 1295 (Fed. Cir. 2018). When proving conception via the oral testimony of an inventor, a party must proffer evidence corroborating that testimony. *Shu-Hui Chen v. Bouchard*, 347 F.3d 1299, 1309 (Fed. Cir. 2003). Whether an inventor's testimony has been sufficiently corroborated is determined by a "rule of reason" analysis, in which an evaluation of all pertinent evidence must be made so that a sound determination of the credibility of the inventor's story may be reached. *Id.*

Citing a declaration from inventor Brandon Barnes, Patent Owner contends that the inventors of the '482 patent "conceived the subject matter of claims 15, 16, 50, 63–68, and 71 in July 1999."<sup>6</sup> PO Resp. 26 (citing Ex. 2002 ¶¶ 36–54). In particular, Patent Owner relies on a Siecor project known as "Project C333," which allegedly launched on July 19, 1999, and sought to modify a new UniCam connector "such that a light injection/detection system or similar light device could be used to evaluate

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<sup>6</sup> At oral argument, Patent Owner's counsel appeared to back away from a July 1999 conception date and instead asserted a conception date that was merely "before October 6th, 1999." Tr. 63:22–64:6. This distinction does not affect our analysis because we conclude that Patent Owner has not produced evidence sufficient to corroborate a conception date before October 6, 1999.

optical continuity.” *Id.* at 26–27 (citing Ex. 2002 ¶¶ 41–45; Ex. 2007). Patent Owner supports its assertion of an earlier conception date with the following evidence (*see id.* at 27): (1) a “Project Approval Form” for Project C333 dated July 19, 1999 (Ex. 2007); (2) certain drawings that are alleged to “closely resembl[e] the figures in the ’482 patent” (Ex. 2006); (3) certain testing notes and a molding test run report that allegedly show the creation of “working prototypes to test various materials and designs” (Exs. 1024, 2008–2010); and (4) a report related to Project C333 (Ex. 2011). With reference to these documents, Mr. Barnes testifies as follows:

I have been asked to say whether we, prior to October 6, 1999, had the idea of using a translucent cam mechanism with our MTRJ UniCam connectors to allow technicians to evaluate fiber continuity through the cam as described [in the] “RE45,482” patent. After reviewing these documents, it is clear to me that we did.

Ex. 2002 ¶ 54.

Petitioner argues Patent Owner “has not provided affirmative inventor testimony or even a single document that establishes conception prior to Takizawa.” Pet. Reply 7. Petitioner notes that Exhibit 2007 is Patent Owner’s only supporting document that predates Takizawa. *Id.* at 8. Petitioner contends Exhibit 2007 “says nothing about using the glow from a connector as a measure of continuity” and “is silent about the design of *any* connector, the design of a *translucent* connector, or which parts of any such connector (i.e., the splice components and cam mechanism) should be translucent.” *Id.* (emphases in original). Petitioner also argues that Patent Owner’s first translucent cam was not produced until October 18, 1999. *Id.* at 9 (citing Ex. 1024). Petitioner additionally quotes a “Preliminary Design Review” document dated December 10, 1999, stating that Patent Owner

“still needed ‘to make a decision on the material used for the UniCam cam molded part.’” Pet. Reply 10 (quoting Ex. 2011, 7).

Our reviewing court has stated: “[T]he conception inquiry asks whether the inventors embraced the invention in their minds as of the date alleged. Whether or not subsequent testing succeeded or failed, or even took place, does not determine whether conception was complete as of that date.” *In re Jolley*, 308 F.3d 1317, 1325 (Fed. Cir. 2002). Following this framework, we must consider whether the evidence arising from before October 6, 1999, corroborates conception, regardless of whether subsequent testing by Patent Owner succeeded. The only evidence from before October 6, 1999, that Patent Owner provides to corroborate Mr. Barnes’s testimony regarding conception is the Project Approval Form for Project C333. *See* Ex. 2007. This form states that the objective of Project C333 is to “[b]rainstorm” designs for a “continuity verification device for use by the installer.” *Id.* No particular designs are set forth in Exhibit 2007, and Patent Owner does not attempt to link the substance of this document to the inventive limitations of the challenged claims. For example, as noted by Petitioner (Pet. Reply 8), the Project Approval Form does not describe translucent components that use the glow from the connector as a measure of continuity. Accordingly, Exhibit 2007 by itself is not sufficient to corroborate conception because it fails to establish that the inventors had settled on *any* particular design to confirm continuity, let alone the claimed connector and methods of validating continuity.

And, even if we were to additionally consider Patent Owner’s evidence arising after October 6, 1999, this evidence does not substantiate conception before Takizawa’s priority date. For example, in the absence of

a specific link to earlier inventive activity, the fact that Patent Owner produced prototypes with translucent cams by October 18, 1999 (*see* Ex. 1024) does not corroborate conception before Takizawa. In addition, Patent Owner's own Project C333 document from December 1999 states that Patent Owner still had yet to "to make a decision on the material used for the UniCam cam molded part." Ex. 2011, 7. Such a statement casts doubt that the inventors had arrived at the complete invention even two months after October 6, 1999.

Furthermore, we agree with Petitioner (Pet. Reply 10–11) that Mr. Barnes's testimony regarding conception is unpersuasive. Rather than starting with his own recollection of the events surrounding conception and corroborating it with contemporaneous evidence, Mr. Barnes's testimony about the conception date is based on "reviewing . . . documents," meaning the documents cited by Patent Owner that are discussed above. Ex. 2002 ¶ 54. As such, we agree with Petitioner that Mr. Barnes's testimony on conception lacks "independent recollection of conception activity prior to the Takizawa reference" and amounts to "a *post hoc* (and incomplete) corroboration of various disjointed documents." Pet. Reply 11. Because the documents on which Mr. Barnes bases his testimony have the deficiencies mentioned above, we do not credit Mr. Barnes's testimony on conception.

Therefore, we determine that Patent Owner's evidence is insufficient to establish conception before October 6, 1999. Accordingly, we determine that Takizawa qualifies as prior art under 35 U.S.C. § 102(e) because Takizawa's national stage application date of October 6, 1999, is before the earliest possible effective filing date for the challenged claims of the '482 patent, which is March 22, 2000. *See* Ex. 1001, [64]; Ex. 1006, [86].

7. *Claim 15*

a. *Comparison of de Jong, CamLite, Takizawa, and Knecht to Claim 15*

In its obviousness analysis for claim 15, Petitioner cites de Jong for teaching a fiber optic connector with ferrule 10 that receives optical fiber 12. Pet. 35 (citing Ex. 1004, Abstract, 2:8–14, Figs. 1, 2). Petitioner maps the recited “field fiber” to de Jong’s optical fiber 30 and contends it is loaded through crimp tube 18 until it meets terminal end of fiber 12 (e.g., an “optical fiber stub”). *Id.* at 35–36 (citing Ex. 1003 ¶¶ 45–46; Ex. 1004, 2:15–65). Regarding “splice components . . . for aligning a field fiber to the optical fiber stub,” Petitioner cites de Jong’s and Knecht’s lid 10, frame 11, and rods 15–17 and 16–18 and contends these constitute splice components that align the field fiber to the optical fiber stub. *Id.* at 36 (citing Ex. 1003 ¶¶ 47–50; Ex. 1004, 2:15–65). For the recited sleeve, Petitioner contends “each of the housing 16 of de Jong and the tubular housing 25 of Knecht constitutes a sleeve in which splice components are disposed.” *Id.* at 37 (citing Ex. 1003 ¶ 51).

Regarding the recited cam mechanism, Petitioner contends de Jong’s locking member/slider 14 is a cam mechanism disposed about housing 16. *Id.* at 38 (citing Ex. 1003 ¶¶ 52–53; Ex. 1004, Abstract, 2:62–65, Figs. 2, 7). Petitioner also contends “leftward movement of the slider 14 (cam mechanism) relative to the housing 16 (sleeve) urges a tab 40 inward to cause the lid 10 and the frame 11, and thus the rods 15–18 therewithin (splice components), to be compressed relative to one another.” *Id.* (citing Ex. 1004, Figs. 2, 7). Petitioner further contends this compression operably interconnects and aligns fiber 30 and fiber 12. *Id.* at 38–39 (citing Ex. 1003 ¶ 54). Petitioner also contends that “CamLite discloses a connector having

at least one splice component and a cam mechanism that is identical or substantially identical to the slider 14 (cam mechanism) taught by de Jong.” *Id.* at 39 (citing Ex. 1003 ¶¶ 55–58); *see also* PO Resp. 2 (Patent Owner stating that CamLite is the commercial version of the connector described in de Jong).

Given that CamLite instructs an installer to look for a bright glow and/or laser light at the rear of the connector (*see* Ex. 1007, 6, 7), Petitioner contends that at least one of the splice components of the mechanical splice of CamLite’s connector must be transparent or translucent, rather than opaque. Pet. 41 (citing Ex. 1003 ¶¶ 60–61). Petitioner also relies on Takizawa for teaching a translucent cam mechanism and splice components. *Id.* at 43–44. In particular, Petitioner cites Takizawa for disclosing a “member for clamping the optical fiber in the connection mechanism is preferably made from a resin or glass or the like, having transparent or suitably translucent properties so that a connection condition of the fiber can be verified.” *Id.* (citing Ex. 1003 ¶ 71; Ex. 1006, 4:35–41). Petitioner further cites Takizawa’s teaching that such a mechanism allows “leakage light from the connection point of the pair of optical fibers to be observed by eye from outside of the connection mechanism.” *Id.* at 44 (citing Ex. 1003 ¶ 71; Ex. 1006, 4:35–55). In view of these teachings, Petitioner contends an ordinarily skilled artisan “would have been motivated to arrive at a connector having both a cam mechanism and also one or more splice components that are translucent to allow for ascertaining light leakage.” *Id.* (citing Ex. 1003 ¶ 71).

The only aspect of Petitioner’s analysis that Patent Owner disputes is related to the translucency of the cam mechanism. *See* Tr. 59:2–5.

Although Patent Owner acknowledges that CamLite and Takizawa teach translucency in the connector, Patent Owner contends that the translucency is not in relation to “**both** the cam mechanism and splice components,” as is recited in claim 15. PO Resp. 28–30. Patent Owner contends that only Takizawa’s component section 40, and not force-applying device 36 (which teaches a cam mechanism), is described as being translucent. *Id.* at 29 (citing Ex. 1006, 7:2–27, 8:20–48, Fig. 4A). Patent Owner argues that “Petitioner offers only conclusory assertions of its expert that it would have been obvious to create a translucent cam mechanism.” *Id.* at 30.

Patent Owner references Takizawa’s Figure 4A, which depicts optical fibers being held together using component section 40, around which force-applying device 36 (i.e., “C-shape spring 36”) applies clamping force. *Id.* at 29 (citing Ex. 1006, 7:2–27, 8:20–48, Fig. 4A). Patent Owner notes that force-applying device 36 has opening 48 through which a technician may see the internals of the connector. *Id.* at 30 (citing Ex. 1006, 8:40–42; Ex. 2004 ¶ 52; Ex. 2002 ¶ 48). Patent Owner argues that the use of opening 48 to see any glow emanating therewithin is a different technique than is recited in claim 15, so an ordinarily skilled artisan would have had “no reason or motivation to combine when Takizawa already provides the ability to visually inspect the glow.” *Id.* (citing Ex. 2004 ¶ 58).

We do not agree with Patent Owner’s arguments. Petitioner relies on de Jong and CamLite, and not Takizawa, for teaching the recited cam mechanism and splice components. *See* Pet. 36, 38–39 (citing Ex. 1003 ¶¶ 55–58; Ex. 1004, Abstract, 2:15–65, Figs. 2, 7). Petitioner further contends—and Patent Owner does not dispute—that at least CamLite’s splice components must be translucent. *Id.* at 41 (citing Ex. 1003 ¶¶ 60–61,

63); Tr. 59:2–5. In conjunction with these teachings, Petitioner cites Takizawa’s express teaching (*see* Pet. 43–44) that “the member (component section) for clamping the optical fiber in the connection mechanism is preferably made from a resin or glass or the like, having transparent or suitably translucent properties so that the accommodation condition and connection condition of the optical fiber can be verified.” Ex. 1006, 4:35–41. Although Patent Owner would have us read this statement only in the context of the specific embodiment of Takizawa’s Figure 4A (*see* PO Resp. 29–30), we agree with Petitioner (Pet. Reply 5–6) that holding Petitioner to Takizawa’s Figure 4A embodiment in the manner suggested by Patent Owner amounts to a bodily incorporation argument. “The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference.” *In re Keller*, 642 F.2d 413, 425 (CCPA 1981). “Rather, the test for obviousness is what the combined teachings of the references would have suggested to those having ordinary skill in the art.” *In re Mouttet*, 686 F.3d 1322, 1333 (Fed. Cir. 2012). In this case, we credit Dr. DeCusatis’s testimony that an ordinarily skilled artisan considering Takizawa would have had “a strong motivation to arrive at an optical connector having structural componentry that is translucent.” Ex. 1003 ¶ 71. Therefore, in light of Takizawa’s teaching on a translucent clamping member (*see* Ex. 1006, 4:35–41), we are persuaded that the combined teachings of de Jong, CamLite, and Takizawa would also teach a translucent cam mechanism.

Based on our analysis of Petitioner’s contentions and the cited art, we find that the combination of de Jong, CamLite, Takizawa, and Knecht teaches every limitation of claim 15.

b. *Rationale for Combining de Jong, CamLite, and Takizawa*

According to Petitioner, de Jong (including Knecht) and CamLite “arose under the auspices of the same company, Siecor Corporation.” Pet. 42 (citing Ex. 1004, [73]; Ex. 1007, 8). Petitioner also contends that CamLite and de Jong both concern identical optical connector technologies, namely, the Siecor CamLite connector. *Id.* at 42–43 (citing Ex. 1003 ¶¶ 66–68; Ex. 1007, 1). Thus, according to Petitioner, an ordinarily skilled artisan “would have been motivated to consider and combine CamLite and de Jong (including Knecht) by a desire to fully understand the connector technology available from Siecor and to better assess the installation tools that are useful for optical fiber connectorization.” *Id.* at 43 (citing Ex. 1003 ¶¶ 66–68). Petitioner further contends an ordinarily skilled artisan would have had a reasonable expectation that the features of CamLite and de Jong could be combined based on “the extremely close relationship between CamLite and de Jong.” *Id.*

Petitioner contends an ordinarily skilled artisan “would . . . have been motivated to modify the cam mechanism present in CamLite to be transparent or translucent” based on “a desire to visually detect the emanation of light or glow from the junction between the field fiber and fiber stub within the one or more splice components and cam mechanism of the connector, so as to better facilitate the viewing of such light or glow.” *Id.* at 41 (citing Ex. 1003 ¶ 62). As further motivation, Petitioner cites the possibility of viewing the light emanating from the junction between the field fiber and fiber stub from a variety of viewing directions via the use of a translucent cam mechanism. *Id.* at 42 (citing Ex. 1002 ¶¶ 63–64).

As further support for this modification, Petitioner cites Takizawa as “articulat[ing] therewithin a strong motivation to arrive at an optical connector having structural componentry that is translucent.” *Id.* at 43 (citing Ex. 1003 ¶ 71). Petitioner contends an ordinarily skilled artisan “would have been motivated to arrive at a connector having both a cam mechanism and also one or more splice components that are translucent to allow for ascertaining light leakage.” *Id.* at 44 (citing Ex. 1003 ¶ 71). Petitioner additionally contends the subject matter of Takizawa is closely related to that of CamLite and de Jong, so an ordinarily skilled artisan “would have had a reasonable expectation that the combination of Takizawa with de Jong and CamLite would be successful.” *Id.* (citing Ex. 1003 ¶ 70).

Patent Owner argues that “Takizawa already provides the ability to visually inspect the glow” via opening 48 in force-applying device 36. PO Resp. 30–31 (citing Ex. 1006, 8:40–9:6, Fig. 4A). As such, Patent Owner contends an ordinarily skilled artisan would have just used Takizawa’s existing mechanism in de Jong for evaluating fiber continuity. *Id.* (citing Ex. 2004 ¶ 58). According to Patent Owner, Petitioner has not established a reason why such an artisan would have “create[d] a connector with **both** a translucent cam mechanism and translucent splice components.” *Id.* at 31 (citing Ex. 2004 ¶ 58).

We do not agree with Patent Owner’s arguments, which would have us impose the structure of Takizawa’s force-applying device on the combination of references in this ground. But, as mentioned above, Petitioner relies on de Jong’s cam mechanism in the combination, not Takizawa’s force-applying device. See Pet. 38 (citing Ex. 1004, Abstract, 2:62–65, Figs. 2, 7). And, regardless of the type of force-applying

mechanism and method of observing light leakage employed in other portions of the reference, Takizawa nonetheless teaches making translucent “the member (component section) for clamping the optical fiber in the connection mechanism” to observe light leakage. Ex. 1006, 4:35–41. As our reviewing court has stated, “[a] reference must be considered for everything it *teaches* by way of technology and is not limited to the particular *invention* it is describing and attempting to protect.” *Belden Inc. v. Berk-Tek LLC*, 805 F.3d 1064, 1076 (Fed. Cir. 2015) (quoting *EWP Corp. v. Reliance Universal Inc.*, 755 F.2d 898, 907 (Fed. Cir. 1985)). Therefore, we decline to impose Takizawa’s particular force-applying device on the combination with de Jong and CamLite in the manner suggested by Patent Owner.

We also agree with Petitioner that, even when the splice components of a particular application might already be translucent, as in de Jong and CamLite, Takizawa provides motivation “to make the splice junction even more visible by adding additional translucent componentry.” Pet. Reply 5 (citing Ex. 1003 ¶¶ 64–65, 70–71). This is supported by Dr. DeCusatis’s testimony that

one having ordinary skill in the art particularly would have recognized that, by employing not only one or more translucent splice component(s) but also a translucent cam mechanism, it would be possible to view the light emanating from the junction between the optical field fiber and optical fiber stub from any of a variety of viewing directions rather than only one or another specific viewing directions and still attain a reasonably accurate assessment of the continuity at the junction.

Ex. 1003 ¶ 64. Mr. Pearson does not dispute the notion that additional translucent componentry would have been desirable, but rather shifts the discussion to applying Takizawa’s particular force-applying device. See

Ex. 2004 ¶¶ 56–58. But, as discussed above, this reframing of the issue belies what is taught elsewhere in Takizawa regarding a translucent component section for clamping. *See* Ex. 1006, 4:35–41. For this reason, we credit Dr. DeCusatis’s testimony over Mr. Pearson’s testimony on this issue. Thus, we are persuaded by Petitioner’s rationale that, in light of Takizawa, an ordinarily skilled artisan would have considered it beneficial to include additional translucent components in the clamping portion of a connector.

Accordingly, we are persuaded by Petitioner’s rationale for combining de Jong, CamLite, and Takizawa.

*c. Secondary Considerations of Nonobviousness*

Patent Owner does not present secondary considerations of nonobviousness related to the claims in this ground.

*d. Conclusion Regarding Claim 15*

As discussed above, Petitioner has established that the combination of de Jong, CamLite, Takizawa, and Knecht teaches all the limitations in claim 15. Petitioner has also provided a persuasive rationale for combining de Jong, CamLite, and Takizawa. Patent Owner presents no evidence of secondary considerations of nonobviousness for this ground. Thus, we determine, by a preponderance of the evidence, that the subject matter of claim 15 would have been obvious over the combination of de Jong, CamLite, and Takizawa under 35 U.S.C. § 103(a).

8. *Claim 16*

Claim 16 depends from claim 15 and recites that the sleeve defines a window through which the splice components are exposed, and the cam mechanism engages the splice components via the window defined by the sleeve. Petitioner contends de Jong's slot 41 is such a window exposing the splice components in housing 16, which Petitioner likens to the sleeve. Pet. 44–45 (citing Ex. 1003 ¶ 73; Ex. 1004, 2:15–65, Fig. 2). Petitioner further contends de Jong's "slider 14 (cam mechanism) engag[es] the tab 40 portion of those splice components by virtue of the tab 40 extending outward to the slider via the window formed by the slot 41." *Id.* at 45 (citing Ex. 1003 ¶ 73). Patent Owner does not dispute Petitioner's analysis of the additional limitations in claim 16. See Tr. 59:2–5. We are persuaded that the combination of de Jong, CamLite, and Takizawa teaches the additional limitations in claim 16.

Petitioner's rationale for combining de Jong, CamLite, and Takizawa is the same as that of claim 15. Patent Owner relies on the same arguments against Petitioner's use of Takizawa that we discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 16 would have been obvious over the combination of de Jong, CamLite, and Takizawa under 35 U.S.C. § 103(a).

9. *Claim 64*

Claim 64 depends from claim 15 and recites that both splice components are translucent. Petitioner relies on the same analysis based on CamLite and Takizawa from claim 15 for teaching that at least one splice component is translucent. Pet. 45 (citing Ex. 1003 ¶¶ 92–93). In light of

this teaching, Petitioner contends it would have been obvious for an ordinarily skilled artisan to arrive at a connector with two translucent splice components because this modification would have “allow[ed] for enhanced viewing of the light/glow emanating from the junction between two spliced fibers . . . from numerous viewing angles.” *Id.* at 46 (citing Ex. 1003 ¶¶ 94–96). Petitioner asserts that using the same translucent material for both would be desirable as potentially being less expensive to manufacture. *Id.* at 46 (citing Ex. 1003 ¶ 97). Patent Owner does not dispute Petitioner’s analysis of the additional limitation in claim 64. *See* Tr. 59:2–5. We are persuaded that the combination of de Jong, CamLite, and Takizawa teaches the additional limitation in claim 64.

Petitioner’s rationale for combining de Jong, CamLite, and Takizawa is the same as that of claim 15. Patent Owner relies on the same arguments against Petitioner’s use of Takizawa that we discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 64 would have been obvious over the combination of de Jong, CamLite, and Takizawa under 35 U.S.C. § 103(a).

*10. Claim 65*

Claim 65 depends from claim 15 and recites that the sleeve is a ferrule holder. Petitioner contends de Jong teaches ferrule 10 as being fitted into housing 16 (i.e., the sleeve), and that housing 16 supports ferrule 10. Pet. 46 (citing Ex. 1003 ¶ 98; Ex. 1004, 2:8–14, 2:31–33, Fig. 2). Patent Owner does not dispute Petitioner’s analysis of the additional limitation in claim 65. *See* Tr. 59:2–5. We are persuaded that the combination of de Jong, CamLite, and Takizawa teaches the additional limitation in claim 65.

Petitioner's rationale for combining de Jong, CamLite, and Takizawa is the same as that of claim 15. Patent Owner relies on the same arguments against Petitioner's use of Takizawa that we discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 65 would have been obvious over the combination of de Jong, CamSplice, and Takizawa under 35 U.S.C. § 103(a).

*11. Claim 66*

Claim 66 depends from claim 15 and recites that the recited optical fiber connector further includes a spring. Petitioner cites de Jong's coil spring 17 that is placed over housing 16. Pet. 47 (citing Ex. 1003 ¶ 99; Ex. 1004, 2:43–44, Fig. 7). Patent Owner does not dispute Petitioner's analysis of the additional limitation in claim 66. *See* Tr. 59:2–5. We are persuaded that the combination of de Jong, CamLite, and Takizawa teaches the additional limitation in claim 66.

Petitioner's rationale for combining de Jong, CamLite, and Takizawa is the same as that of claim 15. Patent Owner relies on the same arguments against Petitioner's use of Takizawa that we discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 66 would have been obvious over the combination of de Jong, CamLite, and Takizawa under 35 U.S.C. § 103(a).

*12. Claim 67*

Claim 67 depends from claim 15 and recites that the recited optical fiber connector further includes a crimp band. Petitioner cites crimp ring 32 in de Jong's connector assembly. Pet. 47 (citing Ex. 1003 ¶ 100; Ex. 1004,

2:52–53, Fig. 7). Patent Owner does not dispute Petitioner’s analysis of the additional limitation in claim 67. *See* Tr. 59:2–5. We are persuaded that the combination of de Jong, CamLite, and Takizawa teaches the additional limitation in claim 67.

Petitioner’s rationale for combining de Jong, CamLite, and Takizawa is the same as that of claim 15. Patent Owner relies on the same arguments against Petitioner’s use of Takizawa that we discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 67 would have been obvious over the combination of de Jong, CamLite, and Takizawa under 35 U.S.C. § 103(a).

*13. Claim 68*

Claim 68 depends from claim 15 and recites that the recited optical fiber connector further includes a boot. Petitioner cites boot 26 in de Jong’s connector assembly. Pet. 47 (citing Ex. 1003 ¶ 101; Ex. 1004, 2:52–53, Fig. 7). Patent Owner does not dispute Petitioner’s analysis of the additional limitation in claim 68. *See* Tr. 59:2–5. We are persuaded that the combination of de Jong, CamLite, and Takizawa teaches the additional limitation in claim 68.

Petitioner’s rationale for combining de Jong, CamLite, and Takizawa is the same as that of claim 15. Patent Owner relies on the same arguments against Petitioner’s use of Takizawa that we discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 68 would have been obvious over the combination of de Jong, CamLite, and Takizawa under 35 U.S.C. § 103(a).

*B. Obviousness Ground Based on de Jong, CamLite, Takizawa, Dean, and CamSplice*

Petitioner contends that claim 63 would have been obvious over de Jong, CamLite, Takizawa, Dean, and CamSplice. Pet. 32–33, 47–51. Petitioner additionally relies on Knecht as being incorporated by reference into de Jong and Dean. *Id.* at 49.

*1. Dean*

Dean is a patent directed to connectors for two optical fibers. Ex. 1009, 1:5–6. Figure 3 of Dean is reproduced below.

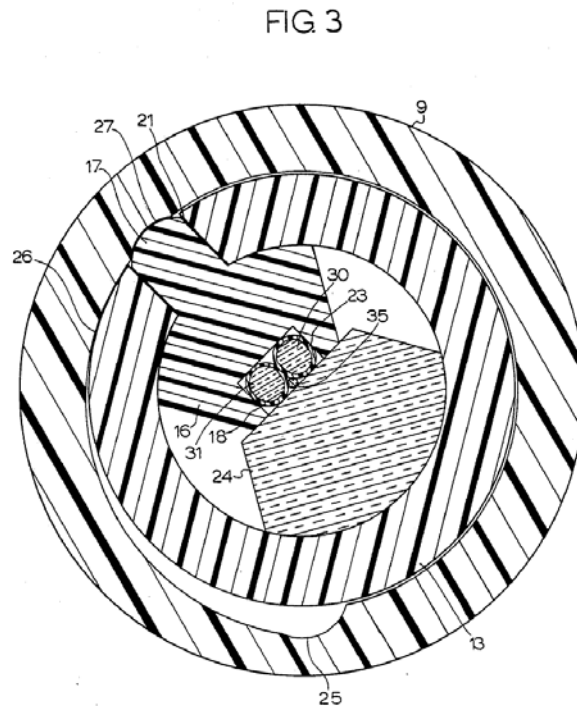


Figure 3 depicts a cross-sectional view of the connector disclosed in Dean. *Id.* at 2:32–33. Locking ring 9 is placed around indentation/rib 17 of bottom member 16 provided in housing 13. *Id.* at 3:5–7. Bottom member 16 also has a slot opposite rib 17 for carrying glass rods 30, 31. *Id.* at 2:54–55.

Rotation of locking ring 9 from first inner diameter 25 to second inner diameter area 26 provides inward radial compression to rib 17 and bottom member 16, centering optical fiber 35. *Id.* at 3:17–20. The connector has a stable closed position when locking ring 9 is turned so that third inner diameter area 27 is adjacent rib 17. *Id.* at 3:20–23. The connector may be reopened by deliberately applying rotational torque to the locking ring. *Id.* at 1:45–49.

Petitioner contends Dean qualifies as prior art under 35 U.S.C. § 102(b) based on its issue date of May 8, 1990. Pet. 20. We agree. Dean's issue date of May 8, 1990, is more than one year before the earliest possible effective filing date for the challenged claims of the '482 patent, which is March 22, 2000. See Ex. 1001, [64]; Ex. 1009, [45].

## 2. *CamSplice*

The CamSplice reference is an assembly manual from Siecor Corporation that “outlines the use of the Siecor CamSplice and TKT-100 Tool Kits for splicing single or multi-mode optical fibers.” Ex. 1008, 1. “The Siecor CamSplice is a mechanical splice which accepts either 250 or [sic] 900  $\mu\text{m}$  fibers.” *Id.* Figure 1 of the CamSplice reference is reproduced below.

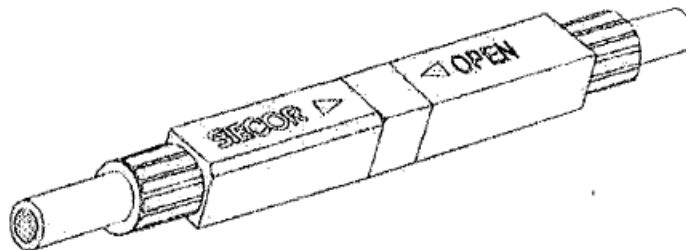


Figure 1

Figure 1 depicts a Siecor CamSplice mechanical splice.

To assemble the CamSplice with a tool, two fibers are slid into the CamSplice; the second fiber is slid “into the CamSplice until it butts against the first fiber.” *Id.* at 3. To actuate the CamSplice, the levers of a tool are rotated down to a horizontal position. *Id.* at 4. If testing of the splice indicates an unacceptable loss of power, the splice may be “tune[d].” *Id.* To tune the splice, the levers are rotated back to a “vertical position to open the splice.” *Id.* Then, the left fiber is tightened into the CamSplice by rotating the left lever by 45°. *Id.* The right fiber is slightly rotated and then rebuted against the left fiber. *Id.* Tuning is repeated until an acceptable loss is achieved and both levers are rotated down fully “to actuate the splice.” *Id.* If this does not result in an acceptable loss, a cleaning procedure can also be performed. *Id.*

Petitioner contends CamSplice “is a printed publication dated July 1994” with “a copyright notice dated 1994,” so “CamSplice . . . constitutes prior art to the ’482 Patent under at least 35 U.S.C. [§] 102(b).” Pet. 17 (citing Ex. 1008, 1, 6). Similar to its showing for the CamLite reference, Petitioner presents testimonial evidence from Alan J. McFarland regarding CamSplice being a “Siecor Recommended Procedure[]” that was widely disseminated upon publication and included with each unit of the product sold. *See id.* at 14–15 n.1 (citing Ex. 1013 ¶¶ 9–10), 17 n.2 (citing Ex. 1013 ¶¶ 12–13). Patent Owner does not dispute the prior art status of CamSplice.

Based on Petitioner’s evidence, we determine that CamSplice qualifies as prior art under 35 U.S.C. § 102(b). Petitioner’s evidence establishes that CamSplice was publicly disseminated more than one year before the earliest possible effective filing date for the challenged claims of the ’482 patent, which is March 22, 2000. *See* Ex. 1001, [64].

3. *Claim 63*

a. *Comparison of de Jong, CamLite, Takizawa, Dean, and CamSplice to Claim 63*

Claim 63 depends from claim 15 and recites “the cam mechanism is reversible for releasing the splice components.” Petitioner’s obviousness analysis builds upon its analysis for claim 15 from the de Jong–CamLite–Takizawa ground. Petitioner cites Dean’s “connector in which each of locking rings 9, 10 has a cam shaped inner surface such that rotation of the locking rings 9, 10 relative to the ribs 17 radially compresses the ribs 17, thereby centering optical fibers held within the connector.” Pet. 47 (citing Ex. 1009, 1:31–35). Petitioner also cites Dean’s teaching that the connector has a “stable closed position” that “is not likely to be disturbed unless rotational torque is deliberately applied to the locking rings to reopen the connector.” *Id.* at 48 (citing Ex. 1009, 1:35–39). Petitioner additionally cites CamSplice for teaching that the levers of an assembly tool are rotated down to actuate the splice and can be rotated back to their vertical position to open the splice. *Id.* at 49 (citing Ex. 1008, 4). Petitioner explains that, in CamSplice, “rotation of multiple cams [is] by way of multiple levers, and at least one splice component is present in relation to each of the cams.” *Id.* at 50 (citing Ex. 1008, 1, 4).

Patent Owner does not dispute Petitioner’s analysis of the additional limitation in claim 63. *See* Tr. 59:2–5. We are persuaded that the combination of de Jong, CamLite, Takizawa, Dean, and CamSplice teaches the additional limitation in claim 63.

b. *Rationale for Combining de Jong, CamLite, Takizawa, Dean, and CamSplice*

Petitioner’s reasons for combining Dean with de Jong and CamLite are similar to those for the de Jong–CamLite–Takizawa ground, namely, the references arose from the same entity (Siecor Corporation) and they relate to an evolution of similar technology. *Id.* at 49 (citing Ex. 1003 ¶¶ 79–80). Petitioner further notes that Dean and de Jong both incorporate Knecht by reference and disclose cam-actuated optical technologies. *Id.* (citing Ex. 1003 ¶ 81). Regarding the addition of CamSplice to the combination, Petitioner notes that Dean and CamSplice both disclose “a rotationally-actuable cam mechanism that can be operated in a reversible manner so as to release splice components.” *Id.* at 50 (citing Ex. 1003 ¶ 84). Petitioner argues “Dean’s disclosure of how to ‘reopen’ a cam mechanism provides a motivation to arrive at a rotationally-actuable cam mechanism that is reversible, as is disclosed in CamSplice.” *Id.* (citing Ex. 1003 ¶¶ 90–91). Petitioner relies on the same arguments made above for adding Takizawa to the combination. *See id.* at 42–43.

Petitioner also contends an ordinarily skilled artisan would have recognized the problem of cam mechanisms creating fiber junctions that are lossy or ineffective. *Id.* at 50–51 (citing Ex. 1003 ¶¶ 86). According to Petitioner, a technician needed to cut off the end of an optical fiber, discard the connector, and repeat the fiber connectorization process, which is wasteful in terms of time and fiber. *Id.* at 51 (citing Ex. 1003 ¶ 86; Ex. 1007, 7). Petitioner contends an ordinarily skilled artisan faced with this problem would have been motivated to apply one of the limited number of solutions, namely, the use of a reversible, rotationally-actuable cam

mechanism as described in CamSplice. *Id.* (citing Ex. 1003 ¶¶ 87–89); Pet. Reply 17 (citing Ex. 1008, 1, 4; Ex. 1003 ¶¶ 82–83).

Patent Owner contends Petitioner has not put forth a sufficient rationale for combining CamSplice and CamLite. PO Resp. 12–21. In particular, Patent Owner contends that certain commonalities between these references do not constitute a reason to combine them. *Id.* at 12–17. Patent Owner also argues that CamLite’s teaching of cutting off a connector in cases of poor coupling would not have motivated an ordinarily skilled artisan to combine CamSplice with CamLite. *Id.* at 17–18. According to Patent Owner, Petitioner’s purported motivation to reach CamLite is merely “a retelling of the ’482 patent’s description of its invention” that is made with hindsight. *Id.* at 17 (citing Ex. 1001, 3:42–48, 4:44–51). Patent Owner also argues that Petitioner provides no evidence to support its contention that CamSplice provides a “ready solution” to CamLite’s deficiencies. *Id.* at 18.

Although we agree with Patent Owner that commonalities alone are not sufficient to support Petitioner’s obviousness rationale, *see Securus Techs., Inc. v. Glob. Tel\*Link Corp.*, 701 F. App’x 971, 977 (Fed. Cir. 2017), Petitioner provides a persuasive reason why an ordinarily skilled artisan would have combined CamSplice with CamLite: CamSplice’s reversible, rotationally-actuatable cam would have allowed the artisan to avoid the inefficiencies associated with linearly-actuated cam mechanisms of cutting off the end of an optical fiber, discarding a connector, and restarting the connectorization process when a junction is too lossy. *See* Pet. 49–51 (citing, *inter alia*, Ex. 1003 ¶¶ 82–83, 88–89). In particular, CamSplice describes a “[t]uning” process to “[o]ptimize the splice” when “the splice loss is NOT acceptable” based on optical power meter or optical

time domain reflectometer (OTDR) testing. Ex. 1008, 2, 4. Importantly, Patent Owner does not dispute that CamSplice teaches this functionality. See Tr. 17:15–22.

Certain other evidence in the record also supports the combination. For example, de Jong states that “[i]n the field, the steps to complete connectorization are similar to those for installing a mechanical splice.” Ex. 1004, 1:34–36 (cited at Pet. Reply 16 n.7). Considering that CamLite is the commercial embodiment of the de Jong patent (see PO Resp. 2), this statement from de Jong corroborates that an ordinarily skilled artisan would have associated prior art for mechanical splices, like CamSplice and Dean, with prior art from fiber optic connectors, like CamLite. In addition, the commonalities between CamLite and CamSplice mentioned by Petitioner (e.g., arising from the same entity, being directed to same general problem, having common features, see Pet. 49, 73–74) give additional support to Petitioner’s obviousness rationale.<sup>7</sup>

Patent Owner argues that Petitioner’s description of the problem to be solved is merely a “retelling of the ’482 patent’s description of its invention”

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<sup>7</sup> These purported commonalities are discussed in more detail with respect to the de Jong–CamLite–CamSplice ground. See *infra* § II.C.1.b. Even though Patent Owner disputes certain facts undergirding these purported commonalities (PO Resp. 12–17), the evidence supports the commonalities mentioned by Petitioner. For example, Patent Owner argues Petitioner defines the general problem addressed by the references too broadly. *Id.* at 14–15. Yet even if we were to apply Patent Owner’s conception of the problem (see Tr. 23:6–24), Petitioner’s point would still apply. Moreover, Patent Owner acknowledges that neither CamLite nor CamSplice required epoxy and polishing in the field. See PO Resp. 16–17. Finally, even though CamLite may only accommodate one (and not two) 900  $\mu\text{m}$  fiber, it nonetheless supports this type of fiber. See Ex. 1007, 5.

made with hindsight. PO Resp. 17. Yet CamLite itself teaches a visual fault locator test after crimping that may result in cutting off the connector.

Ex. 1007, 7. In particular, the installer is advised to “[c]ut off the connector” and begin the connectorization process again when the visual fault test results in a bright glow at the rear of the connector housing, which is indicative of “high attenuation.” *Id.* Considering that an ordinarily skilled artisan at the time of the ’482 patent would have had 2 years of experience with fiber optic equipment (*see supra* § II.A.2), we are satisfied that such an artisan would have recognized this circumstance to be inefficient. The testimony of both Dr. DeCusatis and Mr. Barnes supports this notion. *See* Ex. 1003 ¶¶ 12, 86; Ex. 1023, 70:10–72:7. Accordingly, we do not agree with Patent Owner’s argument regarding impermissible hindsight.

Patent Owner also argues that “CamSplice and CamLite are substantially different in both design and purpose,” emphasizing CamSplice’s lack of a ferrule and connector and CamSplices’s use of a different type of testing method from that of CamLite. PO Resp. 18–21. Regarding the ferrule and connector, we agree with Petitioner (Pet. Reply 18–19) that this amounts to a bodily incorporation argument. *See Keller*, 642 F.2d at 425. In this case, Petitioner cites primarily to CamLite for the glow being indicative of a discontinuity. *See* Pet. 39–41. In addition, Petitioner’s obviousness combination relies on de Jong for teaching the connector and ferrule. *See id.* at 35. Consistent with *Keller*, we are satisfied the combined teachings of the references posited by Petitioner would have suggested the invention of claim 63 to an ordinarily skilled artisan. *See Keller*, 642 F.2d at 425.

Regarding differences in test methods, Patent Owner's declarants testified that the test method of CamSplice, OTDR, can likewise be applied to connectors, like that of CamLite. Pet. Reply 18–19 (citing Ex. 1021, 58:11–19, 59:8–10; Ex. 1022, 93:16–94:15). As such, we do not agree that the differences between CamLite's visual fault locator test and CamSplice's OTDR would undermine Petitioner's obviousness combination in the manner suggested by Patent Owner.

We have discussed Patent Owner's arguments against adding Takizawa to the combination above. On the entire trial record, we are persuaded by Petitioner's reasons for combining de Jong, CamLite, Takizawa, Dean, and CamSplice.

*c. Secondary Considerations of Nonobviousness*

Patent Owner makes certain allegations regarding secondary considerations of nonobviousness. For objective evidence of secondary considerations to be accorded substantial weight, its proponents must establish a nexus between the evidence and the merits of the claimed invention. *Merck & Cie v. Gnosis S.P.A.*, 808 F.3d 829, 837 (Fed. Cir. 2015).

Patent Owner asserts there was a long-felt need in the field to improve mechanical splice connectors like CamLite. PO Resp. 22–23 (citing Ex. 2004 ¶ 62). In support of this assertion, Patent Owner cites testimony from Petitioner's declarant, Dr. DeCusatis, stating “a ***long-standing specific problem*** in the field of optical fiber in the context of cam-actuated optical connector technologies is how to efficiently attain the effective coupling of optical fibers.” *Id.* at 23 (quoting Ex. 1003 ¶ 12) (emphasis added by Patent

Owner). In light of this testimony, Patent Owner contends Dr. DeCusatis “suggest[s] that the approach of the ’482 patent’s claims is what ultimately met this ‘long-standing specific problem’ in the industry.” *Id.*

Petitioner focuses its analysis on visual fault locator (VFL) capabilities and contends Patent Owner “has failed to establish that VFL was important” and “provides no survey data or metrics establishing a long-felt need for VFL functionality.” Pet. Reply 20. Petitioner also argues that installers do not need to use VFL to check installation, which makes VFL optional. *Id.* at 20–21 (citing Ex. 1021, 59:17–24; Ex. 1023, 95:22–96). Thus, according to Petitioner, “while VFL may be helpful in assessing continuity by inexperienced installers, it does not satisfy any long-felt need.” *Id.* Based on deposition testimony from Dr. DeCusatis, Petitioner also argues that ordinarily skilled artisans “are always going to strive for a way to make a better mechanical splice, but will likely never get there because there will always be loss.” *Id.* at 21 (citing Ex. 2005, 15:21–16:6, 54:19–55:12).

According to Patent Owner, the purported long-felt need is the very broad notion of efficiently coupling optical fibers. *See* PO Resp. 23. Yet Petitioner points to testimony showing that VFL capabilities, which are required by the challenged claims, are an optional way to check connections and, therefore, are not necessary to couple optical fibers efficiently. *See* Pet. Reply 20–21 (citing Ex. 1021, 59:17–24; Ex. 1023, 95:22–96). This undercuts the notion that the claimed invention meets a long-felt need. We also credit Dr. DeCusatis’s testimony that improving the efficiency of coupling of optical fiber connections is a long-standing issue for which “there’s room for improvement.” Ex. 2005, 54:19–55:12. Thus, even if we were to accept Patent Owner’s definition of the long-felt need, the

incremental improvement of the claimed invention did not fully meet that need. *See id.* As such, we accord Patent Owner’s evidence of long-felt need little weight.

Patent Owner also argues that the failure of its own joint venture, Siecor, and of its competitors to improve upon the CamLite connector is evidence of nonobviousness. PO Resp. 24–25. Patent Owner cites Mr. Barnes’s testimony that VFL checks were “thought to do more harm than good” when applied to CamLite “because light would still be visible even in a good connection, which led to users damaging the fibers and splice components attempting to ‘optimize’ the connection.” *Id.* at 24–25 (citing Ex. 2002 ¶ 33). Thus, Patent Owner states that “the VFL check was ultimately scrapped when Siecor replaced the product line with the first-generation UniCam connectors.” *Id.* at 25 (citing Ex. 2002 ¶ 35).

Even if we were to credit evidence of failure from Patent Owner’s own joint venture, Siecor, to include VFL in CamLite’s replacement as indicative of nonobviousness,<sup>8</sup> Patent Owner’s evidence does not prove that Siecor failed to make the claimed invention. Instead, Patent Owner merely supports its contention with “institutional knowledge at Siecor/Corning” that VFL in CamLite “would often do more harm than good.” Ex. 2002 ¶ 33. Patent Owner does not explain how a decision not to add VFL based on institutional knowledge is evidence that attempts to add VFL had failed. And, even if we were to believe that Siecor’s institutional knowledge

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<sup>8</sup> We agree with Petitioner that Patent Owner’s approach is unorthodox. *See* Pet. Reply 23. We need not determine whether Patent Owner’s approach is apt for “failure of others” analysis because we do not find Patent Owner’s evidence persuasive.

somehow would have discouraged an ordinarily skilled artisan from reaching the claimed invention, Patent Owner's present-day product embodying the invention of the '482 patent is susceptible to the same type of installer-discretion problems as CamLite. *See* Ex. 1023, 83:22–84:17. In this sense, the “failure” referenced by Patent Owner still exists today and was not solved by the claimed invention. Thus, we do not credit Siecor's “institutional knowledge” and its attendant decision to exclude VFL from UniCam as demonstrating a “failure of others.”

Patent Owner also contends the invention of the '482 patent “was praised by the industry and commercially successful.” PO Resp. 25. As evidence of such praise, Patent Owner cites a customer's positive comment about using a prototype. *Id.* (citing Ex. 2002 ¶¶ 57–58; Ex. 2012, 4). Patent Owner also cites positive statements in Petitioner's marketing materials about Petitioner's OptiCam product. *Id.* (citing Ex. 2002 ¶¶ 67–75; Ex. 2017). Nevertheless, the only alleged links between this evidence and the claims of the '482 patent are Patent Owner's unsupported assertions that the referenced prototype and the OptiCam product use the '482 patent's approach. *Id.* In the absence of any evidence and analysis establishing that the prototype and the OptiCam product fall within the claimed subject matter of the '482 patent, we accord little weight to Patent Owner's evidence of praise.

Patent Owner's only statement regarding commercial success is the following: “[A]s explained by Sean Kelly, Corning's Vice President of Product Line Management in Optical Solutions, the next-generation UniCam continuity test tool arising from the '482 patent has been a commercially successful product line for Corning since its release.” PO Resp. 25 (citing

Ex. 2003 ¶¶ 3–7; Ex. 2013). Petitioner then cites testimony from Messrs. Barnes and Pearson for the proposition that “[t]his tool has the same design and operation as the tool illustrated in Figure 3 of the ’482 patent.” *Id.* at 25 (citing Ex. 2001 ¶¶ 62–66; Ex. 2004 ¶ 65). Petitioner argues Patent Owner has not presented any market share analysis and has failed to establish a nexus between the purported commercial success and the claimed invention. Pet. Reply 22–23.

At oral argument, Patent Owner’s counsel acknowledged that Patent Owner’s data supporting its commercial success assertions are contained in its exhibits and not discussed in its brief. Tr. 34:22–36:12. The data, including raw sales data and a “voice-of-customer report” in Exhibit 2013, are neither analyzed nor even mentioned in Patent Owner’s Response. Instead, Patent Owner relies on a one-sentence conclusory statement ascribed to Mr. Kelly that the UniCam continuity test tool is commercially successful. *See* PO Resp. 25. To the extent Patent Owner relies on the data in Exhibit 2013, which is incorporated via Mr. Kelly’s declaration, this amounts to improper incorporation by reference in violation of 37 C.F.R. § 42.6(a)(3). We decline to root through Patent Owner’s exhibits in an attempt to synthesize data necessary to substantiate commercial success with a nexus to the claimed invention. Accordingly, we agree with Petitioner (Pet. Reply 23) that Patent Owner’s evidence “is deficient on its face” and accord it little weight.

*d. Conclusion Regarding Claim 63*

As discussed above, Petitioner has established that the combination of de Jong, CamLite, Takizawa, Dean, and CamSplice teaches all the

limitations in claim 63. Petitioner has also provided a persuasive rationale for combining de Jong, CamLite, Takizawa, Dean, and CamSplice. We additionally considered Patent Owner's evidence of secondary considerations above, and we accord it little or no weight. Thus, we determine, by a preponderance of the evidence, that the subject matter of claim 63 would have been obvious over the combination de Jong, CamLite, Takizawa, Dean, and CamSplice under 35 U.S.C. § 103(a).

*C. Obviousness Ground Based on CamSplice, CamLite, and de Jong*

Petitioner contends that claims 18, 20–24, and 49 would have been obvious over CamSplice, CamLite, and de Jong. Pet. 52–81. Petitioner additionally relies on Knecht as being incorporated by reference into de Jong. *Id.* at 52.

*1. Claim 18*

*a. Comparison of CamSplice, CamLite, and de Jong to Claim 18*

In its obviousness analysis for claim 18, Petitioner relies on CamLite for teaching a connector assembly process using a laser that gives the installer visual feedback when the fibers are successfully butted in the connector. Pet. 52, 64 (both citing Ex. 1007, 1). Petitioner further relies on de Jong's connector having ferrule 10 for teaching the same components in the “providing” step of claim 18. *Id.* at 53, 65 (citing Ex. 1004, 2:8–65, Fig. 2). Citing testimony from Dr. DeCusatis, Petitioner contends de Jong's “fiber 12 constitutes an optical fiber stub, and the region within the ferrule 10 into which that fiber is received constitutes a bore within which the fiber stub is at least partially disposed.” *Id.* at 65 (citing Ex. 1003 ¶ 105).

Petitioner further maps an end portion of de Jong's fiber 12 extending past a rear face of ferrule 10 to the same recitation in claim 18. *Id.* (citing Ex. 1003 ¶ 105; Ex. 1004, 2:8–14, Fig. 2). Regarding the “at least one splice component,” Petitioner contends Knecht's lid 10, frame 11, and rods 15–17 and 16–18 constitute splice components. *Id.* at 66 (citing Ex. 1003 ¶¶ 106–107; Ex. 1004, 2:15–65).

For the “securing an end portion” limitation, Petitioner cites CamLite for teaching “a connector with a mechanical splice and a fiber stub, and installation of a field fiber that includes inserting the field fiber into the connector so that the field fiber contacts an end of the fiber stub inside the connector.” *Id.* at 53–54, 66 (citing Ex. 1007, 1, 6–7; Ex. 1003 ¶¶ 108–109). In particular, Petitioner contends that CamLite's teachings on actuating the splice are commensurate with the “securing” limitation. *Id.* at 66–67 (citing Ex. 1003 ¶ 109; Ex. 1007, 6–7). Petitioner also contends de Jong teaches this limitation because its slider 14 secures end portions of fibers relative to one another. *Id.* at 53–54 (citing Ex. 1004, Abstract, 2:62–65, Figs. 2, 7), 67 (citing Ex. 1003 ¶¶ 110–113).

Regarding “evaluating the continuity,” Petitioner contends “CamLite discloses laser light being visible at the rear of the connector when the field fiber is fully inserted and contacts the optical fiber stub inside the connector.” *Id.* at 54 (citing Ex. 1007, 1, 6, 7), 67–68 (citing Ex. 1003 ¶ 115; Ex. 1007, 6, 7). Petitioner contends that, in CamLite's “continuity testing process,” the installer observes the intensity of laser light that is visible at the rear of the connector; very little visible light indicates correct installation, whereas a bright glow indicates that the fibers are not touching inside the connector. *Id.* at 67–68 (citing Ex. 1007, 7).

For the “repositioning and re-securing” limitation, Petitioner relies on CamSplice for teaching an optimization process known as “tuning.” *Id.* at 54–55 (citing Ex. 1008, 4, Figs. 7, 8), 70 (citing Ex. 1008, 1, 4, Fig. 8). According to Petitioner, tuning involves opening the splice, “rotating a left lever to tighten a left fiber, pulling back on a right fiber, slightly rotating it, [and] rebutting it against the left fiber.” *Id.* at 70 (citing Ex. 1008, 4, Fig. 8). Thereafter, according to Petitioner, both levers are rotated fully down to actuate the splice. *Id.* Regarding the “re-evaluating the continuity” limitation, Petitioner cites CamSplice for teaching the checking of splice loss after repositioning and re-securing. *Id.* at 56 (citing Ex. 1008, 4), 71 (citing Ex. 1003 ¶ 126; Ex. 1008, 4).

Patent Owner does not dispute that the art cited by Petitioner teaches the limitations of claim 18. Tr. 17:15–22. Based on our analysis of Petitioner’s contentions and the cited art, we find that the combination of CamSplice, CamLite, de Jong, and Knecht teaches every limitation of claim 18.

*b. Rationale for Combining CamLite, CamSplice, and de Jong*

Petitioner’s reasons for combining CamLite, CamSplice, and de Jong are similar to the reasons discussed above for the de Jong–CamLite–Takizawa–Dean–CamSplice ground. According to Petitioner, de Jong (including Knecht), CamLite, and CamSplice “all ar[o]se under the auspices of Siecor Corporation,” so an ordinarily skilled artisan “would have been motivated to combine the subject matter of these references to achieve enhanced optical connector technologies.” *Id.* at 72–73 (citing Ex. 1003 ¶¶ 128–129, 141). Petitioner also contends that CamSplice, CamLite, and

de Jong concern closely related optical connector technologies and that an ordinarily skilled artisan would have been familiar with the evolution of Siecor's technology. *Id.* at 73 (citing Ex. 1003 ¶¶ 129, 131, 142). Thus, according to Petitioner, an ordinarily skilled artisan "would have been motivated to fully understand the connector technology available from Siecor." *Id.* Petitioner further contends an ordinarily skilled artisan would have had a reasonable expectation that the features of CamLite and de Jong could be combined based on "the extremely close relationship between CamLite and de Jong." *Id.* at 69–70.

Petitioner also notes that all three references "are very closely related" and "address[] mechanisms and processes that facilitate alignment and coupling of optical fibers." *Id.* at 73 (citing Ex. 1003 ¶¶ 129). Petitioner further contends the three references "concern optical connector technologies that are suited for use by a field technician," so they are "all directed toward solving the same general long-standing problem." *Id.* at 73–74 (citing Ex. 1003 ¶ 130). Petitioner additionally notes similarities in the specific features of the references. *Id.* at 74 (citing Ex. 1003 ¶¶ 131, 132) (noting commonalities with 900  $\mu\text{m}$  fibers, no need to polish fibers, and epoxy-free technologies).

Petitioner also contends an ordinarily skilled artisan would have recognized the problem of cam mechanisms creating fiber junctions that are too lossy. *Id.* at 74 (citing Ex. 1003 ¶¶ 133, 146). According to Petitioner, known processes for fixing this problem required a technician to cut off the end of an optical fiber, discard the connector, and restart the connectorization process, which is inefficient. *Id.* (citing Ex. 1003 ¶ 133; Ex. 1007, 7). Petitioner contends an ordinarily skilled artisan faced with this

problem would have been motivated to apply one of the finite number of solutions, namely, the use of a reversible, rotationally-actuatable cam mechanism as described in CamSplice. *Id.* at 74–75 (citing Ex. 1003 ¶¶ 135, 147–149); Pet. Reply 17 (citing Ex. 1008, 1, 4; Ex. 1003 ¶¶ 82–83).

Patent Owner relies on the same arguments against Petitioner’s reasons for the combination that we have discussed above. *See supra* § II.B.3.b. On the entire trial record, we are persuaded by Petitioner’s reasons for combining CamSplice, CamLite, and de Jong.

*c. Secondary Considerations of Nonobviousness*

Patent Owner relies on the same evidence of secondary considerations of nonobviousness that we have discussed above. *See supra* § II.B.3.c.

*d. Conclusion Regarding Claim 18*

As discussed above, Petitioner has established that the combination of CamSplice, CamLite, de Jong, and Knecht teaches all the limitations in claim 18. Petitioner has also provided a persuasive rationale for combining CamSplice, CamLite, and de Jong. We additionally considered Patent Owner’s evidence of secondary considerations above, and we accord it little or no weight. Thus, we determine, by a preponderance of the evidence, that the subject matter of claim 18 would have been obvious over the combination of CamSplice, CamLite, and de Jong under 35 U.S.C. § 103(a).

*2. Claim 20*

Claim 20 depends from claim 18 and recites that the fiber optic connector in the preamble of claim 18 further comprises a cam mechanism.

Claim 20 also recites that the “securing” step further comprises actuating the cam mechanism. For the cam mechanism, Petitioner cites de Jong’s slider 14. Pet. 58–59 (citing Ex. 1004, Abstract, 2:62–65, Figs. 2, 7), 75 (citing Ex. 1003 ¶ 164). Petitioner further contends that actuating slider 14 secures end portions of de Jong’s fiber 30 and fiber 12. *Id.* at 75 (citing Ex. 1003 ¶ 164). Patent Owner does not dispute Petitioner’s analysis of the additional limitations in claim 20. See Tr. 17:15–22. We are persuaded that the combination of CamSplice, CamLite, and de Jong teaches the additional limitations in claim 20.

Petitioner’s rationale for combining CamSplice, CamLite, and de Jong is the same as that of claim 18. Patent Owner relies on the same arguments against Petitioner’s obviousness rationale and the same evidence of secondary considerations that we have discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 20 would have been obvious over the combination of CamSplice, CamLite, and de Jong under 35 U.S.C. § 103(a).

### 3. *Claim 21*

Claim 21 depends from claim 18 and recites that the “evaluating the continuity” step comprises “introducing light into at least one of the optical field fiber and the optical fiber stub such that a glow emanates from at least one of the end portions of the optical field fiber and the optical fiber stub.” For the cam mechanism, Petitioner cites CamLite for teaching that “laser light is introduced into the optical fiber stub so that, after the optical field fiber contacts the stub, laser light proceeds from the fiber stub into the field fiber and travels down the field fiber.” Pet. 60–61 (citing Ex. 1007, 1, 6, 7),

76 (citing Ex. 1003 ¶¶ 168–169). Petitioner contends a glow emanates from this junction when the fibers are not touching. *Id.* Patent Owner does not dispute Petitioner’s analysis of the additional limitations in claim 21. *See* Tr. 17:15–22. We are persuaded that the combination of CamSplice, CamLite, and de Jong teaches the additional limitation in claim 21.

Petitioner’s rationale for combining CamSplice, CamLite, and de Jong is the same as that of claim 18. Patent Owner relies on the same arguments against Petitioner’s obviousness rationale and the same evidence of secondary considerations that we have discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 21 would have been obvious over the combination of CamSplice, CamLite, and de Jong under 35 U.S.C. § 103(a).

4. *Claim 22*

Claim 22 depends from claim 21 and recites that the “evaluating” and “re-evaluating” steps further comprise “monitoring the glow emanating from the at least one of the end portions of the optical field fiber and the optical fiber stub.” Petitioner cites CamLite and provides an analysis similar to that of claim 21. Pet. 61 (citing Ex. 1007, 1, 6, 7), 76–77 (citing Ex. 1003 ¶ 172; Ex. 1007, 6, 7). Patent Owner does not dispute Petitioner’s analysis of the additional limitations in claim 22. *See* Tr. 17:15–22. We are persuaded that the combination of CamSplice, CamLite, and de Jong teaches the additional limitation in claim 22.

Petitioner’s rationale for combining CamSplice, CamLite, and de Jong is the same as that of claim 18. Patent Owner relies on the same arguments against Petitioner’s obviousness rationale and the same evidence of

secondary considerations that we have discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 22 would have been obvious over the combination of CamSplice, CamLite, and de Jong under 35 U.S.C. § 103(a).

5. *Claim 23*

Claim 23 depends from claim 18 and recites “repeating the step of repositioning and re-securing and the step of re-evaluating until the continuity of the optical field fiber and the optical fiber stub is acceptable.” Petitioner references its analysis from claim 18 and contends an ordinarily skilled artisan would have found it obvious to repeat the “repositioning and re-securing” and “re-evaluating” steps in view of CamSplice’s “Tuning” procedure, which we discussed above. Pet. 61–62 (citing Ex. 1008, 4), 77–78 (citing Ex. 1003 ¶¶ 177–182; Ex. 1008, 4). Patent Owner does not dispute Petitioner’s analysis of the additional limitations in claim 23. See Tr. 17:15–22. We are persuaded that the combination of CamSplice, CamLite, and de Jong teaches the additional limitation in claim 23.

Petitioner’s rationale for combining CamSplice, CamLite, and de Jong is the same as that of claim 23. Patent Owner relies on the same arguments against Petitioner’s obviousness rationale and the same evidence of secondary considerations that we have discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 23 would have been obvious over the combination of CamSplice, CamLite, and de Jong under 35 U.S.C. § 103(a).

6. *Claim 24*

Claim 24 depends from claim 23 and further recites

the step of introducing light into at least one of the optical field fiber and the optical fiber stub such that a glow emanates from at least one of the end portions of the optical field fiber and the optical fiber stub and the step of monitoring the glow emanating from the at least one of the end portions of the optical field fiber and the optical fiber stub.

Petitioner cites CamLite for teaching the use of laser light and monitoring the glow to check continuity in a connector between a field fiber and a fiber stub. Pet. 62–63 (citing Ex. 1007, 1, 6, 7), 79–80 (citing Ex. 1003 ¶¶ 184–185; Ex. 1007, 6, 7). Patent Owner does not dispute Petitioner’s analysis of the additional limitations in claim 24. *See* Tr. 17:15–22. We are persuaded that the combination of CamSplice, CamLite, and de Jong teaches the additional limitations in claim 24.

Petitioner’s rationale for combining CamSplice, CamLite, and de Jong is the same as that of claim 24. Patent Owner relies on the same arguments against Petitioner’s obviousness rationale and the same evidence of secondary considerations that we have discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 24 would have been obvious over the combination of CamSplice, CamLite, and de Jong under 35 U.S.C. § 103(a).

7. *Claim 49*

Claim 49 depends from claim 18 and recites

the continuity of the optical field fiber and the optical fiber stub is acceptable when at least one of a measured amount of insertion loss is less than a first predetermined value and a

measured amount of reflectance is greater than a second predetermined value.

Petitioner cites CamSplice's teaching of using an Optical Power Meter or an Optical Time Domain Reflectometer (OTDR) to optimize loss "based upon whether the OTDR or power meter indicates a loss less than a predetermined value of 0.5 dB." Pet. 63–64, 80 (both citing Ex. 1008, 2, 4). Petitioner contends an ordinarily skilled artisan would have known that an Optical Power Meter can be used to measure insertion loss, whereas OTDR is used to measure reflectance. *Id.* (citing Ex. 1003 ¶ 189). Petitioner contends an ordinarily skilled artisan would have known to compare these measurements to predetermined levels, such as the disclosed 0.5 db. *Id.* at 80–81 (citing Ex. 1003 ¶¶ 189–192). Patent Owner does not dispute Petitioner's analysis of the additional limitations in claim 49. *See* Tr. 17:15–22. We are persuaded that the combination of CamSplice, CamLite, and de Jong teaches the additional limitations in claim 49.

Petitioner's rationale for combining CamSplice, CamLite, and de Jong is the same as that of claim 49. Patent Owner relies on the same arguments against Petitioner's obviousness rationale and the same evidence of secondary considerations that we have discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 49 would have been obvious over the combination of CamSplice, CamLite, and de Jong under 35 U.S.C. § 103(a).

*D. Obviousness Ground Based on CamSplice, CamLite, de Jong, and Dean*

Petitioner contends that claims 18, 20–24, and 49 would have been obvious over CamSplice, CamLite, de Jong, and Dean. Pet. 52–81.

Petitioner additionally relies on Knecht as being incorporated by reference into de Jong. *Id.* at 52.

Petitioner's obviousness analysis for this ground is the same as the CamSplice–CamLite–de Jong ground except that it adds citations from Dean. For the “repositioning and re-securing” limitation in claim 18, Petitioner additionally relies on Dean's teachings regarding a connector having a rotationally-actuatable and reopenable cam mechanism that imparts force upon the fibers within the connector when the cam is actuated. *Id.* at 54–56 (citing Ex. 1009, 1:35–49, Fig. 3), 71 (citing Ex. 1003 ¶¶ 136–138). For claim 20, Petitioner additionally cites Dean's locking rings, each of which allegedly includes “a cam shaped inner surface such that rotation of the locking rings relative to ribs radially compresses ribs to center optical fibers held within the connector” and to “secur[e] the end portions of optical fibers relative to one another.” *Id.* at 58–60 (citing Ex. 1009, 1:29–35, Figs. 2, 3), 76 (citing Ex. 1003 ¶ 165; Ex. 1009, 1:29–35). As stated above, Patent Owner does not dispute that the art cited by Petitioner teaches the limitations of claims 18, 20–24, and 49. Tr. 17:15–22. Petitioner's additional citations to Dean further support its unpatentability contentions. We are satisfied that the combination of CamSplice, CamLite, de Jong, and Dean teaches every limitation of claims 18, 20–24, and 49.

Petitioner's reasons for combining Dean with CamSplice, CamLite, and de Jong are similar to those discussed above with respect to claim 63. *See supra* § II.B.3.b. In addition, Petitioner contends Dean's description of a reopenable cam mechanism would have motivated an ordinarily skilled artisan to “arrive at a rotationally-actuatable cam mechanism that can be both repeatedly actuated and repeatedly deactuated.” Pet. 72 (citing

Ex. 1003 ¶ 139), 73 (citing Ex. 1003 ¶ 144). Patent Owner relies on the same arguments against Petitioner’s obviousness rationale discussed above. We are persuaded by Petitioner’s reasons for combining CamSplice, CamLite, de Jong, and Dean.

Patent Owner relies on the same evidence of secondary considerations that we have discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claims 18, 20–24, and 49 would have been obvious over the combination of CamSplice, CamLite, de Jong, and Dean under 35 U.S.C. § 103(a).

*E. Obviousness Grounds Based on CamSplice, CamLite, de Jong, and Takizawa and CamSplice, CamLite, de Jong, Dean, and Takizawa*

Petitioner contends that claims 50 and 71 would have been obvious over (1) the combination of CamSplice, CamLite, de Jong, and Takizawa; and (2) the combination of CamSplice, CamLite, de Jong, Dean, and Takizawa. Pet. 64, 81–84. Petitioner additionally relies on Knecht as being incorporated by reference into de Jong. *Id.* at 52.

Claim 50 depends from claim 18 and recites “at least one of a cam mechanism or the at least one splice component is translucent.” Claim 71 also depends from claim 18 and recites “a cam mechanism and the at least one splice component are translucent.” Petitioner’s obviousness analysis for claims 50 and 71 builds upon its analysis for claim 18 and cites CamLite and Takizawa for teaching the translucency limitations in the same manner as the de Jong–CamLite–Takizawa ground discussed above. Pet. 64 (citing Ex. 1006, 4:35–41; Ex. 1007, 1, 6, 7), 81–84 (citing Ex. 1003 ¶¶ 196–199, 206–213; Ex. 1006, 4:35–55); *see supra* § II.A.7. We are persuaded that CamLite and Takizawa teach the translucency limitations for the same

reasons mentioned above. We are also persuaded by Petitioner's reasons for combining the references in these grounds for the same reasons mentioned above. *See supra* §§ II.A.7.b, II.B.3.b, II.C.1.b.

Patent Owner relies on the same arguments against Petitioner's obviousness rationale and the same evidence of secondary considerations that we have discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claims 50 and 71 would have been obvious over (1) the combination of CamSplice, CamLite, de Jong, and Takizawa; and (2) the combination of CamSplice, CamLite, de Jong, Dean, and Takizawa.

*F. Obviousness Grounds Based on CamSplice, CamLite, de Jong, and UniCam and CamSplice, CamLite, de Jong, Dean, and UniCam*

Petitioner contends that claim 19 would have been obvious over (1) the combination of CamSplice, CamLite, de Jong, and UniCam; and (2) the combination of CamSplice, CamLite, de Jong, Dean, and UniCam. Pet. 56–58, 84–87. Petitioner additionally relies on Knecht as being incorporated by reference into de Jong. *Id.* at 52.

*1. UniCam*

The UniCam reference from Siecor Corporation provides assembly instructions for the Siecor UniCam connector, which is “a field-installable connector.” Ex. 1010, 1. Figure 5 of UniCam is reproduced below.

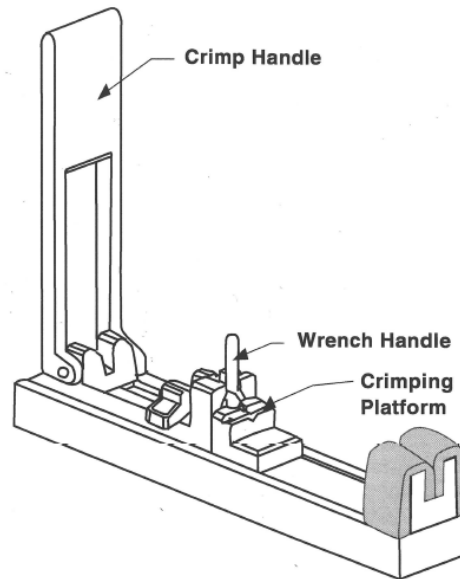


Figure 5 — Installation Tool

Figure 5 depicts an “installation tool . . . designed to position the fiber into the UniCam connector, rotate the cam that aligns the fibers, and crimp the fiber in place.” *Id.* at 4. As part of the installation process, the connector cam is actuated by rotating the wrench handle past 90°. *Id.* at 8, Fig. 18.

Petitioner contends UniCam “is a printed publication dated February 1996” with “a copyright notice dated 1996,” so “UniCam . . . constitutes prior art to the ’482 Patent under at least 35 U.S.C. [§] 102(b).” Pet. 21–22 (citing Ex. 1010, 1, 11). Similar to its showing for the CamLite reference, Petitioner presents testimonial evidence from Alan J. McFarland regarding UniCam being a “Siecor Recommended Procedure[]” that was widely disseminated upon publication and included with each unit of the product sold. See *id.* at 14–15 n.1 (citing Ex. 1013 ¶¶ 9–10), 21 n.3 (citing Ex. 1013 ¶¶ 14–15). Petitioner additionally cites testimony from Donald Warren regarding the purchase of a Siecor TKT-UniCam Termination Kit and about how this purchase came with a copy of the UniCam reference. *Id.* at 21 n.3

(citing Ex. 1014 ¶¶ 2–5). Patent Owner does not dispute the prior art status of UniCam.

Based on Petitioner’s evidence, we determine that UniCam qualifies as prior art printed publication under 35 U.S.C. § 102(b). Petitioner’s evidence establishes that UniCam was publicly disseminated more than one year before the earliest possible effective filing date for the challenged claims of the ’482 patent, which is March 22, 2000. *See* Ex. 1001, [64].

2. *Claim 19*

Claim 19 depends from claim 18 recites that the “providing” step further comprises “disposing the fiber optic connector in an installation tool.” Claim 19 also recites that the “repositioning and re-securing” step “is accomplished without removing the fiber optic connector from the installation tool.” Petitioner notes that both CamLite and CamSplice disclose the use of assembly tools. Pet. 85 (citing Ex. 1007, 7; Ex. 1008, 3). As discussed above, Petitioner relies on CamSplice for teaching repositioning and re-securing of joined fibers and further notes that “optimization and subsequent actuation of the splice are performed while the CamSplice remains within the assembly tool.” *Id.* at 56–58 (citing Ex. 1008, 1, 3–5), 85 (citing Ex. 1003 ¶ 152; Ex. 1008, 4). Petitioner additionally cites UniCam for teaching the use of a connector assembly tool including positioning of the fibers and “actuation of a rotationally-actuatable cam mechanism, and camming of the connector[, which] involves rotating the cam by rotating a wrench of the tool.” *Id.* at 56–58 (citing Ex. 1008, 1, 3–5), 85–86 (citing Ex. 1003 ¶ 154; Ex. 1010, 1, 4, 8, 9, Fig. 18). We are

persuaded that UniCam and the other references teach the additional limitations in claim 19.

Petitioner contends it would have been obvious for ordinarily skilled artisan to combine UniCam with de Jong, CamLite, and CamSplice (with or without Dean) because these references all arose from Siecor Corporation. *Id.* at 86 (citing Ex. 1003 ¶ 155). Petitioner also contends “the interconnectedness and relatedness of these references” and the aim “to achieve enhanced optical connector technologies” would have motivated such an artisan. *Id.* (citing Ex. 1003 ¶ 156). Petitioner further argues the artisan “would have been motivated to combine UniCam with CamSplice because each of CamSplice and UniCam discloses use of a rotationally-actuable cam mechanism that can be actuated and deactuated.” *Id.* at 87 (citing Ex. 1003 ¶ 157). Regarding the combination with Dean, Petitioner contends an ordinarily skilled artisan would have been motivated to combine UniCam with Dean because both describe a rotationally-actuable cam mechanism that is reopenable. *Id.*

Petitioner further contends an ordinarily skilled artisan would have been motivated to combine UniCam with CamLite and de Jong, in view of Dean, by a desire to develop an optical assembly connector tool that operated similar to the tools in CamLite and de Jong, but that allowed for actuation of a rotatably-actuable cam mechanism to achieve assembly as shown in Dean. *Id.* (citing Ex. 1003 ¶ 161). Petitioner additionally contends the artisan would have applied UniCam’s tool for this purpose because UniCam, de Jong, and CamLite all concern the implementation of optical connectors that connect optical field fibers with optical fiber stubs. *Id.*

Patent Owner does not dispute Petitioner's reasons for combining UniCam with the other references. *See* PO Resp. 12. We have considered Petitioner's reasons for combining UniCam with the other references in conjunction with the obviousness rationales discussed above. *See supra* §§ II.C.1.b., II.D. We are persuaded by Petitioner's reasons for the combinations.

Patent Owner relies on the same arguments against Petitioner's obviousness rationale and the same evidence of secondary considerations that we have discussed above. On the entire trial record, we determine, by a preponderance of the evidence, that the subject matter of claim 19 would have been obvious over (1) the combination of CamSplice, CamLite, de Jong, and UniCam; and (2) the combination of CamSplice, CamLite, de Jong, Dean and UniCam.

### III. CONCLUSION

Petitioner has demonstrated, by a preponderance of the evidence, that:

Claims 15, 16, and 64–68 are unpatentable under § 103(a) over the combination of de Jong, CamLite, and Takizawa;

Claim 63 is unpatentable under § 103(a) over the combination of de Jong, CamLite, Takizawa, Dean, and CamSplice;

Claims 18, 20–24, and 49 are unpatentable under § 103(a) over the combination of CamSplice, CamLite, and de Jong;

Claims 18, 20–24, and 49 are unpatentable under § 103(a) over the combination of CamSplice, CamLite, de Jong, and Dean;

Claims 50 and 71 are unpatentable under § 103(a) over the combination of CamSplice, CamLite, de Jong, and Takizawa;

Claims 50 and 71 are unpatentable under § 103(a) over the combination of CamSplice, CamLite, de Jong, Dean, and Takizawa;

Claim 19 is unpatentable under § 103(a) over the combination of CamSplice, CamLite, de Jong, and UniCam; and

Claim 19 is unpatentable under § 103(a) over the combination of CamSplice, CamLite, de Jong, Dean, and UniCam.

#### IV. ORDER

Accordingly, it is:

ORDERED that claims 15, 16, 18–24, 49, 50, 63–68, and 71 of the '482 patent are held to be unpatentable; and

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

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Patent RE45,482 E1

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