

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMMSCOPE TECHNOLOGIES LLC,
Petitioner,

v.

BELDEN INC.,
Patent Owner.

Case No. IPR2023-01062
Patent 6,570,095 B2

PATENT OWNER'S NOTICE OF APPEAL

Pursuant to 28 U.S.C. § 1295(a)(4)(A), 35 U.S.C. §§ 141, 142, and 319, 37 C.F.R. §§ 90.2 and 90.3, and 5 U.S.C. §§ 701-706, Patent Owner Belden Inc. (“Belden”) hereby provides notice that it appeals to the United States Court of Appeals for the Federal Circuit from the Final Written Decision of the Patent Trial and Appeal Board (“Board”) entered on December 18, 2024 (Paper No. 46) (“Final Written Decision”) attached as Exhibit A, and from all underlying orders, decisions, rulings, and opinions regarding the *inter partes* review of U.S. Patent No. 6,570,095 B2 (“’095 Patent”) in Case No. IPR2023-01062. This Notice is filed no later than sixty-three (63) days after issuance of the Final Written Decision and is therefore timely under 35 U.S.C. § 142, 37 C.F.R. § 90.3(b)(1), and Federal Circuit Rule 15(a)(1).

In accordance with 37 C.F.R. § 90.2(a)(3)(ii), the expected issues on appeal include, but are not limited to:

- The Board’s determination that German Patent No. DE 29719866 U1 (“GmbH-866”) anticipates claims 27-29 of the ’095 Patent and that such claims are unpatentable;
- The Board’s determination that the combination of GmbH-866, U.S. Patent No. 3,894,172 (“Jachimowicz”), and U.S. Patent No. 5,670,748 (“Gingue”) renders obvious claims 30-33 of the ’095 Patent and that such claims are unpatentable;

- The Board’s failure to comply with the Administrative Procedure Act, including whether the Board’s Final Written Decision is arbitrary, capricious, an abuse of discretion, not in accordance with law, or in excess of the Board’s jurisdiction, and any procedural irregularities associated with the proceeding;
- The Board’s findings that conflict with the evidence of record and/or are otherwise not supported by substantial evidence;
- The Board’s factual findings, conclusions of law, claim constructions, including the claim construction of “twisted pairs,” or other determinations supporting or related to the foregoing issues; and
- All issues decided adversely to Belden in any order, decision, ruling, or opinion underlying or supporting the Final Written Decision.

Pursuant to 35 U.S.C. § 142 and 37 C.F.R. § 90.2(a), Belden is electronically filing this Notice with the Director of the United States Patent and Trademark Office via email at efileSO@uspto.gov, and electronically filing and serving a copy of this Notice with the Patent Trial and Appeal Board via the Board’s P-TACTS System. In addition, Belden is electronically filing a copy of this Notice and the required docketing fees with the Clerk’s Office for the United States Court of Appeals for the Federal Circuit via CM/ECF.

Date: February 12, 2025

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CERTIFICATE OF SERVICE AND FILING

I hereby certify that on February 12, 2025, in addition to being filed and served electronically through the Board's P-TACTS System, a true and correct copy of the foregoing "**PATENT OWNER'S NOTICE OF APPEAL**" was electronically filed and served on the Director of the United States Patent and Trademark Office via e-mail at the following:

Office of the General Counsel
U.S. Patent and Trademark Office
efileSO@uspto.gov

I also hereby certify that on February 12, 2025, a true and correct copy of the foregoing "**PATENT OWNER'S NOTICE OF APPEAL**" and the filing fee were electronically filed with the Clerk's Office of the United States Court of Appeals for the Federal Circuit via CM/ECF.

I also hereby certify that on February 12, 2025, a true and correct copy of the foregoing “**PATENT OWNER’S NOTICE OF APPEAL**” was served via email upon the following attorneys at CARLSON, CASPERS, VANDENBURGH & LINDQUIST P.A.:

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EXHIBIT *A*

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMMSCOPE TECHNOLOGIES LLC,
Petitioner,

v.

BELDEN INC.,
Patent Owner.

IPR2023-01062
Patent 6,570,095 B2

Before CHRISTOPHER M. KAISER, KIMBERLY McGRAW, and
SHARON FENICK, *Administrative Patent Judges*.

McGRAW, *Administrative Patent Judge*.

JUDGMENT

Final Written Decision

Determining All Challenged Claims Unpatentable

35 U.S.C. § 318(a)

Dismissing Petitioner's Motion to Exclude Evidence

Dismissing Patent Owner's Motion to Exclude Evidence

37 C.F.R. § 42.64

I. INTRODUCTION

We instituted this *inter partes* review pursuant to 35 U.S.C. § 314 to review claims 27–33 of U.S. Patent No, 6,570,095 B2 (Ex. 1001, “the ’095 patent”) owned by Belden, Inc. (“Patent Owner” or “Belden”). We have jurisdiction under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, CommScope Technologies LLC (“Petitioner” or “CommScope”) has shown by a preponderance of the evidence that claims 27–33 are unpatentable.

A. Procedural History

CommScope Technologies LLC (“Petitioner”) filed a Petition (Paper 1, “Pet.”) requesting an *inter partes* review of claims 27–33 of the ’095 patent. Belden, Inc. (“Patent Owner”) filed a Preliminary Response to the Petition (Paper 6, “Prelim. Resp.”). Petitioner then filed an authorized “Paper Identifying Inconsistencies” (Paper 7), in response to which Patent Owner filed an authorized Sur-reply (Paper 9).

We instituted this *inter partes* review of all challenged claims based on all grounds asserted in the Petition. Paper 10 (“Inst. Dec.”).

Belden then filed a Patent Owner Response (Paper 19, “PO Resp.”) and CommScope filed a Reply (Paper 29, “Pet. Reply”) and Belden filed a Sur-reply. Paper 33 (“PO Sur-reply”). Petitioner filed a Motion to Exclude Exhibit 2012 (Paper 35, “Pet. Mot. Excl.”), to which Patent Owner filed an Opposition (Paper 37, “PO Opp.”), and Petitioner filed a Reply (Paper 40 (“Pet. Reply Mot. Excl.”). Patent Owner also filed a Motion to Exclude (Paper 36, “PO Mot. Excl.”), to which Petitioner filed an Opposition (Paper 38, “Pet. Opp.”), and Patent Owner filed a Reply (Paper 39, PO Reply Mot. Excl.”). A consolidated oral hearing was held on September 23, 2024 with

IPR2023-01061. Following the hearing, Petitioner filed a motion requesting authorization to file an affidavit certifying the accuracy of the English language translation of foreign language document Yanagita as supplemental evidence (Paper 40) to which Patent Owner filed an opposition (Paper 44). Petitioner's request to file the supplemental evidence was denied. Paper 45.

B. Related Proceedings

The parties identify *Belden, Inc. v. CommScope, Inc.*, Case No. 1:22-cv-00783-RGA (D. Del.), and Patent Owner additionally identifies *Belden Techs., Inc. v. Superior Essex Inc.*, Case No. 1:08-cv-00063-SLR (D. Del.), as related matters. Pet. 82; Paper 4 § II. The parties also identify three terminated Reexaminations of three patents. Pet. 82; Paper 4 § II. Patent Owner identifies IPR2023-01061 as a related matter. Paper 4 § II.

C. Real Parties-In-Interest

The parties identify themselves as the real parties-in-interest. Pet. 82; Paper 4 § I. Petitioner additionally identifies CommScope, Inc. of North Carolina, CommScope, Inc., and CommScope Holding Company as real parties-in-interest. Pet. 82.

D. The '095 Patent

The '095 patent, titled "Multi-Pair Data Cable with Configurable Core Filling and Pair Separation," relates to "high speed data communications cables having a light-weight, configurable core-refilling isolation pair separator that provides geometrical separation between the twisted pairs of insulated conductors." Ex. 1001, code (54), 1:17–20. The '095 patent describes a cable that "includes a plurality of twisted pairs of insulated conductors, and a dielectric pair separator formed with a plurality of folds, to provide a plurality of grooves extending along a longitudinal length of the

dielectric filler.” *Id.*, Abstract. Figure 4 of the ’095 patent is reproduced below.

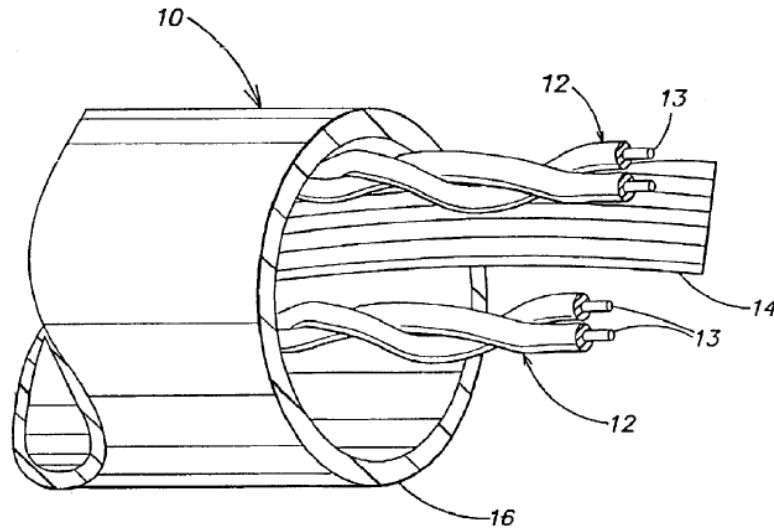


Figure 4 is a perspective view of data communications cable 10, showing twisted pairs 12 of insulated conductors 13, with twisted pairs 12 separated by low dielectric constant, low dissipation factor, polymer pair separator 14, all encased within jacket assembly 16. *Id.* at 4:59–65. “The configurable pair separator 14 runs along a longitudinal length of the cable, and is configured such that the twisted pairs are disposed within channels or grooves 15 of the pair separator along the length of the cable.” *Id.* at 5:2–5. According to the ’095 patent, “the pair separator improves the crosstalk isolation between the twisted pairs by providing desired spacing between the twisted pairs.” *Id.* at 5:11–14. “[T]he configurable pair separator is preferably a flame-retardant, low-dielectric constant, low-dissipation factor, foamed polymer tape, such as, for example, a foamed flame retardant, cellular polyolefin or fluoropolymer like NEPTC PP500 ‘SuperBulk’, a foamed fluorinated ethylene propylene (FEP) or a foamed polyvinyl chloride (PVC).” *Id.* at 5:24–30.

Figure 5, reproduced below, is a cross-sectional view of the cable of Figure 4.

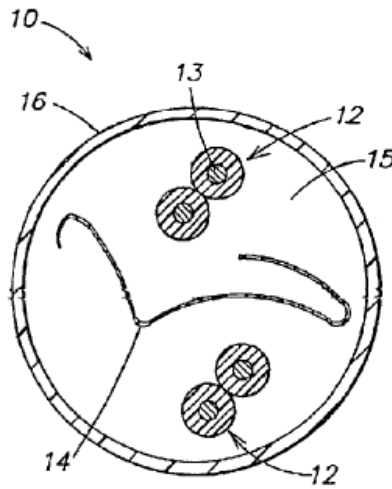


Figure 5 shows the same elements of cable 10 as in Figure 4, but from a cross-sectional perspective, including twisted pairs 12, conductors 13, separator 14, and jacket 16, as well as “grooves 15.” *Id.* at 4:59–5:5.

E. Illustrative Claim

Of the challenged claims, only claims 27 and 31 are independent. Claims 27 and 31 are similar to each other, except that claim 27 requires the pair separator to be arranged within the cable jacket to form at least two grooves, while claim 31 requires the pair separator to include a substantially flat dielectric tape formed of a foamed polymer. Claim 27 is reproduced below.

27. [27.pre] A data communications cable comprising:
- [27.a] a first twisted pair of insulated conductors,
 - a second twisted pair of insulated conductors,
 - [27.b] a configurable dielectric pair separator that separates the first and second twisted pairs of conductors, the configurable dielectric pair separator being substantially flat;
 - [27.c] a jacket enclosing the first and second twisted pairs of insulated conductors and the dielectric pair separator; and

[27.d] wherein the configurable dielectric pair separator, the first twisted pair of insulated conductors and the second twisted pair of insulated conductors are twisted about a common central axis to form a twisted pair cable, and

[27.e] wherein the configurable dielectric pair separator is arranged within the jacket to form at least two grooves.

Ex. 1004, 12:8–24 (bracketed designations added by Petitioner).

F. The Asserted Grounds of Unpatentability

Petitioner contends claims 27–33 of the '095 patent are unpatentable on the following grounds. Pet. 2–3.

Ground	Reference(s)	35 U.S.C. § ¹	Claims Challenged
1	Roberts ²	102(a), (b)	27–29
2	Roberts, Jachimowicz, ³ Gingue ⁴	103(a)	30–33
3	GmbH-866 ⁵	102(a), (b)	27–29
4	GmbH-866, Jachimowicz, Gingue	103(a)	30–33

¹ The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. §§ 102 and 103. Because the '095 patent has an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA versions of §§ 102 and 103.

² Roberts, et al., US Patent No. 3,622,683 (issued Nov. 23, 1971) (Ex. 1009, “Roberts”).

³ Jachimowicz, et al., US Patent No. 3,894,172 (issued July 8, 1975) (Ex. 1014, “Jachimowicz”).

⁴ Gingue et al., US Patent No. 5,670,748 (issued Sept. 23, 1997) (Ex. 1013, “Gingue”).

⁵ NK Networks GmbH, German Patent No. DE 29719866 U1 (original in Ex. 1011) (published Feb. 5, 1998) (Ex. 1010, “GmbH-866”).

Ground	Reference(s)	35 U.S.C. § ¹	Claims Challenged
5	Roberts, GmbH-866, Jachimowicz, Gingue	103(a)	27–33
6	GmbH-866, Roberts, Jachimowicz, Gingue	103(a)	27–33
7	Yanagita ⁶	102(a), (b)	27–29
8	Yanagita, Jachimowicz, Gingue	103(a)	30–33

In support of its unpatentability arguments, Petitioner relies on the declarations of Kenneth Cornelison (Exs. 1007, 1081). Patent Owner relies on the declarations of Dr. Charles A. Eldering (Exs. 2001, 2007).

II. DISCUSSION

A. Principles of Law

“In an [*inter partes* review], the petitioner has the burden from the onset to show with particularity why the patent it challenges is unpatentable.” *Harmonic Inc. v. Avid Tech., Inc.*, 815 F.3d 1356, 1363 (Fed. Cir. 2016) (citing 35 U.S.C. § 312(a)(3) (requiring *inter partes* review petitions to identify “with particularity . . . the evidence that supports the grounds for the challenge to each claim”)). This burden of persuasion never shifts to Patent Owner. *See Dynamic Drinkware, LLC v. Nat’l Graphics*,

⁶ Yanagita, certified translation of Japanese Patent Application Pub. No. S43-15470 (original in Ex. 1056) (published June 28, 1968) (Ex. 1012, “Yanagita”). Petitioner also provides an uncertified English translation (Ex. 1055) that was before the Office during the reexamination of the ’057 patent. Unless indicated otherwise, all citations to “Yanagita” are to the certified English translation (Ex. 1012).

Inc., 800 F.3d 1375, 1378 (Fed. Cir. 2015) (discussing the burden of proof in *inter partes* review).

“A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” *Verdegaal Bros. Inc., v. Union Oil Co.*, 814 F.2d 628, 631 (Fed. Cir. 1987); *see also Finisar Corp. v. DirecTV Group, Inc.*, 523 F.3d 1323, 1334 (Fed. Cir. 2008) (to anticipate a patent claim under 35 U.S.C. § 102, “a single prior art reference must expressly or inherently disclose each claim limitation”). Whether a reference anticipates is assessed from the perspective of a person of ordinary skill in the art. *See Dayco Prods., Inc. v. Total Containment, Inc.*, 329 F.3d 1358, 1368 (Fed. Cir. 2003) (“[T]he dispositive question regarding anticipation [i]s whether one skilled in the art would reasonably understand or infer from the [prior art reference’s] teaching’ that every claim element was disclosed in that single reference.” (quoting *In re Baxter Travenol Labs.*, 952 F.2d 388, 390 (Fed. Cir. 1991))).

A claim is unpatentable as obvious under § 103(a) if the differences between the claimed subject matter and the prior art are such that the subject matter, as a whole, would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. *KSR Int’l Co. v. Teleflex Inc.*, 550 U.S. 398, 406 (2007). The question of obviousness is resolved on the basis of underlying factual determinations, including (1) the scope and content of the prior art; (2) any differences between the claimed subject matter and the prior art; (3) the level of skill in the art; and (4) when in evidence, objective indicia of non-

obviousness (i.e., secondary considerations).⁷ *Graham v. John Deere Co.*, 383 U.S. 1, 17–18 (1966). “To satisfy its burden of proving obviousness, a petitioner cannot employ mere conclusory statements. The petitioner must instead articulate specific reasoning, based on evidence of record, to support the legal conclusion of obviousness.” *In re Magnum Oil Tools Int’l, Ltd.*, 829 F.3d 1364, 1380 (Fed. Cir. 2016).

B. Level of Ordinary Skill in the Art

We consider the grounds of unpatentability in view of the understanding of a person of ordinary skill in the art (sometimes abbreviated herein as “POSITA”). *Graham*, 383 U.S. at 17–18. Petitioner argues that a “person of ordinary skill in the art of the ’095 patent would have had a bachelor’s degree in electrical engineering and a minimum of 3–4 years of industry experience in connection with designing, manufacturing, and testing of twisted-pair data cables.” Pet. 11 (citing Ex. 1007 ¶ 13). Petitioner also argues an “individual with a master’s degree in electrical engineering would require less industry experience (e.g., 1–2 years).” *Id.* (citing Ex. 1007 ¶ 13). Patent Owner did not dispute this proposed definition prior to institution. *See generally* Prelim. Resp.

In our Decision on Institution, we adopted Petitioner’s proposal. During the trial, neither party expressly disputed our definition of a POSITA or explicitly argued that the outcome of this case would differ based upon our adoption of any particular definition of a POSITA. *See generally* Pet. Reply; PO Resp.

⁷ Patent Owner does not rely on evidence of secondary considerations to support its patentability arguments. *See generally* PO Resp.; PO Sur-reply.

Upon review of the full record, we see no reason to modify, and we thus maintain, the definition of a POSITA applied in our Decision on Institution.

In its Reply, Petitioner states that Patent Owner's expert, Dr. Eldering, "[appears to have] minimal industry experience with twisted pair data cables, and certainly not the 3–4 years' experience of a POSITA." Pet. Reply 2 n.1. Petitioner further states that Dr. Eldering has never designed a twisted pair cable and none of his patents are directly specifically to the design of a cable. *Id.*

To the extent Petitioner argues that Dr. Eldering does not meet the minimum qualifications of a POSITA, we disagree. First, our definition of a POSITA requires 3–4 years of industry experience for those holding only a bachelor's degree and that less years of industry experience is required for those with additional education. Inst. Dec. 8–9. Dr. Eldering holds a Ph.D. in electrical industry and, thus, less than 3–4 years of industry experience is required. Moreover, Dr. Eldering's declaration, testimony, and CV demonstrate that Dr. Eldering has many years of industry experience with twisted pair data cables. *See, e.g.*, Ex. 2001 ¶ 13 (discussing his 1990–1993 industry experience with twisted wire pairs, including research regarding delivery of high-speed digital data services over twisted wire pair cable), ¶ 14 (discussing industry experience at General Instrument, including the development of products using twisted wire pair cable for distribution of voice signals), ¶ 15 (discussing additional industry experience including evaluation of crosstalk in systems using twisted pair wire cabling and optimizing modulation format), App'x A; Ex. 1070, 201:1–202:7. We thus determine that Dr. Eldering's education and industry experience qualifies him to testify regarding the perspective of a POSITA.

We also note that, although Petitioner criticizes the industry experience of Dr. Eldering, Petitioner does not allege that Dr. Eldering is not qualified to opine from the perspective of a POSITA and did not file an objection to Dr. Eldering's testimony under 37 C.F.R. § 42.64(b) or a motion to exclude Dr. Eldering's testimony under 37 C.F.R. § 42.64(c). *See Kyocera Senco Industrial Tools Inc. v. International Trade Commission*, F.4th 1369, 1376–77 (Fed. Cir. 2022) (stating that an expert witness in a patent case must have at least an ordinary skill in the art to offer expert testimony from the perspective of a skilled artisan).

We address how much weight should be given to Dr. Eldering's testimony, as well as to Mr. Cornelison's testimony, throughout our Decision below.

C. Claim Construction

We interpret a claim “using the same claim construction standard that would be used to construe the claim in a civil action under 35 U.S.C. [§] 282(b).” 37 C.F.R. § 42.100(b). Under this standard, we construe the claim “in accordance with the ordinary and customary meaning of such claim as understood by one of ordinary skill in the art and the prosecution history pertaining to the patent.” *Id.*

“[T]he ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention” and “after reading the entire patent” and its prosecution history. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313, 1321 (Fed. Cir. 2005) (en banc). Only terms that are in controversy need to be construed, and then only to the extent necessary to resolve the controversy. *Vivid Techs., Inc. v. Am. Sci. & Eng'g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999).

Prior to institution, Petitioner proposed constructions for “data communications cable,” “dielectric pair separator,” “substantially flat,” “configurable,” and “grooves.” Pet. 12–18. In its Preliminary Response, Patent Owner proposed construction of “twisted pairs” of insulated conductors as “two insulated conductors twisted together” as shown in Figure 4 of the ’095 patent. Prelim. Resp. 16; *see also id.* at 10–17 (discussing the construction of twisted pairs).

In our Decision on Institution, we provided a preliminary construction for the terms “dielectric pair separator,” “substantially flat,” “configurable,” “grooves,” and “twisted pairs.” Dec. Inst. 10–13. In particular, we construed the “substantially flat” separator recited in independent claims 27 and 31 as “a separator that is a substantially flat member prior to being formed into the cable assembly, and that the term does not require that the separator be substantially flat in the finished cable.” Dec. Inst. 11. During trial, neither party disputed this construction. Upon review of the full record, for the reasons set forth in Decision on Institution, we maintain our construction of these terms.

In our Decision on Institution, we also construed the term “twisted pair of insulated conductors” as a “pair of insulated conductors that are twisted together” and we invited the parties address this construction, including whether the twisted pairs must form a “balanced transmission line.” Dec. Inst. 12–13 (noting that Patent Owner reserved the right to argue that twisted pairs should be more narrowly construed as further requiring a balanced transmission line) (citing Prelim. Resp. 15 n.4).

After institution, Patent Owner argued that the plain and ordinary meaning of “twisted pair of insulated conductors” requires “*two* insulated conductors *twisted together*” around one another to form a balanced

transmission line” as shown in Figure 4 of the ’095 patent. PO Resp. 10. Petitioner replied that Patent Owner’s addition of “balanced transmission line” to the Board’s preliminary construction is unnecessary as the dispute between the parties centered only on whether the conductors of the asserted art are “twisted together” (i.e., twisted around each other) and that neither Petitioner nor Patent Owner dispute that if a pair of conductors are twisted around one another, they form a balanced transmission line. *See* Pet. Reply 1.

Based upon a full record, we maintain our construction of the term “twisted pairs,” which both parties agree require a “pair of insulated conductors that are twisted together,” (i.e., “two insulated conductors twisted around each other”). We agree with Petitioner that no further construction of the term is required as there is no dispute between the parties that if a pair of insulated conductors are twisted together (i.e., two insulated conductors are twisted around each other), that they form a balanced transmission line. *See Nidec Motor Corp. v. Zhongshan Broad Ocean Motor Co.*, 868 F.3d 1013, 1017 (Fed. Cir. 2017) (citing *Vivid Techs., Inc. v. Am. Sci. & Eng’g, Inc.*, 200 F.3d 795, 803 (Fed. Cir. 1999)) (holding that only claim terms in controversy need to be construed, and only to the extent necessary to resolve the controversy).

D. Overview of the Prior Art

1. GmbH-866 (Ex. 1010)

GmbH-866 is a German patent application publication titled “Data transfer cable.” Ex. 1010, code (54). GmbH-866 “relates to a data transfer cable consisting of at least n-pairs, n being an even-numbered multiple of 1, of two isolated conductors in each case, a shielding of the conductor pairs that consists of an electrically conductive material, and an outer cable

sheath.” *Id.* at 2. GmbH-866 describes that “[d]ata transfer cables of this kind typically consist of four pairs of two stranded isolated copper conductors or wires,” where “the individual conductor pairs are in each case surrounded by a shielding consisting of a metal foil.” *Id.*

Figure 1, reproduced below, shows a cross-section of GmbH-866’s cable.

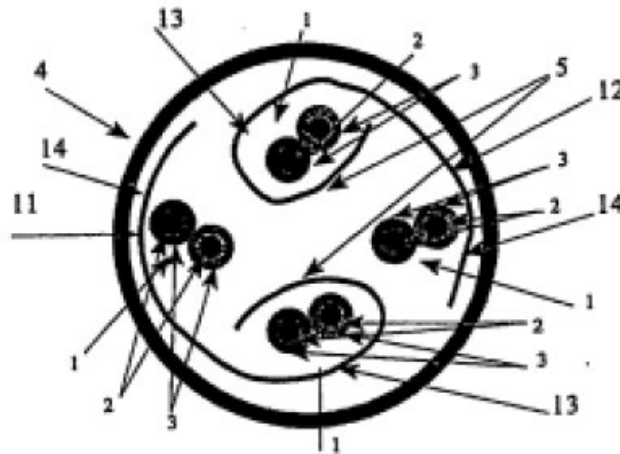


Figure 1 shows pairs 1, wires 2, insulation 3, electrical shielding 5, shieldings 11 and 12, each defining round portion 13 and curved end portion 14. *Id.* at 3–4. “[S]hieldings 11, 12 preferably consist of metal foils, in particular, aluminum foils or aluminum foils laminated with plastics material.” *Id.* at 5. The individual “copper conductors or wires preferably have an insulation 3 consisting of a thermoplastic polymer, in particular polyethylene, cell polyethylene, foam-skin polyethylene, skin-foam-skin polyethylene, polypropylene, or cell polypropylene.” *Id.* at 3.

In the GmbH-866 cable, the “stranding of the pairs 1 can consist in what is known as a helix stranding or in an SZ stranding (alternating, right-left stranding).” *Id.* at 3. According to GmbH-866:

The production of a data transfer cable according to the invention, as described above, can take place such that the partial shieldings 11, 12 or 17, 18 are applied together with the stranding

or the conductor pairs 1 and/or the longitudinally extending deformation of the conductor pairs 1. In particular, in the case of the stranding of the conductor pairs in the SZ stranding method, the laying tools provided for the partial shieldings 11, 12 can assist the change in the stranding direction in each case.

Id. at 5–6.

2. *Jachimowicz (Ex. 1014)*

Jachimowicz is a U.S. Patent titled “Multicable Telephone Cable in a Common Sheath.” Ex. 1014, code (54). Jachimowicz relates to a “communication cable for telephone use [which] has comparatively small numbers of pairs with the conductors of each pair twisted together with different lays and the pairs are assembled into shielded units.” *Id.* at code (57).

Jachimowicz addresses problems in telephone cable bundles of frequency-related interference between circuits. *Id.* at 1:6–16. To address this, Jachimowicz discloses:

The cable of this invention consists of a multitude of identical small cables twisted together to form one cable core. Over the cable core there is one common cable sheath of a conventional design. Each of the electrically separate small cables consist of a bundle of 12 transmission pairs with possibly one pair added for control and supervisory circuit. The pairs of the bundle (unit) have each a pair lay (length of pair twist) difference from lays of remaining pairs in the unit.

Id. at 1:54–63. Figure 1, reproduced below, shows a cross-section of one of its small cables.

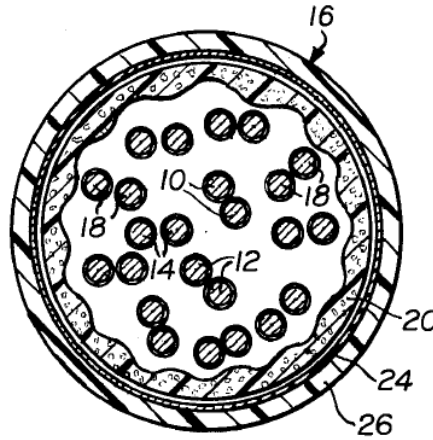


Figure 1 shows cable unit 16, comprising pairs of insulated conductors 10, 12, 14, and 18, foamed polyethylene 20, metal shield 24, and plastic insulating tape 26. *Id.* at 2:28–66. Jachimowicz describes:

To lock the pairs 10, 11, 14 and 18 together and prevent lay distortion when the bundle is handled in manufacturing processes or at installation, a thin jacke[t] of foamed polyethylene 20 is extruded over the bundle. The pairs can be held together in the bundle in other ways, if desired, as by applying a tape made of foamed thermoplastic supported by a film such as Mylar or polypropylene, or other material.

Id. at 2:46–54.

3. *Gingue* (Ex. 1013)

Gingue is a U.S. Patent titled “Flame Retardant and Smoke Suppressant Composite Electrical Insulation, Insulated Electrical Conductors and Jacketed Plenum Cable Formed Therefrom.” Ex. 1013, code (54). *Gingue* “relates to insulated electrical conductors and jacketed electrical cables,” a “composite electrical insulation exhibiting reduced flame spread, reduced smoke evolution, and favorable electrical properties,” and “insulated electrical conductors and jacketed plenum cable formed from the flame retardant and smoke suppressant composite insulation.” *Id.* at 1:7–15.

Gingue describes “concerns that flame and smoke could travel along the extent of a plenum area in the event the electrical conductors and cable were involved in a fire,” and “a standard to reduce the amount of flammable material incorporated into insulated electrical conductors and jacketed cables.” *Id.* at 1:34–41. Gingue also describes the additional need for “enhanced electrical properties for the transmission of voice and data over twisted pair cables.” *Id.* at 3:26–30. Gingue further describes that “the electrical performance of an insulating material is enhanced by foaming or expanding the corresponding solid material,” which “decreases the amount of flammable material employed for a given volume of material.” *Id.* at 3:20–24.

Figure 2, reproduced below, shows a sectional view of a 4-pair jacketed electrical cable.

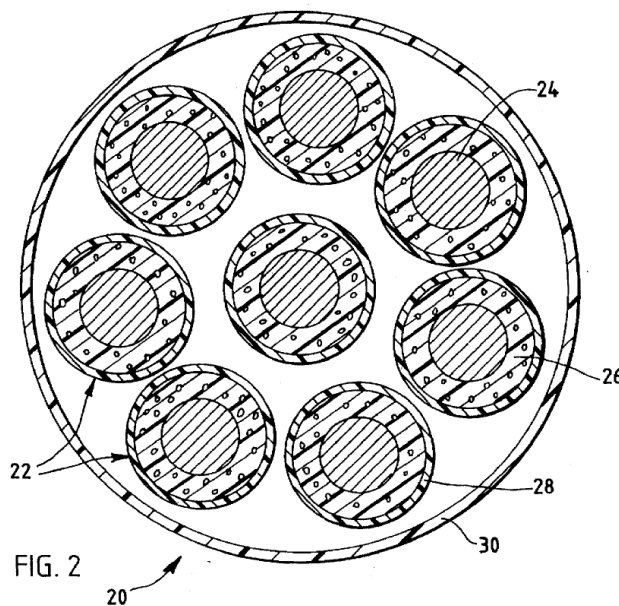


Figure 2 illustrates a jacketed electrical cable 20, where “each of insulated electrical conductors 22 comprises a centrally disposed electrical conductor 24, a foamed polymeric inner layer 26 surrounding the central conductor 24, and an outer layer 28 comprising a halogenated polymeric

material and at least one flame retardant and smoke suppressant additive.”
Id. at 6:45–50.

E. Asserted Anticipation of Claims 27–29 by GmbH-866

Petitioner argues that claims 27–29 would have been anticipated by GmbH-866. Pet. 41–52; Pet. Reply 12–20. Patent Owner disagrees with Petitioner’s assertions. PO Resp. 41–49; PO Sur-reply 18–26. Having considered the parties’ contentions and supporting evidence, we determine that Petitioner has demonstrated by a preponderance of the evidence that GmbH-866 anticipates claims 27–29 of the ’095 patent.

1. Independent Claim 27

The preamble and claim element [27.a] recite a data communications cable comprising a first twisted pair of insulated conductors and a second twisted pair of insulated conductors. Petitioner asserts GmbH-866 discloses the preamble and the twisted pair limitations because GmbH-866 teaches a data transfer cable having “four pairs 1,” each consisting of two isolated, stranded (i.e., twisted) copper conductors 2 or wires. Pet. 42–43 (citing Ex. 1010, Title, 3–4; Ex. 1007 ¶¶ 95–96, 172–178); *see also* Ex. 1010, 4 (“the invention can also comprise just two pairs of stranded conductors”); Ex. 1010, 3 (stating the “wires preferably have an 3”). Petitioner asserts that a POSITA would have understood that “stranded” means “twisted.” Pet. 43 (citing Ex. 1007 ¶ 174).

Claim element [27.b] requires a “configurable dielectric pair separator that separates the first and second twisted pairs of conductors, the configurable dielectric pair separator being substantially flat.” Petitioner asserts that GmbH-866’s partial shieldings 11 and 12 are each a dielectric pair separator that are substantially flat as required by claim element [27.b]. Pet. 44–46 (citing Ex. 1007 ¶¶ 44–45, 97–98, 181, 183–185; Ex. 1010, 4,

Fig. 1; Ex. 1031, 4; Ex. 1009, 13:40–45). Petitioner asserts that a POSITA would have understood that the plastic material used to laminate the aluminum foil of shielding 11 or 12 is a dielectric and that the plastic-laminated aluminum foil of shieldings 11 or 12 creates an insulating layer between the metal foil and adjacent components. Pet. 44–45 (citing Ex. 1007 ¶¶ 44–45, 181; Ex. 1031, 4; Ex. 1009, 13:40–45).

Claim element [27.c] requires a jacket enclosing the first and second twisted pairs and the separator. Petitioner asserts that GmbH-866’s cable sheath 4 is a jacket that encloses the first and second twisted pairs and the separator as required by claim element [27.c]. Pet. 46–47 (citing Ex. 1010, 4, Fig. 1; Ex. 1007 ¶¶ 186–187).

Claim element [27.d] requires that the separator and the first and second twisted pairs “are twisted about a common central axis to form a twisted pair cable” and that the separator is “arranged within the jacket to form at least two grooves.” Ex. 1001, 12:18–23. Petitioner asserts that GmbH-866 describes twisting all of the components of a cable about a central axis in the final cable assembly as required by claim element [27.d]. Pet. 47–48 (citing Ex. 1010, 2–3, 5–6; Ex. 1007 ¶¶ 188–194).

Claim element [27.e] requires that configurable dielectric pair separator is arranged within the jacket to form at least two grooves. Petitioner asserts that GmbH-866’s partial shielding 11 and 12 are each arranged with in cable sheath 4 so that the sheath (jacket) forms at least two grooves as required by claim element [27.e]. Pet. 49–50 (citing Ex. 1007 ¶¶ 195–196; Ex. 1010, Figs. 1–5).

Patent Owner does not dispute most of Petitioner’s assertions. *See generally* PO Resp.; PO Sur-reply. Patent Owner, however, does assert that GmbH-866 fails to disclose a first and second “*twisted pair* of insulated

conductors” and, therefore, cannot anticipate claim 27. PO Resp. 41–49; *see also id.* at 16 (stating anticipation by inherent disclosure is appropriate only when the reference discloses that prior art must *necessarily* include the unstated limitation) (citing *Transclean Corp. v. Bridgewood Servs., Inc.*, 290 F.3d 1364, 1373 (Fed. Cir. 2002)); PO Sur-reply 18–26.

Patent Owner asserts that GmbH-866 never refers to “twisted pairs” and that the “stranded copper conductors” relied on by Petitioner are *not inherently* twisted pairs, but rather are conductors that are made up of small diameter wires that are twisted or *stranded* together to form a larger diameter wire. PO Resp. 42–44 (citing Pet. 43; Ex. 2001 ¶¶ 80–81; Ex. 2004, 106:15–163:2); PO Sur-reply 22–23 (citing Ex. 2001 ¶ 80).

To support this argument, Patent Owner points to the “plain language” of GmbH-866, which it reads as stating that the pairs can consist of either stranded copper conductors or solid wires. PO Resp. 44 (citing Ex. 1010, 3; Ex. 2001 ¶ 83); *see also* Ex. 1010, 3 (stating the cable of Figure 1 “comprises four pairs 1, ***each consisting of two isolated, stranded copper conductors or wires.*** Optionally, these ***copper conductors or wires*** may comprise a conductor coating”).

Patent Owner asserts that, as admitted by Petitioner’s expert, it was well known that a standard individual conductive wire in a data communications cable could be comprised of either (1) a single solid core wire having a single, solid strand of conductive material, or (2) stranded conductors, each conductor containing a number of smaller diameter wires that are twisted together to form the overall larger single conductor. PO Resp. 42–43. Patent Owner asserts that even Petitioner’s declarant, Mr. Cornelison, admitted that “stranded” can mean different things and that a stranded copper conductor has fine filaments twisted together to make up an

overall larger conductor. *See, e.g., id.* at 41 (citing Ex. 2004, 213:3–214:2); PO Sur-reply 22–23. Patent Owner further asserts that stranded conductors have advantages over solid core wires, including better flexibility and high frequency performance. PO Reply, 43 (citing Ex. 2004, 162:18–164:9; Ex. 2001 ¶ 82).

In addition, Patent Owner asserts that a POSITA would have understood that GmbH-866 does not teach twisted pairs, but, rather, teaches away from twisted pairs, because the disclosed conductors are both physically and electromagnetically intertwined, not isolated. *Id.* at 44 (citing Ex. 2001 ¶ 83). Patent Owner also contends that twisted pairs are not typically referred to as having a “diameter,” yet GmbH-866 describes the “effective diameter” of the individual conductors, thus indicating that the conductors are not twisted pairs. *Id.* at 45 (citing Ex. 2001 ¶ 86).

In addition, Patent Owner asserts that GmbH-866’s statement on page 4 that the invention can also “comprise just two pairs of stranded conductors” relates to the teaching that pairs are stranded together into helical or SZ form, not that individual conductors are twisted together to form a twisted pair. *Id.* at 46–48.

a) Analysis of “Twisted Pair” Limitations

Based upon our review of the full record, we agree with Petitioner that GmbH-866 discloses a first and second “twisted pair of insulated conductors” as required by claim 27. Anticipation is assessed from the perspective of a person of ordinary skill in the art. *Dayco Prods.*, 329 F.3d at 1368. The “dispositive question regarding anticipation [i]s whether one skilled in the art would reasonably understand or infer from the [prior art reference’s] teaching” that every claim element was disclosed in that single reference. *Id.* (quoting *Baxter Travenol Labs.*, 952 F.2d at 390). Thus, the

relevant issue presented here is whether a POSITA would reasonably understand or infer that the “stranded” conductors in GmbH-866 constitute “twisted pairs,” not whether the term “stranded” or “stranding” conductors could have another meaning in another context.

Petitioner provides persuasive arguments and evidence that the “pairs” of stranded copper conductors referred to in GmbH-866, and shown in Figure 1, refer to twisted pairs. GmbH-866 states that:

A data transfer cable according to the invention, shown in Figure 1, comprises *four pairs 1, each consisting of two isolated, stranded copper conductors 2 or wires.*

Ex. 1010, 3 (emphasis added). GmbH-866 further states that:

The stranding of the pairs 1 can consist in what is known as a helix stranding or in an SZ stranding (alternating, right-left stranding). . . . The structure described above is common to all embodiments of the data transfer cable according to the invention. However, it is possible not only, as shown, for four pairs 1 to be provided, but rather that a data transfer cable according to *the invention can also comprise just two pairs of stranded conductors.* Any desired n-pairs can be provided, n being an even-numbered multiple of 1.

Ex. 1010, 3–4 (emphasis added).

We are persuaded by Mr. Cornelison’s supported testimony that a POSITA would have understood that the italicized language, i.e., “*four pairs 1, each consisting of two pairs isolated, stranded copper conductors*” (Ex. 1010, 3) and the “*two pairs of stranded conductors*” (Ex. 1010, 4) refer to “twisted pairs” because twisted pairs was the conventional practice for data communications cables using pairs of copper conductors. Pet. 22 (citing Ex. 1007 ¶¶ 33–35, 89–90, 118; Ex. 1019, 1:10–15; Ex. 1016, 7; Ex. 1029, 23, 25, 33 Fig. 55.1; Ex. 1017, 11), 43.

Mr. Cornelison persuasively supports this position by explaining that since well before 1999, twisting pairs of insulated conductors into multiple sets of twisted pairs was the most common and conventional way to provide insulated conductors in data communications cables. Ex. 1007 ¶ 33. Mr. Cornelison cites to numerous references that show that it was conventional practice to use twisted (stranded) pairs of insulated copper wires in data communications cables as of February 1999 and for decades prior. *See, e.g., id.* ¶¶ 33, 177 (*citing* Exs. 1014, 1016, 1017, 1029, 1035); *see also* Ex. 1019, 1:10-15 (“A typical telephone cable is constructed of twisted pairs of metal conductors”); Ex. 1016 at 7 (“Most of the cables within the scope of AT&T’s EC&W product line utilize the twisted pair construction.”); 9 (showing “pair twisting” as the first step in making cable core units); Ex. 1029, 23 (“Twisted Pair Data Cables”), 25 (“Cables with twisted pairs are used where balanced signal transmission is required, together with low crosstalk”), 33 (Fig. 55.1: cross-section of telecommunication twisted pair cable); Ex. 1017, 11 (“The most commonly used transmission media in present-day digital loop applications is twisted pair metallic (copper) cable”); Ex. 1035, 20 (“Insulated conductors twisted to form pairs with varying lays to minimize crosstalk and meet capacitance unbalance limitations.”).

Patent Owner asserts that the term “stranded conductors” does not *necessarily* teach “twisted pairs” but rather refers to a stranded wire, which Petitioner’s own expert admits is a wire that is “first formed of much smaller elements of rods of copper and then assembled together to form a larger composite conductor.” PO Resp. 43 (quoting Ex. 2004, 160:15–163:2 and citing Ex. 2001 ¶ 82); PO Sur-reply 22–23 (stating stranded copper conductors in GmbH-866 do not “necessarily” teach twisted pairs and the

term “twisted pair” never appears in GmbH-866). Patent Owner asserts that there are advantages to a stranded conductor over solid core wires, including improved flexibility and electrical characteristics. *Id.* at 43–44. Patent Owner also asserts that if GmbH-866 were teaching that “conductor pairs” of GmbH-866 were themselves stranded together, then a POSITA would expect some teaching that the two conductors are twisted together within a given pair. *Id.* at 45.

Patent Owner’s arguments do not rebut Mr. Cornelison’s persuasive testimony that twisted pairs are commonly used in data communications cables and that, unless otherwise indicated, a POSITA would assume that a “pair” in a data communication’s cable refers to a twisted pair. While we agree that a stranded wire or stranded conductor can refer to wire/conductor that is made up of small diameter wires that are twisted together, the cited material of GmbH-866 refers to “pairs” of stranded conductors. Petitioner has the better argument that a POSITA would understand that the “pairs of stranded conductors” refers to a twisted pair of conductors, which is how pairs of conductors are normally provided, and not just two individually stranded conductors that are not twisted around each other but, rather, are made up of smaller wires that are twisted around each other. Additionally, as Petitioner contends, “stranding” relates throughout the GmbH-866 reference to the twisting of individual components together, and we agree with Petitioner that a consistent reading of the term in the reference leads to the conclusion that the pairs of conductors/wires are twisted together. *See* Pet. Reply 15–16 (citing Ex. 1010, 3, 4; Ex. 1081 ¶¶ 46–48).

We do not agree with Patent Owner’s argument that GmbH does not disclose twisted pairs because the reference refers to “effective diameter” of the individual copper conductors or wires but a twisted pair is not typically

referred to as having a diameter at all. PO Resp. 45–46 (citing Ex. 2001 ¶ 86; Ex. 1010, 3); *see also id.* at 46 (stating that an effective diameter is typical for both stranded copper conductors or solid wires in a data transfer cable). GmbH, however, states that the “effective diameter of said copper conductors or wires is in particular 0.4 to 0.66 mm.” Ex. 1010, 3. Thus, GmbH-866 is merely identifying the effective diameter of each of the copper conductors or wires that comprise the twisted pair, not to the overall diameter of the twisted pair. *See* Ex. 1010, 3.

Patent Owner also asserts that because GmbH states that the stranded conductor or wire preferably has insulation element 3 that surrounds each individual stranded copper conductor or wire, but does not state that the insulation along with the conductors are twisted together, a POSITA would not expect GmbH-866 to teach that the conductors and their surrounding insulation are stranded together. PO Resp. 46 (citing Ex. 2001 ¶ 87). We disagree with this argument. In particular, we disagree with Patent Owner’s unsupported contention that a POSITA would expect a reference teaching twisted/stranded pairs of insulated conductors to state that the conductors, *as well as their surrounding insulation*, are stranded together.

Thus, for the forgoing reasons, Petitioner has sufficiently shown that GmbH-866 discloses the first and second twisted pairs of insulated conductors as recited in claim 27.

We have also reviewed Petitioner’s contentions and supporting evidence that GmbH-866 discloses the remaining limitations of claim 27, which Patent Owner does not dispute. *See generally* PO Resp. We agree with and adopt Petitioner’s analysis as to these claim elements, which are set forth above.

Thus, based on the record developed during trial, we conclude Petitioner has demonstrated by a preponderance of the evidence that claim 27 is anticipated by GmbH-866.

*b) Petitioner's Additional Arguments
Regarding Patent Owner's Previous Statements
about GmbH-866*

Petitioner, in its Reply, also argues that Patent Owner's position that GmbH-866 does not disclose twisted pairs is not credible because Patent Owner previously admitted, in both a previous district court patent litigation and a reexamination proceeding, that GmbH-866 disclosed twisted pairs. *See, e.g.*, Pet. Reply 12–15. In particular, Petitioner asserts that Patent Owner admitted that GmbH-866 disclosed twisted pairs in a Joint Statement of Admitted Facts (*id.* at 13 (citing Ex. 1076 ¶¶ 16, 18)), in discovery responses, dispositive motion practice, and during trial (*id.* at 13 (citing Ex. 1077, 31; Ex. 1061, 11; Ex. 1063, 1360:19–20) as well as during a prior *inter partes* reexamination (*id.* at 13 (citing Ex. 1058, 69; Ex. 1059, 21–33))).

Patent Owner responds that its earlier statements in these other proceedings related to a different, uncertified English language translation (Ex. 1057) of GmbH-866 than that at issue in the present proceeding, that there are “significant” differences between the two translations, and that the statements were made by a different expert. *See, e.g.*, PO Sur-reply 18–25. To support these argument, Patent Owner provides a copy of an expert report (Ex. 2012) that was relied upon in the prior litigation. *Id.* at 19–21 (citing Ex. 2012).

Because we already determined that Petitioner sufficiently shows that the GmbH-866 discloses twisted pairs and that claim 27 is anticipated by GmbH-866, we need not consider Petitioner's additional argument that

Patent Owner's admissions constitute further evidence that GmbH-866 discloses twisted pairs or Patent Owner's arguments in opposition thereto.

2. *Claims 28 and 29*

Petitioner argues that claims 28 and 29 are anticipated by GmbH-866. Pet. 50–52. In particular, Petitioner asserts that GmbH-866's partial shield 11 or 12 discloses the limitations of claim 28 requiring the separator to be arranged so as to provide sufficient spacing between the first and second twisted pair of insulated conductors to provide a desired crosstalk isolation between the first and second twisted pairs. Pet. 50–51 (citing Ex. ¶¶197–202; Ex. 1010, 4, claim 1, Fig. 1; Ex. 1023, 3:17–24; Ex. 1015, 7:58–61; Ex. 1003, 15). Petitioner also asserts that the grooves formed by GmbH-866's partial shielding 11 do not form completely enclosed channels as required by claim 29 (“wherein the at least two grooves do not form completely enclosed channels”). Pet. 52 (citing Ex. 1010, Fig. 1; Ex. 1001, 5:6–7, Fig. 5; Ex. 1007 ¶¶ 203–204).

Other than asserting GmbH-866 does not disclose twisted pairs, which we address above, Patent Owner does not dispute these particular assertions. We have reviewed Petitioner's contentions and evidence that GmbH-866 discloses each limitation recited in claims 28 and 29. We agree with and adopt Petitioner's analysis as to these claim elements, as set forth above.

F. Asserted Obviousness of Claims 30–33 over GmbH-866, Jachimowicz, and Gingue (Ground 4)

Petitioner argues that independent claim 31 and dependent claims 30, 32, and 33 would have been obvious over GmbH-866 and one or more of Jachimowicz and Gingue. Pet. 52–59.

1. *Dependent Claim 30*

Claim 30 depends from claim 27 and further requires the separator to comprise “a foamed polymer tape.” Ex. 1001, 12:36–58. In connection with claim 27, Petitioner asserts that GmbH-866 discloses a substantially flat separator (i.e., partial shieldings 11 or 12) that comprise a metal foil laminated with a plastic coating. Pet. 44 (citing Ex. 1010, 5, Fig. 1; Ex. 1007 ¶¶ 44–45, 98, 181, 183); *see also* Ex. 1007 ¶ 215 (describing GmbH-866’s partial shields 11, 12 as a “metal foil . . . ‘laminated with plastics material’”) (citing Ex. 1010, 5). Regarding claim 30, Petitioner admits that GmbH-866’s separator (shielding 11 or 12) does not disclose a “foamed polymer tape.” Pet. 52. Petitioner asserts, however, that Jachimowicz discloses foamed polymer tape, that both Jachimowicz and Gingue teach the benefits of using foamed polymer in data communications cables, and that it would have been obvious to use a foamed polymer tape with GmbH-866’s partial shielding 11 and 12, either in addition to or in place of the shielding’s non-foamed plastic coating. *Id.* at 52–53 (citing Ex. 1007 ¶¶ 103–107, 141–143, 206–220; Pet. 31–40); *see also id.* at 33–38 (describing the benefits of using foamed polymer insulators with Roberts’ metal shield member 15).

More particularly, Petitioner asserts that it was known that metal shielding around twisted pairs, such as that shown in GmbH-866, caused undesirable transmission loss that degraded cable performance. Pet. 54 (citing Ex. 1007 ¶¶ 49–50, 208, 212; Ex. 1015, 2:54–66); *see also* Ex. 1015, 2:54–65 (stating that “as the electric and magnetic fields are confined [by the shielding], capacitance . . . change[s] each in such a way as to increase transmission loss”). Mr. Cornelison testifies that GmbH-866’s metal shield

would have been expected to cause detrimental transmission loss. Ex. 1007 ¶ 208 (citing Ex. 1015, 2:54–65).

Petitioner asserts that a POSITA would have been motivated to include a substantially flat foamed polymer tape in GmbH-866’s substantially flat dielectric separator (shieldings 11, 12), either in addition to or instead of the non-foamed plastic coating for three reasons: (1) reduce transmission losses, (2) enhance protection against dielectric breakdown, and (3) improve flame resistance of the cable. Pet. 53–57 (citing Pet. 31–38; Ex. 1007 ¶¶ 205–214; Ex. 1010, Fig. 1). First, Petitioner asserts that adding a foamed polymer tape to the separator’s shield would predictably reduce transmission losses by lowering the dielectric constant of the material between conductors and increasing the distance between conductors. Pet. 55 (citing Pet. 35–36 (citing Ex. 1007 ¶¶ 103–107, 146–149; Ex. 1014, 2:55–60; Ex. 1015, 2:62–64)). Second, Petitioner asserts that adding a foamed polymer tape provides “dielectric protection” from unwanted electrical energy escaping holes in the copper conductor insulation. Pet. 36 (citing Ex. 1009, 13:41–45, 3:39–51; Ex. 1007 ¶¶ 150–152). Third, Petitioner asserts that adding a foamed polymer tape would predictably improve the flame resistance of GmbH-866’s outdoor cable. Pet. 55–56 (citing Ex. 1007 ¶¶ 213–214).

Patent Owner responds that Petitioner’s proposed combination does not teach a pair separator that is a “substantially flat foamed polymer tape.” PO Resp. 66–72. Patent Owner argues that, while Gingue discloses foamed polymers, it does not disclose or suggest using a foamed polymer *tape*. PO Resp. 67 (citing Ex. 2007 ¶ 180–181; Ex. 1013, 1:8–15, 5:24–29).

Patent Owner asserts that Jachimowicz’s jacket does not separate the twisted pairs, but rather locks the pairs together. *Id.* Patent Owner contends

that a POSITA would understand that Jachimowicz's jacket, whether an extruded foam polymer or a tape, needs to be sufficiently *rigid* to bundle the pairs of conductors together and render them "unable to move" and that nothing in Jachimowicz suggests a jacket designed to "lock" the twisted pairs together would or could be used to separate conductor pairs. *Id.* at 68–69 (citing Ex. 2007 ¶¶ 182–185).

Patent Owner also asserts that the only depiction of Jachimowicz's jacket, relied on by Petitioner, is shown in Figure 1 as having an "undulating surface" and is therefore not substantially flat. *Id.* at 69–70 (citing Ex. 2007 ¶ 186; Ex. 1014, Fig. 1); Ex. 2007 ¶ 186 (stating that a POSITA would understand "foamed jacket (20) or foamed tape ([Ex. 1014], 3:51–52) to have an undulating surface, just as it is shown in FIG. 1").

Patent Owner does not dispute Petitioner's first and second reasons that a POSITA would have been motivated to include a substantially flat foamed polymer tape, such as that taught in Jachimowicz, in GmbH-866's substantially flat dielectric separator (shieldings 11, 12), but does assert that Mr. Cornelison admitted that Mylar and foamed polymers are flammable and that adding such flammable material would make the cables more flammable, not flame retardant. PO Resp. 53 (citing Pet. 34–35, 54–56, 74–75; Ex. 1007 ¶¶ 46, 210–214, 280–281, 286; Ex. 2004, 129:15–130:13).

a) Analysis

We agree with Petitioner, and Patent Owner does not dispute, that GmbH-866 discloses partial shieldings 11, 12 (i.e., separators), comprising aluminum foil laminated with plastic (dielectric) material, that are substantially flat prior to installation. *See, e.g.*, Pet. 44–46; Ex. 1007 ¶¶ 183–185; Ex. 1010, 4, Fig. 1. We also agree, and Patent Owner does not dispute, that polymers such as polyethylene have a very low dielectric

constant, that foaming a polymer further lowers the dielectric constant, and that a POSITA would have been motivated to modify GmbH-866 to use a foamed dielectric polymer instead of, or in addition to, the non-foamed plastic dielectric coating on GmbH-866's shielding 11, 12 in order to lower the dielectric constant of materials between conductors, thereby reducing transmission loss and predictably improve performance and reliability of the cable. *See* Pet. 34–35, 53–57 (citing, *inter alia*; Ex. 1007 ¶¶ 44–45, 48, 143, 146–149; Ex. 1015, 2:62–64; Ex. 1014, 2:46–54, 2:55–60; Ex. 1013, 2:10–14, 3:20–25). As such, we need not consider whether a POSITA would also been motivated to use a foamed dielectric polymer instead of, or in addition to, the non-foamed plastic dielectric coating on GmbH-866's shielding in order to improve the flame resistance of GmbH-866's outdoor cable. *See* Pet. 55–56 (citing Ex. 1007 ¶¶ 213–214).

We also agree with Petitioner that Jachimowicz discloses a substantially flat tape made of foamed thermoplastic and that a POSITA would have been motivated to modify partial shieldings 11, 12 of GmbH-866 to include a substantially flat dielectric foamed polymer tape, such as that taught by Jachimowicz, as both Jachimowicz and Gingue teach the benefits of using a foamed polymer as a dielectric isolation/insulation component in communications cables in place of, or in addition to, metal/plastic shieldings 11, 12. *See, e.g.*, Pet. 53–57; Ex. 1007 ¶¶ 205–220; *see also* Ex. 1007 ¶ 143 (stating that Gingue teaches advantages of using foamed polymers, such as that disclosed in Jachimowicz, as insulation for conductors over non-foamed plastic polymers, because of their very low dielectric constant and enhanced electrical properties and citing, *inter alia*, Ex. 1013, 2:10–14, 3:20–26; Ex. 1014, 2:46–54).

We find that Jachimowicz’s Mylar backed, foamed tape is substantially flat. *See, e.g.*, Pet. 32–34; Ex. 1007 ¶¶ 144, 210; Ex. 1081 ¶¶ 83–84; Ex. 2004, 104:4–104:16. Mr. Cornelison persuasively testifies, based on his many years in the industry and experience and familiarity with Mylar-backed foamed tapes, that a POSITA would have understood the tape used in Jachimowicz, a Mylar backed foam tape, would be substantially flat. Ex. 1081 ¶ 84; *see also id.* ¶ 83 (stating that foamed tape would be flat before being wrapped around twisted pairs).

We have considered Patent Owner’s argument that Jachimowicz does not disclose a substantially flat dielectric polymer tape because (1) the foamed jacket shown in Figure 1 has an undulating, not flat, structure and (2) Jachimowicz does not state that its tape is flat before it is installed within the Jachimowicz cable. PO Resp. 69–70 (citing Ex. 2007 ¶¶ 186–188); *see also id.* at 70 (stating a POSITA would not understand Jachimowicz’s tape to be flat, “given the only depiction” of jacket 20 in Figure 1); *see also* PO Sur-reply 26–27 (asserting that it is “wrong . . . to distinguish between the jacket and the tape” because “they are both the same element ‘20’”).

We disagree with Patent Owner’s argument. Even though both the jacket and the tape are identified as element 20, the jacket and the tape are not exactly the same. For example, the jacket is made up of foamed polyethylene that, during manufacturing of the cable, is “extruded” over the bundle to “lock” the pairs together. Ex. 1014, 2:47–50. In contrast, Jachimowicz states that the pairs can be “held” together in other ways by “applying” a tape made of foamed thermoplastic supported by a film such as Mylar or polypropylene. *Id.* at 2:50–53. Thus, the method of applying the tape and jacket are different. We credit Mr. Cornelison’s persuasive testimony that the undulations seen in the extruded jacket in Figure 1 were

the result of the extrusion process in which the extruded foam would conform to the twisted pairs that it was being extruded over. Ex. 1081 ¶ 83. We also credit Mr. Cornelison’s testimony that while foamed tape may compress and conform to the twisted pairs *after* being wrapped around them, a POSITA would have expected the tape to be *flat before* it was applied.⁸ *Id.*

We disagree with Patent Owner’s argument that, because Mr. Cornelison stated during his deposition that did not know if all tapes were substantially flat, he is “merely speculat[ing]” that Jachimowicz’s tape could be flat. PO Resp. 70 (citing Ex. 2004, 102:13–103:8). We have reviewed the testimony and understand Mr. Cornelison to have testified that he did not agree, or know, if *all tapes* were substantially flat, but that *Mylar* backed foamed tapes, like that described by Jachimowicz, were substantially flat. *See* Ex. 1081 ¶ 84; Ex. 2004, 102:22–103:8. We also disagree with Patent Owner’s contention that Mr. Cornelison had an incorrect understanding of the tape’s function. PO Resp. 70–71. Patent Owner asserts that Mr. Cornelison improperly believes that the purpose of the tape is merely to keep the tape “held together,” which could allow conductors, pairs to move above, while the purpose of the jacket is to “lock the pairs” to deliberately limit the movement of the pairs. *Id.* (citing Ex. 2004, 106:16–112:1). Mr. Cornelison’s testimony, however, mirrors the language used in Jachimowicz when describing the jacket and when using the tape. *Compare* Ex. 1014, 2:47–49 (stating jacket 20 “lock[s]” pairs together) *with id.* at 2:51–54

⁸ Because we agree with Mr. Cornelison that a POSITA would expect Jachimowicz’s foamed tape to be flat before it was applied, we do not reach Petitioner’s arguments that a tape with an undulating surface would be considered “substantially flat.” *See, e.g.,* Pet. Reply 30.

(stating the pairs can be “held together in the bundle in other ways” by “applying a tape made of foamed thermoplastic”).

As such, we determine Petitioner has sufficiently shown that GmbH-866, in combination with Jachimowicz and Gingue discloses all of the limitations recited in claim 30 and provides a sufficient reason for combining the teachings to arrive at the claimed subject matter of claim 30. Thus, we determine that Petitioner has shown by a preponderance of the evidence that claim 30 would have been obvious over the combined teachings of GmbH-866, Jachimowicz, and Gingue.

2. Independent Claim 31

As noted above, independent claim 31 recites claim elements similar to those independent claim 27, but claim 31 further requires that the configurable dielectric pair separator include a “substantially flat dielectric tape formed of a foamed polymer.” Ex. 1001, 12:43–45. Petitioner asserts that GmbH discloses the limitations of claim 31 (i.e., elements [31.a]–[31.b] and [31.d]–[31.e]) that are similar to those found in claim 27 (i.e., elements [27.a]–[27.d]) for the same reasons as set forth in connection with claim 27. Pet. 57 (citing Ex. 1007 ¶¶ 171–196, 221–223, 226–228). Other than the arguments set forth above regarding claim 27, Patent Owner does not dispute that GmbH-866 discloses limitations [31.a]–[31.b] and [31.d]–[31.e]. We agree with Petitioner that GmbH discloses claim elements [31.a]–[31.b] and [31.d]–[31.e] for the same reasons that GmbH discloses the corresponding claim elements in claim 27 as set forth above in Section II.E.1.

With regard to the limitation requiring that the configurable dielectric pair separator include a substantially flat dielectric tape formed of a foamed polymer set forth in claim element [31.c], Petitioner asserts that a POSITA

would have found this element taught by the combination of GmbH-866, Jachimowicz, and Gingue for the same reasons set forth with respect to claim 30, which recites the same limitation. Pet. 57–58 (citing Pet. 52–57; Ex. 1007 ¶¶ 205–220, 224–225). Patent Owner’s arguments regarding the patentability claim 31 are the same as its arguments regarding claim 30. *See* PO Resp. 66–72. We agree with Petitioner that the combination of GmbH-866, Jachimowicz, and Gingue teaches the subject matter recited in claim element [31.c] and provides a sufficient reason for combining the references to arrive at the claimed subject matter. Thus, we determine that Petitioner has shown by a preponderance of the evidence that claim 31 would have been obvious over the combined teachings of GmbH-866, Jachimowicz, and Gingue.

3. *Claim 32*

As noted above, claim 32 depends from claim 31 and further requires that the “configurable dielectric pair separator is arranged to provide a sufficient spacing between the at least two twisted pairs of insulated conductors so as to provide a desired crosstalk isolation between the at least two twisted pairs of insulated conductors.” Ex. 1001, 12:53–58.

Petitioner argues that GmbH-866 teaches the limitations recited in claim 32 for the same reasons asserted with respect to claim 28, i.e., GmbH-866’s partial shield 11 or 12 provides sufficient spacing between the first and second twisted pair of insulated conductors to provide a desired crosstalk isolation between the first and second twisted pairs. Pet. 58 (citing Ex. 1007 ¶¶ 197–202, 229–230). Patent Owner does not dispute these particular assertions.

We have reviewed Petitioner’s arguments and agree with Petitioner that GmbH’s partial shield 11 or 12 provides sufficient spacing between the

first and second twisted pair of insulated conductors to provide a desired crosstalk isolation between the first and second twisted pairs. Thus, we determine that Petitioner has shown by a preponderance of the evidence that claim 32 would have been obvious over the combined teachings of GmbH-866, Jachimowicz, and Gingue.

4. *Claim 33*

As noted above, claim 33 depends from claim 31 and further requires that the “configurable dielectric pair separator is arranged within the jacket to provide at least two grooves, at least one twisted pair of conductors being disposed within each of the at least two grooves.” Ex. 1001, 12:59–63. Petitioner argues that GmbH-866 teaches the limitations recited in claim 33 for the same reasons asserted with respect to claim element [27.e]. In particular, Petitioner asserts that GmbH-866’s partial shielding 11 and 12 are each arranged within cable sheath 4 so that the sheath (jacket) forms at least two grooves as required by claim element [27.e]. Pet. 58 (citing Pet. 49–51; Ex. 1007 ¶¶ 195–196, 231–232).

Patent Owner does not dispute these particular assertions. We have reviewed Petitioner’s arguments and evidence and determine that Petitioner shows by a preponderance of the evidence that claim 33 would have been obvious over GmbH-866, Jachimowicz, and Gingue.

G. *Remaining Challenges*

Because we determine that all challenged claims are unpatentable over the GmbH-866 asserted grounds, we need not, and do not, reach Petitioner’s remaining grounds.

III. PETITIONER’S MOTION TO EXCLUDE EXHIBIT 2012

Petitioner filed a Motion to Exclude Exhibit 2012, an exhibit titled “Rebuttal Expert Report of Mark Horenstein, Ph.D.” that was filed for the

first time with Patent Owner's PO Sur-reply. Paper 35. As noted above in Section II.E.1.b, Exhibit 2012 was submitted to rebut Petitioner's arguments that Patent Owner previously admitted that GmbH-866 discloses twisted pairs. *See also* PO Sur-reply 18–22 (stating Patent Owner's current expert "reached different conclusions regarding what a POSITA would understand reading the certified translation of GmbH-866"). As also noted above, we do not rely on Petitioner's arguments about Patent Owner's previous statements to resolve the patentability of the challenged claims, and thus do not need to consider Patent Owner's rebuttal evidence. Accordingly, Petitioner's Motion to Exclude Exhibit 2012 is *dismissed* as moot.

IV. PATENT OWNER'S MOTION TO EXCLUDE EXHIBIT 1055

Patent Owner filed a motion to exclude Exhibit 1055, which is an "uncertified" English language transition of Yanagita Japanese patent application (Ex. 1056). Paper 36. We do not rely on Patent Owner's Exhibit 2012 to resolve the disputes before us in this proceeding. Therefore, Petitioner's Motion to Exclude Exhibit 2012 is *dismissed* as moot.

V. CONCLUSION

In summary:

Claims	35 U.S.C. §	Reference(s)	Claims Shown Unpatentable	Claims Not Shown Unpatentable
27–29	102(a), (b)	Roberts		
30–33	103(a)	Roberts, Jachimowicz, Gingue		
27–29	102(a), (b)	GmbH-866	27–29	
30–33	103(a)	GmbH-866, Jachimowicz, Gingue	30–33	
27–33	103(a)	Roberts, GmbH-866, Jachimowicz, Gingue		
27–33	103(a)	GmbH-866, Roberts, Jachimowicz, Gingue		
27–29	102(a), (b)	Yanagita		
30–33	103(a)	Yanagita, Jachimowicz, Gingue		
Overall Outcome			27–33	

VI. ORDER

In consideration of the foregoing, it is hereby:

ORDERED that Petitioner has shown by a preponderance of the evidence that claims 27–33 of the '905 Patent are unpatentable;

FURTHER ORDERED that Petitioner's Motion to Exclude is dismissed as moot; and

FURTHER ORDERED that Patent Owner's Motion to Exclude is dismissed as moot; and

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

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