

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

BERK-TEK LLC
Petitioner

v.

BELDEN TECHNOLOGIES INC.
Patent Owner

Case IPR2013-00059
Patent 7,135,641

Before JAMESON LEE, JOSIAH C. COCKS, and
PHILLIP J. KAUFFMAN, *Administrative Patent Judges*.

KAUFFMAN, *Administrative Patent Judge*.

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

I. BACKGROUND

A. *Introduction*

On November 19, 2012, Petitioner, Berk-Tek, LLC, filed a petition for *inter partes* review of claims 1-22 of U.S. Patent No. 7,135,641 B2 (“the ’641 Patent”).¹ Paper 1. Petitioner filed a revised petition on November 28, 2012.² Paper 4 (“Pet.”). On May 2, 2013, the Board instituted trial for claims 1-22. Paper 12 (“Dec.”).

After institution of trial, Patent Owner filed a patent owner response (Paper 19, “PO Resp.”), but did not file a motion to amend. Subsequently, Petitioner filed a reply to Patent Owner’s Response. Paper 20 (“Pet. Reply”).

Oral hearing was held on January 23, 2014.³

The Board has jurisdiction under 35 U.S.C. § 6(c). This final written decision is issued pursuant to 35 U.S.C. § 318(a).

Claims 1-9, 11-19, 21, and 22 of the ’641 Patent are unpatentable.

Claims 10 and 20 have not been shown to be unpatentable.

¹ On the original Petition, Petitioner is identified as “Nexans, Inc.” Paper 1. By Notice dated April 18, 2013, Nexans informed the Board that Nexans’s successor in interest is “Berk-Tek, LLC.” Paper 12.

² All further references to the Petition are to the revised Petition unless otherwise stated.

³ A transcript of the oral hearing is included in the record as Paper 26 (“Tr.”).

B. Standard for Decision with Respect to Patentability

When, as here, an *inter partes* review is instituted and not dismissed, the Board shall issue a final written decision with respect to the patentability of any patent claim challenged by Petitioner. 35 U.S.C. § 318(a). The standard for determining patentability is set forth in 35 U.S.C. § 316(e), which provides as follows:

(e) Evidentiary standards - In an *inter partes* review instituted under this chapter, Petitioner shall have the burden of proving a proposition of unpatentability by a preponderance of the evidence.

C. The '641 Patent

The '641 Patent relates to high-speed communication cables using at least two twisted pairs of wires. Ex. 1001, 1:29-30. As background, the '641 Patent describes that when twisted pairs of conductors lay close together, such as in a cable, electrical energy may be transferred from one pair within a cable to another, causing crosstalk, which is undesirable generally. Ex. 1001, 1:47-51. If adjacent twisted pairs of conductors either have the same pair lay (the longitudinal distance between twists in twisted pairs of conductors) or have the same twist direction, the pairs lay closer together, increasing undesirable crosstalk between those pairs. *Id.* at 1:58-65. Conversely, varying pair lay and/or twist direction between adjacent twisted pairs increases the distance between these pairs and reduces crosstalk. *Id.* at 1:66-2:3.

One embodiment of the '641 Patent includes a jacket that comprises a plurality of protrusions, which extend away from an inner circumferential

surface of the jacket and keep the plurality of twisted pairs of insulated conductors away from the inner circumferential surface of the jacket, thereby reducing alien near end crosstalk between the plurality of twisted pairs. *Id.* at 3:48-60.

Figure 13 of the '641 Patent is reproduced below:

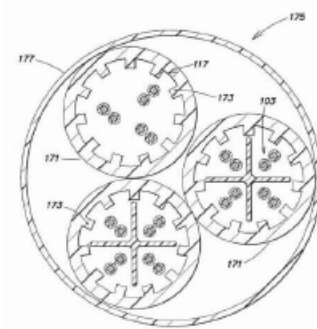


Figure 13 illustrates an embodiment of cables having jackets with inwardly extending projections.

Cable 117, shown in Figure 13, includes striated jacket 171 having a plurality of inwardly extending projections 173 that provide “more air separating the jacket . . . from the twisted pairs 103 compared with a conventional jacket.” *Id.* at 11:5-11. The separation of the jacket from the twisted pairs permits “less attenuation due to increased air surrounding the twisted pairs” and helps “to reduce alien crosstalk between adjacent cables . . . in a bundled cable.” *Id.* at 11:14-18.

D. Illustrative Claim

Of the challenged claims, claims 1 and 13 are independent. Claim 1 is illustrative and is reproduced below:

1. A cable comprising:
 - a plurality of twisted pairs of insulated conductors including a first twisted pair and a second twisted pair, each twisted pair comprising two insulated conductors twisted together in a helical manner;
 - a separator disposed among the plurality of twisted pairs of insulated conductors so as to physically separate the first twisted pair from the second twisted pair; and
 - a jacket surrounding the plurality of twisted pairs of insulated conductors;wherein the jacket comprises a plurality of protrusions extending away from an inner circumferential surface of the jacket, and wherein the plurality of protrusions cause the plurality of twisted pairs of insulated conductors to be kept away from the inner circumferential surface of the jacket.

E. The Prior Art References Supporting Alleged Unpatentability of Claims 1-22

Gingue '748	US 5,670,748	Sep. 23, 1997	Ex. 1014
Newmoyer '046	US 5,796,046	Aug 18, 1998	Ex. 1008
Grandy '612	US 6,150,612	Nov. 21 2000	Ex. 1010
Gagnon '308	US 6,441,308 B1	Aug 27, 2002	Ex. 1012
Clark '954	US 6,248,954 B1	Jun. 19, 2001	Ex. 1013

F. *Pending Grounds of Unpatentability Against Claims 1-22*⁴

References	Basis	Claims Challenged
Newmoyer '046 and either Grandy '612 or Admitted Prior Art (APA)	§ 103(a)	1-3, 5, 7-9, 11-17, 19, 21 and 22
Newmoyer '046 and Grandy '612	§ 103(a)	18
Newmoyer '046, Gagnon '308, and either Grandy '612 or APA	§ 103(a)	4
Newmoyer '046, Clark '954, and either Grandy '612 or APA	§ 103(a)	6
Newmoyer '046, Gingue '748, and either Grandy '612 or APA	§ 103(a)	10 and 20

II. CLAIM INTERPRETATION

In an inter partes review, claim terms in an unexpired patent are interpreted according to their broadest reasonable construction in light of the specification of the patent in which they appear. 37 C.F.R. § 42.100(b). Claim terms are also given their ordinary and customary meaning as would be understood by one of ordinary skill in the art in the context of the entire disclosure. *In re Translogic Tech., Inc.*, 504 F.3d 1249, 1257 (Fed. Cir. 2007). An inventor may rebut that presumption by providing a definition of the term in the specification with reasonable clarity, deliberateness, and precision. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994). In the absence of such a definition, limitations are not to be read from the

⁴ See Dec. 16.

specification into the claims. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

A. *Claim Language*⁵

We begin our claim construction analysis with the claims. *See Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (“It is a bedrock principle of patent law that the claims of a patent define the invention to which the patentee is entitled the right to exclude.” (citations and quotations omitted)). Independent claims 1 and 13 are each directed to a cable that includes a jacket comprising “a plurality of protrusions extending away from an inner *circumferential surface* of the jacket.” Ex. 1001, 11:50-52; 12:34-36 (emphasis added). Both claims call for the protrusions to provide space between the plurality of twisted pairs of insulated conductors and the inner circumferential surface of the jacket. *Id.* at 11:52-55 (claim 1, cause “to be kept away”); 12:36-39 (claim 13, “provide an air gap”).

This language establishes two requirements regarding the claimed circumferential surface. First, the protrusions are not part of the claimed circumferential surface because the protrusions cannot both be part of the circumferential surface and provide space between that surface and the plurality of twisted pair conductors. Second, the circumferential surface

⁵ Patent Owner and Petitioner each discusses the meaning of an “inner circumferential surface” as claimed. *See, e.g.*, Pet. Reply 16; Pet. Reply 8. However, the claim term “inner” is not in dispute, and identifies the inner as opposed to the outer surface of the jacket. Therefore, our discussion focuses on the claim term “circumferential surface.”

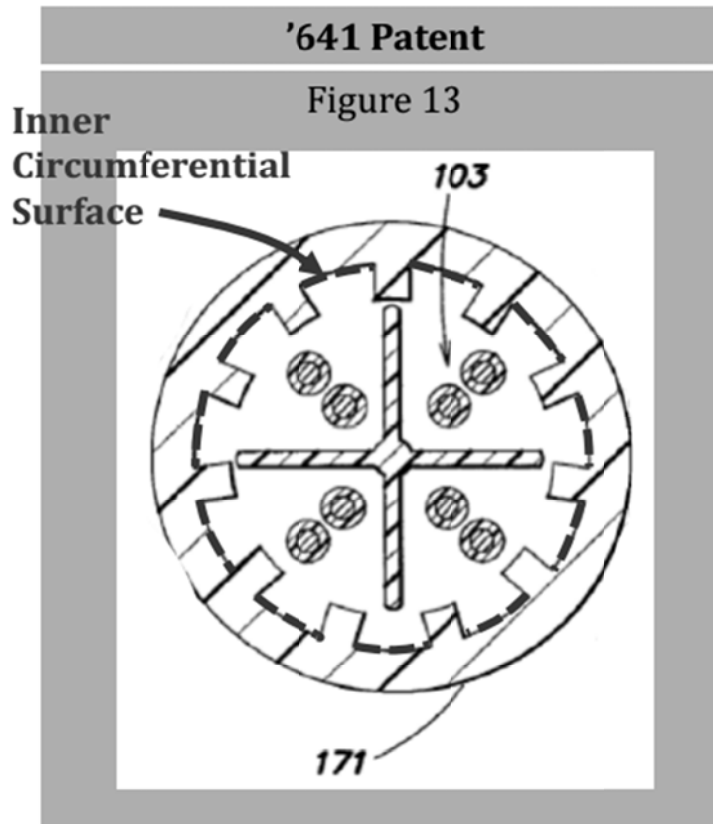
Case IPR2013-00059
Patent 7,135,641

serves as a reference point from which the protrusions extend because the protrusions extend away from the circumferential surface.

B Patent Owner Interpretation

According to Patent Owner, a person of ordinary skill in the art would recognize that claims 1 and 13 require that the jacket has an inner circumferential surface and that the plurality of protrusions 173 extend away from this inner circumferential surface, as illustrated in Figure 13. PO Resp. 16-19. This assertion simply echoes the claim language. Patent Owner provides a more detailed claim construction via an annotated drawing and reference to the prior art.

An annotated version of a portion of Figure 13
of the '641 is reproduced below:



This figure depicts one of the three cables 117
(not labeled here) shown in Figure 13 of the '641 Patent.

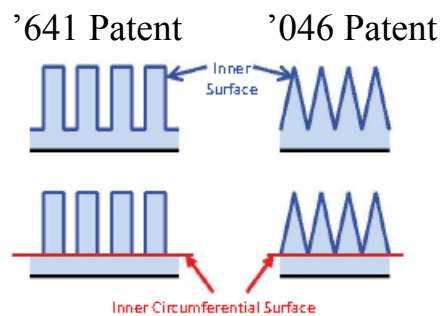
Using a dotted line, Patent Owner identified the claimed
“circumferential surface” as the portion of the inner surface between
projections 173 (protrusions). Ex. 2001, 21; Ex. 1001, 11:5-7. Patent
Owner then argues that Newmoyer '046's inner surface is made up entirely
of angled surfaces forming peaks and valleys, and therefore, Newmoyer
'046 does not disclose protrusions that extend away from the circumferential
surface of the jacket as claimed. PO Resp. 18 (citing Ex. 2001 ¶ 48-49).
This interpretation is echoed by the Declaration of Mr. Clark, inventor of the

'641 Patent. Ex. 2001 ¶¶ 2, 46-49. In light of these assertions, Patent Owner's claim interpretation is that the claimed "circumferential surface" must extend some distance between protrusions and does not extend across the base of the protrusions.

C. *Petitioner Interpretation*

Petitioner contends that the claimed "circumferential surface" is a virtual surface that spans a circumference from which the protrusions extend. Pet. Reply 7. To illustrate this claim construction, Petitioner provides a figure contrasting the inner surface to the claimed "circumferential surface" for both the '641 Patent and Newmoyer '046. *Id.*

Petitioner's figure contrasting the two inner surfaces is reproduced below:



The figure is a cross-sectional view of a portion of the cable jackets of the '641 Patent and Newmoyer '046.⁶

⁶ Column labels added for clarity.

In this figure, Petitioner illustrates the inner surface (top left and right) includes the protrusions while the claimed “circumferential surface” (bottom left and right) is a virtual surface that spans the circumference and does not include the protrusions. *Id.*

Therefore, Patent Owner contends that the claimed “circumferential surface” is discontinuous, extending some distance between protrusions and not extending across the base of the protrusions, while Petitioner contends that the claimed “circumferential surface” is continuous (spans the circumference) to include extending across the base of the protrusions.

D. Interpretation

We agree with Petitioner that the claimed “circumferential surface” is “virtual,” in that, as explained above, the claims require that the “circumferential surface” serves as a reference point from which the protrusions extend. We also agree with Petitioner that the claimed “circumferential surface” spans the circumference (is continuous rather than discontinuous) to include extending across the base of the protrusions. The ordinary meaning of “circumferential” is “of, at, or close to the circumference,” and the ordinary meaning of “circumference” is “the line bounding a circle or other rounded surface, a periphery.” WEBSTER’S NEW UNIVERSAL UNABRIDGED DICTIONARY (Deluxe Second Ed. 1983) (“circumferential,” a.; “circumference,” n. def. 1) (Ex. 3001). Therefore, the ordinary meaning of the term “circumferential” suggests that the claimed “circumferential surface” extends along the line bounding the inner surface

(the periphery) of the jacket, to include extending across the base of the protrusions.

We discern nothing in the Specification inconsistent with the ordinary meaning of “circumferential.” The Specification simply echoes the claim language, describing that “[t]he jacket comprises a plurality of protrusions extending away from an inner circumferential surface of the jacket.” *See e.g.*, Ex. 1001, 3:42-44. Also consistent with the ordinary meaning of “circumferential,” the Specification describes that cable 117 is provided with striated jacket 171 having a plurality of extending projections 173 that hold jacket 171 further away from the twisted pairs 103. *Id.* at 11:5-7, 15-17; fig. 13.

Patent Owner’s reliance on Figure 13 of the ’641 Patent is misplaced. Although the embodiment shown in Figure 13 includes a surface that spans some distance between protrusions, claims 1 and 13 do not recite explicitly that the claimed circumferential surface is limited to the surface between protrusions. *See* Ex. 1001, 11:5-7. Nor does the Specification describe the claimed circumferential surface as extending between but not across the base of the protrusions. *See* Pet. Reply 9. Therefore, the language of claims 1 and 13 is broader than this example as reflected in Figure 13 of the Specification. Accordingly, such limitation is not imported into claims 1 and 13. *See Superguide Corp. v. DirecTV Enterprises, Inc.*, 358 F.3d 870, 875 (Fed. Cir. 2004) (“Though understanding the claim language may be aided by the explanations contained in the written description, it is important not to import into a claim limitations that are not a part of the claim. For

example, a particular embodiment appearing in the written description may not be read into a claim when the claim language is broader than the embodiment.”); *see also* Pet. Reply 7-9 (arguing that Patent Owner’s claim construction is an improper attempt to import limitations of the Specification).

The Clark Declaration parallels Patent Owner’s argument in that it repeats the claim language with emphasis added, and attempts to incorporate the characteristics of the embodiment shown in Figure 13 as limitations of claims 1 and 13. Ex. 2001 ¶ 46. This interpretation suffers from the shortcomings noted above.

Having considered Patent Owner’s proposed claim construction, argument, and supporting evidence, the claim construction proffered is not the broadest reasonable interpretation in light of the Specification. Significantly, we note that at the oral hearing, when asked if the broadest reasonable interpretation permitted the “circumferential surface” to extend along the base of the protrusions, counsel for Patent Owner answered that he could not say that such interpretation was unreasonable. Tr. 52-54.

Under the broadest reasonable interpretation consistent with the specification, the claimed “circumferential surface” of the jacket extends along the periphery of the inner surface of the jacket, including the base of the protrusions.

III. PATENTABILITY

A. *Alleged Obviousness over Newmoyer '046 and either Grandy '612 or APA*

Petitioner provides sufficient explanations and evidence to demonstrate by a preponderance of the evidence that the combination of Newmoyer '046 and either Grandy '612 or APA would have rendered the subject matter of claims 1-3, 5, 7-9, 11-17, 19, 21, and 22 obvious to one with ordinary skill in the art. Pet. 18-22, 26-31, 42-47; Pet. Reply 1-5, 7-13.

1. *Newmoyer '046*

Newmoyer '046 discloses a communications cable that includes a striated jacket having an inner surface that includes a plurality of sharply angled, inwardly directed projections. Ex. 1008, 1:7-12; fig. 1.

Newmoyer '046 states that a major concern for cable manufacturers is the deleterious effects of capacitive coupling between the plurality of electrical conductors and the cable jacket. *Id.* at 1:15-19. One technique for reducing coupling and attenuation is to cause the jacket to be loosely fitting over the core; however, this technique has the drawback of causing impedance variations. *Id.* at 1:54-63. Another technique to reduce capacitive coupling between the electrical conductors and the cable jacket is to cause the cable jacket to be less intimate with electrical conductors it encases. *Id.* at 1:38-41.

Newmoyer '046's cable includes a plurality of sharply angled, inwardly directed projections on the inner surface of the cable jacket to maintain the pairs of electrical conductors in the core of the cable in an intended configuration, such that impedance variations and capacitive

coupling between the electrical conductors and the cable jacket are both reduced. *Id.* at 2:9-26. Specifically, the cable includes means 20 that spaces the inner surface of the cable jacket 14 away from the twisted pairs. *Id.* at 3:29-32. In one embodiment of Newmoyer '046's invention, communications cable 10 includes inner surface 18 of cable jacket 14 that is spaced away from twisted pairs 12 by means 20, a plurality of sharply angled striations 21 that define sharply angled, inwardly directed projections 23.⁷ *Id.* at 3:9-16, 33-37.

Newmoyer '046 discloses that the number of striations may be varied depending on a variety of factors, such as: the number of cables 12 in core 11; the specific jacketing compound used; and the dielectric properties, melt flow characteristics, and hardness of the jacketing compound. *Id.* at 3:50-58. For example, a cable having four twisted pairs of conductors 12 in core 11 may have between 18 and 36 striations 21 equally spaced about the inner surface 20 of cable jacket 14. *Id.* at 3:40-45.

2. *Grandy '612*

Grandy '612 discloses a high performance data cable that includes star separator 50 having longitudinal projections (54, 56, 58, and 60) that extend outwardly from core 52 and form regions (55, 57, 59, and 61) that house conductors (10, 20, 30, and 40), which maximizes pair to pair distance and improves crosstalk performance. Ex. 1010, 1:4-5, 5:66-6:12; fig. 1; Pet. 25-

⁷ Newmoyer '046 identifies the inner surface of cable 10 as element 18 and the outer surface as element 16 (Ex 1008, 3:12-13; fig. 1), and later mistakenly identifies the inner surface as element 16 (Ex. 1008, 3:30).

26. Grandy '612 further states that the separator has a cross sectional profile that maximizes air space around the twisted conductor pairs, while holding the pairs in relatively fixed position within the core in relation to each other, enhancing attenuation performance and providing stable impedance performance. *Id.* at 4:66-5:4.

3. *APA*

The '641 Patent states that another solution to twisted pairs lying too closely together is demonstrated in Belden Wire & Cable Company's product number 1711A, which includes a "star"-shaped core that separates adjacent twisted pairs of conductors of the cable to help reduce and stabilize crosstalk between the twisted pairs. Ex. 1001, 2:18-26.

4. *Petitioner's Obviousness Reasoning*

a) *Newmoyer '046 and Grandy '612*

Petitioner provides two primary reasons for adding the separator of Grandy '612 to the cable of Newmoyer '046. First, Petitioner reasons that Newmoyer '046 and Grandy '612 each seek to improve transmission properties by maintaining the twisted pairs in position with respect to each other to minimize impedance variations in the communications cable. Pet. 28-29. Second, Petitioner asserts a person of ordinary skill in the art would have combined Grandy '612's separator with Newmoyer '046's cable to enhance the overall performance of the cable as market forces demanded because doing so would incorporate the benefits of Newmoyer '046's design (improved attenuation, impedance, and alien crosstalk) and those of Grandy

'612's design (improved attenuation, impedance, and internal crosstalk).
Pet. 22, 27-29; Pet. Reply 12.

Petitioner asserts this combination would have had a reasonable expectation of success because the cables have a substantial overlap of technology and would produce a predictable result. Pet. 28. Therefore, according to Petitioner, the combination would have been obvious because it is the combination of familiar elements according to known methods that yields predictable results. *Id.*

b) Newmoyer '046 and APA

Petitioner's reasoning for this combination is similar to that for the combination of Newmoyer '046 and Grandy '612, discussed above.

Specifically, Petitioner asserts a person of ordinary skill in the art would have combined the separator of the APA with Newmoyer '046's cable to enhance the overall performance of the cable as market forces demanded because doing so would incorporate the benefits of Newmoyer '046's design (improved attenuation, impedance, and alien crosstalk) and those of the separator of the APA (reducing crosstalk). Pet. 22, 31-33; Pet. Reply 12.

Petitioner asserts that such combination would have had a reasonable expectation of success because the cables have a substantial overlap of technology and would produce a predictable result. Pet. 28. Therefore, according to Petitioner, the combination would have been obvious because it is the combination of familiar elements according to known methods that yields predictable results. *Id.*

5. *Analysis*

We have reviewed the parties' arguments and supporting evidence. Petitioner's explanations and supporting evidence demonstrate by a preponderance of the evidence how the subject matter of the challenged claims would have been unpatentable as obvious over Newmoyer '046 and either Grandy '612 or APA. Our analysis will focus on the deficiencies alleged by Patent Owner.

Patent Owner presents three main arguments: Newmoyer '046 does not disclose a "circumferential surface" as claimed; the combination would not have had predictable results; and Petitioner has not provided a sufficient rationale for combining the teachings of the references.

a) *Circumferential Surface*

Patent Owner argues that the inner surface of Newmoyer '046's cable jacket consists entirely of angled surfaces forming peaks and valleys, and therefore, Newmoyer '046 does not disclose a circumferential surface as claimed. PO Resp. 17-18.

As explained in our claim construction above, the broadest reasonable interpretation of a circumferential surface of the jacket as claimed excludes the protrusions, and extends along the periphery of the inner surface of the jacket to include the base of the protrusions. Consequently, Patent Owner's argument is unpersuasive because it is not commensurate in scope with claims 1 and 13. *See In re Self*, 671 F.2d 1344, 1348 (CCPA 1982) ("[A]ppellant's arguments fail from the outset because . . . they are not based on limitations appearing in the claims.").

Patent Owner also argues that Petitioner identifies an inner circumference of the jacket but fails to identify an inner circumferential surface as claimed. PO Resp. 18-19. This argument is factually incorrect. Petitioner states that the jacket of Newmoyer '046's cable includes inner surface 16 and that this jacket includes a plurality of protrusions extending away from its inner circumference. Pet. 18-19.

Patent Owner also argues that Newmoyer '046 teaches away from configurations of the protrusions other than striations that are angled peaks and valleys. PO Resp. 20-21. Our decision is based upon the conclusion that Petitioner has demonstrated that Newmoyer '046 discloses a circumferential surface as claimed. We do not rely upon Petitioner's alternative assertion that Newmoyer '046 suggests alternative configurations of the protrusions (striations). *See* Pet. 21. For that reason, this argument is not relevant.

b) Predictability of the Newmoyer '046 and Grandy '612 Combination

Patent Owner argues that Petitioner's reasoning for the combination of Newmoyer '046 and Grandy '612 cannot be applied properly because the combination of Newmoyer '046 and Grandy '612 would not have had predictable results. PO Resp. 22. In support of this contention, the Clark Declaration states that in the area of communications cable design, the relationship between any single design parameter and any particular performance criterion is rarely one-to-one; rather, parameters are interrelated and affect the performance criteria and manufacturability in complex and unpredictable ways. Ex. 2003 ¶¶ 27, 55. The Clark declaration also states:

[a]t the time of the '641 Patent's inventions, it would not have yielded predictable results to combine a separator disposed among the plurality of twisted pairs of insulated conductors so as to physically separate the first twisted pair from the second twisted pair, and a jacket having a plurality of protrusions extending away from the inner circumferential surface of the jacket.

Ex. 2001 ¶ 56.

Similarly, the Brenneke Declaration states that the design and fabrication of data cables having twisted pairs is not an exact science, and even changes to physical attributes that appear minor can change the interaction of electric and magnetic fields to have unforeseen and unpredictable consequences on the cable's electrical performance. Ex. 2003 ¶¶ 6-7. Patent Owner also provides testimony of Mr. Baxter from litigation in Delaware⁸ involving the '641 Patent. There, Mr. Baxter conceded that changing one cable parameter, such as attenuation, may impact other characteristics of the cable, and that these trade-offs can be quite complex. Ex. 2001 ¶ 28. Further, Mr. Baxter testified that many factors affect cable performance, such as flammability, stability, and durability, and other factors must be considered such as manufacturability and cost. *Id.*

Patent Owner's assertions do not demonstrate that the proposed combination would not have yielded predictable results. Patent Owner's

⁸ *Belden Technologies, Inc. and Belden CDT (Canada) Inc. v. Superior Essex Inc. and Superior Essex Communications LP*, Case No. 08-cv-063-SLR (D. Del.).

evidence simply presents general design concerns, and fails to address the predictability of adding a separator to a cable. *See* Pet. Reply 10-11.

Further, “general unpredictability in the art of cable design” (PO Resp. 23), without more, does not establish that the proposed combination would not have yielded predictable results. Even in an unpredictable art, the appropriate inquiry is whether there was a reasonable expectation of success. For example, in *O’Farrell*, Appellants argued that at the time of the claimed invention there was significant unpredictability in the field of the claimed invention. *In re O’Farrell*, 853 F.2d 894, 902 (Fed. Cir. 1988). Applying a Graham factor analysis, the court held that obviousness does not require absolute predictability of success; rather, a reasonable expectation of success is all that is required. *Id.* at 903-904; *see in re Inland Steel Co.* 265 F.3d 1354 (Fed. Cir. 2001); *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). Consequently, the proper inquiry here is whether there was a reasonable expectation of success in adding Grandy ’612’s separator to Newmoyer ’046’s cable.

The ’641 Patent includes embodiments utilizing a separator (core or separator 101). *See e.g.*, Ex. 1001, 5:3-16; 11:45-65; figs. 1, 9A, 9B. The Specification does not disclose that incorporation of a separator proved difficult or produced unexpected/unpredictable results. To the contrary, the ’641 Patent acknowledges that it was known to utilize a core that separates twisted pairs to reduce and stabilize crosstalk between the twisted pairs (APA). *Id.* at 2:18-26. In light of this, we agree with Petitioner that the addition of a separator (core) was a known method with a predictable result

(reduced crosstalk). Grandy '612's star separator is similar to the core of the APA, in that it separates the twisted pair conductors of the cable to improve crosstalk. Ex. 1010, 5:66-6:12; fig. 1; Ex. 1001, 5:3-16; 11:45-65; Pet. 25-26.

For these reasons, Petitioner has established a reasonable expectation of success in the proposed modification, and Patent Owner's argument regarding predictability is unpersuasive.

c) Motivation to combine Newmoyer '046 with either Grandy '612 or APA

Patent Owner presents four contentions in support of the argument that a person of ordinary skill in the art would have no motivation to combine the elements of Newmoyer '046 with the elements of either Grandy '612 or the APA.⁹ PO Resp. 24-30.

1) General Desire to Reduce Crosstalk

Patent Owner asserts that given the large number of parameters that may be modified in a cable, the general desire to reduce crosstalk is insufficient to provide a motivation to make the specific combination of features recited in claims 1 and 13. PO Resp. 25-26 (citing Ex. 2001 ¶ 60). Patent Owner goes on to assert that Petitioner's sole support for the motivation to combine, the Baxter Declaration, is entitled to no weight. PO Resp. 26.

For the reasons that follow, we disagree with the characterization that the rationale proffered is simply a general desire to reduce crosstalk, and the

⁹ Patent Owner's arguments have been reorganized to facilitate our analysis.

characterization that the Baxter declaration is the sole support for Petitioner's proffered rationale.

Rationale

As detailed above, Petitioner reasons that a person of ordinary skill in the art would have made the proposed combination in order to enhance overall performance of the cable as market forces demanded to incorporate the benefits of Newmoyer '046 (improved attenuation, impedance, and alien crosstalk) and those of either Grandy '612 (improved attenuation, impedance, and internal crosstalk) or the APA (reducing crosstalk). Pet. 22, 27-29, 31-33; Pet. Reply 12. The references support this contention, the merits of which are unchallenged by Patent Owner. *See* Ex. 1001, 2:18-26; Ex. 1008, 1:66-2:57; Ex. 1010, 4:24-29, 37-40; 5:2-4. Petitioner also reasons that Newmoyer '046 and Grandy '612 each seek to improve transmission properties by maintaining the twisted pairs in position with respect to each other to minimize impedance variations in the communications cable. Indeed, Newmoyer '046 and Grandy '612 each seek to minimize impedance variations. Ex. 1008, 2:9-18, 51-53; Ex. 1010, 4:24-29, 378-40; 4:66-5:4.

Patent Owner has not addressed persuasively either of these sufficiently supported rationales. Thus, even without considering the Baxter Declaration, Patent Owner's argument does not demonstrate cogently how the proffered rationale is in error.

Baxter Declaration

Patent Owner provides three lines of argument for according no weight to the Baxter Declaration. First, Patent Owner argues that the Declaration may not be considered as expert testimony. At the oral hearing, counsel for Patent Owner acknowledged that the Baxter Declaration was admissible. Tr. 30, 33; *see also* 37 CFR § 42.61(b) (admissibility of records of the Office). Patent Owner asserted that although the Declaration is admissible, it should not be considered as expert testimony because Mr. Baxter has not been utilized as an expert in this proceeding and been subject to cross-examination. Tr. at 29-36; *see also* PO Resp. 26.

But admissibility as an Office record does not preclude a hearsay objection if the Declaration is relied on by Petitioner as expert testimony for the truth of the matter asserted therein. An Office record is admissible to show what was said during a previous Office proceeding. Petitioner clearly has relied on the Baxter declaration as expert testimony for the truth of the matter asserted therein, beyond the nature of an Office record. Patent Owner could have made a hearsay objection and requested cross-examination of Mr. Baxter. Then, Petitioner would have had to produce Mr. Baxter for cross-examination or address the issue in some other way. Here, Patent Owner neither made a hearsay objection nor requested cross-examination. *See generally* 37 CFR § 42.52; *see* 37 CFR § 42.64(b)(1)(ii). Therefore, this line of argument is unpersuasive.

Second, Patent Owner argues that, “Mr. Baxter never actually opines on the state of the art at the time the invention was made, as required by 35

U.S.C. 103(a), meaning his declaration cannot be said to provide an ‘alien crosstalk’ motivation.” PO Resp. 26. Patent Owner’s contention is factually incorrect in that the Declaration contains information regarding the state of the art at the time of the invention. *See e.g.*, Ex. 1015 ¶ 18 (discussing industry interest in alien crosstalk in 2003); ¶ 20 (discussing whether the proposed combination would have been within the level of ordinary skill in the art at the time of the ’641 priority date).

Third, Patent Owner contends that the Declaration is not credible because it offers no objective support, and is undermined by testimony of Mr. Baxter regarding the unpredictable nature of high-speed, data cable design in a Delaware lawsuit regarding the ’641 Patent. PO Resp. 26. We disagree. The Declaration provides objective support. For example, the Declaration details Mr. Baxter’s education, background, and experience. Ex. 1015 ¶¶ 2-7. The Declaration also states that Mr. Baxter’s opinion is based on the ’641 Patent, Newmoyer ’046, and an industry standard from 2003. *Id.* ¶¶ 8, 9, and 18.

Regarding Mr. Baxter’s testimony in the Delaware lawsuit, as detailed above, such testimony acknowledges that changing one cable parameter may impact other characteristics of the cable, that design trade-offs can be quite complex, and that other factors must be considered. Patent Owner fails to explain persuasively how these acknowledgements regarding the state of that art undermine Mr. Baxter’s credibility.

Accordingly, Patent Owner’s arguments regarding the Baxter Declaration are unpersuasive.

2) *Newmoyer '046 suggests the modification is not necessary*

Patent Owner argues that Newmoyer '046 suggests that addition of the Grandy '612 separator is not necessary because Newmoyer '046's jacket already reduces crosstalk and attenuation. PO Resp. 27 (citing Ex. 2001 ¶ 62).

This argument is not supported adequately by the reference. Newmoyer '046 does not disclose or suggest that the cable invented is the pinnacle of design with regard to crosstalk and attenuation. Rather, Newmoyer '046 discloses a cable that reduces attenuation and alien crosstalk. Ex. 1008, 2:13-18; Ex. 1015 ¶ 16.

3) *Tradeoffs*

Patent Owner argues that adding a separator to a cable increases the size and weight of the cable, reduces flexibility, and increases cost. PO Resp. 28 (citing Ex. 2001 ¶ 63). To that end, Patent Owner contends that one of ordinary skill in the art would not have been motivated to combine the teachings of Newmoyer '046 and Grandy '612.

At most, Patent Owner's argument identifies drawbacks of the proposed combination; however, that there are tradeoffs involved regarding features, costs, manufacturability, or the like, does not necessarily prevent the proposed combination. *See Medichem, S.A. v. Rolabo, S.L.*, 437 F.3d 1157, 1165 (Fed. Cir. 2006) (“[A] given course of action often has simultaneous advantages and disadvantages, and this does not necessarily obviate motivation to combine.”); *Winner Int'l Royalty Corp. v. Wang*, 202 F.3d 1340, 1349 n.8 (Fed. Cir. 2000) (“The fact that the motivating benefit

comes at the expense of another benefit, however, should not nullify its use as a basis to modify the disclosure of one reference with the teachings of another. Instead, the benefits, both lost and gained, should be weighed against one another.”). Patent Owner’s argument is unpersuasive in that it fails to weigh the alleged drawbacks against the benefit identified by Petitioner. In particular, Petitioner has attributed the benefit of reducing “internal crosstalk” to the presence of a separator in data communications cables. Pet. Reply 29 (citing Ex. 1015 ¶¶ 10-17).

4) *Alien Crosstalk*

Patent Owner argues that increasing the size of the striations of Newmoyer ’046’s jacket to address alien crosstalk adequately would result in a loose jacket. PO Resp. 28 (citing Ex. 2001 ¶ 63). According to Patent Owner, this result would be undesirable because Grandy’s impedance stability is dependent on a tightly applied jacket that holds the core in a manner that reduces conductor-to-conductor spacing variation. *Id.*

Contrary to what Patent Owner’s argument implies, this ground of unpatentability does not propose to increase the size of the striations in Newmoyer’s jacket in order to further reduce alien crosstalk. Rather, as explained in the obviousness reasoning above, the Petition lists reduction of alien crosstalk as one advantage of Newmoyer ’046’s cable that would be retained when combined with Grandy’s separator to enhance the overall performance of the cable.

6. Conclusion

Upon review of the Petition, Patent Owner's response, and Petitioner's reply, we determine that Petitioner has shown by a preponderance of the evidence that claims 1-3, 5, 7-9, 11-17, 19, 21, and 22 are unpatentable as obvious over Newmoyer '046 and either Grandy '612 or APA.

B. Alleged Obviousness over Newmoyer '046 and Grandy '612

As noted in section I.F. above, Petitioner contends that claim 18 is unpatentable as obvious over Newmoyer '046 and Grandy '612. Petitioner provides sufficient explanations and evidence to demonstrate by a preponderance of the evidence that the combination of Newmoyer '046 and Grandy '612 would have rendered the claimed subject matter obvious to one with ordinary skill in the art. Pet. 18-22, 26-31, 45-46; Pet. Reply 1-8, 10-15. Our analysis will focus on the deficiencies alleged by Patent Owner.

Claim 18 depends from independent claim 13, and recites, "wherein the jacket has a substantially circular cross-sectional shape." Patent Owner repeats the arguments for independent claim 13 against the first ground of unpatentability, and makes no separate argument based upon the limitation added by claim 18. PO Resp. 30. The analysis of independent claim 13 in the first ground of unpatentability above is applicable here. Patent Owner does not challenge other aspects of this ground of unpatentability.

Upon review of the Petition, Patent Owner's response, and Petitioner's reply, we determine that Petitioner has shown by a

preponderance of the evidence that claim 18 is unpatentable as obvious over Newmoyer '046 and Grandy '612

C. Alleged Obviousness over Newmoyer '046, Gagnon '308, and either Grandy '612 or APA

As noted in section I.F. above, Petitioner contends that claim 4 is unpatentable as obvious over Newmoyer '046, Gagnon '308, and either Grandy '612 or APA. Petitioner provides sufficient explanations and evidence to demonstrate by a preponderance of the evidence that the combination of Newmoyer '046, Gagnon '308, and either Grandy '612 or APA would have rendered the claimed subject matter obvious to one with ordinary skill in the art. Pet. 18-22, 26-31, 35-37, 45-46; Pet. Reply 1-8, 10-15. Our analysis will focus on the deficiencies alleged by Patent Owner.

Claim 4 depends from independent claim 1 and recites, “wherein the jacket comprises a dual-layer structure including a first jacket layer and a second jacket layer and wherein the plurality of protrusions extend away from an inner circumferential surface of the first jacket layer.”

1. Gagnon '308

Gagnon '308 discloses a dual layer jacket electrical cable that includes a first layer 40 and a second layer 41 that exceeds certain standards for Category 5 type cables. Ex. 1012, 1:4-5; 7:29-8:17; fig. 4b; *see also* Pet. 34, 42.

2. Analysis

Patent Owner argues that Gagnon '308 does not cure the deficiencies of Newmoyer '046 and Grandy '612 discussed with regard to independent

claim 1 for the first ground of unpatentability. PO Resp. 30-31. This argument is unpersuasive because our analysis of independent claim 1 in the first ground of unpatentability revealed that there are no deficiencies in Newmoyer '046 or Grandy '612 to be cured.

Upon review of the Petition, Patent Owner's response and Petitioner's reply, we determine that Petitioner has shown by a preponderance of the evidence that claim 4 is unpatentable as obvious over Newmoyer '046, Gagnon '308, and either Grandy '612 or APA.

D. Alleged Obviousness over Newmoyer '046, Clark '954, and either Grandy '612 or APA

As noted in section I.F. above, Petitioner contends that claim 6 is unpatentable as obvious over Newmoyer '046, Clark '954, and either Grandy '612 or APA. Petitioner provides sufficient explanations and evidence to demonstrate by a preponderance of the evidence that the combination of Newmoyer '046, Clark '954, and either Grandy '612 or APA would have rendered the claimed subject matter obvious to one with ordinary skill in the art. Pet. 18-22, 26-31, 35-38, 45-46; Pet. Reply 1-8, 10-15. Our analysis will focus on the deficiencies alleged by Patent Owner.

Claim 6 depends from independent claim 1 and recites, "wherein the plurality of twisted pairs of insulated conductors and the jacket are helically twisted together with a cable twist lay that is within a range of about 2 to 6 inches."

1. Clark '954

Clark '954 discloses helical twisting of a cable. Ex. 1013, 8:63-9:4; *see also* Pet. 36-37.

2. Analysis

Patent Owner argues that Clark '954 does not cure the deficiencies of Newmoyer '046 and Grandy '612 discussed with regard to independent claim 1 for the first ground of unpatentability. PO Resp. 31. This argument is unpersuasive because our analysis of independent claim 1 in the first ground of unpatentability above revealed that there are no deficiencies in Newmoyer '046 or Grandy '612 to be cured.

Upon review of the Petition, Patent Owner's response, and Petitioner's reply, we determine that Petitioner has shown by a preponderance of the evidence that claim 6 is unpatentable as obvious over Newmoyer '046, Clark '954, and either Grandy '612 or APA.

E. Alleged Obviousness over Newmoyer '046, Gingue '748, and either Grandy '612 or APA

As noted in section I.F. above, Petitioner contends that claims 10 and 20 are unpatentable as obvious over Newmoyer '046, Gingue '748, and either Grandy '612 or APA. For the reasons that follow, we do not agree. Having reviewed the parties' arguments and supporting evidence, we determine that Petitioner's explanations and supporting evidence do not demonstrate by a preponderance of the evidence how the subject matter of

the challenged claims would have been obvious over Newmoyer '046, Gingue '748, and either Grandy '612 or APA.

Claim 10 depends indirectly from independent claim 1 and claim 20 depends from independent claim 13. Claims 10 and 20 each add the limitation that the jacket comprises a foamed polymer.

1. Gingue '748

Gingue '748's invention "relates to insulated electrical conductors and jacketed electrical cables." Ex. 1014, 1:8-9. Gingue '748 states that the electrical performance of an insulating material, such as fluorinated ethylene/propylene polymer, is enhanced by foaming or expanding the corresponding solid material, and for a given volume of material this decreases the flammable material involved, providing a favorable balance of electrical properties and flame retardancy. Gingue '748, 2:60-3:26; *see also* Pet. 38, 43.

Gingue '748 discloses a cable design having a foamed polymeric inner layer that provides optimized electrical characteristics, and a halogenated polymeric outer layer that incorporates intumescent char and flame retardancy. Ex. 1014, 4:2-10, 22-31.

In a first embodiment, insulated electrical conductor 10 includes electrical conductor 12 having foamed polymeric inner layer 14 and halogenated polymeric outer layer 16. *Id.* at 5:3-8, 25-30; fig. 1. In a second embodiment, jacketed electrical cable 20 includes electrical conductor 24 surrounded by foamed polymeric inner layer 26 and halogenated polymeric outer layer 28. *Id.* at 6:41-54; fig. 2.

Outer jacket 30 of the second embodiment may be comprised of the same halogenated polymeric material as the outer layer 28. *Id.* at 6:64-67.

Gingue '748 does not disclose that a halogenated polymeric material is a foamed polymeric material, and Petitioner offers no evidence that a halogenated material is a foamed polymer. Consequently, there is insufficient evidence in the record that a halogenated polymeric material is a foamed polymeric material. Further, Gingue '748 does not disclose that a cable jacket may be comprised of a foamed polymeric material.

2. *Obviousness reasoning*

Petitioner notes that Gingue '748 discloses the advantages of foamed insulation for any type of insulating material, and that the same material (halogenated polymeric material) may be used as a layer of insulation as may be used for the jacket. Pet. Reply 14. In light of this, Petitioner reasons that it would have been obvious to modify Newmoyer's jacket to be comprised of a foamed polymer. Pet. 38-40; Pet. Reply 14-15.

3. *Analysis*

Patent Owner argues that, "Gingue '748 merely discloses foaming a polymer in the context of material used for the insulation layer surrounding the conductors of a twisted pair, not for use in a cable jacket." PO Resp. 32 (citing Ex. 1014, 5:23-6:40 as an example); Ex. 2001 ¶ 72.

Petitioner incorrectly associates Gingue '748's disclosure relating to halogenated polymeric material with the disclosure related to foamed polymeric material. As detailed above, Gingue '748 discloses that a halogenated polymeric material is suitable for use as an outer layer of

insulation on a conductor to provide intumescent char and flame retardancy when used in conjunction with an inner layer of foamed polymeric material providing optimal electrical characteristics. This halogenated polymeric material is also suitable for use in a cable jacket; however, the record contains no evidence that a halogenated polymeric material is a foamed polymeric. Further, although Gingue '748 discloses that a foamed polymeric material is suitable as an inner layer of insulation for a conductor, Gingue '748 makes no disclosure that a foamed polymeric material is also suitable for use in a cable jacket. *See Brand v. Miller*, 487 F.3d 862, 868-69 (Fed. Cir. 2007) (Although the Board may apply its expertise to interpreting evidence in the record, it is impermissible for the Board to base factual findings on its expertise.).

Upon review of the Petition, Patent Owner's response, and Petitioner's reply, we determine that Petitioner has not shown by a preponderance of the evidence that claims 10 and 20 are unpatentable over Newmoyer '046, Gingue '748, and either Grandy '612 or APA.

IV. CONCLUSION

Petitioner has met its burden of proof by a preponderance of the evidence in showing under 35 U.S.C. § 103 that: (1) claims 1-3, 5, 7-9, 11-17, 19, 21, and 22 are unpatentable as obvious over Newmoyer '046 and either Grandy '612 or APA; (2) claim 18 is unpatentable as obvious over Newmoyer '046 and Grandy '612; (3) claim 4 is unpatentable as obvious over Newmoyer '046, Gagnon '308, and either Grandy '612 or APA; and (4)

Case IPR2013-00059
Patent 7,135,641

claim 6 is unpatentable as obvious over Newmoyer '046, Clark '954, and either Grandy '612 or APA.

Petitioner has not meet its burden of proof by a preponderance of the evidence in showing that claims 10 and 20 are unpatentable over Newmoyer '046, Gingue '748, and either Grandy '612 or APA.

V. ORDER

In consideration of the foregoing, it is
ORDERED that claims 1-9, 11-19, 21 and 22 of U.S. Patent
7,135,641 are unpatentable;

FURTHER ORDERED that claims 10 and 20 of U.S. Patent
7,135,641 have not been demonstrated to be unpatentable; and

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

Case IPR2013-00059
Patent 7,135,641

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