

Paper No. \_\_\_\_

UNITED STATES PATENT AND TRADEMARK OFFICE

---

BEFORE THE PATENT TRIAL AND APPEAL BOARD

---

COMMSCOPE TECHNOLOGIES LLC

Petitioner

v.

BELDEN INC.  
Patent Owner

---

IPR

U.S. Patent No. 10,832,833

Issued: November 10, 2020

Filed: March 18, 2019

---

**PETITION FOR *INTER PARTES* REVIEW OF U.S. PAT. NO. 10,832,833  
UNDER 35 U.S.C. §§ 311-319 AND 37 C.F.R. § 41.100 ET SEQ.**

---

## **Table of Contents**

|                                                             |      |
|-------------------------------------------------------------|------|
| MANDATORY NOTICES .....                                     | vii  |
| A. Real Parties-in-Interest .....                           | vii  |
| B. Related Matters.....                                     | vii  |
| C. Lead and Back-Up Counsel.....                            | vii  |
| D. Service Information.....                                 | viii |
| PRELIMINARY MATTERS .....                                   | 1    |
| A. Standing.....                                            | 1    |
| B. Identification of Challenge.....                         | 1    |
| C. Supporting Declaration .....                             | 2    |
| D. Fees.....                                                | 2    |
| Introduction.....                                           | 3    |
| Summary of the Challenged Patent .....                      | 4    |
| A. Brief Description .....                                  | 4    |
| B. Relevant History of the ‘833 Patent .....                | 5    |
| C. ‘833 Patent Claims .....                                 | 5    |
| D. Prosecution History .....                                | 5    |
| Summary of the Asserted Prior Art .....                     | 6    |
| A. Primary References .....                                 | 6    |
| 1. “Glew”: U.S. Patent Pub. No. 2013/0248240 (EX-1008) .... | 6    |
| 2. “Cook”: U.S. Patent No. 9,363,935 (EX-1010).....         | 6    |
| 3. “Pfeiler”: U.S. Patent No. 7,335,837 (EX-1011).....      | 7    |
| 4. “Roberts”: U.S. Patent No. 3,622,683 (EX-1009).....      | 7    |
| B. Secondary References .....                               | 7    |
| 1. “Simons”: U.S. Patent No. 3,911,200 (EX-1012) .....      | 7    |
| 2. “Jachimowicz-036”: U.S. Patent No. 3,233,036 (EX-1013)7  |      |
| 3. “Jachimowicz-172”: U.S. Patent No. 3,894,172 (EX-1014)7  |      |

|                                                                                                                                                                                                                                           |    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| Claim Construction.....                                                                                                                                                                                                                   | 8  |
| Level of Ordinary Skill.....                                                                                                                                                                                                              | 9  |
| Discretionary Issues.....                                                                                                                                                                                                                 | 9  |
| Argument .....                                                                                                                                                                                                                            | 11 |
| Ground 1: Cook Anticipates Claims 1-8, 48-50.....                                                                                                                                                                                         | 11 |
| A. Independent Claim 1 .....                                                                                                                                                                                                              | 11 |
| 1. A cable for reducing alien cross-talk and return loss<br>between adjacent twisted pairs of conductors comprising: [1A]<br>a first twisted pair of conductors having a first side portion and<br>a first outwardly facing portion,..... | 11 |
| 2. [1B] a second twisted pair of conductors having a second<br>side portion and a second outwardly facing portion; and.....                                                                                                               | 11 |
| 3. [1C] a filler member configured to non-conductively shield<br>the first side portion of the first twisted pair of conductors from<br>the second side portion of the second twisted pair of<br>conductors; .....                        | 11 |
| 4. Element 1D .....                                                                                                                                                                                                                       | 13 |
| 5. Element 1E.....                                                                                                                                                                                                                        | 15 |
| 6. Element 1F .....                                                                                                                                                                                                                       | 15 |
| 7. Element 1G .....                                                                                                                                                                                                                       | 16 |
| 8. Element 1H .....                                                                                                                                                                                                                       | 17 |
| 9. Element 1I.....                                                                                                                                                                                                                        | 18 |
| 10. Element 1J.....                                                                                                                                                                                                                       | 19 |
| 11. Element 1K .....                                                                                                                                                                                                                      | 20 |
| B. Dependent Claims 2-8 .....                                                                                                                                                                                                             | 21 |
| 1. Claim 2.....                                                                                                                                                                                                                           | 21 |
| 2. Claim 3:.....                                                                                                                                                                                                                          | 21 |
| 3. Claim 4:.....                                                                                                                                                                                                                          | 22 |
| 4. Claim 5:.....                                                                                                                                                                                                                          | 22 |

|                                                                                                                                                   |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 5. Claim 6:.....                                                                                                                                  | 23 |
| 6. Claim 7:.....                                                                                                                                  | 23 |
| 7. Claim 8:.....                                                                                                                                  | 24 |
| C. Independent Claim 48 .....                                                                                                                     | 24 |
| 1. Element 48A .....                                                                                                                              | 24 |
| 2. Element 48B.....                                                                                                                               | 25 |
| 3. Element 48C.....                                                                                                                               | 26 |
| D. Independent Claim 49 .....                                                                                                                     | 27 |
| 1. Element 49A .....                                                                                                                              | 27 |
| 2. Element 49B.....                                                                                                                               | 28 |
| 3. Element 49C.....                                                                                                                               | 29 |
| E. Independent Claim 50 .....                                                                                                                     | 29 |
| Ground 2: Glew Anticipates Claims 1-8, 48-50.....                                                                                                 | 30 |
| A. Independent Claim 1 .....                                                                                                                      | 30 |
| 1. A cable for reducing alien cross-talk and return loss<br>between adjacent twisted pairs of conductors comprising: [1A],<br>[1B] and [1C] ..... | 30 |
| 2. Element 1D .....                                                                                                                               | 32 |
| 3. Element 1E.....                                                                                                                                | 33 |
| 4. Element 1F .....                                                                                                                               | 34 |
| 5. Element 1G .....                                                                                                                               | 34 |
| 6. Element 1H .....                                                                                                                               | 35 |
| 7. Element 1I.....                                                                                                                                | 35 |
| 8. Element 1J.....                                                                                                                                | 36 |
| 9. Element 1K .....                                                                                                                               | 37 |
| B. Dependent Claims 2-8 .....                                                                                                                     | 39 |
| 1. Claim 2.....                                                                                                                                   | 39 |
| 2. Claim 3:.....                                                                                                                                  | 40 |

|                                                                                                                                                   |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 3. Claim 4:.....                                                                                                                                  | 40 |
| 4. Claim 5:.....                                                                                                                                  | 40 |
| 5. Claim 6:.....                                                                                                                                  | 41 |
| 6. Claim 7:.....                                                                                                                                  | 41 |
| 7. Claim 8:.....                                                                                                                                  | 43 |
| C. Independent Claim 48 .....                                                                                                                     | 43 |
| 1. Element 48A .....                                                                                                                              | 43 |
| 2. Element 48B.....                                                                                                                               | 44 |
| 3. Element 48C.....                                                                                                                               | 45 |
| D. Independent Claim 49 .....                                                                                                                     | 45 |
| 1. Element 49A .....                                                                                                                              | 45 |
| 2. Element 49B.....                                                                                                                               | 46 |
| 3. Element 49C.....                                                                                                                               | 46 |
| E. Independent Claim 50 .....                                                                                                                     | 47 |
| Ground 3: Roberts Anticipates Claims 1, 3-8, 48-50 .....                                                                                          | 48 |
| A. Independent Claim 1 .....                                                                                                                      | 48 |
| 1. A cable for reducing alien cross-talk and return loss<br>between adjacent twisted pairs of conductors comprising: [1A],<br>[1B] and [1C] ..... | 48 |
| 2. Element 1D .....                                                                                                                               | 51 |
| 3. Element 1E.....                                                                                                                                | 53 |
| 4. Element 1F .....                                                                                                                               | 53 |
| 5. Element 1G .....                                                                                                                               | 54 |
| 6. Element 1H .....                                                                                                                               | 54 |
| 7. Element 1I.....                                                                                                                                | 55 |
| 8. Element 1J.....                                                                                                                                | 56 |
| 9. Element 1K .....                                                                                                                               | 56 |
| B. Dependent Claims 3-8 .....                                                                                                                     | 57 |

|                                                                                                                                                    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 1. Claim 3:.....                                                                                                                                   | 57 |
| 2. Claim 4:.....                                                                                                                                   | 58 |
| 3. Claim 5:.....                                                                                                                                   | 59 |
| 4. Claim 6:.....                                                                                                                                   | 59 |
| 5. Claim 7:.....                                                                                                                                   | 60 |
| 6. Claim 8:.....                                                                                                                                   | 61 |
| C. Independent Claim 48 .....                                                                                                                      | 61 |
| 1. Element 48A .....                                                                                                                               | 61 |
| 2. Element 48B.....                                                                                                                                | 63 |
| 3. Element 48C.....                                                                                                                                | 66 |
| D. Independent Claim 49 .....                                                                                                                      | 67 |
| 1. Element 49A .....                                                                                                                               | 67 |
| 2. Element 49B.....                                                                                                                                | 68 |
| 3. Element 49C.....                                                                                                                                | 68 |
| E. Independent Claim 50 .....                                                                                                                      | 68 |
| Ground 4: Claims 1, 3-8, 48-50 are Obvious in view of Roberts and one or more of Jachimowicz-172 and/or the knowledge of a POSITA .....            | 69 |
| Ground 5: Claims 1, 3-8, 48-50 are Obvious in view of Grounds 3 and/or 4 and one or more of Jachimowicz-036 and/or the knowledge of a POSITA ..... | 71 |
| Ground 6: Claims 1-8 are obvious in view of any of Grounds 3-5 and further in view Simons and/or the knowledge of a POSITA .....                   | 75 |
| Ground 7: Pfeiler Anticipates Claims 1-8, 48-50.....                                                                                               | 78 |
| A. Independent Claim 1 .....                                                                                                                       | 78 |
| 1. A cable for reducing alien cross-talk and return loss between adjacent twisted pairs of conductors comprising: [1A], [1B] and [1C] .....        | 78 |
| 2. Element 1D .....                                                                                                                                | 81 |
| 3. Element 1E.....                                                                                                                                 | 83 |

|                                   |     |
|-----------------------------------|-----|
| 4. Element 1F .....               | 84  |
| 5. Element 1G .....               | 84  |
| 6. Element 1H .....               | 85  |
| 7. Element 1I.....                | 86  |
| 8. Element 1J.....                | 87  |
| 9. Element 1K .....               | 87  |
| B. Dependent Claims 2-8 .....     | 88  |
| 1. Claim 2.....                   | 88  |
| 2. Claim 3:.....                  | 89  |
| 3. Claim 4:.....                  | 90  |
| 4. Claim 5:.....                  | 90  |
| 5. Claim 6:.....                  | 91  |
| 6. Claim 7:.....                  | 92  |
| 7. Claim 8:.....                  | 93  |
| C. Independent Claim 48 .....     | 93  |
| 1. Element 48A .....              | 93  |
| 2. Element 48B.....               | 94  |
| 3. Element 48C.....               | 95  |
| D. Independent Claim 49 .....     | 96  |
| 1. Element 49A .....              | 96  |
| 2. Element 49B.....               | 97  |
| 3. Element 49C.....               | 97  |
| E. Independent Claim 50 .....     | 98  |
| Conclusion .....                  | 98  |
| Appendix A: Claims Listing .....  | 99  |
| Appendix B: Exhibit Listing ..... | 104 |

## **MANDATORY NOTICES**

### **A. Real Parties-in-Interest**

CommScope Technologies LLC, CommScope, Inc. of North Carolina, CommScope, Inc., and CommScope Holding Company, Inc. are the real parties-in-interest.

Based on current law and information available at this time, it is not clear to Petitioner that there are any other real parties-in-interest.

### **B. Related Matters**

The challenged patent, as well as three additional patents, were asserted against Petitioner in a complaint in *Belden Inc. v. CommScope, Inc. et al.*, Case No. 22-783-RGA (D. Del.) (served June 14, 2022). One of the additional patents, U.S. Patent No. 9,991,030 (the '030 Patent), is related to (and in the same family as) the challenged patent. Petitioner is filing a separate Petition for *Inter Partes* Review that challenges several claims of that '030 Patent. Petitioner is also filing two other Petitions for *Inter Partes* Review that challenge claims of the other two patents asserted in the lawsuit.

### **C. Lead and Back-Up Counsel**

| <b>Lead Counsel</b>                                                                                                      | <b>Backup Counsel</b>                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Timothy A. Lindquist,<br>Reg. No. 40,701<br>Capella Tower, Suite 4200<br>225 South Sixth Street<br>Minneapolis, MN 55402 | Dennis C. Bremer, Reg. No. 40,528<br>Capella Tower, Suite 4200<br>225 South Sixth Street<br>Minneapolis, MN 55402<br>dbremer@carlsoncaspers.com |

|                                                                           |                                          |
|---------------------------------------------------------------------------|------------------------------------------|
| tlindquist@carlsoncaspers.com<br>Phone: 612.436.9619<br>Fax: 612.436.9605 | Phone: 612.436.9614<br>Fax: 612.436.9605 |
|---------------------------------------------------------------------------|------------------------------------------|

**D. Service Information**

Please address all correspondence and service to all counsel listed above.

Petitioner consents to service by email at the email addresses listed.

## **PRELIMINARY MATTERS**

### **A. Standing**

Petitioner certifies that IPR is available for the '833 Patent; Petitioner is not barred or estopped.

### **B. Identification of Challenge**

Petitioner requests invalidation of claims 1-8 and 48-50.<sup>1</sup>

|                 | <b>Claims</b> | <b>Basis for Unpatentability</b>                                                                                        |
|-----------------|---------------|-------------------------------------------------------------------------------------------------------------------------|
| <b>Ground 1</b> | 1-8, 48-50    | Anticipated by <b>Cook</b>                                                                                              |
| <b>Ground 2</b> | 1-8, 48-50    | Anticipated by <b>Glew</b>                                                                                              |
| <b>Ground 3</b> | 1, 3-8, 48-50 | Anticipated by <b>Roberts</b>                                                                                           |
| <b>Ground 4</b> | 1, 3-8, 48-50 | Obvious in view of <b>Roberts</b> in view of one or more of <b>Jachimowicz-172</b> and/or the knowledge of a POSITA     |
| <b>Ground 5</b> | 1, 3-8, 48-50 | Obvious in view of Grounds 3 and/or 4 in view of one or more of <b>Jachimowicz-036</b> and/or the knowledge of a POSITA |
| <b>Ground 6</b> | 1-8           | Obvious in view of any of Grounds 3-5 in view of one or more of <b>Simons</b> and/or the knowledge of a POSITA          |
| <b>Ground 7</b> | 1-8, 48-50    | Anticipated by <b>Pfeiler</b>                                                                                           |

---

<sup>1</sup> Petitioner does not concede that any challenged claim meets grounds for patentability that cannot be raised during an IPR, including patentability requirements under Sections 101 and 112.

**C. Supporting Declaration**

Petitioner submits an expert declaration from Kenneth Cornelison (EX-1006).

**D. Fees**

Petitioner authorizes the Patent Office to charge Deposit Account No. 502880 for the fee set forth in 37 C.F.R. § 42.15(a) and any other required fees.

## **Introduction**

The '833 patent discloses a cable having twisted-pair conductors, a filler, and a multi-layer barrier tape, with dielectric and conductive layers, surrounding the conductors and filler. Three of the challenged independent claims recite that the barrier tape comprises three layers, with a conductive layer positioned between two non-conductive layers, which Patent Owner successfully argued during prosecution distinguished over a prior art reference (“Nordin”) that disclosed (per Patent Owner’s arguments) a three-layer barrier tape having the non-conductive layer in between two conductive layers. This petition identifies multiple references that teach cables with a three-layer barrier tape as recited in the claims. The remaining challenged independent claim recites a cable with elements such as twisted-pair conductors, a filler, a barrier tape with at least one conductive and one non-conductive layer, and a jacket, which also are present in the several prior art cable references identified below.

The PTAB should institute review for two main reasons. First, the references disclose cables having three-layer barrier tapes as recited and supposedly missing from Nordin. Second, the references disclose all the limitations recited in the claims - or at least make them obvious.

## **Summary of the Challenged Patent**

### **A. Brief Description**

The '833 Patent discloses “methods of manufacture and implementations of unshielded twisted pair (UTP) cables with a barrier tape, which may be conductive or partially conductive, with reduced alien crosstalk and return loss . . . via control of application angle of the barrier tape around helically arranged twisted pairs of conductors.” EX-1001, 2:28-34. In one implementation – called fixed tape control (FTC) – “the angle of application of the barrier tape is configured to match a helical twist angle of the cable, and the edges of the barrier tape are precisely placed on terminal portions of arms of the filler.” *Id.*, 2:43-47, 5:44-55. In a second implementation – called oscillating tape control (OTC) – “the angle of application of the barrier tape is continuously varied across a predetermined range.” *Id.*, 2:53-56, 5:56-65. The '833 Patent asserts that FTC- or OTC-applied barrier tape is an improvement over “typical longitudinal or spirally applied tape” (i.e., “application methodologies of barrier tapes used in typical cables”). *Id.*, 5:66-6:8, 10:4-11:5; EX-1006, ¶¶45-48.

The '833 Patent discloses that the barrier tape is a “conductive barrier tape 110” that “has three layers in a dielectric/conductive/dielectric configuration” and “may comprise a continuously conductive tape, a discontinuously conductive tape,

. . . a combination of a foil and dielectric material or any other such materials.”

EX-1001, 3:22-25, 6:9-14, 7:38-60, FIGS. 1, 3A; EX-1006, ¶48.

### **B. Relevant History of the '833 Patent**

The '833 Patent issued from U.S. App. No. 16/356,825 ('825 Application), filed on March 18, 2019. The '825 Application claims priority from U.S. Application No. 15/996,161, which claims priority from U.S. Application No. 15/610,504, which claims priority from U.S. Application No. 14/520,125, which claims further priority from U.S. Provisional Application No. 61/894,728, filed on October 23, 2013.

### **C. '833 Patent Claims**

There are 4 independent claims at issue in this Petition (1, 48-50). Claims 48-50 recite similar limitations but are written as a product (claims 48-49) and a method (claim 50). Claim 1 recites similar limitations to claims 48-50 but includes recitations to “non-conductive shield[ing]” and a barrier tape that comprises two layers (instead of comprising three layers as in claims 48-50). The Claims Listing Appendix lists the text of each of the claims and labels each element (A, B, C, etc.).

### **D. Prosecution History**

The '833 Patent is a continuation of U.S. Patent No. 10,236,099, and claims priority to a provisional filed on October 23, 2013. Claims 1-8 (and 48-50) were

originally rejected based on double-patenting in view of the '099 patent, and claims 48-50 were further rejected as anticipated by US Publication No. 2012/0222883 ("Nordin"). *See* EX-1002, EX-1003. To overcome the Nordin anticipation rejection, Patent Owner amended claims and argued that Nordin disclosed a three-layer barrier tape having a non-conductive layer sandwiched between two conductive layers whereas claims 48-50 each required a three-layer barrier tape having a conductive layer sandwiched between non-conductive layers. EX-1004. The Examiner then allowed the claims.

### **Summary of the Asserted Prior Art**

#### **A. Primary References**

##### **1. "Glew": U.S. Patent Pub. No. 2013/0248240 (EX-1008)**

Glew published on September 26, 2013, from an application filed in March 2013, and is prior art. It discloses a cable having a three-layer barrier tape as recited in the claims, but was not considered by the Examiner.

##### **2. "Cook": U.S. Patent No. 9,363,935 (EX-1010)**

Cook issued on June 7, 2016, from an application filed on March 15, 2013. It is prior art and discloses a cable having a three-layer barrier tape as recited in the claims, but was not considered by the Examiner.

**3. “Pfeiler”: U.S. Patent No. 7,335,837 (EX-1011)**

Pfeiler issued on February 26, 2008, and is prior art. Pfeiler discloses a cable having a three-layer barrier tape as recited in the claims, but was not considered by the Examiner.

**4. “Roberts”: U.S. Patent No. 3,622,683 (EX-1009)**

Roberts issued in November 1971, and is prior art. Roberts is cited on the '833 Patent and was considered in connection with claims in a patent from which the '833 Patent claims priority, but was not relied upon by the Examiner during prosecution of the '833 Patent claims. Roberts discloses a cable having a three-layer barrier tape as recited in the claims.

**B. Secondary References**

**1. “Simons”: U.S. Patent No. 3,911,200 (EX-1012)**

Simons issued in 1975, and is prior art.

**2. “Jachimowicz-036”: U.S. Patent No. 3,233,036 (EX-1013)**

Jachimowicz-036 issued in 1966, and is prior art.

**3. “Jachimowicz-172”: U.S. Patent No. 3,894,172 (EX-1014)**

Jachimowicz-172 issued in 1975, and is prior art.

### **Claim Construction**

Except with respect to the phrase “non-conductively shield,” Petitioner presently believes the plain meaning is enough to resolve this petition.<sup>2</sup>

The phrase “non-conductively shield” is not used in the specification. But in the claims, it is recited in connection with each of a recited “filler member” and “barrier tape” element. *E.g.*, EX-1001, Cl. 1. The specification and claim 1 disclose/recite the filler member as being “made of non-conductive material.” EX-1001, 6:55-58, Claim 1. The specification and claim 1 separately disclose/recite the barrier tape as being “conductive” and including “a conductive layer” In combination with a dielectric/“non-conductive” layer. *Id.*, 3:3-10, 4:17-24, 7:38-60, Cl. 1. Thus, per the specification and claims, each of a dielectric filler and a conductive barrier tape (with a conductive layer) supposedly non-conductively shield.

Respectfully, the term “non-conductively shield” as recited in the claims raises a Section 112 issue, which Petitioner understands will not be resolved via this Petition.

For purposes of this Petition, and with the goal of providing a construction that captures the disclosed preferred embodiments, Petitioner proposes that a filler

---

<sup>2</sup> Petitioner reserves the right to advance specific constructions in district court litigation, as well as in response to any specific constructions advanced by Patent Owner.

member/barrier tape “non-conductively shield[s]” the twisted pair conductors (or portions thereof) if the filler member/barrier tape includes dielectric material (or a layer of dielectric layer) adjacent the conductors (or portions thereof) that blocks or protects the conductors (or portions thereof) as illustrated, for example, in FIG. 1 of the ’833 Patent, and that the filler member/barrier tape can also contain conductive material (or a layer of conductive material). And if the filler member/barrier tape includes a layer of conductive material and a layer of non-conductive material, then the layer of non-conductive material is between the non-conductively shielded components/portions and the conductive layer. *See* EX-1006, ¶¶57-67.

### **Level of Ordinary Skill**

A person of ordinary skill in the art (POSITA) would have a bachelor’s degree in electrical engineering and a minimum of 3-4 years of industry experience in connection with fabrication and testing of twisted-pair data cables. An individual with a master’s degree in electrical engineering would require less industry experience (e.g., 1-2 years). *See* EX-1006, ¶¶11-12.

### **Discretionary Issues**

Petitioner’s grounds are not the same or substantially the same as any combination previously presented to the Patent Office. Glew, Cook, Pfieler and Roberts each disclose a cable having a three-layer barrier tape with the conductive

layer between non-conductive layers and surround the conductors, which the examiner believed the other art failed to disclose (as well as other recited elements) vis-à-vis claims 48-50. Each proposed combination fills the precise gap at issue during prosecution vis-à-vis claims 48-50. Further, each reference shows the elements recited in claim 1. Therefore, there is no need to show an error and discretionary denial is unwarranted.

Discretionary denial is also not warranted because this petition presents compelling evidence of unpatentability. Each ground includes art that expressly discloses the only feature Patent Owner used to distinguish the art during prosecution (re claims 48-50) and all of the features recited in the challenged claims.

Also, although the '833 Patent is involved in litigation, the litigation is at a very early stage: no claim construction opinions have been issued, no written discovery has occurred, no depositions have been taken, and no expert reports have been submitted—all of which weigh against a discretionary denial. *Apple Inc. v. Fintiv Inc.*, IPR2020-00019, Paper 11 at 10 (PTAB Mar. 20, 2020) (precedential); *HP Inc. v. Neodron Ltd.*, IPR2020-00459, Paper 17 at 40 (PTAB Sep. 9, 2020). Trial is not set until October of 2025, more than two years from now. EX-1005. And if this IPR is instituted, Petitioner intends to seek a stay with stipulation to not

raise in district court any of the grounds raised in this Petition, which also weighs against a denial.

### **Argument**

#### **Ground 1: Cook Anticipates Claims 1-8, 48-50**

##### **A. Independent Claim 1**

- 1. A cable for reducing alien cross-talk and return loss between adjacent twisted pairs of conductors comprising:  
[1A] a first twisted pair of conductors having a first side portion and a first outwardly facing portion,**
- 2. [1B] a second twisted pair of conductors having a second side portion and a second outwardly facing portion; and**
- 3. [1C] a filler member configured to non-conductively shield the first side portion of the first twisted pair of conductors from the second side portion of the second twisted pair of conductors;**

To the extent the preamble is limiting, Cook discloses a cable (e.g., “cable 100”) for reducing alien crosstalk and return loss between adjacent twisted pairs of conductors. *See, e.g.*, EX-1010, 3:6-7, 3:28-51, 3:52-62, 4:5-21, 4:55-66, 6:8-22, 6:50-7:1, 7:37-49, 9:35-60, 13:31-36, 14:33-51, 15:3-14, FIG. 1; EX-1006, ¶¶82-88.

As shown, e.g., in annotated FIG. 1, Cook discloses a cable with elements [1A]-[1C]:

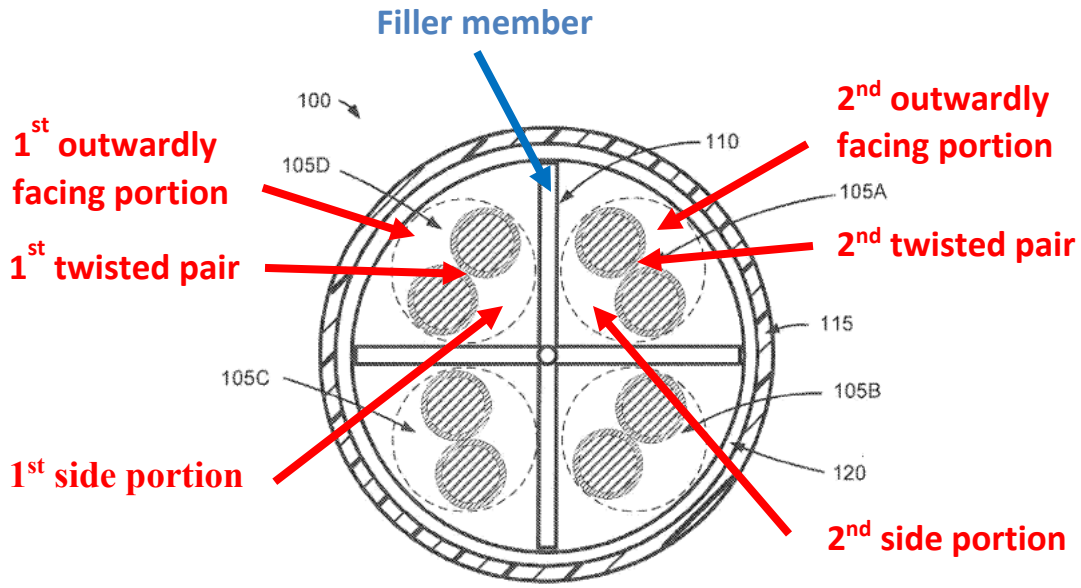


FIG. 1

EX-1010, 4:32-47, 4:55-59 (“[T]he cable may also include a separator 110 (also referred to as a separation filler, a filler, an interior support, or a spline) configured to orient and or position one or more twisted pairs 105A-D ...”), 15:57-16:33, FIGS 1-2; EX-1006, ¶¶83-87.

Like the only disclosed embodiment in the ’833 Patent, separator 110 (*filler member*) may be formed of only a dielectric material. EX-1010, 10:23-36.

Alternatively, separator can have a “continuous” or “discontinuous” conductive layer “sandwiched between two dielectric layers” so as “to provide insulation between the electrically conductive layer and the twisted pairs.” *Id.*, 7:18-20, 11:26-39, FIGS. 7A-7C and 8A-8C, 22:25-23:58. The separator thus provides “*non-conductive shield[ing]*” between the twisted pairs as recited. *See id.*, 3:27-

31, 9:36-41, 15:3-14 (“[T]he separator 110 may provide for shielding between the twisted pairs ...”). EX-1006, ¶¶85-88.

#### 4. Element 1D

**“a barrier tape configured to encircle the filler member and the first and second outwardly facing portions of the first and second twisted pairs of conductors so as to non-conductively shield the first and second outwardly facing portions of the first and second twisted pairs of conductors;”**

Cable shield 120 is a *barrier tape* that encircles the separator (*filler member*) and the twisted pairs of conductors:

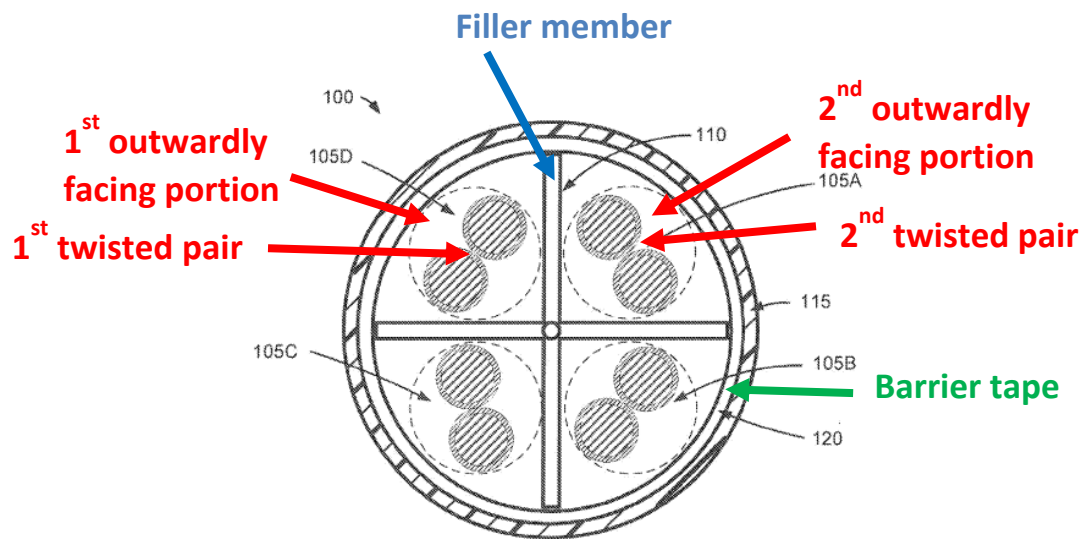


FIG. 1

See EX-1010, 4:5-10 (“[A] cable may include ... a shield layer formed around the twisted pairs and the separator ...”), 4:55-59, 5:46-48, 6:35-41, 15:3-14, 15:57-16:19, 25:39-63 (“A shield layer 1125 may then be folded or wrapped around the separator 1105 and ... a plurality of twisted pairs ...”), FIGS 1-2, 11; EX-1006, ¶¶89-93.

Cook’s shield 120 is “a tape” or “tape shield layer.” EX-1010, 7:10-20, 11:8-39, 22:30-41; EX-1006, ¶¶89-90. According to Cook, the shield “shield[s] the twisted pairs from external signals,” EX-1010, 4:5-10, 15:3-14, which a POSITA would understand to disclose shielding the outwardly facing portions of the twisted pairs. EX-1006, ¶¶89-91. Cook discloses a two-layer shield comprising a layer of discontinuous electrically conductive material (e.g., spaced-apart metal patches) on a single dielectric layer, and a three-layer tape comprising discontinuous electrically conductive material sandwiched between two dielectric layers. See, e.g., EX-1010, 7:10-20, 22:25-41, 22:62-23:22, 23:49-58, FIGS. 7A-7B, 8A-8C, 11. Cook states that the conductive material can be continuous. *Id.*, 7:10-15. On the three-layer tape, one of the dielectric layers “provide[s] insulation between the electrically conductive layer and the twisted pairs 105.” *Id.*, 11:33-36. Figure 11 also shows that the tape is wrapped so that the dielectric layer provides similar insulation. *Id.*, 25:39-63, FIG. 11. Thus, Cook discloses the tape is configured to

non-conductively shield, as recited, and the remainder of this element. EX-1006, ¶¶89-93.

## 5. Element 1E

**“a jacket configured to encircle the barrier tape;”**

As illustrated, e.g., in annotated FIG. 1, jacket 115 encircles the tape shield 120:

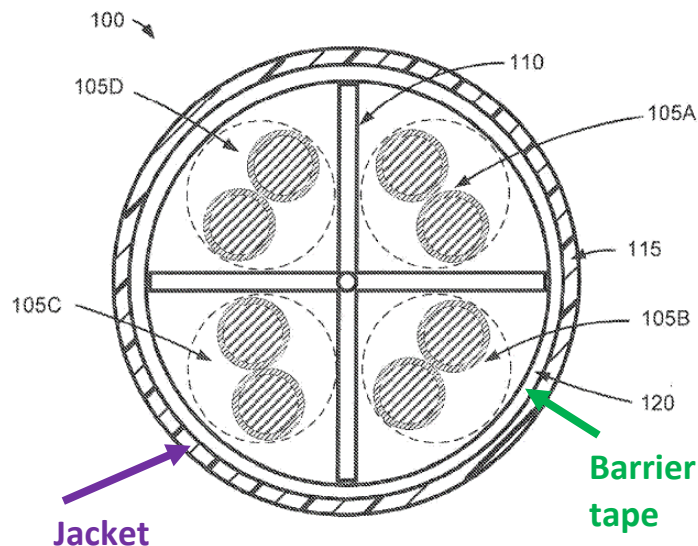


**FIG. 1**

EX-1010, 5:18-20 (“The jacket 115 may enclose the internal components of the cable 100 ...”); *see also*, FIG. 2, EX-1006, ¶94.

## 6. Element 1F

**“wherein the second twisted pair of conductors is located adjacent to a portion of the filler member, and wherein the first twisted pair of conductors is located adjacent to the portion of the filler member;”**

Cook discloses this element as illustrated, e.g., in the annotated FIG. 1:

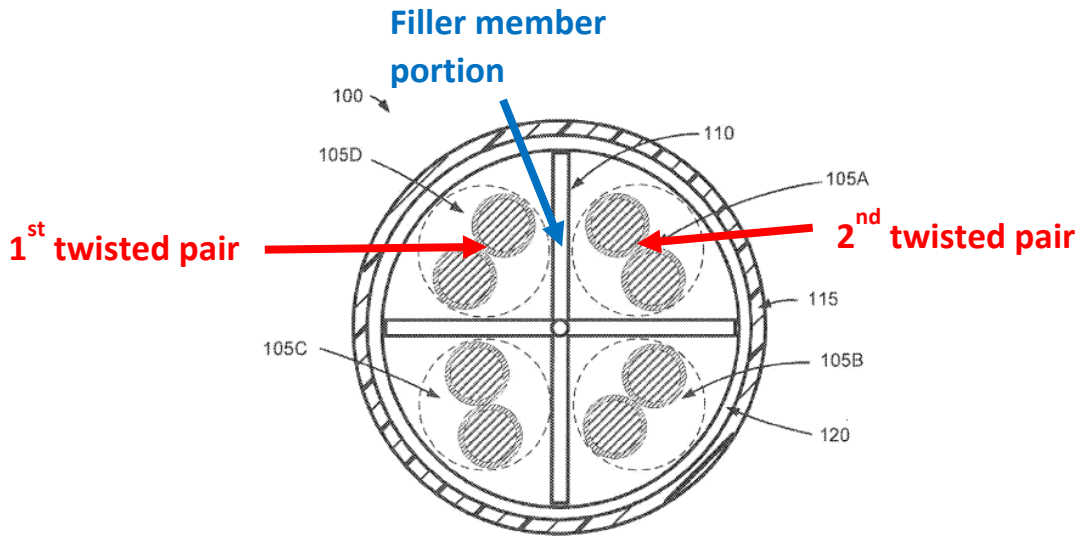


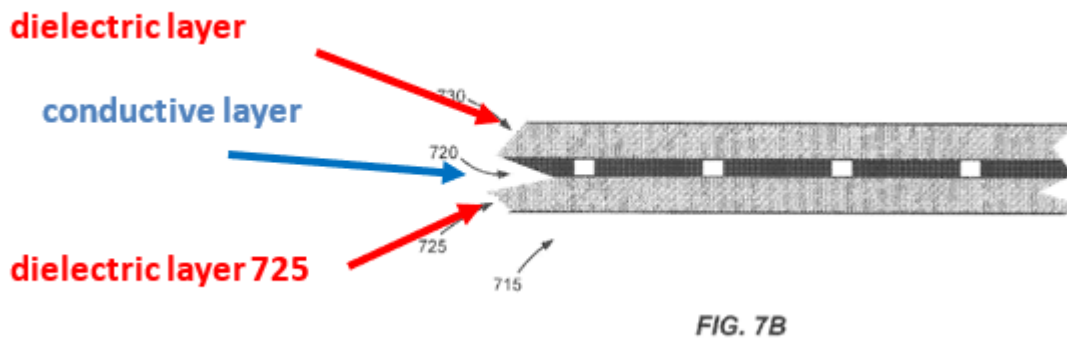
FIG. 1

EX-1010, 4:55-59, 15:57-16:19, FIGS 1-2; EX-1006, ¶¶95-96.

## 7. Element 1G

**“wherein the barrier tape includes a non-conductive layer and a conductive layer;”**

Cook discloses that shield 120 (*barrier tape*) may be a multi-layer tape as shown in FIG. 7A-7C. *E.g.*, EX-1001, 22:25-23:22, 23:49-58, FIGS. 7A-7C, 8A-8C. Figure 7B (annotated below) has an “electrically conductive layer 720” that “is sandwiched between two dielectric layers 725, 730.”



Cook, 7:18-20, 22:39-41, FIG. 7B. Thus, this element is disclosed. *See* EX-1006, ¶¶97-98.

## 8. Element 1H

**“wherein the filler member is made of a non-conductive material;”**

As explained above for Element [1C], Cook discloses that separator 120 (*filler member*) may be formed of a purely dielectric material, or alternatively be a multi-layer tape with one or two non-conductive, dielectric layers. *E.g.*, EX-1001, 8:46-62 (describing “suitable materials” for the separator segments), 9:41-52, 10:23-37 (separator formed from an extruded dielectric material with or without electrically conductive material), 11:8-39, 22:25-23:22, 23:49-58, FIGS. 7A-7C & 8A-8C. Cook thus discloses this element. *See* EX-1006, ¶99.

## 9. Element 1I

**“wherein the filler member includes a plurality of arms that are each configured to radially extend outwardly so as to form a first channel shaped to partially enclose the first twisted pair of conductors and a second channel shaped to partially enclose the second twisted pair of conductors;”**

As shown, e.g., in annotated FIG. 1, separator 110 (*filler member*) has arms that extend radially outwardly to form first and second channels that are shaped as recited:

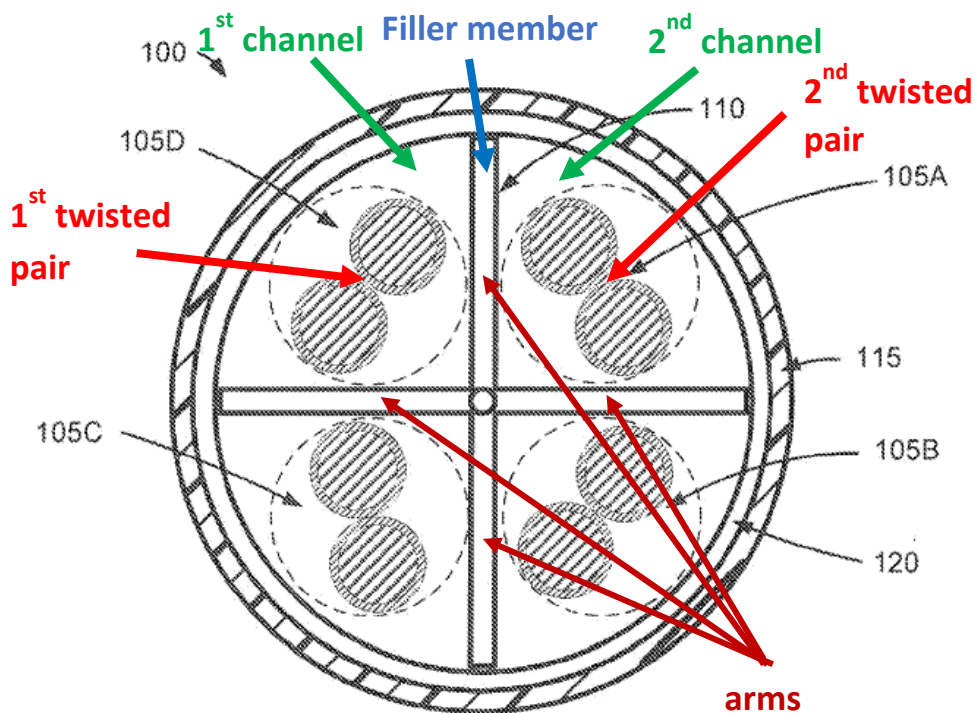


**FIG. 1**

See, e.g., EX-1010, 4:55-59, 15:57-16:19, FIGS. 1-2; see EX-1006, ¶¶100-101.

## 10. Element 1J

“wherein the first terminal portion of the filler member includes a first outwardly facing terminal surface, the second terminal portion of the filler member includes a second outwardly facing terminal surface, and the barrier tape is configured to encircle the first and second outwardly facing terminal surfaces and the first and second twisted pairs of conductors;”

As illustrated, e.g., in annotated FIG. 1, each filler member arm has a terminal portion<sup>3</sup> with an outwardly facing terminal surface, and shield 120 (*barrier tape*) encircles such surfaces and the twisted pairs as recited:

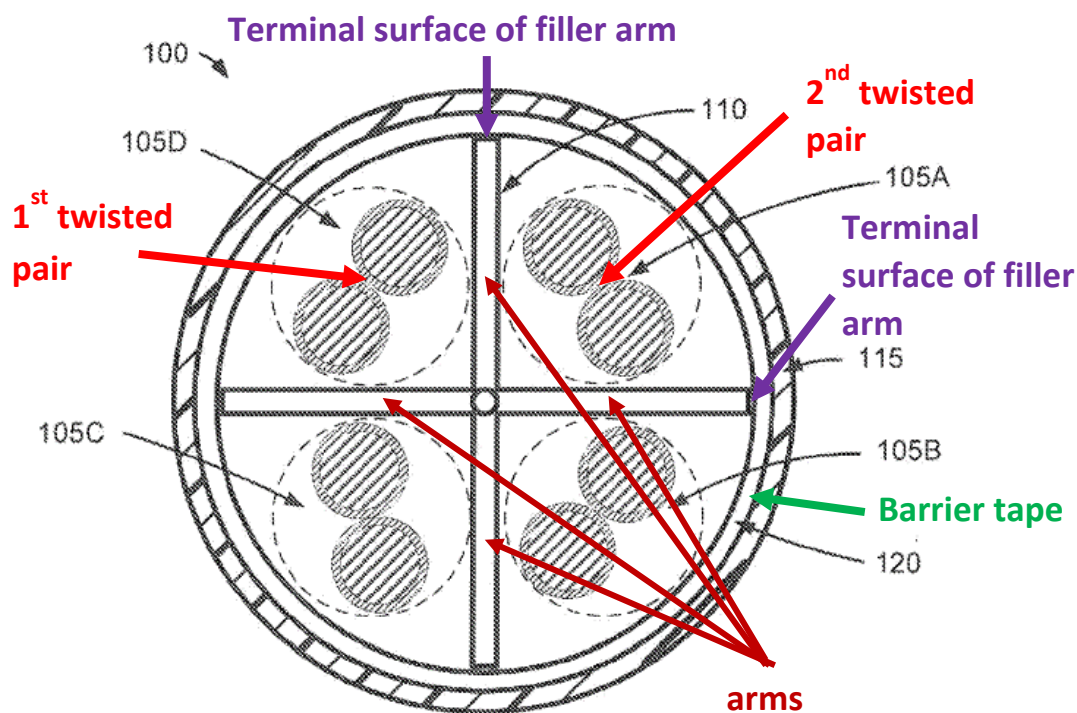


FIG. 1

<sup>3</sup> There is no antecedent basis for “the first[/second] terminal portion.”

See, EX-1010, 4:5-10, 4:55-59, 15:57-16:19, 19:50-53, 25:39-53, FIGS 1-2, 11;  
see EX-1006, ¶¶102-103.

## 11. Element 1K

**“wherein the filler member is configured to extend along a longitudinal portion of the cable and is configured to non-conductively shield the first and second twisted pairs of conductors from being electrically coupled to each other along the longitudinal portion of the cable.”**

Cook’s separator 110 (*filler member*) extends “along the length of the cable 100” so that it is “arranged longitudinally (e.g., end to end) along a length of the cable 100.” EX-1010, 7:43-49; *see also* 17:17-40, 17:48-58, 19:20-37, FIGS. 4A-4B, 25:39-63. The separator “maintains a desired orientation of the twisted pairs . . . along a longitudinal direction of the cable” (*id.*, 7:39-41) and provides “shielding between the twisted pairs” (*id.*, 4:5-10, 15:3-14). As explained above, the separator may be dielectric material or, e.g., a conductive layer sandwiched between the dielectric layers, so that it is *configured to non-conductively shield* the pairs from being electrically coupled as recited. Thus, Cook discloses this element and claim. See EX-1006, ¶¶104-108.

## **B. Dependent Claims 2-8**

### **1. Claim 2**

**“2. The cable of claim 1, wherein the filler member comprises a single unitary component of the cable, and the plurality of arms of the filler member form a cross shape.”**

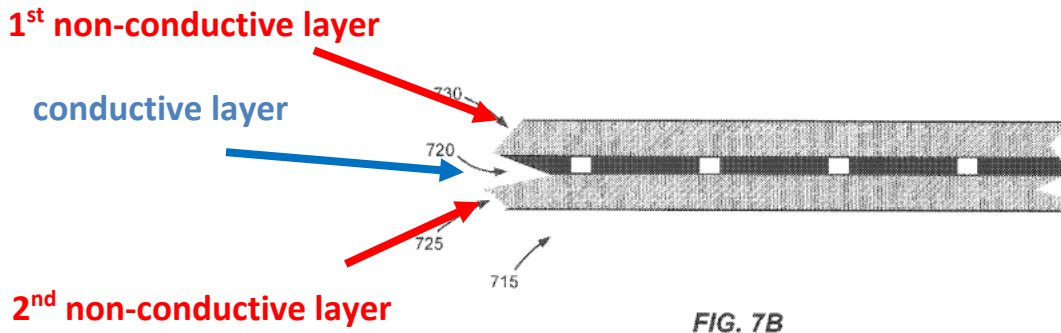
In one disclosed embodiment, separator 110 (*filler member*) is “a continuous separator” (i.e., single unitary component) that “may be scored or partially cut at one or more locations” to “enhance the flexibility of the separator.” EX-1010, 19:30-37; *see also, id.*, 18:65-19:2, 19:20-27; *see* EX-1006, ¶¶109-110.

As shown above for Element [1J], separator 110 has four arms that form a cross shape. E.g., Cook, 11:43-44, 11:55-56, 19:50-51, FIGS. 1, 2, 5A; *see* EX-1006, ¶¶110-111. This claim is disclosed. EX-1006, ¶¶110-111.

### **2. Claim 3:**

**“3. The cable of claim 1, wherein the non-conductive layer of the barrier tape comprises a first non-conductive layer and the barrier tape includes a second non-conductive layer.”**

As shown in annotated FIG. 7B, shield 120 can be a three-layer shield (*barrier tape*) that, like the '833 Patent barrier tape, includes first and second non-conductive layers 725, 730 surrounding conductive layer 720, as recited:



EX-1010, 22:25-41, FIG. 7B; *see* EX-1006, ¶¶112-113.

**3. Claim 4:**

**“4. The cable of claim 3, wherein the conductive layer of the barrier tape is positioned between the first and second non-conductive layers.”**

Cook discloses a three-layer tape as recited. *See* discussion above regarding [1G] and claim 3; EX-1010, 22:25-41, FIG. 7B; EX-1006, ¶114.

**4. Claim 5:**

**“5. The cable of claim 3, wherein the first non-conductive layer comprises an inner non-conductive layer and the second non-conductive layer comprises an outer non-conductive layer.”**

Cook teaches wrapping the shield (*barrier tape*) around the internal separator and twisted pairs. EX-1010, 4:41-44, 4:55-59, 5:46-48, 25:51-54, FIGS. 1, 11. A POSITA would understand that when Cook’s three-layer barrier tape of FIG. 7B (shown annotated above for claims 3-4), is so wrapped to encircle the separator/filler and twisted pairs, one of non-conductive layer 725, 730 is an inner non-conductive layer adjacent the twisted pairs while the other is an outer non-conductive layer as recited. EX-1006, ¶¶115-116.

**5. Claim 6:**

**“6. The cable of claim 1, wherein the filler member and the barrier tape are configured to extend along a longitudinal direction of the cable.”**

Cook’s separator (*filler member*) “function[s] to position or orient the twisted pairs along a longitudinal direction of the cable” (EX-1010, 3:12-14; *see also* 7:37-41), and shield 120 (*barrier tape*) “encases” the twisted pairs and the separator (and thus likewise extends in the longitudinal direction). *See, e.g., id.*, 4:55-62, 5:18-20, 6:35-40, 25:39-63, FIGS. 1, 2, 11. Cook discloses this element/claim. EX-1006, ¶¶117-118.

**6. Claim 7:**

**“7. The cable of claim 1, wherein the first and second twisted pairs of conductors comprise first and second helically twisted pairs of conductors along the longitudinal portion of the cable, and the filler member and the barrier tape are configured to non-conductively shield the first and second helically twisted pairs of conductors along the longitudinal portion of the cable.”**

Cook discloses that each pair of conductors is “twisted together in a helical fashion to form a balanced transmission line.” EX-1010, 1:55-60. Cook also discloses that the twisted pairs and other cable components may be “helically stranded or twisted together.” *Id.*, 25:26-30. The twisted pairs and separator extend along the longitudinal direction of the cable. *Id.*, 3:12-14, 7:37-41, 17:23-61, 25:39-63, FIGS. 4A-4B, 11; EX-1006, ¶120.

Cook discloses the separator (*filler member*) as “shielding between the twisted pairs” and the shield 120 (*barrier tape*) as “shield[ing] the twisted pairs

from external signals.” EX-1010, 4:5-10, 15:3-14. Cook’s separator provides non-conductive shielding for the reasons discussed above in elements [1A-C] and [1K] (e.g., it may be made solely of dielectric/non-conductive material). Shield 120 (*barrier tape*) likewise provides non-conductive shielding as discussed for element [1D]. Thus, this claim is disclosed. EX-1006, ¶¶119-125; *see also* Ground 1 §A(1)-(4) & (11).

**7. Claim 8:**

**“8. The cable of claim 1, wherein the first and second twisted pairs of conductors comprise first and second helically twisted pairs of conductors along the longitudinal portion of the cable, and the filler member is configured to non-conductively shield the first and second helically twisted pairs of conductors along the longitudinal portion of the cable.”**

Cook discloses these claim elements as explained above in connection with claim 7. *See* EX-1006, ¶¶126-130.

**C. Independent Claim 48**

**1. Element 48A**

**“A cable comprising: [48A] a plurality of twisted pair conductors;”**

Cook discloses a cable comprising a plurality of twisted pair conductors, as illustrated, e.g., in annotated FIG. 1:

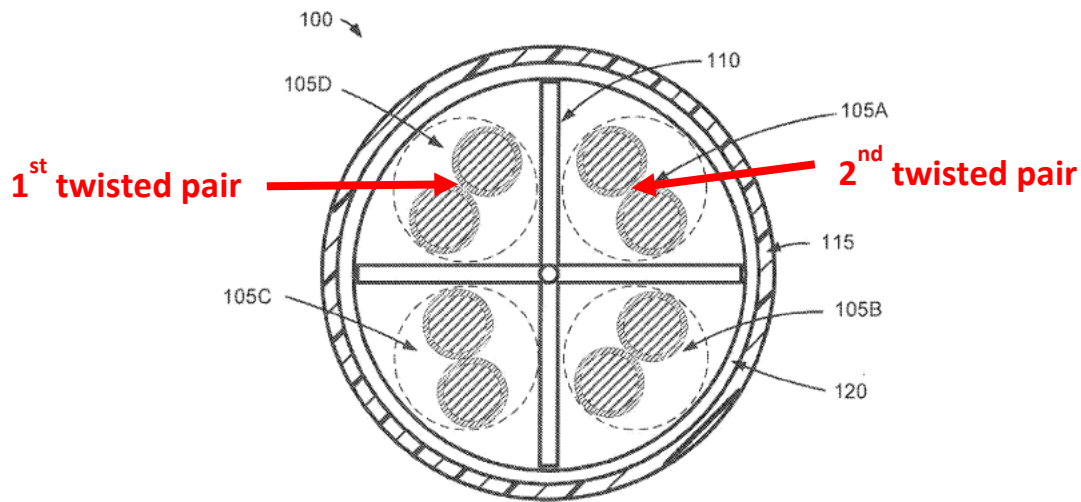


FIG. 1

See, e.g., EX-1010, 4:41-47, 5:63-6:22, 15:57-16:19, FIGS 1-2; EX-1006, ¶¶131-132.

## 2. Element 48B

**“a barrier tape that surrounds the plurality of twisted pair conductors, the barrier tape including an electrically conductive layer enclosed between inner and outer dielectric layers;”**

As shown in the annotated figures below, and in connection with the above discussion of elements [1D] and [1G] and claims 3-4, Cook discloses shield layer 120 with a three-layer tape configuration (*barrier tape*) surrounding the plurality of twisted pairs, and having an electrically conductive layer enclosed between inner and outer dielectric layers:

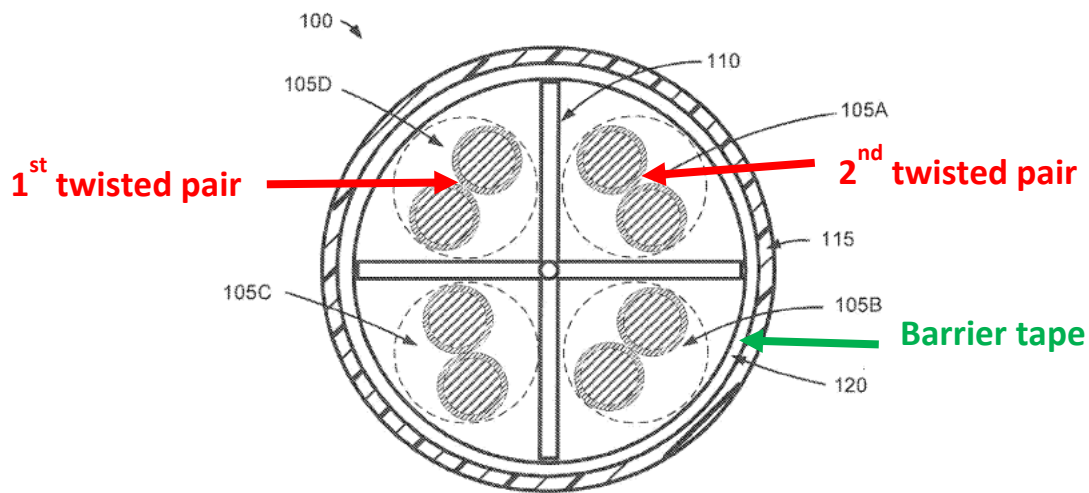


FIG. 1

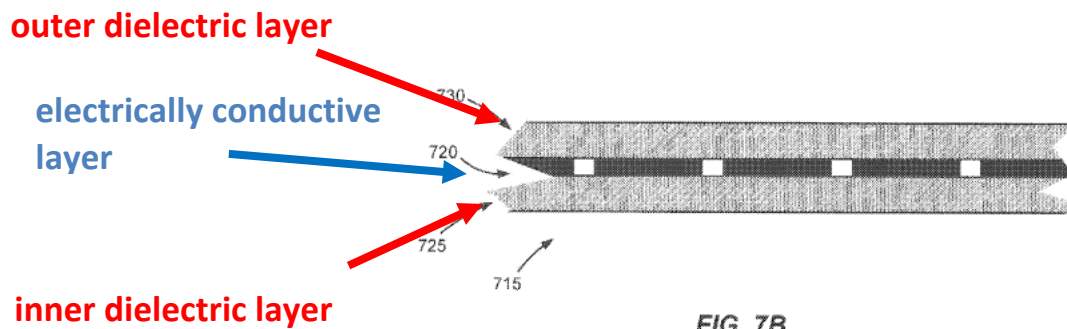


FIG. 7B

See, e.g., EX-1010, 4:5-10, 5:46-48, 6:35-41, 7:10-20, 15:57-16:19, 22:39-41, FIGS. 1-2, 7B, 11. This conductive layer need not span the full width of the dielectric layers, and this element is disclosed. EX-1006, ¶¶133-139; EX-1010, 12:17-23.

### 3. Element 48C

**“a jacket that surrounds the barrier tape.”**

Cook discloses this:

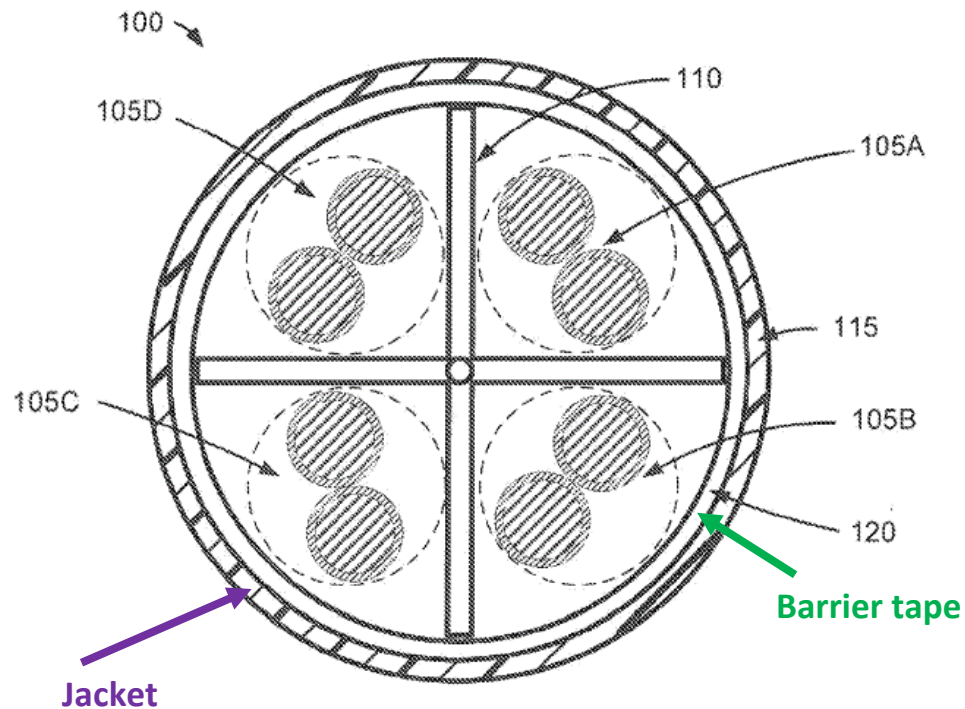


**FIG. 1**

*See supra* discussion of Element [1E]; EX-1010, 5:18-20 (“The jacket 115 may enclose the internal components of the cable 100 ...”). FIGS. 1-2; EX-1006, ¶¶140-141.

#### **D. Independent Claim 49**

##### **1. Element 49A**

**“A cable comprising: [49A] a plurality of pairs of conductors extending along a longitudinal axis;”**

*See* discussion of claim 7 and element [48A]. As shown in annotated FIG. 1, Cook discloses a cable comprising a plurality of twisted pair conductors:

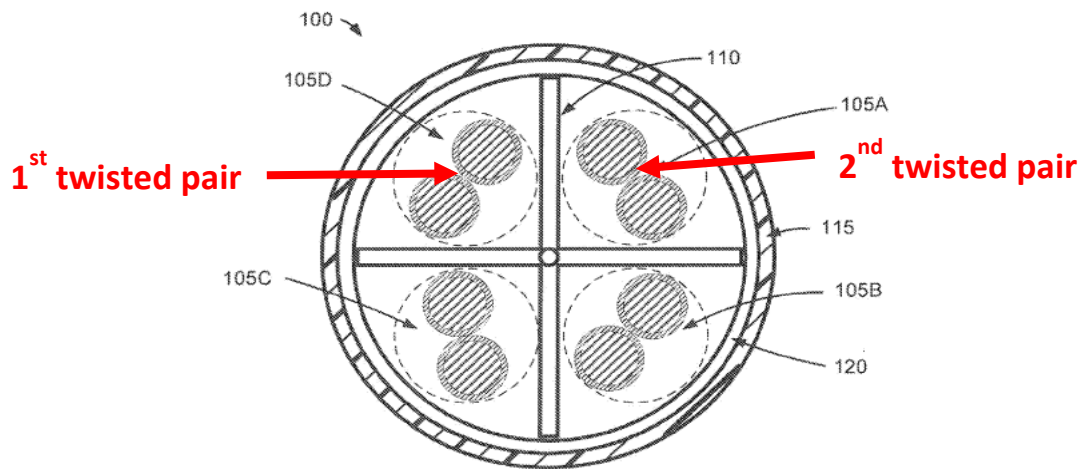


FIG. 1

EX-1010, 4:32-47, 4:55-59, 5:63-6:22, 15:57-63, FIGS 1-2; EX-1006, ¶142. The conductor pairs extend along a longitudinal axis of the cable. *See, e.g.*, EX-1010, 3:12-14; 7:37-41; 17:23-61, 25:39-63, FIGS. 4A-4B, 11; EX-1006, ¶¶142-144.

## 2. Element 49B

**“a barrier tape surrounding the plurality of pairs of conductors, the barrier tape comprising a conductive layer positioned between a first non-conductive layer and a second non-conductive layer; and”**

Cook teaches this. *Supra*, Ground 1 §§A(4), B(3-4), C(2). As already explained in connection with elements [1D], [48B] and claims 3-4, Cook discloses that shield layer 120 is a barrier tape that surrounds the plurality of twisted pairs and can be configured (as shown in FIG. 7B) to have a conductive layer positioned between first and second inner and outer non-conductive layers. EX-1010, 4:5-10, 4:42-47, 5:46-48, 15:57-16:19, 22:25-41, FIGS. 1-2, 7B; EX-1006, ¶¶145-147.

### 3. Element 49C

**“an outer jacket surrounding the barrier tape, the outer jacket comprising a non-conductive material.”**

Cook discloses this. Cook discloses that outer jacket 115 surrounding the barrier tape (shield 120) may be formed of non-conductive materials such as FEP and polyolefin. *See*, EX-1010, 4:32-47, 4:55-59, 5:18-42, 15:57-16:19, FIGS 1-2; EX-1006, ¶¶148-151; Ground 1 §§A(5), B(3).

#### E. Independent Claim 50

Claim 50 is a method claim that recites essentially the same structural limitations as set forth in claims 48 and 49 but with method steps. It recites ([50A]) a plurality of “twisted pairs of conductors” (see [48A]/[49[A]) that are “surround[ed]” by a three-layer barrier tape having “a conductive layer positioned between [first and second] non-conductive layers” (see [48B]/[49B]), with ([50B]) the barrier tape “extending within” (e.g., being surrounded by) a jacket (see [48C]/[49C]), and also [1E]). Cook’s disclosure of a cable having twisted pairs conductors surrounded by a three-layer barrier tape as recited, with a jacket enclosing the conductors and tape, applies equally to the recited method steps of surrounding twisted pair conductors with a three-layer barrier tape ([50A]) and extending the barrier tape within an outer jacket ([50B]), and results in performing the recited method steps. EX-1006, ¶¶152-160. Using Cook’s cable and teaching as described for claims 48-49 above results in performing the method recited in

claim 50 and renders claim 50 anticipated for the same reasons discussed above.

See, EX-1006, ¶¶152-160; Ground 1 §§C, D, *supra*.

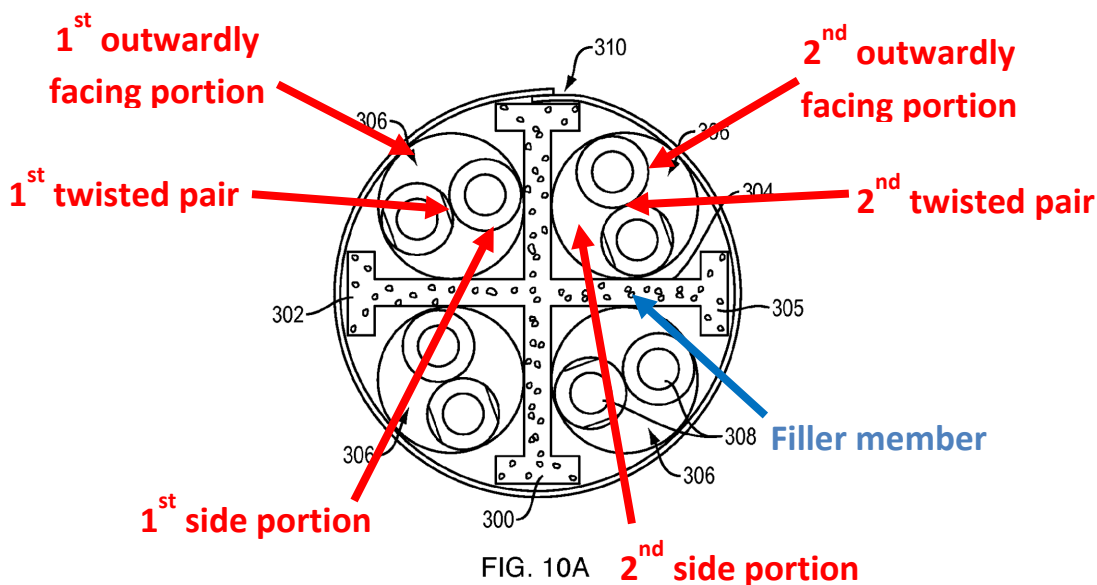
## Ground 2: Glew Anticipates Claims 1-8, 48-50

### A. Independent Claim 1

1. A cable for reducing alien cross-talk and return loss between adjacent twisted pairs of conductors comprising: [1A], [1B] and [1C]

To the extent the preamble is limiting, Glew explains that the invention relates to “shielding of communications cables,” and discloses a twisted pair cable in which “various compositions, methods and devices of the invention can be utilized to reduce or eliminate cross-talk between conductors within a cable or alien cross-talk between cables.” EX-1008, ¶[0101], FIGS 6A, 6B, 10A.

As shown in annotated FIG. 10A, Glew discloses each of elements [1A]-[1C]:



*See, e.g., id.*, ¶¶[0143] (“The conductors can be ... twisted pairs of wires. The separator 10 minimizes, and preferably eliminates, cross-talk between the conductors disposed in different channels.”), [0154], FIG 10A; EX-1006, ¶¶161-163.

Separator 300 (*filler member*) “*is configured to non-conductively shield*” between the twisted pairs as recited. EX-1006, ¶¶162-164. Like the disclosed filler member in the ’833 Patent, Glew discloses that “separator 300 can be formed of a polymeric material, such as, FEP, PFA, MFA....” EX-1008, ¶[0154]. Glew discloses that the separator can instead be conductive strip enclosed by a dielectric polymer (or a dielectric polymer with metallic particles inside). EX-1008, ¶¶[0066], [0120-121], [00152], [0154]; FIGS. 9, 10A. Likewise, Glew incorporates by reference US Publication No. 2010/0206609 (“’609 Publication”), which discloses separators (as disclosed in the ’833 Patent) formed of a purely non-conductive, dielectric material for reducing crosstalk. *Id.*, ¶¶[0144], [0159], [0219]; EX-1026, ¶[0067]. Glew thus includes the disclosure of the ’609 Publication, *see, Arbutus Biopharma Corp. v. Modernatx, Inc.*, 65 F.4th 656, 662-63 (Fed. Cir. 2023) (quoting *Advanced Display Sys., Inc. v. Kent State Univ.*, 212 F.3d 1272, 1282 (Fed. Cir. 2000)), and Glew discloses these elements. EX-1006, ¶¶161-166.

## 2. Element 1D

As shown in the annotated figure, Glew discloses shielding material 310 (*barrier tape*) encircling the separator 300 (*filler member*) and the first and second twisted pairs (308) as recited:

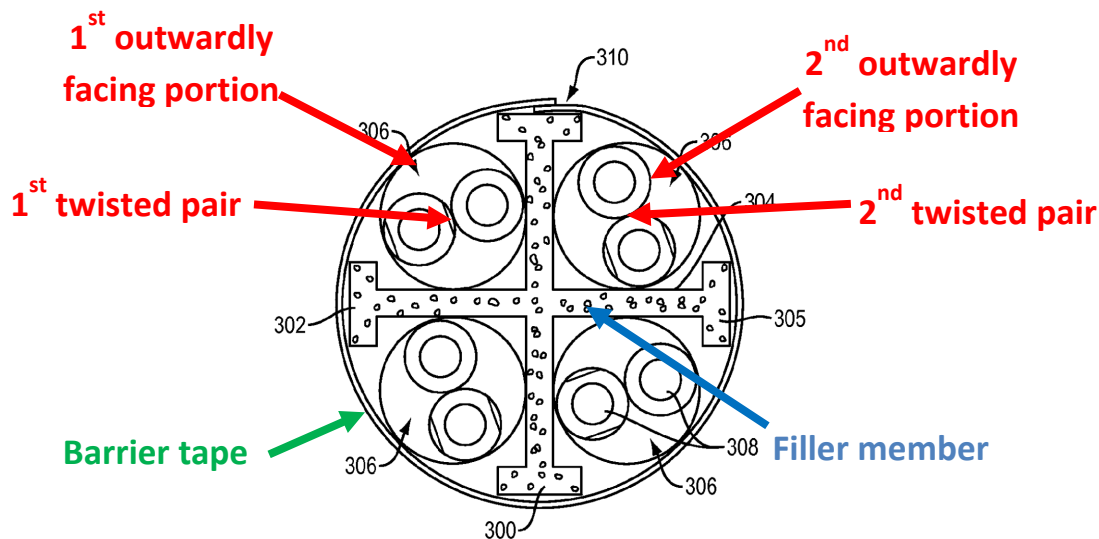


FIG. 10A

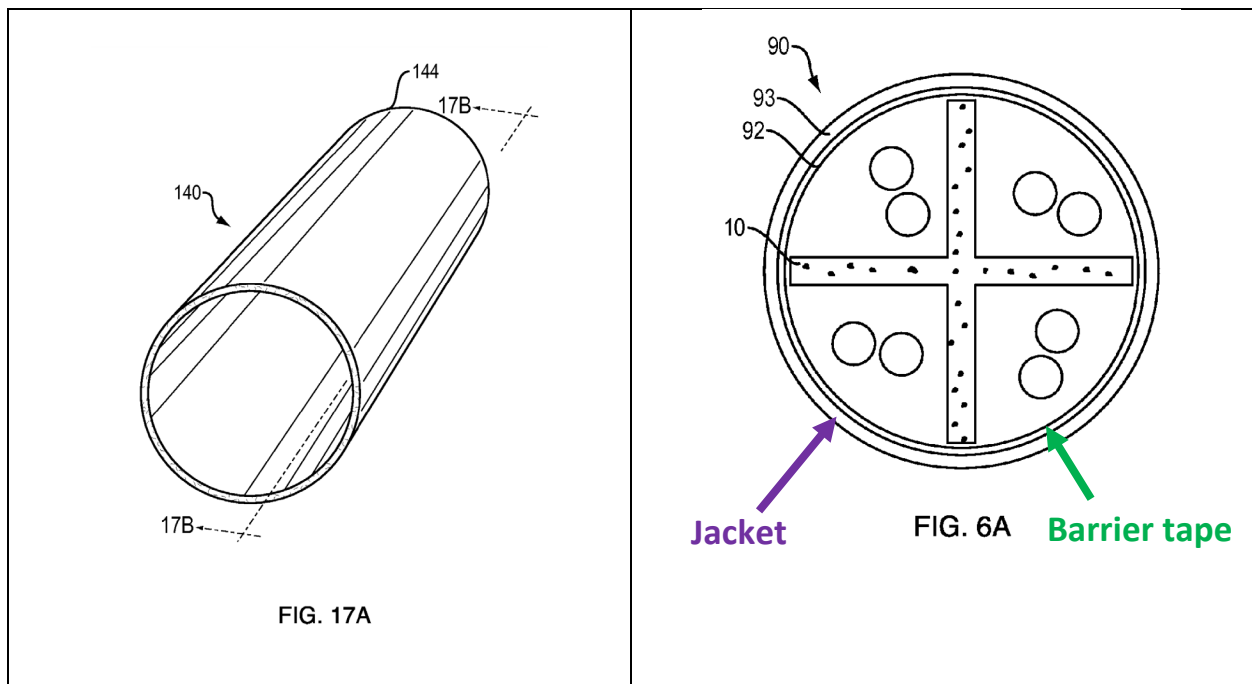
See, e.g., EX-1008, ¶[0154], FIG 10A; EX-1006, ¶167.

Glew states that shielding material 300 “can be a multi-layer tape material, as discussed below with respect to FIGS. 13A, 13B, 13C, 13D ....” EX-1008, ¶[0154]. The multi-layer tapes in FIGS 13A-D include conductive layers and/or dielectric layers with dispersed metallic particles “to provide shielding of electromagnetic radiation.” *Id.*, ¶¶[0030-34], [00164-65], [0186-198]; EX-1006, ¶168. Like the barrier tape disclosed in the ’833 Patent, Figure 13C is a three-layer tape with a conductive layer 133 sandwiched between two dielectric non-conductive layers (i.e., polymeric substrate 135 and non-woven layer 137 which

can also be a polymeric material). EX-1008, ¶¶[0195], [0197], FIG. 13C; EX-1006, ¶166. Thus, a POSITA would understand that this three-layer barrier tape in FIG. 13C, is configured to *non-conductively shield* as recited in Element [1D]. EX-1006, ¶¶167-170; Element [1G], *infra*.

### 3. Element 1E

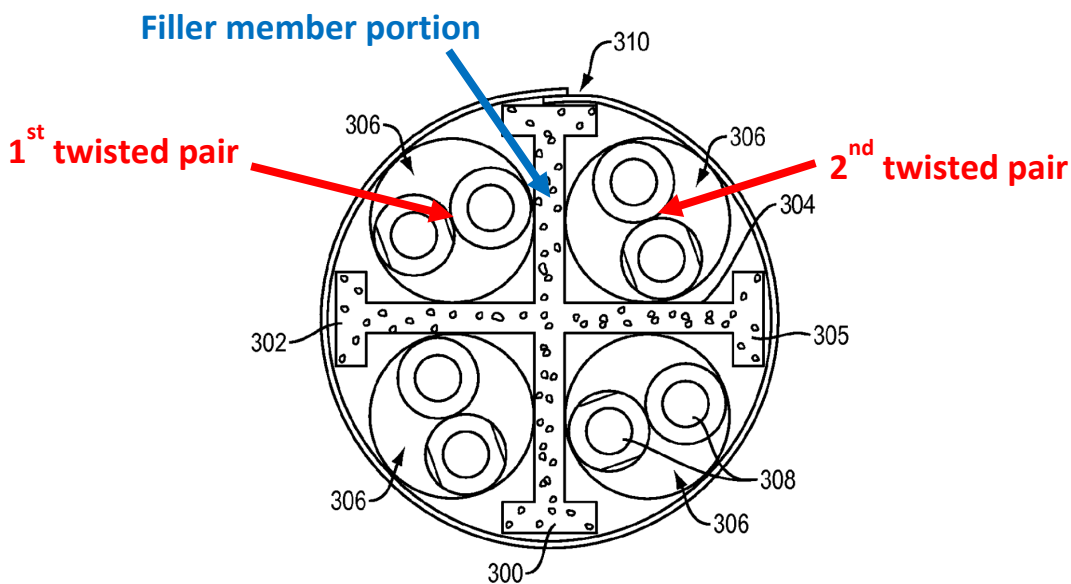
Glew describes and illustrates (see annotated figures below) an outer jacket that encircles the barrier tape as recited:



EX-1008, ¶¶[0038], [0146] (“The metal braid, metal tape 92 ... is turn surrounded by jacket 93 ....”), [221-230], FIGS 6A, 17A, 17B, 18A, 18B; EX-1006, ¶¶171-173.

#### 4. Element 1F

Glew discloses this element, with the first and second twisted pairs of conductors located adjacent an arm of the separator 300 (*portion of the filler member*), as illustrated in annotated FIG. 10A:



See EX-1008, ¶[0154], FIG 10A; EX-1006, ¶¶173-174.

#### 5. Element 1G

Glew discloses that shielding material 310 (*barrier tape*) can be a multi-layer tape material as shown in FIG. 13C. EX-1008, ¶[0154]. The tape in FIG. 13C has “a thin metallic layer 133 (e.g., an aluminum foil layer) [that] is disposed between an underlying polymeric substrate 135 and a non-woven fabric layer 137.”

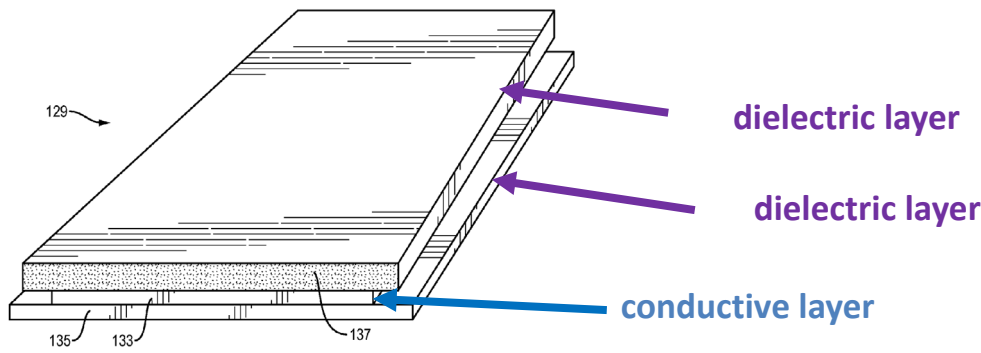


FIG. 13C

*Id.*, ¶[0195], FIG. 13C. Glew states that each substrate layer 135 and non-woven fabric material layer 137 can be an insulative polymeric material (i.e, non-conductive material). *Id.* ¶¶[0188], [0195]. Glew discloses this element. EX-1006, ¶¶175-177.

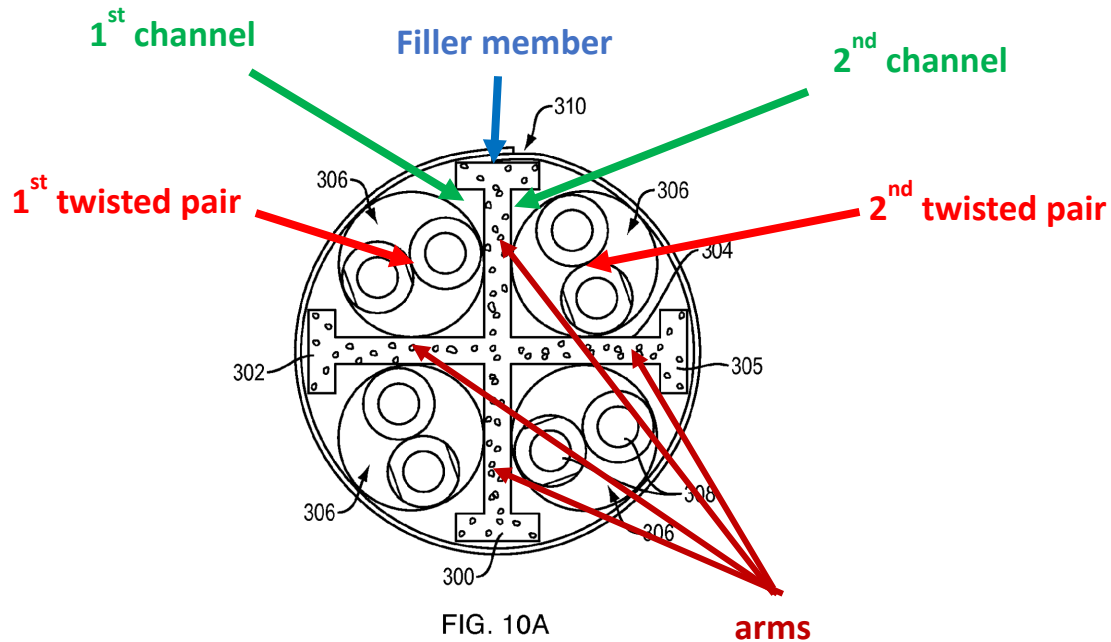
## 6. Element 1H

Glew discloses that separator 300 (*filler member*) “can be formed of a polymeric material, such as FEP, PFA, MFA, and any of the other polymers discussed above” (i.e., is made of a non-conductive material). EX-1008, ¶[0154], FIG. 10A; EX-1006, ¶178; *see also* discussion of Element [1C].

## 7. Element 1I

As illustrated, e.g., in annotated FIG 10A, separator 300 (*filler member*) has arms 304 that extend radially outward to form first and second channels that

partially enclose the first and second twisted pairs 308 as recited:



EX-1008, ¶¶[0143] (“Conductors can be disposed in the channels ... provided by the separator 80.”), [0154], FIGS. 5, 6A-B, 10A; EX-1006, ¶¶179-180.

## 8. Element 1J

As illustrated, e.g., in annotated FIG. 10A, Glew discloses that each filler member arm 304 has a flap portion 305 (*terminal portion*) with an outwardly facing surface, and the shielding material 310 encircles these terminal surfaces and the twisted pairs 308:

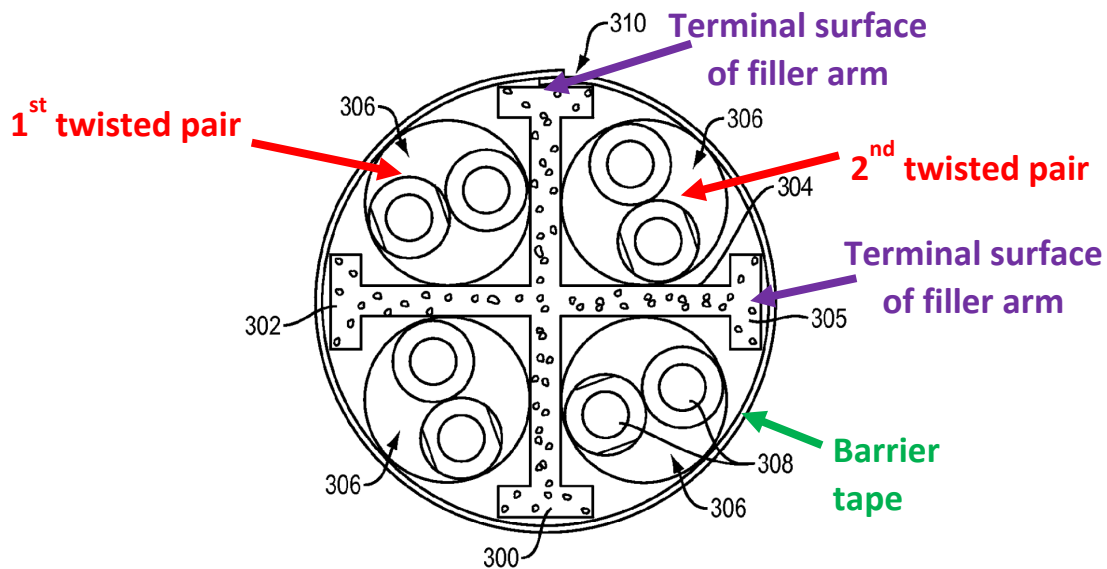


FIG. 10A

EX-1008, ¶¶[0154], [0197], FIG. 10A; EX-1006, ¶¶181-182.

## 9. Element 1K

As shown in annotated FIG 2A, Glew discloses an exemplary separator that is an elongated cross-shaped member that extends from a proximal end 20 to a distal end 30.

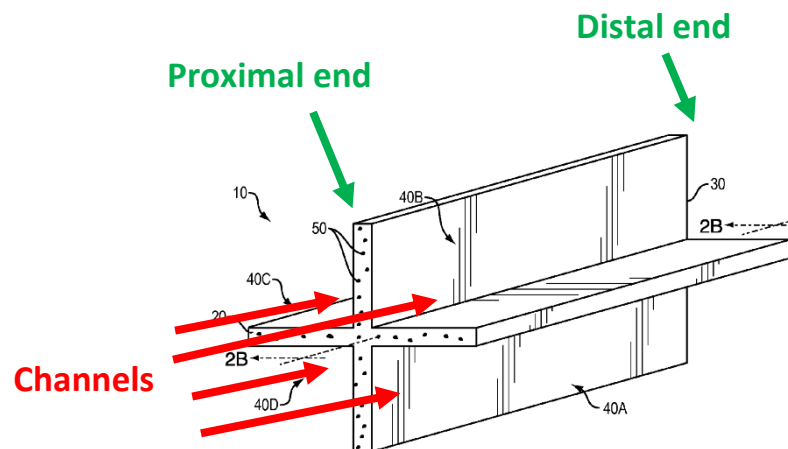


FIG. 2A

EX-1008, ¶¶[0045], [0121-22]; FIG. 2A. The disclosed separators are “*configured to non-conductively shield*” the first and second conductor pairs “*from being electrically coupled to each other along the longitudinal portion of the cable.*”

The separator defines channels (e.g., channels 40A, 40B, 40C, 40D in FIG 2A above) in which each twisted pair can be disposed. *Id.* Figure 10A (below) shows a twisted pair in each of the four channels 306 defined by the cross-shaped separator 300 (*filler member*).

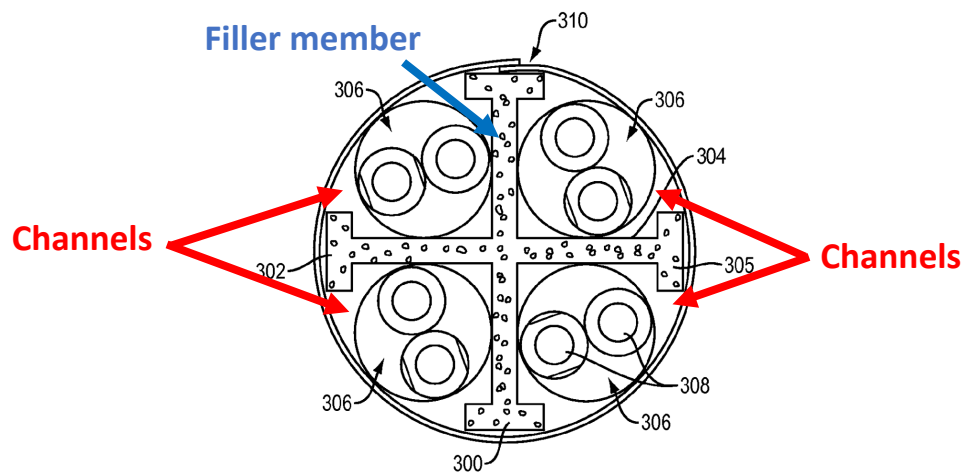


FIG. 10A

*Id.*, ¶¶[0154], FIG. 10A. A POSITA would conclude that Glew’s disclosed separators also non-conductively shield the twisted pairs as recited. EX-1006, ¶¶183-184. As explained for Element [1C], Glew discloses a separator formed only of a polymeric material, or one having a metal strip encased in polymeric material, or a three-layer separator (like the three-layer barrier tape in the ’833 Patent) that has a conductive strip between non-conductive layers. *See, supra,*

Ground 2 §A(1); *see also, id.*, ¶¶[0144], [0154], [0159], [0219], FIGS. 9, 10A; EX-1026, ¶[0067].

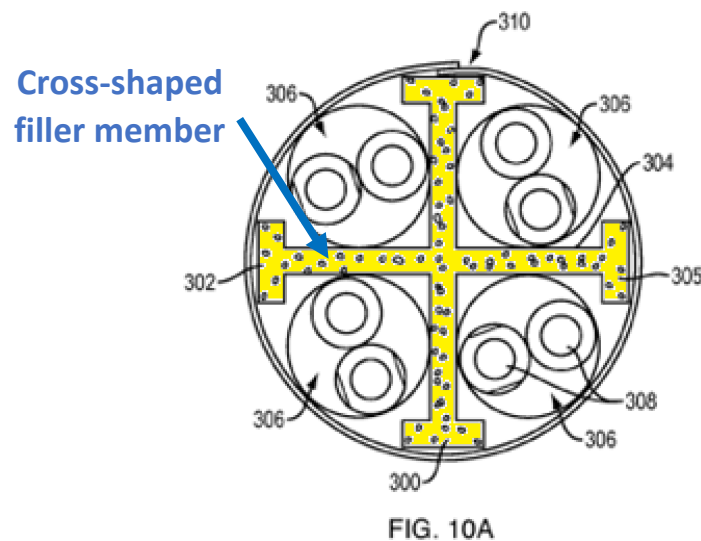
Glew thus discloses this element, as well as the other elements of claim 1. EX-1006, ¶¶183-187.

## B. Dependent Claims 2-8

### 1. Claim 2

**“2. The cable of claim 1, wherein the filler member comprises a single unitary component of the cable, and the plurality of arms of the filler member form a cross shape.”**

As shown in annotated FIG. 10, separator 300 (*filler member*) has four arms that “*form a cross shape*”:



EX-1008, FIG 10A; *see also* FIGS. 5-6B. Glew describes other separators with an “elongated cross-shaped form” and “cross-shaped ... profile.” *Id.*, ¶¶[0121-122]; [0144]. These separators can be formed by extruding polymeric material into “an

elongated cross-shaped form.” *Id.*, ¶¶[0121-0122], [0148]. As an extruded component, separator also would be a *single unitary component*. EX-1006, ¶¶188-190.

**2. Claim 3:**

**“3. The cable of claim 1, wherein the non-conductive layer of the barrier tape comprises a first non-conductive layer and the barrier tape includes a second non-conductive layer.”**

See discussion of element [1G] showing a multi-layer tape (that Glew teaches can be used as the shielding material 310 (*barrier tape*)) having a bottom polymeric substrate 135 (*first non-conductive layer*) and a non-woven fabric layer 137 formed of a polymeric material (*second non-conductive layer*). EX-1008, ¶¶[0154], [0195], FIGS. 10A, 13C; Ground 2 §A(5); EX-1006, ¶¶191-192.

**3. Claim 4:**

**“4. The cable of claim 3, wherein the conductive layer of the barrier tape is positioned between the first and second non-conductive layers.”**

Glew discloses this element, as already discussed with Element [1G] and claim 3. EX-1006, ¶193; Ground 2 §§A(5), B(2).

**4. Claim 5:**

**“5. The cable of claim 3, wherein the first non-conductive layer comprises an inner non-conductive layer and the second non-conductive layer comprises an outer non-conductive layer.”**

See discussion of Element [1G] and claim 3. When shielding material 310 (*barrier tape*) in FIG. 10A is configured as a three-layer tape (as in FIG. 13C) and

wrapped around the twisted pairs of conductors, one non-conductive layer will be positioned between the twisted pairs and the conductive layer 133 (*inner non-conductive layer*) and the other non-conductive layer is external to the conductive layer 133 (*outer non-conductive layer*). EX-1008, ¶¶0197]; EX-1006, ¶¶194-196.

**5. Claim 6:**

**“6. The cable of claim 1, wherein the filler member and the barrier tape are configured to extend along a longitudinal direction of the cable.”**

As explained vis-a-vis [1K], Glew discloses the filler member configured as recited. *See, supra*, Ground 2 §A(9); EX-1006, ¶¶197-198.

Glew also discloses that shielding material 310 is wrapped around the separator and twisted pairs of conductors for the purpose of shielding the twisted pairs, and thus reducing alien crosstalk from other cables. EX-1008, ¶¶[0030], [0101], [00154], [0165]. Since twisted pairs extend along the longitudinal direction of the cable, the shielding material does likewise. EX-1006, ¶¶198-200.

**6. Claim 7:**

**7. The cable of claim 1, wherein the first and second twisted pairs of conductors comprise first and second helically twisted pairs of conductors along the longitudinal portion of the cable, and the filler member and the barrier tape are configured to non-conductively shield the first and second helically twisted pairs of conductors along the longitudinal portion of the cable.”**

Glew discloses that the conductors can be “twisted pairs of wires,” which a POSITA would understand to be conductor pairs twisted together in a helical manner. EX-1008, ¶¶[0005], [0143], [0157]; EX-1006, ¶¶201-203. The twisted

pairs extend along channels defined by an elongated separator, which teaches that the twisted pairs extend “*along the longitudinal direction of the cable.*” *Id.*, ¶¶[0122], [0143], [0154-155], [0157], FIGS 2A, 10A; EX-1006, ¶202.

The ’609 publication, which Glew incorporates by reference (e.g., EX-1008, ¶[0219]), also teaches helically twisting the conductor pairs along the longitudinal direction of the cable. *See e.g.*, EX-1026, ¶¶[0064] [0086], [0187]; EX-1006, ¶203.

Glew further discloses the separator (*filler member*) provides non-conductive shielding as discussed for Elements [1A-C] and [1K], and that the shielding material (*barrier tape*) also non-conductively shields as discussed above for Element [1D]. Since each of the filler and barrier tape (e.g., shielding material 310) extend along the longitudinal direction of the cable (see discussions above for Element [1K] and claim 6), these structures shield *along the longitudinal portion of the cable*. EX-1006, ¶¶204-206; Ground 2 §§A(1), A(2), A(9), B(5), *supra*.

Glew discloses the cable as recited in this claim. EX-1006, ¶¶201-207.

**7. Claim 8:**

**“8. The cable of claim 1, wherein the first and second twisted pairs of conductors comprise first and second helically twisted pairs of conductors along the longitudinal portion of the cable, and the filler member is configured to non-conductively shield the first and second helically twisted pairs of conductors along the longitudinal portion of the cable.”**

Glew discloses these elements, and thus this claim, as explained above in connection with claim 7. EX-1006, ¶¶208-209; Ground 2 §§ A(1), A(9), B(5), B(6).

**C. Independent Claim 48**

**1. Element 48A**

**“A cable comprising: [48A] a plurality of twisted pair conductors;”**

As shown in annotated FIG. 10A and discussed for Elements [1A-1B], Glew discloses this:

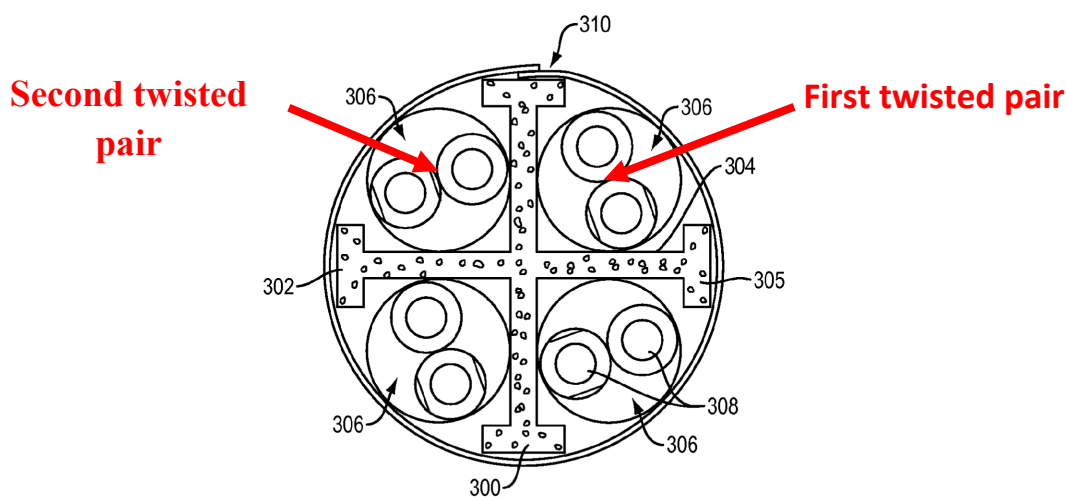


FIG. 10A

See, e.g., EX-1008, ¶¶[0143](“The conductors can be, for example, twisted pairs of wires.”),[0154], FIG. 10A; EX-1006, ¶¶210-211.

## 2. Element 48B

**“a barrier tape that surrounds the plurality of twisted pair conductors, the barrier tape including an electrically conductive layer enclosed between inner and outer dielectric layers;”**

As shown in the annotated figures below, and explained in the discussion of [1D] and [1G] and claims 3-4, Glew discloses a shielding material 310 (*barrier tape*) that surrounds the first twisted pair of insulated conductors, the second twisted pair of insulated conductors, and the filler, and that can be configured with the recited three-layers configuration:

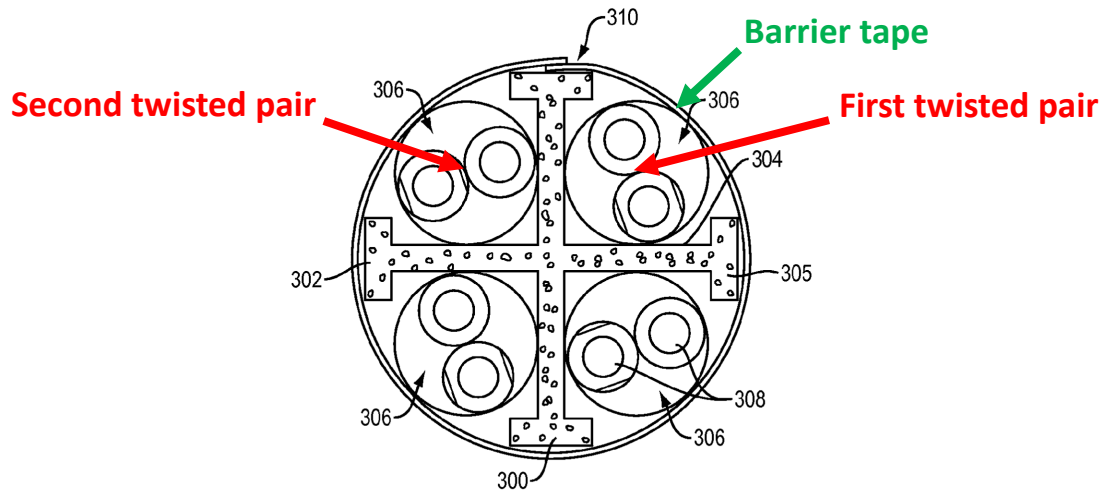


FIG. 10A

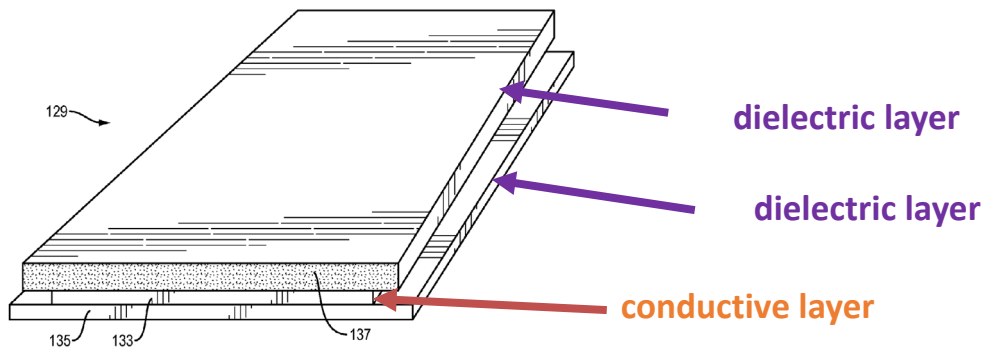


FIG. 13C

See Ground 2 §§A(2), A(5), B(3) *supra*; EX-1008, ¶¶[0154], [0195], [0197]; EX-1006, ¶¶212-214. Glew discloses this element. See EX-1006, ¶¶212-217.

### 3. Element 48C

**“a jacket that surrounds the barrier tape.”**

Glew discloses this. See *supra* discussion of Element [1E]; EX-1008, ¶¶[0038], [0146] (“The metal braid, metal tape 92 ... is turn surrounded by jacket 93 ....”), [221-230], FIGS 6A, 17A, 17B, 18A, 18B; EX-1006, ¶¶218-219.

## D. Independent Claim 49

### 1. Element 49A

**“A cable comprising: [49A] a plurality of pairs of conductors extending along a longitudinal axis;”**

See discussion of claim 7 and Element [48A]. The cable in Glew has multiple conductor pairs for transmitting signals along the longitudinal length of the cable, and discloses this element:

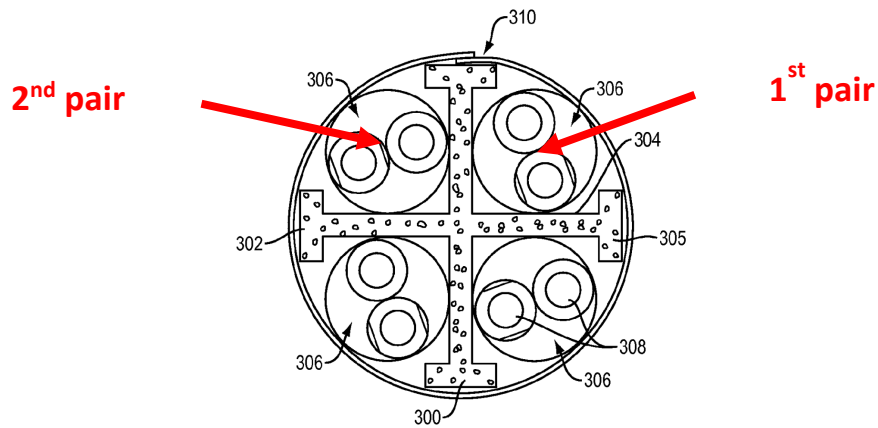


FIG. 10A

See, e.g., EX-1008, ¶¶[0143] (“[C]onductors ... can be disposed in the channels ... provided by the separator 80.”)[0154] (“Flap portions 305 are shaped to form a plurality of channels in which conductors 308 can be disposed.”), FIG. 10A; EX-1006, ¶¶220-222.

## 2. Element 49B

**“a barrier tape surrounding the plurality of pairs of conductors, the barrier tape comprising a conductive layer positioned between a first non-conductive layer and a second non-conductive layer; and”**

Glew teaches this, as already explained in connection with elements [1D] and [48B] and claims 3-4. *Supra*, Ground 2, §§A(2), B(2), B(3), (C)(2); EX-1006, ¶¶223-227; EX-1008, ¶¶[0154], [0195], [0197], FIGS. 10A, 13C.

## 3. Element 49C

**“an outer jacket surrounding the barrier tape, the outer jacket comprising a non-conductive material.”**

Glew discloses the outer jacket surrounding the barrier tape as already discussed with elements [1E] and [48C]. *Supra*, Ground 2 §§A(3), (C)(3). Glew

also discloses that the jacket can be made of a polymeric shell comprising a polymer such as FEP, MFA or PFA (i.e., a non-conductive material). EX-1008, ¶¶[0038],[0042],[0224], FIGS. 6A, 17; EX-1006, ¶¶228-231.

#### **E. Independent Claim 50**

As explained in Ground 1, §E, Claim 50 is a method claim that recites essentially the same structural limitations as set forth in claims 48 and 49 but with method steps. Glew's disclosure of a cable having twisted pairs conductors (see [48A]/[49A]) surrounded by a three-layer barrier tape as recited (see [48B]/[49B]), with a jacket surrounding and enclosing the conductors and tape (see [48C]/[49C] and [1E]), applies equally to the recited method steps 50A and 50B and results in performing the recited method steps. EX-1006, ¶¶232-240. Using Glew's cable and teaching as described for claims 48-49 above results in performing the method recited in claim 50 and renders claim 50 anticipated for the same reasons discussed above. *See* EX-1006, ¶¶232-240; Ground 2 §§C, D, *supra*.

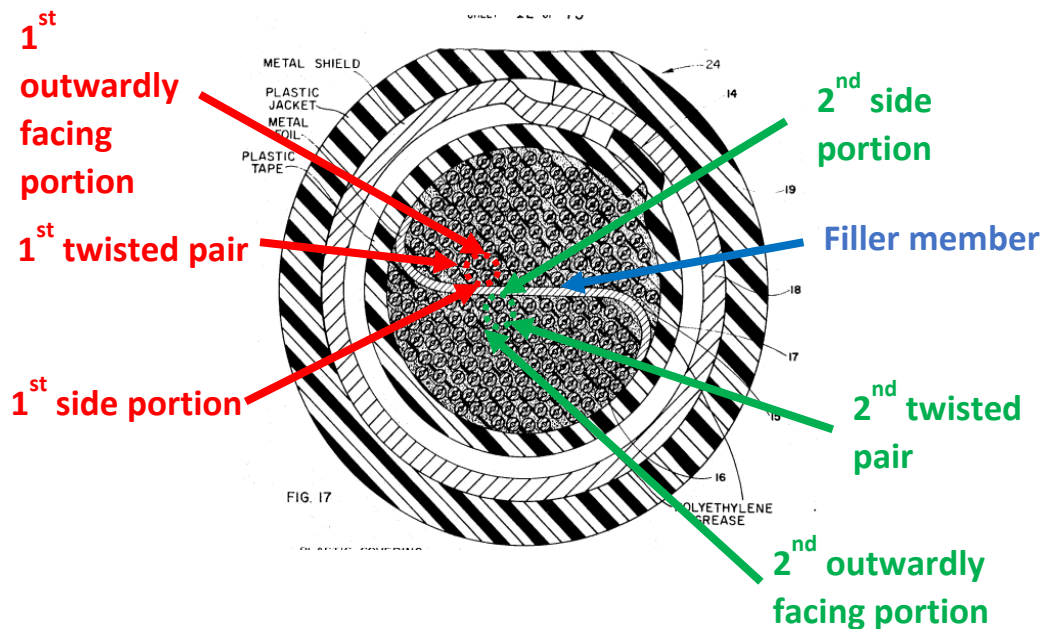
### Ground 3: Roberts Anticipates Claims 1, 3-8, 48-50

#### A. Independent Claim 1

1. A cable for reducing alien cross-talk and return loss between adjacent twisted pairs of conductors comprising: [1A], [1B] and [1C]

To the extent the preamble is limiting, Roberts discloses a cable as described. EX-1009, Title, Abstract, 1:5-31, 2:72-75, 3:32-59, 10:42-11:16, 13:34-36, FIGS. 1&17; EX-1006, ¶¶241-243.

Roberts discloses a cable that includes these elements, as illustrated in annotated FIG. 17 below:



See, e.g., EX-1009, Abstract, 10:48-62, 12:5-8, FIGS. 17 & 23; EX-1006, ¶¶242-243.

Roberts discloses “insulated electrical conductors (pairs), of an otherwise conventional telephone cable design are divided into at least two portions by

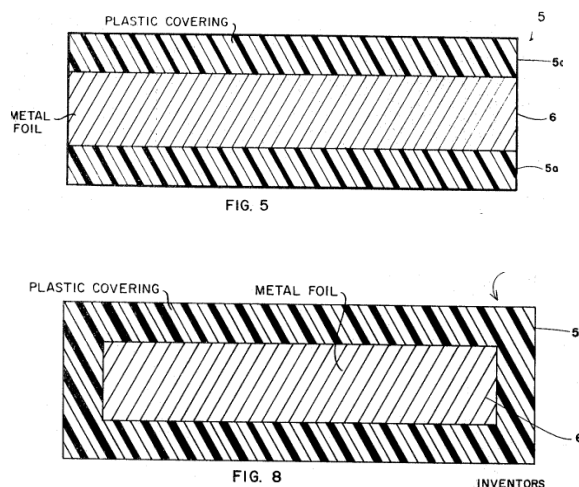
plastic-coated metal foil strip or tape” and explains how measurements “between pairs” demonstrate that dividing the “pairs” as disclosed is an improvement over the prior art. EX-1009, Abstract. Roberts also discloses a manufacturing die having holes through which “twisted electrical conductors (14) and (16) pass.” *Id.*, 12:5-8, FIG. 22; *see also* EX-1016 at p. 9 (“twisted pair wire supply” provides insulated twisted pairs that are then fed through a die plate into the stranding machine). And Roberts’ other Figures mimic catalog images of twisted pair conductors. EX-1006, ¶¶242-246; EX-1038, 20 (102.01). Thus, Roberts discloses conventional twisted pairs of insulated conductors. EX- 1006, ¶¶23-33, 242-246.

Further, unless specified in a reference that a pair was untwisted, it was assumed by a POSITA that the pair was twisted. EX-1006, ¶¶247-248. Using twisted insulated copper conductor pairs was the conventional and common practice for communication cables using pairs of insulated conductors, both at the time of Roberts (1968) and the ’833 Patent priority date. *Id.*; *see also, e.g.*, EX-1040, 1:23-52; EX-1019, 1:10-15 (“A typical telephone cable is constructed of twisted pairs of metal conductors . . .”); EX-1016, p. 7 (“Most of the cables within the scope of AT&T’s EC&W product line utilize the twisted pair construction.”); EX-1014, 2:32-33 (“three pairs 10-14 [of insulated conductors] are each twisted with a different lay”); EX-1038, 102.01. Twisting pairs of conductors was common

and known to help prevent electrical noise and minimize cross talk. EX-1006, ¶¶33-34, 247-248; EX-1016, p. 7; EX-1038, p. 20 (102.01).

Roberts thus discloses cables including a plurality of twisted pair conductors (that are, in the cable of FIG. 17, on each side on each side of the “METAL FOIL” (15)) as recited in the claim. EX-1009, FIG. 17; EX-1006, ¶¶242-249. While the cross-sectional view of FIG. 17 does not specify which two conductors make up each twisted pair, exemplary pairs are circled in the annotated figure above. EX-1006, ¶¶249-250.

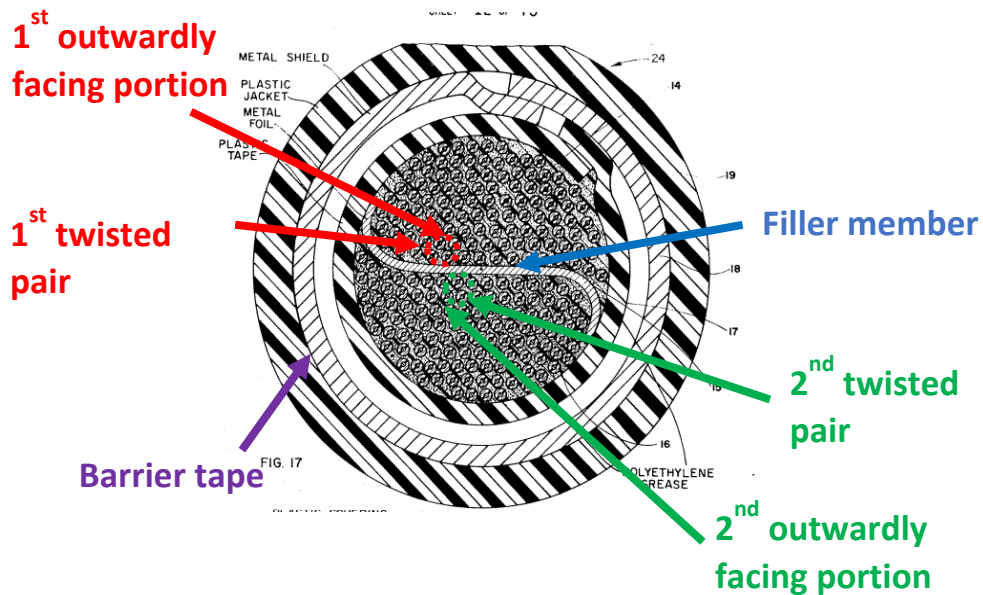
Roberts also has the recited filler member that non-conductively shields. Roberts explains that METAL FOIL shield 15 of FIG. 17 (*filler member*) can be “a metal foil coated on both sides with a plastic, or a metal foil completely surrounded by a plastic.” EX-1009, 10:50-62, FIG. 17. Illustrations of these dielectric-coated metal shields are below:



*Id.*, 7:32-41, 7:71-8:4, 10:50-62, 11:7-16. In one embodiment, the metal layer is aluminum foil and the plastic material is Mylar. *Id.*, 3:50-66. Roberts explains that the dielectric coatings on the foil “keep unwanted currents ... from reaching the metallic shield (aluminum foil)”, and thus shield 15 “non-conductively” shields the twisted pairs from each other as recited. Roberts, 3:37-45; EX-1006, ¶¶241-243, 251-253.

## 2. Element 1D

Roberts shows the recited barrier tape, as illustrated in the annotated Figure below:



See, e.g., EX-1009, 4:15-23, 10:42-51, 12:30-36, FIG. 17; EX-1006, ¶¶254-255.

The metal shield 18 (*barrier tape*) “longitudinally circumscribes and has nested

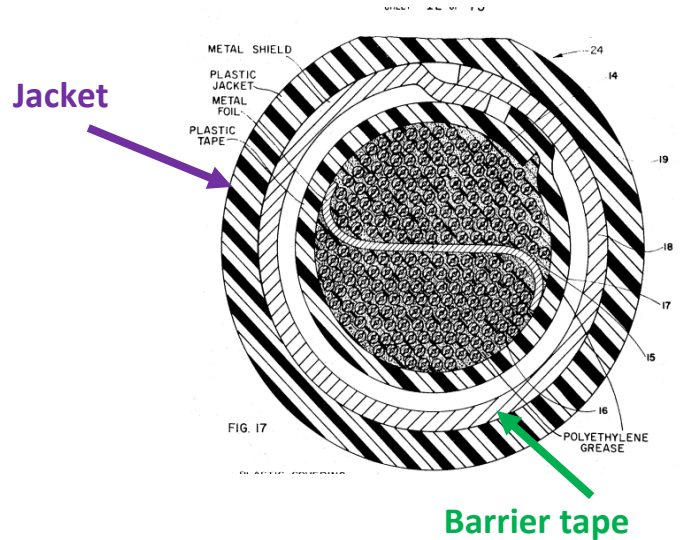
therein,” the conductors and the shield 15 (*filler member*). EX-1009, 10:42-62, FIG. 17; EX-1006, ¶¶254-257. Roberts also describes that during manufacture, the conductors-filler composite is “traversed through a taping machine where metal tape (18) is applied thereto as shown in FIG. 17.” EX-1009, 12:30-33.

Roberts describes the metal shield 18 as a “metal armor shield” (or “metal tape” or “metal armor tape”) which is both a mechanical and an electrical shield, and “can have a plastic, such as a polyethylene, firmly adhered to either one or more surfaces thereof.” *Id.*, 4:15-23; 10:43-46. Metal shielding tape with dielectric layers on both sides of the metal layer or completely enclosing the metal layer are shown in the cross-section illustrations of FIGS. 5 & 8. *Id.*, FIGS. 5 & 8; EX-1006, ¶¶254-257. The cross-section in FIG. 5 is the same as the disclosed barrier tape in FIG. 3A of the ’833 Patent. With this arrangement, the metal shield 18 *non-conductively shields* the outer surfaces of the two pairs of conductors. EX-1006, ¶¶254-259.

Roberts also discloses that the cable is of “conventional telephone cable design” but for dividing the conductors into the separate portions by the filler (i.e., the plastic-coated foil). EX-1009, Abstract. A POSITA would know that conventional metal armor shield tape included a layer of metal in between two layers of dielectric material, which would “non-conductively shield” as recited. *See*, EX-1006, ¶¶44-45, 258-260; EX-1032 to EX-1036.

### 3. Element 1E

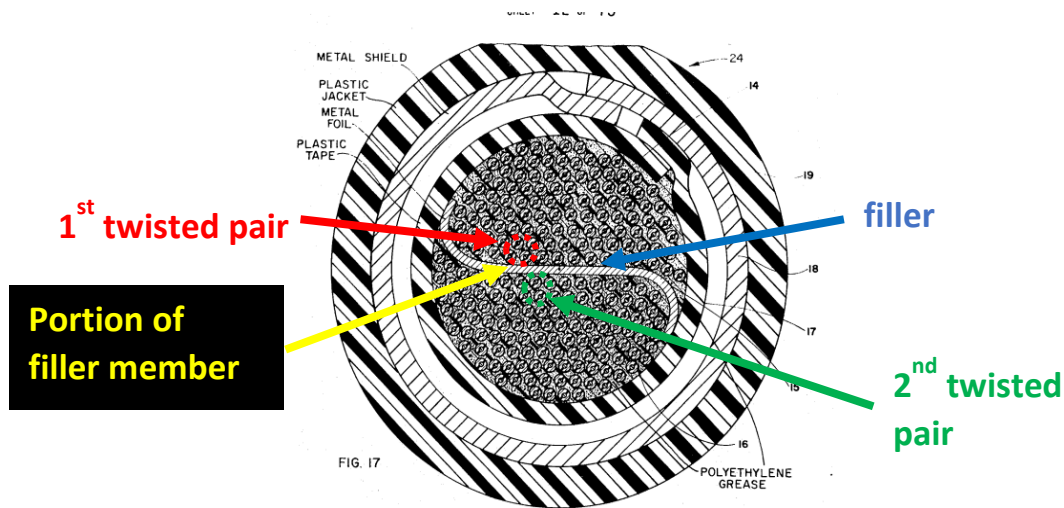
Roberts discloses an outer cable sheath 19 (*jacket*) encircling the barrier tape (i.e., metal shield 18), as illustrated in annotated FIG 17:



See, e.g., EX-1009, 10:42-48, 12:30-36, FIG. 17; EX-1006, ¶262. “[T]here is an outer cable sheath (19) longitudinally circumscribing” the barrier tape, filler, and conductors. EX-1009, 10:42-62, FIG. 17; EX-1006, ¶¶261-263.

### 4. Element 1F

As shown in annotated FIG. 17, the first and second twisted pairs of conductors are located adjacent to a portion of the *filler member*:



See, e.g., EX-1009, Abstract, 10:48-62, FIG. 17; EX-1006, ¶¶264-266.

## 5. Element 1G

As explained in connection with Element [1D], metal armor shield 18 (*barrier tape*) is a metal tape (e.g., foil) that “can have a plastic, such as a polyethylene, firmly adhered to either one or more surfaces thereof.” EX-1009, 4:15-23, 10:43-46, 12:30-36. Roberts thus discloses that shield 18 includes a non-conductive layer and a conductive layer. EX-1006, ¶¶267-270.

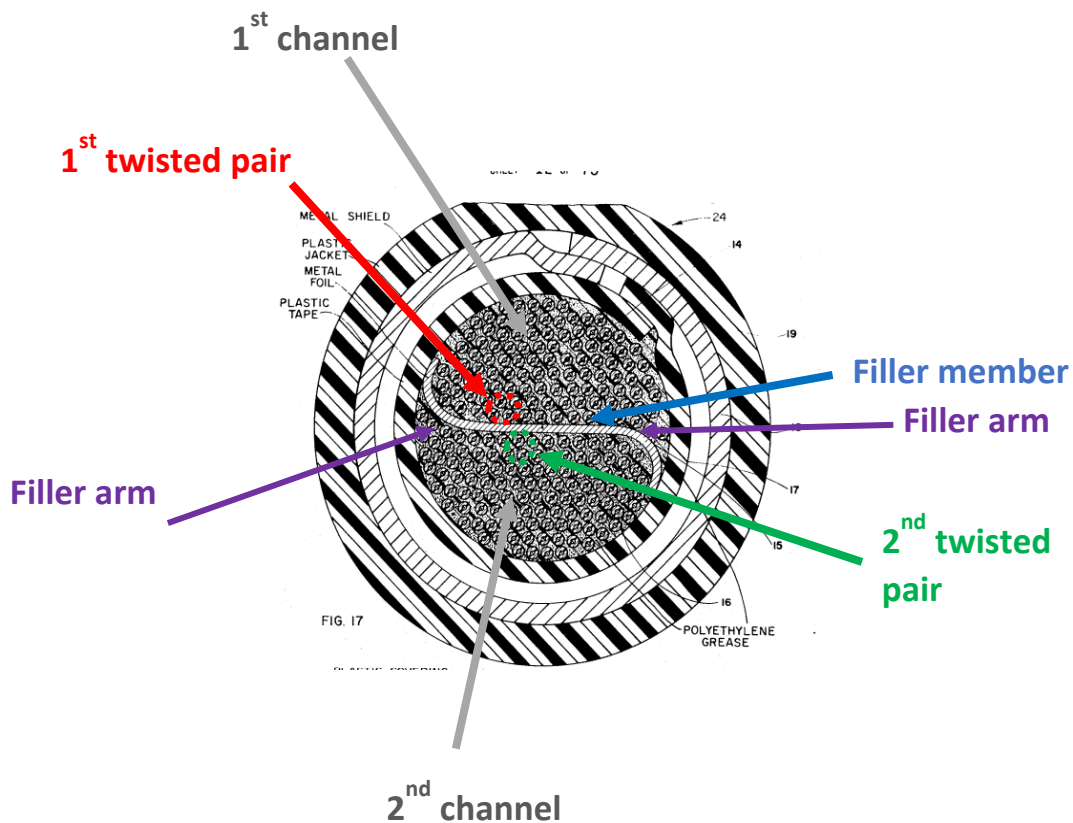
## 6. Element 1H

As explained vis-à-vis elements [1A-C], shield 15 (*filler member*) is a metallic tape (e.g., foil) that is coated on one side, both sides, or completely surrounded by a plastic material such as Mylar. EX-1009, 3:50-66, 12:48-62, 11:13-16, FIGS. 5, 7, 18, 19, 21; *see also* Section [1A-C], *supra*. Thus, Roberts

discloses the filler member being made of a conductive layer (the foil) and a non-conductive material (e.g., Mylar). EX-1006, ¶¶268-270.

## 7. Element 1I

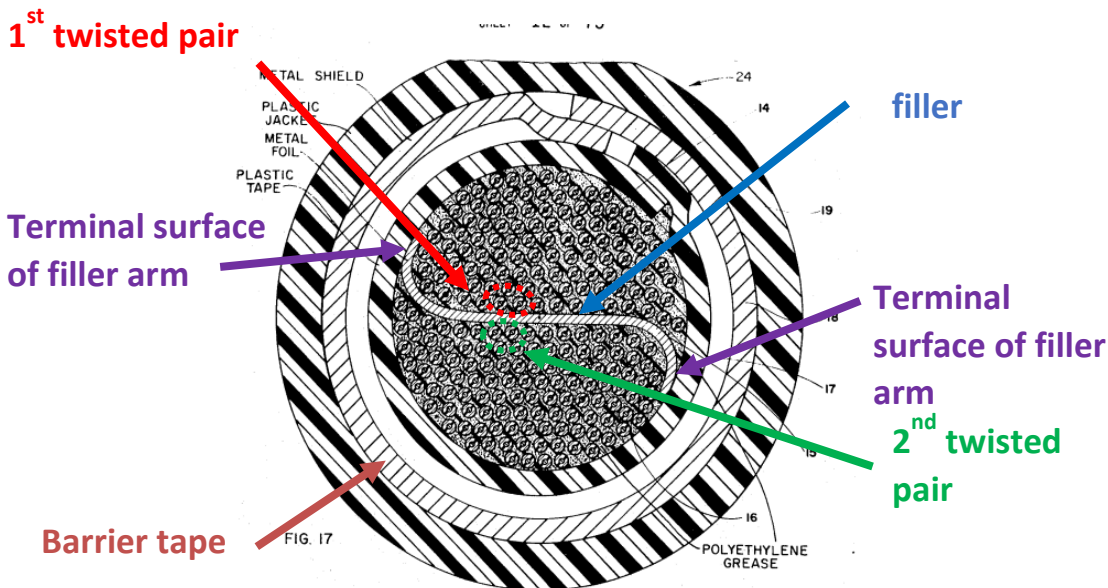
As illustrated in annotated FIG. 17 below, shield 15 (*filler member*) has arms that extend radially outward from a central portion to form first and second channels as recited:



See, e.g., EX-1009, 10:50-52 (“This plurality of insulated conductors is divided into essentially two groups by shield (15).”); EX-1006, ¶¶274-276.

## 8. Element 1J

As illustrated in the annotated figure below, Roberts discloses that each filler member arm has an outwardly facing terminal surface, and the metal armor shield 18 (*barrier tape*) is configured to encircle such surfaces and twisted pairs as recited in this element:



See, e.g., EX-1008, 10:42-62, 12:26-32 FIG. 17; EX-1006, ¶¶277-279; see also Ground 3 §A(3).

## 9. Element 1K

As explained in connection with [1A-C] and [1H], shield 15 (*filler member*) divides the twisted pairs from each other along the longitudinal length of the cable and is configured to “non-conductively shield” the conductors as recited because it includes “a metal foil coated on both sides with a plastic, or a metal foil completely surrounded by a plastic”. E.g., EX-1009, Abstract, 7:32-41, 7:71-8:4, 10:42-62

(describing cross-sectional view of FIG. 17), 11:7-16, 12:12-39 (describing manufacturing steps of FIG. 17), FIGS. 1, 17, 1 23; *see*, EX-1001, 7:38-60, FIGS. 1 & 3A; EX-1006, ¶¶280-285, 295.

Roberts discloses that including the shield (*filler member*) “shows greatly improved” and “vastly improved” properties with respect to “conductive coupling (crosstalk)” between the conductors on opposite sides of the shield. *See, e.g.*, EX-1009, Abstract, 11:7-16; *see also*, *id.*, Title, 12:71-36, FIG. 24; EX-1006, ¶¶280-285.

A POSITA would understand that conductors and the shield 15 in FIG. 17 extend longitudinally along the cable, particularly given the disclosure that the jacket and armor shield longitudinally circumscribe the conductors and filler. *See, e.g.*, EX-1009, 4:15-20; 10:42-62, 12:30-36, FIGS. 1, 17 & 23. Therefore, Roberts discloses this element and claim. EX-1006, ¶¶280-285.

## **B. Dependent Claims 3-8**

### **1. Claim 3:**

**“3. The cable of claim 1, wherein the non-conductive layer of the barrier tape comprises a first non-conductive layer and the barrier tape includes a second non-conductive layer.”**

As explained vis-à-vis elements [1D] and [1G], Roberts discloses that metal armor tape 18 (*barrier tape*) “can have a plastic, such as a polyethylene, firmly adhered to either one or more surfaces thereof.” EX-1009, 4:15-20; 10:43-46,

12:30-36. Thus, the tape can have the following layers (conductive metal layer and two non-conductive plastic layers):

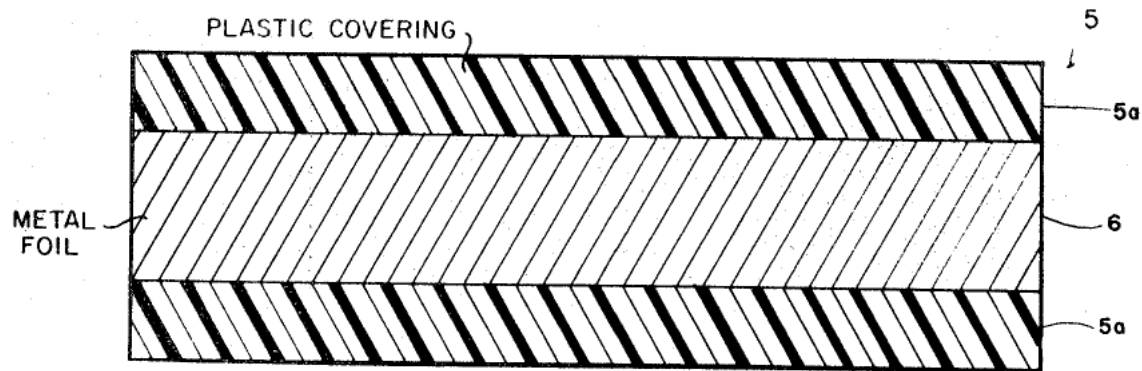


FIG. 5

EX-1009, FIG. 5; EX-1006, ¶286.

Roberts also discloses that the cable is of “conventional telephone cable design”, and a conventional prior art metal armor tape was a three-layer tape (with a conductive layer sandwiched between non-conductive layers). EX-1006, ¶¶283-284, EX-1013 at 2:52-66, Figure; EX-1014 at 3:23-27; EX-1015 at 2:62-3:20, FIG.

1. Thus, Roberts discloses this claim. EX-1006, ¶¶286-287.

## 2. Claim 4:

**“4. The cable of claim 3, wherein the conductive layer of the barrier tape is positioned between the first and second non-conductive layers.”**

As discussed and shown above for [1G] and claim 3, Roberts discloses this element. EX-1006, ¶¶288-289; Ground 3 §§A(4), (B)(1), *supra*.

### 3. Claim 5:

**“5. The cable of claim 3, wherein the first non-conductive layer comprises an inner non-conductive layer and the second non-conductive layer comprises an outer non-conductive layer.”**

As discussed vis-à-vis claim 3 and [1G], Roberts discloses this element. EX-1006, ¶¶290-293; Ground 3 §§A(5), (B)(1). When the metal armor tape 18 is configured as a three-layer tape with the conductive layer positioned between the dielectric layers and wrapped around the filler and twisted pair conductors, one non-conductive layer will be positioned between the twisted pairs and the conductive layer (*inner non-conductive layer*) and the other non-conductive layer is external to the conductive layer (*outer non-conductive layer*). EX-1009, 4:15-23, FIG. 17; EX-1006, ¶¶290-293.

### 4. Claim 6:

**“6. The cable of claim 1, wherein the filler member and the barrier tape are configured to extend along a longitudinal direction of the cable.”**

As explained vis-a-vis [1K], Roberts discloses the filler member configured as recited. *See, supra*, Ground 3 §A(9); EX-1006, ¶¶294-297.

Roberts likewise discloses that armor shield 18 (*barrier tape*) is configured to “longitudinally circumscribe[] and have nested therein” the electrical conductors and filler member. *See* EX-1009, 10:42-62, 12:13-38. Thus, Roberts discloses this claim. EX-1006, ¶¶294-297.

**5. Claim 7:**

**7. The cable of claim 1, wherein the first and second twisted pairs of conductors comprise first and second helically twisted pairs of conductors along the longitudinal portion of the cable, and the filler member and the barrier tape are configured to non-conductively shield the first and second helically twisted pairs of conductors along the longitudinal portion of the cable.”**

As discussed above vis-à-vis [1A-C], Roberts discloses “insulated conductors (pairs), of an otherwise conventional telephone cable design . . .” and utilizing a manufacturing die with holes through which “twisted electrical conductors” pass. *See* Ground 3 §A(1); EX-1009, Abstract, 10:48-62, 12:5-8, FIGS. 17 & 23. Conventional cable design included utilizing twisted pair conductors that were helically twisted, i.e., conductor pairs helically twisted along the longitudinal portion of the cable. EX-1008, ¶[0005]; EX-1014, Abstract, 2:28-34; EX-1016, pp. 7-8; EX-1017, pp. 11, 18. Roberts further discloses that the conductors and shield 15 (*filler member*) are twisted into a twisted composite during manufacturing. EX-1009, 12:12-30, FIG. 23. A POSITA would understand that the twisted pairs of conductors are thus helically twisted pairs of conductors along the longitudinal portion of the cable as recited. EX-1006, ¶¶298-301.

And as discussed above vis-à-vis [1A-C] and [1K], the filler member (shield 15) extends longitudinally along the cable and is configured to non-conductively shield the first and second twisted pairs along the longitudinal portion of the cable.

*See supra* Ground 3 §§A(1), A(9)); *see also* EX-1009, 10:42-62, 12:13-39, FIGS. 17 & 23.

Likewise, Roberts's barrier tape (metal armor shield 18) longitudinally surrounds the filler and conductors, is metal coated with (or enclosed within) plastic (E.g., EX-1009, 4:15-20; 10:43-46, 12:30-36, FIG. 17), and operates as "an electrical, as well as a mechanical, shield" to non-conductively shield as discussed for [1D]. *See id.*, 4:17-23, 10:42-62, 12:13-39, FIGS. 17 & 23; Ground 3 §§A(2). Thus, this element (and claim) is disclosed. EX-1006, ¶¶291-305.

#### 6. Claim 8:

**"8. The cable of claim 1, wherein the first and second twisted pairs of conductors comprise first and second helically twisted pairs of conductors along the longitudinal portion of the cable, and the filler member is configured to non-conductively shield the first and second helically twisted pairs of conductors along the longitudinal portion of the cable."**

Roberts discloses this element as explained above in connection with claim

7. EX-1006, ¶¶306-307; Ground 3 §§A(1), A(9), B(4), B(5).

#### C. Independent Claim 48

##### 1. Element 48A

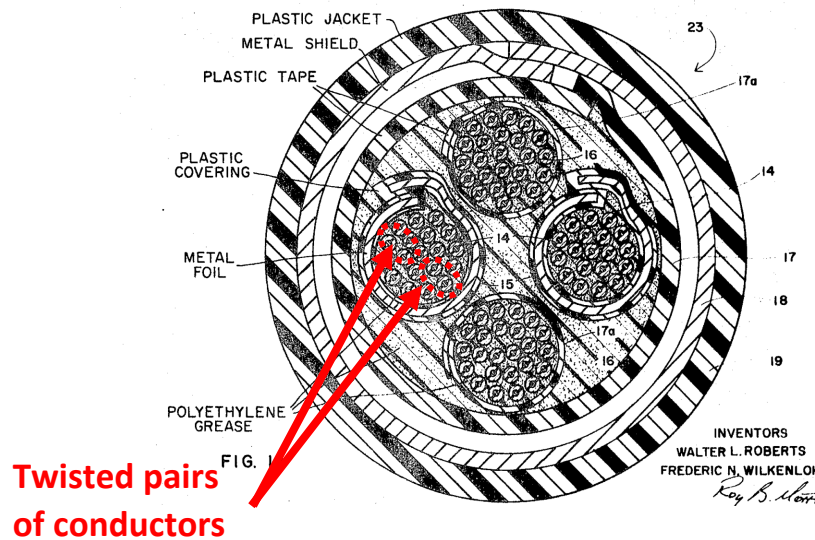
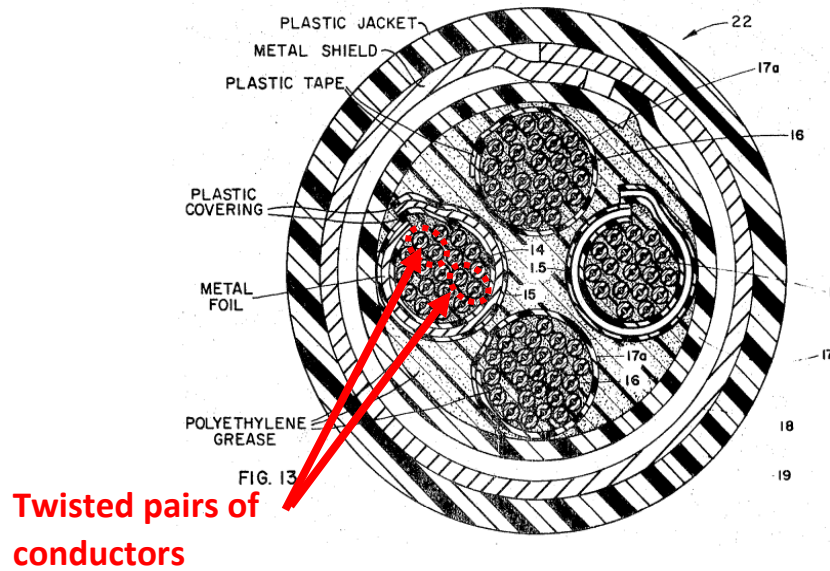
**"A cable comprising: [48A] a plurality of twisted pair conductors;"**

To the extent the preamble is considered limiting, Roberts discloses a cable.

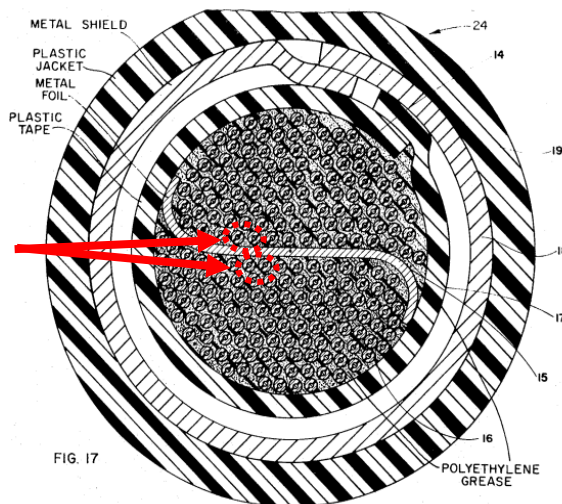
E.g., EX-1009, Abstract, 1:5-8, :72-75, 10:42-11:16, FIGS. 1&17; EX-1006, ¶308.

The cable has a plurality of twisted pair conductors. *Supra*, Ground 3 §A(1).

This is also shown in the annotated figures below:



twisted pairs of  
conductors



See, e.g., EX-1009s, Abstract, 4:1-15, 10:48-50, 7:26-51, 12:5-8, FIGS. 1, 13, 14 & 17; Ground 3 §A(1), *supra*; EX-1006, ¶¶308-310.

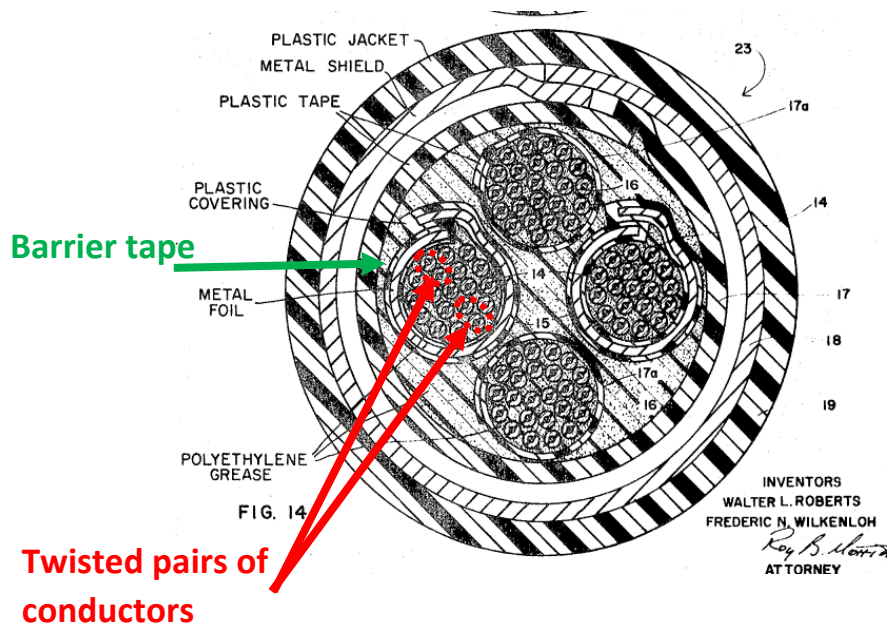
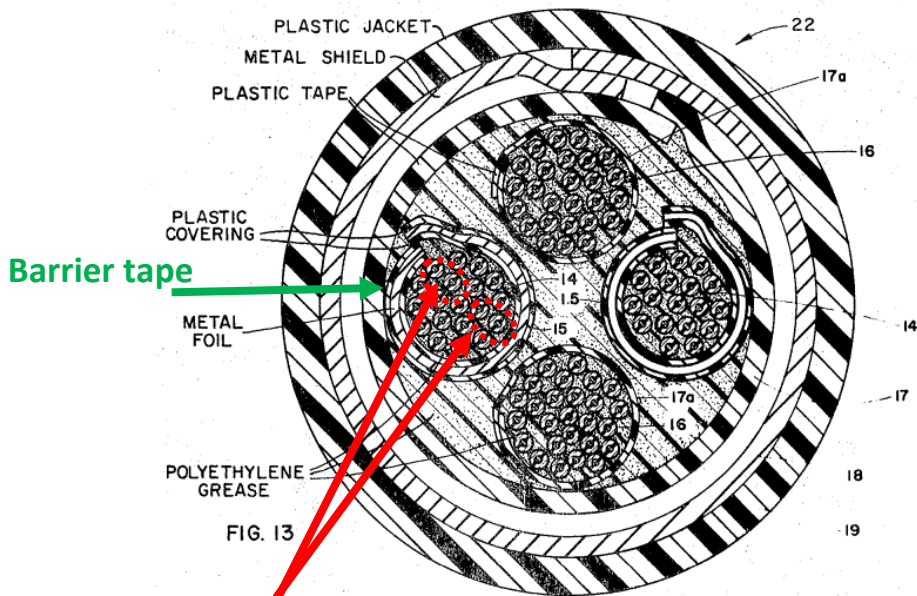
While the cross-sectional views of FIGS. 13, 14 & 17 do not specify which two conductors make up each twisted pair, exemplary pairs are circled on the illustrations above. EX-1006, ¶¶308-310.

## 2. Element 48B

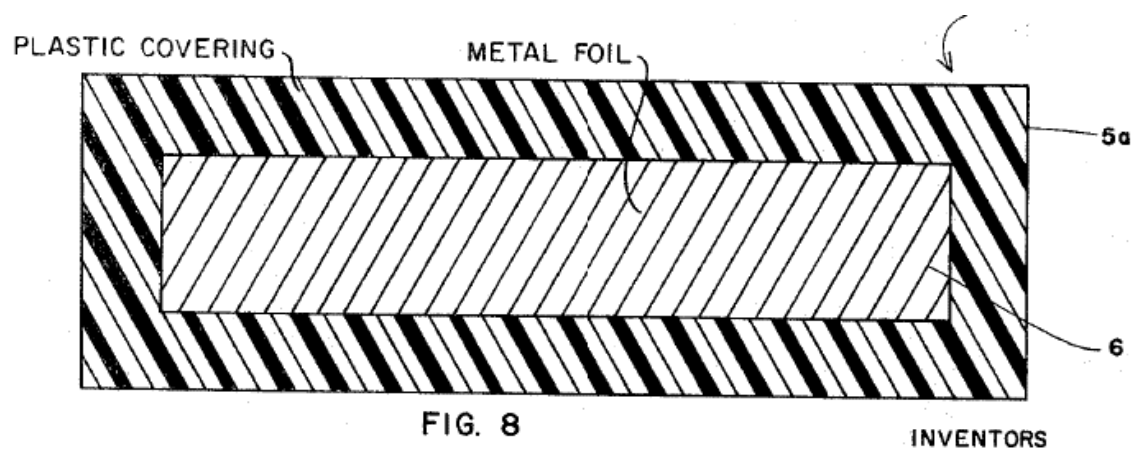
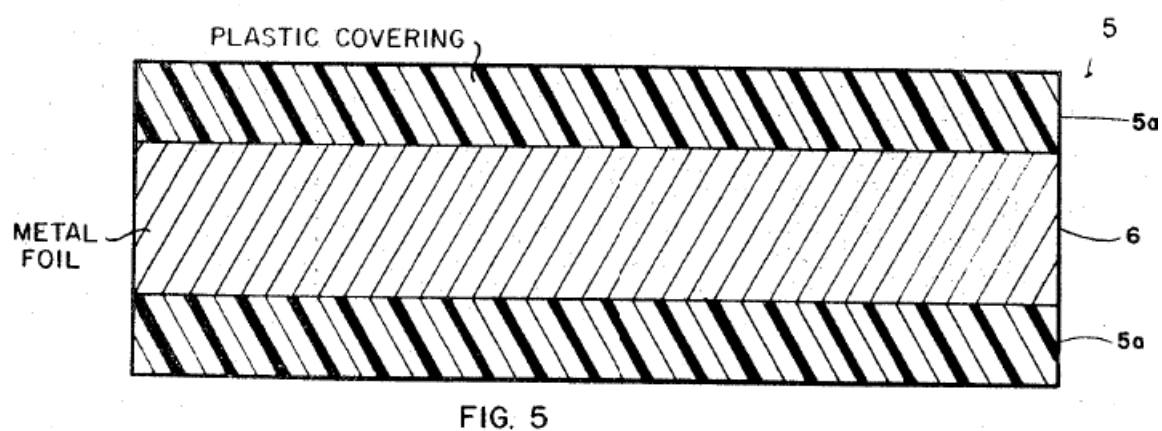
**“a barrier tape that surrounds the plurality of twisted pair conductors, the barrier tape including an electrically conductive layer enclosed between inner and outer dielectric layers;”**

See *supra* discussion of [1D], [1G] and claims 3-4 showing that metal shield 18 in FIG. 17 is a barrier tape as recited herein. Ground 3 §§A(2), A(5), B(1), B(2); EX-1006, ¶315.

Further with reference to the alternative embodiment cables shown in annotated FIGS. 13-14 below, Roberts discloses a shield 15 (*barrier tape*) that surrounds the plurality of twisted pair conductors and includes the recited layers:



EX-1009, 2:55-63, 2:72-75, 7:26-51, 7:65-8:9; EX-1006, ¶312. Roberts calls shield 15 a “tape,” and describes the embodiment in FIG. 13 as having a metal layer between two plastic layers (as shown in FIG. 5) and the embodiment in FIG. 14 as having a metal layer surrounded on all sides by plastic (as shown in FIG. 8). Cross-sections of these two embodiments are illustrated below:



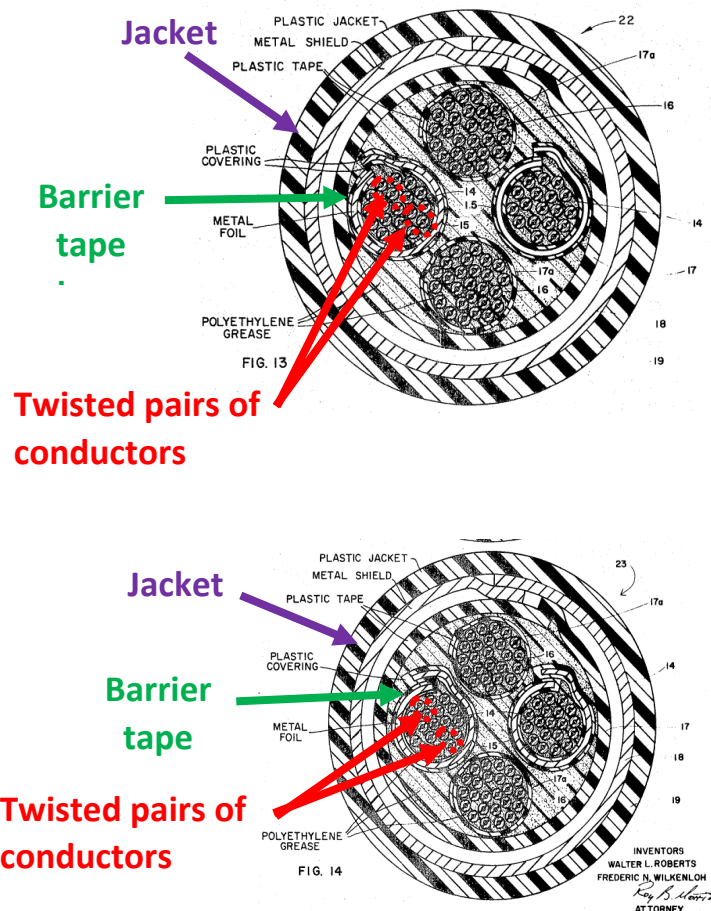
EX-1009, 7:32-41, 7:71-8:4, 11:57-58, 12:4; EX-1006, ¶313. The disclosed three-layer tape of Roberts FIGS. 5 and 8 is like the three-layer tape disclosed in the '833

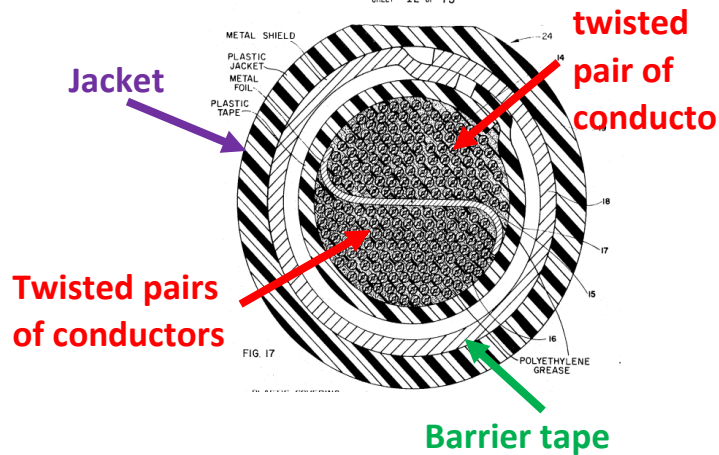
Patent (*Compare* EX-1008, 4:48-53, 7:32-41, 7:71-8:4, FIGS. 5 & 8 *with* EX-1001, 7:38-60, FIG. 3A), and discloses this element. EX-1006, ¶¶314-317.

### 3. Element 48C

**“a jacket that surrounds the barrier tape.”**

Each of Roberts’s disclosed cables includes a jacket (e.g., “PLASTIC JACKET”) that surrounds the barrier tape (and the conductors and other internal components of the cable):





EX-1009, 7:25-35, 7:65-8:7, 10:42-51, 12:30-36, FIGS. 13, 14 & 17; EX-1006, ¶¶318-320.

#### D. Independent Claim 49

Claim 49 is similar to claim 48 (but recites “pairs” instead of “twisted pairs” of conductors, for example), and thus the cited disclosure in Roberts for claim 48 applies equally to this claim.

##### 1. Element 49A

**“A cable comprising: [49A] a plurality of pairs of conductors extending along a longitudinal axis;”**

Roberts teaches this. *See supra* Ground 3 §§A(1), C(1); EX-1009, Abstract, EX-1006, ¶321. Roberts discloses how the cable is manufactured, and that metal armor shield 18 (*barrier tape*) “longitudinally circumscribes and has nested therein” the electrical conductors and filler member, which discloses to a POSITA that the conductor pairs extend along a longitudinal axis as recited. *See* EX-1009, 10:42-62, 12:13-38; EX-1006, ¶¶321-322.

## 2. Element 49B

**“a barrier tape surrounding the plurality of pairs of conductors, the barrier tape comprising a conductive layer positioned between a first non-conductive layer and a second non-conductive layer; and”**

Roberts discloses this as discussed for element [48B]. See, Ground 3 §C(2), *supra*; EX-1006, ¶¶323-329.

## 3. Element 49C

**“an outer jacket surrounding the barrier tape, the outer jacket comprising a non-conductive material.”**

Glew discloses this as explained vis-à-vis [1E] and [48C]. See *supra* Ground 3 §§A(3), C(3); *see also*, EX-1009, 10:42-51, FIGS. 1, 13, 14 & 17; EX-1006, ¶¶330-332.

Roberts also discloses that the jacket may be a “plastic sheath” such as “the customary extruded polyethylene.” EX-1009, 4:23-26, 12:33-36. Roberts thus discloses that the jacket comprises a non-conductive material. Roberts discloses this claim EX-1006, ¶¶330-332.

## E. Independent Claim 50

As explained in Ground 1, §E, Claim 50 is a method claim that recites essentially the same structural limitations as set forth in claims 48 and 49 but with method steps. Roberts’ disclosure of a cable having twisted pairs conductors (see [48A]/[49A]) surrounded by a three-layer barrier tape as recited (see [48B]/[49B]), with a jacket enclosing the conductors and tape (see [48C]/[49C] and also [1E]),

applies equally to the recited method steps 50A and 50B, and results in performing the recited method steps. EX-1006, ¶¶333-342. Using Roberts' cable and teaching as described for claims 48-49 above results in performing the method recited in claim 50 and renders claim 50 anticipated for the same reasons discussed above. See EX-1006, ¶¶333-342; Ground 3 §§C, D, *supra*.

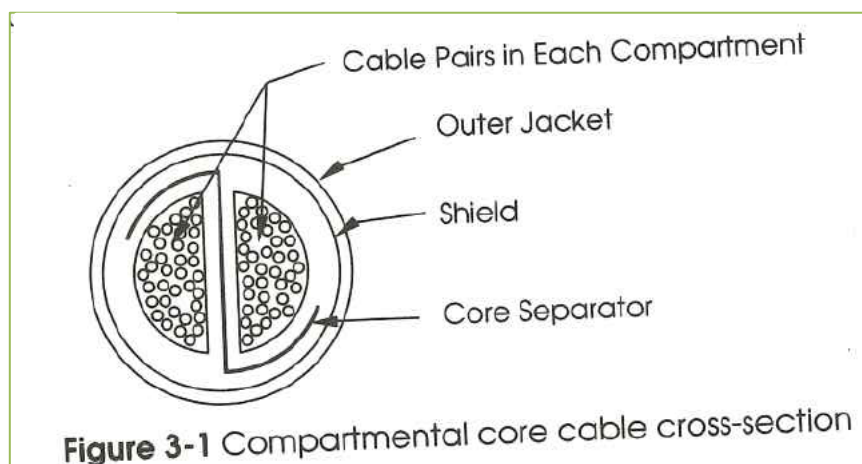
**Ground 4: Claims 1, 3-8, 48-50 are Obvious in view of Roberts and one or more of Jachimowicz-172 and/or the knowledge of a POSITA**

If Roberts is found to not disclose first and second twisted pairs of insulated conductors (elements [1A], [1B], [48A], [50A]), use of twisted pairs of insulated conductors in a cable like that taught by Roberts would have been obvious for all the reasons explained in Ground 3, further in view of Jachimowicz-172 and/or the knowledge of a POSITA.

Roberts discloses a largely “conventional” cable using “pairs” of insulated conductors that are “twisted.” EX-1009, Abstract, 3:5-8, 12:5-8, FIG. 22. A POSITA would understand Roberts thus discloses cables having twisted pairs of insulated conductors. EX-1006, ¶¶32-33, 343-347.

A POSITA also would be motivated, and find it obvious, to use twisted pairs of conductors in Roberts' cable given their benefits and common usage. EX-1006, ¶¶348-350. Jachimowicz-172 teaches a data communications cable that uses multiple twisted pairs of insulated conductors. EX-1014 at 2:32-34 (“three pairs

10-14 [of insulated conductors] are each twisted with a different lay”), Fig. 2 (showing each twisted pair with a different lay), Fig. 4. And by 2013 and well before, 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-1006, ¶¶343-345; EX-1008 at ¶[0004] (“cables normally have four or more twisted pairs of conductors”); EX-1040, 1:23-2:52; EX-1016, p. 7-10; EX-1017, pp. 15-24; EX-1011, 1:15-28.; EX-1038, p. 20. This is because twisted pairs were known to provide the electrical benefits of lower crosstalk and decreased unbalanced mutual capacitance, along with the mechanical benefits of ensuring the individual wires in a pair stay together and the various pairs do not become intermixed. EX-1006, ¶¶346; *see also, e.g.* EX-1016, p. 7. And cables such as those disclosed by Roberts typically utilized twisted pairs that were separated into different groups, such as in Roberts’ cable:



EX-1018, p. 8 (FIG. 3-1); *see* EX-1006, ¶¶345-348, ¶¶32-33.

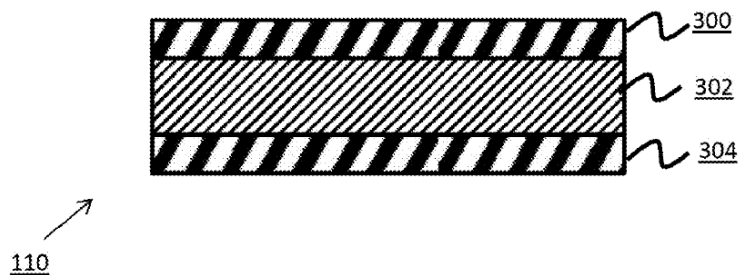
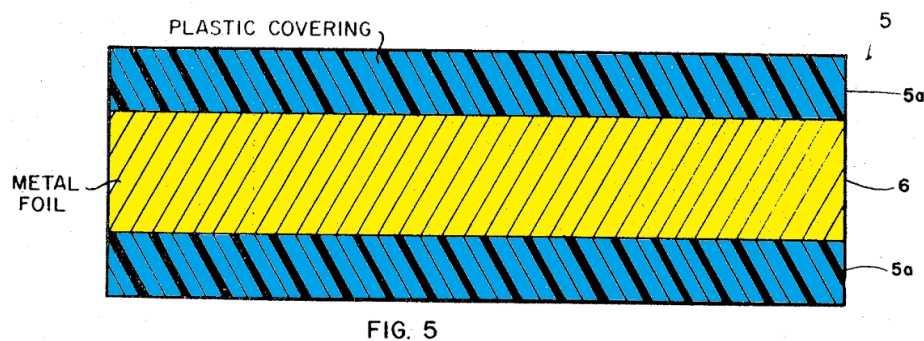
To the extent Roberts is found to not expressly teach that the plurality of insulated conductors are provided as twisted pairs, it would have been an obvious and routine modification to configure the insulated conductors in Roberts as twisted pairs. A POSITA would have been motivated to do this to get the known, predictable mechanical and performance benefits of twisted pairs, and to avoid the known drawbacks of using a plurality of non-twisted pair insulated conductors in a data communications cable. A POSITA would have had a reasonable expectation of success in doing this because providing multiple conductors in data communications cables such as that disclosed by Roberts was the common, conventional way to construct such a cable. EX-1006, ¶¶32-33, 348-351. Further, there was nothing about Roberts' specific cable that would make using twisted pairs unusually difficult or require anything other than routine skill. *Id.*, ¶¶343-351.

**Ground 5: Claims 1, 3-8, 48-50 are Obvious in view of Grounds 3 and/or 4 and one or more of Jachimowicz-036 and/or the knowledge of a POSITA**

If it is found that Roberts' metal tape shield 18 does not disclose the recited barrier tape in any of claims 1, 3-5, or 48-50 then it would have been obvious to a POSITA to modify Roberts (or the Roberts as modified per Ground 4) to include such a barrier tape. EX-1006, ¶¶352-362. Roberts discloses that the inventive cable is largely "conventional" and includes a metal armor tape shield 18. EX-

1009, 4:15-23, 12:30-36, FIGS. 1, 17. This metal tape 18 circumscribes the conductors and interior separating shield 15 (as well as other cable components), operates “as an electrical, as well as a mechanical, shield” and “can have a plastic, such as a polyethylene, firmly adhered to either one or more surfaces thereof.” *Id.*, 4:15-23, 12:30-36, FIGS. 1, 17. The metal tape 18 also is corrugated. *Id.*, 4:15-17.

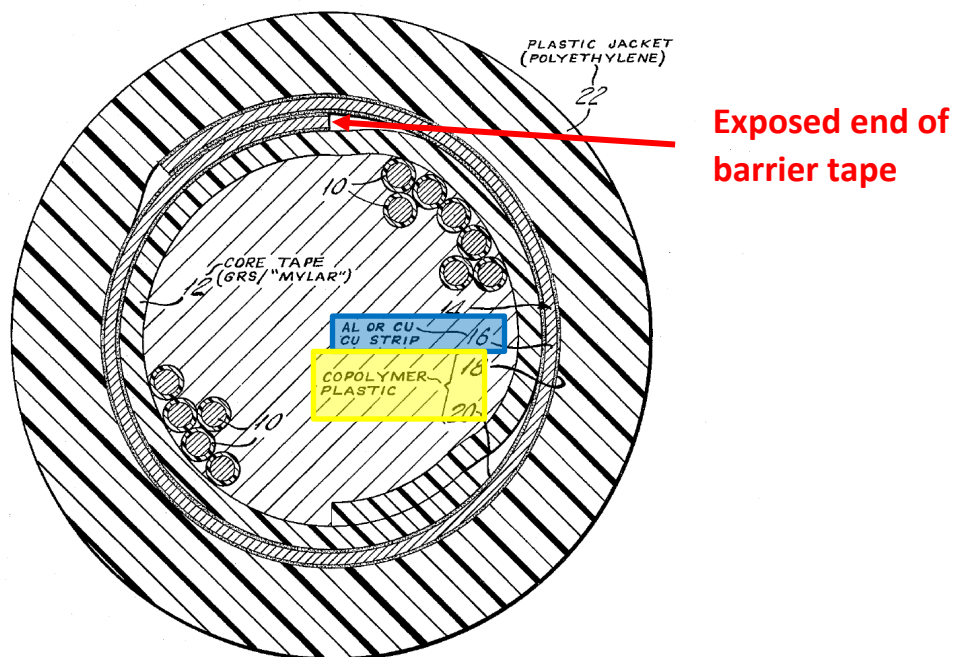
Roberts also discloses an interior metal shield 15 (*filler*) which is a metal tape with a metal layer sandwiched between two layers of a dielectric material. The cross-sectional drawing of this internal three-layer tape shield is the same as the three-layer tape disclosed in the '833 Patent:



*Id.*, 4:48-60, 10:52-62, FIG. 5; EX-1001, FIG. 3A. As illustrated, the metal layer 6 in Roberts is between dielectric non-conductive layers 5a. Roberts alternatively discloses, also like the '833 Patent, that the metal layer can be completely encased within the plastic layers. *Id.*, 4:48-52, FIG. 8; EX-1001, 7:55-58. Roberts also discloses that the three-layer shield 15, like the shield 18, “can be corrugated to increase its mechanical strength.” EX-1009, 4:48-62.

A POSITA, thus, would be motivated by Roberts’ own disclosure to utilize, for the metal tape shield 18 (*barrier tape*), a conductive barrier tape that has the cross section of the metal tape 15 shown in Roberts FIG. 5 (or FIG. 8), which discloses the tape recited in [1G], [48B], [49B], [50A] and claims 3-5. EX-1006, ¶¶352-357. Such tape would exemplify Roberts’ disclosure that tape shield 18 has plastic “adhered to either one or more surfaces thereof.” EX-1009, 4:20-22.

It also would be obvious to a POSITA to use the three-layer barrier tape in Jachowicz-036 on Roberts’ cable. *See* EX-1006, ¶¶358-362. Roberts discloses that the cable is largely “conventional.” (EX-1009, Abstract). Jachimowicz-036 discloses another such conventional cable (but without a filler/separator), which has an outer three-layer barrier tape. As seen in the figure below, which shows the exposed ends of the barrier tape (i.e., shield 14), conductive layer 16 is between two plastic (i.e., dielectric) layers 18, 20.



EX-1013, 1:42-52, 2:52-66, FIG. 3 (annotated). Other conventional, well-known multi-layer barrier tape shields, such as those sold under the Zetabon trademark, also had a metal layer sandwiched between two dielectric layers. EX-1006, ¶¶44-45, ¶¶357-362; EX-1013 at 2:52-66, Figure; EX-1014 at 3:23-27; EX-1015 at 2:62-3:20, Figure.

There are only so many ways to shield with a metal tape having plastic on one or more of its surfaces, and one way is with a conventional, well-known three-layer tape discussed above that meets the claim limitations. A POSITA would have been motivated to use tapes with such designs, particularly in view of Roberts' disclosure, and a POSITA would have a reasonable expectation of success, given Roberts' disclosure of such a three-layer design and given that such

tapes, like Roberts' shield 18, can be corrugated and provide an electrical, as well as mechanical, shield. EX-1006, ¶¶352-362.

Further, there are limited ways to provide a metal tape shield 18 with plastic "adhered to one or more surfaces thereof," one of which has the metal layer and dielectric layers with the cross section as shown in Roberts FIG. 5 (and also EX-1014 and EX-1009, FIG. 3A). The tape as recited is just one of a finite number of possible predictable possibilities.

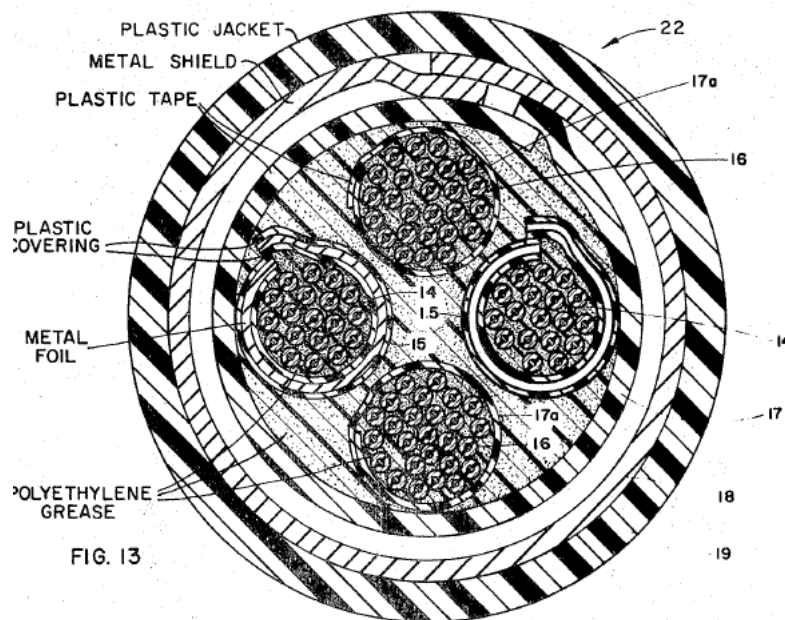
Thus, if Roberts' metal tape shield 18 is found not to disclose the multi-layer barrier tape as recited in the claims, it would have been obvious to a POSITA to modify Roberts (or the modified Roberts per Ground 4) to have such a barrier tape, and the modified Roberts would disclose all of the other claim elements of claims 1-8 and 48-50, making these claims obvious. EX-1006, ¶¶352-362.

**Ground 6: Claims 1-8 are obvious in view of any of Grounds 3-5 and further in view Simons and/or the knowledge of a POSITA**

If Roberts is found to not disclose a filler member with a plurality of arms that form first and second channels that are shaped to partially enclose the first and second conductor pairs (element [1I]), use of such a filler member in a cable taught by Roberts would have been obvious for all the reasons explained in Ground 3, further in view of Simons for this element. Likewise, use of a filler member in the form of a cross shape, as recited in Claim 2, would have been obvious in further view of Simons.

Roberts, vis-à-vis the cable of FIG. 17, teaches all the limitations of claims 1 and 3-8 as explained in Ground 3. Claim 2, which was not addressed in Ground 3 recites a cross-shaped filler member unlike the filler member in Roberts FIG. 17.

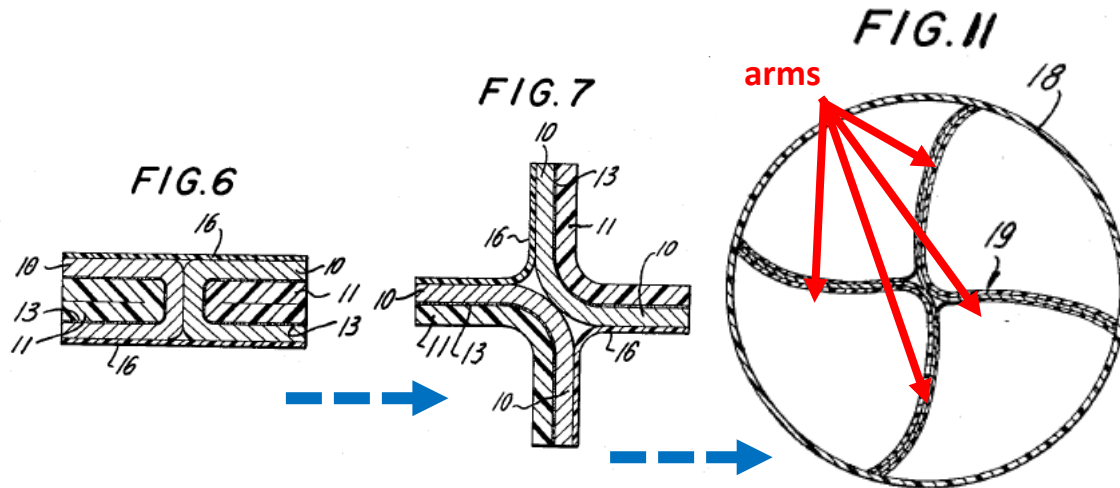
Roberts also discloses separating the conductors into four groups (instead of just two groups as in FIG. 17), and using two plastic-coated metal shields 15 to circumscribe two of the groups and two plastic tapes 17a to circumscribe the other two groups, as illustrated below:



EX-1009, 7:25-51, FIG. 13.

Simons discloses “an improvement over the shielding means disclosed in [Roberts].” EX-1012, 1:5-12. The “improvement” includes a cross-shaped

shielding tape 19 (*filler member*) with four arms that form four compartments (or channels) to separate four groups of conductors from each other:



*Id.*, 2:4-9, 2:18-20, 3:1-26, 3:42-46, FIGS. 1, 6, 7, 11; EX-1006, ¶¶363-365. As Simons explains, the shielding tape of FIG. 6 “is fed into a cabler” and “opens as in FIG. 7 to a system having four fins forming four longitudinal parallel shielding compartments.” EX-1012, 3:15-26. As illustrated, the shielding tape also has plastic/dielectric film 11, 16 on each surface facing the compartment so that such film is between the conductive metal layer 10 and the compartment and thus non-conductively shields conductors within a compartment from conductors in other compartments. *Id.*, 2:25-36, 3:4-15; EX-1006, ¶¶361-366. These four fins (*arms*) form a cross shape as illustrated in FIG. 11. *See* EX-1006, ¶¶366.

A POSITA would be motivated to modify Roberts (or the Roberts as modified per Grounds 4 and/or 5) to use Simons’s “improved” four-arm shield-tape as a filler – particularly when separating conductors into four groups (as

disclosed in, e.g., FIG. 13 of Roberts). Simons discloses that such design is an “improvement” of Roberts and provides examples as to why it is an improvement. EX-1012, 1:5-12, 3:33-44, 4:1-9. A POSITA also would have had a reasonable expectation that such improvement would be successful. The shield-tape in Simons would work to shield the conductor groups of Roberts within the compartments. *See* EX-1006, ¶¶366-369.

Thus, modifying (or further modifying) Roberts to include a filler having four arms in a cross shape (Simons) would have been obvious to a POSITA, and the so-modified Roberts cable would disclose Element [1I] (and the other elements of claim 1). EX-1006, ¶¶362-369. This four-armed cross-shape filler also would be a unitary component of the cable and disclose claim 2’s recited filler member. EX-1006, ¶¶368-369.

Thus, a POSITA would find claims 1-8 obvious based on the combined teaching of Roberts and Simons.

## **Ground 7: Pfeiler Anticipates Claims 1-8, 48-50**

### **A. Independent Claim 1**

- 1. A cable for reducing alien cross-talk and return loss between adjacent twisted pairs of conductors comprising: [1A], [1B] and [1C]**

If the preamble is limiting, Pfeiler discloses a cable with a screening sheet that “drastically reduces so-called cable crosstalk – also termed Alien-NEXT and

Alien-EL-FEXT.” See EX-1011, 1:9-14, 2:42-58, FIGS 6-7; EX-1006, ¶370. The screening sheet has a conductive layer with foil separated by gaps chosen “such that no peaks of impedance or return loss ... will occur in the range of transmission frequency of the data transmission cable.” EX-1011, 1:59-64, 2:4-13.

Pfeiler discloses Elements [1A]-[1C], as illustrated in the annotated Figures below:

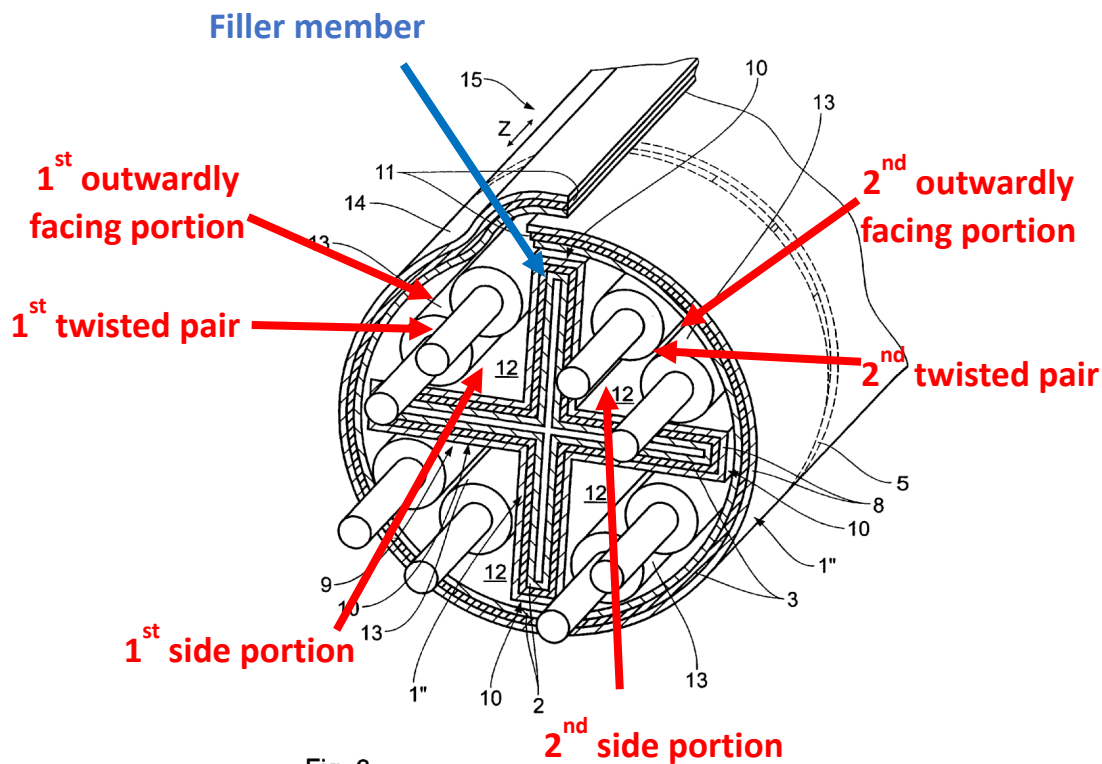


Fig. 6

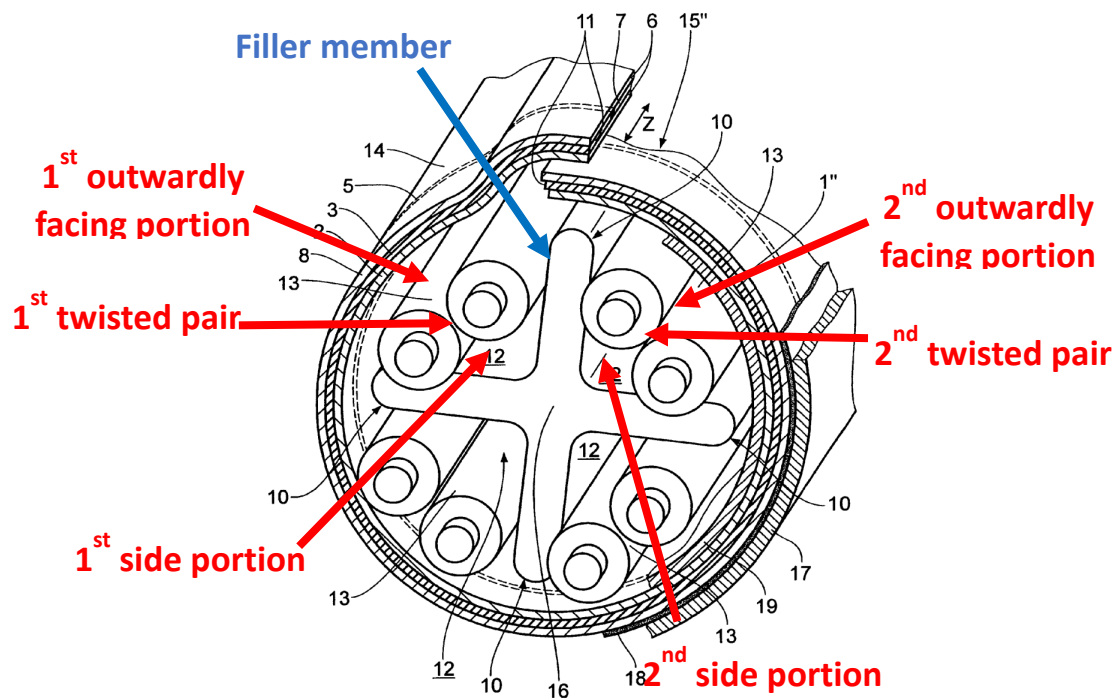


Fig. 7

*Id.*, 1:14-18; 4:13-20, 4:25-29 (“...[T]wisted-pair lines are accommodated in each of the quadrantal zones 16 ...”), 4:42-47, FIGS 6-7; EX-1006, ¶371.

The filler member is a separating structure 9 formed of a screening sheet 1” with four ribs 10 (FIG. 6), or alternatively shown in FIG. 7, as a “cruciform section 16 extruded from insulating plastic material.” EX-1011, 4:16-20, 4:26-29, 4:42-47, FIGS. 4-7; EX-1006, ¶372.

Separating structure 9 provides shielding between the twisted pairs. Pfeiler explains that “[i]nternal crosstalk between the individual cable crosstalk between the individual twisted pairs is strictly reduced by the screening sheet being integrated into the internal supporting and separating structure.” *See* EX-1011, 2:54-58; EX-1006, ¶373.

Further, the shielding is non-conductive. The metallic screening layer 3 (of the screening sheet 1”) is positioned between two non-conductive layers 2, 8, and is formed of discontinuous metalized sections separated by gaps which preclude the flow of potential compensation currents. *See* EX-1011, 1:63-66, 3:23-33, 3:38-44, 4:13-15, FIGS. 1 and 6; EX-1006, ¶¶373-374. Like the filler member in the ‘030 patent, the cruciform section 16 in FIG. 7 is a dielectric “extruded from insulating plastic material.” EX-1011, 4:42-47; EX-1006, ¶374.

A POSITA would understand that these filler members are configured to non-conductively shield the twisted pairs as recited. EX-1006, ¶¶370-375.

## **2. Element 1D**

Pfeiler discloses a barrier tape (external envelope 14 consisting of screening sheet 1”) encircling the filler member (e.g., cruciform section 16) and the first and second twisted pairs:

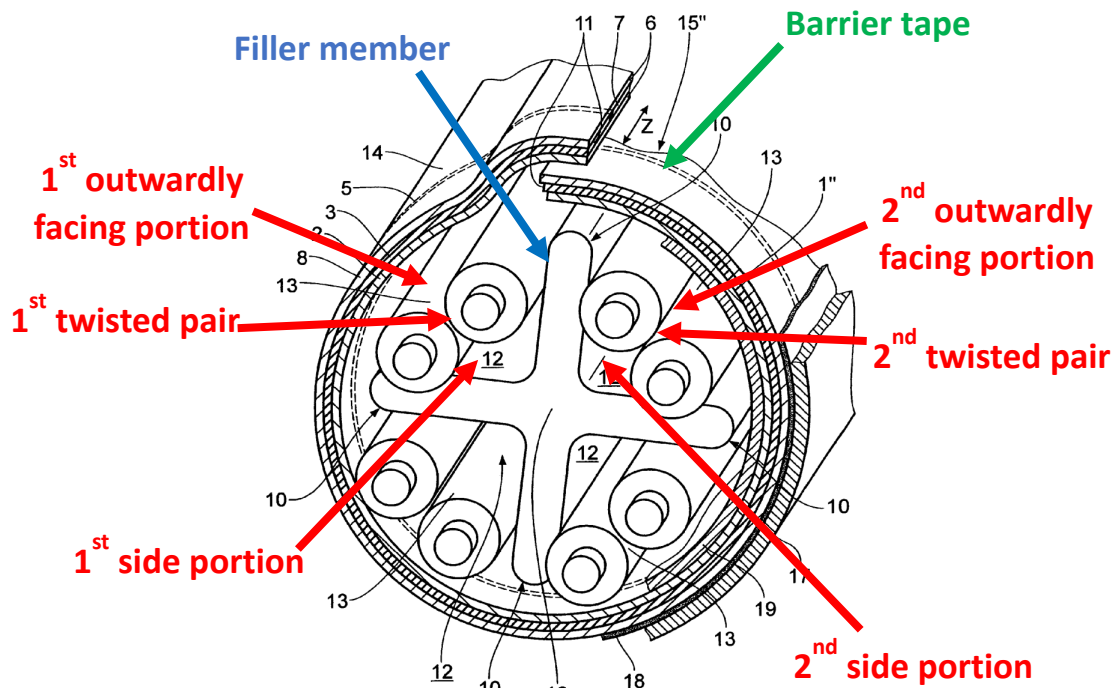


Fig. 7

See, e.g., EX-1011, 4:28-31, 4:42-46, FIG 7; EX-1006, ¶¶376-377.

The external envelope 14 is a tape that consists of a screening sheet with a thin conductive layer 3 sandwiched between two thin plastic layers 2, 8. EX-1011, 3:22-27, 3:38-40, 4:13-15. The screening sheet protects the twisted pairs from “irradiating interfering energy” and “drastically reduces alien crosstalk.” *Id.*, 2:46-54; EX-1006, ¶378. This teaches that the external envelope shields the outwardly facing portions of the twisted pairs. *Id.*

Pfeiler discloses that this shielding is “non-conductive.” The thin metallic layer is formed of spaced-apart metal patches (which prevents a continuous electrical connection in the longitudinal direction of the shielding sheet) and is

insulated between two dielectric layers 2,8. *See, e.g.*, EX-1011, 1:58-65, 3:25-44, 3:57-62 4:13-15, FIGS. 1-2, 6-7. Pfeiler thus discloses that its barrier tape is configured to encircle the filler member and conductors so as to non-conductively shield the conductors as recited in the claims. EX-1006, ¶¶376-381.

### 3. Element 1E

As illustrated in annotated FIG. 7, Pfeiler discloses protecting jacket 17 (*jacket*) that “envelopes the screening sheet” and thus encircles the barrier tape as recited:

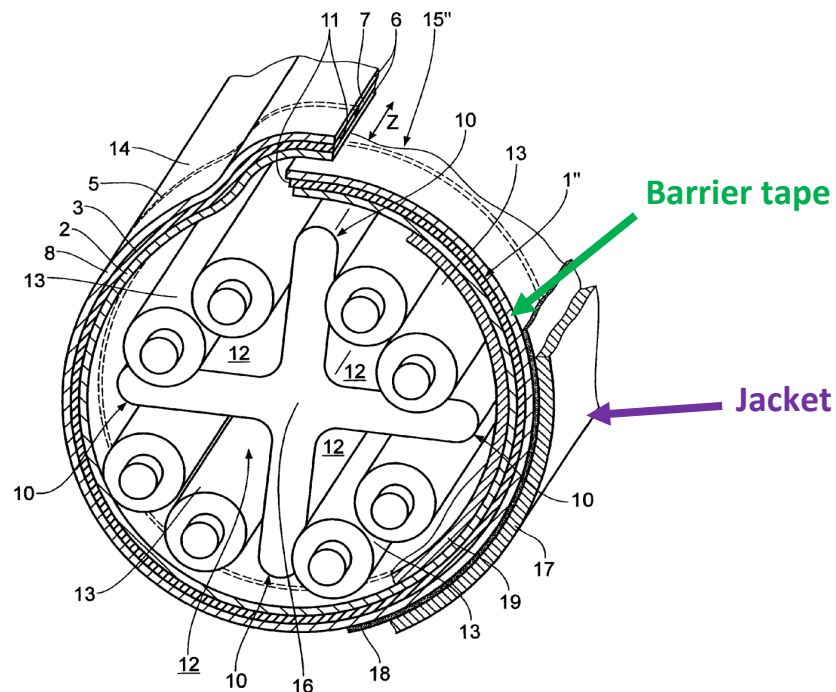


Fig. 7

EX-1009, 4:47-53, FIG 7; EX-1006, ¶¶382-384.

#### 4. Element 1F

As illustrated in the annotated drawing, Pfeiler discloses first and second twisted pairs located adjacent to a portion of the filler member as recited:

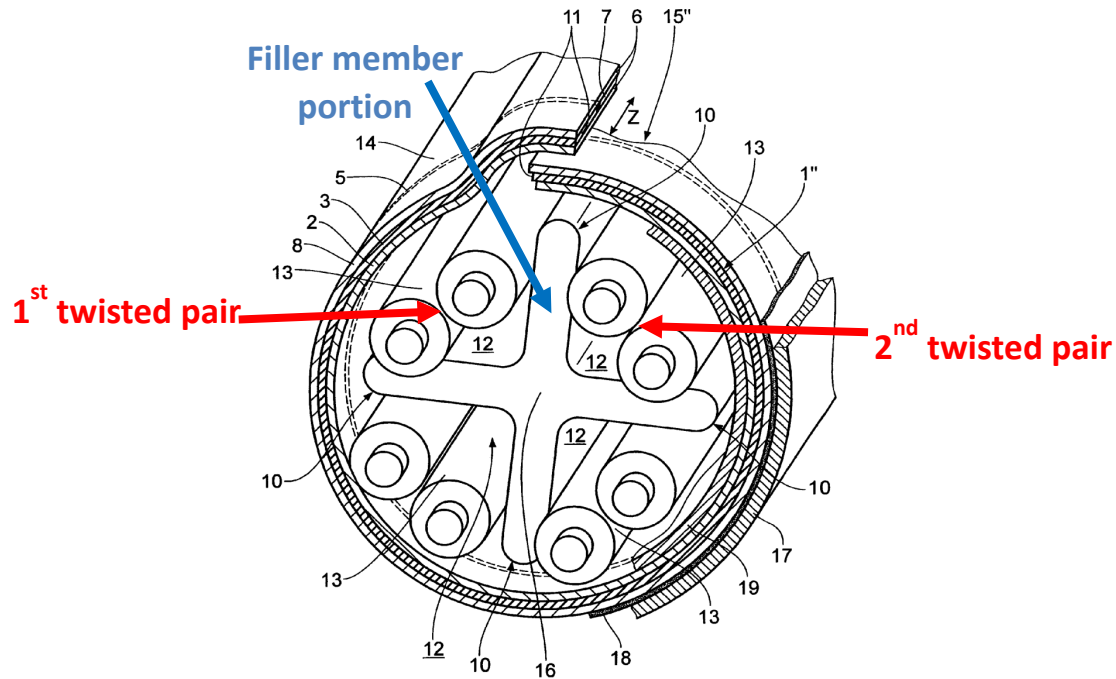
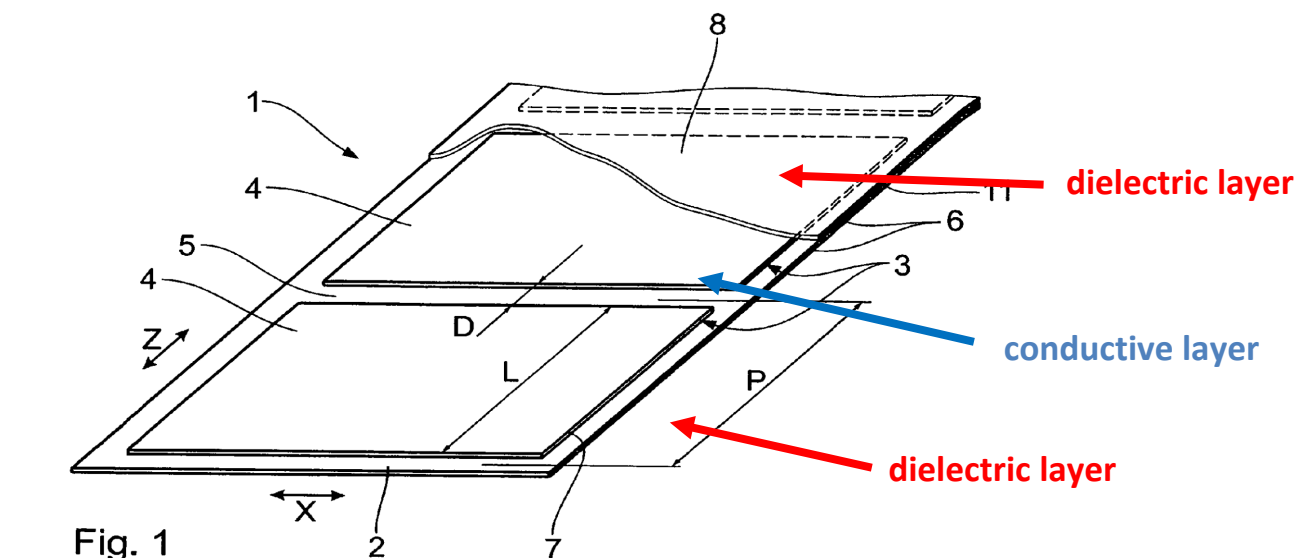


Fig. 7

See EX-1011, 4:13-20, 4:25-28, 4:42-47, FIG7; EX-1006, ¶¶385-387.

#### 5. Element 1G

As shown in the annotated figure below, Pfeiler discloses that the screening sheet 1" (i.e., the barrier tape) includes a dielectric layer (e.g., "substrate layer 2")



EX-1011, 3:22-27, 3:38-39, 3:45-47, 4:13-15; FIGS 1-2, 6-7; EX-1006, ¶389.

A POSITA would understand that screening layer 3, which consists of spaced-apart “metal pieces of foil 4,” is a conductive layer as recited and that substrate layer 2 is a non-conductive layer as recited. EX-1011, 3:25-27; EX-1006, ¶¶388-393. This is consistent with the ’833 Patent disclosure that a “conductive barrier tape 110” may be “conductive or partially conductive” and comprise, among other things, either “a continuously conductive tape [or] a discontinuously conductive tape” (EX-1001, 2:30-32, 7:38-42).

## 6. Element 1H

Pfeiler discloses this. EX-1006, ¶¶394-396. Separating structure 9 (FIG. 6) has one or more dielectric layers, and cruciform section 16 (FIG. 7) is made

entirely of an extruded “insulating plastic material.” EX-1011, 3:22-27, 3:38-41, 4:13-25, 4:42-47; FIGS. 1, 6-7.

## 7. Element 11

As illustrated in annotated FIG 7, separator 16 (*filler member*) has arms (ribs 10) that extend radially outward to form first and second channels (i.e., grooves 12) shaped as recited:

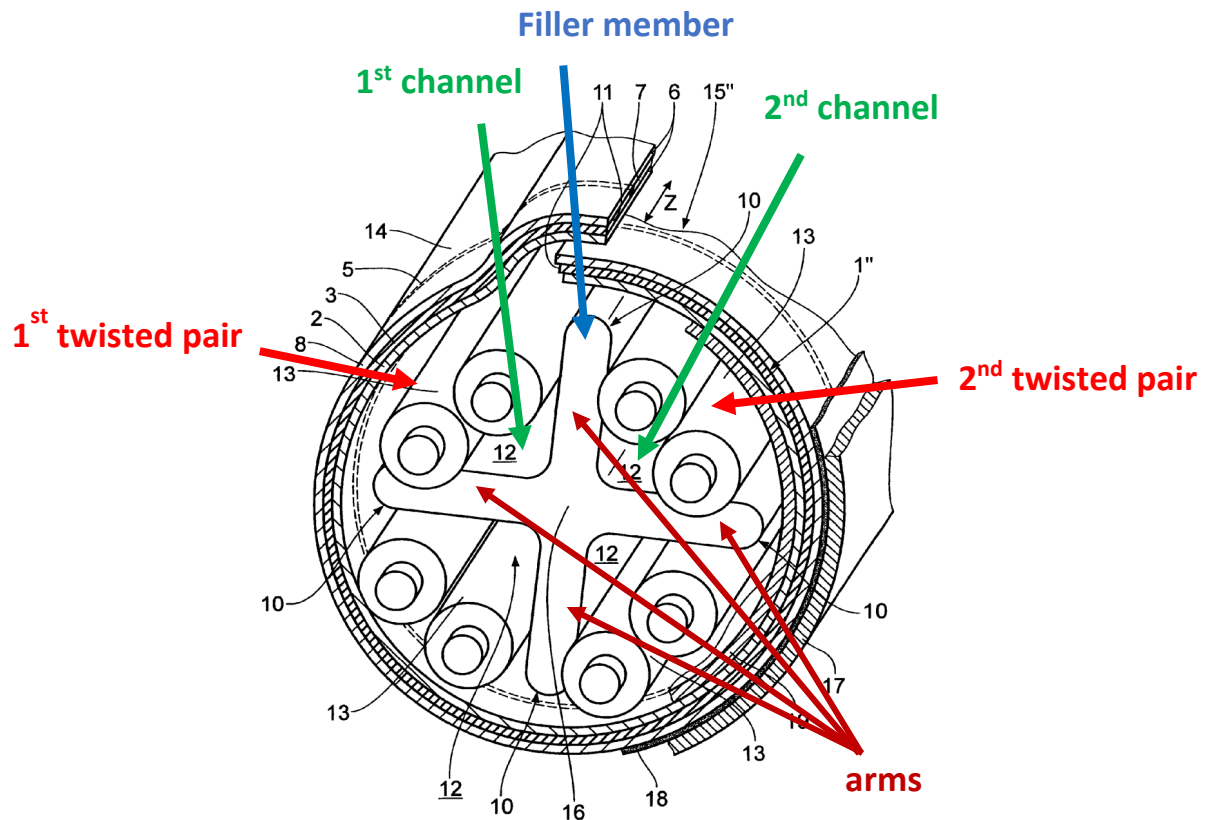


Fig. 7

EX-1011, 4:25-28, FIGS 6-7; EX-1006, ¶¶397-399.

## 8. Element 1J

As illustrated in the annotated figure below, arms of separator 16 (*filler member*) have outwardly facing terminal surfaces, and the barrier tape (envelope 14) encircles these surfaces and the twisted pairs as recited:

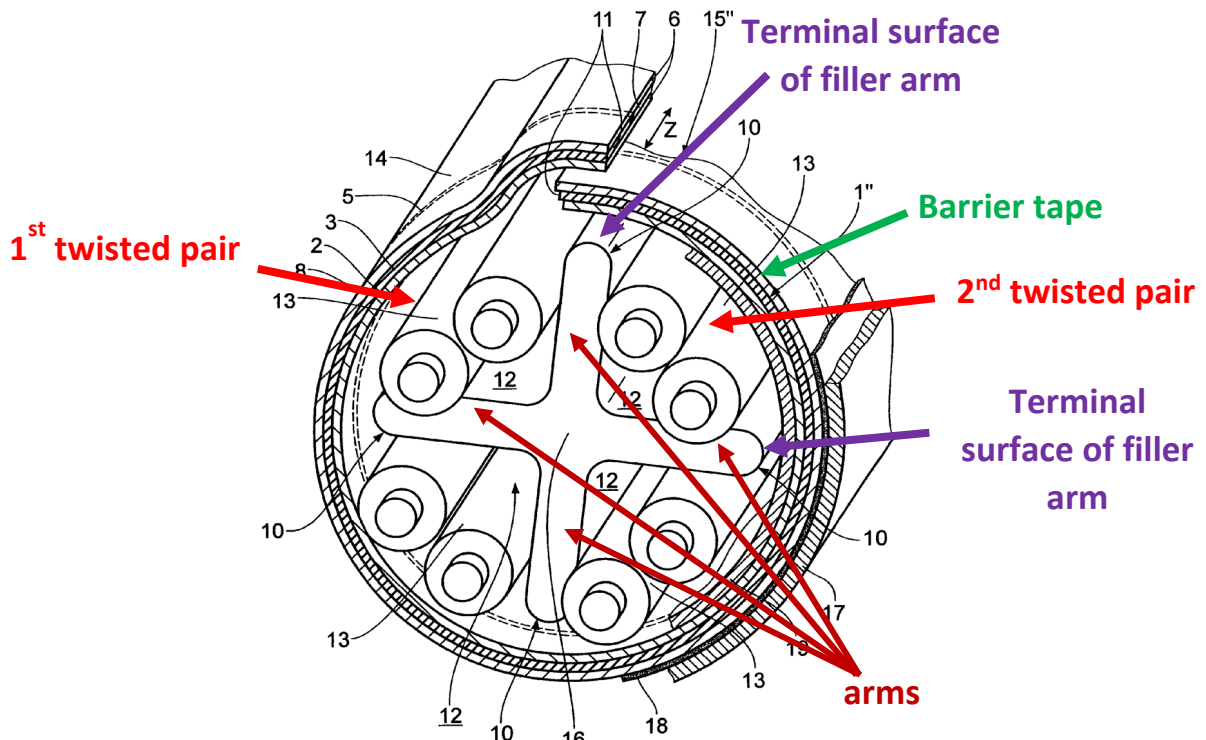


Fig. 7

See, e.g., EX-1011, 4:28-31, 4:42-46, FIGS 6-7; EX-1006, ¶¶400-402.

## 9. Element 1K

Pfeiler discloses that the filler member (e.g., separating structure 9 (FIG. 6) or “customary cruciform” separator 16 (FIG. 7)) extends along a longitudinal portion of the cable and non-conductively shields the pairs as recited. EX-1011, FIGS. 6-7 (showing fillers extending through the cables); EX-1006, ¶¶403-407. For example, structure 9 has ribs 10, and the twisted pairs “are accommodated in

each of the quadrantal zones 12 between the separating ribs and thus screened from each other by the screening layer inside the ribs 10.” EX-1011, 4:25-28. Similarly, as illustrated in FIG. 7, the “customary cruciform” separator 16 has arms that separate and screen the twisted pairs of conductors from each other. EX-1006, ¶¶403-407. Pfeiler explains that the separating structure/cruciform section reduces crosstalk between the twisted pairs, which occurs because the separating structure, along with the twisted pairs, extends along the longitudinal direction of the cable. EX-1011, 4:25-28.

The separating structure (and cruciform) “non-conductively” shields the twisted pairs as already discussed for elements 1A-C. *See* Ground 7 §A(1); EX-1006, ¶¶403-407.

Pfeiler discloses this element (and claim). EX-1006, ¶¶403-407.

## **B. Dependent Claims 2-8**

### **1. Claim 2**

**“2. The cable of claim 1, wherein the filler member comprises a single unitary component of the cable, and the plurality of arms of the filler member form a cross shape.”**

Pfeiler discloses this. EX-1006, ¶¶408-411.

Separating structure 9 consists of a screening sheet 1 that is a single unitary component (i.e., sheet) that is “folded down itself along the longitudinal strip

direction Z in such a way that four separating ribs 10 of star configuration are produced.” EX-1011, 3:22-23, 4:16-20, 4:25-28, FIGS. 4-6, EX-1006, ¶409.

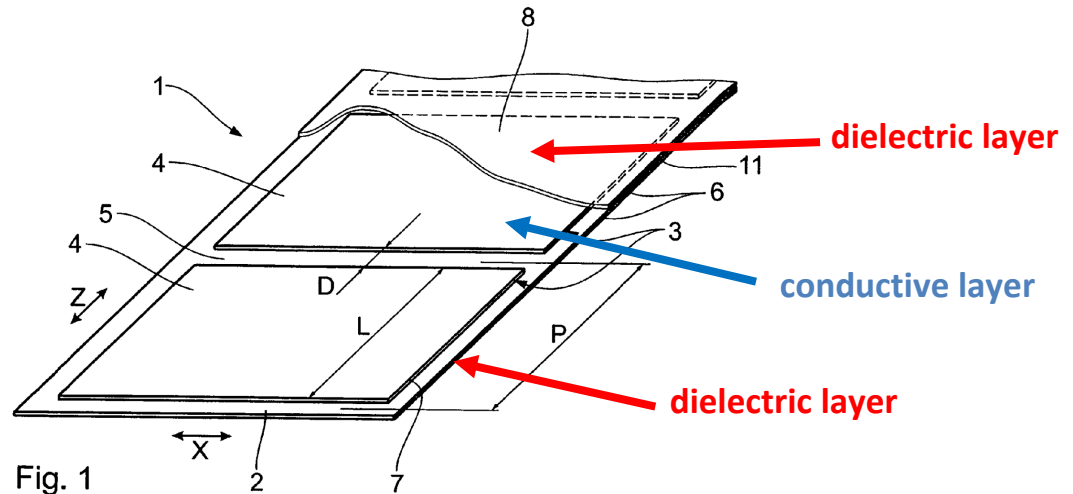
The filler member in FIG. 7 is “a customary cruciform section 16 extruded from insulating plastic material.” EX-1011, 4:41-47. As an extruded component it would be a single unitary component. EX-1006, ¶410.

Each of the disclosed filler members (e.g, separating structure 9 and cruciform section 16) has four arms which form a cross shape. EX-1011, 4:26-29, 4:42-47, FIGS. 6-7.

## **2. Claim 3:**

**“3. The cable of claim 1, wherein the non-conductive layer of the barrier tape comprises a first non-conductive layer and the barrier tape includes a second non-conductive layer.”**

As explained vis-à-vis elements [1D] and [1G], and shown in the annotated figure below, external envelope 14 (*barrier tape*) has a screening sheet 1 with first and second dielectric layers 2,8 surrounding a conductive layer 3, thus disclosing this element:



EX-1011, 3:22-27, 3:38-44, 4:13-15, FIGS. 1-3, 6-7; EX-1006, ¶¶412-414.

### 3. Claim 4:

**“4. The cable of claim 3, wherein the conductive layer of the barrier tape is positioned between the first and second non-conductive layers.”**

As discussed and shown above for [1G] and claim 3, Pfeiler discloses this element. EX-1006, ¶¶415-416; Ground 7 §§A(5), B(2); EX-1011, FIG. 1.

### 4. Claim 5:

**“5. The cable of claim 3, wherein the first non-conductive layer comprises an inner non-conductive layer and the second non-conductive layer comprises an outer non-conductive layer.”**

As discussed vis-à-vis claim 3 and [1G], and illustrated in annotated FIG. 7 below, there is an inner non-conductive layer 2 and an outer non-conductive layer 8 when the barrier tape is wrapped around the conductors. EX-1006, ¶¶417-420; EX-1011, FIGS. 6-7.

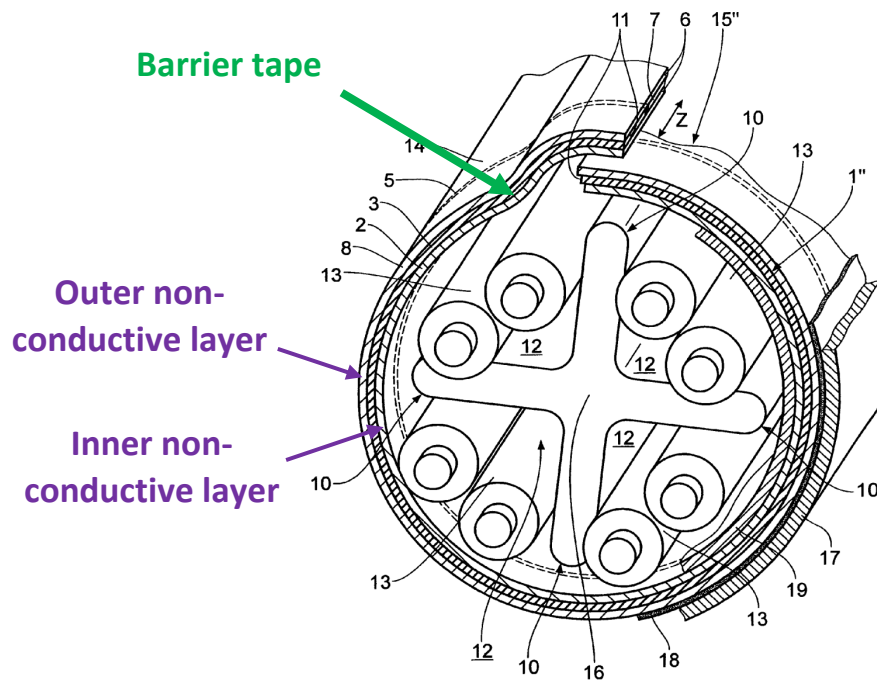


Fig. 7

## 5. Claim 6:

**“6. The cable of claim 1, wherein the filler member and the barrier tape are configured to extend along a longitudinal direction of the cable.”**

As explained vis-a-vis [1K], Pfeiler discloses the filler member configured as recited. *See, supra*, Ground 7 §A(9); EX-1006, ¶¶421-424.

Figures 6-7 show the barrier tapes (i.e., envelope 14) extending along the longitudinal direction of the cable. Pfeiler also explains that “[t]he entire array of the internal supporting and separating structure 9 and the four twisted-pair lines 13 are insulated by an external envelope which again consists of a screening sheet 1’.” EX-1011, 4:28-31; *see also id.*, 2:46-50; EX-1006, ¶¶419-420. Since the

twisted pairs extend along the longitudinal direction of the cable, the insulating external envelope does likewise. EX-1006, ¶¶421-424.

**6. Claim 7:**

**7. The cable of claim 1, wherein the first and second twisted pairs of conductors comprise first and second helically twisted pairs of conductors along the longitudinal portion of the cable, and the filler member and the barrier tape are configured to non-conductively shield the first and second helically twisted pairs of conductors along the longitudinal portion of the cable.”**

Pfeiler discloses cables with “intertwisted pairs of lines, so-called twisted pairs” and “twisted pairs” and “twisted pair lines 13,” which a POSITA would understand to be conductor pairs that are helically twisted. *See* EX-1011, 1:13-18, 2:42-50, 4:25; EX-1006, ¶¶425-426. Pfeiler also discloses that the twisted pairs and other cable components (such as the filler member) may be stranded together along a helical axis when the screening sheet (i.e., barrier tape) is applied over them. *Id.*, 2:28-36. Figures 5-7 show the twisted pairs extending along the longitudinal direction of the cable (like the filler member). EX-1006, ¶¶425-427.

Filler member provides non-conductive shielding as discussed concerning [1A-C] and [1K]. External envelope 14 provides non-conductive shielding as discussed for [1D]. Since separating structure 9 and external envelope 14 extend along the longitudinal direction of the cable (see discussions above for [1K] and claim 6), these structures provide the recited shielding along the longitudinal portion. EX-1006, ¶¶427-429.

Thus, these elements are disclosed. EX-1006, ¶¶425-430; Ground 7 §§A(1), A(2), A(9), *supra*.

**7. Claim 8:**

**“8. The cable of claim 1, wherein the first and second twisted pairs of conductors comprise first and second helically twisted pairs of conductors along the longitudinal portion of the cable, and the filler member is configured to non-conductively shield the first and second helically twisted pairs of conductors along the longitudinal portion of the cable.”**

Pfeiler discloses this as explained for claim 7. EX-1006, ¶¶431-432; Ground 7 §§ A(1), A(9), B(5).

**C. Independent Claim 48**

**1. Element 48A**

**“A cable comprising: [48A] a plurality of twisted pair conductors;”**

As illustrated in the annotated figure below, Pfeiler discloses a cable with a plurality of twisted pair conductors:

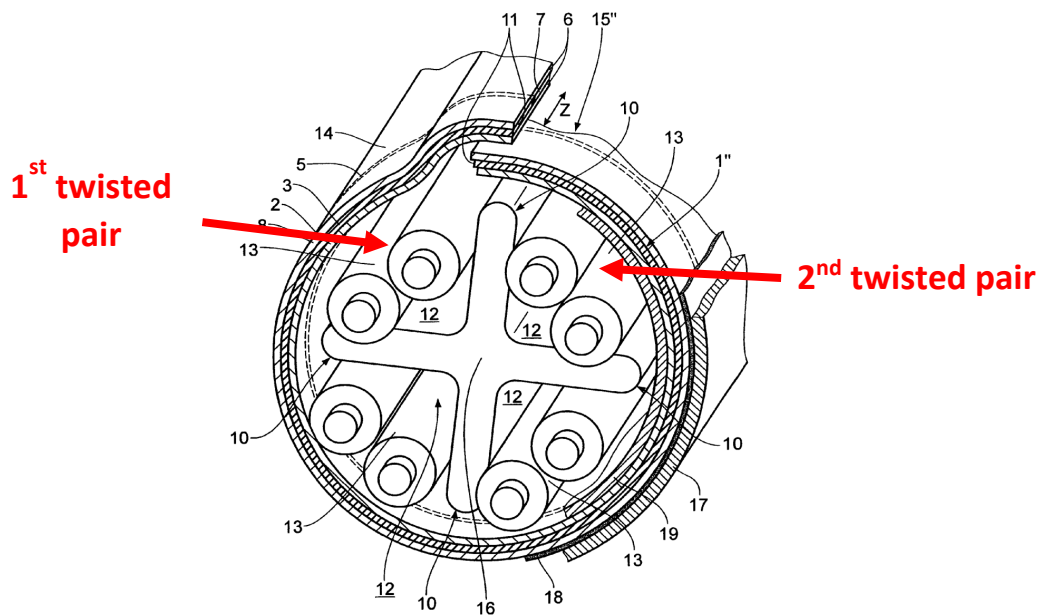


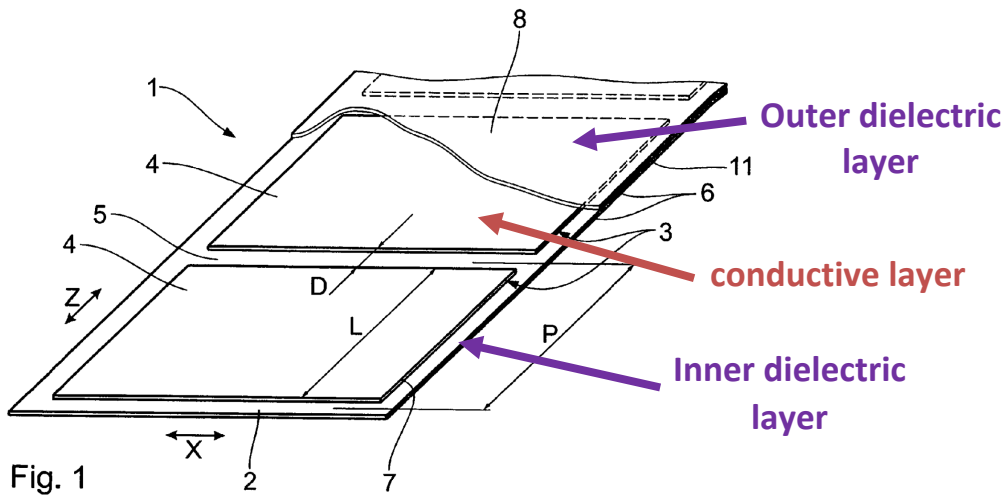
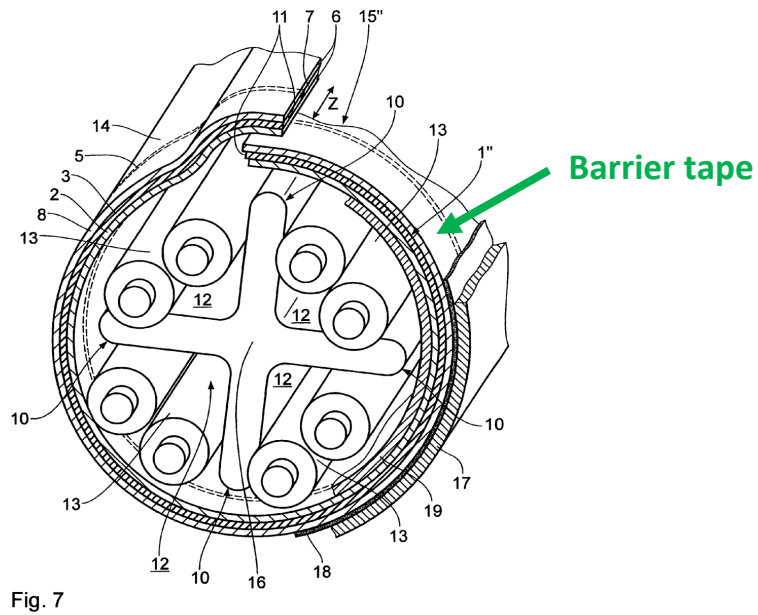
Fig. 7

See, e.g., EX-1011, 1:14-17, 4:25-28, FIGS 6-7; EX-1006, ¶¶433-434.

## 2. Element 48B

**“a barrier tape that surrounds the plurality of twisted pair conductors, the barrier tape including an electrically conductive layer enclosed between inner and outer dielectric layers;”**

As shown in the annotated figures below, and explained in the discussion of [1D] and [1G] and claim 4, Pfeiler shows external envelope 14 (*barrier tape*) surrounding conductor pairs, and having the recited dielectric layers (2, 8) and conductive layer (3). EX-1006, ¶¶435-439; EX-1011, 3:22-27, 3:38-44, 4:13-15, FIGS. 6-7.



### 3. Element 48C

**“a jacket that surrounds the barrier tape.”**

As shown for element [1E], and illustrated below, protecting jacket 17 surrounds the barrier tape (i.e., external envelope 14).

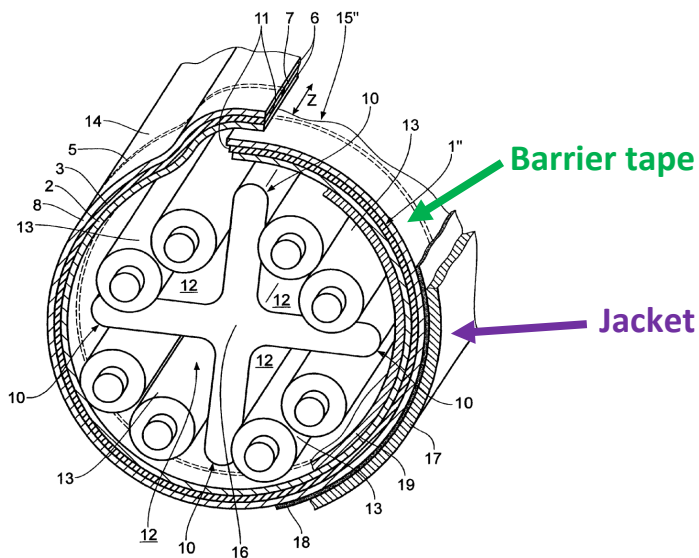


Fig. 7

EX-1006, ¶¶440-442; EX-1011, FIG. 7.

#### D. Independent Claim 49

##### 1. Element 49A

**“A cable comprising: [49A] a plurality of pairs of conductors extending along a longitudinal axis;”**

See discussion of claim 7 and element [48A]. Pfeiler’s conductor pairs extend along a longitudinal axis (A) of the cable:

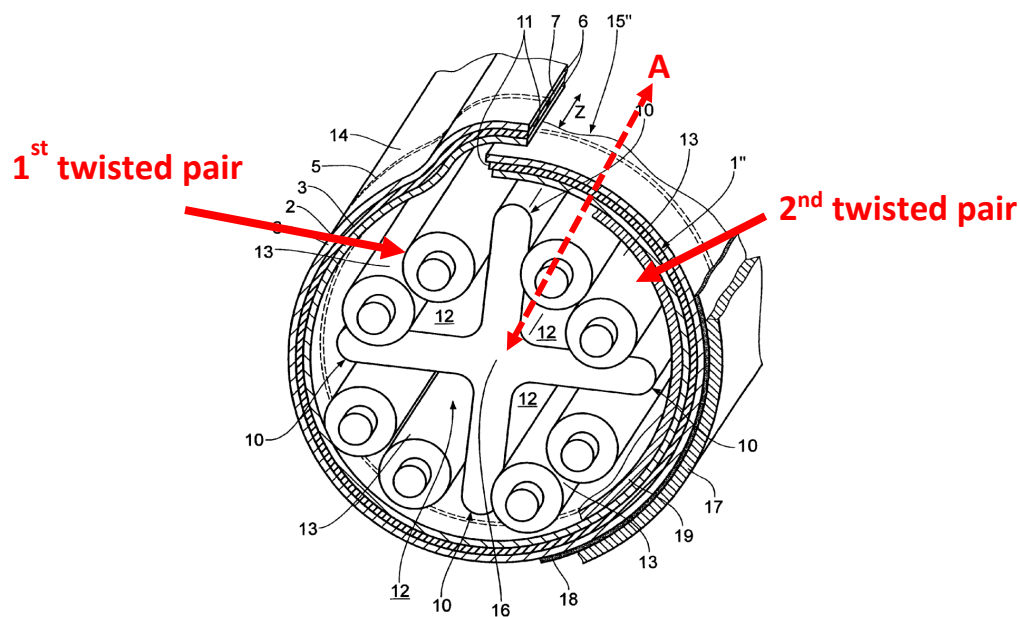


Fig. 7

See, e.g., EX-1011, 4:25-28, FIGS 6-7; EX-1006, ¶¶443-444.

## 2. Element 49B

**“a barrier tape surrounding the plurality of pairs of conductors, the barrier tape comprising a conductive layer positioned between a first non-conductive layer and a second non-conductive layer; and”**

Pfeiler discloses this as discussed for element [48B]. See, Ground 7 §C(2), *supra*; EX-1006, ¶¶445-446.

## 3. Element 49C

**“an outer jacket surrounding the barrier tape, the outer jacket comprising a non-conductive material.”**

Pfeiler discloses the outer protecting jacket surrounding the barrier tape as explained vis-à-vis [1E] and [48C]. See, *supra*, Ground 7 §§A(3), C(3) Pfeiler’s protecting jacket 17 is made of “polymeric insulating material”, which comprises non-conductive material. EX-1011, 4:47-49; EX-1006, ¶¶447-449.

### **E. Independent Claim 50**

As explained in Ground 1, §E, Claim 50 is a method claim that recites essentially the same structural limitations as set forth in claims 48 and 49 but with method steps. Pfeiler's disclosure of a cable having twisted pairs conductors (see [48A]/[49A]) surrounded by a three-layer barrier tape as recited (see [48B]/49B)), with a jacket enclosing the conductors and tape (see [48C]/[49C] and also [1E]), applies equally to the recited method steps 50A and 50B, and results in performing the recited method steps. EX-1006, ¶¶450-459. Using Pfeiler's cable and teaching as described for claims 48-49 above results in performing the method recited in claim 50 and renders claim 50 anticipated for the same reasons discussed above. *See id.*; Ground 7 §§C, D, *supra*.

### **Conclusion**

There is at least a reasonable likelihood claims 1-8 and 48-50 are invalid.

Respectfully submitted,

Dated: June 13, 2023

By: /Timothy A. Lindquist/  
Timothy A. Lindquist, Reg. No. 40,701  
Dennis C. Bremer, Reg. No. 40,528  
Capella Tower, Suite 4200  
225 South Sixth Street  
Minneapolis, MN 55402  
tlindquist@carlsoncaspers.com  
dbremer@carlsoncaspers.com  
Phone: 612.436.9600  
Fax: 612.436.9605

## **Appendix A: Claims Listing**

U.S. Patent No. 10,832,833

Claims 1-8, 48-50

| <b>Designation</b> | <b>Claim 1</b>                                                                                                                                                                                                                                                                                      |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | 1. A cable for reducing alien cross-talk and return loss between adjacent twisted pairs of conductors comprising:                                                                                                                                                                                   |
| Element 1A         | a first twisted pair of conductors having a first side portion and a first outwardly facing portion;                                                                                                                                                                                                |
| Element 1B         | a second twisted pair of conductors having a second side portion and a second outwardly facing portion;                                                                                                                                                                                             |
| Element 1C         | a filler member configured to non-conductively shield the first side portion of the first twisted pair of conductors from the second side portion of the second twisted pair of conductors;                                                                                                         |
| Element 1D         | a barrier tape configured to encircle the filler member and the first and second outwardly facing portions of the first and second twisted pairs of conductors so as to non-conductively shield the first and second outwardly facing portions of the first and second twisted pairs of conductors; |
| Element 1E         | a jacket configured to encircle the barrier tape;                                                                                                                                                                                                                                                   |
| Element 1F         | wherein the second twisted pair of conductors is located adjacent to a portion of the filler member, and wherein the first twisted pair of conductors is located adjacent to the portion of the filler member;                                                                                      |

|            |                                                                                                                                                                                                                                                                                                                                                                                |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Element 1G | wherein the barrier tape includes a non-conductive layer and a conductive layer;                                                                                                                                                                                                                                                                                               |
| Element 1H | wherein the filler member is made of a non-conductive material;                                                                                                                                                                                                                                                                                                                |
| Element 1I | wherein the filler member includes a plurality of arms that are each configured to radially extend outwardly so as to form a first channel shaped to partially enclose the first twisted pair of conductors and a second channel shaped to partially enclose the second twisted pair of conductors;                                                                            |
| Element 1J | wherein the first terminal portion of the filler member includes a first outwardly facing terminal surface, the second terminal portion of the filler member includes a second outwardly facing terminal surface, and the barrier tape is configured to encircle the first and second outwardly facing terminal surfaces and the first and second twisted pairs of conductors; |
| Element 1K | wherein the filler member is configured to extend along a longitudinal portion of the cable and is configured to non-conductively shield the first and second twisted pairs of conductors from being electrically coupled to each other along the longitudinal portion of the cable.                                                                                           |

| Designation | Claim 2                                                                                                                                                                  |
|-------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | 2. The cable of claim 1, wherein the filler member comprises a single unitary component of the cable, and the plurality of arms of the filler member form a cross shape. |

| <b>Designation</b> | <b>Claim 3</b>                                                                                                                                                                    |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | 3. The cable of claim 1, wherein the non-conductive layer of the barrier tape comprises a first non-conductive layer and the barrier tape includes a second non-conductive layer. |

| <b>Designation</b> | <b>Claim 4</b>                                                                                                                              |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------|
|                    | 4. The cable of claim 3, wherein the conductive layer of the barrier tape is positioned between the first and second non-conductive layers. |

| <b>Designation</b> | <b>Claim 5</b>                                                                                                                                                                       |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | 5. The cable of claim 3, wherein the first non-conductive layer comprises an inner non-conductive layer and the second non-conductive layer comprises an outer non-conductive layer. |

| <b>Designation</b> | <b>Claim 6</b>                                                                                                                                |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
|                    | 6. The cable of claim 1, wherein the filler member and the barrier tape are configured to extend along a longitudinal direction of the cable. |

| <b>Designation</b> | <b>Claim 7</b>                                                                                                                                                                                                                                                                                                                                 |
|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | 7. The cable of claim 1, wherein the first and second twisted pairs of conductors comprise first and second helically twisted pairs of conductors along the longitudinal portion of the cable, and the filler member and the barrier tape are configured to non-conductively shield the first and second helically twisted pairs of conductors |

|  |                                              |
|--|----------------------------------------------|
|  | along the longitudinal portion of the cable. |
|--|----------------------------------------------|

| <b>Designation</b> | <b>Claim 8</b>                                                                                                                                                                                                                                                                                                                                                        |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | 8. The cable of claim 1, wherein the first and second twisted pairs of conductors comprise first and second helically twisted pairs of conductors along the longitudinal portion of the cable, and the filler member is configured to non-conductively shield the first and second helically twisted pairs of conductors along the longitudinal portion of the cable. |

| <b>Designation</b> | <b>Claim 48</b>                                                                                                                                                                             |
|--------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | 48. A cable comprising:                                                                                                                                                                     |
| Element 48A        | a plurality of twisted pair conductors;                                                                                                                                                     |
| Element 48B        | a barrier tape that surrounds the plurality of twisted pair conductors, the barrier tape including an electrically conductive layer enclosed between inner and outer dielectric layers; and |
| Element 48C        | a jacket that surrounds the barrier tape.                                                                                                                                                   |

| <b>Designation</b> | <b>Claim 49</b>                                                                                                                                                                                        |
|--------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                    | 49. A cable comprising:                                                                                                                                                                                |
| Element 49A        | a plurality of pairs of conductors extending along a longitudinal axis;                                                                                                                                |
| Element 49B        | a barrier tape surrounding the plurality of pairs of conductors, the barrier tape comprising a conductive layer positioned between a first non-conductive layer and a second non-conductive layer; and |

|             |                                                                                                      |
|-------------|------------------------------------------------------------------------------------------------------|
| Element 49C | an outer jacket surrounding the barrier tape, the outer jacket comprising a non-conductive material. |
|-------------|------------------------------------------------------------------------------------------------------|

| Designation | Claim 50                                                                                                                                                                                     |
|-------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|             | 50. A method for reducing alien crosstalk between cables, the method comprising                                                                                                              |
| Element 50A | surrounding a plurality of twisted pair conductors with a barrier tape comprising a conductive layer positioned between a first non-conductive layer and a second non-conductive layer, and; |
| Element 50B | extending the barrier tape within an outer jacket.                                                                                                                                           |

## **Appendix B: Exhibit Listing**

| <b>Exhibit No.</b> | <b>Exhibit Description</b>                                                                                                              |
|--------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| <b>1001</b>        | U.S. Patent No. 10,832,833 (the “’833 Patent”)                                                                                          |
| <b>1002</b>        | Office Action dated 06/28/2019                                                                                                          |
| <b>1003</b>        | Office Action dated 01/08/2020                                                                                                          |
| <b>1004</b>        | Amendment and Response to Non-Final Office Action dated 04/08/202                                                                       |
| <b>1005</b>        | Scheduling Order, C.A. No. 22-783-RGA (D. Del.)                                                                                         |
| <b>1006</b>        | Expert Declaration of Kenneth Cornelison                                                                                                |
| <b>1007</b>        | <i>Curriculum Vitae</i> of Kenneth Cornelison                                                                                           |
| <b>1008</b>        | U.S. Patent Publication No. 2013/0248240 (Glew)                                                                                         |
| <b>1009</b>        | U.S. Patent No. 3,622,683 (Roberts)                                                                                                     |
| <b>1010</b>        | U.S. Patent No. 9,363,935 (Cook)                                                                                                        |
| <b>1011</b>        | U.S. Patent No. 7,335,837 (Pfeiler)                                                                                                     |
| <b>1012</b>        | U.S. Patent No. 3,911,200 (Simons)                                                                                                      |
| <b>1013</b>        | U.S. Patent No. 3,233,036 (Jachimowicz-036)                                                                                             |
| <b>1014</b>        | U.S. Patent No. 3,894,172 (Jachimowicz-172)                                                                                             |
| <b>1015</b>        | U.S. Patent No. 4,428,787 (Pan)                                                                                                         |
| <b>1016</b>        | <i>Electronic Wire &amp; Cable - A User’s Guide: Performance and Selection</i> , Section 5: Multiconductor Cables, AT&T (1987)          |
| <b>1017</b>        | Whitham D. Reeve, <i>Subscriber Loop Signaling and Transmission Handbook – Digital</i> , IEEE Telecommunications Handbook Series (1995) |
| <b>1018</b>        | Whitham D. Reeve, <i>Subscriber Loop Signaling and Transmission Handbook – Analog</i> , IEEE Telecommunications Handbook Series (1992)  |
| <b>1019</b>        | U.S. Patent No. 5,380,591 (Keogh)                                                                                                       |
| <b>1020</b>        | U.S. Patent No. 1,727,972 (Ford)                                                                                                        |
| <b>1021</b>        | U.S. Patent No. 1,956,730 (Reichelt)                                                                                                    |
| <b>1022</b>        | U.S. Patent No. 3,803,340 (Jachimowicz-340)                                                                                             |
| <b>1023</b>        | Canadian Patent Application No. 2,058,046 (Tessier)                                                                                     |
| <b>1024</b>        | U.S. Patent No. 4,262,164 (Nutt)                                                                                                        |

|             |                                                                                            |
|-------------|--------------------------------------------------------------------------------------------|
| <b>1025</b> | U.S. Patent Pub. No. 2006/0169478 (Clark-478)                                              |
| <b>1026</b> | U.S. Patent Publication No. 2010/0206609 ('609 Publication)                                |
| <b>1027</b> | U.S. Patent No. 5,670,748 (Gingue)                                                         |
| <b>1028</b> | G.F. Moore, <i>Electric Cable Handbook</i> , BICC Cables (3rd. Ed. 1997)                   |
| <b>1029</b> | <i>The New IEEE Standard Dictionary of Electrical and Electronics Terms</i> (5th ed. 1993) |
| <b>1030</b> | Neil Sclater and John Markus, <i>Electronics Dictionary</i> , McGraw-Hill (6th Ed. 1997)   |
| <b>1031</b> | Draka – B03: Rodent protection (2009-01-19)                                                |
| <b>1032</b> | U.S. Patent No. 5,427,643 (Aitken)                                                         |
| <b>1033</b> | U.S. Patent No. 4,213,280 (Sandborn)                                                       |
| <b>1034</b> | U.S. Patent No. 4,439,632 (Aloisio)                                                        |
| <b>1035</b> | U.S. Patent No. 4,327,248 (Campbell)                                                       |
| <b>1036</b> | U.S. Patent No. 5,518,836 (McCullough)                                                     |
| <b>1037</b> | U.S. Patent No. 4,755,629 (Beggs)                                                          |
| <b>1038</b> | Alcatel Cable Systems Product Catalog (circa 1988-1990)                                    |
| <b>1039</b> | U.S. Patent No. 6,378,283 (Barton)                                                         |
| <b>1040</b> | U.S. Patent No. 6,570,095 (Clark)                                                          |
| <b>1041</b> | Declaration of Sylvia D. Hall-Ellis, PhD. re. EX-1016, EX-1017, EX-1018 and EX-1028        |

**CERTIFICATION UNDER 37 CFR § 42.24(d)**

Under the provisions of 37 CFR § 42.24(d), the undersigned hereby certifies that the word count for the foregoing Petition for *Inter Partes* Review totals 13,518 words per Microsoft Word's word count tool, which complies with requirement of 14,000 words allowed under 37 CFR § 42.24(a)(i).

Dated: June 13, 2023

By: /Timothy A. Lindquist/  
Timothy A. Lindquist, Reg. No. 40,701  
Dennis C. Bremer, Reg. No. 40,528  
Capella Tower, Suite 4200  
225 South Sixth Street  
Minneapolis, MN 55402  
tlindquist@carlsoncaspers.com  
dbremer@carlsoncaspers.com  
Phone: 612.436.9600  
Fax: 612.436.9605

## CERTIFICATE OF SERVICE

Pursuant to 37 CFR §§ 42.6(e)(4)(i) *et seq.* and 42.105(b), the undersigned certifies that on June 13, 2023 a complete and entire copy of this PETITION FOR INTER PARTES REVIEW OF UNITED STATES PATENT NO. 10,832,833 PURSUANT TO 35 U.S.C. §§ 311–319, 37 C.F.R. § 42 and all supporting exhibits were provided by Federal Express, to the Patent Owner by serving the correspondence address of record as follows:

Belden Inc.  
C/O Courtenay Brinckerhoff  
Foley & Lardner LLP  
3000 K Street NW, Suite 600  
Washington, DC 20007-5109

Dated: June 13, 2023

By: /Timothy A. Lindquist/  
Timothy A. Lindquist, Reg. No. 40,701  
Dennis C. Bremer, Reg. No. 40,528  
Capella Tower, Suite 4200  
225 South Sixth Street  
Minneapolis, MN 55402  
tlindquist@carlsoncaspers.com  
dbremer@carlsoncaspers.com  
Phone: 612.436.9600  
Fax: 612.436.9605