

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

COMMSCOPE TECHNOLOGIES LLC,
Petitioner,

v.

BELDEN INC.,
Patent Owner.

Case No. IPR2023-01056
Patent 9,991,030 B2

**DECLARATION OF DR. CHARLES A. ELDERING IN SUPPORT OF
PATENT OWNER PRELIMINARY RESPONSE**

CommScope v. Belden
IPR2023-01056

Belden EX-2001

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I. INTRODUCTION

1. I, Dr. Charles A. Eldering, submit this declaration to state my opinions on the matters described below.

2. I have been retained on behalf of Patent Owner, Belden Inc. (“Belden”), as an independent expert for the above-identified *inter partes review* (“IPR”) proceeding involving Patent 9,991,030 B2 (“’030 Patent”).

3. Petitioner, CommScope Technologies LLC (“CommScope”), challenges claims 1-3, 9-14, 16-18 (the “Challenged Claims”) of the ’030 Patent.

4. I have been asked to, and have, reviewed the Expert Declaration of Kenneth Cornelison (“Cornelison” or “Mr. Cornelison”) in which Cornelison has asserted and offered opinions that all of the Challenged Claims are anticipated and/or obvious in view of four primary references (U.S. Patent Publication No. 2013/0248240 (Glew) (EX-1008), U.S. Patent No. 3,622,683 (“Roberts”) (EX-1009), U.S. Patent No. 9,363,935 (“Cook”) (EX-1010), and U.S. Patent Pub. No. 2006/0169478 (Clark-478) (EX-1025)) and three secondary references (U.S. Patent No. 3,911,200 (“Simons”) (EX-1012), U.S. Patent No. 3,233,036 (“Jachimowicz-036”) (EX-1013), and U.S. Patent No. 3,894,172 (“Jachimowicz-172”) (EX-1014)) (collectively, the “Petitioner Prior Art”).

5. Petitioner sets forth eleven different grounds, including three anticipation grounds and eight obviousness grounds.

6. The anticipation grounds are as follows:
 - a. Ground 1 – Claims 1-3, 9-14, 16-18 are anticipated by Cook
 - b. Ground 3 – Claims 1-3, 9-14, 16-18 are anticipated by Glew
 - c. Ground 5 – Claims 1-3, 9-11, 13, 16-18 are anticipated by Roberts
7. The obviousness grounds are as follows:
 - a. Ground 2 – Claim 11 is obvious in view of Cook and Glew and/or the knowledge of a POSITA
 - b. Ground 4 – Claims 1-3, 9-14, 16-18 are obvious in view of Glew and Cook and/or the knowledge of a POSITA
 - c. Ground 6 – Claims 1-3, 9-11, 13, 16-18 are obvious in view of Roberts and Jachimowicz-172 and/or the knowledge of a POSITA
 - d. Ground 7 – Claims 1-3, 9-11, 13, 16-18 are obvious in view of Roberts, Jachimowicz-036 and/or the knowledge of a POSITA
 - e. Ground 8 – Claim 11 is obvious in view of Any of Grounds 5-7 and Glew and/or the knowledge of a POSITA
 - f. Ground 9 – Claims 12 and 16 are obvious in view of Any of Grounds 5-8 and Simons and/or the knowledge of a POSITA
 - g. Ground 10 – Claims 1-3, 9-14, 16-18 are obvious in view of

Clark-478 and Roberts, Glew and/or the knowledge of a POSITA

h. Ground 11 – Claims 3 and 9 are obvious in view of any of
Grounds 3-7 in view of one or more of Cook and/or the
knowledge of a POSITA

8. I have been asked by Belden to prepare this Declaration setting forth my comments and opinions on whether the Challenged Claims would have been anticipated and/or obvious to a person of ordinary skill in the art at the time of the invention of the '030 Patent (2013) in light of the Petitioner Prior Art.

9. For the reasons that follow, I respectfully disagree with Mr. Cornelison. Instead, it is my opinion that the proposed grounds do not render any of the Challenged Claims anticipated or obvious. This Declaration sets forth my opinions and the bases, reasons, and evidence relied upon in forming those opinions.

10. Although I am being compensated at a rate of \$475 per hour and reimbursed for reasonable out-of-pocket expenses, no part of my compensation depends on the outcome of these proceedings, and I have no other interest in these proceedings.

II. QUALIFICATIONS AND BACKGROUND

11. I believe that I am well qualified to serve as a technical expert in this matter based upon my educational and work experience.

12. I have degrees in both physics and electrical engineering, as well as

extensive experience in the telecommunications industry.

13. I gained significant experience in the telecommunications industry as a systems engineer during my time with Alcatel in the 1990-1993 timeframe. During this time, I worked on the development of a Passive Optical Network (PON) telecommunications systems that delivered voice services to buildings over a fiber optic connection with the final connection to the subscriber being over twisted wire pair wiring. I was also involved in research regarding the use of Digital Subscriber Line (DSL) technology to deliver high-speed digital data services from the central office or a remote access point to the subscriber over twisted wire pair cable.

14. My later experience in the cable industry was gained during my time at General Instrument Corporation from 1993–1995. General Instrument was a significant supplier of equipment to the Multiple System Operators (“MSO’s”). My work at General Instrument included development of products to put voice services over Hybrid Fiber Coaxial (HFC) networks including using the use of twisted wire pair cable for distribution of voice signals and in particular Plain Old Telephone Service (POTS) within the residence. I also developed detailed cost-performance analyses of traditional twisted wire pair, HFC, and Fiber to the Curb/Home (FTTC/FTTH) architectures for the delivery of residential voice, video, and data services.

15. Subsequent to my employment in the telecommunications industry and

through my company, Technology, Patents, and Licensing, Inc. I gained further experience regarding the use of twisted wire pair cabling for transmission of high-speed digital signals using formats including but not limited to Asymmetric Digital Subscriber Line (ADSL) and Very High Bitrate Digital Subscriber Line (VDSL). This work included evaluation of crosstalk in these systems and optimization of the modulation format to increase the capacity of the system.

16. A copy of curriculum vitae is attached to this declaration as Appendix A.

III. MATERIALS CONSIDERED

17. I have been asked to provide my opinions regarding whether the Challenged Claims of the '030 Patent would have been anticipated by and/or obvious to a person having ordinary skill in the art at the time of the alleged invention, in light of the Petitioner Prior Art. It is my opinion that the Challenged Claims would not have been anticipated or obvious to a person having ordinary skill in the art at the earliest claimed priority date of the '030 Patent. (2013).

18. In forming my opinions expressed below, in addition to my own knowledge and experience based upon my work in the field of cable technology as described below, I have considered the documents provided to me by Belden's counsel ("counsel"):

EXHIBIT	DESCRIPTION
EX-1001	U.S. Patent No. 9,991,030 ("'030 Patent")

EXHIBIT	DESCRIPTION
EX-1002	Office Action dated 06/28/2019
EX-1003	Amendment and Response to Non-Final Office Action dated 10/3/2017
EX-1004	-
EX-1005	Scheduling Order, C.A. No. 22-783-RGA (D. Del.)
EX-1006	Expert Declaration of Kenneth Cornelison
EX-1007	<i>Curriculum Vitae</i> of Kenneth Cornelison
EX-1008	U.S. Patent Publication No. 2013/0248240 (“Glew”)
EX-1009	U.S. Patent No. 3,622,683 (“Roberts”)
EX-1010	U.S. Patent No. 9,363,935 (“Cook”)
EX-1011	U.S. Patent No. 7,335,837 (“Pfeiler”)
EX-1012	U.S. Patent No. 3,911,200 (“Simons”)
EX-1013	U.S. Patent No. 3,233,036 (“Jachimowicz-036”)
EX-1014	U.S. Patent No. 3,894,172 (“Jachimowicz-172”)
EX-1015	U.S. Patent No. 4,428,787 (“Pan”)
EX-1016	<i>Electronic Wire & Cable - A User's Guide: Performance and Selection</i> , Section 5: Multiconductor Cables, AT&T (1987)
EX-1017	Whitham D. Reeve, <i>Subscriber Loop Signaling and Transmission Handbook – Digital</i> , IEEE Telecommunications Handbook Series (1995)
EX-1018	Whitham D. Reeve, <i>Subscriber Loop Signaling and Transmission Handbook – Analog</i> , IEEE Telecommunications Handbook Series (1992)
EX-1019	U.S. Patent No. 5,380,591 (“Keogh”)
EX-1020	U.S. Patent No. 1,727,972 (“Ford”)
EX-1021	U.S. Patent No. 1,956,730 (“Reichelt”)
EX-1022	U.S. Patent No. 3,803,340 (“Jachimowicz-340”)
EX-1023	Canadian Patent Application No. 2,058,046 (“Tessier”)
EX-1024	U.S. Patent No. 4,262,164 (“Nutt”)
EX-1025	U.S. Patent Pub. No. 2006/0169478 (“Clark-478”)
EX-1026	U.S. Patent Publication No. 2010/0206609 (“’609 Publication”)
EX-1027	U.S. Patent No. 5,670,748 (“Gingue”)
EX-1028	G.F. Moore, <i>Electric Cable Handbook</i> , BICC Cables (3rd. Ed. 1997)
EX-1029	The New IEEE Standard Dictionary of Electrical and Electronics Terms (5th ed. 1993)
EX-1030	Neil Sclater and John Markus, <i>Electronics Dictionary</i> , McGraw-Hill (6th Ed. 1997)

EXHIBIT	DESCRIPTION
EX-1031	Draka – B03: Rodent protection (2009-01-19)
EX-1032	U.S. Patent No. 5,427,643 (“Aitken”)
EX-1033	U.S. Patent No. 4,213,280 (“Sandborn”)
EX-1034	U.S. Patent No. 4,439,632 (“Aloisio”)
EX-1035	U.S. Patent No. 4,327,248 (“Campbell”)
EX-1036	U.S. Patent No. 5,518,836 (“McCullough”)
EX-1037	US Patent Publication No. 2011/0147039 (“Smith”)
EX-1038	US Patent No. 7,532,794 (“Cook-794”)
EX-1039	US Patent No. 6,074,503 (“Clark-503”)
EX-1040	U.S. Patent No. 4,755,629 (“Beggs”)
EX-1041	Alcatel Cable Systems Product Catalog (circa 1988-1990)
EX-1042	U.S. Patent No. 6,378,283 (“Barton”)
EX-1043	U.S. Patent No. 6,570,095 (“Clark”)
EX-1044	U.S. Patent No. 6,365,836 (“Blouin”)
EX-1045	Declaration of Sylvia D. Hall-Ellis, PhD. re. EX-1016, EX-1017, EX-1018 and EX-1028
EX-2001	Declaration of Dr. Charles A. Eldering in Support of Patent Owner Preliminary Response (“Eldering”)
EX-2002	August 29, 2016 Amendment (U.S. Application No. 14/520,125)
EX-2003	March 7, 2017 Amendment (U.S. Application No. 14/520,125)
EX-2004	March 27, 2017 NOA (U.S. Application No. 14/520,125)
EX-2005	May 31, 2017 Original Claims (Application No. 15/610,504)
EX-2006	U.S. Patent No. 8,450,606 B2 (“McNutt”)
EX-2007	U.S. Patent Application Publication No. 2016/0037691 (“Kroushl”)
EX-2008	NEPTCO – NEPTAPE® Data Sheet – NEPTAPE Foil Free Edge Shielding Tapes: General Information (8/2000)
EX-2009	NEPTCO – NEPTAPE® Data Sheet – Foil Free Edge Shielding Tapes - NEPTAPE® F1141 (8/2000)

IV. RELEVANT LEGAL STANDARDS

19. In preparing this declaration and forming my opinions, I am relying on certain legal principles that counsel explained to me.

20. I have reviewed Mr. Cornelison’s summaries of the Relevant Legal Principles with respect to claim construction, anticipation, and obviousness. I do not disagree with those summaries.

A. LEVEL OF ORDINARY SKILL IN THE ART

21. I understand that a person of ordinary skill in the art is determined by considering (1) the type of problems encountered in the art, (2) prior art solutions to those problems, (3) the rapidity with which innovations are made, (4) the sophistication of the technology, and (5) the educational level of active workers in the field.

22. I understand that I must evaluate the ’030 Patent and the Petitioner Prior Art from the perspective of a person of ordinary skill in the art. That is, the ’030 Patent and the Petitioner Prior Art must be evaluated through the eyes of a person with ordinary skill in the relevant art at the time of the invention of this patent (“POSITA”).

23. I understand that the earliest application to which the ’030 Patent claims

priority was a provisional application (No. 61/894,728) filed on October 23, 2013.

I have been asked to assume that the invention date of the Challenged Claims is October 23, 2013 (*i.e.*, the time of the invention).

24. It is my opinion that the ‘030 patent relates to telecommunications in general and telecommunications cables in particular. As stated in the “Field of Invention” portion of the specification of the ‘030 patent, “the invention relates to a filler for controlled placement of pairs of conductors within a data cable and controlled application angle of an electromagnetic interference (EMI) reducing tape.” ‘030 patent 1:17-21.

25. My opinions in this Declaration are based on the perspective of a person of ordinary skill in the art in the 2013 timeframe. This is true even if the testimony is stated in the present tense.

26. Based on the field of the invention and technological aspects, it is my opinion that a person of ordinary skill in the art of the ‘030 patent would have had at least a bachelor’s degree in electrical engineering and a minimum of 3-4 years of industry experience in the telecommunications industry. I do not agree with Mr. Cornelison that a POSITA would have to had direct industrial experience in the designing, manufacturing, and testing of twisted-pair data cables, as general experience in the field of telecommunications would include exposure to issues such as crosstalk, balanced and unbalanced transmission in transmission media including

twisted wire pairs.

27. Based on my educational background and experience in the telecommunications field, and more specifically with telecommunications cables, I am qualified as at least a POSITA with respect to the '030 Patent. Thus, I am familiar with the knowledge of the POSITA. I am able to opine on how POSITA would have understood the disclosure and claims of the '030 Patent, the disclosures of the Petitioner Prior Art and other patents, the motivation to combine the prior art, and what combinations would have been obvious and not have been obvious to a POSITA.

28. Although my definition of a POSITA differs slightly from that offered by Mr. Cornelison, adoption of his definition would not change any of the analysis or opinions offered herein.

V. THE '030 PATENT

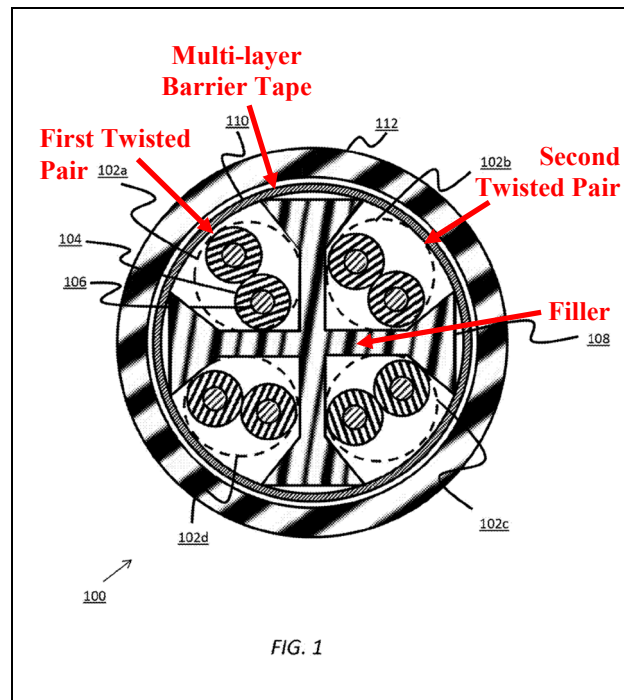
29. The '030 Patent addresses the problem of “crosstalk” between adjacent twisted pairs of conductors. As described in the '030 Patent, “internal” crosstalk occurs within a cable when “signal flow in a first twisted pair of conductors in a multi-pair cable generates an electromagnetic field that is received by a second twisted pair of conductors in the cable and converted back to an electrical signal.” '030 Patent 1:39-44.

30. As also described in the '030 Patent, “alien crosstalk is electromagnetic

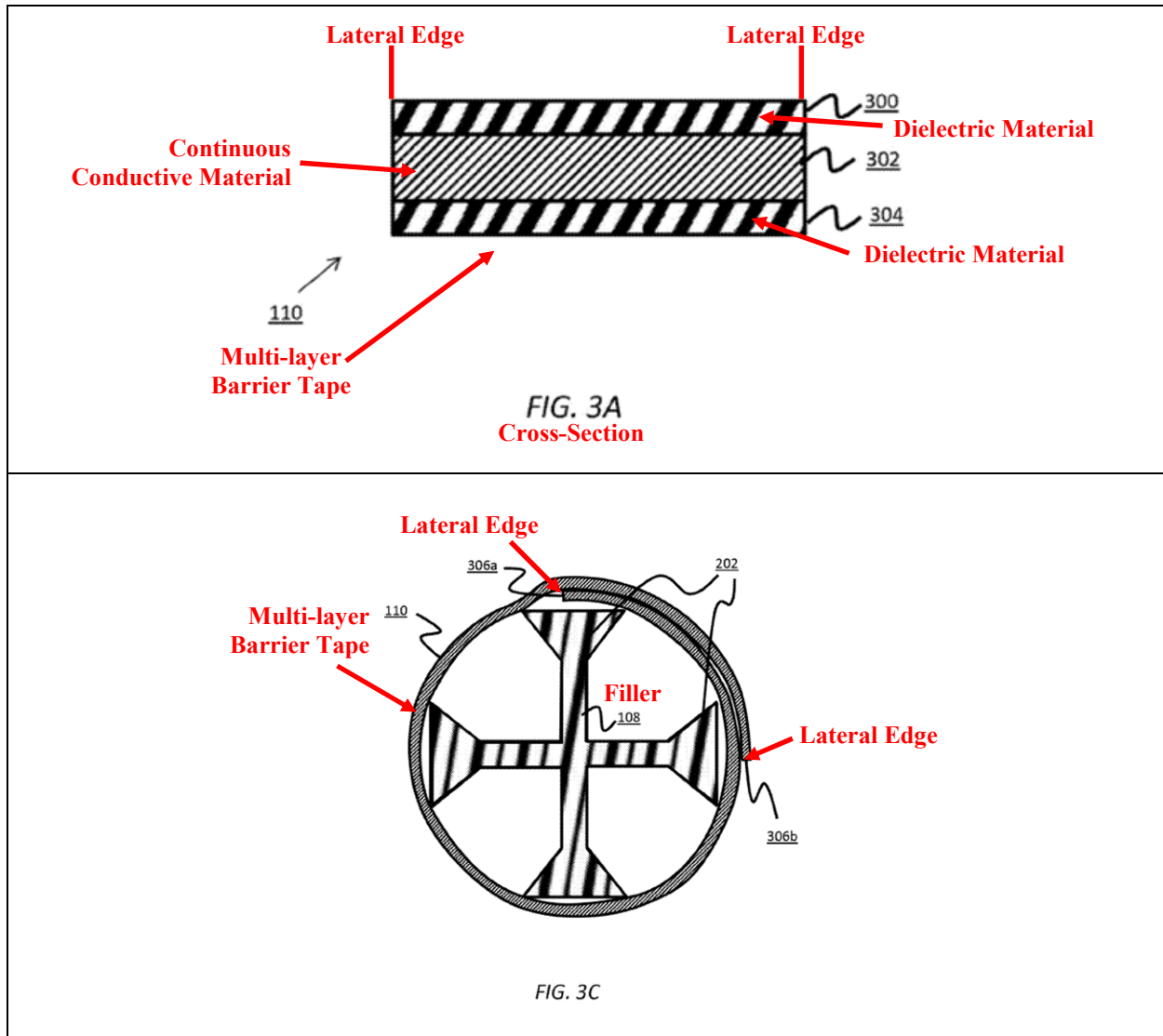
interference between adjacent cables” “with discrete signals [] in close proximity and parallel for long distances.” ’030 Patent 1:44-50.

31. The ’030 Patent provides a solution to reducing alien crosstalk between adjacent cables using a “barrier tape around helically arranged twisted pairs of conductors” and a “filler included within the cable to separate the twisted pairs and provide a support base for the barrier tape.” ’030 Patent 2:22-33.

32. Independent claims 1 and 18 of the ’030 Patent each require: (i) a first twisted pair of insulated conductors (102a); (ii) a second twisted pair of insulated conductors (102b); (iii) a filler (108) separating the first twisted pair of insulated conductors from the second twisted pair of insulated conductors; and (iii) a multi-layer conductive barrier tape (110). ’030 Patent 4:48-61, 6:20-24, 7:32-34, 7:55-57, 11:26-39, 12:28-40, FIGS. 1, 3A-3E.



33. The claimed barrier tape (110) includes a continuous conductive material (302) contained between two layers of a dielectric material (300, 304), where the conductive material extends to each lateral edge (306a, 306b) of the two layers of the dielectric material. The barrier tape also surrounds the first and second twisted pair of insulated conductors and the filler. '030 Patent 6:3-10, 7:34-54, 7:64-8:5, 11:26-39, 12:28-40, FIGS. 1, 3A (cross section)-3E.



VI. THE CHALLENGED CLAIMS ARE NOT ANTICIPATED.

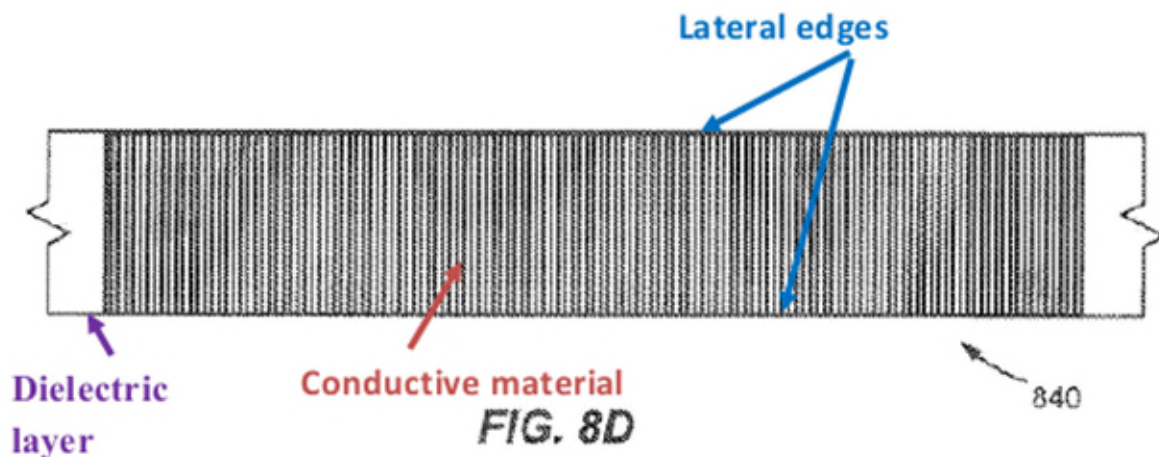
A. COOK DOES NOT ANTICIPATE ANY OF THE CHALLENGED CLAIMS. (GROUND 1)

34. In his Declaration, Cornelison alleged that Cook (EX-1010) anticipates all of the Challenged Claims. EX-1006 ¶¶79-120. I disagree.

35. Independent claims 1 and 18 of the '030 Patent require that the conductive material extend to each lateral edge of the two layers of the dielectric

material. To try to find this claim limitation in Cook, Cornelison relied upon two different embodiments in Cook (*i.e.*, shown in FIGS. 8D and 11). Cornelison ¶¶84-87. But neither of these embodiments disclose a conductive barrier tape comprising a conductive material contained between two layers of a dielectric material, as also required by independent claims 1 and 18.

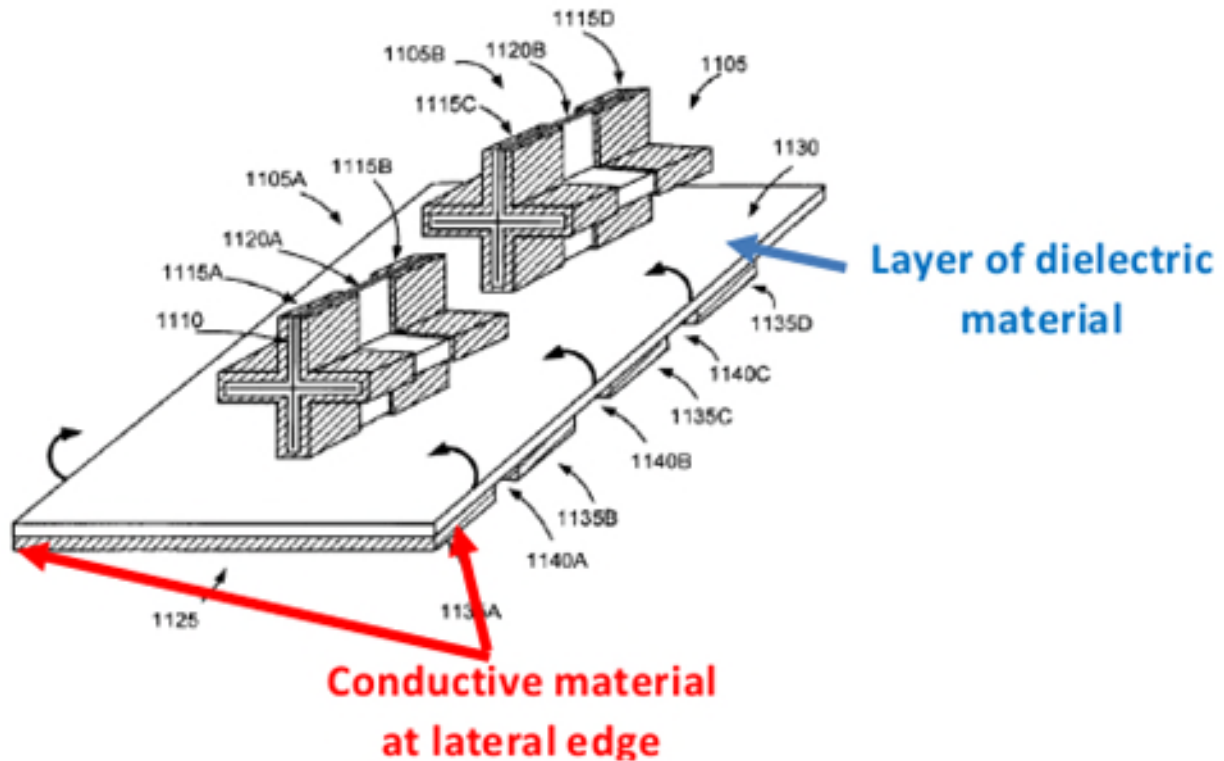
36. Petitioner (Pet. 20) provided the following annotated illustration of the separator or shield layer 840 shown in FIG. 8D of Cook, which is described in Cook as being “a top level (or bottom level) view.” Cook 23:58-64.



37. As shown in FIG. 8D, a POSITA would understand that Cook teaches that the conductive material in the embodiments illustrated in FIGS. 8A-8D is formed on a single dielectric layer. Cook 22:62-23:5.

38. Since the conductive material is visible on the surface of the single layer of dielectric material in the top level (or bottom) level view of FIG. 8D, the conductive material is not contained between two layers of a dielectric material.

39. Cornelison (EX-1006 ¶85) also provided the following annotated illustration of the separator or shield layer 1125 shown in FIG. 11. Cook 25:39-63.



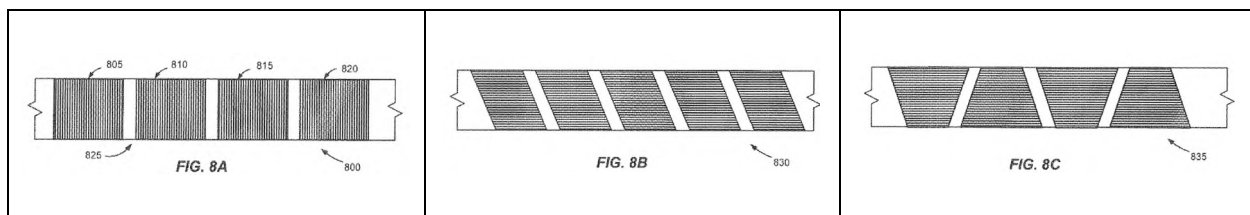
40. As shown in FIG. 11, a POSITA would understand that Cook teaches that the conductive patches 1135A-D of the shield layer 1125 are formed on a single substrate (dielectric) layer 1130. Cook 25:51-57.

41. Since the conductive patches 1135A are visible on the surface of the single substrate layer 1130 of dielectric material in the illustration of FIG. 11, the conductive material is not contained between two layers of a dielectric material.

42. Independent claim 1 of the '030 Patent also requires that the conductive material contained between two layers of a dielectric material be continuous. To try

to find this claim limitation in Cook, Cornelison relied upon various embodiments in Cook (*i.e.*, shown in FIGS. 7B & 8A-8D). Cornelison ¶¶82, 87. But none of those embodiments disclose a continuous conductive material contained between two layers of a dielectric material, as also required by independent claim 1.

43. Cornelison cited to the text of Cook at column 6, line 50, to column 7, line 20. EX-1006 ¶82 (citing Cook 6:50-7:20). But that text only refers to “a relatively continuous shield” (*i.e.*, not continuous) or “a discontinuous shield,” as shown in FIGS. 8A-8C. Cook 6:52-7:9.



44. As shown above, a POSITA would understand that Cook discloses that the “discontinuous” conductive material in those shield layers is formed on a single dielectric material layer (Cook 22:62-23:5) and is not contained between two layers of a dielectric material.

45. This section of Cook (Cook 6:50-7:20) incorporates by reference another patent application (Application No. 12/653,804 that issued as U.S. Patent No. 8,450,606 B2 (“McNutt”) (EX-2006)) with a common inventor to Cook (Christopher W. McNutt). McNutt teaches away from using a continuous shield.

46. McNutt teaches that “complications can arise when a cable is encased

by a shield that is electrically continuous between the two ends of the cable.”

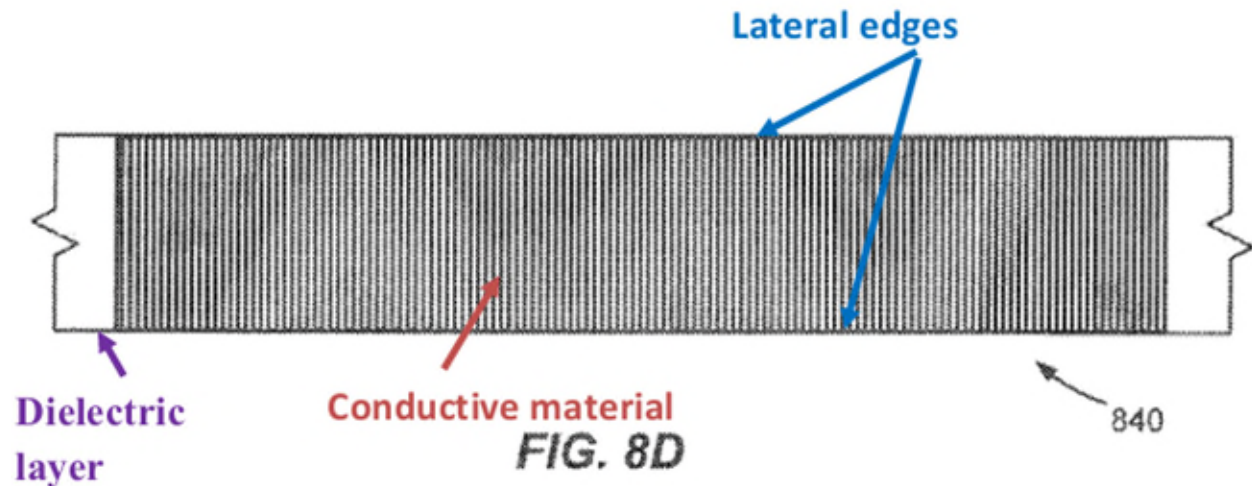
McNutt 1:63-2:4. One of the complications is that “[i]f a person contacts the shielding, the person may receive a shock if the shielding is not properly grounded.”

McNutt 2:5-15. Another complication is that “a continuous shield can also set up standing waves of electromagnetic energy based on signals received from nearby energy sources.” McNutt 2:16-21.

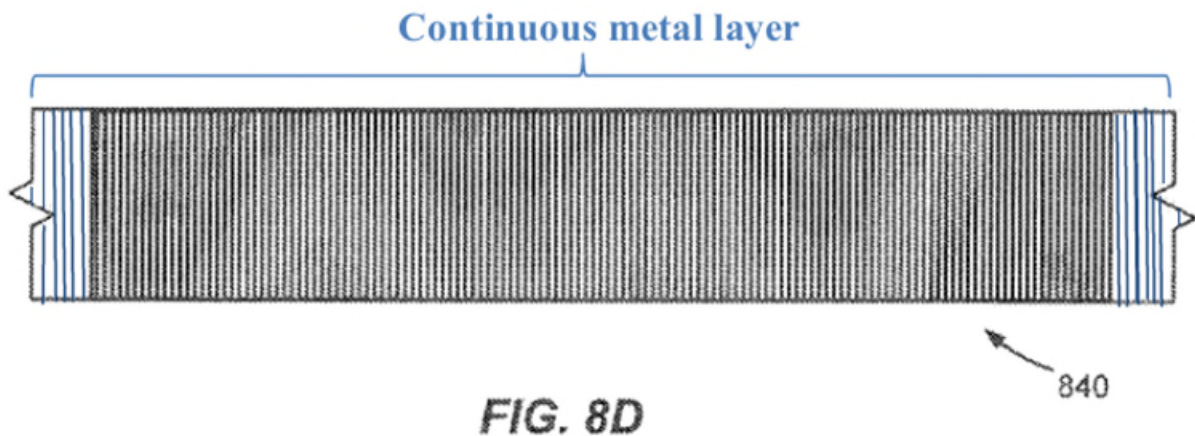
47. To avoid these problems with a continuous shield, McNutt provides a tape that “can be a shield that is electrically discontinuous or exhibits a high level of resistance between opposite ends of a cable.” McNutt 2:39-60, 4:20-36 (“The present invention supports shielding a communication cable, wherein at least one break or discontinuity in a shielding material electrically isolates shielding at one end of the cable from shielding at the other end of the cable.”).

48. Cornelison also cited to the text of Cook at column 11, line 64 to column 12, line 5. EX-1006 ¶82. But that text also only refers to “a relatively continuous shield.”

49. Cook describes the conductive material of the shield layer 840, which is shown in FIG. 8D and annotated by Petitioner (Pet. 20, 22), as being “relatively continuous” with a dielectric end. Cook 23:58-67.

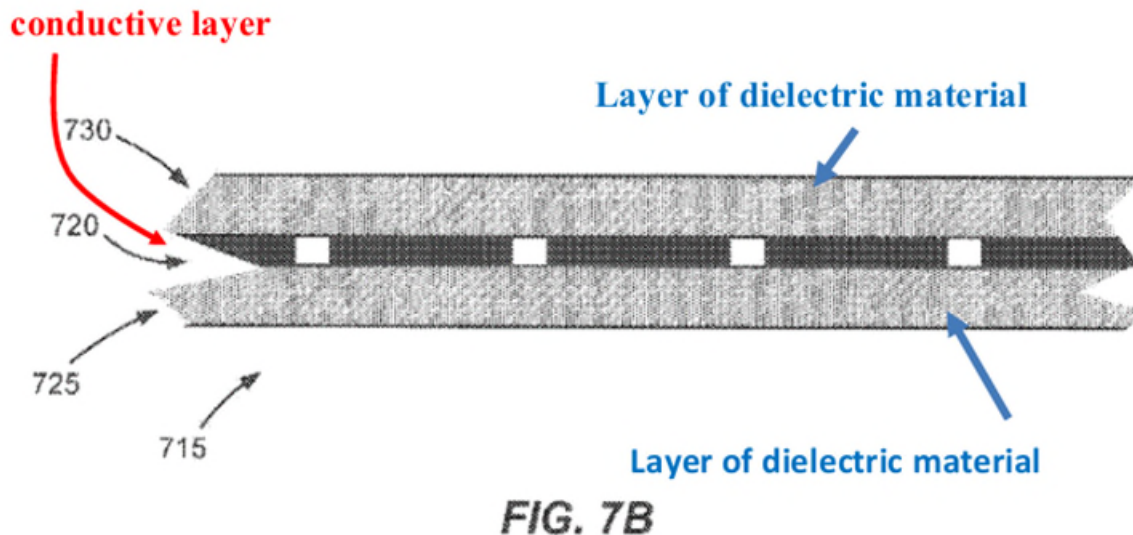


50. Admitting that the metal shield layer 840 was not continuous, Cornelison proposed to modify the shield layer 840 in FIG. 8D to try to provide continuous conductive material. EX-1006 ¶87.



51. As shown in FIG. 8D, a POSITA would understand that Cook teaches that the “relatively” continuous conductive material is formed on a single layer of dielectric material (Cook 22:62-23:5) and is not contained between two layers of a dielectric material.

52. Cornelison also relied upon the shield layer disclosed in FIG. 7B of Cook. EX-1006 ¶82. But Cornelison admitted Cook discloses “a discontinuous ‘electrically conductive layer 720’,” as shown in the figure below annotated by Cornelison. EX-1006 ¶82 (citing Cook 22:39-41, FIG. 7B).



53. Since Cook does not disclose any shield layer (or barrier tape) with conductive material contained between two layers of a dielectric material and extending to each lateral edge of the two layers of the dielectric material, Cook cannot anticipate independent claims 1 and 18 or any of the dependent claims.

54. Since Cook does not disclose any shield layer (or barrier tape) with continuous conductive material contained between two layers of a dielectric material, Cook cannot anticipate independent claim 1 or any of the dependent claims for that additional reason.

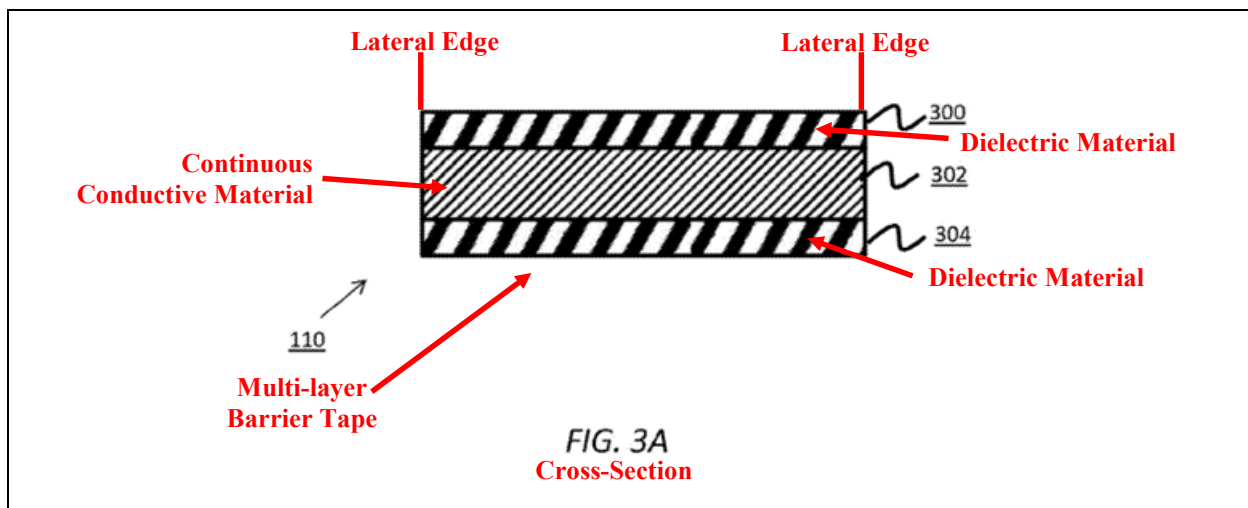
55. For Ground 2, Cornelison also alleged that dependent claim 11, which

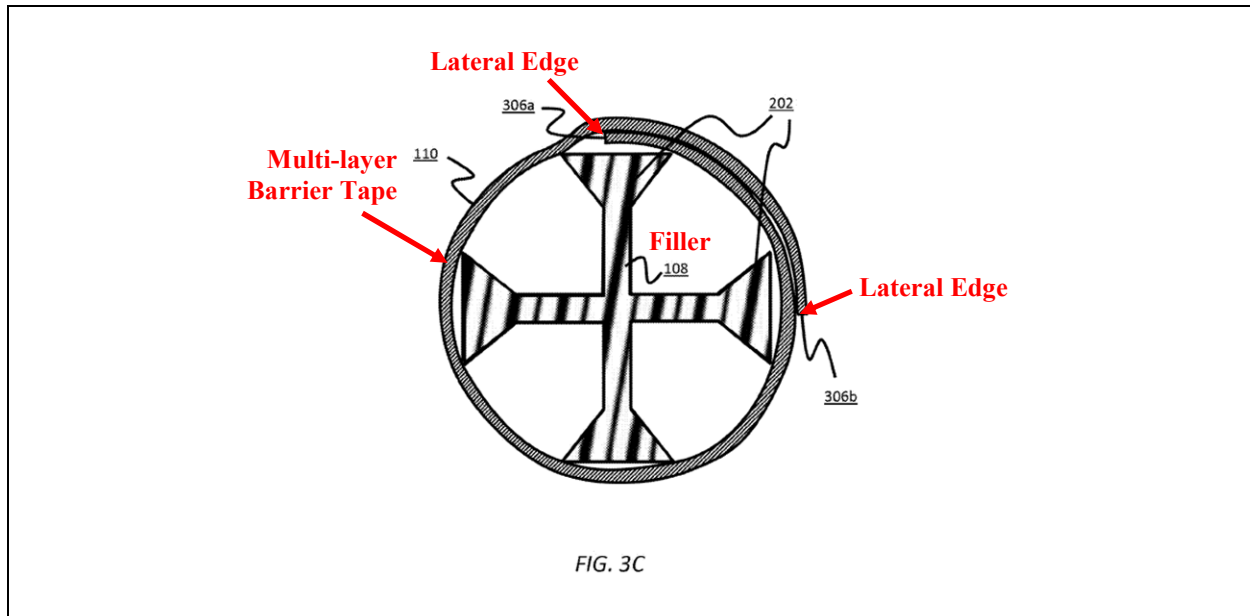
depends from claim 1, is obvious based on the combination of Cook and/or Glew. EX-1006 ¶¶121-128. Since in Ground 2, Cornelison only focused on the additional claim element(s) added in claim 11 and did not even attempt to address Cook's failure to disclose the missing elements of independent claims 1 and 18, Ground 2 does not render obvious dependent claim 11.

B. GLEW DOES NOT ANTICIPATE ANY OF THE CHALLENGED CLAIMS. (GROUND 3)

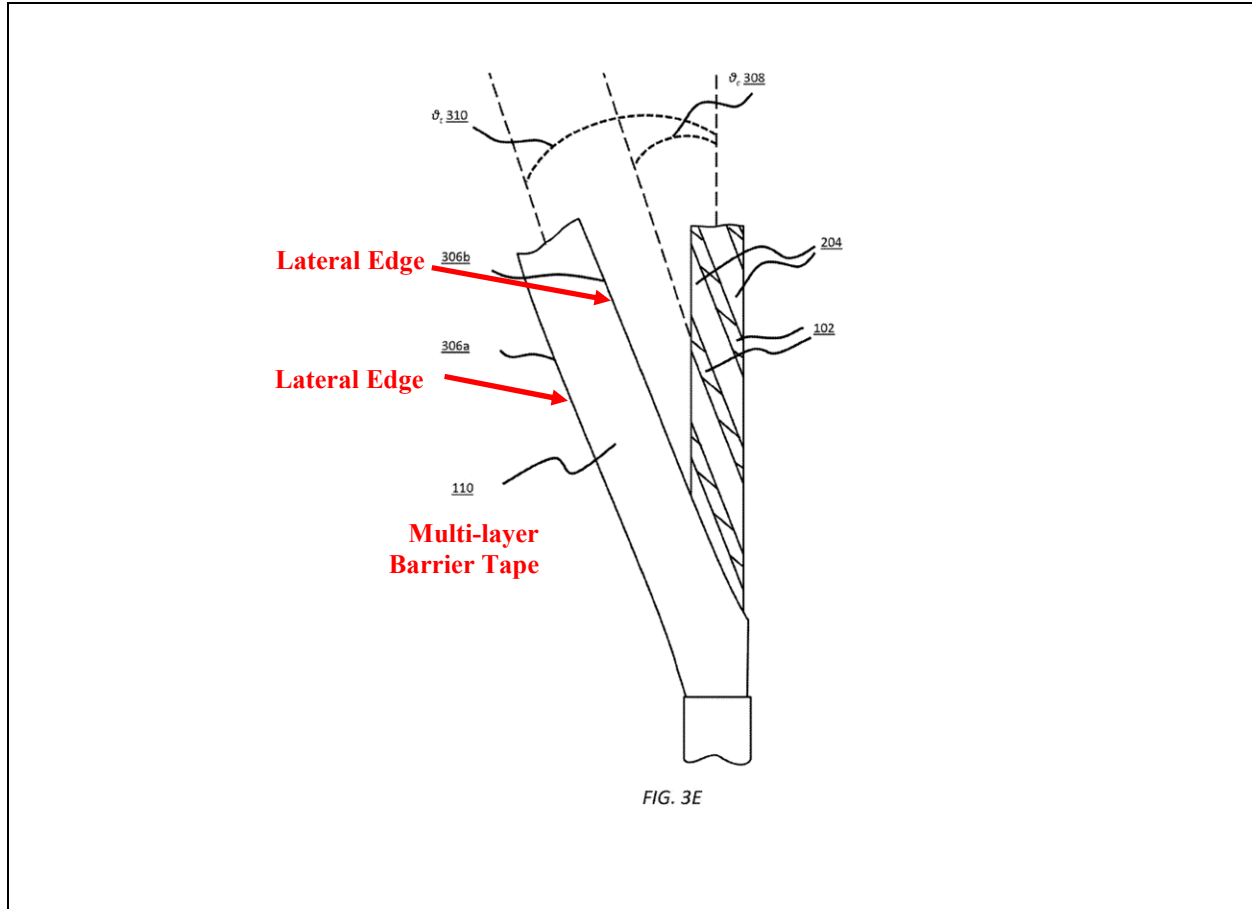
56. In his Declaration, Cornelison alleged that Glew (EX-1008) anticipates all of the Challenged Claims. EX1006 ¶¶129-173. I disagree.

57. Independent claims 1 and 18 of the '030 Patent require a multi-layer barrier tape (110) that comprises a conductive material (302) contained between two layers of a dielectric material (300, 304), where the conductive material extends to each lateral edge (306a, 306b) of the two layers of the dielectric material.





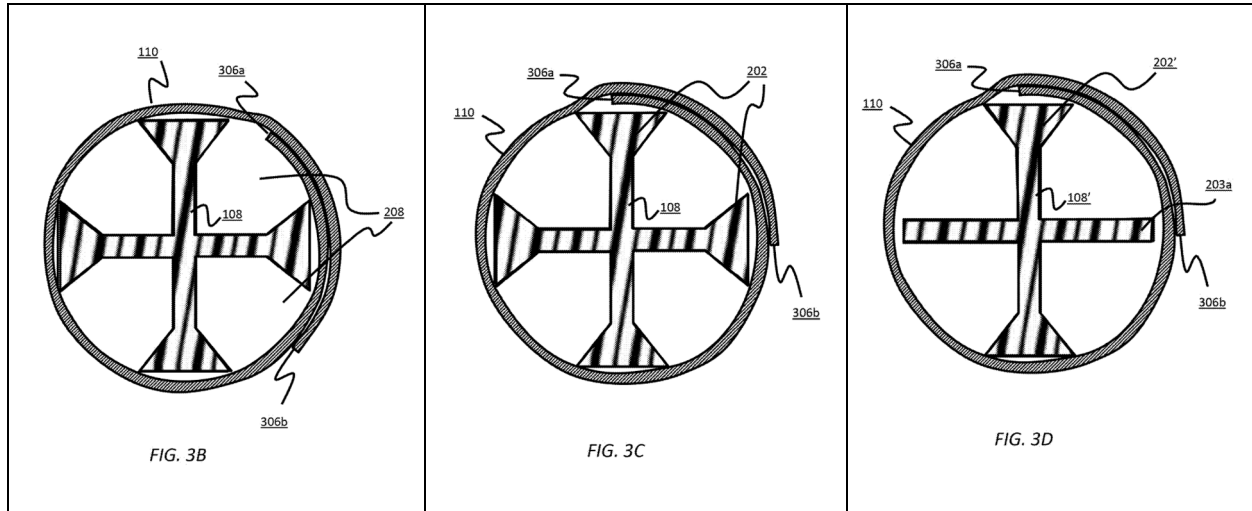
58. The '030 Patent makes it clear that the “lateral edges” of the barrier tape are the conductive edges (306a, 306b) running along the sides of the tape parallel to (or in) the longitudinal direction and exposing the conductive material 302. '030 Patent 7:64-8:3 (“Referring now to FIG. 3B, illustrated is a cross section of an embodiment of a barrier tape 110 around the filler 108 of FIG. 2A. The tape 110 has a first edge 306a and a second edge 306b, referred to generally as edge(s) 306 of the barrier tape 110.”), FIGS. 3B-3E.



59. The '030 Patent states that “the tape edge 306 will continue to follow the end portion 204 of the terminal portion without ever crossing above a channel or pair 102. This prevents electrical coupling of pairs 102 to conductive edges 306 of tape 110, and thus reduces leakage and ANEXT.” '030 Patent 8:38-46, FIG. 3E.

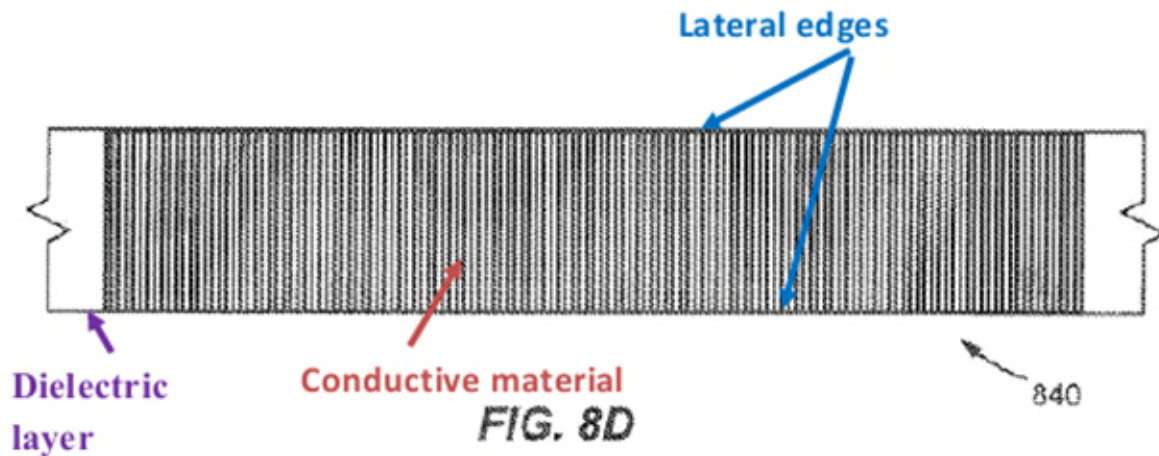
60. Since the conductive material 302 is exposed along the conductive lateral edges 306a, 306b of the barrier tape 110, the patent teaches that these conductive lateral edges should be placed above the terminal portions 202 of the filler 108 (as shown in FIGS. 3C and 3D), and not above the channels 208 holding the twisted pairs (as shown in FIG. 3B), to avoid electrical coupling of the exposed

conductive lateral edges 306a, 306b and the twisted pairs 102. '030 Patent 8:3-25, FIGS. 3B-3D.



61. Two of Petitioner's relied upon prior art references also show that a POSITA would understand that a tape's "lateral edges" are the edges running along the sides of the tape parallel to the longitudinal direction.

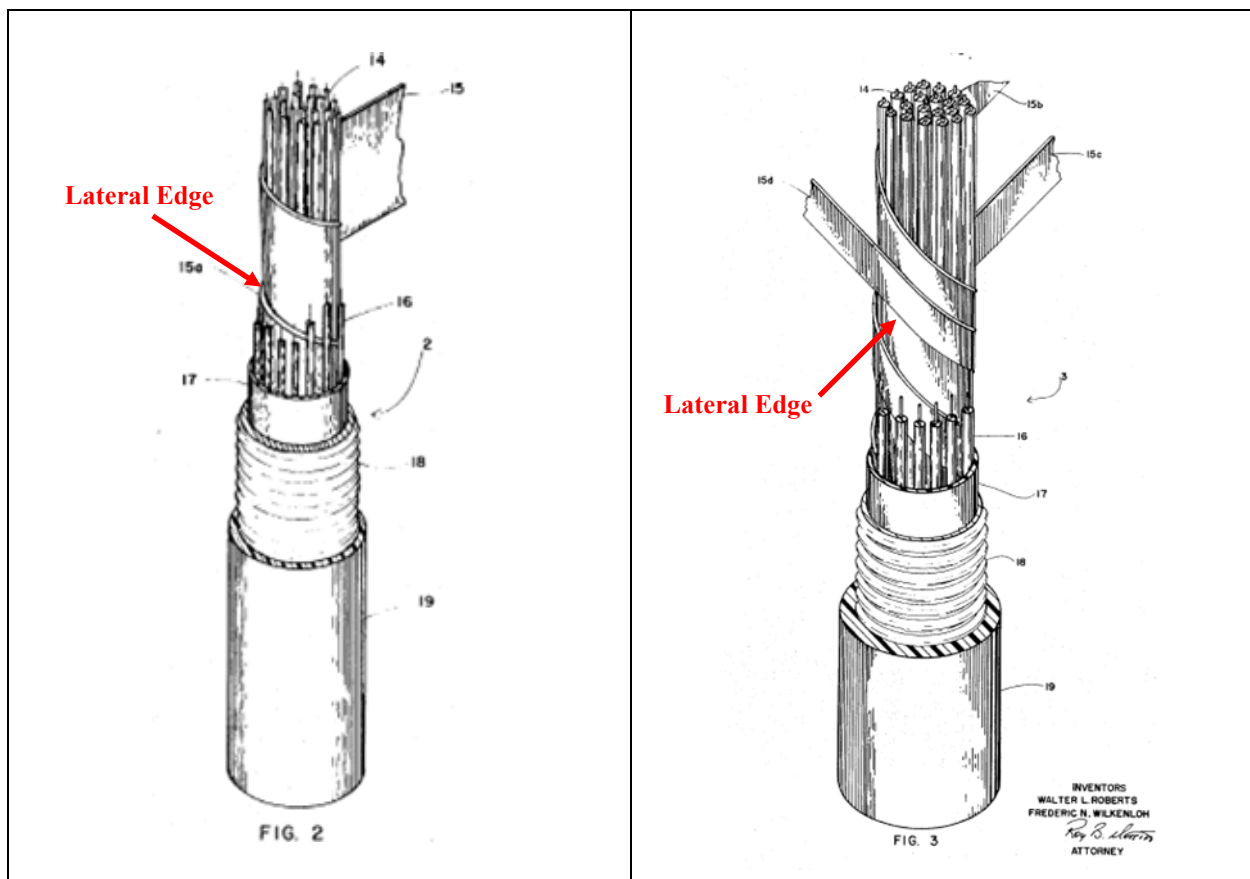
62. In Ground 1, Petitioner provided the following annotated illustration of the shield layer or separator 840 shown in FIG. 8D of Cook (Pet. 20), which describes the "electrically conductive material running along a longitudinal length of the separator." Cook 23:58-67.



63. Those edges running along the side of the tape parallel to the longitudinal direction in Cook, labeled by Petitioner as “lateral edges,” are the same lateral edges 306a, 306b disclosed and claimed in the ’030 Patent.

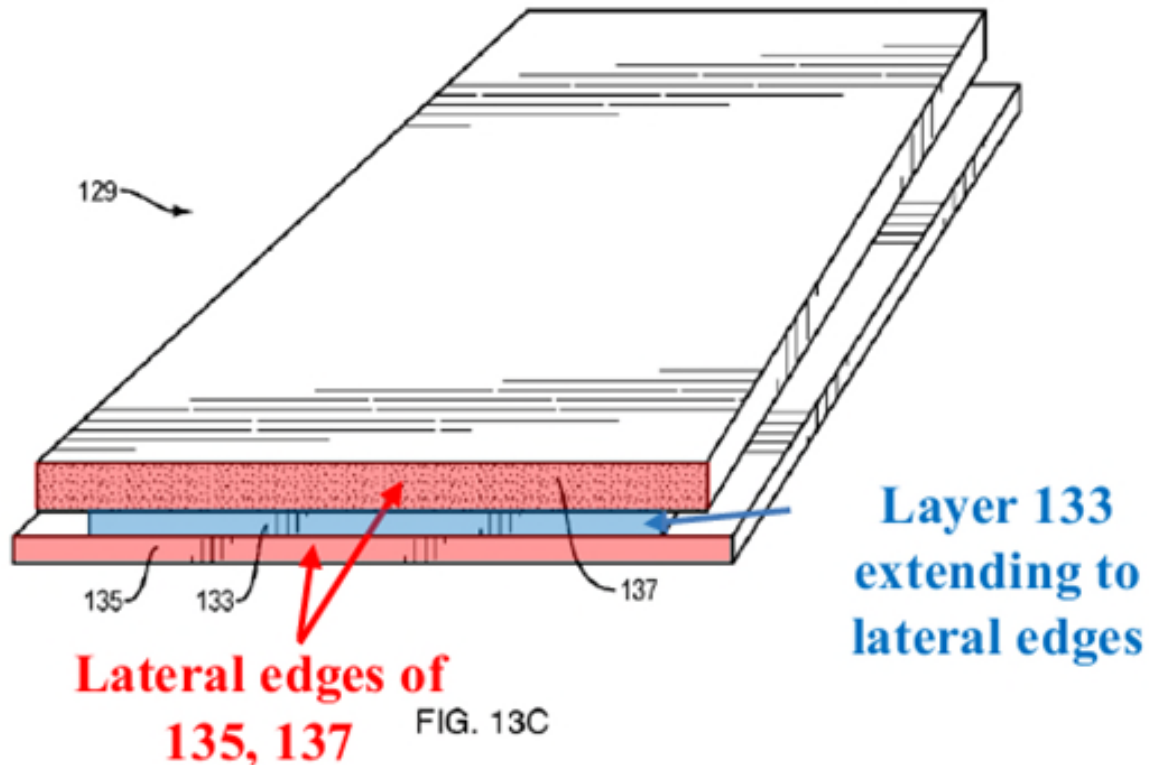
64. Roberts (EX-1009) also shows that POSITA would understand that a tape’s “lateral edges” are the edges running along the sides of the tape parallel to the longitudinal direction. For example, Roberts’ metal foil shield tapes 15 in FIGS. 2 and 3 (a cross-section of which is shown in FIG. 10) have edges running along the sides of the tape parallel to the longitudinal direction (like the conductive lateral edges 306a, 306b of the barrier tape 110 in the ’030 Patent) that are also described as being “lateral edges.” Roberts 2:20-24 (“FIG. 3 ... showing two groups of electrical conductors separated by a shield made from a plurality of tapes helically disposed, the lateral edges of which overlap adjacently lying tapes”), 2:42-46 (“a shield composed of a plurality of tapes made from a metal foil coated on both sides with a plastic, the lateral edges of which overlap adjacently disposed tapes”), 4:27-

33 (“the plastic-coated metal foil shield (15) [FIG. 2] has lateral edges that overlap,” “the lateral edges of the shield overlapping one another. (See [15 a])”), 4:34-40 (“The lateral edges of the helically disposed tapes [of FIG. 3] overlap adjacently lying tapes.”), 5:65-75 (“the shield (15) [of FIG. 10] is made up of a plurality of tapes, the lateral edges of which overlap adjacently disposed like tapes”), FIGS. 2, 3, 10.



65. A POSITA would understand that the claimed “lateral edge[s]” of the barrier tape are the edges running along the sides of the tape parallel to the longitudinal direction.

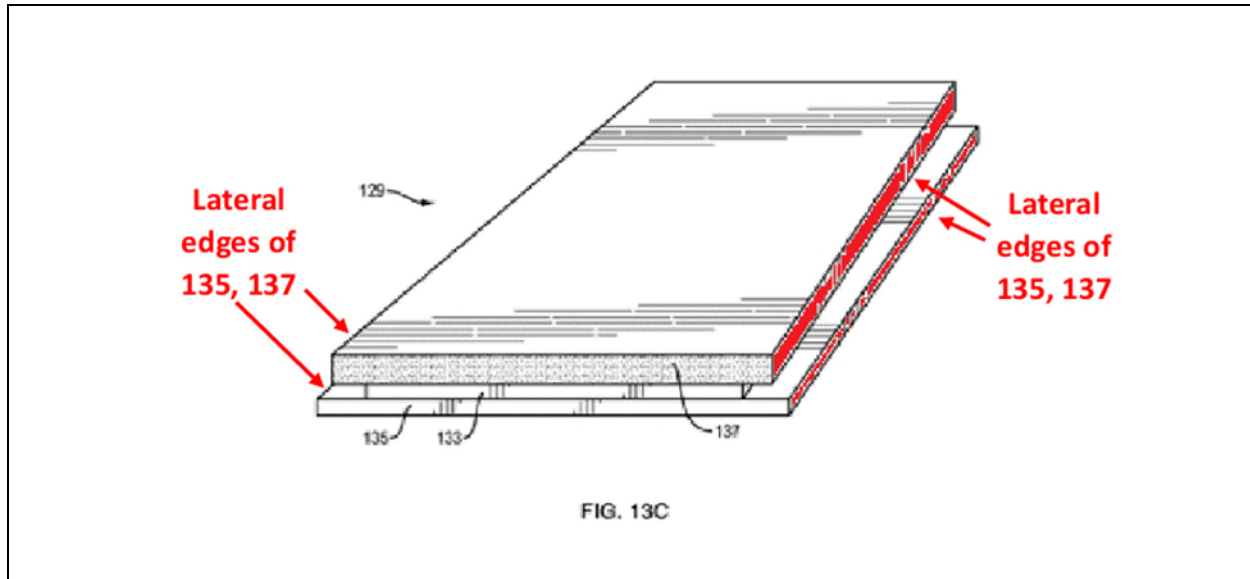
66. Cornelison relied upon FIG. 13C in Glew, as shown below and incorrectly annotated by Cornelison.



Pet. 37.

67. Cornelison argued that “the metallic layer 133 [in Grew] extends to the front edges of dielectric layers 135 and 137, which can be considered “lateral edges” of these two dielectric layers” EX-1006 ¶136. But the “lateral edge[s]” of Glew’s tape 129 are the edges running along the sides of the dielectric layers 135, 137 parallel to the longitudinal direction. The “front edges” of the tape 129 in FIG. 13C identified by Cornelison are not lateral edges, but instead are the ends of the tape or the cross-section prior to the ends of the tape.

68. Cornelison also provided the following annotated figure correctly illustrating how the actual lateral edges in Glew are the edges running along the sides of the tape parallel to the longitudinal direction. EX-1006 ¶174.



69. Applying the proper construction of “lateral edge,” as understood by a POSITA, Glew’s metallic foil layer 133 does not extend to the lateral edges of the dielectric layers 135, 137.

70. Even though Glew’s FIG. 13C shows that the metallic foil layer 133 does not extend to the lateral edges of the dielectric layers 135, 137, Cornelison argued that Glew’s metallic foil layer 133 extends to the lateral edges of the dielectric layers 135, 137 because Glew describes the figures as “schematically” depicting or illustrating the multi-layer tape 129. EX-1006 ¶137 (citing Glew ¶¶[0077-78], [0190], [0195]). Accordingly to Cornelison, the Figure “is intended to

identify and illustrate the three different layers of the multi-layer tape, not to show that these layers must be or are intended to be offset relative to each other when the tape is employed in a cable.” EX-1006 ¶137. I disagree. FIG. 13C shows and a POSITA would understand that Glew’s FIG. 13C shows that the metallic foil layer 133 does not extend to the lateral edges of the dielectric layers 135, 137.

71. Cornelison also stated that a “POSITA would understand that when a three-layer tape, such as shown in FIG. 13C, is manufactured for use in a cable, the three layers would be aligned along the side edges.” EX-1006 ¶138. I disagree.

72. Cornelison alleged that other tapes are “typically” (*i.e.*, not always) manufactured with layers having the same width. In other words, Cornelison admitted that some tapes are actually made with layers having different widths, as shown in FIG. 13C. According to Cornelison, tapes where each layer had a different width, as shown in every tape in FIGS. 13A-13D, would involve “custom-making” the tapes. EX-1006 ¶138.

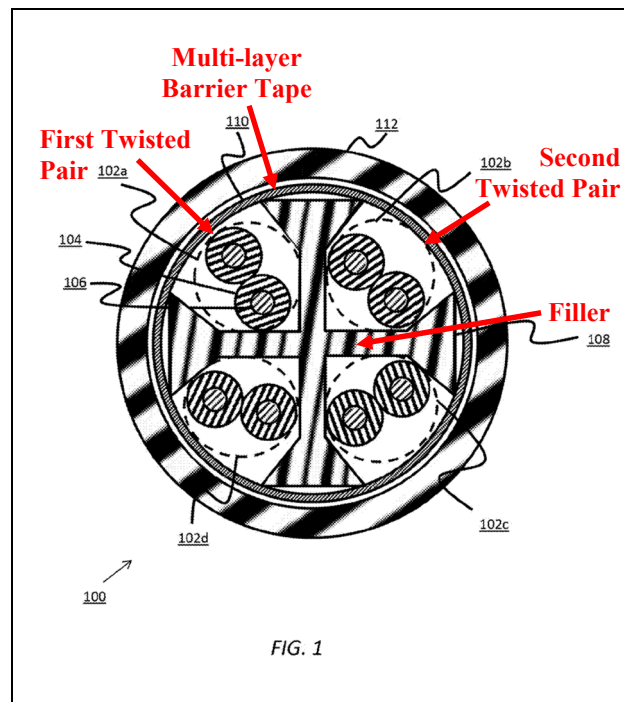
73. Since Glew does not disclose a barrier tape with conductive material extending to each lateral edge of the two layers of the dielectric material, it cannot anticipate independent claims 1 and 18 or any of the dependent claims.

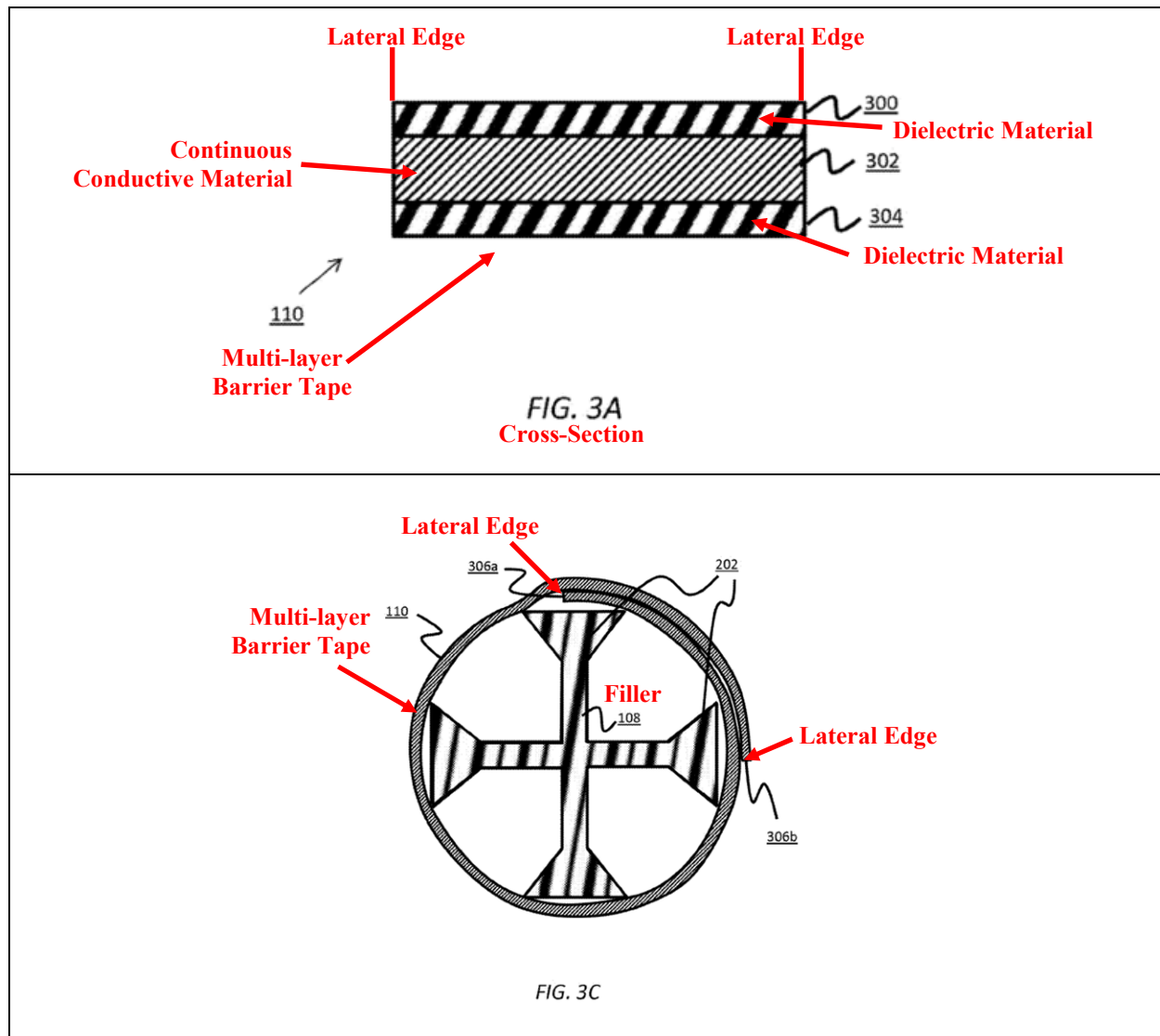
C. ROBERTS DOES NOT ANTICIPATE ANY OF THE CHALLENGED CLAIMS. (GROUND 5)

74. In his Declaration, Cornelison alleged that Roberts (EX-1009)

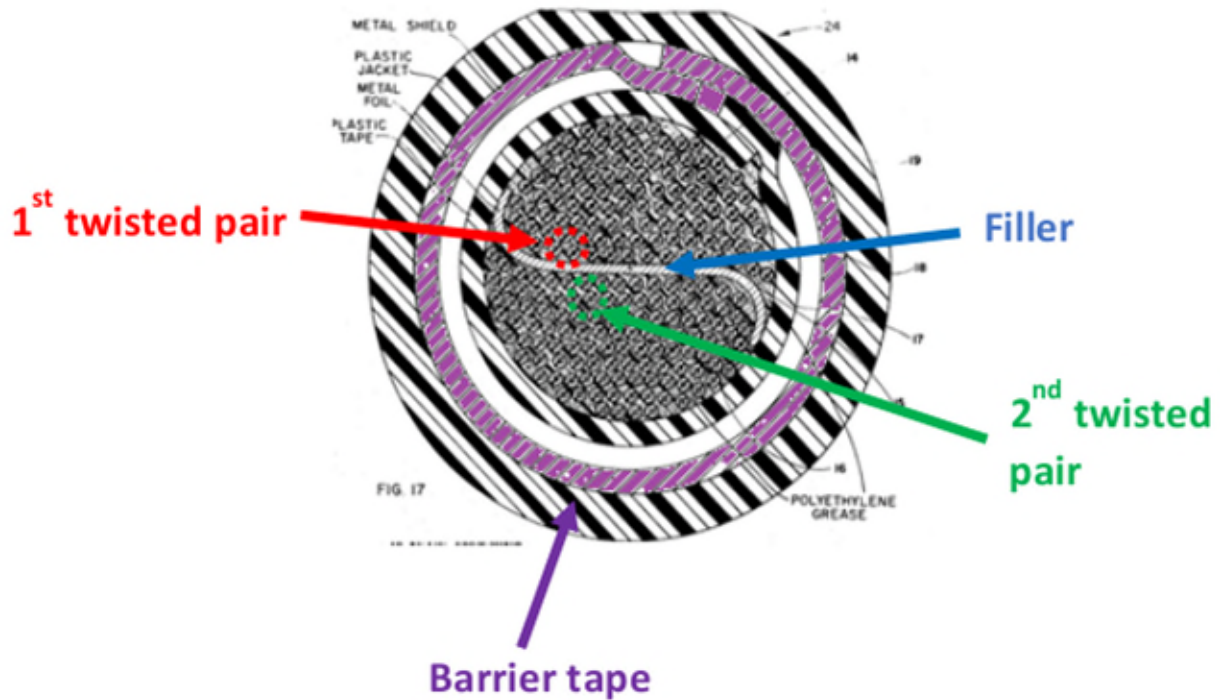
anticipates all of the Challenged Claims. EX-1006 ¶¶191-239.

75. Independent claims 1 and 18 of the '030 Patent require a multi-layer barrier tape (110) that includes a conductive material (302) contained between two layers of a dielectric material (300, 304), where the conductive material extends to each lateral edge (306a, 306b) of the two layers of the dielectric material, and the barrier tape surrounds the first (102a) and second (102b) twisted pairs of insulated conductors and the filler (108).

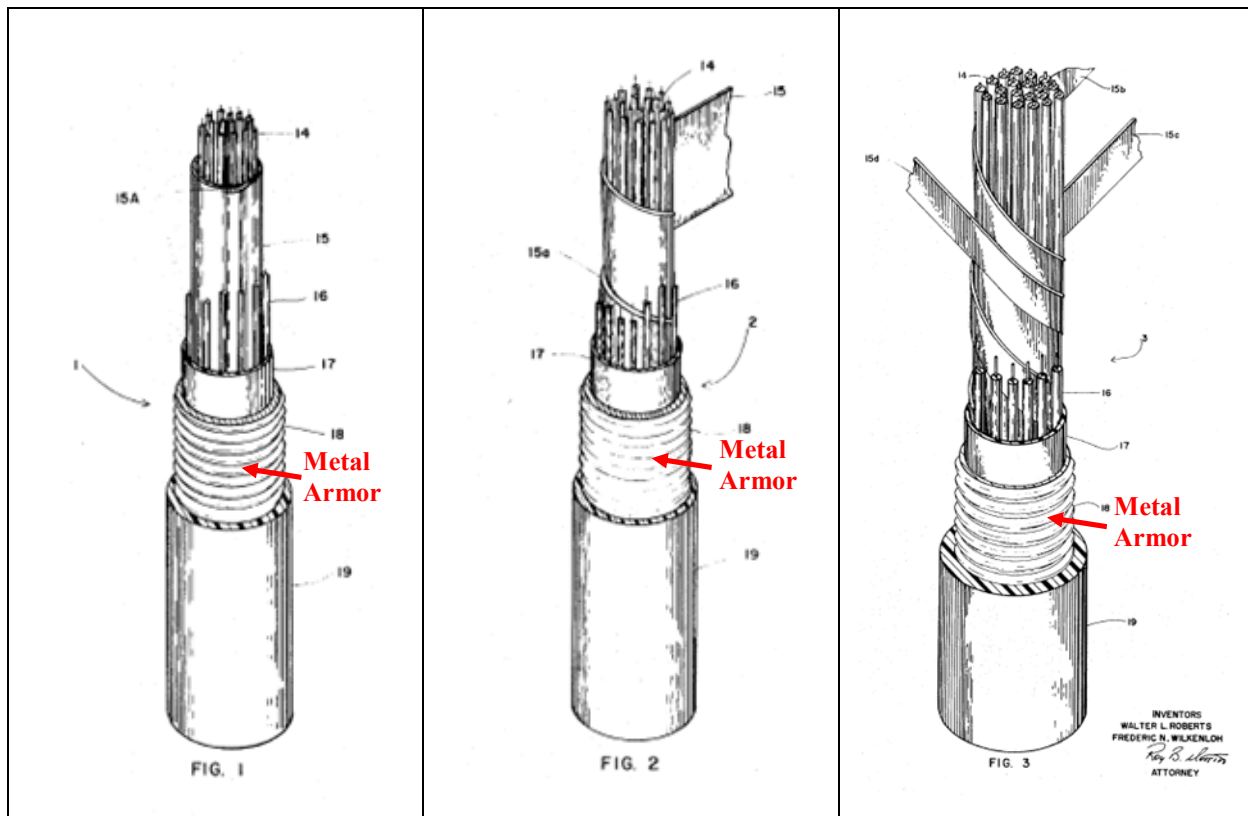




76. In arguing that Roberts discloses the claimed barrier tape, Cornelison relied upon the embodiment of a cable 24 shown in FIG. 17 and annotated by Cornelison, as shown below. EX-1006 ¶24. Cornelison argues that metal shield 18 is the claimed barrier tape.



77. Roberts' metal shield 18 is described in Roberts as "metal armor shield," "metal armor tape," "armor"). Roberts 4:15-22 ("corrugated metal armor tape shown at (18)," "metal armor," "armor"); 10:42-48 ("metal armor shield (18)"), 11:43-49 ("armor (18)"), FIGS. 1, 2, 3, 17.). This metal armor shield/tape 18 provides "mechanical (armor) protection" to the cable. Roberts 4:62-67.



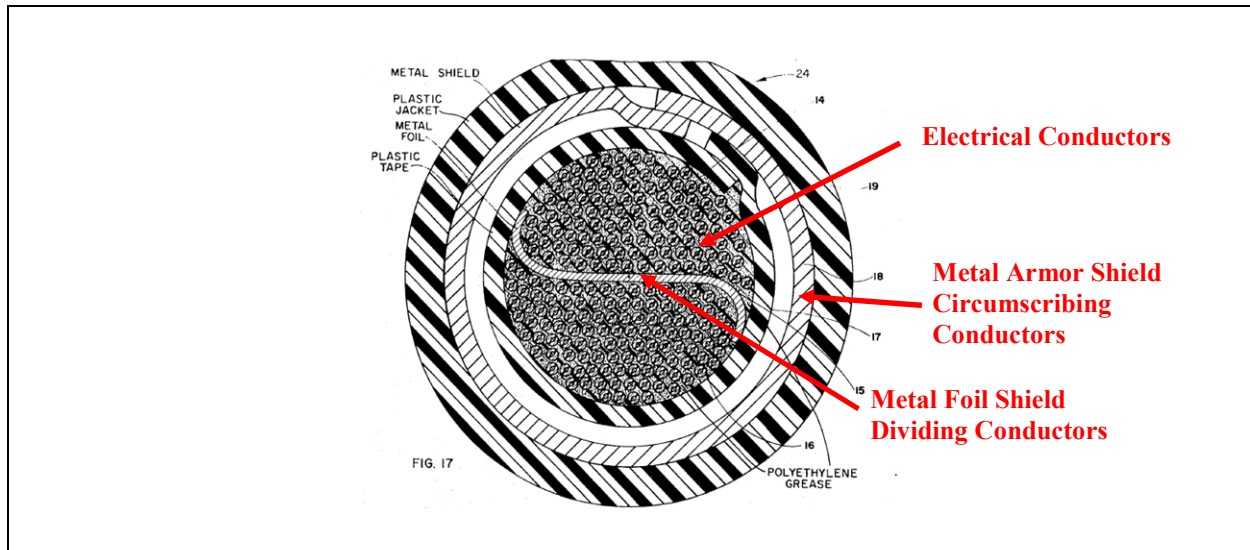
78. Roberts does not disclose that the metal armor shield 18 includes the claimed conductive material contained between two layers of a dielectric material, where the conductive material extends to each lateral edge of the two layers of the dielectric material. So Cornelison instead relied upon a different shield – shield 15. EX-1006 ¶205. But Roberts teaches that shield 15 is a thin metal foil shield in all of the embodiments, including FIG. 17, and not a metal armor shield 18.

79. Roberts’ metal armor shield 18, which provides mechanical protection to the cable, is not a metal foil like shield 15. It has “a thickness greater than a foil” to provide mechanical protection. Roberts 4:15-19. Roberts teaches that metal armor shield 18, which provides a mechanical shield, is different than any of the

other shields disclosed in Roberts, including metal *foil* shield 15, which provides an electrical shield and does not provide “mechanical (armor) protection.” Roberts 4:62-67 (“For the purposes of this disclosure, when reference is made to a shield, other than element (18), an electrical shield is meant. Even though the word ‘shield’ has an accepted double meaning, i.e. electrical as well as mechanical (armor) protection, the metal foil shield of the instant invention connote primarily an electrical shield.”)

80. Roberts also teaches that metal foil shield 15 in FIG. 17 divides “a plurality of insulated electrical conductors [] into essentially two groups” and “that this particular shield does not circumscribe any one group of insulated electrical conductors (14) and (16).” Roberts 10:50-55, FIG. 17.

81. The cable 24 of FIG. 17 is described in Roberts as “a cable structure showing a screen or shield dividing groups of insulated electrical conductors that does not longitudinally circumscribe any group of conductors.” Roberts 2:72-75. As shown in the annotated figure below, unlike the metal foil shield 15 that expressly does not circumscribe the electrical conductors 14, 16, the metal armor shield 18 does exactly that. As a result, a POSITA would not understand that metal foil shield 15 could be used for metal armor shield 18.



82. Roberts also states the “obvious advantage” of not having a metal foil shield circumscribing the electrical conductors “in that less shield material is used in this manufacture, without the loss of any of the desired electrical properties [mitigation of the near-end crosstalk problem].” Roberts 11:7-12 (alteration in original). In doing so, Roberts teaches away from using the metal foil shield 15 as the metal armor shield 18 surrounding the conductors.

83. Since Roberts does not disclose a barrier tape with conductive material extending to each lateral edge of the two layers of the dielectric material, and surrounding the first and second twisted pairs of insulated conductors and the filler, it cannot anticipate independent claims 1 and 18 or any of the dependent claims.

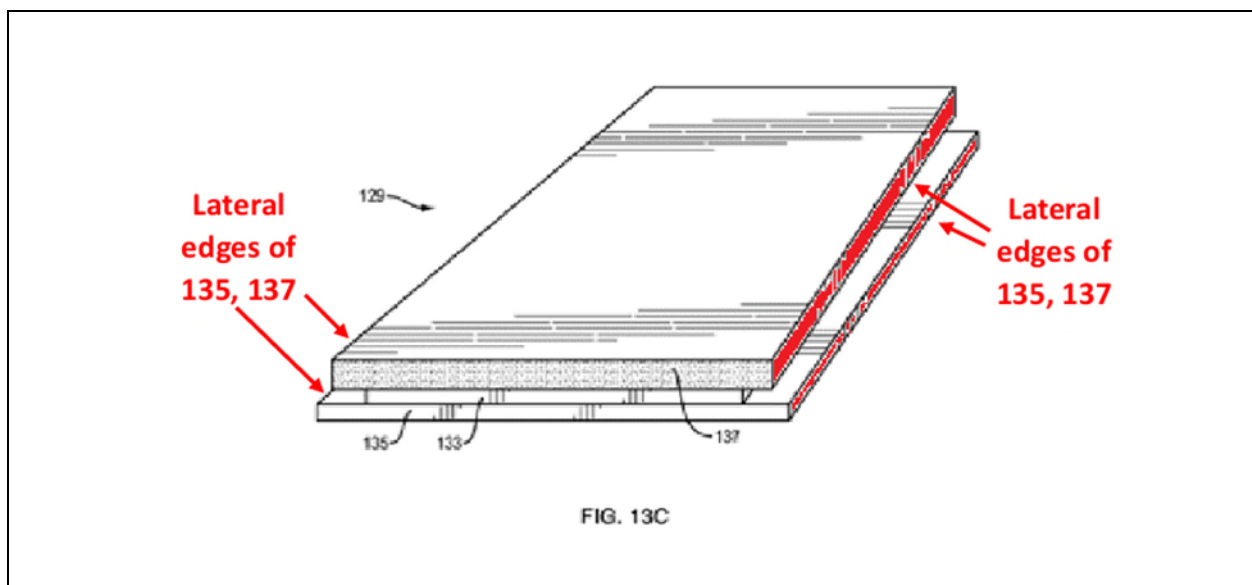
84. For Grounds 8 and 9, Cornelison also alleged that dependent claims 11 (Ground 8) and claims 9 and 12 (Ground 9) respectively, all of which depend from independent claim 1, are obvious based on the combinations of Roberts and Glew

(Ground 8) and Roberts and Simons (Ground 9). EX-1006 ¶¶259-276. Since Cornelison only focused on the additional claim element(s) added in dependent claims 11, 12, and 16 in these Grounds, and did not even attempt to address Roberts' failure to disclose the missing elements of independent claims 1 and 18, Grounds 8 and 9 do not render obvious dependent claims 11, 12, and 16.

VII. THE CHALLENGED CLAIMS ARE NOT OBVIOUS.

A. NEITHER GLEW ALONE, NOR IN COMBINATION WITH COOK, RENDERS OBVIOUS ANY OF THE CHALLENGED CLAIMS. (GROUND 4)

85. As explained above in Ground 3, Glew does not anticipate independent claims 1 and 18 because it does not disclose a barrier tape with conductive material (133) that extends to each lateral edge of the two layers of the dielectric material (135, 137).



Pet. 49.

86. In Ground 4, Cornelison alleged that it would have been obvious based on Glew alone to extend the conductive metal foil layer 133 to the lateral edges of the dielectric layers 135, 137. EX-1006 ¶¶174-179. I disagree.

87. In Ground 4, Cornelison repeated his anticipation theory that “a common method of making multi-layer tapes, such as disclosed in Glew, was [a] process [that] results in all three layers having side edges flush with each other.” EX-1006 ¶176. But Cornelison does not explain why it would “would” have been obvious to make a multi-layer tape having side edges flush with each other.

88. Roberts confirms that Glew’s design in FIG. 13C where the edges of the conductive material did not extend to the lateral edges of the dielectric layers (*i.e.*, a “foil free edge” design) had significant advantages that would be lost if it were modified as suggested by Cornelison.

89. Roberts teaches, there were disadvantages (*i.e.*, “undesirable electrical properties”) to creating a shield, where the edge of the metal foil is exposed as it would be if it extended to the lateral edges of the dielectric layers as claimed in the ’030 Patent.

It is also an embodiment of the instant invention to employ as a shield, a metal foil which is completely surrounded on all sides by a plastic coating, e.g., an aluminum foil, completely surrounded by polyethylene terephthalate (Mylar), polyethylene, polypropylene, polystyrene or PVC. An aluminum foil, which is coated only on its two major surfaces with a plastic, still has exposed naked aluminum surfaces at the edges thereof. When considering a cable of many miles in length, this amount

of exposed conductive metal becomes significant. Therefore, the instant invention takes this into account in one of two ways: the first way is to employ a metal foil which is completely surrounded by plastic. As an example, such a foil would be envisioned as being aluminum with the plastic covering being polyethylene terephthalate (Mylar). Another way to mitigate undesirable electrical properties created by having an exposed surface (edge) of metal to the electrical conductors is to fill that portion of the space created by the plastic-coated metal foil shield not otherwise occupied by the electrical conductors therein with a polyethylene greaselike material. This greaselike material acts as both a dielectric protection, as well as an inhibitor of any subsequent incoming moisture.

Roberts 3:52-74.

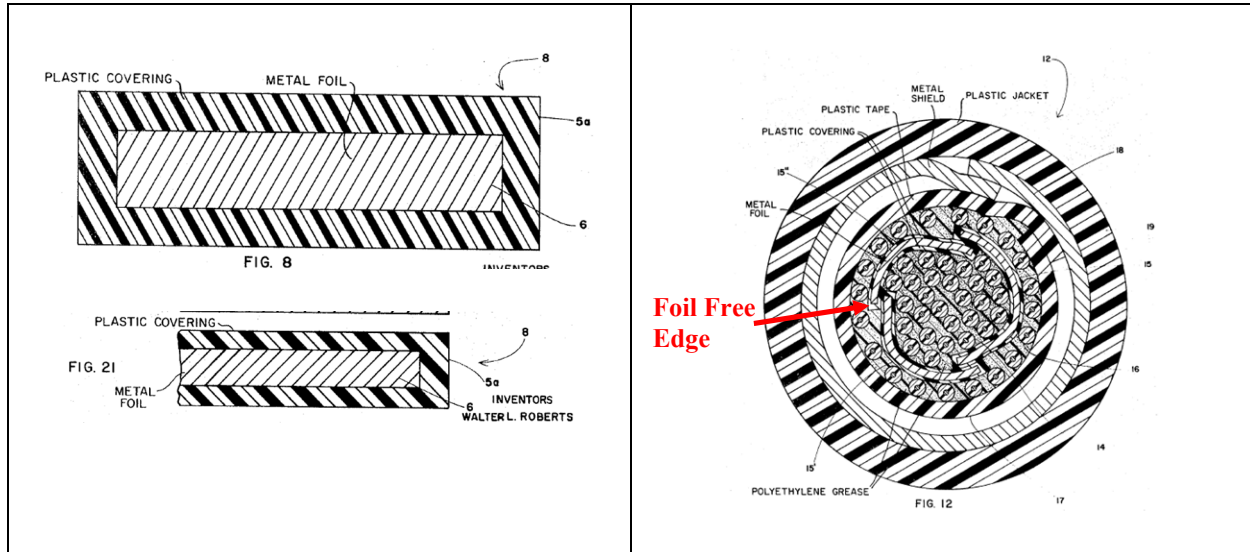
Element (9) of FIG. 9, shows a cross-sectional view of that cable structure as depicted in FIG. 1. Like numbers of FIG. 1 also represent like elements in FIG. 9. Here it will be noted that the plastic-coated metal foil shield (15) is coated on its two major surfaces with a plastic; however, it can be seen by element (20), that thin strips of uninsulated metal are exposed to the first and second group of electrical conductors (14) and (16) respectively. It is quite obvious that pinholes in the electrical insulation of the insulated electrical conductors (14) or (16), or the shield (15), would allow unwanted electrical energy to reach exposed portions (edges) of the aluminum foil shield, through the edges (20) or pinholes in its plastic coating. From an electrical standpoint, it is desirable to avoid this. It is also electrically desirable to keep moisture away from the electrical conductors. Thus, the instant invention envisions an embodiment in which a polyethylene greaselike material (a flooding compound) is disposed in that cavity created or defined by the foil shield (15) not otherwise occupied by insulated electrical conductors (14). Furthermore, it is also envisioned that the same polyethylene greaselike material can be disposed in that cavity created by the plastic-coated metal foil shield (15) and plastic tape (17) not otherwise occupied by the insulated electrical conductors (16).

Roberts 4:68-5:15, 5:48-54, 6:15-28, FIGS. 9 & 10.

90. To avoid these conductive edges, Roberts discloses in FIGS. 8 and 21

a “metal foil shield [8] having a plastic coating that completely surrounds said foil.”

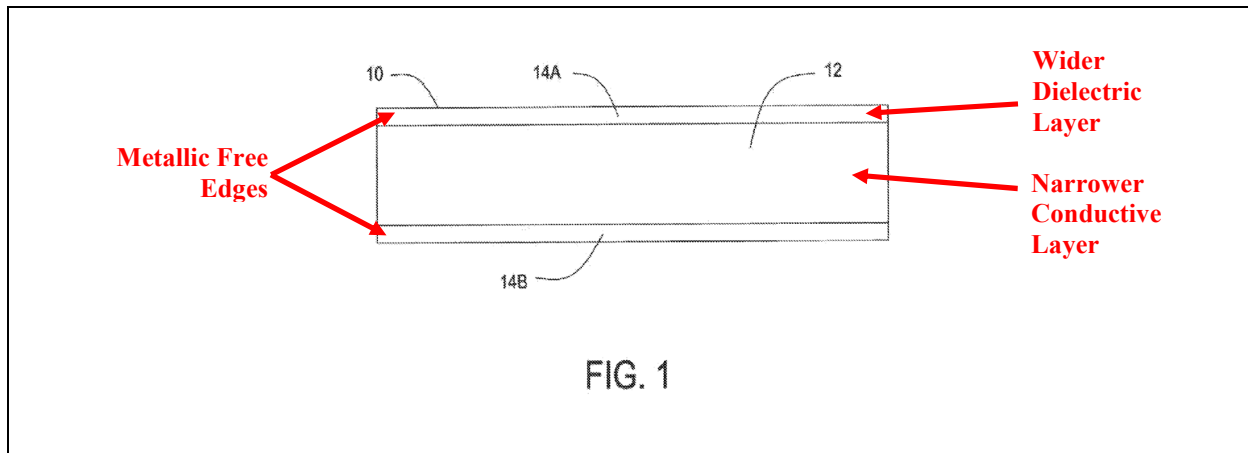
Roberts 2:37-38, 2:47-53, 3:1-7, 6:29-65, 6:66-7:25, FIGS. 8, 11, 12, 14, 16, 21.



91. Cornelison, elsewhere in the Declaration admitted that “POSITAs have been motivated to isolate the conductors from the metal layer of a shield since at least the 1960s, as exemplified by Roberts, which discloses adding mylar and also a grease-like dielectric material to cables to help isolate the conductors from the metal layer in multi-layer shields.” EX-1006 ¶291 (citing Roberts 3:37-75, 4:48-5:15). A POSITA would be discouraged from Cornelison’s proposed modification of Glew’s actual teachings to create edges where the conductive foil was exposed.

92. Another reference filed around the priority date of the ’030 Patent confirms that there were known advantages to having the conductive layer be narrower than the dielectric layer(s) as disclosed in Glew. In FIG. 1 of U.S. Patent Application Publication No. 2016/0037691 (“Kroushl”) (EX-2007), “a first

polyester substrate tape 10 is provided having a laminated metallic surface 12 thereon.... The associated metal layer 12 deposited thereon is an aluminum layer ... approximately 0.25” narrower than the width of tape 10.” Kroushl ¶¶[0017], [0023].



93. Having the tape or dielectric layer wider than the conductive layer provides “two metallic free segments 14a and 14b on each side of metallic layer 12 running the length of tape 10.” Kroushl ¶[0024], Abstract, ¶[0012], [0014].

94. The “advantage of metallic free zones 14a and 14b is that they can help prevent the unintentional shorting of adjacent metallic segments 16 when the tape is applied around the cable core.” Kroushl ¶[0028].

95. Data sheets of NEPTAPE Foil Free Edge Shielding Tapes available in 2000 provide additional evidence of the advantages of a shield having foil free edges as shown in Glew. For example, the foil free edge tapes “offer a film/film/foil construction with a wider, thicker top film layer which overlaps the foil, providing non-conductive foil free edges.” EX-2008 1; EX-2009 (“Three ply tape with a

thicker film layer which overlaps the foil”).

96. These foil free edge shielding tapes were to be used for “[s]hielding of twisted pairs in multi-pair cables such as process control, computer, or instrumentation cables.” EX-2008 1.

97. The “[f]oil free film edge provides isolation between pairs, preventing shield to shield shorts and eliminating the need for a polyester overwrap.” EX-2008 1.

98. Since Cornelison’s proposed Glew modification theory (*i.e.*, extending the conductive metal foil layer 133 to the lateral edges of the dielectric layers 133, 135 and exposing the metal foil 133) would result in undesirable electrical properties and possible shorting of electrical shields, a POSITA would not be motivated to make such a modification.

99. Cornelison also argued that the manufacturing of the tape 129 shown in FIG. 13C “would take much more time and be more complex and costly to make than using the customary slitting process.” EX-1006 ¶¶178, 186. I disagree and Cornelison does not provide any evidence to support his opinion.

100. Cornelison’s also argued that the Challenged Claims were obvious based on the combination of Glew and Cook. EX1006 ¶¶180-188. I disagree.

101. Cornelison argued that “Cook thus demonstrates that it is well-known for multi-layer tapes to have the metal layer side edges flush/aligned with the

dielectric layer edges,” and cited to two additional prior art references (EX-1037 and EX-1038). EX1006 ¶183.

102. As explained in Ground 1, Cook does not disclose any shield layer (or barrier tape) with conductive material contained between two layers of a dielectric material and extending to each lateral edge of the two layers of the dielectric material. So Cook does not demonstrate that it is “well-known” for multi-layer tapes to have the metal layer side edges flush/aligned with the dielectric layer edges.

103. It is my opinion that neither Glew alone or the combination of Glew and Cook render obvious any of the Challenged Claims.

B. THE COMBINATION OF ROBERTS AND JACHIMOWICZ-172 DOES NOT RENDER OBVIOUS ANY OF THE CHALLENGED CLAIMS. (GROUND 6)

104. As explained in Ground 5, Roberts does anticipate independent claims 1 and 18 (or any of the dependent claims) because it does not disclose a barrier tape with conductive material extending to each lateral edge of the two layers of the dielectric material, and surrounding the first and second twisted pairs of insulated conductors and the filler.

105. In Ground 6, Cornelison argues that the combination of Roberts and Jachimowicz-172 should render obvious independent claims 1 and 18 and several dependent claims. EX-1006 ¶¶240-248. But Cornelison does not even attempt to address Roberts’ failure to disclose a barrier tape with conductive material extending

to each lateral edge of the two layers of the dielectric material, and surrounding the first and second twisted pairs of insulated conductors and the filler. Exactly like Ground 5, Cornelison in Ground 6 relies exclusively on Roberts (and not Jachimowicz-172) as allegedly disclosing a barrier tape with conductive material extending to each lateral edge of the two layers of the dielectric material, and surrounding the first and second twisted pairs of insulated conductors and the filler, this Ground fails for the same reasons as Ground 5.

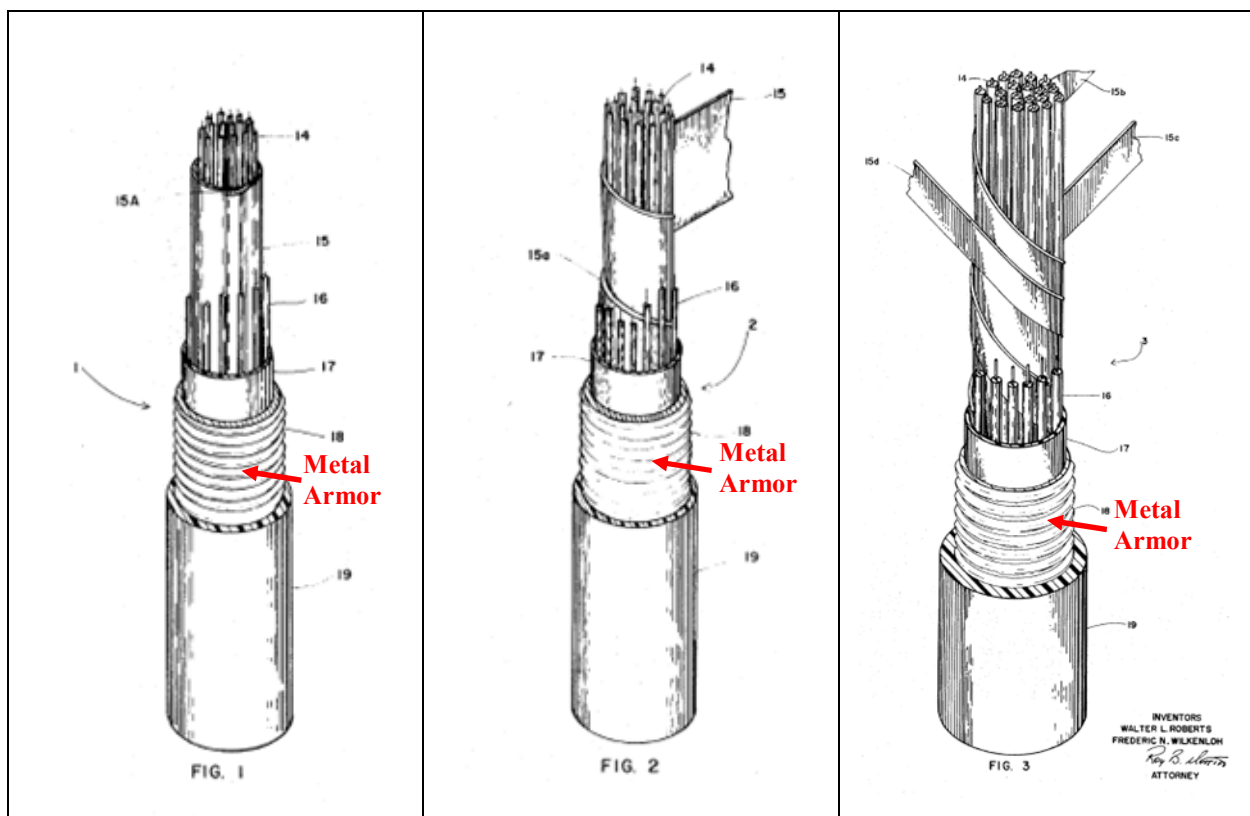
C. THE COMBINATION OF ROBERTS AND JACHIMOWICZ-036 DOES NOT RENDER OBVIOUS ANY OF THE CHALLENGED CLAIMS. (GROUND 7)

106. As explained above in Ground 5, Roberts does not anticipate independent claims 1 and 18 (or any of the dependent claims) because Roberts' metal armor shield 18 does not disclose a barrier tape with conductive material that extends to each lateral edge of the two layers of the dielectric material and surrounds the first and second twisted pairs of insulated conductors and the filler.

107. In Ground 7, Cornelison alternatively alleged that it would have been obvious based on Roberts alone to use the configuration of the metal foil shield 5 shown in FIG. 5 of Roberts for the metal armor shield 18. EX-1006 ¶¶249-258. I disagree. Cornelison's argument is nothing more than a repeat of Cornelison's Ground 5 anticipation argument.

108. As explained in Ground 5, Roberts' metal shield 18 is described in

Roberts as “metal armor shield,” “metal armor tape,” “armor”). Roberts 4:15-22 (“corrugated metal armor tape shown at (18),” “metal armor,” “armor”); 10:42-48 (“metal armor shield (18)”), 11:43-49 (“armor (18)”), FIGS. 1, 2, 3, 17.). This metal armor shield/tape 18 provides “mechanical (armor) protection” to the cable. Roberts 4:62-67.



109. Roberts does not disclose that the metal armor shield 18 includes the claimed conductive material contained between two layers of a dielectric material, where the conductive material extends to each lateral edge of the two layers of the dielectric material. So Cornelison instead relied upon a different shield – shield 15.

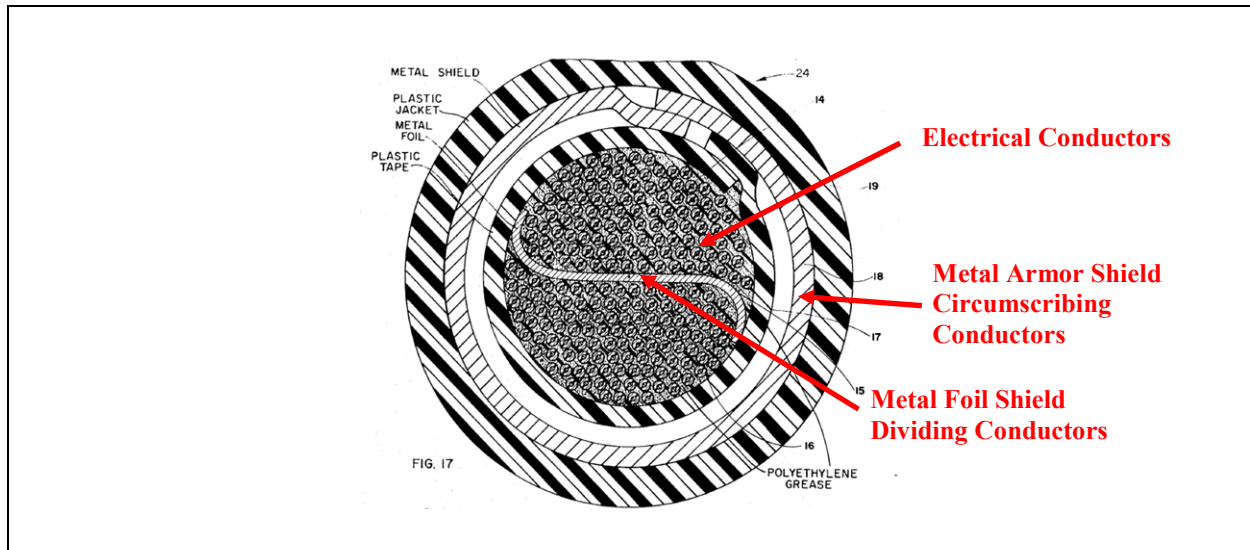
EX-1006 ¶252-253. But Roberts teaches that shield 15 is a thin metal foil shield in all of the embodiments, including FIG. 17, and not a metal armor shield 18.

110. Roberts' metal armor shield 18, which provides mechanical protection to the cable, is not a metal foil like shield 15. It has "a thickness greater than a foil" to provide mechanical protection. Roberts 4:15-19. Roberts teaches that metal armor shield 18, which provides a mechanical shield, is different than any of the other shields disclosed in Roberts, including metal foil shield 15, which provides an electrical shield and does not provide "mechanical (armor) protection." Roberts 4:62-67 ("For the purposes of this disclosure, when reference is made to a shield, other than element (18), an electrical shield is meant. Even though the word 'shield' has an accepted double meaning, i.e. electrical as well as mechanical (armor) protection, the metal foil shield of the instant invention connote primarily an electrical shield.")

111. Roberts also teaches that metal foil shield 15 in FIG. 17 divides "a plurality of insulated electrical conductors [] into essentially two groups" and "that this particular shield does not circumscribe any one group of insulated electrical conductors (14) and (16)." Roberts 10:50-55, FIG. 17.

112. The cable 24 of FIG. 17 is described in Roberts as "a cable structure showing a screen or shield dividing groups of insulated electrical conductors that does not longitudinally circumscribe any group of conductors." Roberts 2:72-75.

As shown in the annotated figure below, unlike the metal foil shield 15 that expressly does not circumscribe the electrical conductors 14, 16, the metal armor shield 18 does exactly that. As a result, a POSITA would not understand that metal foil shield 15 could be used for metal armor shield 18.



113. Roberts also states the “obvious advantage” of not having a metal foil shield circumscribing the electrical conductors “in that less shield material is used in this manufacture, without the loss of any of the desired electrical properties [mitigation of the near-end crosstalk problem].” Roberts 11:7-12 (alteration in original). In doing so, Roberts teaches away from using the metal foil shield 15 as the metal armor shield 18 surrounding the conductors.

114. Petitioner argued that “it would be obvious to use the three-layer barrier tape [shield 14] in [Jachimowicz-036] on Roberts’ cable.” Pet. 73. I disagree. Cornelison never explained why or how shield 14 disclosed in Jachimowicz-036

would be used “on Roberts’ cable.” Cornelison ¶254. For example, Cornelison did not even try to explain how the shield 14 disclosed in Jachimowicz-036 would be used in Roberts’ cable (i.e., whether it would replace the metal armor shield 18 in Roberts or be used in addition to the metal armor shield 18). Nor did Cornelison even attempt to explain why a POSITA would be motivated to use the shield 14 disclosed in Jachimowicz-036 in Roberts

115. Cornelison’s only reasons offered for modifying Roberts’ metal armor shield 18 is that “well-known multi-layer shields ... have a continuous metal layer sandwiched between and extending to the lateral edges of the dielectric layers.” EX-1006 ¶¶44-45, 254-256. Cornelison cited to several other references (EX-1013, EX-1014, EX-1031 to EX-1037) not identified in the proposed obviousness ground that allegedly disclose “well-known multi-layer barrier tape shields, such as those sold under the Zatabon trademark.” 1006 ¶¶44-45, 254-256. These references include EX-1031, which is directed to “Rodent Protection” rather than communications cable shielding to prevent cross-talk. Other than alleging that the shields were “well-known,” Cornelison did not offer any other explanations regarding why those references render any of the Challenged Claims obvious.

116. For the same reasons why it would not have been obvious to use Roberts’ thin metal foil shield 15 for the metal armor shield 18 (which is designed to be thicker than the foil shield to provide mechanical protection (Roberts 4:15-

19)), it also would not have been obvious to use Jachimowicz-036's foil shield 14, which is also described as being a thin foil. Jachimowicz-036 1:41-45 ("the shield ... consists of a metallic strip such as aluminum or copper. The strip is relatively thin.")

117. As explained in Ground 4, Roberts teaches away from such a modification since it expressly discloses various disadvantages of using a shield where the edge of the metal foil is exposed as it would be if it extended to the lateral edges of the dielectric layers as suggested by Cornelison. Roberts 3:52-74 ("undesirable electrical properties created by having an exposed surface (edge) of metal to the electrical conductors"), 4:68-5:15, 5:48-54, 6:15-28, FIGS. 9 & 10.

118. Cornelison stated that "POSITAs have been motivated to isolate the conductors from the metal layer of a shield since at least the 1960s, as exemplified by Roberts, which discloses adding mylar and also a grease-like dielectric material to cables to help isolate the conductors from the metal layer in multi-layer shields." EX-1006 ¶291 (citing Roberts 3:37-75, 4:48-5:15).

119. Neither Roberts alone nor the combination of Roberts and Jachimowicz-036 render obvious any of the Challenged Claims, Ground 7 should be rejected.

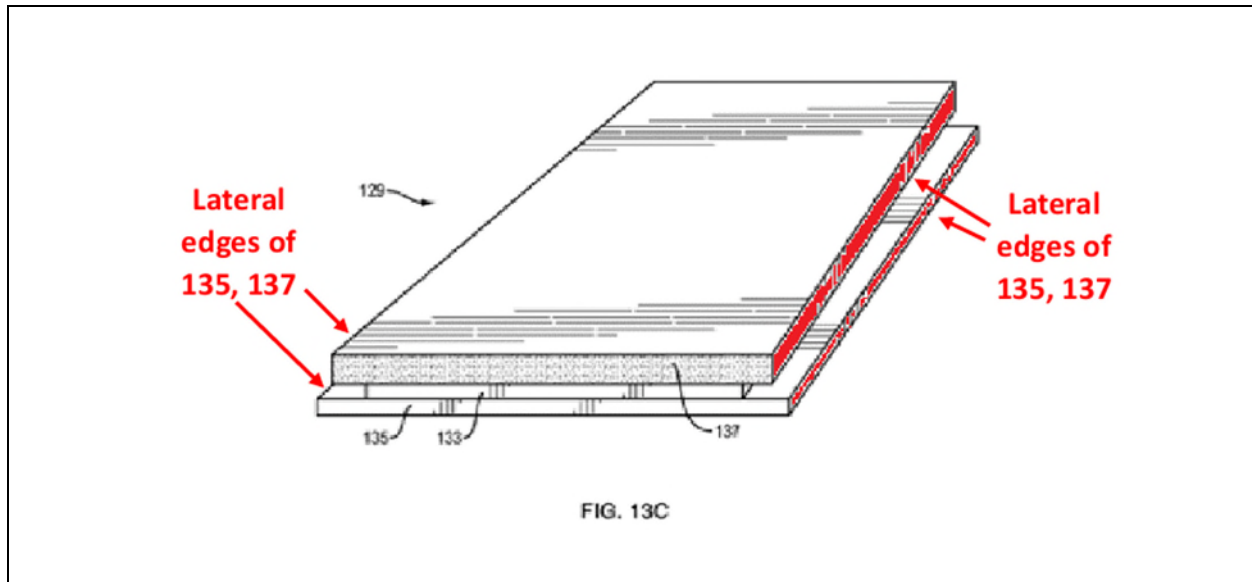
D. THE COMBINATION OF CLARK-478, ROBERTS, AND GLEW DOES NOT RENDER OBVIOUS ANY OF THE CHALLENGED CLAIMS. (GROUND 10)

120. In his Declaration, Cornelison also alleged that the combination of Clark-478 (EX-1025), Roberts, and Glew renders obvious the Challenged Claims. EX-1006 ¶¶277-337.

121. In Ground 10, Cornelison argued that “[s]urrounding Clark-478’s filler and twisted pairs with Roberts’/Glew’s three-layer tapes” would be obvious. EX-1006 ¶288.

122. But as explained in Ground 5, Roberts does not disclose a barrier tape with conductive material extending to each lateral edge of the two layers of the dielectric material, and surrounding the first and second twisted pairs of insulated conductors and the filler.

123. And as explained in Ground 3 and as demonstrated in Cornelison’s own annotated figure below (EX-1006 ¶174), Glew does not disclose a barrier tape with conductive material (133) extending to each lateral edge of the two layers of the dielectric material (135, 137).



124. Since Glew’s three-layer tape does not disclose a barrier tape with conductive material extending to each lateral edge of the two layers of the dielectric material, the proposed combination with Clark-478 would also lack that claim element.

125. Cornelison’s reliance on Roberts’ metal armor shield 18, which as explained in Ground 5, is not a barrier tape with conductive material extending to each lateral edge of the two layers of the dielectric material, the proposed combination with Clark-478 would also lack that claim element.

126. Cornelison’s alleged motivation for modifying Clark-478 teaches away from providing a barrier tape with conductive material extending to each lateral edge of the two layers of the dielectric material (i.e., exposing the metal layer). According to Cornelison, “POSITAs have been motivated to isolate the conductors from the

metal layer of a shield since at least the 1960s, as exemplified by Roberts, which discloses adding mylar and also a grease-like dielectric material to cables to help isolate the conductors from the metal layer in multi-layer shields.” EX-1006 ¶291 (citing Roberts 3:37-75, 4:48-5:15,). Under Cornelison’s theory then, a POSITA would not want to extend the conductive material to each lateral edge of the two layers of the dielectric material since that would not isolate the metal layer of the shield from the conductors.

127. The combination of Clark-478, Roberts, and Glew does not render obvious any of the Challenged Claims.

128. For Ground 11, Cornelison alleges that dependent claims 3 & 9, which depend from independent claim 1, are obvious based on the combination of Glew and/or Roberts and/or Cook. EX1006 ¶¶ 338-339 Since in Ground 11, Cornelison only focused on the additional claim element(s) added in claims 3 and 9 and did not even attempt to address those prior art references’ failure to disclose the missing elements of independent claims 1 and 18, Ground 11 does not render obvious dependent claims 3 & 9.

129. In signing this declaration, I understand that the declaration will be filed as evidence in a contested case before the Patent Trial and Appeal Board of the United States Patent and Trademark Office. I acknowledge that I may be subject to cross-examination in this case and that cross-examination will take place within the United States. If cross-examination is required of me, I will appear for cross-examination within the United States during the time allotted for cross-examination.

130. I declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: September 20, 2023

By: 

Charles A. Eldering, Ph.D.

APPENDIX A

Curriculum Vitae
Dr. Charles A. Eldering

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AREAS OF SPECIALIZATION: Extensive technical and market expertise in the areas of telecommunications, microelectronics, consumer electronics, targeted advertising, location-based services, data mining, and bioinformatics, with over 30 years of industrial experience. Highly skilled in the management and utilization of patents including infringement analysis and documentation of use of claimed technology.

EDUCATION:

- 1989 University of California; Davis, California
 Ph.D. Electrical Engineering
- 1985 Syracuse University; Syracuse, New York
 M.S. Solid State Science and Technology
- 1981 Carnegie Mellon University; Pittsburgh, Pennsylvania
 B.S. Physics

OTHER QUALIFICATIONS:

Registered U.S. Patent Agent. Registration No. 39,180
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EMPLOYMENT HISTORY:

December 2013 to present:

CAsE Analysis, Inc.
Founder & President

September 2022 to present

SitNet LLC
Founder and Managing Member

May 2000 to December 2021

Expanse Networks/Expanse Bioinformatics
Founder and President

December 1997 to December 2013:

Technology, Patents & Licensing, Inc. (now TechPats)
Founder and President

October 1995 to November 1997:

Next Level Communications, Rohnert Park, CA
Director, Advanced Systems Engineering

September 1993 to September 1995:

General Instrument Corporation, Hatboro, PA
Manager, Fiber-to-the-Curb/Switched Digital Video Systems; March 1995 to September 1995
Manager, Broadband Systems Engineering; January 1994 to March 1995
Senior Project Engineer, Systems Engineering; September 1993 to December 1993

January 1990 to August 1993:

Alcatel, Madrid, Spain
Senior Engineer/Manager, Fiber in the Loop R&D; October 1990 to August 1993
Consultant; January 1990 to September 1990

June 1986 to August 1990:

University of California, Davis, CA
Researcher, Department of Electrical and Computer Engineering

October 1981 to May 1986:

United States Air Force, Rome Laboratory, Rome, NY

Officer

EXPERT WITNESSING:

1. *CommScope Technologies v. Belden Nos.*, IPR2023-01056, -01058, -01061, -01062 (PTAB)
2. *PPC v. Perfect Vision Manufacturing, Inc.*, Case No. 4:22-CV-204 (Eastern District of Arkansas)
3. *PPC v. Perfect Vision Manufacturing, Inc.*, Case No. 4:22-CV-163 (Eastern District of Arkansas)
4. *PCC v. CommScope Technologies, LLC*, Case No. 22-783-RGA (District of Delaware)
5. *PPC v. Charles Industries, LLC and Amphenol Corporation*, Case No. 1:22-CV-01517 (District of Delaware)
6. *Belden v. CommScope, Inc.*, Case No. 22-782-RGA (District of Delaware)
7. *Amphenol Corporation v. PPC Broadband, Inc.*, Nos. IPR2022-00718, -00719, -00720 and -00721 (PTAB).
8. *PPC Broadband, Inc. v. Amphenol Corporation*, Nos. IPR2022, -00830, -00831, -00946, -00947, -01087, -01088 (PTAB).
9. *Sony Corporation and Sony Electronics Inc. v. ARRIS International plc, ARRIS Group, Inc., ARRIS Technology, Inc., ARRIS Enterprises LLC, ARRIS Solutions, Inc. and ARRIS Global Ltd. (formerly Pace Ltd.)*, In the Matter of Certain Digital Cable and Satellite Products, Set-Top Boxes, Gateways, and Components Thereof, United States International Trade Commission, Washington, D.C. (Investigation No. 337-TA-1049).
10. *Unified Patents Inc. v. Harry Heslop & Sportbrain Holdings, LLC*, No. IPR2016-01464 (PTAB).
11. *Unified Patents Inc. v. Hybrid Audio, LLC*, No. IPR2016-01265 (PTAB).
12. *Unified Patents Inc. v. Qurio Holdings, Inc.*, No. IPR2015-01991 (PTAB).
13. *Unified Patents Inc. v. Rothschild Connected Devices Innovations, LLC*, No. IPR2016-00535 (PTAB).
14. *Unified Patents Inc. v. FO2GO LLC*, No. IPR2016-00454 (PTAB).
15. *Unified Patents Inc. v. Nonend Inventions, NV*, No. IPR2016-00174 (PTAB).
16. *Unified Patents Inc. v. iMTX Strategic, LLC*, No. IPR2015-01061 (PTAB).
17. *Unified Patents Inc. v. TransVideo Electronics, Ltd.*, No. IPR2015-01519 (PTAB).
18. *PPC Broadband, Inc. d/b/a PPC v. Times Fiber Communications, Inc.*, United States District Court for the Northern District of New York (Civil Action No. 5:13-cv-460-TJM-DEP)
19. *PPC Broadband, Inc. d/b/a PPC v. Corning Gilbert, Inc.*, United States District Court for the Northern District of New York (Civil Action No. 5:13-cv-00538-GLS-DEP).
20. *PPC Broadband, Inc. v. Corning Optical Communications RF, LLC, In the Matter of Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same*, United States International Trade Commission, Washington, D.C. (Investigation No. 337-TA-938).
21. *BroadSoft, Inc. v. CallWave Communications, LLC*, United States District Court for the District of Delaware (DED-1-13-cv-00711-RGA).

22. *Netflix, Inc., v. OpenTV, Inc.*, No. IPR2014-00252 (PTAB).
23. *Mediatube Corp and Northvu Inc. v. Bell Canada and Bell Aliant Regional Communications, Limited Partnership*, Canadian Federal Court (C.A. T-705-13).
24. *John Mezzalingua Associates, Inc. d/b/a PPC v. Corning Gilbert Inc.*, United States District Court for the District of Arizona (Case No. 2: 12-CV-12-02208-SMM).
25. *Corning Gilbert Inc., v. PPC Broadband, Inc.*, No. IPR2013-00345 (PTAB).
26. *Corning Gilbert Inc., v. PPC Broadband, Inc.*, No. IPR2013-00340 (PTAB).
27. *Corning Gilbert Inc., v. PPC Broadband, Inc.*, No. IPR2013-00342 (PTAB).
28. *Corning Gilbert Inc., v. PPC Broadband, Inc.*, No. IPR2013-00346 (PTAB).
29. *Corning Gilbert Inc., v. PPC Broadband, Inc.*, No. IPR2013-00347 (PTAB).
30. *PPC Broadband, Inc. v. Corning Gilbert Inc.*, United States District Court for the Northern District of New York (Civil Action No. 5:13-cv-1310).
31. *PPC Broadband, Inc. d/b/a PPC v. Corning Gilbert, Inc.*, United States District Court for the Northern District of New York (Civil Action No. 11-cv-00761-GLS-DEP).
32. *Corning Gilbert, Inc. v. The United States of America, et al.* in the United States Court of International Trade (Case No. 11-00511).
33. *Parus Holdings, Inc. v National Airtran Airways, Inc., Airtran Holdings, Inc., Airtran Holdings, LLC* in the United States District Court for the Middle District of Florida, Tampa Division (Case No. 8:11-cv-01685-EAK-TBM).
34. *John Mezzalingua Associates, Inc. d/b/a PPC v. International Communications Manufacturing Corporation, Randall A. Holliday, and Belden Inc.* in the United States District Court for the Western District of Wisconsin (Case No. 3:11-cv-00424-bbc).
35. *eTool Development, Inc., and eTool Patent Holdings Corp. v National Semiconductor Corporation* in the United States District Court for the Eastern District of Texas, Marshall Division (Case No. 2:08-cv-196).
36. *John Mezzalingua Associates, Inc. d/b/a PPC, Inc. v. PCT International, Inc.* in the United States District Court for the Western District of Texas, San Antonio Division (Case No. 5:09-cv-00410-RF).
37. *John Mezzalingua Associates, Inc. d/b/a PPC, Inc. v. PACE Electronics, Inc. (d/b/a PACE International) and Perfect 10 Antenna Company* in the United States District Court for the Western District of Minnesota (Case No. 0:10-cv-00064 MJD/JJG).
38. *John Mezzalingua Associates, Inc. d/b/a PPC, Inc. v. Hanjiang Fei Yu Electronics Equipment Factory, Zhongguang Electronics, Yangzhou Zhongguang Electronics Co., Ltd., and Yangzhou Zhongguang Foreign Trade Co., Ltd.* in Certain Coaxial Cable Connectors and Components Thereof and Products Containing Same, United States International Trade Commission, Washington, D.C. (Investigation No. 377-TA-650).
39. *Arrow Communication Laboratories, Inc. v. John Mezzalingua Associates, Inc.*, in the Northern District of New York (Civil Action No. 05-CV-1456 (NAM/DEP) (Lead Case); 05-CV-0703 (NAM/DEP) (Member Case).
40. *Agrizap Inc. v. Woodstream Corporation* in the United States District Court for the Eastern District of Pennsylvania (Case No. 04-CV-03925-RK).

41. *John Mezzalingua Associates, Inc. d/b/a PPC, Inc. v. Corning Gilbert, Inc.* in the United States District Court for the Western District of Wisconsin (Case No. 03-C-0354-S).
42. *John Mezzalingua Associates, Inc. d/b/a PPC, Inc. v. Arris International, Inc.* in the United States District Court for the Western District of Wisconsin (Case No. 03-C-0353-C).
43. *Arris International, Inc., and Randall A. Holliday, v. John Mezzalingua Associates, Inc. d/b/a PPC* in the United States District Court for the District of Colorado, Denver Division (Case No. CA 01-WM-2061).

REVIEWED PUBLICATIONS:

1. Eric E. Bensen, Charles A. Eldering, Jim Longacre, Anthony W. Shaw, Daniel H. Sherr, Matthew W. Stavish, and John M. White, "Patent Commentaries Analyzing the America Invents Act," *Lexis Nexis*, 2011.
2. Malcolm T. "Ty" Meeks and Charles A. Eldering, PhD, "Patent Valuation: Aren't We Forgetting Something? Making the Case for Claims Analysis in Patent Valuation by Proposing a Patent Valuation Method and a Patent-Specific Discount Rate Using the CAPM", *Northwestern Journal of Technology and Intellectual Property*, (Fall, 2010) Vol. 9, No. 3.
3. C.A. Eldering, "Technology and Competition: A Five-Year Outlook for the Telecommunications Marketplace," in *Communications Deregulation and FCC Reform*, J.A. Eisenach and R.J. May, eds. (Kluwer Academic Publishers, 2001).
4. S.C. Durant, E.J. Basinski, K.L. Cerrone, C.A. Eldering and M. Ishimaru, "Patent Portfolio Development," in *Electronic Software Patents: Law and Practice*, S.W. Lundberg and S.C. Durant, eds. (BNA Books, 2000).
5. C.A. Eldering, "Patents and Telecommunications", Guest Editorial in *IEEE Communications Magazine*, vol. 38, no. 7, p. 96 (July 2000).
6. C.A. Eldering, M.L. Sylla, J.A. Eisenach, "Is There a Moore's Law for Bandwidth?," in *IEEE Communications Magazine*, vol. 37, no. 10, pp. 117-121 (October 1999).
7. C.A. Eldering, "Impact and Results of Telecommunications Deregulation," Guest Editorial in *IEEE Communications Magazine*, vol. 37, no. 10, p. 98 (October 1999).
8. C.A. Eldering, "Prospects for Broadband Deployment in a Deregulated Environment", Guest Editorial in *IEEE Communications Magazine*, vol. 36, no. 7, p. 86 (July 1998).
9. S. Wang, S.T. Kowel, C.A. Eldering, "Differential Detection with Polymer-Based Etalon Modulators," *IEEE Journal of Lightwave Technology*, vol. 16, no. 3, pp. 448-452 (March 1998).
10. C.A. Eldering, J.P. Blasko, A. Brown, "Comparative Analysis of Provisional Patents Under US and UK Law," *Journal of the Patent and Trademark Office Society*, vol. 79, no. 11, pp. 791-881 (November 1997).
11. C.A. Eldering, "Customer Premises Equipment for Residential Broadband Networks," *IEEE Communications Magazine*, vol. 35, no. 6, pp. 114-121 (June 1997).
12. N. Omoigui, M. Sirbu, C.A. Eldering, and N. Himayat, "Comparing Integrated Broadband Architectures from an Economic and Public Policy Perspective," in *The Internet and Telecommunications Policy Research*, G.W. Brock and G.L. Rosston, eds. (Lawrence Erlbaum Associates, NJ, 1996).
13. C.A. Eldering, N. Himayat and F.M. Gardner, "CATV Return Path Characterization for Reliable Communications," *IEEE Communications Magazine*, vol. 33, no. 8, pp. 62-69 (August 1995).
14. D. Shen, S.T. Kowel, and C.A. Eldering, "Amorphous Silicon Thin-Film Photodetectors for Optical Interconnection," *Optical Engineering*, vol. 34, no. 3, pp. 881-886 (March 1995).
15. C.A. Eldering, F. Herrerias, R. Martín, P.J. García, "Burst Mode Clock Recovery System for Fiber Optic Receivers," *IEEE Journal of Lightwave Technology*, vol. 12, no. 2, pp. 271-279 (February 1994).
16. C.A. Eldering, "Theoretical Determination of Sensitivity Penalty for Burst Mode Fiber Optic Receivers," *IEEE Journal of Lightwave Technology*, vol. 11, no. 12, pp. 2145-2149 (December 1993).

17. C.A. Eldering and A. Martín, "An Out-of-Band Signalling Technique for Passive Optical Networks," *International Journal of Digital and Analog Communication Systems*, vol. 6, pp. 49-52 (1993).
18. C.A. Eldering, A. Dienes, and S.T. Kowel, "Time Response Limitations of Etalons as Calculated From Frequency Analysis," *Optical Engineering*, vol. 32, no. 3, pp. 464-468 (March 1993).
19. S.T. Kowel and C.A. Eldering, "Polymer Etalons and Free Space Interconnects," in *Polymers for Lightwave and Integrated Optics: Technology and Applications*, Lawrence A. Hornak, Editor (Marcel Dekker, 1992).
20. C.A. Eldering, A. Knoesen and S.T. Kowel, "Use of Fabry-Perot Devices for the Characterization of Polymeric Electro-Optic Films," *Journal of Applied Physics*, vol. 69, no. 6, pp. 3676-3686 (March 15, 1991).
21. C.A. Eldering, S.T. Kowel, M.A. Mortazavi and P. Brinkley, "Electro-Optic Polymer Materials and Devices for Global Optical Interconnects," *Applied Optics*, vol. 29, no. 8, pp. 1142-1149 (March 1990).
22. C.A. Eldering, S.T. Kowel, and A. Knoesen, "Electrically Induced Transmissivity Modulation in Polymeric Thin Film Fabry-Perot Etalons," *Applied Optics*, vol. 28, no. 20, pp. 4442-4445 (October 1989).
23. C.A. Eldering, S.T. Kowel, A. Knoesen, B.L. Anderson and B.G. Higgins, "Characterization of Modulated Spin-Coated and L/B Thin Film Etalons," *Thin Solid Films* vol. 179, pp. 535-542 (1989).
24. S.T. Kowel, R. Selfridge, C.A. Eldering, N. Matloff, P. Stroeve, B. Higgins, M.P. Srinivasan and L.B. Coleman, "Future Applications of Ordered Polymeric Thin Films," in *Thin Solid Films*, vol. 152, pp. 377-403 (1987).

PUBLICATIONS IN CONFERENCE PROCEEDINGS:

1. C.A. Eldering, "An Overview of Wired Broadband Access Systems," *Proceedings of the IEEE Sarnoff Symposium on Advances on Wired and Wireless Communications*, pp. 1-7 (Trenton, NJ, March 19, 1997).
2. R. Mason, N. Himayat, C.A. Eldering, N. Omoigui, M. Sirbu "Overview of Hybrid Fiber-Coax and Fiber-in-the-Loop Architectures," *Proceedings of the 1995 National Fiber Optic Engineers Conference*, pp. 284-291 (Boston, MA, June 18-22, 1995).
3. C.A. Eldering, F.M. Gardner, N. Himayat, "Performance Comparison of Multiple-Access Techniques in Hybrid Fiber-Coax Return Systems," *1995 Optical Fiber Conference Technical Digest* (San Diego, CA, Feb 26- Mar 3, 1995).
4. N. Himayat, C.A. Eldering, M. Kolber, E. Dickinson, "Characteristics of Hybrid Fiber-Coax Return Systems," *1995 SCTE Conference on Emerging Technologies Proceedings Manual* (Orlando, FL, Jan 4-6, 1995).
5. C.A. Eldering, M. Kauffman, D. Grubb, S. Warwick, and G. Hawley, "Engineering Requirements for Hybrid Fiber-Coax Telephony Systems," *1994 NCTA Technical Papers* (New Orleans, LA, May 23-25, 1994).
6. D.S. Shen, S.T. Kowel, and C.A. Eldering, "Amorphous Silicon Thin Film Photodetectors for Optical Interconnection", *Proceedings of the International Parallel Processing Symposium* (Cancún, Mexico, April 26-29, 1994).
7. C.A. Eldering, G. Van der Plas, and J. De Groote, "Burst and Bit Synchronization Methods for Passive Optical Networks," *Proceedings of the Fourth IEEE Workshop on Local Optical Networks* (Versailles, France, September 1992).
8. C.A. Eldering and A. Martín, "System Specification and Requirements for Fiber in the Loop Systems," *Proceedings of SPIE Symposium on Opto-Electronics/Fibers* (Boston, MA, September 1992).
9. C.A. Eldering, F. Neira and J. Rueda, "The First Generation of Fiber Provided Subscriber Services for Spain," *Proceedings, Telco 92* (Madrid, Spain, May 1992).

10. P.J. García, R. Martín, C.A. Eldering, A. Martín, "Consideraciones de Diseño de Sistemas TDM/TDMA por Fibra Optica para el Area de Distribución de Abonados," *Proceedings, TELECOM I+D* (Madrid, Spain, November 1991).
11. C.A. Eldering, S. Allaire, A. Martín, R. Martín, F. Marcel, "Transmitter and Receiver Requirements for Time Division Multiple Access Passive Optical Networks," *Proceedings of the Third IEEE Workshop on Local Optical Networks* (Tokyo, Japan, September 1991).
12. J. Rueda García and C.A. Eldering, "Subscriber Loop Optical Distribution Architecture (SODA): A Cost Effective TDM/TDMA Fiber System," *Fiber Networks for Telephony and CATV*, SPIE vol. 1578, pp. 68-78 (Boston, MA, September 1991).
13. D. Yankelevich, A. Knoesen, C.A. Eldering and S.T. Kowel, "Reflection-Mode Polymeric Interference Modulators," *Proceedings of the SPIE Symposium on Optical Applied Science and Engineering* (San Diego, CA, August 1991).
14. C.A. Eldering, A. Knoesen and S.T. Kowel, "Characterization of Polymeric Electro-Optic Films Using Metal Mirror/Electrode Fabry-Perot Etalons," *Nonlinear Optical Properties of Organic Materials III*, SPIE Vol. 1337, pp. 348-357 (San Diego, CA, July 1990).
15. M. Landgraf, C.A. Eldering, P.F. Brinkley and S.T. Kowel, "Receiver and Transmitter Designs for Optical Interconnects," *Optical Information-Processing Systems and Architectures II*, SPIE vol. 1347, pp. 580-591 (San Diego, CA, July 1990).
16. C.A. Eldering, S.T. Kowel , P. Brinkley, N. Matloff, T. Schubert, R. Gosula, "Fixed Optical Interconnects for Concurrent Computing Systems," *Optical Information Processing Systems and Architectures* , SPIE vol. 1151, pp. 72-82 (San Diego, CA, August 1989).
17. N. Matloff, T. Schubert, S. Kowel, C.A. Eldering and M. Loving, "Performance Analysis of the OPTIMUL Multiprocessor Interconnect," *Proceedings of the IEEE Phoenix International Conference on Computers and Communications* (Phoenix, AZ, 1989).
18. N. Matloff, S.T. Kowel and C.A. Eldering, "OPTIMUL: An Optical Interconnect for Multiprocessor Systems," *Proceedings of the 1988 ACM International Conference on Supercomputing*, (St- Malo, France, 1988).
19. D.J. Burns, M.T. Pronobis, C.A. Eldering and R.J. Hillman, "Reliability/Design Assessment by Internal Node Timing Margin Analysis Using Laser Photocurrent Injection," *Proceedings of the IEEE International Reliability Physics Symposium*, pp. 76-82 (Las Vegas, NV, 1984).
20. M.J. Walter, C.A. Eldering, K.M. Krevis and J.R. Haberer, "Internal Node Testing by Tester Aided Voltage Contrast," *Proceedings of the International Symposium for Testing and Failure Analysis*, pp. 156-161 (San Jose, CA, 1982).

PRESENTATIONS:

1. Eldering, C.A., Moderator, Panel on A Framework for Strategic Patenting, 8th Annual IP Dealmakers Forum (New York, 2021).
2. Eldering, C.A., Chair of Inaugural 2018 LF Dealmakers Forum (New York, NY, 2018).
3. Eldering, C.A., Moderator, Panel on Leveraging Data to Identify Valuable Patents, 5th Annual IP Dealmakers Forum (New York, NY, 2018).
4. Eldering, C.A., Moderator, Panel on Trade Secrets – What IP Investors Need to Know, 6th Annual IP Dealmakers Forum (New York, NY, 2016)
5. Eldering, C.A. and de Wit, S., IP Under the Microscope: Using Patent Valuation Wisely. Presentation to CIP Forum 2011 (Gothenburg, Sweden, 2011).
6. Eldering, C.A. What's a patent worth? Presentation to Princeton Chapter of American Society of Appraisers, Princeton, NJ (May 18, 2009).
7. Eldering, C.A. Patent Purchasing: What makes a patent transaction possible? 10th Annual Intellectual Property Institute – WSBA Continuing Legal Education, (March 11, 2005).

8. Eldering, C. A. and Paratore, B. Video Technology-Past, Present & Future. *United States Patent and Trademark Office Technology Fair*, (June 10, 2004).
9. Eldering, C.A. Testimony before the PA House Committee. *House Bill 1516*, (January 27, 2000).
10. Eisenach, J., R. May and Eldering, C.A. *Regulatory Overkill: Pennsylvania's Proposal to Breakup Bell Atlantic*, (December 16, 1999).
11. Eldering, C.A. Comments before the Federal Communications Commission. *Regulating Cable Internet Services*, (May 25, 1999).
12. Eldering, C.A. Panel participant in The ADSL Forum. *Washington DC Summit*, (March, 1999).
13. Eldering, C.A. Panel participant in Online Advertising: What It Is, Where It Is Going. *Speech in the Digital World: The First Amendment and Advertising*, sponsored by the Progress and Freedom Foundation, (November, 1998).
14. Eldering, C.A. Panel participant in Deregulating Digital Transport: The Bandwidth Crisis and the Role of Government. *Progress & Freedom Foundation's 5th Annual Cyberspace and the American Dream Aspen Summit 1998*, (August, 1998), broadcast on C-SPAN.
15. Eldering, C.A. Evolution of Broadband Access Technologies and Systems. *Networld + Interop '97; The 4th Annual Engineer Conference*, (May, 1997).
16. Eldering, C.A. An Overview of Wired Broadband Access Systems. *IEEE Sarnoff Symposium on Advances on Wired and Wireless Communications*, (March, 1997).
17. Eldering, C.A. Technology: Past and Present – The Impact of Network Competitors. Communications Media Center at New York Law School, *Seminar on Cable TV Franchise Renewals: Business as Usual or A Time for New Priorities?*, (November, 1996).
18. Eldering, C.A. Broadband Access Technologies. *The 8th Annual Digital Audio/Video Workshop*, (October, 1996).
19. Eldering, C.A. Burst Mode Receivers for Fiber Optic Networks. *1995 IEEE/LEOS Summer Topical Meetings on IC's for New Age Lightwave Communications*, (August, 1995).
20. Eldering, C.A. Performance Comparison of Multiple-Access Techniques in Hybrid Fiber-Coax Return Systems. *1995 Optical Fiber Conference*, (February, 1995).
21. Eldering, C.A. Characteristics of Hybrid Fiber-Coax Return Systems. *1995 SCTE Conference on Emerging Technologies*, (January, 1995).
22. Eldering, C.A. Engineering Requirements for Hybrid Fiber-Coax Telephony Systems. *NCTA Engineering Committees 1994 Technical Program*, (May, 1994).
23. Eldering, C.A. Burst and Bit Synchronization Methods for Passive Optical Networks. *Fourth IEEE Workshop in Local Optical Networks*, (September, 1992).
24. Eldering, C.A. Transmitter and Receiver Requirements for Time Division Multiple Access Passive Optical Networks. *Third IEEE Workshop on Local Optical Networks*, (September, 1991).
25. Eldering, C.A. Subscriber Loop Optical Distribution Architecture (SODA): A Cost Effective TDM/TDMA Fiber System. *Fiber Networks for Telephony and CATV*, (September, 1991).
26. Eldering, C.A. Fixed Optical Interconnects for Concurrent Computing Systems. *Optical Information Processing Systems and Architectures*, (August, 1989).

TEACHING APPOINTMENTS:

- University of California at Davis. Lecturer, Electronics Laboratory, (1987-88).
- State University of New York, Utica/Rome. Adjunct Professor, Electronics, (1985-86).

REPORTS, THESES, OTHER PUBLICATIONS:

1. Charles Eldering and Juan Gisone. Claims-based patent valuation. *Intellectual Asset Management Magazine*, (Issue 50 November/December 2011).
2. Charles A. Eldering, Technology, Patents & Licensing, Inc. and Expanse Networks, Inc., Amici Curiae Supporting MercExchange L.L.C., *eBay Inc. v. MercExchange L.L.C.*, on Writ of Certiorari to the United States Court of Appeals for the Federal Circuit (2006).
3. Keeler, P. and C.A. Eldering, S. Weiswasser, A. Weixel and H. Feld. *Reply Comments of Next Level Communications*, CC Docket No. 98-147. FCC Proceedings on Deployment of Wireline Services Offering Advanced Telecommunications Capability. (October 16, 1998).
4. Eisenach, J. and C.A. Eldering. *Comments of the Progress and Freedom Foundation*, CC Docket No. 98-146. FCC Proceedings on Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996. (September 14, 1998).
5. Eames, T., C.A. Eldering and J. Bernstein. *Reply Comments of Next Level Communications*, RM no. 9244, file no. CCB/CPD 98-15. FCC Proceedings on Petition of Alliance for Public Technology Requesting Issuance of Notice of Inquiry and Notice of Proposed Rulemaking to Implement Section 706 of the 1996 Telecommunications Act. (May 4, 1998).
6. Eames, T., C.A. Eldering and J. Bernstein. *Comments of Next Level Communications*, CC Docket No. 98-11. FCC Proceedings on Petition of Bell Atlantic Corporation for Relief from Barriers to Deployment of Advanced Telecommunications Services. (April 6, 1998).
7. Bernstein, J., T. Eames and C.A. Eldering. *Comments of Next Level Communications*, CC Docket No. 98-32. FCC Proceedings on Petition of Ameritech Corporation to Remove Barriers to Invest in Advanced Telecommunications Capacity. (April 6, 1998).
8. Eldering, C.A. and J. Bernstein. *Comments of Next Level Communications*, CC Docket No. 98-26. Petition of US West Communications, Inc. for Relief from Barriers to Deployment of Advanced Telecommunications Services. (April 6, 1998).
9. Eames, T. and C.A. Eldering. Going All-Digital. *Telephony*, (August 18, 1997).
10. Blasko, J.P., C.A. Eldering and A. Brown. Provisional Applications Offer Patentees Priority. *National Law Journal*, (June 16, 1997).
11. Eames, T., B. Weeks and C.A. Eldering. A Winning Solution. *Telephony*, (June 2, 1997): 150-162.
12. Eldering, C.A. Analysis of Fiber to the Curb and Fiber to the Home Architectures. Internal Report prepared for *Telettra España*. (August, 1990).
13. Eldering, C.A. Electro-Optic Polymeric Thin Films and Device. *Ph.D. Dissertation*, University of California, Davis, (1997).
14. Eldering, C.A., B.J. Walker, S.P. Ilitzki and D.J. Holtzhauer. Temperature Measurements Using Infrared Techniques. *Internal Government Report*, Rome Air Development Center (March, 1986).
15. Eldering, C.A. Evaluation of the Use of p-n Structures as Photodetectors in Silicon Integrated Circuits. *Master's Thesis*, (June, 1985), also published as a Government technical report, RADC-TR-85-123.

ISSUED US PATENTS:

1. U.S. Patent 11,166,074 Creating customized programming content
2. U.S. Patent 11,003,694 Learning systems for pangenetic-based recommendations
3. U.S. Patent 10,667,009 Profiling and identification of television viewers

4. U.S. Patent 10,438,240 Methods and systems using a multi-platform targeted advertising system to select advertisements within a target geographic area
5. U.S. Patent 10,379,812 Treatment determination and impact analysis
6. U.S. Patent 10,231,031 Queue based advertisement scheduling and sales
7. U.S. Patent 10,206,012 Queue based head-end advertisement scheduling method and apparatus
8. U.S. Patent 10,116,983 System and method for managing advertising in program streams
9. U.S. Patent 10,182,258 Profiling and identification of television viewers
10. U.S. Patent 10,104,414 Method and system for targeted advertisement filtering and storage
11. U.S. Patent 9,918,117 System and method for managing advertising in program streams
12. U.S. Patent 9,906,819 Advertisement management system for digital video streams
13. U.S. Patent 9,888,297 Queue based advertisement scheduling and sales
14. U.S. Patent 9,602,884 Customizing programming content
15. U.S. Patent 9,582,647 Attribute combination discovery for predisposition determination
16. U.S. Patent 9,544,631 Queue-based head-end advertisement scheduling method and apparatus
17. U.S. Patent 9,524,194 Performing services on behalf of physical devices
18. U.S. Patent 9,479,803 Alternative advertising in prerecorded media
19. U.S. Patent 9,473,814 Profiling and identification of television users
20. U.S. Patent 9,426,315 Grouping advertisement subavails
21. U.S. Patent 9,432,733 Queue based advertisement scheduling and sales
22. U.S. Patent 9,390,423 Methods and systems for verifying advertisements in a multi-platform targeted advertising system
23. U.S. Patent 9,232,252 Queue-based head-end advertisement scheduling method and apparatus
24. U.S. Patent 9,170,992 Treatment determination and impact analysis
25. U.S. Patent 9,165,604 Alternative advertising in prerecorded media
26. U.S. Patent 9,147,112 Advertisement Detection
27. U.S. Patent 9,124,949 Grouping advertisement subavails
28. U.S. Patent 9,043,827 Method and system for providing conditional access to encrypted content
29. U.S. Patent 9,031,870 Pangenetic Web User Behavior Prediction System
30. U.S. Patent 8,934,843 Weighting factor adjustment in adaptive antenna arrays
31. U.S. Patent 8,930,204 Determining lifestyle recommendations using aggregated personal information
32. U.S. Patent 8,837,920 Alternative Advertising in prerecorded media
33. U.S. Patent 8,813,126 Advertisement Filtering and Storage for Targeted Advertisement Systems
34. U.S. Patent 8,789,091 Queue based advertisement scheduling and sales
35. U.S. Patent 8,788,286 Side effects prediction using co-associating bioattributes
36. U.S. Patent 8,788,283 Modifiable attribute identification
37. U.S. Patent 8,776,111 Methods and systems for generating subscriber usage profiles in a multi-platform targeted advertising system
38. U.S. Patent 8,775,287 Method and system for determining insurance needs

39. U.S. Patent 8,677,401 Grouping advertisement subavails
40. U.S. Patent 8,667,536 Profiling and identification of television viewers
41. U.S. Patent 8,655,915 Pangenetic web item recommendation system
42. U.S. Patent 8,655,908 Predisposition modification
43. U.S. Patent 8,655,899 Attribute method and system
44. U.S. Patent 8,635,087 Aggregating personal information
45. U.S. Patent 8,634,652 Video entity recognition in compressed digital video streams
46. U.S. Patent 8,606,761 Lifestyle optimization and behavior modification
47. U.S. Patent 8,581,873 Elastomeric wave tactile Interface
48. U.S. Patent 8,577,296 Weighting factor adjustment in adaptive antenna arrays
49. U.S. Patent 8,570,938 Method and system for adaptive antenna array pairing
50. U.S. Patent 8,484,677 Advertisement monitoring system
51. U.S. Patent 8,473,457 Method of distributing contact and calendar records
52. U.S. Patent 8,458,121 Predisposition prediction using attribute combinations
53. U.S. Patent 8,458,097 System, method and software for healthcare selection based on pangenetic data
54. U.S. Patent 8,452,619 Masked data record access
55. U.S. Patent 8,424,043 Method and system for detecting unscheduled events and recording programming streams
56. U.S. Patent 8,417,675 Method of distributing contact and calendar records
57. U.S. Patent 8,386,519 Pangenetic web item recommendation system
58. U.S. Patent 8,374,387 Video entity recognition in compressed digital video streams
59. U.S. Patent 8,365,216 Video stream modification to defeat detection
60. U.S. Patent 8,358,204 Dynamic tactile interface
61. U.S. Patent 8,346,307 Method of displaying contact information
62. U.S. Patent 8,335,854 Performing services on behalf of low-power devices
63. U.S. Patent 8,326,648 System for secure mobile healthcare selection
64. U.S. Patent 8,306,975 Expanded interest recommendation engine and variable personalization
65. U.S. Patent 8,290,351 Alternative advertising in prerecorded media
66. U.S. Patent 8,280,633 Weather risk estimation system and method
67. U.S. Patent 8,273,425 Nanotube assisted self-cleaning material
68. U.S. Patent 8,266,256 Virtualization for low-power networks
69. U.S. Patent 8,258,956 RFID tag filtering and monitoring
70. U.S. Patent 8,255,403 Pangenetic web satisfaction prediction system
71. U.S. Patent 8,253,703 Elastomeric wave tactile interface
72. U.S. Patent 8,234,244 Method of distributing contact and calendar records
73. U.S. Patent 8,225,347 Advertisement filtering and storage for targeted advertisement systems
74. U.S. Patent 8,224,835 Expanding attribute profiles
75. U.S. Patent 8,209,319 Compiling co-associating bioattributes

- 76. U.S. Patent 8,200,509 Masked data record access
- 77. U.S. Patent 8,185,597 Providing notifications to an individual in a multi-dimensional personal information network
- 78. U.S. Patent 8,185,461 Longevity analysis and modifiable attribute identification
- 79. U.S. Patent 8,180,675 System and method for automatically managing avail inventory data and avail pricing
- 80. U.S. Patent 8,151,295 Queue based advertisement scheduling and sales
- 81. U.S. Patent 8,150,422 Method of displaying contact information
- 82. U.S. Patent 8,126,486 Adaptive antenna weighting system for wireless local area and personal area networks
- 83. U.S. Patent 8,121,915 Generating financial plans using a personal information aggregator
- 84. U.S. Patent 8,116,616 Alternative advertising in prerecorded media
- 85. U.S. Patent 8,108,406 Pangenetic web user behavior prediction system
- 86. U.S. Patent 8,099,424 Treatment determination and impact analysis
- 87. U.S. Patent 8,087,045 Grouping advertisement subavails
- 88. U.S. Patent 8,077,021 Dynamic tactile interface
- 89. U.S. Patent 8,075,980 Diffraction grating assisted self-cleaning material
- 90. U.S. Patent 8,073,708 Aggregating personal healthcare information
- 91. U.S. Patent 8,073,194 Video entity recognition in compressed digital video streams
- 92. U.S. Patent 8,072,314 Secondary card reader
- 93. U.S. Patent 8,065,324 Weight and diet attribute combination discovery
- 94. U.S. Patent 8,055,643 Predisposition modification
- 95. U.S. Patent 8,051,033 Predisposition prediction using attribute combinations
- 96. U.S. Patent 8,046,798 Profiling and identification of television viewers
- 97. U.S. Patent 8,024,348 Expanding attribute profiles
- 98. U.S. Patent 7,984,466 Advertising management system for digital video streams
- 99. U.S. Patent 7,970,827 Providing notifications to an individual in a multi-dimensional personal information network
- 100.U.S. Patent 7,962,934 Advertising monitoring system
- 101.U.S. Patent 7,952,480 RFID tag filtering and monitoring
- 102.U.S. Patent 7,949,565 Privacy-protected advertising system
- 103.U.S. Patent 7,941,434 Efficiently compiling co-associating bioattributes
- 104.U.S. Patent 7,941,329 Insurance optimization and longevity analysis
- 105.U.S. Patent 7,933,912 Compiling co-associating bioattributes using expanded bioattribute profiles
- 106.U.S. Patent 7,930,714 Video detection and insertion
- 107.U.S. Patent 7,917,438 System for secure mobile healthcare selection
- 108.U.S. Patent 7,870,576 Targeted advertising through electronic program guide
- 109.U.S. Patent 7,844,609 Attribute combination discovery
- 110.U.S. Patent 7,818,310 Predisposition modification

111.U.S. Patent 7,810,114	Advertisement filtering and storage for targeted advertisement systems
112.U.S. Patent 7,809,154	Video entity recognition in compressed digital video streams
113.U.S. Patent 7,801,956	Providing notifications to an individual in a multi-dimensional personal information network
114.U.S. Patent 7,797,302	Compiling co-associating bioattributes
115.U.S. Patent 7,694,318	Video detection and insertion
116.U.S. Patent 7,690,013	Advertisement monitoring system
117.U.S. Patent 7,690,011	Video stream modification to defeat detection
118.U.S. Patent 7,689,682	Obtaining lists of nodes of a multi-dimensional network
119.U.S. Patent 7,500,258	Advertisement subgroups for digital streams
120.U.S. Patent 7,440,674	Alternative advertising in prerecorded media
121.U.S. Patent 7,432,811	RFID tag filtering and monitoring
122.U.S. Patent 7,420,458	Secondary card reader
123.U.S. Patent 7,331,057	Grouping advertisement subavails
124.U.S. Patent 7,328,448	Advertisement distribution system for distributing targeted advertisements in television systems
125.U.S. Patent 7,313,811	Optical conversion device
126.U.S. Patent 7,298,264	RFID tag filtering and monitoring
127.U.S. Patent 7,260,823	Profiling and identification of television viewers
128.U.S. Patent 7,240,355	Subscriber characterization system with filters
129.U.S. Patent 7,177,844	Apparatus and method for activation of a security module in a set-top retail environment
130.U.S. Patent 7,152,237	Delivering advertisements to the set-top-box
131.U.S. Patent 7,150,030	Subscriber characterization system
132.U.S. Patent 7,062,510	Consumer profiling and advertisement selection system
133.U.S. Patent 7,039,932	Queue-based head-end advertisement scheduling method and apparatus
134.U.S. Patent 6,915,530	Ingress detection and characterization by time/frequency map
135.U.S. Patent 6,882,709	Enhanced broadband telephony services
136.U.S. Patent 6,880,170	Ingress detection and attenuation
137.U.S. Patent 6,820,277	Advertising management system for digital video streams
138.U.S. Patent 6,714,917	Subscriber identification based on electronic program guide data
139.U.S. Patent 6,704,930	Advertisement insertion techniques for digital video streams
140.U.S. Patent 6,684,194	Subscriber identification system
141.U.S. Patent 6,615,039	Advertisement subgroups for digital streams
142.U.S. Patent 6,560,578	Advertisement selection system supporting discretionary target market characteristics
143.U.S. Patent 6,457,010	Client-server based subscriber characterization system
144.U.S. Patent 6,324,519	Advertisement auction system
145.U.S. Patent 6,321,384	Noise reduction in cable return paths

146.U.S. Patent 6,317,884	Video, data, and telephony gateway
147.U.S. Patent 6,298,348	Consumer profiling system
148.U.S. Patent 6,216,129	Advertisement selection system supporting discretionary target market characteristics
149.U.S. Patent 6,078,593	Method and apparatus for reliable operation of universal voice grade cards
150.U.S. Patent 5,881,362	Method of ingress noise reduction in cable return paths
151.U.S. Patent 5,742,591	Interference cancellation system for CATV return transmissions
152.U.S. Patent 5,479,451	Method and device for data recovery in burst mode systems
153.U.S. Patent 5,408,525	Diverter interface between two telecommunication lines and a station set
154.U.S. Patent 5,357,588	Opto-electronic transducer device for optical link termination equipment and application thereof to various types of optical link
155.U.S. Patent 4,813,772	Electro-optical interface
156.U.S. Patent 4,698,587	Method of characterizing critical timing paths and analyzing timing related failure modes in very large scale integrated circuits

FUNDED RESEARCH PROPOSALS:

- Raised \$3.6 million in capital (December 1999 through April 2000) for Expanse Networks, Inc. for development of systems and intellectual property in the area of targeted advertising.
- Kowel, S.T., A. Knoesen (principal investigators) and C.A. Eldering (proposal co-author), *Polymeric Ultrathin Film Multilayered Modulators*, funded by NSF Quantum Electronics, Waves and Beams Program for approximately \$300,000 over 3 years.

PROFESSIONAL ACTIVITIES AND PUBLIC RECOGNITION:

- Recognized in *IAM Strategy 250 – The World's Leading IP Strategists* published by *Intellectual Asset Management (IAM) Magazine* (2009-2011). *IAM Strategy 300* (2012-2013).
- Certified Passive Home Consultant, *Passive Home Institute*.
- Guest Editor. Feature topic: Patents and Telecommunications. *IEEE Communications Magazine* (July, 2000).
- Cited in "Who Owns the Knowledge Economy? Patent Wars." *The Economist*, (April 8-14, 2000).
- Cited in "Access: Not a Rocket Science" *Cable World*, (February, 2000).
- Cited in "Patents Considered Vital to Thrive on the Internet." *New York Times Outlook 2000*, (December, 1999).
- Guest Editor for Feature topic: Broadband Technologies and Trials. *IEEE Communications Magazine* (October, 1999).
- Guest Editor for Feature topic: Broadband Deployment in a Deregulated Environment. *IEEE Communications Magazine* (July, 1998).
- Member of *Network Reliability and Interoperability Council* and contributor to NRIC reports to FCC on interoperability and telecommunications deregulation.
- Senior Member, *IEEE*.
- Chair, *Access Subcommittee of IEEE Communications Society*.
- Member, Technical Program Committee and Session Chair, *IEEE Communications Society Broadband '96 Conference*.
- Invited speaker, 1995 *IEEE/LEOS Summer Topical Meeting*.

- Co-chair, 1991 *SPIE Fibers '91 Conference*.
- Chair, 1993 *SPIE Conference on LANs and MANS*.
- Invited participant, 1990 *Gordon Conference on Organic Thin Films*.

LANGUAGES:

- English: native language
- Spanish: speak, read, and write
- Portuguese: speak, read and write
- German: working knowledge
- Italian: working knowledge