

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the application of: Wehrli *et al.*

Application number: 15/610,504

Filed: May 31, 2017

For: *Improved High Performance Data Communications Cable*

Attorney Docket No.: 096001-1205 (BEL-001USCN)

Art Unit: 2847

Examiner: Mayo III, William H.

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MS Amendment  
Commissioner for Patents  
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Alexandria, VA 22313-1450

**RESPONSE TO NON-FINAL OFFICE ACTION**

Dear Examiner Mayo:

**INTRODUCTORY COMMENTS**

This Response is filed responsive to the non-final Office Action dated July 3, 2017. In view of the comments set forth below, Applicants respectfully urge reconsideration, withdrawal of the outstanding rejections and allowance of the Claims.

**Listing of Claims** begins on page 2 of this paper.

**Remarks/Arguments** begin on page 5 of this paper.

**LISTING OF CLAIMS**

The following Listing of Claims is currently pending in this application.

**Listing of Claims**

1. (Original) A cable, comprising:
  - a first twisted pair of insulated conductors;
  - a second twisted pair of insulated conductors;
  - a filler separating the first twisted pair of insulated conductors from the second twisted pair of insulated conductors; and
  - a multi-layer conductive barrier tape comprising a continuous conductive material contained between two layers of a dielectric material, the conductive material of the barrier tape extending to each lateral edge of the two layers of the dielectric material, the barrier tape surrounding the first twisted pair of insulated conductors, the second twisted pair of insulated conductors, and the filler.
2. (Original) The cable of claim 1, wherein the filler comprises a dielectric material.
3. (Original) The cable of claim 1, wherein the filler has a helical twist at a first angle.
4. (Original) The cable of claim 3, wherein the barrier tape has a helical twist at a second angle.
5. (Original) The cable of claim 4, wherein the second angle is equal to the first angle.
6. (Original) The cable of claim 4, wherein the second angle varies along the length of the cable.
7. (Original) The cable of claim 4, wherein the second angle varies between the first angle and a third angle, distinct from the first angle.

8. (Original) The cable of claim 4, wherein the second angle varies between a first value, less than the first angle, and a second value, greater than the first angle.

9. (Original) The cable of claim 3, wherein the first twisted pair of insulated conductors and the second twisted pair of insulated conductors have a helical twist around the filler at the first angle.

10. (Original) The cable of claim 1, wherein the filler comprises at least one arm.

11. (Original) The cable of claim 10, wherein a seam of the barrier tape is positioned above a terminal portion of an arm of the filler.

12. (Original) The cable of claim 10, wherein the filler comprises four arms in a cross shape.

13. (Original) The cable of claim 10, wherein each arm ends in a symmetrical terminal portion.

14. (Original) The cable of claim 10, wherein the terminal portion of each arm is wider than a middle portion of said arm.

15. (Original) The cable of claim 10, wherein the terminal portion of each arm has a trapezoidal profile.

16. (Original) The cable of claim 10, wherein a pair of arms of the filler forms a channel; and wherein the first twisted pair of insulated conductors is positioned within the channel.

17. (Original) The cable of claim 1, further comprising a jacket surrounding the conductive barrier tape.

18. (Original) A method of manufacture of a cable, comprising:

providing a first twisted pair of insulated conductors and a second twisted pair of insulated conductors;

positioning a filler between the first twisted pair of insulated conductors and the second twisted pair of insulated conductors; and

wrapping the first twisted pair of insulated conductors, second twisted pair of insulated conductors, and filler with a conductive barrier tape comprising a conductive material contained between two layers of a dielectric material, the conductive material of the barrier tape extending to each lateral edge of the two layers of the dielectric material.

19. (Original) The method of claim 18, further comprising:

helically twisting the filler at a first angle; and

helically twisting the conductive barrier tape at the first angle.

20. (Original) The method of claim 18, further comprising:

helically twisting the filler at a first angle; and

helically twisting the conductive barrier tape at an angle varying between the first angle and a second angle.

**REMARKS**

Claims 1-20 were presented for examination, and all Claims were rejected. No Claims are amended or canceled herein. Claims 1-20 are currently pending, of which Claims 1 and 18 are independent. Applicants submit that Claims 1-20 are patentable and in condition for allowance.

The following comments address all stated grounds of rejection. Applicants traverse all pending rejections and urge the Examiner to pass the Claims to allowance in view of the remarks set forth below.

**OBJECTION TO THE DRAWINGS**

In the Office Action, the Examiner objected to Figures 1-3D as lacking proper cross-hatching. Applicants respectfully submit that the Examiner may have inadvertently considered the drawings originally filed in the parent Application No. 14/520,125, rather than the present drawings. During prosecution of the parent application, the Examiner objected to the original figures as lacking proper cross-hatching, and Applicants amended the application, replacing the original figures with figures including cross-hatching copied from MPEP 608.02 at the Examiner's request. The Examiner approved those replacement drawings and allowed the parent application.

In filing the present application, Applicants included the replacement drawings approved by the Examiner during prosecution of the parent application, rather than the original drawings. Accordingly, Applicants submit that the present drawings meet all of the requirements of MPEP 608.02, and respectfully request the Examiner to withdraw the objection to the drawings.

**OBJECTION TO THE SPECIFICATION**

In the Office Action, the Examiner objected to the Abstract as referring to purported merits or speculative applications. As discussed above, Applicants believe the Examiner may have inadvertently considered the specification of the parent application. The present Abstract, reproduced below, is identical to the amended Abstract approved by the Examiner in the parent application, and includes no statements of merit or speculative applications:

Two electromagnetic interference (EMI) controlling tape application methodologies for unshielded twisted pair (UTP) cable include Fixed Tape Control (FTC) and Oscillating Tape Control

(OTC). In FTC, tape application angle and edge placement are controlled to maintain position of the tape edges over a base of nonconductive filler in the cable. In OTC, the tape application angle is continuously varied, resulting in crossing of the tape edges over all of the pairs of conductors with varying periodicity. In both implementations, the filler allows a cylindrical shape.

Accordingly, Applicants respectfully request the Examiner to withdraw the objection to the specification.

### **DOUBLE PATENTING**

Claims 1-20 were rejected on the ground of nonstatutory double patenting over Claims 1-17 of U.S. Patent No. 9,697,929. Applicants file herewith a terminal disclaimer over U.S. Patent No. 9,697,929, obviating this rejection.

### **CLAIM REJECTIONS UNDER 35 U.S.C. §103**

#### **I. Claims 1-20 Rejected under 35 U.S.C. §103**

Claims 1-3, 9-13, and 16-18 were rejected under 35 U.S.C. §103 as unpatentable over U.S. Patent No. 6,812,408 to Clark *et al.* (“Clark”) in view of U.S. Patent No. 3,622,683 to Roberts (“Roberts”). Claims 4, 5, 14, and 19 were rejected under 35 U.S.C. §103 as unpatentable over Clark and Roberts in further view of U.S. Publication No. 2012/0222883 to Nordin *et al.* (“Nordin”). Claims 6-8 were rejected under 35 U.S.C. §103 as unpatentable over Clark, Roberts, and Nordin in further view of U.S. Publication No. 2012/0227998 to Lindstrom *et al.* (“Lindstrom”). Claim 15 was rejected under 35 U.S.C. §103 as unpatentable over Clark, Roberts, and Nordin in further view of U.S. Patent No. 6,365,836 to Blouin *et al.* (“Blouin”). Claim 20 was rejected under 35 U.S.C. §103 as unpatentable over Clark, Roberts, and Nordin, in further view of Lindstrom. Claim 20 was also rejected under 35 U.S.C. §103 as unpatentable over Nordin and Lindstrom, in further view of G.B. Patent No. 988,789 to Smith Corp. (“Smith”). Applicants respectfully traverse these rejections.

#### **A. Claims 1 and 18 Patentable over Clark and Roberts**

MPEP 2143.01 notes that “[o]bviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so.” *Citing to In re Kahn*, 441 F.3d 977, 986 (Fed. Cir. 2006).

However, MPEP 2143.01(VI) explains that such teachings, suggestions, or motivations are inadequate, where they change the principle of operation of the reference:

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 813 (CCPA 1959). (emphasis added)

Applicants submit that the present rejection is improper, because it requires changing the principle of operation of the cited art.

Claim 1 is directed to a cable, and recites, in part:

a first twisted pair of insulated conductors;  
a second twisted pair of insulated conductors; ... and  
a multi-layer conductive barrier tape comprising a continuous conductive material contained between two layers of a dielectric material,... the barrier tape surrounding the first twisted pair of insulated conductors, the second twisted pair of insulated conductors... (emphasis added)

Claim 18 recites similar limitations.

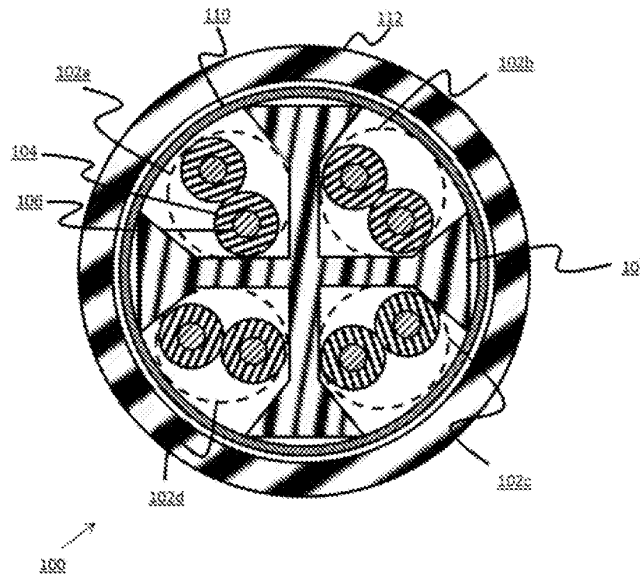
As the Examiner admits on page 8, Clark fails to disclose a barrier tape comprising a conductive material in-between two dielectric layers. Instead, the Examiner cites Roberts for this feature, noting that Roberts describes “a conductive barrier tape comprising an aluminum layer coated on both sides by a dielectric layer such as mylar, for the purpose of reducing crosstalk between adjacent conductors, which result from barrier tapes having one dielectric layer laminated to aluminum.” (page 8, emphasis added). The Examiner contends that it would be obvious to combine the teachings of Clark and Roberts “because Roberts teach[es] that such a configuration provides a communications cable (Figs 1-24) that reduces crosstalk between adjacent conductors, which results from barrier tapes only having one dielectric layer laminated to aluminum.” (page 9, emphasis added). The Examiner supports this rationale by quoting Roberts, col. 3, lines 27-51, which states:

When a signal is transmitted over any circuit in this cable, it is permissible */sic/* to consider an electromagnetic field as spreading out from this circuit in the form of a wave motion. This wave reaches other conductors and may induce currents and electromotive forces in other circuits unless they are perfectly balanced. The first of these circuits may be called the disturbing and the other the disturbed circuit. If the disturbing and disturbed

circuits are on opposite sides of a shield, it is obvious that the disturbance is reduced due to the attenuation the wave energy undergoes when passing through a shield and such reflections as may occur. This object is achieved in the instant invention by using a piece of metal (copper, aluminum, silver, steel, and etc.) foil, either per se, coated on both sides, coated only on one side, or completely surrounded by a plastic such as polyethylene, polypropylene, or polyethylene teraphthalate (Mylar). It is, however, one of the many preferred embodiments of the instant invention to use aluminum foil coated on both sides with a plastic. The reason for this preference is that the instant invention uses the plastic coating of the metal (aluminum) foil as a dielectric to keep unwanted currents [emitting from pinholes in the insulation of individual electrical conductors], from reaching the metallic shield (aluminum foil). It is quite obvious that when a metal foil, coated only on one side, is employed, that the bundle of electrical conductors in nearest proximity therewith is not protected by a dielectric from the electrical conductors, other than that dielectric used as the insulation on the electrical conductors themselves. Thus, there is in this instance a preference for the aluminum foil shield, coated on both sides with the polyethylene teraphthalate (Mylar) dielectric. (emphasis added)

Thus, as the Examiner notes, Roberts teaches the use of a shield, made of aluminum foil coated on both sides, deployed between two conductors or a “disturbing” and a “disturbed” circuit, to prevent crosstalk between these circuits.

However, the barrier tape of Claim 1 is not deployed *between* the conductors, but instead is deployed “*surrounding* the first twisted pair of insulated conductors [and] the second twisted pair of insulated conductors. An example implementation is shown in FIG. 1, reproduced below, showing the barrier tape 110 around conductor pairs 102a-102d:



As shown, the barrier tape 110 is not deployed between any pair of conductors. Therefore, they cannot be considered “disturbing and disturbed circuits... on opposite sides of a shield” where “it is obvious that the disturbance is reduced due to the attenuation the wave energy undergoes when passing through a shield and such reflections as may occur,” as taught by Roberts. In fact, for the claimed barrier tape to “reduce crosstalk between adjacent conductors” despite not being deployed between the conductors, as the Examiner contends is the motivation to combine Clark and Roberts, the principle of operation of Roberts’ shield (and indeed, known physics) would have to be modified.<sup>1</sup>

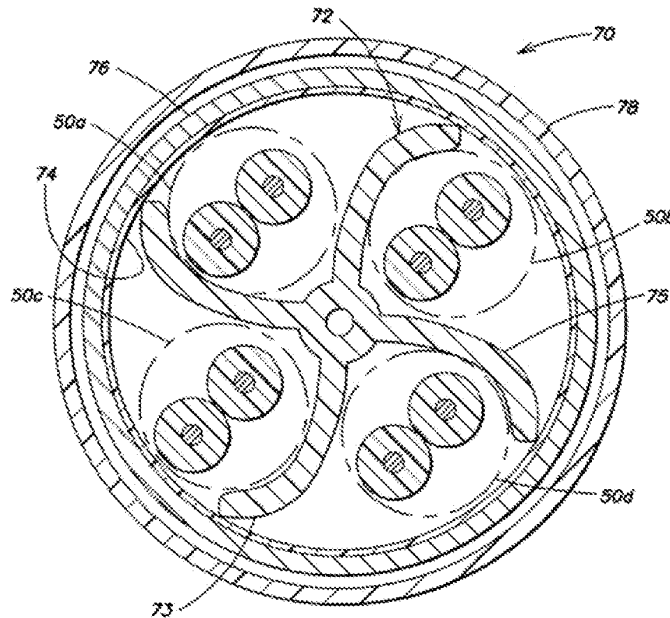
Because one must change the principle of operation of Roberts’ shield to reduce crosstalk between the claimed pairs of insulated conductors when the barrier tape is positioned *surrounding* the claimed pairs of insulated conductors, rather than between them, there is no motivation to combine Roberts with Clark to result in the claimed invention under MPEP 2143.01(VI). Therefore, Applicants respectfully submit that the rejection of Claim 1 is improper and should be withdrawn.

<sup>1</sup> Applicants note that Clark describes at para. 48 the use of an aluminum/mylar separator or filler 72 *between* the conductors to reduce crosstalk between the twisted pairs of the cable. Thus, the Examiner’s rationale to combine Clark and Roberts to reduce crosstalk between the conductors would be correct, *if* Applicants were claiming a metalized filler. However, this rationale does not apply to the claimed barrier tape.

**B. Dependent Claim 11 Patentable over Clark and Roberts**

Dependent Claim 11 depends from Claim 1 and is therefore patentable for at least the reasons discussed above. Furthermore, Claim 11 has its own independent basis for patentability.

Claim 11 recites, in part, that “a seam of the barrier tape is positioned above a terminal portion of an arm of the filler.” (emphasis added). In rejecting this Claim, the Examiner notes that Clark describes that “the barrier tape (76) is positioned above the terminal portion (i.e. ends) of the arms (75) of the filler (72, Fig 2).” (page 7). FIG. 2 of Clark is reproduced below:



While Clark does show a shield positioned above the terminal portions of the arms of the fillers (as well as above every other part of the filler), Clark does not show – nor does the Examiner contend that Clark shows – a seam of the barrier tape positioned above a terminal portion of an arm.<sup>2</sup>

Because Clark is silent regarding placement of a *seam* of the barrier tape, Applicants submit that Claim 11 is independently patentable over the cited art and in condition for allowance.

<sup>2</sup> In fact, Clark suggests at para. 48 the use of a metalized separator 72 in contact with a surrounding conductive shield 76 to “form conductive compartments.” Due to the small size of Clark’s terminal portions and their contact points with the separator, to ensure proper connection, one of skill in the art reading the teachings of Clark would likely position a seam of the shield at any point *except* above the terminal portions of the arms. Regardless, Clark is silent regarding any such positioning.

C. Dependent Claims 2-10, 12-17, and 19-20 Patentable

As discussed above in connection with the rejections of Claims 1 and 18, Applicants submit that these Claims are patentable and in condition for allowance. Claims 2-10 and 12-17 depend upon and incorporate all of the patentable subject matter of Claim 1. Claims 19-20 depend upon and incorporate all of the patentable subject matter of Claim 18. Therefore, Claims 2-10, 12-17, and 19-20 are also patentable and in condition for allowance.

For at least the above-discussed reasons, Applicants submit that Claims 1-20 are patentable over the cited art and in condition for allowance. Accordingly, Applicants respectfully request the Examiner to withdraw the rejections of Claims 1-20 under 35 U.S.C. §103.

**CONCLUSION**

In light of the aforementioned arguments, Applicants contend that each of the Examiner's rejections have been adequately addressed and all of the pending Claims are in condition for allowance. Accordingly, Applicants respectfully request reconsideration, withdrawal of all grounds of rejection, and allowance of all of the pending Claims.

Should the Examiner feel that a telephone conference with Applicants' attorney would expedite prosecution of this application, the Examiner is urged to contact the Applicants' attorney at the telephone number identified below.

Respectfully submitted,

FOLEY & LARDNER LLP

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