Jan. 20, 1953 T. K. COX 2,626,302

CABLE WITH WEAKENED STRIPPING PLANE

Filed Sept. 9, 1947

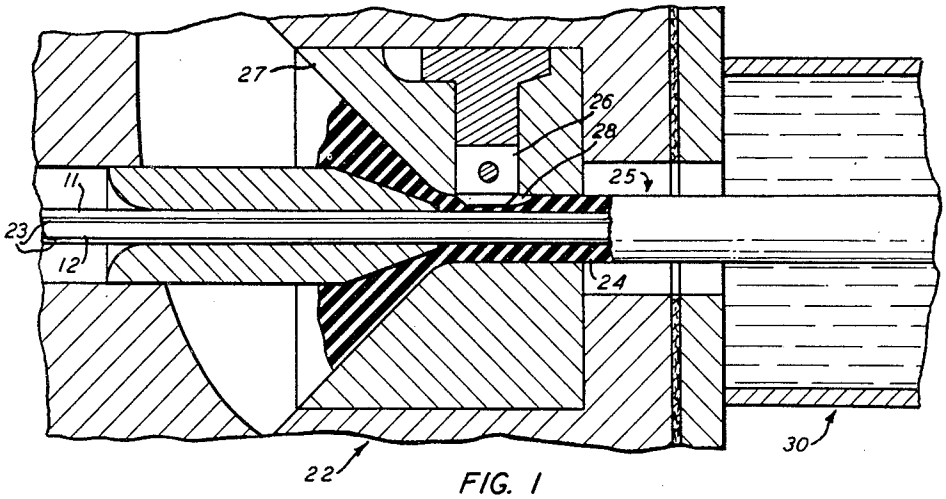


FIG. 1

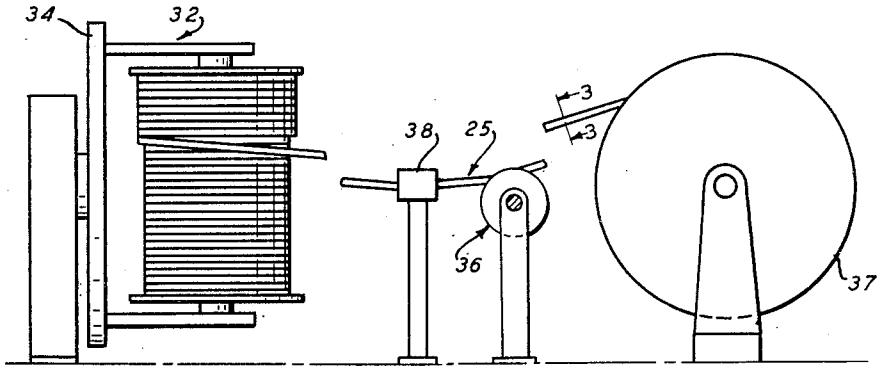


FIG. 2

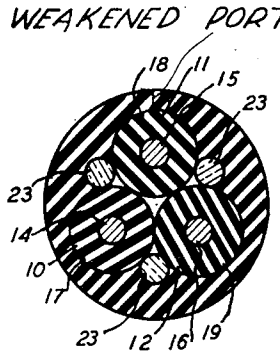


FIG. 3

INVENTOR
T. K. COX

BY
ATTORNEY

Patented Jan. 20, 1953

2,626,302

UNITED STATES PATENT OFFICE

2,626,302

CABLE WITH WEAKENED STRIPPING PLANE

Thomas K. Cox, Randallstown, Md., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

Application September 9, 1947, Serial No. 773,005

3 Claims. (Cl. 174—113)

1

This invention relates to electrical cables, and more particularly to electrical cables with weakened stripping planes.

In the use of electrical cables of a type which includes a plurality of individually insulated conductors twisted together and enclosed in a tough weatherproofing jacket, it is often necessary to remove end portions of the jacket of such a jacketed conductor in order to connect the individually insulated conductors thereof to electrical apparatus. Such removal of the jacket, which is formed of very tough material, is difficult.

An object of the invention is to provide new and improved electrical cables.

A further object of the invention is to provide a multi-conductor cable having a packet thereabout which is provided with a weakened portion extending along one of the conductors.

An electrical cable illustrative of certain features of the invention includes a plurality of individually insulated, bunched conductors, and a jacket enclosing the conductors and having a weakened stripping plane extending along one of said conductors.

A complete understanding of the invention may be obtained from the following detailed description of a cable embodying the invention, when read in conjunction with the appended drawings, in which:

Fig. 1 is a fragmentary, sectional view of an apparatus for performing some of the operations used in making the cable;

Fig. 2 is a front elevation of an apparatus for performing another operation used in making the cable, and

Fig. 3 is an enlarged, vertical section taken along line 3—3 of Fig. 2.

Referring now in detail to the drawings, individually insulated conductors 10, 11 and 12, which include solid conductors 14, 15 and 16, respectively, and colored coverings 17, 18 and 19, respectively, each of which coverings is of a color different from that of the other coverings, are advanced through an extruder 22 in parallel, spaced relationship together with Fiberglas strands 23—23 (Fig. 3), and the extruder forms a jacket 24 around the individually insulated conductors and the strands to form a jacketed cable 25. The jacket 24 is composed of a jacketing compound including a thermoplastic material, such as a copolymer of vinyl chloride and vinyl acetate, and as it is formed around the individually insulated conductors and the strands 23—23, a knife 26 projecting from a die 27 forms a slit 28 in the jacket along the conductor 11. The

2

portion of the die beyond the knife closes the slit while the material is still somewhat plastic so that a smooth exterior surface is imparted to the jacket.

The molecules of the portions of the jacket on each side of the slit are oriented by the knife so that they extend lengthwise with respect to the conductor, and the resealed portions of the jacket form a cleavage plane along which the jacket has its least tear resistance. However, the tear resistance of the jacket along the cleavage plane is sufficiently high to withstand all the stresses ordinarily encountered in the normal use of the jacketed conductor 25. Thus, the tear resistance of the portion of the jacket along the cleavage plane is lowest without decreasing the abrasion resistance of this portion of the jacket since the slit is resealed and the exterior surface of the jacket is completely smooth.

The jacketed cable 25 then is advanced from the extruder into and through a cooling trough 30, into which cold water is introduced, which cools the jacket 24. Although the slit 28 is closed and the sides thereof are sealed together, the jacket is substantially weaker along the slit 28 than it is at any other portion thereof, and the color of the covering 18 adjacent to the slit 28 locates the slit for stripping operations of the jacket during installation of the jacketed cable.

After the jacket 24 has been formed over the three conductors 10, 11 and 12, the jacketed cable 25 is placed on a revolving supply unit 34 of a twister 32 (Fig. 2) which also includes a takeup capstan 36 and a takeup reel 37. The supply unit twists the cable as the takeup capstan 36 advances it therefrom through a guide 38. This twisting twists the individually insulated conductors 10, 11 and 12 together so that the cable will have the proper electrical characteristics and flexibility. The twister 32 serves to twist the solid conductors 14, 15 and 16 sufficiently beyond their elastic limits to cause these conductors to hold the entire cable in its twisted form.

While the outer surface of the jacket 24 is completely smooth and unmarked, it has a cleavage plane along the insulated conductor 11 where the slit 28 was formed. Thus, the coloring of the covering 18 of the insulated conductor 11 locates the weakened portion of the jacket so that the end portions of the jacket may be easily stripped from the end portions of the individually insulated conductors 10, 11 and 12. Although the tear resistance of the jacket 24 is weakened somewhat along the cleavage plane, this portion of the jacket has sufficient strength to withstand

ordinary usage of the jacketed conductor, and is completely watertight.

If it is wished to form the jacket 24 from a thermosetting type of plastic, such as rubber compound or a compound containing a synthetic, rubber-like material, the above-described method may be used if vulcanization is substituted for the step of cooling the jacket after it has been extruded. Furthermore, other thermoplastic materials, as well as thermosetting materials, may be used in place of the co-polymer of vinyl chloride and vinyl acetate. For example, polymerized ethylene, polymerized isobutylene or polymerized vinyl chloride may be used in place of the co-polymer of vinyl chloride and vinyl acetate. Jacketed cables having either more or less than three individually insulated conductors may be formed by the above-described method.

What is claimed is:

1. An electrical cable, which comprises a plurality of individually insulated, bunched-together conductors, and an outermost jacket enclosing the conductors and having a weakened, sealed portion extending along one of said conductors and extending radially toward said one of said conductors from the exterior of said jacket.

2. An electrical cable, which comprises a plurality of individually insulated conductors, each of said conductors having a covering of a coloring different from those of the others, and an outside jacket composed of thermoplastic compound enclosing the conductors and having an invisible, sealed cleavage plane extending radially along one of the conductors, whereby the invisible cleavage plane of the jacket may be located

at the conductor end by a color of the covering of that conductor.

3. An electrical cable, which comprises at least three individually insulated conductors, and an outside tight-fitting jacket composed of thermoplastic compound enclosing the conductors, said jacket and said conductors being twisted to a predetermined pitch along substantially the entire length thereof, said jacket being integral throughout and having a weakened portion extending along one of said conductors and extending radially inwardly toward said one of said conductors from the exterior of the jacket.

THOMAS K. COX.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
170,266	Hoogeveen	Nov. 23, 1875
1,627,740	Hosford	May 10, 1927
1,940,917	Okazaki	Dec. 26, 1933
2,106,048	Candy	Jan. 18, 1938
2,204,782	Wermine	June 18, 1940
2,232,085	Troche	Feb. 18, 1941
2,413,715	Kemp et al.	Jan. 7, 1947

FOREIGN PATENTS

Number	Country	Date
530,297	England	Dec. 9, 1940
544,427	England	Apr. 13, 1942
681,220	Germany	Sept. 18, 1939