

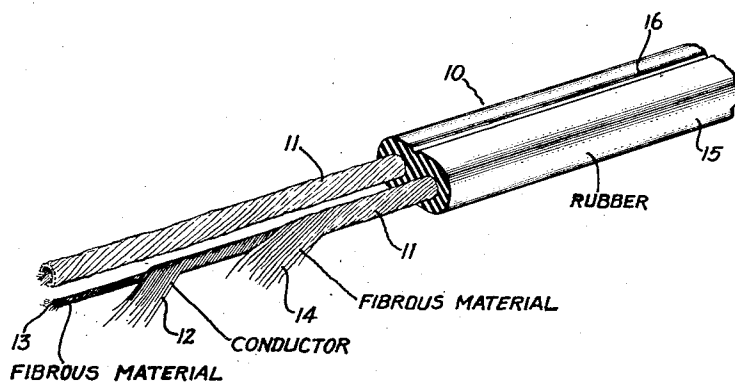
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ELECTRIC CORD

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ELECTRIC CORD

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2 Claims. (Cl. 174—121)

This invention relates to an electric cord, and more particularly to an all-rubber electric cord having extreme flexibility and high tensile strength.

5 In certain cases it is desirable to provide an electric cord of small diameter which is extremely flexible and which possesses a high tensile strength capable of withstanding continuous pulls and twists incident to its use. Such a cord is commonly used in conjunction with electric razors. According to present practice, an electric cord of this type is constructed by wrapping individual strands of a copper conductor around individual strands of fibrous material, such as cotton thread, and then bunching the spiralled conductors together and providing them with an over-all cotton wrap and an outer jacket of rubber. An electric cord so constructed is commonly known to the trade as a "tinsel" cord. This construction provides an electric cord which is reasonably satisfactory in use, but which is expensive to manufacture due to the fact that it is necessary to spiral each strand of the copper conductor around a fibrous core individually and then assemble the individual strands of the conductor. Furthermore, the provision of a plurality of individual supporting cores or threads for each of the conductors increases the over-all diameter of the cord.

30 It is an object of this invention to provide an improved construction in electric cords, of the type described, which is of small diameter, which possesses extreme flexibility and high tensile strength, and which may be manufactured at low cost.

35 In the accompanying drawing the single figure shows a perspective view of an electric cord embodying the features of the invention.

40 Referring to the drawing, an electric cord is shown at 10 provided with a plurality of current-carrying means in the form of insulated conducting wires 11. The current-carrying means are identical in construction and a description of one will suffice to explain the structure of both.

45 In accordance with the invention the conductor 12 of the current-carrying means is formed of a plurality of parallel strands of copper which are twisted with a relatively short pitch spiral about a central core 13 formed of a fibrous material such as cotton, linen, or the like. It has been found that a pitch of from $\frac{1}{4}$ inch to $\frac{3}{4}$ inch is satisfactory. In twisted position the strands of the conductor are parallel to each other. The fibrous core provides a cushioning means for the spiralled copper conductors as the conductors

twist down upon and compress the core whenever the cord is elongated as when subjected to a tensile stress. Moreover, the fibrous core 13 absorbs a portion of the stress placed upon the electric cord and prevents the parallel strands of the conductor from becoming kinked or twisted whenever the cord is subjected to sharp bends or twists.

5 To further strengthen the cord and to provide a protective covering for the strands of the copper conductor, an outer wrap 14 of fibrous material having parallel strands of cotton, linen, or the like, is twisted about the copper conductors with a spiral pitch, at least as long as and preferably longer than the pitch with which the strands of the conductor 12 are applied. In twisted position the strands of the wrap remain in parallel relation to each other. By making the spiral pitch of the outer wrap 14 at least as long as or longer than that of the conductor 12, stress placed upon the cord will be absorbed by the wrap 14 and will not distort or twist the strands of the copper conductor. This result will be apparent from the fact that as the cable elongates under stress the convolutions of the spiralled conductor will untwist relatively to each other without absorbing any of the stress due to the fact that they are applied with a relatively short pitch spiral, whereas the strands of the outer wrap, being applied with a longer spiral pitch, are able to untwist only a small amount relatively to each other and thereby they absorb the stress applied to the cord and prevent excessive untwisting of the strands of the copper conductor such as might injure the conductor.

35 In the form of the invention illustrated the twisted insulated wires are assembled in pairs and are run through an extruding machine wherein an over-all insulating cover of rubber 15 is applied to the wires. The rubber cover is grooved, as shown at 16, to facilitate separation of the individual wires by tearing apart the rubber cover along the grooves. This construction makes possible easy stripping and connection of the electric cord. The outer wrap 14 protects the strands of the conductor as the wires are run through the extruding machine; moreover, the wrap prevents the copper conductors from coming into direct contact with any oxidizing agents which may be present in the rubber. The rubber provides an outer covering which is resilient and extremely flexible and, at the same time, one which is tough and durable and which will not crack or chip in use.

55 It will be seen that the diameter of the cord

is reduced over that of existing cords, such as "tinsel" cord, by virtue of the fact that all the strands of the respective conductors are spirally wound around a single fibrous core, whereas in such prior constructions each strand is spirally wound around an individual core. Inasmuch as the strands of the conductor and outer wrap are supplied in parallel relationship the thickness of the built-up fibrous core is increased only by the diameter of a single conductor strand and a single strand of the outer wrap. Moreover, a cord constructed in accordance with this invention possesses a high degree of flexibility due to the fact that the spiral conductors are cushioned upon the fibrous core, and any bending of the cord is taken up by flexing between the adjacent convolutions of the spirals. This flexing action takes place between the adjacent convolutions of the conductors as well as between those of the outer wrap. The flexibility of the cord is increased by virtue of the fact that the individual strands of the conductor and outer wrap are maintained in parallel relationship as they are spirally wound around the inner core. The inner core and the outer wrap cooperate in combination with the rubber cover to absorb all of the stress which may be applied to the cord and hence provide an electric cord

which is capable of withstanding a high tensile stress without damage to the conductors.

What I claim as new and desire to secure by Letters Patent of the United States, is,

1. In an electric cord, a core of fibrous material, a conductor comprising a plurality of parallel strands of copper, the strands of said conductor being spirally wrapped around said core in parallel relationship, an outer wrap of fibrous material having parallel strands, said strands being spirally wound around said conductor in parallel relationship with a pitch at least as long as that of said spiral conductor to absorb stresses applied to said cord, and an over-all insulating covering of rubber.

2. In an electric cord, a core of fibrous material, a conductor comprising a plurality of parallel strands, the strands of said conductor being spirally wrapped around said core in parallel relationship with a relatively short pitch spiral, an outer wrap of fibrous material having parallel strands, said strands being spirally wound around said conductor in parallel relationship with a pitch longer than that of said spiral conductor to absorb stresses applied to said cord, and an over-all insulating covering of rubber.

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