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ELECTRIC CABLE FOR HIGH-FREQUENCIES

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Fig. 1.

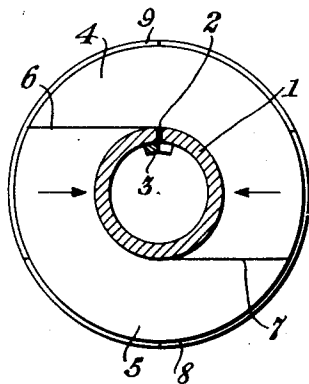
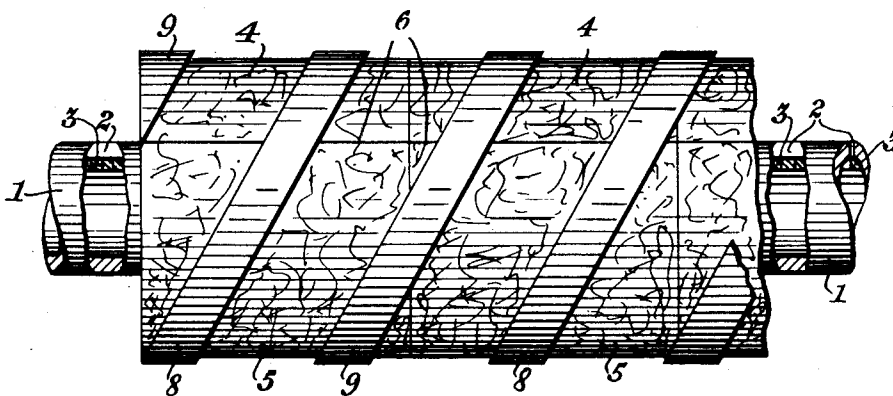


Fig. 2.



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ELECTRIC CABLE FOR HIGH FREQUENCIES

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1 Claim. (Cl. 174—28)

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This invention relates to concentric conductor electric cables.

In British Application No. 11723/45 there is described a coaxial cable in which the inner conductor is constructed as a hollow cylinder so as to function as the outer conductor of an inner coaxial cable. This tubular conductor may be formed by a copper tape or tapes having abutting longitudinal edges. The problem then arises of holding the tape in circular form.

According to the present invention a tubular inner conductor formed of tape or tapes having abutting longitudinal edges is maintained in spaced relation from its outer conductor by means of spacers of dielectric material, each spacer being formed in two or more portions which when placed together to form a complete washer exert a wedging action upon the tape or tapes forming the conductor so as to hold the edges of the said tape or tapes in abutting relation.

The said discs may be formed of insulating material expanded into a porous honeycomb structure, as described and claimed in British Application No. 20343/44 so that as pointed out therein the pressure upon the inner conductor is more uniformly distributed along the length of the cable, for a given amount of solid insulating material.

The portions of the spacers may be held together to exert their wedging action upon the inner conductor either by forming the outer conductor immediately around them, or by extruding a thin walled tube of insulating material around them, or by means of a wrapping of insulating tape.

One embodiment of the invention is shown in the accompanying drawings, in which:

Figure 1 shows a spacing member embracing a hollow inner conductor of a coaxial cable; and

Figure 2 is a view showing how the spacing members may be held upon the inner conductor.

Referring to the drawings, Figure 1 shows the central conductor of a coaxial cable in the form of a copper tape 1 folded longitudinally to form a hollow tube. This copper tape 1 may itself form the outer conductor of an inner coaxial cable (not shown) or may enclose a plurality of stranded and insulated conductors forming a telephone cable of conventional type. The edges of the tape are shown slightly separated at 2. These edges

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may be furnished with teeth 3 arranged as described in British Specification No. 476,098 but underlying the inner sides of the opposite edges. The spacers for locating the inner conductor 1 concentrically of the outer conductor (not shown) are formed of two portions 4 and 5 which fit together over the folded tape 1 and abut along lines 6, 7 which are tangential to the inner conductor. When, therefore the two portions 4 and 5 are held together over the folded tape 1 by means hereinafter described, a wedging action is exerted upon the folded tape 1 which holds the longitudinal edges of the tape together.

In order that this wedging action should be exerted over the greater part or the whole length of the inner conductor 1 the spacers 4, 5 are preferably formed of a thermoplastic material that has been expanded into a porous honeycomb structure.

Figure 2 shows two spacers in position upon the central conductor 1 and as shown these spacers are closely spaced upon the conductor 1. Because the spacers are constructed of an expanded material the total amount of solid dielectric does not exceed that used in normal air-spaced concentric cables.

The material used for the spacers is preferably a low loss thermoplastic material such as a solid polymer of ethylene (polythene).

The two portions 4, 5 of each spacer are shown in Figure 2 as being held together to exert their wedging action upon the inner conductor 1 by means of a wrapping of polythene tape 8, 9. Over these tapes is applied the outer conductor (not shown) which may be of any convenient construction.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

In a coaxial cable of the type that comprises a single metal tape longitudinally folded with edges abutting constituting a tubular central conductor, an outer conductor arranged concentrically about but in spaced relationship to the central conductor and a plurality of insulating tubular spacers within the outer conductor and surrounding the central conductor to hold the conductors in the desired relationship characterized in that each of said spacers comprises a pair of inter-

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engaging elements that, when interengaged, have an annular cross-sectional outline cut along two oppositely directed tangentially extending lines originating at diametrically opposite points on the central opening of the annular area, said elements being maintained in interengagement by tapes wrapped therearound, whereby the longitudinal edges of tape constituting the central conductor are pressed together.

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