Sept. 24, 1929. E. W. ENGLE 1,729,160

RUBBER COATED CONDUCTOR AND METHOD OF MAKING SAME

Filed Feb. 23, 1926

Fig. 1.

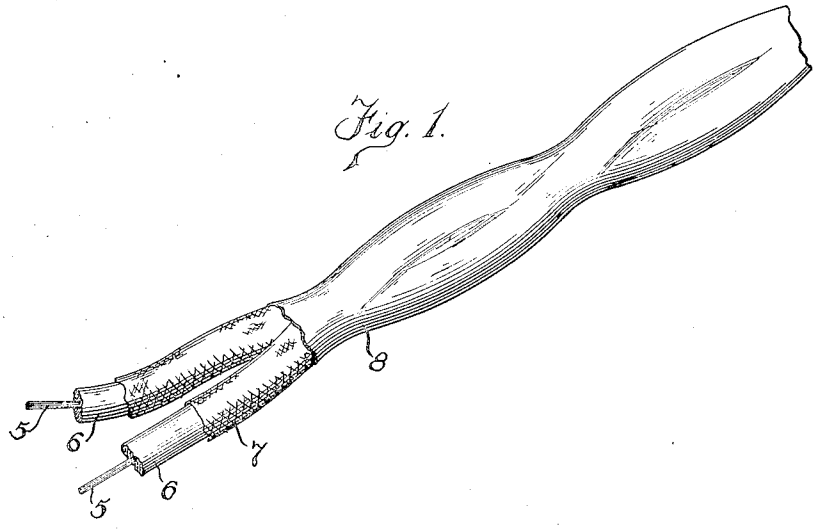


Fig. 2.

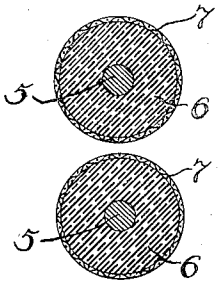
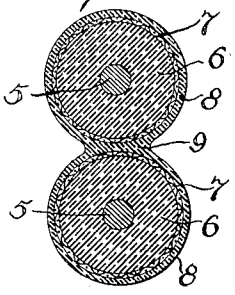


Fig. 3.



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Patented Sept. 24, 1929 1,729,160

UNITED STATES PATENT OFFICE

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RUBBER-COATED CONDUCTOR AND METHOD OF MAKING SAME

Application filed February 23, 1926. Serial No. 89,835.

My invention relates to a process for applying an acid-proof flexible coating to insulated electrical fabric covered conductors.

It is an object of my invention to provide an improved method of making conductors acid and water-proof by coating them with rubber.

The further object is to provide a plurality of conductors having a layer of rubber coating which is impregnated in the fabric insulation of the conductors in an improved manner.

Other objects will appear from the description, reference being had to the accompanying drawings in which:

Figure 1 shows a pair of conductors with the successive layers removed so as to show the construction.

Figure 2 is a section of a pair of conductors prior to treatment according to the improved process of my invention.

Figure 3 is a section of a pair of conductors after treatment according to the process of my invention.

In using conductors for connecting cells in which an acid electrolyte is employed and in other instances where electrical conductors are used where they are subject to contact with acid or acid fumes, the usual layer of fabric surrounding the rubber composition insulation often becomes soaked with acid. Thus, in handling the conductor the hands become stained, the acid corrodes metal and wooden parts with which it comes into contact, and after a short time the fabric becomes loose and frayed, making the conductor unsightly and reducing its strength and insulating properties.

My invention contemplates overcoming these difficulties by impregnating the fabric cover of the conductors with raw rubber and then applying a rubber coating over the entire group of conductors in such a manner that the rubber coating is homogeneous with the impregnating rubber which lies between the threads of the fabric, and then vulcanizing the rubber. Any acid which is accidentally spilled or otherwise comes into contact with the rubber covered conductor can readily be removed by wiping with a wet rag.

As shown in the drawings, the usual insulated conductor consists of a wire 5 which may be a single or a stranded wire, surrounded by a layer 6 of insulating rubber composition or similar material. A fabric 7 is woven around the layer of rubber 6 to strengthen and protect it.

The process of coating the conductor preferably consists of three main steps: first, impregnating the fabric with rubber; second, coating the twisted conductors with a heavy layer of rubber; and third, vulcanizing this outer layer.

In carrying out the first step of the process the fabric covered conductors are passed through or dipped into a weak solution of raw rubber in carbon disulphide, benzine, chloroform or other suitable solvent, depending upon the kind of raw rubber used. The conductors may be passed through the solution singly or twisted in groups of two or more. The capilliary action of the fabric will draw the rubber solution into its crevices and pores. After this step the conductor is slightly heated to drive off most of the solvent leaving the rubber thoroughly impregnated in the fabric.

The twisted conductors are then dipped into a strong, preferably saturated, solution of the raw rubber, to form a relatively heavy layer 8 of rubber around the two conductors. The conductors may be slightly agitated during this step of the process so that the rubber will deposit itself between the two conductors as shown at 9 in Figure 3. The layer 8 of rubber will form a homogeneous mass with the rubber which is impregnated in the fabric.

After the layer 8 of rubber is sufficiently thick on the conductors the resulting dual conductor is removed from the solution and partially dried and then vulcanized. The process of dipping the conductors to form the layer 8 may be repeated several times if desired to form the desired thickness of the layer. This process results in a pair of flexible conductors which are securely held together, which are very durable, which will readily withstand the corrosive action of acids and most other chemicals, and which do not tend to absorb liquids. The impregnation of the fabric with rubber extends the life of the fabric, and, due

to the homogeneity of the rubber layers, the rubber layer 8 is prevented from peeling off as is often the case where the rubber layer is molded over the conductor.

While I have illustrated my invention as applied to a two-conductor cable, it will be apparent that it may readily be employed in cables consisting of three or more conductors with equal advantages and although I have described the preferred process of applying the layer of rubber to the conductors, other modified processes will be apparent to those skilled in the art and I do not wish to limit myself to the process described, except as by the claims which follow.

I claim:

1. The process of coating a plurality of fabric covered conductors with rubber which consists in dipping the fabric covered conductors in a weak solution of rubber, partially drying them, dipping them into a strong solution of rubber to form a rubber coating completely surrounding the conductors, and vulcanizing the rubber on the conductors.

2. The process of forming an insulating non-absorbent coating of rubber around a plurality of fabric covered conductors which consists in impregnating the fabric with a weak solution of rubber, partially drying the fabric, forming a coating surrounding all of the conductors by dipping them into a strong solution of rubber and vulcanizing this coating of rubber.

3. A plurality of wires, insulating material surrounding said wires, a fabric cover for protecting said insulating material, and a layer of rubber impregnated into said fabric, said rubber serving the double function of protecting the fabric against water and corrosive fluids and of uniting the wires in an integral unit.

In witness whereof, I hereunto subscribe my name this 18th day of February, 1926.

EDGAR W. ENGLE.