

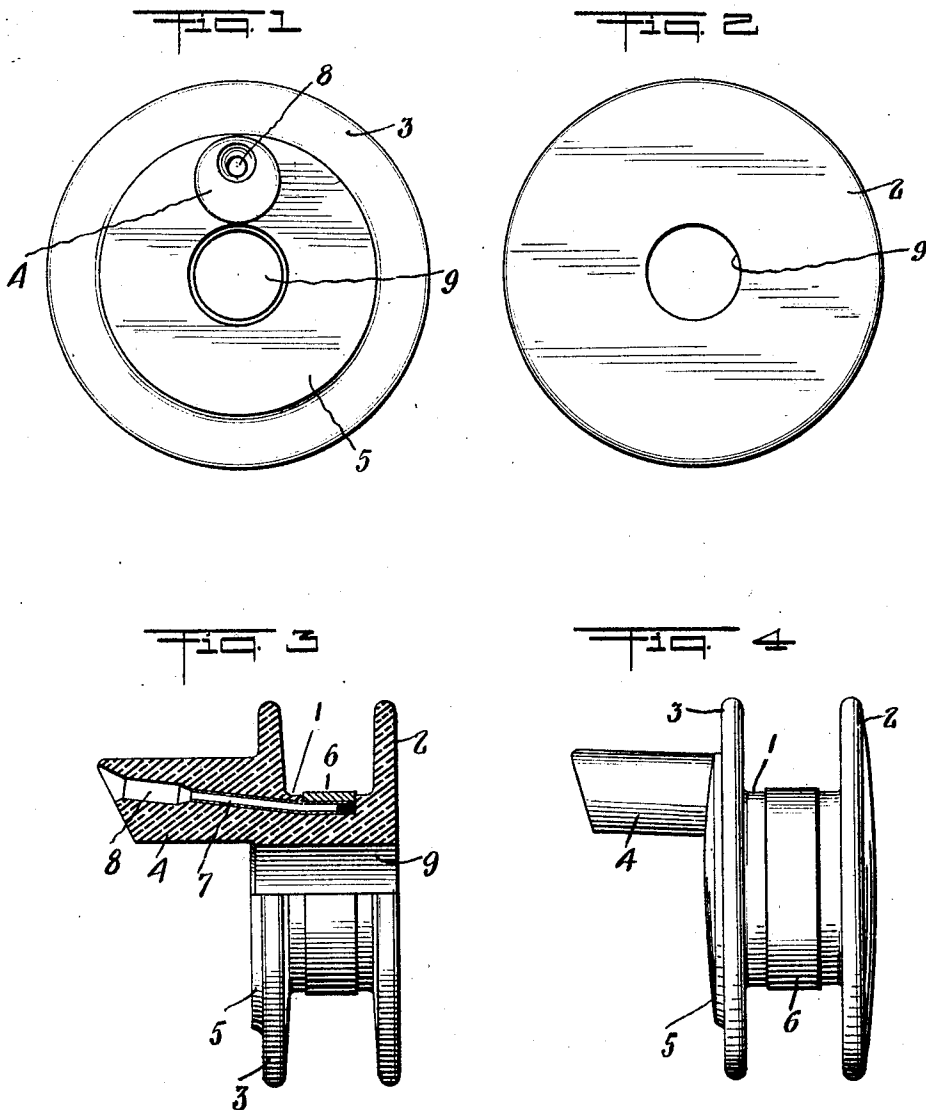
Feb. 28, 1928.

1,660,441

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METHOD OF FORMING ELECTRICAL INSULATORS

Filed Jan. 14, 1927



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METHOD OF FORMING ELECTRICAL INSULATORS.

Application filed January 14, 1927. Serial No. 161,193.

My invention relates to improvements in methods of forming insulation; especially insulation to be used for electrical appliances, and to be produced by molding it into shape.

5 An object of the invention is to provide a method of forming such insulation so as to give the exact dimensions and configuration required to permit the insulation, when finished, to fit snugly and properly into the place intended to receive it in the electrical device of which it is to be a part.

Another object of the invention is to provide a method of forming such insulation in a manner that will prevent warping and deformation of every kind that would render the insulation unfit for service.

Further objects and advantages of the invention will be made clear in the following description, taken with the accompanying drawings, which illustrate the preferred mode of practicing the invention; but I of course reserve the right to make such changes in the carrying out of my process as are embraced within the principle of the invention and do not exceed the scope of the appended claims.

On said drawings:—

Figure 1 is a front view;

Figure 2 a rear view, and

30 Figure 3 is a side view, partly in section, of a body of insulation made in accordance with my improved process, as it appears when completed; and

35 Figure 4 is a side view, partly in section, similar to Figure 3, showing the insulation as it is formed in the stages prior to finishing, to allow for cooling and contracting, and thus insure the final correct shape.

40 The same numerals identify the same parts throughout.

My invention is set forth here in connection with the insulation which carries the slip ring on the armature of a high tension magneto of the type which supplies ignition current to internal combustion engines; but obviously the invention can be practiced to form insulators for other electrical apparatus also. Such an insulator comprises a tubular body or neck 1 with a flange 2 at one end and a flange 3 at the opposite end; the flange 3 carrying an eccentric, axially extending boss 4. The face of the flange 3 is raised or presented in relief to some extent, as indicated at 5. Encircling the relatively thick neck 1 between the relatively thin flanges 2 and 3 is the slip ring 6, upon which is to

bear a contact brush, not shown, connected to the distributor of the magneto; and the boss 4 has a passage 7 with an enlarged end 8. Through the neck passes a bore 9. In practice the bore 9 receives the shaft of the armature of the magneto, and the insulator is thus mounted to rotate with the armature. The high tension winding on the armature can be united to the ring 6 by a conductor in the passage 7 of the boss 4.

The insulator is usually made of rubber, and formed in a mold. To make the insulator fit into place properly on the armature of the magneto, and afford the desired insulating effect, the insulator must not only have the exact size required, but must also be of correct shape, with the opposite ends or faces of the flanges 2 and 3 parallel to each other, and the boss 4 parallel to the axis of the bore 9. If the interior of the mold has the surfaces which engage the outer flat faces of the flanges 2 and 3 parallel to each other, so that the insulator has these two faces or ends flat or plane, and normal to the axis of the bore 9, when it is removed from the mold, it is liable on cooling to contract and shrink adjacent the two open ends of the bore 9, drawing the outer faces of the flanges 2 and 3 inward adjacent the bore, and thus making the opposite ends of the insulator concave. This warping or distortion constitutes a defect which renders the insulator entirely unserviceable.

To avoid such distortion, I mold the insulator in a deformed die which gives the insulator an initial shape that is shown in Figure 4. The inside surfaces of the die which engage the outer faces of the flanges 2 and 3, or opposite ends of the insulator, are made concave to a predetermined degree, and when the insulator is first taken out of this die, its two opposite ends are slightly convex and the boss 4 diverges or is tilted outward with respect to the axis of the bore 9. The mold is made in sections, and need not be described here, except to say that its interior is of the same general shape as that of the insulator to be produced. The insulating material fills the cavity of the mold and remains therein for an interval as long as necessary; for example ten minutes to one hour, the mold being heated during the entire period to the necessary extent, as by steam at from 50 to 200 lbs. pressure in contact with the exterior of the mold, which may be located at this stage in a suitable

chamber. The insulator is then removed from the mold and subjected to a second, open heat in a vulcanizing device or chamber, for the necessary period, which may be
5 several hours (such as 3 to 10) in length, at a somewhat lower temperature provided by steam at say 30 to 90 lbs. pressure. The insulator then becomes permanently set by contraction, the convexity of the two ends
10 disappears, and is replaced by perfectly flat, plane surfaces, as indicated in Figure 3, and the boss 4 no longer diverges, but becomes parallel to the axis of the bore 9. Thus all distortion is obviated without cutting away
15 any part of the insulation, and the insulator gets its final correct shape without further working after leaving the mold, except the additional thermal treatment above described.

20 By this process the insulators can be produced in large quantities, with the highest degree of certainty that they will effectually answer their intended purpose in actual practice under service conditions.

25 Of course any way of applying the heat may be followed since not only steam heat can be utilized but dry heat as well.

Having described my invention, what I believe to be new and desire to secure and
30 protect by Letters Patent of the United States is:—

1. The method of producing insulation which consists in forming the insulation first in a deformed die, and then causing the in-
35 sulation, after removal from the die, to take

on its correct shape and dimensions by contraction.

2. The method of producing insulation which consists in giving the insulation a swelled out form in a mold which is sub-
40 jected to heat, and then removing the insulation from the mold and subjecting it to open heat to a diminished degree to allow the insulation to shrink into its finished shape and condition.

3. The method of forming insulation that shrinks on cooling which consists in molding the insulation under the influence of heat to form it with bulging sides and other por-
45 tions thereof deformed, then removing it from the mold and subjecting it to further heat at a lower temperature out of the mold, till all the deformation is removed by said shrinkage.

4. The method of moulding an article having relatively thick and thin portions out of a material that shrinks on cooling which consists in initially forming of convex con-
50 tour, surfaces that are adjacent a thick portion of the article.

5. The method of moulding an article having a body and bearing a flange, out of material subject to shrinkage, which consists in initially forming the article with a convex surface upon the flange and adjacent
60 said body so that such surface will be flat after shrinkage.

In testimony whereof I affix my signature.

ISAAC Q. GURNEE.