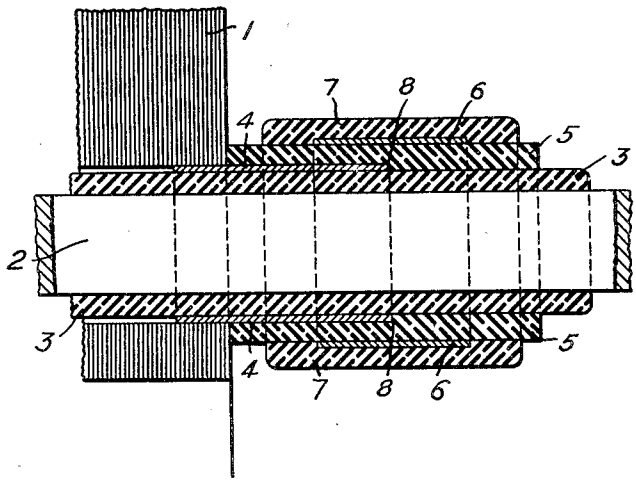
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CORONA ELIMINATION IN DYNAMO ELECTRIC MACHINES

Filed June 13, 1929



INVENTOR

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UNITED STATES PATENT OFFICE

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CORONA ELIMINATION IN DYNAMO-ELECTRIC MACHINES

Application filed June 13, 1929, Serial No. 370,602, and in Germany July 2, 1928.

My invention relates to high-voltage electrical apparatus and more particularly to means for protecting the insulating covering of a conductor against corona.

Heretofore, the insulating covering or sleeve of a high-voltage winding has been protected against corona by providing a conducting or semi-conducting coating on the exterior of the insulation, and insulating the coating from the external air. The conducting coatings have been applied in the form of tinfoil or the like. Although the electrostatic field is properly distributed by the coatings previously employed, so far as the machine and the exterior of the insulating sleeve is concerned, nevertheless, the field strength in the interior of such arrangements, at the edges or outer ends of the coatings, is very strong, and danger still exists, even when the edges are surrounded by insulating material of great dielectric strength. Failure of the insulation will take place at these places in the course of time.

The object of my invention is to diminish the electric field strength at the ends of the conducting coatings.

According to the present invention, in the vicinity of the ends of the coating and on the insulating layer covering the coating, is disposed an additional coating consisting of a conductive or semi-conductive material which preferably overlaps the edge of the first coating without, however, touching either the casing itself or the first coating. The additional coating, which may also be covered with insulating material, thus operates as a parallel condenser to the first coating and draws to itself a portion of the lines of force which extend between the first coating and the conductor.

For a better understanding of my invention, reference may be had to the following detailed description, taken in connection with the accompanying drawing, wherein the single figure illustrates, in detail, the arrangement of my conductive coatings with respect to each other and to the insulating layers.

In the drawing, 1 denotes the end of a core of a high-voltage machine, in which an armature conductor 2 is mounted. 3 is a usual insulating covering or sleeve surrounding the conductor 2. On the sleeve 3 is provided a conducting layer or foil 4 which is in conductive relation to the machine core 1. On the foil 4, an insulating layer 5 is disposed. In accordance with the present invention, a second coating 6, preferably of semi-conducting material, is mounted on the layer 5 at the end of the foil 4. The coating 6 is covered by a further layer 7 of insulating material.

The action of the coating 6, which extends to both sides of the sharp edge or end 8 of the coating 4, is as follows: From the coating 4, some of the lines of force extend to the coating 6, particularly those lines which are concentrated at the sharp edge 8, while the others may extend to the conductor 2. The electrostatic pressure which was heretofore concentrated at the sharp edge, is now distributed throughout a large conducting area whereby the electrostatic pressure per unit area is below a harmful value. In the coating 6, are developed small currents which are incapable of heating it very much because the part of the voltage difference, which falls on this coating, in the path of the total voltage difference between the coating 4 and the conductor 2, can be kept as low as desired.

I claim as my invention:

1. In electrical apparatus, a high-voltage conductor having an insulating covering, means for providing corona protection to the insulating covering comprising a grounded conductive coating on said covering, an insulating layer surrounding said coating, an outer semi-conductive ungrounded coating separated from the first coating by said insulating layer and another insulating layer for embedding said semi-conductive layer.

2. In electrical apparatus, a high-voltage conductor having an insulating covering, means for providing corona protection to the insulating covering comprising a grounded conductive coating on said covering, an insulating layer surrounding said coating, an outer semi-conductive ungrounded coating separated from the first coating by said insulating layer extending on both sides of the edge of the first coating and another insu-

lating layer for embedding said semi-conductive layer.

3. In electrical apparatus, a high-voltage conductor having an insulating covering, a conductive coating surrounding said covering and grounded to said apparatus, means for preventing the formation of corona at the edge of the said grounded coating comprising a semi-conductive shield embedded in insulating material, said shield surrounding said coating near its edge but concentrically and insulatingly spaced therefrom.

In testimony whereof, I have hereunto subscribed my name this 22d day of May, 1929, at Berlin-Siemensstadt, Germany.

MORITZ SCHENKEL.