

# UNITED STATES PATENT OFFICE

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## ELECTRICAL TRANSFORMER

No Drawing.

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This invention relates to a novel composition for use in impregnating electrical transformers, and more particularly electrical transformers used in radio apparatus.

5 A principal object of this invention is the provision of a novel composition for use in electrical transformers and particularly radio transformers which will function both as an insulator and to eliminate substantially  
10 all the noise or hum incident to the operation of the transformer, which noise or hum is particularly troublesome in radio transformers.

15 Other and further objects of the invention will be more apparent as the description of the invention proceeds.

The elimination of noise or hum due to the operation of transformers, especially transformers used in so-called alternating current  
20 power operating radio receiving sets, has been long desired and sought. I have discovered that substantially all of this noise or hum may be removed if the transformers used in such apparatus are treated so as to properly cement the core and coils together. I  
25 have also discovered that not only must the core and coils constituting the transformer be cemented together, but the composition used for this purpose must be such that it will withstand the constant strain due to the tendency of the transformer core to vibrate, and it must be such that it will adhere to the laminations under all operating conditions. The composition must be one which will completely  
30 penetrate between the laminations of the core and the coils. It must be an effective insulator, cheap, efficient, and easy to manipulate.

I have found that I may obtain all the objects of my invention by using as the impregnating composition for the transformer, a composition consisting of rosin and asphalt. This mixture possesses particularly advantageous properties for use in the present invention which neither of these substances alone  
45 possesses. While rosin itself has not the necessary adhering qualities, and asphalt has not the desired penetrating qualities and must be used at a temperature which is injurious to the insulation in the transformer

coils, the mixture of the two is peculiarly adapted to the process of the present invention.

In carrying my invention into practice, I first combine the rosin and asphalt by heat and fusion in a treating tank. While the proportions may vary, I preferably employ a mixture consisting of about 70 parts of rosin to about 30 parts of asphalt. The rosin employed is preferably one which has a relatively high softening or flow point and a very low viscosity, and high surface tension at the temperature at which the transformers are treated. The asphalt should preferably have a relatively low flow point, in the neighborhood of about 75 to 85° C., and a viscosity of about 600 centipoise at 150° C. The mixture of rosin and asphalt is thoroughly agitated in the treating tank to insure even distribution of the components.

The transformer to be treated, that is, the assembled core and coils, is placed in the molten compound, which should be maintained at about 160 to 175° C. until the preliminary ebullition of gas and moisture has ceased. At this point it will be found that the composition has penetrated between the laminations of the steel parts of the core. Where the depth of penetration or thickness of insulation is not greater than about 2 inches, a period of from 10 to 15 minutes is sufficient to accomplish the requirements of the process. A longer period than this may injure the insulation and set up destructive distillation of the organic material. The transformer is then removed and cooled, the composition sets hard and holds all the parts together, giving a unit which is solidly and firmly united in every part, preventing vibrations and eliminating substantially all the noise which may be incident to the operation of the apparatus in which the transformer is used.

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

1. A composition for use in impregnating transformers, said composition consisting of about 70 parts of rosin and about 30 parts of asphalt.

2. An electrical apparatus of the class de-

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scribed the parts of which are impregnated with a composition consisting of rosin and asphalt.

3. An electrical transformer comprising a laminated core and coils, said core and coils being impregnated with a composition consisting of rosin and asphalt.

In witness whereof, I have hereunto set my hand this 23rd day of December, 1929.

HUGH J. CAMERON.

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