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HIGH FREQUENCY IRON CORE

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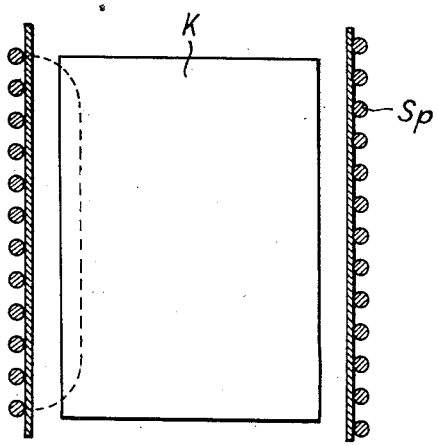

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HIGH FREQUENCY IRON CORE

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2 Claims. (Cl. 175—21)

When mass cores are used for high frequency coils the core aside from being permeated by magnetic lines of force is also permeated by electric lines of force. In the figure wherein the coil is designated by Sp and the core by K, such an electric field line is shown in dotted lines. Since the dielectric constant of the mass core (pressed material or sprayed material) is very high and furthermore has often a very high temperature coefficient, the dielectric behavior of the mass core is found to be an inconvient feature when the core is to serve for determining the frequency particularly in the case of short waves. It would as such be conceivable to shield the core against electric field lines by means of an electrically conducting sheet metal mantle but in this case an additional element of the structure is required, namely, the shielding mantle.

In accordance with the invention in a high frequency iron core consisting of finely distributed iron powder and a binder, an electrically semi-conducting binding means is employed. It is possible for instance to add carbon in an extremely fine distribution of the type used for making resistance layers.

If in using the invention the conductivity becomes essentially greater than the wattless conduction value of the capacity which is formed by the iron core as the dielectric, yet not as high as conductivity of the iron, the dielectric behavior is no longer of importance. Hence, dielectric losses occur no longer. The upper limit for the value of the conduction lies in the additional damping which is caused in the core by the eddy currents due to the conduction. This limit is determined by the respectively prevailing frequency range and dielectric constant of the material and can be maintained within reasonable limits. Hence, the conductivity of the entire iron core is given a value such that the eddy losses are still permissible and the dielectric losses are diminished in view of the conducting shunt.

Moreover, it will be sufficient if only the exterior layer of the core is devised in the manner according to the invention. But in this case the making of the core meets with difficulties.

I claim:

1. A core for a high frequency inductance device composed of compressed finely divided magnetic material mixed with a semi-conducting binder, said binder being composed of insulation material mixed with finely divided carbon.

2. A core for a high frequency inductance device composed of finely divided iron mixed with a binder which has finely divided carbon dispersed throughout it.

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