

## UNITED STATES PATENT OFFICE

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DIELECTRIC FOR ELECTROSTATIC  
CONDENSERS

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3 Claims. (Cl. 175-41)

This invention relates to electrostatic condensers.

This application is a continuation in part of my copending application Serial No. 88,534, filed July 2, 1936.

An object of the invention is to improve the characteristics of an electrostatic condenser, for instance, to increase its capacity.

The dielectric of this invention is a solid composition of hydrogenated castor oil and a vegetable oil of the group comprising castor oil, oiticica oil and cotton seed oil. The new dielectric composition may be employed as an impregnant in association with conventional paper wound electrostatic condensers.

Vegetable and other oils have been used heretofore for impregnating paper spacer electrostatic condensers. The oil brings about an improvement in capacity but while such condensers are satisfactory for many purposes, there are also some disadvantages associated with their use. Since oil will flow at ordinary temperatures, it is necessary to use unusual precaution in the sealing of the condenser and in the construction of the container. Many unsaturated oils, such as castor oil, tend to oxidize when exposed to the air, resulting in reaction products such as water and acids which cause deterioration of the condenser.

The hydrogenation of the unsaturated compounds tends to stabilize them so that under the electrostatic stresses they do not dissociate and cause ionization.

Hydrogenated castor oil, which is a hard, solid material, has long been known to the condenser art to possess a high dielectric constant but its application as a dielectric medium in an electrostatic condenser has not to date been practical because of its excessively high power factor and tendency to crack. In order to use hydrogenated castor oil as an impregnant, it is necessary to heat it up to liquification temperature so as to

allow complete penetration of the absorbent paper spacers. As the oil cools and solidifies, however, minute cracks develop throughout the entire mass, thus bringing about low break down potentials and allowing absorption of moisture. The excessive power factor eventually brings about overheating and decomposition.

I have found that by combining hydrogenated castor oil with a vegetable oil, such as castor oil, oiticica oil or cottonseed oil that a new and improved dielectric is obtained having all the high capacitance advantages of hydrogenated castor oil but possessing none of its disadvantages in respect to cracking, brittleness, etc.

I have found that not all oils will combine with the hydrogenated castor oil to form compositions suitable as dielectrics. For instance, mineral oil, which is the most widely used dielectric oil employed in electrostatic condensers, is not suitable.

I have also found that glyceryl phthalate, preferably in the liquid form, may be substituted for part or all of the oil and that it combines with the hydrogenated castor oil.

The dielectric of this invention may be prepared by heating the hydrogenated castor oil to liquid form and adding the vegetable oil. The proportion of added oil may be from 5% to 50%.

What is claimed is:

1. A solid condenser dielectric consisting substantially of hydrogenated castor oil and an added vegetable oil, the latter being present in the proportion of from 5% to 50%.

2. A dielectric for electrostatic condensers and the like consisting substantially of a solid composition of hydrogenated castor oil and 5% to 50% of a vegetable oil miscible therewith.

3. A condenser having a dielectric consisting substantially of a solid mixture of hydrogenated castor oil and from 5% to 50% of unhydrogenated vegetable oil.

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