PUBLISHED
MAY 18, 1943.
BY A. P. C.

T. RUMMEL
POLYMERIZING APPARATUS
Filed Nov. 7, 1939

Serial No.
303,336

Fig. 1.

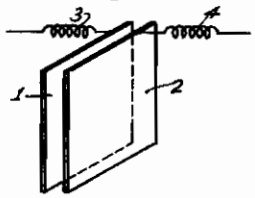
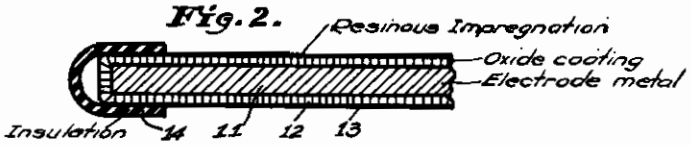


Fig. 2.



Theodor Rummel
Inventor
by Wright Bros
Attys.

Published May 18, 1943

Serial No. 303,336

ALIEN PROPERTY CUSTODIAN

POLYMERIZING APPARATUS

Theodor Rummel, Berlin-Charlottenburg 9, Germany; vested in the Alien Property Custodian

Application filed November 7, 1939

The present invention relates to improvements in apparatus for polymerizing oils by means of electric discharges.

In the methods used prior to this invention for polymerizing oils by means of glow discharges, apparatus have been used in which insulating elements have been placed in the discharge path for stabilizing the discharge. To this end, plates of glass or organic insulating materials have been used, the thickness of which could not be made less than 1 mm if arcing and puncturing of the insulating material was to be avoided. The tension used in the known apparatus generally amounted to 4000–8000 volts or more at 500 periods per second. In larger apparatus, the insulating plates have usually not been made of glass but of presspahn. However, this material easily warps in continued use and the water content thereof also leads often to disturbances in the operation. Furthermore, presspahn being an organic substance, it can easily be burnt by arcing.

It is the object of the present invention to overcome the disadvantages of the insulating plates according to the prior art and to provide in place thereof layers of oxide of a thickness below 0.4 mm, and preferably of a thickness of approximately 0.05 mm. It has been found that, although the stabilizing voltage, that is, the voltage drop in the layer, is only very small, the stabilization is amply sufficient. For attaining this purpose, the stabilizing layers may preferably be obtained by layers which are formed electrolytically on light alloys. However, similar effective layers may also be formed by chemical methods. The stabilizing action of the oxide layers is principally based upon their quality to act as condensers.

Another advantage of the invention is the fact that no intermediate layers are required which may warp or distort during the operation. Furthermore, the present invention makes it possible to operate at a tension of 360 to 2000 volts, that is, at a much lower tension than that previously required.

The accompanying drawing illustrates diagrammatically one embodiment of the present invention.

Referring to the drawing, the plates preferably consist of aluminum or other light metals and are oxidized electrolytically. The plates are preferably spaced from one another from 1 to 15 mm. The operating temperature may be lower than 100° C. and the pressure may be less than 100 mm and generally 1 to 25 mm mercury column. The current density may be 3–4 times as high as the current density of the known devices. The results have proved to be very satisfactory. The construction of an apparatus according to the invention is also considerably less complicated than the construction of apparatus of the known type.

Whereas the insulating layers previously applied were easily subject to severe aging and deterioration, the stabilizing layers according to the invention are free therefrom. If desired, the layers may be protected by condensation products of phenol or polymerisation products of styrol. However, the edges of the plates are to be protected in all cases against coronas by covering the same with suitable insulating materials.

The oil obtained by the present invention is of excellent quality. The relatively low tension as compared with the known processes also causes a reduction of the cost of the electrical energy required.

THEODOR RUMMEL.