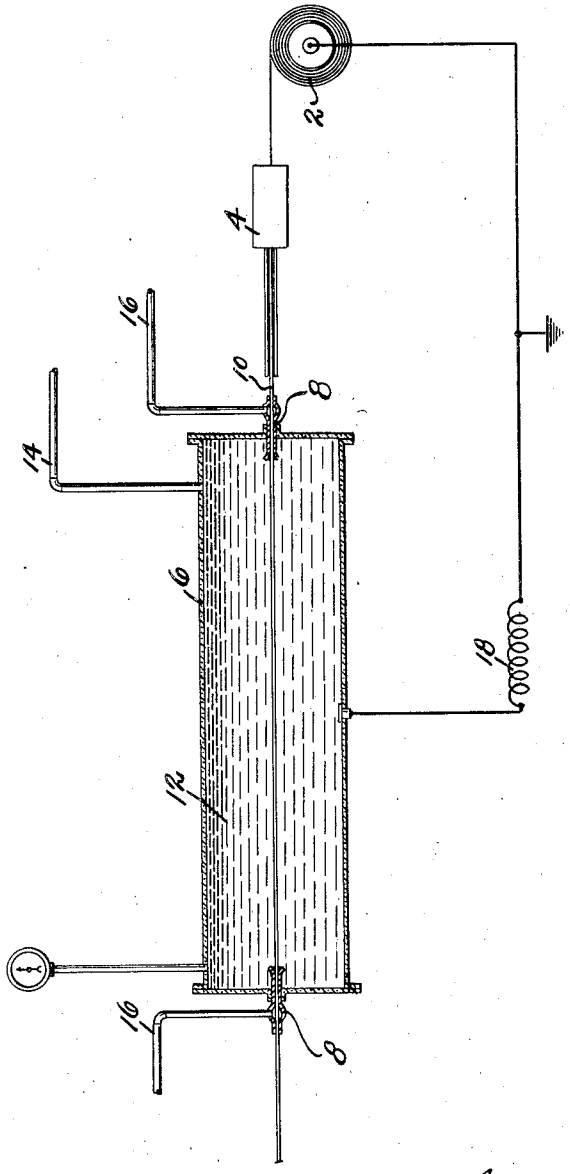
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METHOD OF AND APPARATUS FOR THE ELECTROSTATIC CURING OF HEAT CURABLE MATERIALS WHILE UNDER PRESSURE

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METHOD OF AND APPARATUS FOR THE ELECTROSTATIC CURING OF HEAT CURABLE MATERIALS, WHILE UNDER PRESSURE

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4 Claims. (Cl. 219—47)

This invention relates to an improved method and apparatus for the electrostatic curing of rubber and rubber-like materials, plastics, etc., and has for its primary object the provision of means whereby the material to be cured is subjected to fluid pressure during the curing operation.

The accompanying drawing illustrates one embodiment of my invention as applied to the curing of the insulation of insulated conductors.

Referring to the drawing in detail: 2 designates a reel of bare wire which is to be insulated with any suitable rubber compound, the insulation thereafter to be electrostatically vulcanized with the wire in motion and while the insulation is maintained under pressure.

4 designates the apparatus for applying the insulation. This may be the usual extruding mechanism employed in the art of insulating conductors. It is obvious that the wire 2 as it emerges from the mechanism 4 has been insulated with an uncured insulating material.

6 designates a pressure cylinder of porcelain, for instance, or other insulating material sufficiently strong to withstand pressures of several hundred pounds.

Each end of this pressure cylinder 6 is equipped with a stuffing box 8. The insulated wire which I have designated 10, it is understood, passes continuously through the pressure cylinder, and in order that the insulation will not be injured and that the insulated wire may be moved with the minimum of effort the stuffing boxes 8 are not leakproof fit on the wire.

Oil or other electrically conducting medium 12 is supplied to the pressure cylinder by supply pipe 14 which is connected to any suitable pressure supply source.

As above mentioned, the stuffing boxes 8 are a loose fit upon the insulated wire, and in order that the conducting fluid 12 may not escape and may be maintained under pressure suitable conduits 16 communicate with the stuffing boxes, these conduits being connected to a suitable source of compressed air.

It will be understood that this air pressure substantially balances the pressure on the pressure fluid being introduced through the conduit 14 so that escape of the oil from the cylinder 6 past the stuffing boxes 8, as the insulated wire passes continuously through the pressure cylinder, is eliminated, enabling the insulation to be maintained under high pressure during the curing operation. The pressures employed may be varied over a wide range up to hundreds of pounds to the square inch.

While the ability to maintain high pressures on the insulation during the curing stage is of paramount importance, it will be appreciated also that by reason of the balanced condition of the system anly the minimum effort is required to advance the conductor assembly.

A high frequency source of electrical energy has been diagrammatically indicated at 18. The bare wire 2 constitutes one electrode of this system, the conducting fluid 12 the other electrode.

It will be seen from all of the foregoing that in accordance with this invention the material to be cured is passed continuously through a pressure cylinder while being subjected to the influence of an electrostatic field.

It is to be understood that changes may be made in the details of the apparatus above described without departing from the spirit and scope of the invention.

What I claim is:

1. The method of heat curing materials while maintaining the same under pressure, which method comprises subjecting the material to the influence of an electrostatic field while the material is being moved through a pressure chamber containing a pressure fluid in which the material is submerged and while preventing loss of pressure fluid from the chamber past the material as the same passes into and out of the chamber by maintaining the chamber at the points of entrance and exit of the material in communication with an outside source of fluid supply at a pressure which is as high as that of the first mentioned pressure fluid and directed inwardly of the chamber.

2. An apparatus for the heat curing of materials comprising in combination a pressure chamber, a fluid in said chamber, means for maintaining the fluid under pressure, stuffing boxes at the ends of the chamber for permitting of the continuous passage through the chamber of the material to be cured into and out of the chamber, and pressure supply means connected to said stuffing boxes for imposing pressure on the fluid in the chamber through the stuffing boxes in a direction inwardly of the chamber, the last mentioned pressure being at least as high as the pressure at which the fluid in said chamber is maintained.

3. An apparatus for the heat curing of materials comprising in combination a pressure chamber containing a liquid, means for maintaining said liquid under pressure, a stuffing box

at each end of the chamber for permitting of the continuous passage through the chamber of the material to be cured, and air pressure supply means connected to each of said stuffing boxes for sealing the stuffing boxes against the escape of fluid from the pressure chamber.

4. An apparatus for the heat curing of materials comprising in combination a pressure chamber, an electrical conducting liquid in the chamber, means for maintaining said liquid under pressure, a stuffing box at each end of the pressure chamber for permitting of the continuous passage through the chamber of an insulated conductor, means for supplying air pressure to said stuffing boxes inwardly of the pressure chamber to limit the escape of the conducting liquid from the pressure chamber, and a source of high frequency electrical energy, one electrode of which is provided by the said conductor, the conducting liquid in the pressure chamber constituting the other electrode for said electrical energy source, whereby as the insulated conductor passes through the pressure chamber its insulation will be subjected to pressure while under the influence of an electrostatic field.

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