E. HAEFELY.

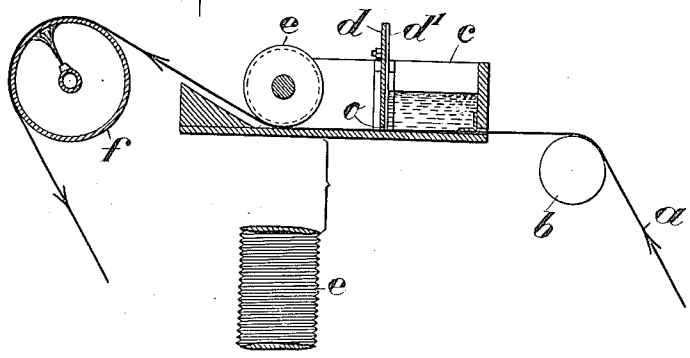
MANUFACTURE OF INSULATING FIBROUS WEBS FOR ELECTRIC INSULATION PURPOSES.

APPLICATION FILED DEC. 19, 1918.

1,311,121.

Patented July 22, 1919.

FIG. 1.



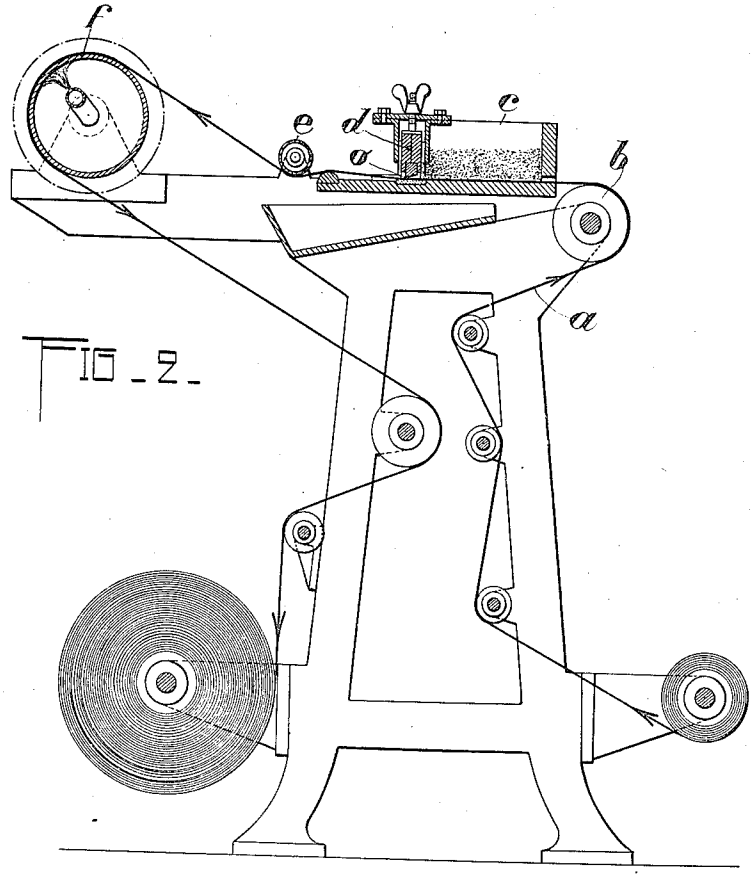


FIG. 2.

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MANUFACTURE OF INSULATING FIBROUS WEBS FOR ELECTRIC INSULATION PURPOSES.

1,311,121. Specification of Letters Patent. Patented July 22, 1919.

Application filed December 19, 1918. Serial No. 267,509.

To all whom it may concern:

Be it known that I, EMIL HAEFELY, a citizen of the Swiss Republic, and resident of Basel, Switzerland, have invented new and useful Improvements in the Manufacture of Insulating Fibrous Webs for Electric Insulation Purposes, of which the following is a full, clear, and exact specification.

For the manufacture of varnished paper such as generally used for electric insulation purposes, there is most employed a solution of varnish and the like in alcohol, benzene and other volatile solvents, which is applied in liquid state to the paper web, whereupon the varnish, on passage of the paper web through a drying room or over a drying surface, is dried up by elimination of the solvent. This method of manufacture first asks for a solvent for the varnish. Then, by applying a liquid varnish solution, the paper absorbs a certain quantity of moisture, which for the required dryness of insulation material, must be eliminated afterward. On the other hand, it has been proposed for the manufacture of mica, to agitate the small mica leaves together with a powdered agglutinant to provide them with a fine powder covering or coating.

The present invention relates to an apparatus for the manufacture of insulating fibrous webs for electric insulation purposes, wherein an agglutinant in powdered state is applied to a fibrous web, such as paper, textile material and the like, but which is characterized by a continuous and uniform supplying and distribution of the powdered agglutinant over the fibrous web in such a way that the web is drawn or moved through a receptacle for the powdered agglutinant and under a striker so as to receive and carry along with it the powdered agglutinant from the receptacle in a uniform layer of desired thickness, whereupon the agglutinant is caused to adhere to the web by heating to smelting.

For a better distribution of the powdered agglutinant it is advantageous to arrange a finely grooved, either fixed or intermittently or slowly rotatable distributing cylinder, which acts to a certain extent as a comb and determines simultaneously according to the size and to the form of its grooves, the quantity of powdered agglutinant taken along with the web. But, any other device for distributing the powdered agglutinant, as for example a comb, a brush, an inclined plane and so on, may be employed.

The smelting of the agglutinant upon the web can be obtained by way of heat conduction or heat radiation. To this end, the web can be led over a heating surface in form of a cylinder, table or the like or it can be conveyed through a heating room which is heated electrically or by vapor heat radiators.

When an insulating web coated in this way is used for the manufacture of insulation tubes or cylinders according to the winding principle, it may often be desirable to have a certain length of the web free from agglutinant, to allow for example the manufacture of a plurality of concentric subsequently separable tubes or cylinders successively in one continuous operation. Such clearing of agglutinant may be obtained by a periodic stopping of the supply of agglutinant by lowering the said striker down onto the web.

The improved arrangement gives also a simple means for limiting the coating on the web in the direction of the breadth thereof, for example in such a manner that both the longitudinal edges or one or more middle longitudinal strips of the web remain free from agglutinant. This can be obtained by convenient means allowing to limit within the range of the striker the supplying area for agglutinant on the web according to the desired breadth.

The invention is particularly intended for applying fusible natural or artificial varnishes and resins upon paper webs to constitute a convenient material for the manufacture of electric insulating pieces or articles of all kinds.

Figure 1 of the accompanying drawing shows diagrammatically and Fig. 2 by a vertical sectional view the constructional arrangement of the apparatus according to the invention designed for example for varnishing a paper web.

The paper web *a* supplied continuously from a supply cylinder passes over a guiding roller *b* into a transverse varnish sup-

plying trough *c*, furnished with powdered varnish and over the bottom of which the web is conveyed, whereupon it leaves the trough *c* through an exit slot *o* and under a vertically adjustable slide *d* forming a striker, provided with a felt lining (Fig. 2) and arranged to substantially determine the thickness of the layer of powder carried along by the surface of the paper web. After going out of the trough *c* the paper web covered with a thin layer of varnish powder passes under a finely grooved distributing cylinder *e*, which for example may be provided with a fine screw thread and can be stationary or rotatable. This distributing cylinder *e* distributes the varnish powder to some extent like a comb over the paper web to regulate the quantity as well as the uniformity of varnish supply thereon. Finally, the paper web thus supplied with varnish powder is conveyed over a rotary heating cylinder *f*, on which the varnish powder, by reason of the heat, smelts to a uniformly varnish coating firmly adhering to the paper web. The quantity of the varnish supply depends on the size and form of the grooves of the distributing cylinder *e*. By replacing the same by another cylinder having greater or smaller groove sizes or different groove forms, it is possible to regulate at will the quantity of the varnish coating; however, there could be employed other means for this purpose.

To completely stop the varnish supply, the slide *d* is lowered down onto the paper web so that no more varnish can be carried along with the paper web.

To limit the varnish supply area in the direction of the breadth of the paper web so that the same remains free from varnish at its longitudinal edges or in a middle longitudinal part, it suffices to vary the useful breadth of the exit slot *o* for the varnish powder in conformity therewith, for example by means of insertible auxiliary slides d^1 (Fig. 1) combined with the main striking slide *d*.

What I claim is:

1. In an apparatus for the manufacture of insulating fibrous webs for electric insulation purposes, a receptacle to receive a charge of powdered agglutinant, means for conveying a web through said receptacle in contact with the powdered agglutinant to carry therefrom along with it, means for distributing the supplied agglutinant upon the web to a uniform layer and heating means to smelt the agglutinant upon the web.

2. In an apparatus for the manufacture of insulating fibrous webs for electric insulation purposes, a receptacle to receive a charge of powdered agglutinant, means for conveying a web through said receptacle in contact with the powdered agglutinant to carry therefrom along with it, adjustable means for regulating the agglutinant supply upon the web and heating means to smelt the agglutinant upon the web, substantially as described.

3. In an apparatus for the manufacture of insulating fibrous webs for electric insulation purposes, a receptacle to receive a charge of powdered agglutinant, means for conveying a web through said receptacle in contact with the powdered agglutinant to carry therefrom along with it, adjustable means for regulating the agglutinant supply upon the web, distributing means to uniformly distribute the agglutinant upon the web and heating means to smelt the agglutinant for causing it to adhere to the web, substantially as described.

4. In an apparatus for the manufacture of insulating fibrous webs for electric insulation purposes, a receptacle to receive a charge of powdered agglutinant, means for conveying a web through said receptacle in contact with the powdered agglutinant to carry therefrom along with it, an adjustable striking slide for regulating the agglutinant supply upon the web, distributing means to uniformly distribute the agglutinant upon the web and heating means to smelt the agglutinant for causing it to adhere to the web, substantially as described.

5. In an apparatus for the manufacture of insulating fibrous webs for electric insulation purposes, a receptacle to receive a charge of powdered agglutinant, means for conveying a web through said receptacle in contact with the powdered agglutinant to carry therefrom along with it, adjustable means for regulating the agglutinant supply upon the web, a finely grooved cylinder to uniformly distribute the agglutinant upon the web and heating means to smelt the agglutinant for causing it to adhere to the web, substantially as described.

6. In an apparatus for the manufacture of insulating fibrous webs for electric insulation purposes, a receptacle to receive a charge of powdered agglutinant, means for conveying a web through said receptacle in contact with the powdered agglutinant to carry therefrom along with it, adjustable means for regulating the agglutinant supply upon the web and a heating cylinder for guiding the web and simultaneously smelting the agglutinant to cause it to adhere to the web, substantially as described.

7. In an apparatus for the manufacture of insulating fibrous webs for electric insulation purposes, a receptacle to receive a charge of powdered agglutinant, means for conveying a web through said receptacle to supply powdered agglutinant upon its surface, adjustable means for regulating the agglutinant supply upon the web, said regulating means being arranaged to allow of

complete stopping of the agglutinant supply, and heating means to smelt the agglutinant upon the web, substantially as described.

8. In an apparatus for the manufacture of insulating fibrous webs for electric insulation purposes, a receptacle to receive a charge of powdered agglutinant, means for conveying a web through said receptacle to supply powdered agglutinant upon its surface, adjustable means for regulating the agglutinant supply upon the web, said regulating means being combined with means for limiting the agglutinant supply area in the direction of breadth of the web, and heating means to smelt the agglutinant upon the web, substantially as described.

In witness whereof I have hereunto signed my name this 18th day of November, 1918, in the presence of two subscribing witnesses.

EMIL HAEFELY.

Witnesses:
H. H. WICK,
AMAND BRAUN.