E. HAEFELY.

PROCESS OF PRODUCING INSULATING MATERIALS.

APPLICATION FILED MAY 27, 1912.

1,228,371. Patented May 29, 1917.

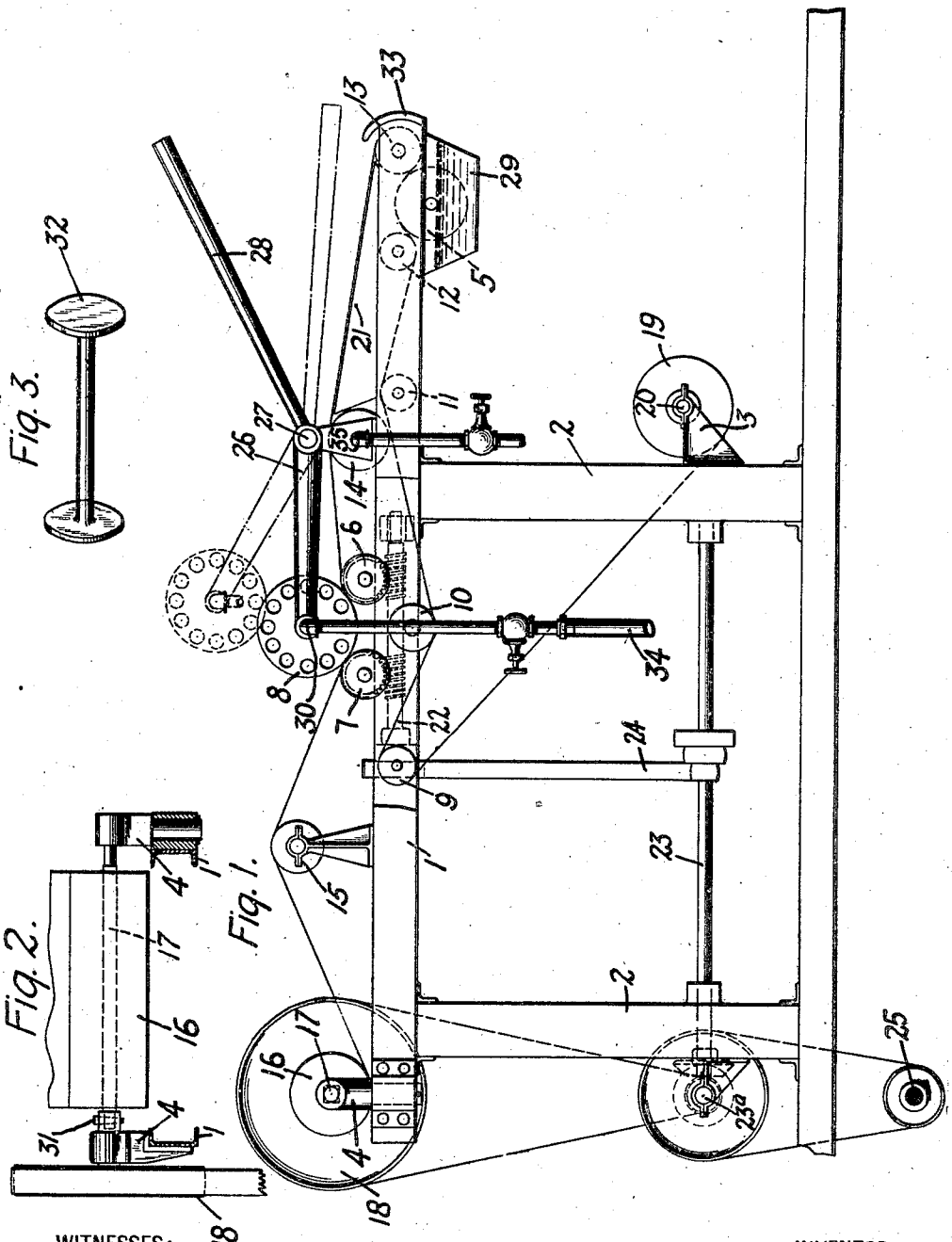


Fig. 1.

Fig. 2.

Fig. 3.

WITNESSES:

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PROCESS OF PRODUCING INSULATING MATERIALS.

1,228,371. Specification of Letters Patent. Patented May 29, 1917.

Application filed May 27, 1912. Serial No. 700,027.

To all whom it may concern:

Be it known that I, EMIL HAEFELY, a citizen of the Republic of Switzerland, and a resident of Basel, in Switzerland, have invented a new and useful Improvement in Processes of Producing Insulating Materials, of which the following is a specification.

My invention relates to processes and apparatus for the production of insulating materials and it has special reference to the production of insulating fabrics.

One object of my invention is to provide a continuous and effective process for producing an insulating fabric which is specially adapted for use in the manufacture of insulating sleeves or terminal bushings for high-voltage electrical apparatus.

In my co-pending applications, Serial Nos. 507,002 and 507,003, filed July 10, 1909, now Patents 1,067,333 and 1,120,811 is shown and described apparatus for utilizing insulating fabric which is coated with shellac or other suitable insulating material having the quality of softening under the influence of heat.

According to my present invention, I provide a relatively simple process for continuously producing fabric of the general class indicated above and having characteristics which peculiarly adapt it for use with high-voltage electrical apparatus.

Figure 1 of the accompanying drawings is an elevation of a machine embodying my invention and adapted for practising my process. Figs. 2 and 3 are detail views of parts of the machine shown in Fig. 1.

Referring to the drawings, the apparatus here shown comprises a supporting frame having horizontal side beams 1 and uprights 2, supply roll brackets 3, gathering roll brackets 4, a brush roll 5, pressure rolls 6 and 7, a heating roll or cylinder 8 coöperating therewith and a plurality of intermediate guide rolls 9 to 15, inclusive.

A gathering roll 16 is mounted on a shaft 17 and is rotated by a pulley 18, the shaft being rotatively supported in the bearing brackets 4. A feed or supply roll 19 is mounted on a shaft 20, the fabric being led from the roll 19 over guide pulleys 9, 10 and 11, over the brush roll 5 with which it is held in engagement by guide rolls 12 and 13, over the top plane surface of a table 21, and guide roll 14, under the heating cylinder 8 which coöperates with the pressure rolls 6 and 7 and over guide roll 15 to the gathering roll 16.

The rolls 6 and 7 are driven by a shaft 22 to which they are geared, the heating cylinder 8 being free to rotate as the fabric travels.

The shaft 22 is operatively connected to a jack shaft 23 by a belt 24, the shaft 23 being geared to a shaft 23^a to which the pulley 18 is belted. The shaft 23^a is connected to a driving shaft 25 or it may be driven by any other suitable means.

The heating cylinder 8 is supported in a frame 26 which is pivotally mounted on a rod 27 and is provided with a lever 28 by means of which it may be raised to disengage the cylinder from the fabric, as shown in broken lines in Fig. 1. The brush roll 5 operates partially within a tank or vessel 29 containing alcohol, or some other suitable liquid, with which it is desired to moisten one side of the fabric. The arrangement of parts is such that the fabric does not dip into the liquid but the brush roll 5 is partially submerged.

Heat may be supplied to the cylinder 8 by any convenient means, such as a gas flame, gas being supplied to a central pipe 30 which is perforated and extends throughout the length of the cylinder.

The operation of the machine in practising my process is as follows:

A roll of paper or other suitable fabric is first coated with shellac, varnish or other suitable material which becomes softened when heat is applied, and is then mounted on the brackets 3 to constitute the roll 19 of Fig. 1. The coated fabric is then fed, as already explained, over rolls 9, 10, 11 and 12 to the brush roll 5. The coated surface is here moistened by coming in contact with the wet surface of the roll 5 and, as indicated in Fig. 1, then passes immediately over the roll 13 and the table 21. Mica flakes may be placed upon the fabric, which is still sufficiently wet with alcohol to cause them to be retained in the positions in which they are placed. The fabric progresses at such rate of speed that one or two attendants may carefully lay the insulating flakes in position, so that they overlap to produce a highly insulating sheet or strip. As the fabric passes under the heating roll 8, the mica flakes are anchored in position by

the application of heat and by the pressure exerted by the heating roll upon the pressure rolls 6 and 7. After passing over the guide roll 15, the fabric is wound upon the gathering roll 16.

When the roll is complete, it may be removed by withdrawing a pin 31, sliding the shaft 17 into the bearing 4 at the right in Fig. 2, and swinging the roll out of range of the bearing at the opposite end, the right hand bearing being pivotally supported, as shown in Fig. 2.

If it becomes necessary to stop the machine, the heating roll 8 may be lifted out of engagement with the fabric by forcing the lever 28 downwardly into the position shown in broken lines, and a reel 32 (Fig. 3) may be inserted under the heating roll. With this adjustment in view, the pipe 30 is provided with a flexible section or hose connection 34. The roll 14 is also preferably provided with a heater 35 in order to soften the shellac or varnish with which the paper or other fabric is coated.

An apron 33 is preferably mounted on the frame members 1 in order to prevent the attendants or external objects from coming into contact with the roll 13. This is particularly important since the fabric at this point is wet with alcohol and, if any of the alcohol is removed so as to produce dry spots, the mica flakes may not stay in position. The product produced in this way is particularly well adapted for use in the manufacture of high-potential terminal bushings or sleeves but may, of course, be used for any other suitable purpose.

I claim as my invention:

1. The process of manufacturing insulating material which consists in moistening with a solvent liquid the surface of a fabric coated with an adhesive, distributing mica flakes upon the wet surface and applying heat and pressure to the mica-covered strip before the solvent has dried.

2. The process of manufacturing insulating material which consists in moistening the surface of an insulating gum-coated fabric with a solvent liquid, distributing mica flakes upon the wet surface and applying heat and pressure thereto.

3. The process of manufacturing insulating material which consists in moistening with alcohol the surface of a fabric coated with insulating gum, distributing mica flakes upon the wet surface and applying heat and pressure thereto.

4. The process of manufacturing insulating material which consists in continuously passing a strip of insulating gum-coated fabric from a source of supply over and in contact with a source of solvent material, thereafter, applying mica flakes to the fabric, and then passing the fabric between pressure members at least one of which is heated.

5. The process of manufacturing insulating material which consists in continuously passing a strip of insulating gum-coated fabric over a source of solvent material, manually distributing mica flakes upon the wet surface, and applying heat and pressure to the fabric.

6. The process of manufacturing insulating material which consists in moistening the surface of an insulating gum-coated fabric with a solvent liquid, distributing flakes of refractory insulating material upon the wet surface and applying heat and pressure thereto.

7. The process which consists in providing a wet coating of adhesive material upon a sheet of fabric, distributing flakes of refractory insulating material upon the wet surface, and applying heat and pressure thereto.

8. The process which consists in providing a wet coating of adhesive material upon a web of fabric, distributing flakes of refractory insulating material upon the wet surface, and applying heat and pressure thereto.

9. The process which consists in providing upon the surface of a sheet of fabric a wet coating comprising an adhesive material and a solvent thereof, distributing mica flakes upon the wet surface and applying heat and pressure to the mica-covered sheet before the solvent has dried.

10. The process which consists in providing upon the surface of a sheet of fabric a wet coating of shellac and a shellac solvent, distributing mica flakes upon the wet surface and applying heat and pressure thereto.

11. The process which consists in providing upon a continuous web of fabric a wet coating comprising an adhesive and a solvent thereof, manually distributing mica flakes upon the wet surface, and applying heat and pressure to the mica-carrying fabric.

In testimony whereof, I have hereunto subscribed my name this 2d day of May, 1912.

EMIL HAEFELY.

Witnesses:
GEO. GIFFORD,
ARNOLD ZUBER.