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J. J. HOEFLICH

APPARATUS FOR TREATING FABRICS AND THE LIKE

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FIG. 1.

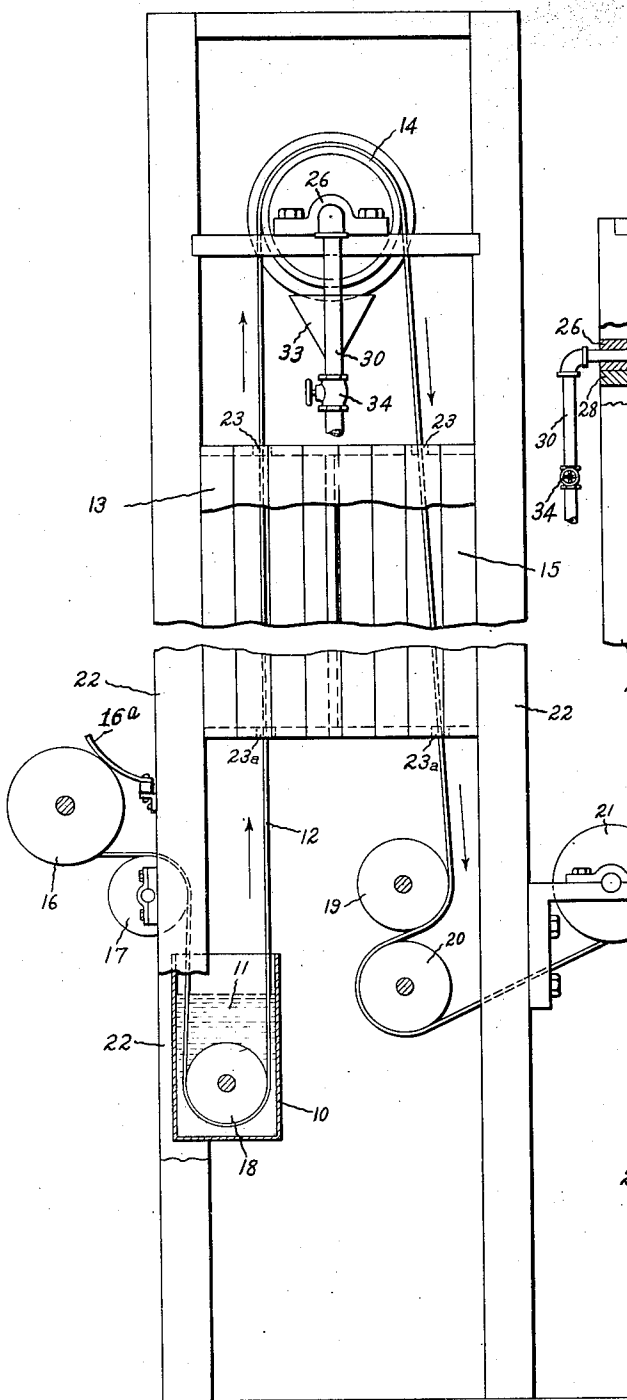


FIG. 2.

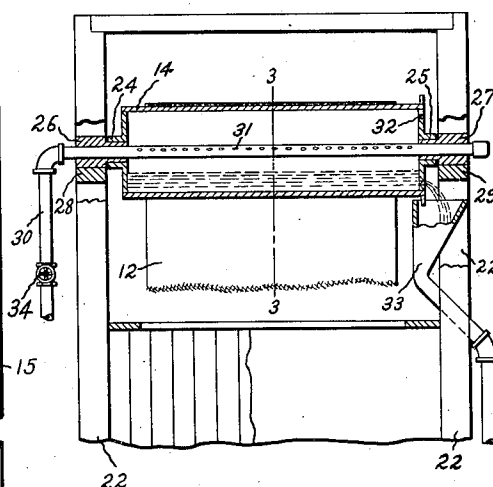
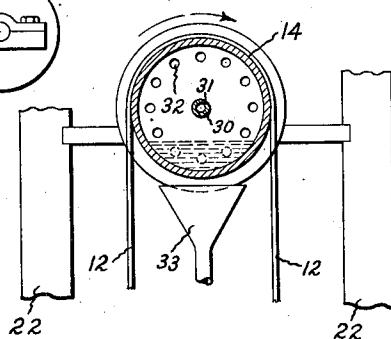


FIG. 3.



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR TREATING FABRICS AND THE LIKE.

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To all whom it may concern:

Be it known that I, JOSEPH J. HOEFLICH, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Apparatus for Treating Fabrics and the like, of which the following is a specification.

My invention relates to apparatus for treating various materials, such as fabric, paper, and the like, with a compound, such as varnish or shellac, and has for its object the provision of means whereby the compound may be applied to the material in a simple, reliable and economical manner.

More specifically my invention relates to apparatus for shellacking fabric, although it has application in the treating of various other materials, such as paper, and in the application of various other compounds, such as varnish.

Shellacked materials have various applications in which the adhesive properties of the shellac may be utilized, for example, in electrical machinery for securing field or armature coils in their slots. In this application a strip of shellacked material is placed in the slot around the coil, the shellac acting to bind the coil securely in place.

A common method of shellacking fabric is to treat the fabric in separate sheets about one yard square. These sheets are dipped in the shellac and hung up by hand to dry. This process is, therefore, necessarily slow and expensive.

In carrying out my invention I provide apparatus whereby the fabric or other material may be shellacked in relatively long lengths which are fed continuously through the apparatus. In this manner the shellac may be applied rapidly and without the necessity of manual handling of the material.

For a more complete understanding of my invention, reference should be had to the accompanying drawing in which Fig. 1 is an elevation view partially in section showing apparatus for shellacking fabric embodying my invention. Fig. 2 is a section view showing the method of cooling the guide roller, while Fig. 3 is a transverse sectional view of the roller.

Referring to the drawing, the apparatus for shellacking fabric or other materials in one form of my invention comprises a suitable container 10 for the bath 11 of shellac

or other treating compound through which the length of fabric 12 is drawn continuously and then passed upward through a drying chamber or oven 13, maintained at a comparatively low temperature where the shellac is partially dried, from which the fabric passes over a roller 14, forming a support and a guide for the fabric, and then downward through a second drying chamber or oven 15 which is maintained at a comparatively high temperature and in which the drying of the shellac is completed. The untreated fabric is supplied from a reel 16 which is provided with suitable means, such as a spring arm 16^a bearing on its periphery, for restraining its rotation so as to place the fabric strip under tension. From the roll 16 the fabric passes over a guide roller 17 from which it is directed downward and passes under a guide roller 18 which is mounted in the container 10 and immersed in the shellac bath 11. From the roller 18 the fabric passes upward through the first drying oven and then downward through the second drying oven as previously described. After the shellacked fabric leaves the high temperature oven 15 it is passed a short distance through the air for the purpose of allowing it to cool after which it is passed between two guide rollers 19 and 20 and is wound up on a reel 21. The roller 20 is driven by suitable means such as an electric motor (not shown), the driving means applying sufficient tension to the fabric to draw it through the apparatus from the supply roll 16. The reel 21 is driven from roller 20 through a suitable driving connection (not shown) embodying a slip connection to provide in a well known manner for increase in diameter of the reel as the treated fabric is wound on. The apparatus is mounted on a suitable framework shown as comprising four upright posts 22.

The two chambers or ovens 13 and 15, forming the drying means, are mounted side by side on the supporting framework. They are each provided with an upper slot 23 and a lower slot 23^a through which the fabric strip passes into and out of the ovens. The drying ovens are heated in any suitable manner, preferably, however, by steam.

Due to the fact that the shellac after the fabric emerges from the low temperature drying oven 13 is only partially dry, it has

a tendency to stick to the roller 14 in passing over it unless some means are provided to overcome this tendency. By reason of its location directly above the ovens 13 and 15, the roller is also exposed to a certain amount of heat from the ovens whereby its temperature is raised and the tendency of the shellac to stick to the roller increased. I have found that by suitably cooling the roller so as to maintain it at a relatively low temperature with relation to the temperature of the fabric as it emerges from the drying oven 13, that the shellac on coming into contact with the roller will be hardened or set by the cooling action of the roller so that it will not have any tendency to stick to the roller. The fabric will then pass freely over the roller 14 and be thus supported and guided from one drying oven to the next.

To provide for cooling, the roller 14 is constructed of relatively thin sheet metal so that it is hollow. The ends of the roller are provided with central flanged apertures 24 and 25 forming internal bearings in which fit stationary tubular supporting members 26 and 27. These supporting members are secured to transverse supporting members 28 and 29 secured to posts 22. Water or other suitable cooling fluid is circulated through the hollow roller through the agency of a pipe 30 which passes through and is supported by the tubular supporting members 26 and 27. A series of apertures 31 are provided along the length of the section of the pipe 30 which is included within the hollow roller. The water, which is supplied through pipe 30 under suitable pressure, is forced out of the apertures 31 in jets which play against the inner surface of the roller throughout its length whereby the roller is cooled. For the escape of the cooling water from the interior of the roller a series of equally spaced apertures 32 are provided in the right hand end of the roller. The cooling water collects at the bottom of the roller as the roller is rotated by the passing of the fabric strip over it and escapes from the apertures 32 into a suitable drain pipe 33. Preferably the apertures 31 are so placed circumferentially of the pipe 30 as to direct the water in jets at a slight angle with the vertical in the direction in which the roller is rotated by passing of the fabric strip over it, as shown in Fig. 3. In this manner, the contact friction of the water in running down the inner surface of the roller assists the fabric in turning the roller. A suitable valve 34 is provided in the pipe 30 whereby the amount of water supplied to the roller can be regulated so as to maintain the roller at the most efficient temperature to prevent the shellac from sticking.

In its operation the apparatus after once

being started is substantially automatic for a given length of fabric. I have found that an efficient speed of the fabric is 15 inches a minute. By increasing the width of the fabric and correspondingly enlarging the machine, the output for each machine may be increased as desired.

By providing an oven of higher temperature for completing the drying operation greater speed is obtained. When using shellac, it is necessary to dry the shellac slowly at first by using the comparatively low temperature oven, otherwise blistering may occur, after which the drying operation may be completed rapidly in the high temperature oven without injury to the shellac. Obviously a single oven of even temperature may be used through which the fabric would be passed twice, although such an arrangement would not give as high speed.

While I have described my invention as embodied in concrete form and as operating in a specific manner, in accordance with the provisions of the patent statutes, it should be understood that I do not limit my invention thereto, since various modifications thereof will suggest themselves to those skilled in the art without departing from the spirit of my invention, the scope of which is set forth in the annexed claims.

What I claim as new and desire to secure by Letters Patent of the United States, is,—

1. Apparatus for treating material in continuous lengths, comprising means for applying the treating compound, drying means through which the material is passed, a roller for supporting the material as it is passed through said drying means, and means for cooling said roller to prevent the treated material from sticking thereto.

2. Apparatus for treating material in continuous lengths, comprising means for applying the treating compound, drying means through which the material is passed a plurality of times, a roller for supporting the material between successive passes through said drying means, and means for cooling said roller to prevent the treated material from sticking thereto.

3. Apparatus for treating material in continuous lengths, comprising means for applying the treating compound, a plurality of drying ovens, and a cooled roller over which the material is passed from one drying oven to the next.

4. Apparatus for treating material in continuous lengths, comprising means for applying the treating compound, a plurality of drying ovens, a roller over which the material is passed from one drying oven to the next, and means for cooling such roller so as to set the compound and prevent sticking to the roller.

5. Apparatus for treating material in continuous lengths, comprising means for ap-

plying the treating compound, a plurality of drying chambers maintained at different temperatures, a roller over which the material is passed from one drying chamber to the next, said roller being hollow and provided with a tubular supporting shaft, and means for circulating a cooling fluid through said shaft and the interior of said roller so as to maintain said roller at a relatively low temperature whereby the compound is set to prevent sticking as the material passes over said roller.

6. Apparatus for treating material in continuous lengths, comprising a bath of treating compound, a plurality of drying chambers maintained at different temperatures, a roller, means for passing material through said bath, upward through one of said drying chambers, over said cooled roller and

then downward through another drying chamber, and means for cooling said roller so as to prevent the compound from sticking thereto.

7. Apparatus for treating material in continuous lengths comprising a bath of treating compound, a pair of drying chambers maintained at different temperatures, a roller, means for passing the material continuously through said bath, upward through the chamber of lower temperature, over said roller and then downward through the chamber of higher temperature, and means for cooling said roller so as to prevent the compound from sticking thereto.

In witness whereof, I have hereunto set my hand this 21st day of March, 1923.

JOSEPH J. HOEFLICH.