

UNITED STATES PATENT OFFICE.

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PROCESS OF STIFFENING HATS.

SPECIFICATION forming part of Letters Patent No. 631,904, dated August 29, 1899.

Application filed November 29, 1898. Serial No. 697,745. (No specimens.)

To all whom it may concern:

Be it known that we, JOHN HENRY NEAVE, of Rainow, county of Macclesfield, England, and FELIX DEHAN, of Paris, France, have
5 invented a new and useful Improvement in Processes of Stiffening Hats, of which the following is a specification.

This invention has reference to the manufacture of felt hats or hats of analogous materials, and relates more particularly to the
10 "stiffening" of the hat.

It has been the custom in the manufacture of hats, as far as we are aware, in stiffening the same to apply to the hat a solution containing a resinous or analogous material and
15 then immediately subject it to the action of heat at a degree sufficient to melt the resinous material, which on cooling assumes a crystalline condition and renders the hat stiff. The surface was then cleared by the
20 action of steam, by rubbing it with an abrasive substance, or by subjecting it to an alkaline bath. The result of these operations is that the stiffening material being near the surface of the hat is liable to be brought to the surface and the surface thereby marred by the
25 subsequent manipulation of the hat to finish it. It is the aim of our invention primarily to avoid the liability of the stiffening material being brought to the surface after the latter is cleaned; and to this end our invention consists, broadly, in applying the stiffening material in an amorphous condition, then subjecting the surface of the hat to a clearing process
30 to remove the surplus material, and finally subjecting the hat to the action of a sufficient degree of heat to melt the stiffening material and cause it to assume a crystalline condition and thereby stiffen the hat.

40 In proceeding to carry our invention into effect we first prepare a bath of the stiffening material, which may consist of a solution of some resinous gum—such as, rosin or shellac, preferably the latter—with the proper proportion of alkali. This bath is prepared
45 in the usual and well-known manner, the shellac being in an amorphous or non-crystalline condition. The hat to be stiffened is treated in this bath in the usual manner by immersion or otherwise. It is now instead
50 of being subjected to the influence of a suffi-

cient degree of heat to melt the shellac and to cause it to crystallize, as under the previous method, subjected to a washing or cleaning operation to clear the surplus solution from the surface, it being possible while
55 the shellac is in this condition to more thoroughly free it from the hat than if it were in a crystalline and stiff condition. The result of the clearing of the surface of the hat at this stage is that the shellac is freed from the hat to a considerable extent, remaining
60 only in the interior of the hat, thereby avoiding any liability of its being brought to the surface by any finishing process or treatment to which it might thereafter be subjected.

We prefer to effect the clearing of the surface by stretching the hat over a rotary block and permitting water to flow thereon, the
65 cleansing being effected by rubbing a brush in contact with the rapidly-moving surface of the hat. The block should be driven at from two hundred to three hundred revolutions per minute, and while the water trickles over the surface of the hat it is brushed by the
70 attendant, the result being that the surface is thoroughly cleansed of the shellac and the material of the hat freed of the shellac to a considerable depth. After the surface is sufficiently cleansed the water remaining may be
80 removed by placing the hat on a block similar to that just described and rotating the same at from twelve hundred to fifteen hundred revolutions per minute. The hat is then thoroughly dried in a suitable manner, but preferably by the application of a moderate degree of heat—say not exceeding 100° Fahrenheit—according to the quality of the shellac
85 or the stiffening material, not sufficient, however, to melt the shellac which is left in the body of the hat, and after being dried in this manner any shellac remaining on the surface may be easily and quickly removed in the
90 form of powder by brushing. The hat is now subjected to the action of heat sufficient to melt the shellac. We prefer to accomplish this by subjecting the hats, twelve to eighteen at once, on a block in a chamber to a steam-bath. The steam should have free circulation through the chamber, but not under
100 pressure. The effect of the bath will be to melt the shellac, which on assuming a cry-

talline condition will impart to the hat the necessary stiffness.

From the foregoing description it is seen that by our process the shellac is retained in an amorphous condition, in which condition it may be freely removed from the nap and from the surface, whereas in the methods previously employed the shellac is caused to assume a crystalline form immediately after its application and is in this way fixed tightly upon the surface of the hat as well as in its interior. By our process we keep the shellac in its amorphous condition, so that it can be readily removed from the surface by brushing or washing, and after the surface is thus effectually and thoroughly cleaned we cause the shellac to assume a crystalline condition.

While we have described the washing process as the primary means for removing the surplus stiffening material, it is to be understood that this step of the process may be dispensed with and the surplus material removed in powdered form by brushing or otherwise acting on the surface of the hat after the latter is dried subsequent to the application of the stiffening material.

Having thus described our invention, what we claim is—

1. The improved process of stiffening hats, which consists in applying thereto a resinous material in an amorphous condition, removing that portion of the said material which is at the surface of the hat, and finally causing

the remaining resinous material below the surface to assume a crystalline form.

2. The improved process of stiffening hats, which consists in applying to the same a resinous material in an amorphous condition, subjecting the surface of the hat to a washing process, drying the same, subjecting the surface to a brushing action, and finally causing the remaining resinous material to assume a crystalline form.

3. The improved process of stiffening hats, which consists in applying to the hat a resinous material in an amorphous condition, removing the material from the surface of the hat and subjecting the hat to a steam-bath to cause the remaining resinous material to crystallize.

4. The process of stiffening hats, which consists in applying to the same shellac or analogous resinous material in an amorphous condition, subjecting the hat to a washing action to remove the shellac from its surface, drying the hat, subjecting the dried surface to a brushing action, and finally subjecting it to heat to melt the shellac.

In testimony whereof we hereunto set our hands, this 9th day of November, 1898, in the presence of two attesting witnesses.

JOHN HENRY NEAVE.
FELIX DEILAN.

Witnesses:

J. ALLISON BOWEN,
GEO. E. LIGHT.