(No Model.)

G. YULE.

Process of and Apparatus for Felting Hats.

No. 241,266. Patented May 10, 1881.

Fig. 1.

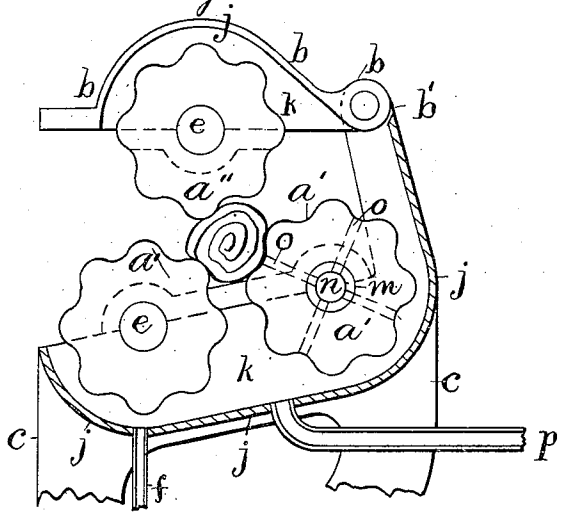


Fig. 2.

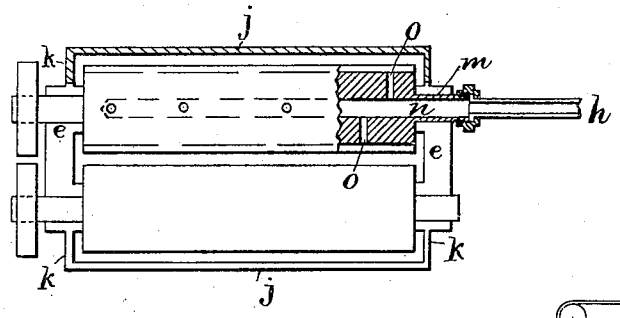


Fig. 3.

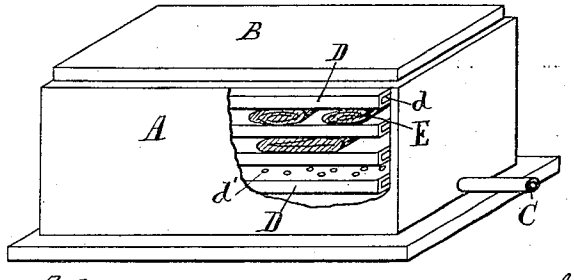
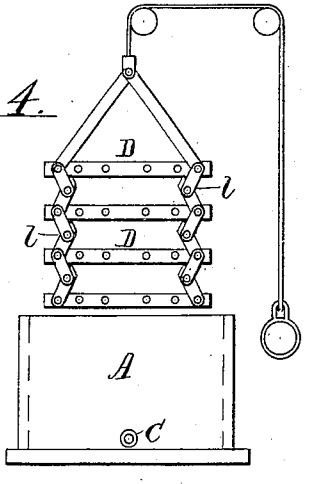


Fig. 4.



Attest:

C. C. Herrick

Wm. Dietz

Inventor.

Thos. S. Crane, Atty.

for George Yule Inventor

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

GEORGE YULE, OF NEWARK, NEW JERSEY.

PROCESS OF AND APPARATUS FOR FELTING HATS.

SPECIFICATION forming part of Letters Patent No. 241,266, dated May 10, 1881.

Application filed February 4, 1881. (No model.)

To all whom it may concern:

Be it known that I, GEORGE YULE, a citizen of the United States, residing at Newark, in Essex county, State of New Jersey, have invented a new and useful Improvement in the Process of and Apparatus for Felting Hats, of which the following is a description.

My invention relates to an improvement in the process and apparatus employed in felting hats, and will be fully understood by reference to the accompanying drawings and description.

Figure 1 of the drawings is a transverse section of a roller felting-machine supplied with my improved steam-jacket and perforated roller. Fig. 2 is a plan of the two lower rollers of such a machine, showing the lower part of the steam-jacket, where it incases the rollers, and exhibiting the perforated roller, partly in section, to show the induction and eduction apertures. Fig. 3 is a perspective view of a steam-box adapted to heat the felts under a limited pressure without agitation or rolling of the felts; and Fig. 4 is an end view of the box and the pressing-plates lifted therefrom to remove the rolls of felts.

My invention consists in an improvement upon the process hitherto in use for felting hat-bodies by means of rollers, wherein the felts have always been prepared for the action of the rollers by one of two methods—viz., dipping in boiling water or rolling in a rotating barrel supplied with steam. The operation of the steam was found to be preferable to that of the water upon new and tender felts; but having discovered that the agitation of the felts in the barrel produced a grainy or mottled felt in the finished article, and such quality being very undesirable, I have devised a change in the process at the first stage to avoid such results, and secure the utmost advantage from the subjection of the felts to steam before applying any rolling action or pressure to them. In place of the tumbling of the rolls of felt loosely about in a barrel, I envelope them in an atmosphere of steam under such circumstances that they may be penetrated with the heat and moisture, and merely warmed and softened preparatory to the operation of the rolls. The tender felts are then subjected to a rolling pressure in rollers revolved at a slow rate of speed—say eighty revolutions per minute—and are then able to bear the usual treatment with hot water and rolls running at speeds varying from one hundred to one hundred and fifty turns per minute.

By the use of the steam-box I have found that the felts produced were of much better quality than those rolled in a steam-barrel, and I have also found that weights applied to the felts in the steam-box were beneficial, and I have devised the arrangement shown in Figs. 3 and 4 as the most convenient for steaming and pressing the felts in a box upon a large scale.

A is the box, having a lid, B, and supplied with steam by a pipe, C.

D are a series of shelves, perforated longitudinally at *d* for the circulation of the steam, and upon their surface at *d'* for the diffusion of the vapor among the felts E, arranged inside between the several shelves. When packed in the box the weight of the shelves presses the felts to a moderate degree, and keeps the rolls and various felts in better condition than when the same are steamed without any such constraint.

To insert the felts between the shelves with facility the latter may be connected by jointed links *l* at their ends, and the whole can thus be lifted out together, as seen in Fig. 4, to remove and replace the felts, the links permitting the shelves to separate sufficiently for these objects.

I have also found that rollers can be operated to great advantage in a strong vapor of steam, and have therefore devised the apparatus shown in Fig. 1, consisting of a steam-jacket surrounding the rollers, to receive and retain steam in close proximity to them.

In Figs. 1 and 2, *a a'* are the lower rollers, and *a''* the upper roller, mounted in the usual way in a swing-frame, *b*, hinged to ears *b'*, formed upon the main frame *c*. The lower rollers are surrounded beneath and at the rear by a jacket, *j*, shown provided with a steam-supply pipe, *p*.

The swing-frame *b* is also formed with a jacket, *j*, which, in connection with the one about the lower rolls, effectually retains the steam near the rollers, the end bearings, *e*, being also constructed to close the space at each end of the rolls, as shown at *k*. A waste-pipe, *f*, is provided at the lowest part of the jacket, to

drain off the water which would fall into the tank usually provided upon the frame *c* for dipping the felts in hot water at the later stages of the felting process; but if no such tank were employed on the steam-jacketed machine the pipe *k* would discharge elsewhere.

The method of leading steam into the perforated roller is shown in Fig. 2, *h* being the supply-pipe, coupled with a swivel-joint to the hollow axle *m*, the aperture *n* extending inside the roller and connecting with various holes, *o*, leading the steam outward to the surface.

By the use of either the steam-roller or the pipe *p* the jacket is effectually fed with steam and the felts worked under the most favorable conditions.

I am aware that a perforated roller has been patented heretofore to J. Wharton, and do not therefore claim the same as my invention.

Although I use the machine provided with steam in such a jacket for all the stages of the felting process, I do not limit myself to such a process, but claim the different processes which I have mentioned above in the following manner:

I claim—

1. The steaming-box provided with weights for pressing the hats preparatory to the roller treatment, and operating substantially as and for the purpose described.

2. The process herein described for hardening felts by rollers, consisting in subjecting the hats to the vapor of steam in a jacket, surrounding the rollers while rolling, and pressing the hats in the usual manner.

3. In combination with two or more revolving rollers adapted to felt a bundle of hats by the process herein described, a steam-jacket for retaining steam about the rollers, and means for supplying steam thereto, substantially as and for the purpose set forth.

In testimony that I claim the foregoing I have hereto set my hand this day, February the 2d, 1881.

GEORGE YULE.

Witnesses:
THOS. S. CRANE,
ISADOR HANNOCH.