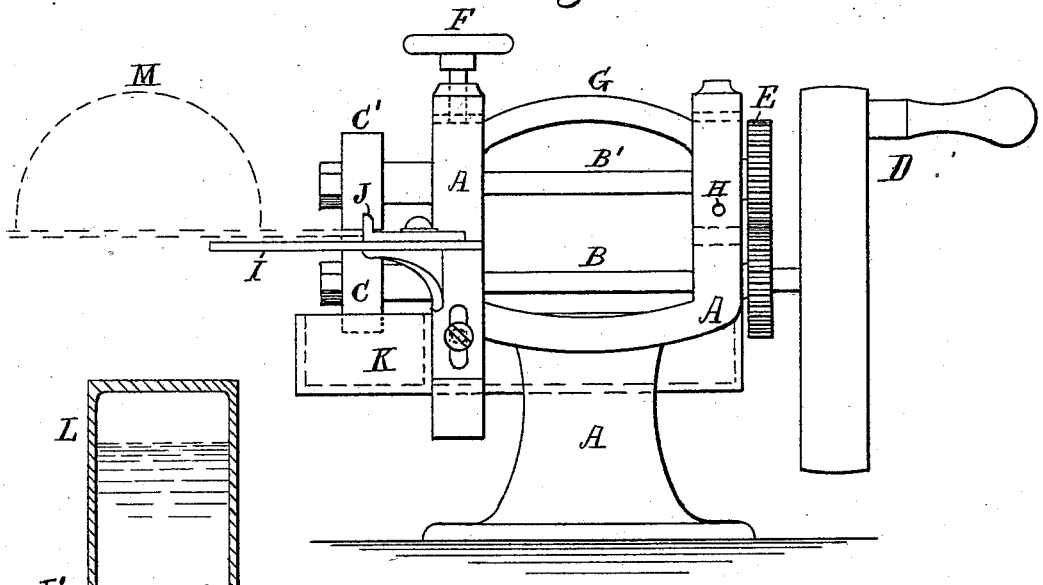
(No Model.) 2 Sheets—Sheet 1.

E. TWEEDY & G. YULE.

HAT BRIM STIFFENING MACHINE.

No. 302,528. Patented July 22, 1884.

Fig 1



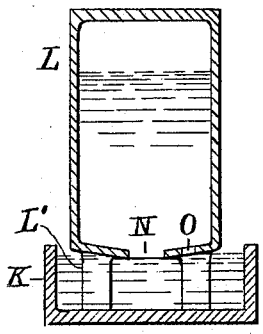


Fig 3.

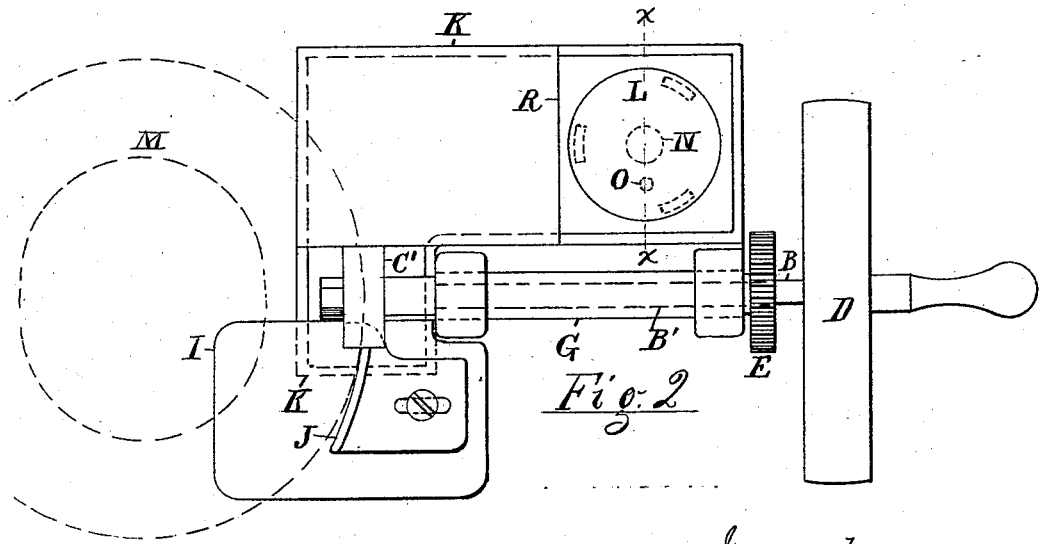


Fig. 2

Attest:
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per Thos. S. Crane Atty

(No Model.) 2 Sheets—Sheet 2.

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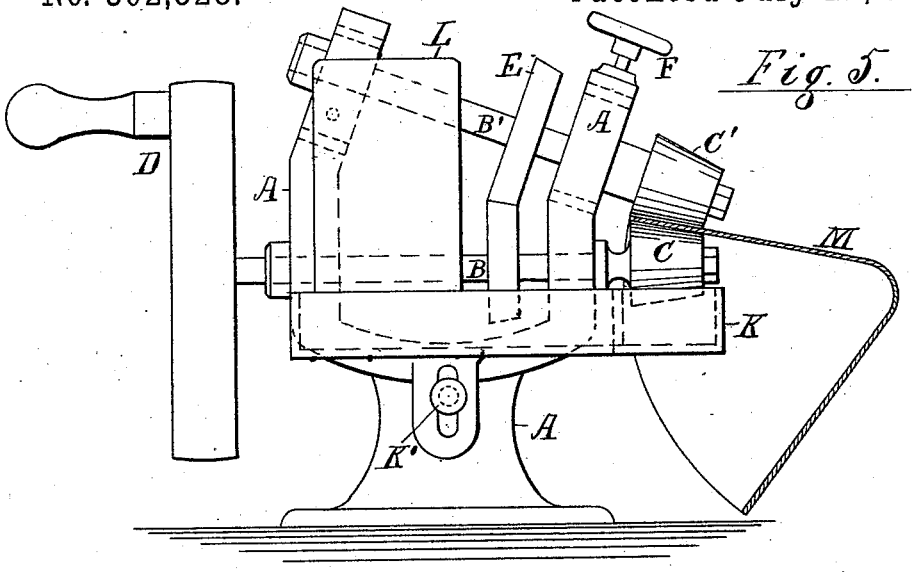

Fig. 5.

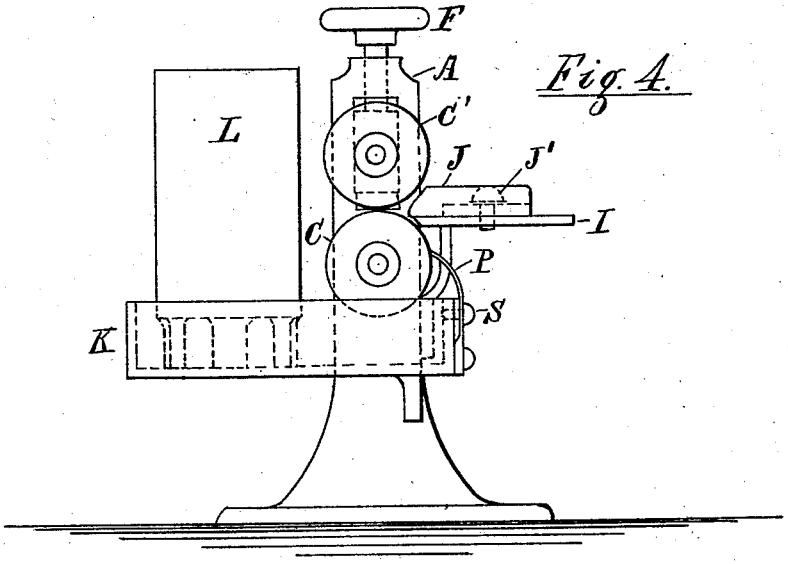

Fig. 4.

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per Thos. S. Crane, Atty

UNITED STATES PATENT OFFICE.

EDMUND TWEEDY, OF DANBURY, CONNECTICUT, AND GEORGE YULE, OF NEWARK, NEW JERSEY.

HAT-BRIM-STIFFENING MACHINE.

SPECIFICATION forming part of Letters Patent No. 302,528, dated July 22, 1884.

Application filed April 3, 1884. (No model.)

To all whom it may concern:

Be it known that we, EDMUND TWEEDY and GEORGE YULE, citizens of the United States, residing, the said TWEEDY in Danbury, Fairfield county, Connecticut, and the said YULE in Newark, Essex county, New Jersey, have invented certain new and useful Improvements in Hat-Brim-Stiffening Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

The object of this invention is to provide a means of applying the stiffening-solution exclusively to the brim of a hat, or to any portion of the brim that may be desired, and the construction is therefore such that no other part of the hat is touched by the pressing-rollers employed, and the stiffening may be applied to the desired part of the brim with greater ease and uniformity than has been possible with the devices previously used.

Our invention is particularly applicable to stiffening the border or outer part of the brims of "flexible" or "semi-stiff" hats which have been stiffened while in the conical shape to a uniform degree throughout the entire brim, in the usual manner or by means of our invention, but to which it is necessary to give a greater degree of stiffness in the border, which is to be turned over in the process of curling, in order that the curl may be made firmer and more rigid, and more capable of retaining its form and contour. By our invention this can be done while the hat is in the conical shape before blocking, or, as we prefer, after the hat has been "finished" and the brim has been trimmed to its proper shape for curling. This supplementary stiffening has usually been done to the hat while in this condition by dipping a small sponge or other porous substance into a solution of stiffening material, and applying it by the hand to the edge of the brim. It is obvious that this method must be very uncertain in its results, both as regards the marginal line of its action, and also the quantity of the solution imparted to different portions of the brim. It is also defective in that sufficient pressure cannot be exerted to cause the solution to penetrate the felt.

Our invention is also applicable to the stiffening of the entire brims of either "soft," "stiff," or "semi-stiff" hats, these terms being used to designate the different degrees of the stiffening material imparted to the hat.

Heretofore in the use of rubber stiffening-machines the stiffening-solution has been applied by dipping the whole or part of the hat into the tank containing the solution, and then removing the superfluous fluid by pressure between rollers. As such rollers are usually constructed with bearings at both ends, they cannot be applied to a single thickness of the felt at the edge of the brim, but the hat-body required to be doubled together in flat form and passed bodily between the pressing-rollers. The pressure of the rollers may also be so adjusted as to cause the solution to penetrate the felt to any required degree. It is obvious that when a doubled hat-body has the brim part dipped in a tank of solution no exactness can be secured in the application of the stiffening in a marginal band, and when such a hat-body is passed, with the tip first, through a pair of rollers, to press out the surplus solution, it is obvious that the hat-body will be creased at two opposite edges, and will be permanently marked at such points if any stiffening be upon the rollers. It has therefore required a constant wiping of the rollers to avoid such an effect upon the hat-body as far as possible; but no care has been able to prevent a certain degree of damage to the bodies by such "crozing" or folding of the hat-bodies under pressure between the stiffening-rollers. It has also been difficult heretofore to maintain the solution at a fixed depth in the dipping-tank when stiffening brims, that the workman might determine the width of the stiffening upon the hat-brim by touching the edge of the body to the bottom of the tank. It has therefore been common to use an adjustable bottom in such tanks, and to set the same a proper distance below the surface of the solution to correspond with the width of the brim to be dipped, or to place bricks in the solution from time to time to raise the level, as required, when use or evaporation had altered the same. Such devices, however, in no wise prevented the formation of a crust upon the surface of the liquid, which

has also been a great source of annoyance in attempting to do fine work. Our invention obviates all these difficulties, and provides a perfect means of applying the stiffening to the brims of hats by the use of overhung rollers, one of which rotates in contact with the solution, and by preserving the solution from the atmosphere in a reservoir and discharging it at a uniform level into a small tank below the transferring-roller. In our construction the rollers are overhung or journaled in bearings at one end only, so that the edge of the brim can be passed between the two rollers and the stiffening be applied to the same without the rollers touching any other part of the hat or body. As the hat during such operation turns around as if mounted on a hat-block, the degree to which the brim penetrates the rollers may be accurately gaged, and the stiffening thus confined exactly to the desired limit. The construction of the reservoir and tank are equivalent to the inverted bird-fountains and to certain inkstands in which the atmospheric pressure sustains a supply of fluid above the desired level, and no discharge is effected until a vent in the bottom of the reservoir is uncovered by the descent of the fluid in the tank. Such a self-feeding reservoir is therefore as well adapted for use in the dipping-tanks previously used as in the particular machine we have invented, and we do not therefore limit ourselves to one particular application of it. When thus used, the reservoir can be made adjustable in the tank, as by an elevating-screw, so as to raise and lower the level of the solution as required.

A machine embodying our improvement is shown in the annexed drawings, in which Figure 1 is a side elevation, looking toward the gage-table. Fig. 2 is a plan of the parts shown in Fig. 1. Fig. 3 is a vertical section of the tank and reservoir on line *x x* in Fig. 2. Fig. 4 is a front elevation, and Fig. 5 is a side elevation, looking toward the tank, of a similar machine, having conical rollers adapted to stiffen the brims of bodies before blocking. The lower roller is arranged to dip into or touch the solution in a stationary tank, and to thus carry a graduated amount of the stiffening into contact with the brim, a scraper being used, when desired, to remove any excess from the rim of the roller. The reservoir is furthermore constructed to maintain a fixed level for the surface of the solution in the tank, that the amount applied to the roller and hat-brim may vary as little as possible.

A is the frame of the machine, carrying two shafts, B B′, one of which carries the stiffening-roller C and hand-wheel and crank D, and the other carries the pressure-roller C′. The shafts are connected together by gears E, and the upper or pressure roller, C′, may be adjusted to or from the lower one, to press more or less of the solution into or from the brim, by a regulating-screw, F, the shaft B′ being carried in a loose yoke, G, which is pivoted into the frame A at H.

A table or support for the hat-brim is shown at I, arranged adjacent to the side of the rollers, and supplied with a movable gage, J, by which the penetration of the brim between the rollers may be graduated. Beneath the roller C is the front part of the tank K, arranged to carry the stiffening-solution in contact with the roller, the tank being extended along one side of the frame A to a point where a reservoir, L, can be located without interfering with the operator's hands in subjecting the hat to the rollers.

The hat is indicated by dotted lines M in Figs. 1 and 2, in which it will be seen that the brim of the hat necessarily covers a part of the tank adjacent to the rollers.

The reservoir is formed with an outlet, N, and a vent-hole, O, at one end, and is inverted in the tank, with its outlet at the level where the surface of the fluid in the tank is intended to stand. When such fluid is consumed below the level of the vent-hole O, a bubble of air enters the reservoir through the vent and permits a portion of the fluid to escape until the vent-hole is again covered.

By this device a constant supply of the solution may be furnished to the roller C; but in case the same applies too much of the stiffening to the brim I use the scraper P (shown in Fig. 4) to remove the surplus, and thus secure exactly the amount required.

The scraper is shown as a leaf-spring attached to one side of the tank K, and is provided with an adjusting-screw, S, to vary its pressure, the spring being constructed to normally pass away from the roller.

The object of the entire construction is to apply the stiffening-solution in a band to the whole or any desired part of the brim of the hat, and we do not therefore limit ourselves to the precise construction shown, as it is obviously immaterial how the rollers are mounted to secure their application in the required manner, nor how the solution is maintained at a fixed level, or, indeed, whether it be maintained at such level or not if the scraper be used to remove the surplus from the roller C.

The chief advantage in the use of a reservoir, as L′, is to protect the solution from evaporation and thickening prior to its application to the hat, and the same object may be still further secured by providing a cover to the tank, except where it is penetrated by the roller C or reservoir L. Such cover is shown at R, and might be made integral with the reservoir by casting in one piece.

Having thus fully set forth the construction of our device as shown herein, it will be seen that the upper roller not only serves to draw the brim along and rotate the hat, but may be regulated by the screw F to discharge any desired proportion of the solution from the brim, and thus determine its stiffness quite independently of the scraper P.

In Fig. 5 the mounting of the tank adjustably upon the frame A is indicated by a slotted foot and screw, K, by means of which the

tank can be brought closer to or farther from the roller, as desired, an elevating-screw being employed to secure a fine adjustment, if desired. In the same figure is shown the application of our invention to an unblocked conical hat-body, the same requiring conical rollers to operate with facility, such as are shown in the drawings. In this figure it will be seen that one of the rollers is inside the conical body (it is immaterial which roller) and the other outside, so that the brim alone is operated on, and the rest of the body is neither folded nor creased in applying the marginal stiffening desired.

Having thus shown how our invention may be modified without altering its principle of operation, we claim the same in the following manner:

1. The method herein shown and described for applying stiffening to a hat-brim, consisting in feeding the solution to the brim by the edge of a pressing-roller, substantially as shown and described.

2. The combination, with a tank of stiffening-solution, of a reservoir constructed and operated as described, to maintain the level of the solution automatically, substantially as and for the purpose set forth.

3. In a machine for stiffening hat-brims, the combination, with a tank of stiffening-solution, of an overhung roller revolving in contact with the solution, and means for guiding the hat-brim and pressing it upon the roller, as and for the purpose set forth.

4. The combination, with the tank of solution and the overhung roller C, revolving in contact with the fluid, of the adjustable pressing-roller C′ and the scraper P, arranged and operated as herein shown and described.

5. The combination, with the tank of solution and the overhung rollers C and C′, of the table I and gage J, arranged and operated substantially as herein set forth.

6. The combination, in a brim-stiffening machine, of the tank K, overhung rollers C C′, and the reservoir L, constructed with outlet N and vent O, arranged and operated substantially as set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

EDMUND TWEEDY.
GEORGE YULE.

Witnesses:
BUTLER COLES,
THOMAS E. TWEEDY.