(No Model.)

J. S. TAYLOR.

MACHINERY FOR FELTING HATS.

No. 263,076. Patented Aug. 22, 1882.

Fig. 1.

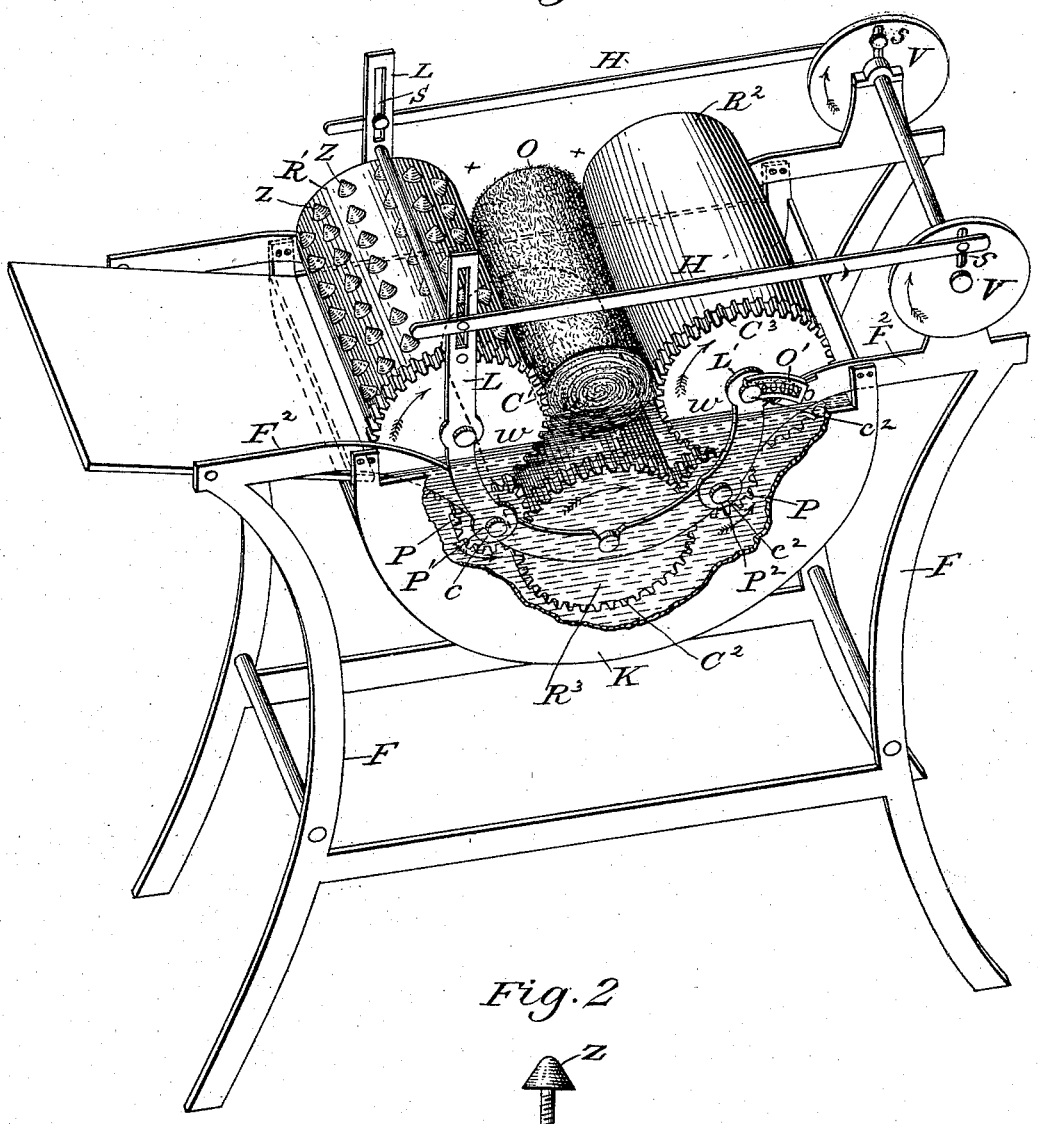

Fig. 2

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UNITED STATES PATENT OFFICE.

JAMES S. TAYLOR, OF DANBURY, CONNECTICUT.

MACHINERY FOR FELTING HATS.

SPECIFICATION forming part of Letters Patent No. 263,076, dated August 22, 1882.

Application filed January 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES S. TAYLOR, of Danbury, county of Fairfield, and State of Connecticut, have invented certain new and useful Improvements in Machinery for Felting Hats, which improvements are fully set forth in the following specification and accompanying drawings, having letters of reference marked thereon.

Figure 1 is a perspective view of the machine, partly in section. Fig. 2 is a view of a detached detail, as hereinafter explained.

The object of my invention is to facilitate the process of felting hat goods, and other fabrics.

In the drawings, F represents the frame of the machine.

K is a kettle for containing hot water, (represented at *w w*.)

R′ R^2 R^3 represent three rollers, about four inches in diameter and about two feet long, placed nearly or quite parallel with each other, provided with suitable bearings at each end, and having driving-gears C′ C^2 C^3, to which motion is communicated by means of connecting-gears P P. The roller R^3 is suspended at each end in the hanging frame F^2, so as to be entirely immersed in the water. The roller R′ is suspended by means of levers L L, which turn on centers represented at *c*. To this roller a vibratory motion is communicated through the connecting-rods H H by means of the crank-wheels V V, the levers L L and crank-wheels V V being each provided with a slot, S S, for the purpose of adjusting the connecting-rods H H, whereby to increase or decrease the pressure against the goods to be felted. The roller R^2 is also suspended by means of the levers L′ L′ at each end, and turning on centers represented at c^2. To this roller an elastic or yielding force is applied by means of springs at one or both ends, as represented at O′.

The axes of the two rollers R′ R^2 are nearly perpendicularly in line with the center bearing-points, P′ P^2. This arrangement, while supporting the rolls in their proper position, leaves them free to be brought against the articles to be felted without the action of hand or foot levers, and to be released from the articles without the action of weights or balancing expedients usually employed for that purpose. The rollers thus supported in a transverse curve form an opening or chamber for receiving and discharging the goods and for felting the same, the roller R^3 constituting the base of the receptacle and the rollers R′ R^2 the sides without the interposition of any roller or other object.

The three rollers R′ R^2 R^3 are held by means of the hanging frame F^2, so that the roll of goods to be felted is from one-fourth to one-half immersed in the heated liquid, as shown by the dotted line, while the remaining portions of the goods are exposed to the cooling action of the air as they are revolved in the machine, thus exposing and subjecting their several portions to the continued and alternate action of air and water, heat and cold, and at the same time to the rolling and felting motion imparted by the machine.

The roller R′ is provided with adjustable knuckles Z Z, one being shown detached in Fig. 2. These knuckles or projections are conical or tapering in form, about one to one and one-half inch in diameter at the base, and of equal height, having for their purpose that of being forced against the goods to be felted, giving a proper degree of fulling motion to enliven up the goods in the manner analogous to that imparted in the well-known process of felting by hand. These knuckles are made of elastic material—as rubber—or of wood, glass, porcelain, or of metals suitable for withstanding the action of the acids usually used by the trade, and may be round, square, or of other forms. They may be made adjustable to the roller by means of bolts or screws, as represented at Z, Fig. 2.

The roller R^2 is made convex in its form, as represented, for the purpose of presenting the central portion of its surface against the central portion of the roll of goods, in order to felt that portion in a greater degree than the outer ends, and to prevent the formation of felting-welts in the goods, often found when subjected to too much work near the outer ends of the rolls in the process of felting.

In operating the machine motion is communicated to the three rollers in the direction indicated by the arrows. The hat-bodies O, hav-

ing been previously formed preparatory to the process of felting, are rolled up in a cloth usually employed for that purpose, and deposited in the chamber or receptacle (formed by the arrangement of the rollers in a transverse curve) through the receiving-space from *x* to *x*, the vibrating motion communicated to the roller R′ as it recedes from the center allowing the roll of goods to pass down to the said chamber. While the goods remain therein the continuous vibrating motion of the knuckled roller R′, in connection with the revolving motion of the three rollers in the direction indicated by the arrows, imparts to the goods a rolling and vibrating movement, while they are at the same time exposed to the heating and cooling action of water and air. The receding motion of the roller R′ allows goods to be entered and removed from the receptacle or chamber without removing either one of the rolls for that purpose, thus dispensing with a large amount of manual labor usually heretofore expended in releasing and securing one or more of the rolls. The roll of goods, as it is revolved in the machine, presents its lower surface to the action of the heated liquid, as indicated by the dotted line, and absorbs so much of the heated liquid, as it alternately presents its lower surface to the water, as is necessary to properly saturate and heat the fibers, which liquid is again immediately ejected or forced from the goods by the pressure of the revolving rollers. The roll of goods is therefore continually saturated and resaturated at its under portion with the heated liquid, while the liquid is ejected from its upper portion. The goods are thus alternately subjected to heating and cooling action, as well as repeatedly saturated by and freed from water, as also subjected to the rotary, compressive, and vibratory mechanical action of the machine.

I do not in the present application claim a method of scalding and felting hat-bodies which consists in rolling and manipulating the goods in scalding water on open rollers without superimposed pressure. Neither in the present application do I claim the combination, in a hat-felting machine, of a kettle and a series of rollers suspended therein in a transverse curve, with pinions or gearing for driving said rollers together and in the same direction, such method and mechanical combination being set forth and claimed in an application filed by me of even date herewith; but,

Having described my invention, what I claim as new is—

1. The method herein described of scalding and felting hat-bodies, which consists in rolling the goods alternately in air and hot water on open rollers without superimposed pressure, and at the same time subjecting the goods to automatic compression and vibratory movement, substantially as set forth.

2. In a hat-felting machine, a kettle and a series of rollers suspended therein on a transverse curve, the lower roller being in fixed bearings and the upper rollers automatically yielding or constructed to have lateral vibration, combined with gearing for rotating said rollers simultaneously and in the same direction, substantially as set forth.

3. In a hat-felting machine, a kettle and a series of three rollers suspended therein on a transverse curve, the lower roller being in fixed bearings, one of the upper rollers having positive lateral vibration and the other upper roller resting in elastic or yielding bearings, substantially as set forth.

4. The combination, in a hat-felting machine, of a kettle and a series of rollers suspended therein on a transverse curve, one of which, R′, is provided with knuckles and adapted to be given positive lateral vibration, substantially as set forth.

5. The combination, in a hat-felting machine, of a kettle and a series of rollers suspended therein on a transverse curve, one of which, R^2, is convex and mounted in elastic or yielding bearings, substantially as set forth.

6. The combination, in a hat-felting machine, of a kettle and a series of rollers suspended therein on a transverse curve, the roller R^3 being in fixed bearings, the roller R′ provided with knuckles and adapted to receive positive lateral vibration, and the other roller, R^2, convex and mounted in elastic or yielding bearings, substantially as set forth.

7. The adjustable knuckles Z, combined with a roller or rollers of a hat-felting machine, substantially as set forth.

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Witnesses:
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