J. Vero,

Felting Machine.

No. 112,197. Patented. Feb. 28. 1871.

FIG. 1.

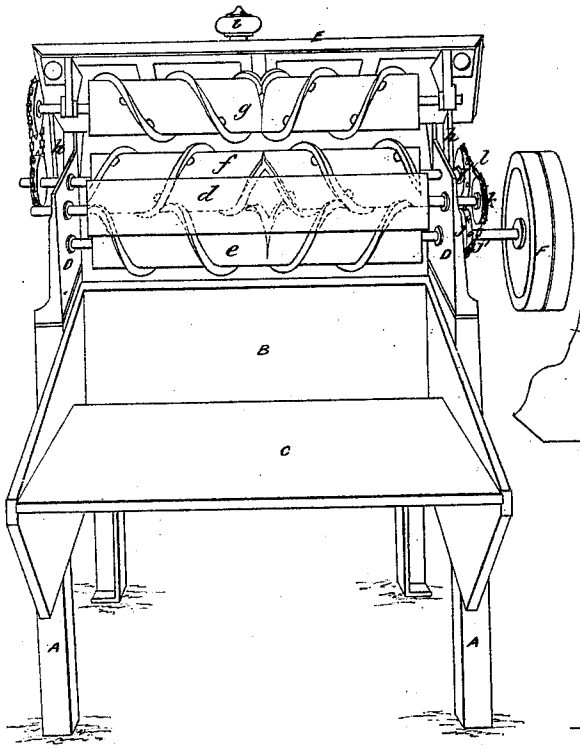


FIG. 2.

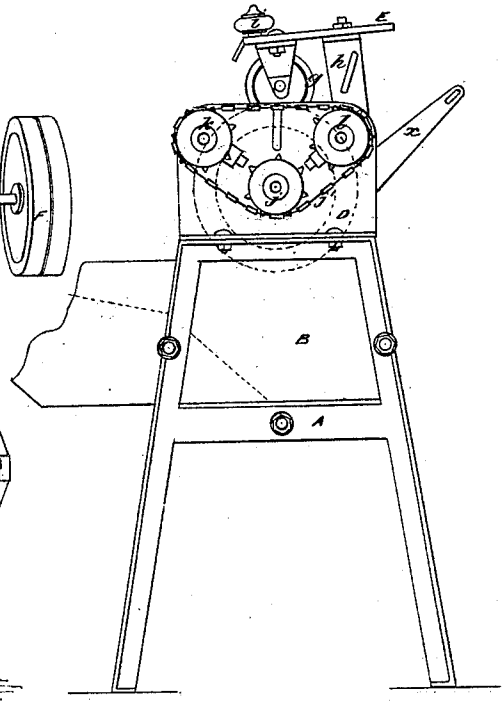


FIG. 3.

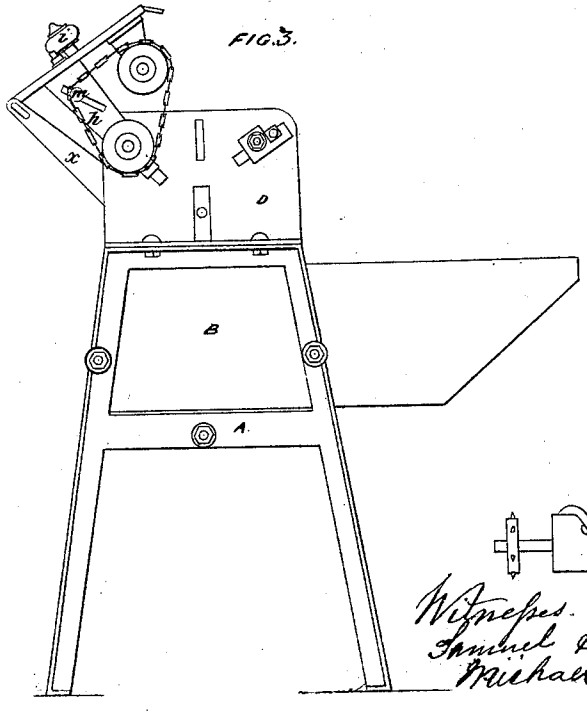
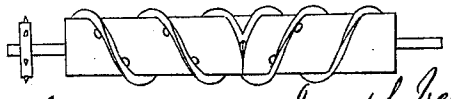


FIG. 4.



Witnesses.
Samuel Daley
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JOSEPH VERO, OF DEWSBURY NEAR LEEDS, ENGLAND.

Letters Patent No. 112,197, dated February 28, 1871.

IMPROVEMENT IN MACHINES FOR FELTING HAT-BODIES.

The Schedule referred to in these Letters Patent and making part of the same.

I, JOSEPH VERO, of Dewsbury near Leeds, in the county of York, England, have invented "Improvements in Machinery for Felting the Bodies of Hats and other coverings for the head," of which the following is a specification.

The object of my invention is to felt, or what is technically termed "plank," the bodies of hats and other coverings for the head. This I effect by the use of very simple apparatus or machinery.

Within and between suitable side frames I place a trough (open or otherwise) containing vitriol and water, or other suitable liquid, in which the bodies to be planked or felted are dipped, as may be required in the process of felting.

In front of the frame-work I place a suitable table or plank, upon which the operator places the hardened bodies or other coverings for the head, requiring to be felted for opening and wrapping up in suitable cloths.

Between the side frames and over the trough I place three or more rollers in a horizontal position. By preference I use four rollers, the three under ones being at an angle acute to each other, as well as being in proximity to each other, and having bearings in the side frame, while the fourth or upper roller rests in a frame-work (furnished with a movable weight, which follows up with pressure as the roll of "bodies" becomes less in circumference) having its fulcrums, and capable of swinging upon the axis of the roller at the back of the machine, though, when in position, the upper roller rests over the center and lower roller.

I must here explain that the rollers above named are not grooved, but have screws or worms chased upon their peripheries, extending from each outer end and toward the center, and there meeting; or, instead of the screws or worms being chased out of the solid rollers, strips of lead (or other metal that will withstand the action of the acid) may be coiled round smooth rollers of wood, or other suitable material, in the manner just described, which may be secured to the rollers by screws or nails; and, although I prefer that all the rollers should be so screwed, chased, or coiled, still, if desired, the front and back rollers might be left even, or one of the same, the main work of felting devolving upon the bottom and upper rollers; or, the screws or worms cut or coiled upon the center and upper rollers might be alternately right and left-hand threads.

The operation is as follows:

Suitable gearing being used to actuate the respective rollers, the material or bodies to be felted having been wrapped round a small loose roller and covered with a cloth, the upper screwed or wormed roller is raised by the means before named, and the roll of "bodies" to be felted put between the rollers in motion, the two outer rollers preventing its escape. A squeezing motion is thus given to it, and it is caused to rotate, but not to traverse. From the peculiar construction of the screwed or wormed rollers, and the fact that the hollow of the lower wormed roller is opposite the full part of the pressing or upper roller, a milling or felting process takes place, aided by the pressure of the balance weight, and the operation is repeated as often as may be desired, the small roller released and replaced in each roll of bodies or left out, as the case may require.

But, in order that my invention may be the better understood, reference is made to the accompanying drawing and the letters and figures marked thereon, similar letters representing similar parts; that is to say—

Description of Drawing.

Figure 1 is a front perspective elevation;

Figure 2 is a side elevation of the right-hand side;

Figure 3 is a side elevation of the left-hand side; and

Figure 4 is a smooth roller, with chain-wheel, having a worm or screw coiled around it.

Letters A show the frame-work, consisting of two side frames, between which the dipping-trough B, which is filled with the acid solution before named, is placed, being secured by bolts from frame to frame.

C is the planking-board, upon which the articles to be operated upon are placed.

Letters D are side plates, secured by bolts to the frames A, and which carry the rollers *d*, *e*, and *f*.

It will be seen that the roller *d* is shown plain, while the rollers *e* and *f* are screwed or wormed in the manner before named, viz., from each extremity, meeting in the center.

The roller *g* is similarly screwed or wormed, although, if preferred, it may have a right-hand thread from end to end, the roller *e* having a left-hand thread, or *vice versa*.

E is a frame, carrying the roller *g*, and capable of swinging upon the axis of the roller *f* through its arms *h*. In fig. 2 this frame is shown in working position, the weight *i* of which may be moved backward and forward according to the pressure required. In fig. 3 the same frame is shown thrown back and resting against the support *x*, to allow the operator to put in or take out the roll of bodies to be operated upon, or which has been operated upon by the rollers *e* and *g*, the front and back rollers *d* and *f* preventing it from dropping out.

F represents the driving-pulley, having two speeds, keyed on the shaft of the bottom roller *e*, and communicating rotary motion, by means of the chain-pulley *j* and chain *j'*, to the other chain-pulleys *k* and *l* keyed on the axes of the rollers *d* and *f*, the latter in turn, by similar means, imparting motion to the roller *g* (see

fig. 3) on the other or left-hand side of the machine, the chain being kept sufficiently tight by an adjustable pulley, *m*, working in a slot in the arm *h*.

By means of the worms on the rollers above described lateral motion of the material under operation is prevented and a rotary motion imparted with an effectual felting result.

Although I have only shown in the drawing what I term a single machine, it is obvious that the bottom rollers *d*, *e*, and *f* may be constructed two or more times the length of the top on *g*, and that two or more movable top rollers, having independent frames E swinging upon the axis of the roller *f* (which may be cut at suitable places to receive the arms *h*) and geared independently of each other, may be used, the trough and planking-board being proportionately increased, and thus two or more sets of bodies may be felted at the same time.

Having now particularly described the nature of my invention, and in what manner the same may be performed, I would have it understood that I do not confine myself to the precise mechanical details shown and described; but

What I claim is—

The felting or "planking" of the bodies of hats, or other coverings for the head, by means of the apparatus shown and described, the predominant features of such apparatus consisting in the nature and arrangement of the screws or worms.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOSEPH VERO.

Witnesses:

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