(No Model.)

H. W. SCOTT.

MACHINE ADAPTED TO WASHING AND SCOURING KNIT AND OTHER GOODS.

No. 305,245. Patented Sept. 16, 1884.

FIG. 1.

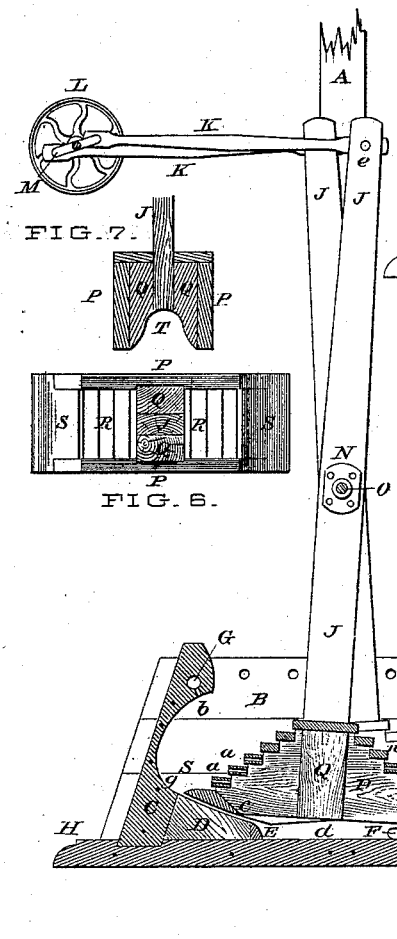

FIG. 2.

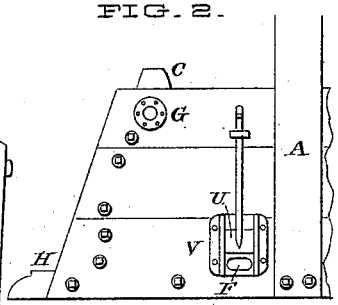

FIG. 3.

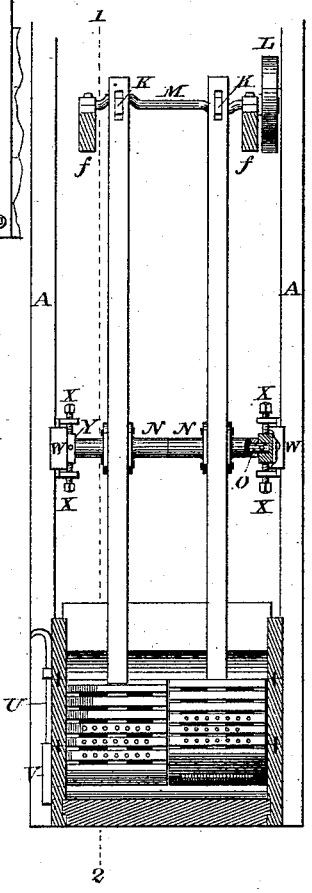

FIG. 4.

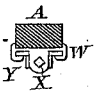

FIG. 5.

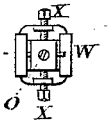

FIG. 7.

FIG. 6.

WITNESSES:

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MACHINE ADAPTED TO WASHING AND SCOURING KNIT AND OTHER GOODS.

SPECIFICATION forming part of Letters Patent No. 305,245, dated September 16, 1884.

Application filed December 13, 1883. (No model.)

To all whom it may concern:

Be it known that I, HENRY W. SCOTT, of Bennington, in the county of Bennington and State of Vermont, have invented certain Improvements in Machines Adapted to Washing and Scouring Knit and other Goods, of which the following description, in connection with the accompanying single sheet of drawings, constitutes a specification.

The matters of invention constituting the subject-matter of this patent relate to details in the construction and method of operating mills for washing or fulling knit goods, cloths, and articles requiring like manipulation, for the purposes of cleansing them and bringing them into proper condition for the subsequent finishing processes.

The invention is fully illustrated in the drawings, wherein Figure 1 is mainly a side elevation of my machine, but showing the tub and one of the beaters in transverse section taken on line 1 2 of Fig. 3. Fig. 2 shows a side view of one-half of the tub, exhibiting connection for the pipe which supplies the tub with water, and also the sluice-gate at the bottom of the tub. Fig. 3 is an end elevation, mainly, of the mill, but also showing the tub alone in vertical transverse section taken on line 3 4 of Fig. 1. Figs. 4 and 5 are respectively top and face views of the device for adjusting the vertical position of the beaters. Fig. 6 is an inverted view of the bottom of one of the beaters. Fig. 7 is a detail showing a water-gap or sluiceway at or beneath the bottom end of the beater-arm.

Certain imperfections both in the construction of mills for scouring and washing hosiery-goods after they are made up, and in the operation of the same, have heretofore existed. Some mills in their operation will impact the garments submitted to their action so that they will work them up into a nearly solid wad or roll, the sleeves and legs of drawers being almost inextricably snarled and knotted together, in which condition many of them become damaged by the action of the mill. In other cases the mills are so constructed that the goods are caught under the toe of the beater, between that and the bed, and are there torn or cut. In other tubs, in which the curved form of the interior against or upon which the goods are rolled is cut out of solid timber, the end of the grain of the wood is left so exposed to the action or rubbing thrust of the goods under the impact of the beater that it becomes raised, roughened, and upset, so that the goods become seriously worn in the process of scouring and washing. In other mills the goods get caught between the beaters, or between the beater and the side of the tub, and in such cases they get torn or cut. Other mills are constructed by using nails or exposing iron fittings, where the action of the soaps, alkalies, acids, or water thereon results in staining the goods with iron rust, oil used for lubrication, verdigris, (where copper or brass is employed,) and in other ways.

To obviate these objections the present mill is devised. Bunching and knotting of the goods is avoided by the relative shapes of the beaters and ends of the tub in which they work. Goods are prevented from catching between the toe of the beater and bed or bottom of the tub by close adjustment of the bottom of the beater to the bottom of the tub. Roughening of the wood surfaces upon which the goods roll or are shoved along ahead of the beater is prevented by constructing those portions of the bottom or bed with the grain of the wood set on end, so as to be inclined away from the advancing movement of the beater as it works against the goods. This arrangement of the grain of the wood for the purpose stated is of great importance and effects a very material improvement in the action of the mill. The goods are prevented from being caught between the beaters, or between the beaters and sides of the tub, by building the beaters so that they will entirely fill out the inner breadth of the tub, leaving barely room for free action, and hanging them on long sleeve-bearings, which prevent lateral swing or displacement. All parts of the tub exposed to the goods or to the liquors in which they are undergoing treatment are made wholly of wood, so as to avoid stains or spots of all kinds.

My tub, as shown in Fig. 1, is constructed of heavy plank sides B and a plank bottom, H. The ends C C are of heavy plank or timber set at an incline, so that the top ends over-

hang inwardly. The grain of the end-plank, C C, runs parallel with the plank, or at least in a direction so that where it is cut off in the formation of the lower part of the curve, as at *g g*, its end shall not be presented toward the beater, so as to wear up rough. The ends are worked out in the concave form shown at *b g b g*, the shape being such as will facilitate the rise of the goods in front of the beater without being impacted materially, and then cause the top of the rolling mass to topple over backward in front of the beater as the same recedes for a new thrust or stroke. Through the upper and overhanging part of the ends of the tub a water-weir is provided, G G, which opens out at G, Fig. 2, so as to make connection with any convenient supply-pipe. This weir G is perforated with a range of small holes, *b b*, through which fine jets of water are thrown down upon the goods in the direction of the toe of the beater.

I construct that portion of the bed of the tub lying immediately beneath the toe of the beater, and in conjunction with which the beater works, of wood, with the grain thereof inclined away from the advancing toe of the beater, as shown at D D, Fig. 1. The tops of blocks D D are finished on the arc of a circle having the pivot-bearing of the beater-arm O for a center. The under sides of the toe-pieces S S of the beaters are also worked on a like curve, to adapt them to the curve of the bed. Blocks D D are held in place by cleats E E, fastened to bottom of the tub.

On either or both sides of the tub, beneath the beaters, the sluice-gates U are fitted to close the aperture F. (Shown in Fig. 1.) These gates have the pads made of wood fitted to slide in appropriate ways, V, and are fitted so as not to leak. The beaters are hung so that an ample water-way, *d*, is left under the hammers and over the bottom of the tub.

The beaters consist of two cheek-pieces, P P, Figs. 6 and 7, the upper edges of which are cut away or stepped, as seen at *n n n*, Fig. 1. Athwart these steps are laid and fastened the beater-bars R R R. These bars are slightly less in thickness than the height of the steps, thus leaving an open space or interval between them, (seen clearly in Fig. 3,) which permits the free passage of water through between them. The bottom or toe piece, S, is made broader than the other bars, and has its front or leading edge beveled or rounded over into a shape to readily slide under the goods and exert a lifting as well as a crowding or shoving force. The trailing edge is beveled down thin, as at *c c*, so as to cut its way through the water with least resistance on the back-stroke of the beater. The lowest of the series of steps or beater-bars R R are perforated, as at *a a a*, Figs. 1 and 3, for the purpose of facilitating the escape of the water from the goods as they are compressed by the beater in its forward stroke. Holes *a a* also form a valuable adjunct in working up a soap-suds preparatory to scouring a batch of goods.

Blocks or furring-pieces Q Q, Fig. 7, are interposed between cheeks P P and arm J, and the whole is firmly pinned together. The bottom end of arm J and furrings Q Q are cut away, substantially as shown in Fig. 7, so as to leave an open throatway or channel for the swash of the water or suds as the beater sways to and fro in the tub. As tubs and beaters have formerly been made, the beater has usually been a solid head or block, and when fitted to run closely in the tub moved substantially the whole volume of water and goods back and forth as it vibrated, which involved an excessive and needless outlay of power.

For the purpose of hanging the beaters, two posts, A A, connected with the sides of the tub and extending up, so as to take onto some stable portion of the building, are provided. Upon each post is attached a casting, W W, or equivalent device, carrying a vertically-adjustable pivot-box, Y Y. This box is provided with flanges, which slide in vertical ways in plate W. The pivot-bar O has each of its ends fastened into one of the boxes Y, so that when the parts are all in position the posts A A cannot spread apart. Flanged sleeves N N are bolted to opposite sides of arm J, as shown in Fig. 3, through the bore of which and through arms J J the bar O passes. Sleeves N N N N are of a length that, with the thickness of the arms to which they are attached, they just fill the interval between the shoulders of pivot-bearings Y Y, thereby providing against lateral play.

The pivot-bearings may be vertically adjusted by means of the adjusting-screws X X X X, thus enabling the beaters to be set as close to the bed of the tub as it may be found practical to work them.

The beaters are driven by crank and pitman connections at the top of the arms J J, as seen at K L M, Figs. 1 and 3.

It has been found that the mill works easier to arrange the cranks opposite each other rather than at an angle. I have shown the shaft on which driving-pulley L is mounted double-cranked for the purpose above stated. Advantages are secured by placing the driving-gear overhead, as shown, rather than connecting with the beater-arm near the hammer, in that the use of the long arm renders the apparatus more elastic and removes the pitmen or connecting-rods out of the way in filling or emptying the mill, and also avoids the opportunity for pieces of the goods to be caught and damaged or destroyed in those parts of the machine.

I claim—

1. In mills of the character described, a tub having those portions of the bed against which the goods are subjected to the severest treatment under the action of the toe-piece of the beater constructed of wood, with the end of the grain exposed and the grain itself inclined to the line of movement of the beater, substantially in the manner described, and for the purposes set forth.

2. A beater-head or hammer for mills of the character described, substantially hollow, so as to admit of a circulation of water through it, having its working-face made up of a series of separate transverse bars, with intervals between them, arranged step fashion, substantially as shown and described.

3. In mills for washing goods of the kind described, a hollow beater-head or hammer, in which the handle or arm thereof, upon which said hammer is hung, is stopped off above the plane of the bottom of said hammer, as a means for the free transit of water through beneath the hammer, substantially as described, and for the purposes specified.

4. As an improvement in the beating-face of the hammers of mills of the character specified, a series of transverse beating-bars arranged step fashion, with intervals between them, of which those of the series next above the toe-piece are perforated, in the manner described, and for the purposes set forth.

5. As an improvement in the toe-piece of a hollow beater-head or hammer, a thin trailing edge, in combination with openings above said toe-piece for the passage of water, substantially as described and set forth.

6. As a means for preventing lateral vibration of the beater-heads and of securing vertical adjustment of the same in mills of the kind described, the combination of a pivot-bar mounted at each end in vertically-adjustable fittings, in combination with sleeve-bearings attached to the arms of the beaters, of sufficient length to prevent lateral oscillation of said beater-heads within the tub, and means connected with said rod for preventing longitudinal slip of said sleeve-bearings along said pivot-bar, substantially as described and set forth.

7. A beater-head or hammer having a long upwardly-extending arm connected at its top with a motor for actuating the same, and pivoted at some point between the hammer and the driving-connection upon a vertically-adjustable pivot-bar, substantially in the manner described, and for the purposes set forth.

8. In a mill of the character described, the combination of means located above the toe of the hammer for throwing a jet of water downwardly into the tub, with the described transverse openings between the beater-bars for the passage of the water from the goods, or the space occupied by the goods, through the hammer to the water-way underneath the same, substantially as described and set forth.

9. A mill of the character described, consisting of a tub with two milling-compartments, between which one or more hollow beaters or hammers are arranged to oscillate, said hammers being constructed with perforated milling-faces and open communication from one milling-compartment through said perforated faces to the opposite compartment, substantially as described, and for the purposes set forth.

In testimony whereof I have hereto affixed my name, at Bennington, Vermont, this 27th day of November, A. D. 1883.

HENRY W. SCOTT.

In presence of—
FRANKLIN SCOTT,
WILLIS H. PHILLIPS.