3 Sheets—Sheet 1.

S. ARNOLD.

Device for Washing Piece Goods.

No. 204,938. **Patented June 18, 1878.**

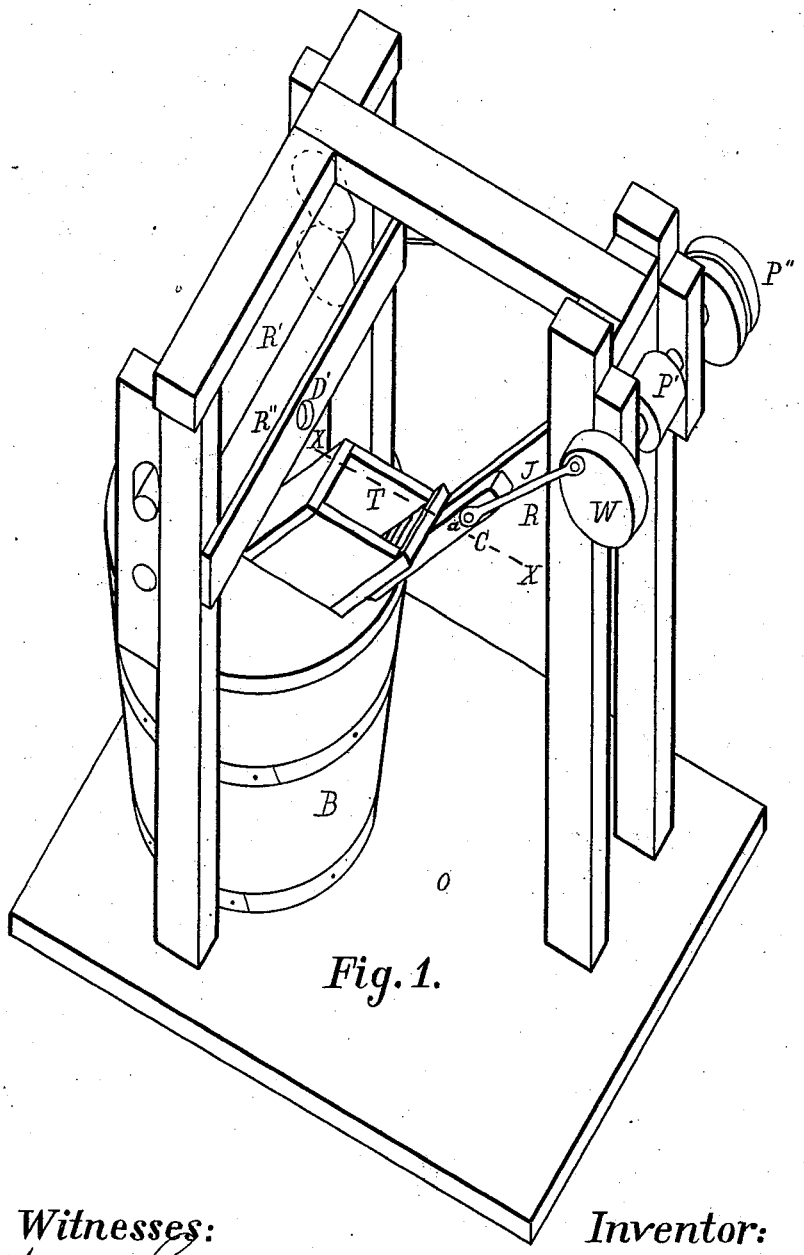

Fig. 1.

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Fig. 2.

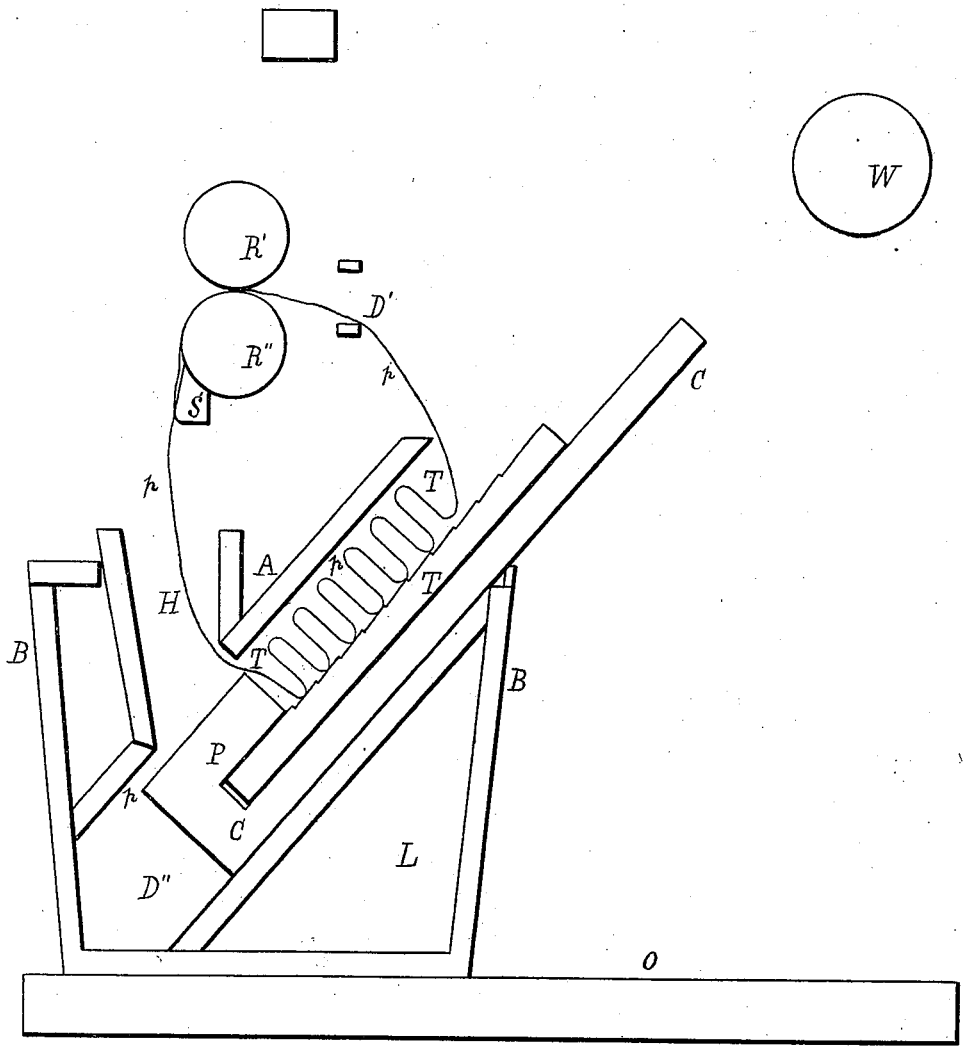

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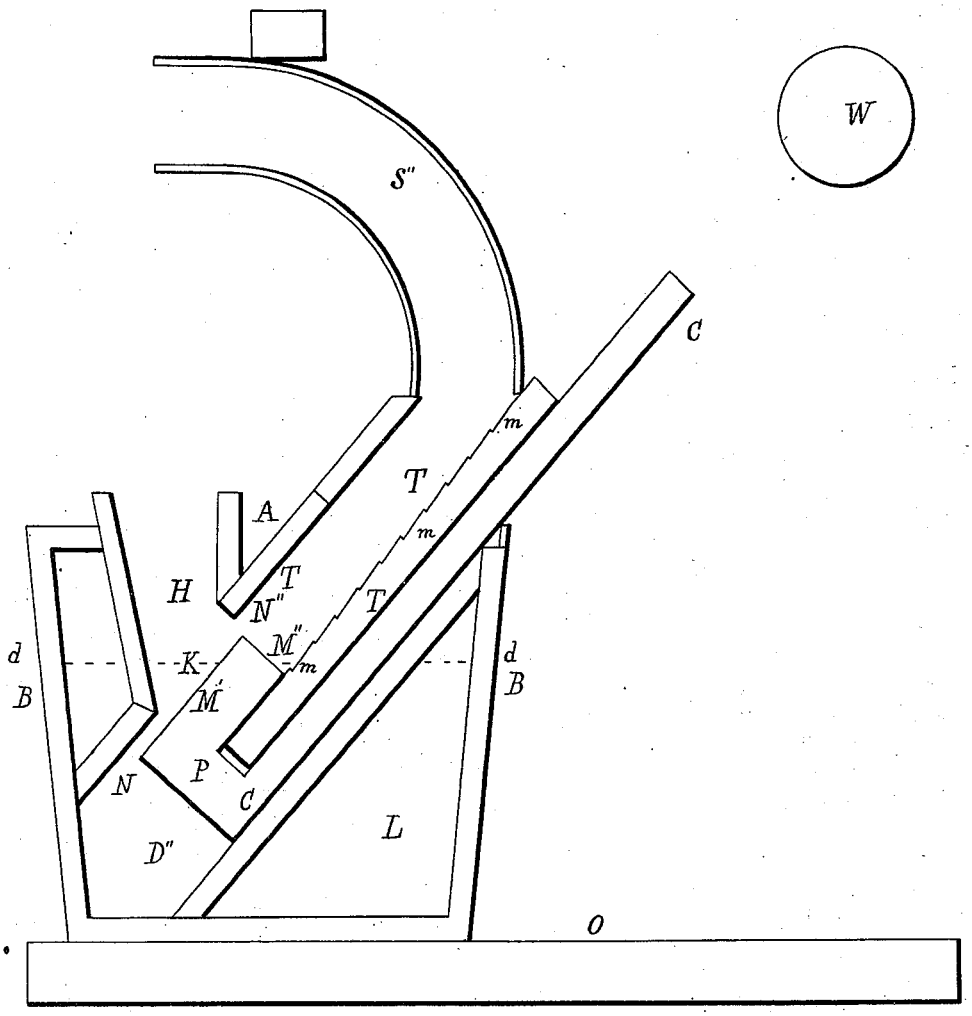
Fig. 3.



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UNITED STATES PATENT OFFICE.

SATTERLEE ARNOLD, OF LANSINGBURG, NEW YORK.

IMPROVEMENT IN DEVICES FOR WASHING PIECE GOODS.

Specification forming part of Letters Patent No. **204,938**, dated June 18, 1878; application filed February 27, 1878.

To all whom it may concern:

Be it known that I, SATTERLEE ARNOLD, of the village of Lansingburg, county of Rensselaer, and State of New York, have invented a new Device for Washing Piece Goods, Piece Knit Fabrics, and other articles, of which the following is a specification:

My invention relates to a manner and means for washing in the piece knit fabrics or piece woolen goods, and, by the same means and method, wool, raw cotton, paper stock, and other articles.

The object of the invention is to automatically supply to the device the material or fabric to be treated in alternating portions, so as to make the process continuous, and to avoid the knotty distortion and longitudinal tension produced upon the fabric by fulling-mills and other devices employed for washing purposes, in which the whole piece is under treatment at one time.

It is also one of the objects of my invention to combine a rubbing and squeezing means to operate upon the material being washed instead of a pounding or beating motion alone, as the former better facilitates the fulling of the fabric while it is under the influence of soap and hot water.

My invention consists in combining with an elevating or delivery trough a reciprocating piston-foot working in the trough, in connection with a supply-aperture opening into the latter, and opposite the line of the piston motion, by means of which the fabric or material to be washed may enter the trough, to be rubbed and squeezed by the reciprocating piston-foot, and forced into and through the elevating or delivery trough.

My invention further consists in combining with a washing-tub a connected elevating or delivery trough containing a supply-opening and a reciprocating piston or plunger foot, which moves in the trough at or near the supply-opening, and that rubs and squeezes the material to be washed, and forces the same ahead of and beyond the piston-foot into and through the trough.

My invention also consists in combining with a washing-tub or inclosure for containing washing-liquid a receiving-hopper and a connected elevating or delivery trough, a reciprocating upturned plunger-foot working in the trough at or near the hopper-opening, and, by means of a reciprocating rod operating outside of the trough, with two engaging squeezing or wringer rollers, through which and between which the fabric is passed to the receiving-hopper from the elevating-trough when the two ends of the piece fabric have been tied for the purpose of continuing and repeating the operation of washing and wringing or squeezing automatically.

My invention further consists in combining with a washing-tub having a receiving-hopper and a connected elevating or delivery trough a reciprocating rubbing piston-foot and actuating reciprocating plunger with two engaging rollers, a stripping-bar placed in a stationary position and parallel to the rollers, over which bar the piece fabric must pass when returning to the hopper after having passed through the rollers.

My invention also consists in connecting the elevating-trough at its upper end with the receiving-hopper by means of a curved spout, so that when wool, raw cotton, paper-stock, or other like material that cannot be connected and made continuous like piece fabrics, is being washed, it may automatically be elevated from the liquid and fall from the spout into the receiving-hopper to repeat the operation of washing.

My invention further consists in forming ratchet recesses or steps in the wall or walls of the elevating-trough, so that the steps or recesses formed will partially hold up the mass of fabric or material being elevated, and prevent its weight from acting upon the upturned rubbing reciprocating foot in its descent.

My invention also consists in combining with a washing-tub or receptacle a supply-hopper, an elevating or delivery trough, connected, by means of an aperture formed at the bottom of the former and opening into the upper side of the latter near its end, with a reciprocating upturned plunger-foot working in the bottom of the trough and across the aperture which connects the hopper and trough, actuated by a plunger-rod working outside of the trough, and the upturned foot attached to the plunger-rod and formed to pass around the lower wall of the delivery-trough

and turn up across the supply-opening, connecting the latter with the hopper and two engaging squeezing-rollers, a stripping-bar stationary and parallel to the rollers, with the latter actuated by a belt from the main shaft or pulley that moves the reciprocating plunger.

In the accompanying drawings there are three illustrations of my invention, in all of which the same reference letters designate the same parts.

Figure 1 exhibits a view in perspective of a washing-tub, in which the discharging-trough, rollers, and plunger are shown, with the means of actuating the reciprocating plunger by means of a crank motion. Fig. 2 illustrates a vertical section of the same application, taken on the line X X of Fig. 1, in which the walls of the tub and the hopper and its connections with the elevating delivery-trough is shown, and also the position of the upturned rubbing-foot attached to the lower end of the reciprocating rod which actuates it; also the plunger space in the tub below the delivery-opening of the hopper, together with the ratchet-formed steps or recesses in the trough. Fig. 3 exhibits a vertical section of the device shown in Fig. 1, taken on the line X X, with the wringing or squeezing rollers omitted, and the elevating-trough curved upward and toward the hopper, so as to discharge its contents into it for the continuous washing of other material than piece fabrics.

The various parts of the device are designated by letter reference, as follows: B denotes the tub; D″, a portion of the trough below the elevating delivery part; T, the elevating-trough; W, the wheel which actuates the plunger C by means of the crank-shaft or pitman J and crank-pin R. P″ designates the pulley by which motive power is communicated; P′, a roller for the cloth to pass over when being first drawn through the rollers R′ and R″ to the hopper; P, the upturned foot of the piston or plunger having the rubbing-surface M′ and the pushing end surface M″ for squeezing the fabric or material and forcing it into and through the trough, where the beveled recesses *m m m m* hold the material in place and keep the mass from falling down with the descent of the plunger. When the end of the piece fabric first inserted has come up through the elevating-trough the two ends are tied and the device automatically passes the fabric through the process for such time as may be desirable. The course and direction of the fabric, as described, are shown at Fig. 2 by the letters *p p p p*.

This device will be found very useful for washing wool, raw cotton, paper-stock, and other substances, in which case the rollers will be dispensed with and the elevating discharge-trough carried up and over toward the hopper-mouth, so as to return the material automatically for continuous washing, as shown at S″, Fig. 3.

While I have illustrated my arrangement of a hopper and trough connected by an aperture, with the sides of the two making an acute angle at the point of union, and the leading feature of the invention being the combination of the elevating or delivery trough with a supply-aperture formed in the latter, and a reciprocating plunger-foot moving across the supply-aperture, and so as to rub and squeeze the material to be washed, as well as to push the same through the trough, it is plain that the same purpose can be accomplished by combining a hopper and trough at right angles, or in any position where the hopper and trough can connect.

It is also true that, so far as washing piece fabrics is concerned, the leading feature of the invention will be preserved if the hopper be entirely omitted, and a simple supply opening be formed in the trough, and so located with reference to the piston-foot that the latter shall rub the fabric when entering the trough by its reciprocating motion, and shall intermittently squeeze the same as it pushes it ahead of the piston-foot into and through the trough.

While I have shown and described a piston-foot actuated by means of a rod moving along the outside wall of the trough, with the plunger piston-end turned up around the wall of the trough to enter the latter at its end, the same effect will be produced by the combined trough supply-aperture and piston-foot moving in the trough, when the foot is made to reciprocate by any of the well-known mechanical means employed to produce such a motion, and whether the foot be made to turn up into the trough or to work directly from the end of a reciprocating rod.

Having thus described my invention and its application, what I claim, and desire to secure by Letters Patent, is—

1. In a washing apparatus, the combination of an elevating or delivery trough, a supply-aperture formed in the latter, and a reciprocating piston-foot working in the trough opposite the aperture to rub the material being washed, also to squeeze the same by an alternating intermittent pressure, and so as to force the material into and through the trough, as shown and described.

2. In combination and arranged within a washing tub or vessel, a vertical receiving hopper opening into an elevating or discharging trough, having beveled cross-recesses or ratchet-formed steps arranged upon its walls with a reciprocating plunger-foot that rubs the material to be washed and squeezes the same by an alternating intermittent pressure, and forces the material into and through the trough, as herein described and shown.

3. In combination with a washing tub or vessel, the vertical hopper H, plunger-space D″, elevating-trough T, with its cross-recesses or beveled steps *m m m m*, the upturned plunger-foot P, actuating plunger-rod C, crank-shaft J, crank-pin R, wheel W, engaging-roll-

ers R′ and R″, and stripping-bar S′, arranged to operate as and for the purposes described and set forth.

4. In combination with a washing tub or vessel, a vertical receiving hopper opening into an elevating or discharging trough, arranged with beveled cross-recesses or steps on its bottom or top, or both, with a reciprocating piston-foot that moves in the trough and rubs the material being washed, and squeezes the same with an alternating and intermittent pressure, and forces the same into the trough, with the latter curved upward and forward, and so as to discharge the material into the hopper to repeat the washing, as herein shown and described.

Signed at Troy, New York, this 15th day of February, 1878.

SATTERLEE ARNOLD.

Witnesses:

BERNARD BLAIR,

M. H. HORAN.