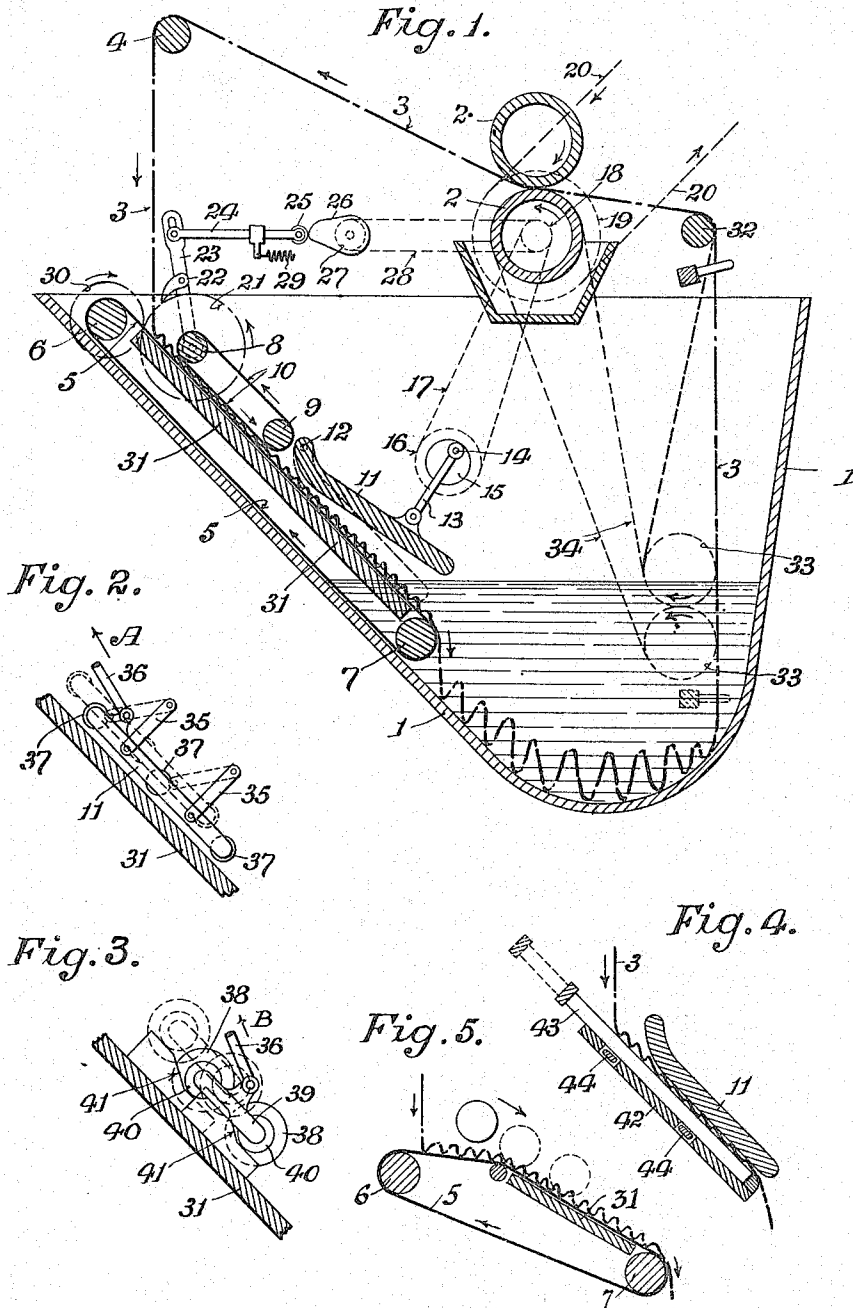


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 WASHING AND SCOURING MACHINE.  
 APPLICATION FILED MAR. 14, 1914.

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Patented Dec. 22, 1914.



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# UNITED STATES PATENT OFFICE.

JOHN S. AINLEY, OF HUDDERSFIELD, ENGLAND.

WASHING AND SCOURING MACHINE.

1,122,227.

Specification of Letters Patent.

Patented Dec. 22, 1914.

Application filed March 14, 1914. Serial No. 824,837.

*To all whom it may concern:*

Be it known that I, JOHN SHAW AINLEY, a subject of King George V of Great Britain, residing at Huddersfield, in the county of York, England, have invented certain new and useful Improvements in Washing and Scouring Machines, of which the following is a specification.

This invention relates to machines such as washing and scouring machines, for treating with liquids, textile piece goods, warp yarns and the like, either secured together in endless rope form and passing through the machine in several drafts or in separate lengths of fabric or yarn made endless and traveling through the machine in separate drafts or widths in the ordinary manner, the object of my improvements being to provide means for dealing with or operating on the fabric in its passage through the machine whereby superior results may be obtained and the operation of the machine improved.

The essential feature of my improvements is, that the fabric or yarn, in addition to being passed through nipping or squeezing rollers clear of the liquor or liquid in the vessel of the machine as ordinarily, is also subjected to a pressing or "possing" action in the liquid, whereby the washing liquor or liquid is worked intimately into the fabric or yarn and is enabled to more rapidly effect the loosening or removal of the dirt. To effect this I provide at the feeding or leading-in side of the machine, a suitable crushing member adapted to be operated to intermittently press against or crush the drafts of fabric or yarn, which are intermittently carried forward beneath the crushing member by suitable means. After being subjected to this crushing or pressing action, the drafts of fabric or yarn are delivered to the bottom of the vessel, and then conducted to the usual nipping or squeezing rollers clear of the liquid and back again beneath the crushing member to receive a further crushing or pressing action, the cycle being repeated as many times as may be found necessary. The crushing member may be operated to give any desired number of squeezes or pressings for each traverse of the fabric or yarn through the machine.

If desired, instead of the fabric or yarn being conducted from the bottom of the vessel direct to the nipping or squeezing rollers

clear of the liquid it may, before leaving the liquid, be passed between a pair of nipping or squeezing rollers submerged in the liquid, in which case one of the said submerged nipping rollers is preferably driven by an endless apron or sheet from the driven roller of the usual nipping rollers clear of the liquid.

In the accompanying drawing:—Figure 1 shows a sectional elevation of a machine embodying my improvements in one form; Figs. 2 and 3 are details showing constructions of and means for operating the crushing member which may be adopted in place of the arrangement shown in Fig. 1; Fig. 4 illustrates a modified form of means for intermittently carrying the fabric or yarn beneath the crushing member, and Fig. 5 is a detail showing a modification in the arrangement of the endless feeding apron and working of the pressing or crushing member in conjunction therewith.

In the drawing, 1 represents the vat or vessel of the machine and 2, 2, the ordinary nipping or squeezing rollers located above the vessel clear of the liquor or liquid therein.

In the embodiment shown at Fig. 1, I provide at the side of the machine where the fabric 3 ordinarily descends from the usual taking off roller 4 to the bottom of the machine, an intermittently driven apron or endless sheet or tapes 5 extending around two rollers 6 and 7 suitably arranged with respect to each other to support the apron or tapes 5 in the desired position, the upper end of the apron being so disposed with respect to the taking off roller 4 that the fabric as it descends from the said roller will fall on to the apron, and become more or less cuttled or folded, the liquor from the vessel 1 being pumped in any ordinary manner on to the fabric as it passes to the endless apron. At a convenient distance apart and parallel or substantially parallel with the apron 5 are two rollers 8 and 9 carrying a second shorter apron or tapes 10 which acts or act to flatten and partly squeeze the folds of fabric, and following same and also on the same side of the apron 5 on which the fabric is cuttled or falls I provide a flap or plate or the like 11 which is adapted to be intermittently moved toward the apron 5 to press upon or squeeze or "poss" the portion of fabric lying beneath or opposite

same, and to be moved away therefrom to permit of the pressed or "passed" portion of fabric being carried forward and a fresh portion presented under the said flap or plate. The flap or plate, is, in the embodiment now being referred to, suitably pivoted at its upper end at 12 so as to be capable of being swung to and fro to give the necessary pressing or passing action. The desired swinging movements may be imparted to the flap or plate by any suitable means, as for instance by means of a link 13 pivotally connected at one end to the flap and pivotally mounted at its opposite end on a pin 14 eccentrically disposed on a disk 15, driven by chain wheel or pulley 16, chain or belt 17, and a chain wheel or pulley 18 fast on the axis of the bottom roller of the pair of nipping or squeezing rollers, which said roller is driven by a pulley 19 and belt 20 from any convenient source of motion.

The desired intermittent movements may be imparted to the aprons or tapes 5 and 10 as follows:—A ratchet wheel 21 fast on the axis of the roller 8 is adapted to be engaged by a pawl 22 carried by a pivotally mounted arm 23, the free end of which arm is connected to one end of a slidable bar or rod 24. The opposite end of the bar or rod carries a bowl or runner 25 adapted to ride on the periphery of a cam 26 driven by chain wheel or pulley 27 and chain or belt 28 from a chain wheel or pulley fast on the axis of the driven roller of the pair of nipping rollers 2, 2. As the cam 26 is rotated, the arm 23 is swung to and fro, and the pawl 22 intermittently rotates the ratchet wheel 21 and roller 8, and causes an intermittent traverse of the apron 10. A spring 29 connected at one end to the bar or rod 24 and at its other end to a suitable fixed part of the machine acts to swing back the arm 23 and maintain the bowl or runner in contact with the cam during the idle portion of the latter's revolution. A gear fast on the axis of the roller 8 meshes with a gear 30 fast on the axis of the roller 6, so that the intermittent movements of the said roller 8 are transmitted to the roller 6 and consequently to the apron 5.

The position of the driving pin 14, from which the flap 11 is operated, is preferably adjustable on the disk 15 to permit of variations in the extent of movement of the said flap and the means for intermittently moving the aprons 5 and 10 are also preferably capable of adjustment as by altering the radial movement of the pawl 22 at each revolution of the cam 26.

The flap or plate 11 preferably extends across the whole width of the machine and its operating face may be either plain, or grooved or fluted longitudinally to enable the liquid squeezed from the fabric to pass away. The upper end of the flap or plate

is preferably upturned as shown, or rounded off to clear the traveling fabric.

A suitable bed 31 is provided beneath the portion of the apron 5 opposite the apron 10 and flap or plate 11 to act as a support for the said apron 5 and prevent undue strain thereof.

After being carried forward clear of the flap or plate the fabric is delivered to the bottom of the vessel and then conducted in any suitable manner, as for instance over a roller 32, to the nipping or squeezing rollers 2, 2, from which it passes again over the taking-off roller 4 and back again to the apron 5 to be again subjected to the action of the "passing" or pressing flap or plate 11, this being repeated as many times as may be found necessary.

Instead of conducting the fabric straight from the bottom of the vessel to the nipping or squeezing rollers 2, 2, I may employ a second pair of nipping rollers 33, 33 wholly submerged in the liquid, and pass the fabric between them prior to its emerging from the liquid. Preferably one of said rollers 33, 33 is driven by an endless apron 34 from the lower roller 2, such apron 34 in imparting motion direct to the submerged squeezing rollers insuring the fabric or yarn traveling from said rollers to the upper squeezing rollers at a constant and uniform speed so that the fabric is neither put in tension nor slackened by any irregularity in the speeds of the two sets of rollers. If the apron 34 be employed, the trough under the squeezing rollers 2, 2 is omitted. Alternatively the rollers 33, 33, or one of them, could be driven by a rope, chain, or other drive external of the machine.

The apron 10 with its supporting rollers may be replaced by a series of loosely rotating rollers, or may be entirely dispensed with.

Instead of the crushing plate 11 being pivoted at its upper end and swung toward and away from the fabric as above set forth, it may be carried by the free ends of a pair of pivotally supported links or arms such as 35, 35, Fig. 2, and be connected by a link 36 to a suitably reciprocated member, or to an eccentric driving pin such as 14. Movement of the link 36 in the direction of the arrow A, Fig. 2, causes the plate 11 to move bodily away from the bed 31, and a movement in the reverse direction causes the plate to approach the bed, and crush or press the portion of fabric presented opposite to it. In this instance the plate 11 has rollers 37 to avoid rubbing of the fabric as the plate makes its inward movement, this taking place in an angular direction as will be understood.

In the modification shown at Fig. 3, the crushing member comprises a pair of rollers

38, 38, linked together at 39 and having, on their axes, runners 40 adapted to run on cam surfaces or inclined planes 41, so that as the link 39 is pulled in the direction of the arrow B, the runners 40 ride up the cam surfaces or inclines and cause the rollers 38, 38 to be moved away from the bed 31. The endless apron may be either intermittently or continuously traversed forward.

10 Instead of raising the roller pressing member away from the endless apron as in Figs. 2 and 3, the bed 31 may be shortened and arranged out of line with the two rollers over which the apron 5 travels, as shown at Fig. 5, the apron thus traveling at its upper end in a horizontal direction to and then downwardly at an angle over the bed 31. The pressing member in this instance is reciprocated only, so as to travel over a portion of the fabric on the inclined portion of the apron and then away from and clear of the fabric, as illustrated by the dotted and full line positions of the pressing roller, the result being the same as before described.

25 Other forms of construction and modes of operation of the crushing member may suggest themselves to those skilled in the art of machine construction, as for instance, a mutilated roller or rollers engaging the fabric only when the longer radii are presented opposite thereto, or a revolving cylinder carrying rollers, may comprise the pressing member, and instead of the roller pressing member being moved over the fabric or yarn in the direction of its length, it may be passed transversely thereto or across the fabric or yarn. I do not therefore limit myself to the exact constructions and modes of operation shown and described, as they are given by way of illustration.

Fig. 4 illustrates an alternative arrangement for carrying the fabric forward beneath the flap or plate 11. In this instance the apron 5 is replaced by a bed 42 supported in the desired angular position and provided with a series of longitudinal grooves, in which a series of bars such as 43 are adapted to be reciprocated intermittently by any suitable means.

The upper edges of the bars 43 are normally flush with the bed 42 or slightly below same, and I preferably provide suitable means such as rocking bars 44, 44, to engage the undersides of said bars 43 and raise them above the level or surface of the bed 42 during the time the bars are moving in a downward direction to carry the fabric forward beneath the flap or plate 11. I preferably arrange that during the times the bars 43 are in motion in either direction the flap or plate 11 is at rest in its position farthest away from the bed 42 so as to avoid any friction on the fabric. To this end I also arrange that the bars 43 when moving

back or upwardly to engage or come beneath a fresh portion of fabric, are held in their rearward position with their upper edges flush with or slightly beneath the surface of the bed 42.

Any suitable means other than those above set forth may be employed to intermittently traverse the fabric beneath the flap or plate 11.

An ordinary stop motion, though not shown, would be provided to bring about stoppage of the machine when any obstruction, entanglement or knotting of the fabric or yarn occurs.

By the means above described, I obtain a squeezing or crushing action of the fabric or yarn while in the liquor or liquid in the vessel, in addition to the nipping or squeezing of the fabric or yarn when passing between the usual pair of squeezing rollers, such action being supplemented if desired by the second pair of nipping or squeezing rollers between which the fabric or yarn may be caused to pass before finally leaving the liquor or liquid, such action expediting the washing or scouring process and giving better results.

If the apron 5 is driven continuously and the pressing member is disconnected the machine will answer very well for washing and scouring fabrics in the full width.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. The combination, with a support, and means for depositing the material loosely on the support; of driving devices which move the material step by step longitudinally, a pressing device, and means for pressing the material between the pressing device and the support when the material is stationary.

2. The combination, with a supporting conveyer, and means for depositing the material loosely on the conveyer; of driving devices for moving the conveyer step by step, a pressing device, and means for pressing the material between the pressing device and the conveyer when the conveyer is stationary.

3. The combination, with a main supporting conveyer apron, means for depositing the material loosely on the said apron, and an auxiliary conveyer apron arranged over the material and the receiving portion of the main conveyer apron; of driving devices for moving the conveyer aprons step by step, a pressing device arranged over the delivery portion of the main conveyer apron, and means for pressing the material between the pressing device and the main conveyer apron when the conveyer aprons are stationary.

4. The combination, with a support, and means for depositing the material loosely on the support; of driving devices which

move the material step by step longitudinally; a pivoted pressing plate arranged opposite the material on the delivery portion of the said support, and means for reciprocating the pressing plate so that the material is pressed between it and the support when the material is stationary.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN S. AINLEY.

Witnesses:

THOMAS H. BARRON,  
ELSIE M. GLENNHILL.

Copies of this trade-mark may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."