

1,001,435.

The figure contains six sub-figures labeled Fig. 1 through Fig. 10. Fig. 1, 2, and 3 are side cross-sectional views of a mechanical assembly. Each shows a rectangular frame (4) with a central vertical channel. At the top, there are two circular components (5 and 6) and a horizontal bar (7) with a knob (13). Fig. 4 is a top-down view of the assembly, showing the circular components (5 and 6) and the frame (4). Fig. 5 is a side cross-sectional view of a different part of the assembly, showing a curved frame (4) and a central vertical channel. Fig. 10 is a side cross-sectional view of a spring mechanism, showing a coiled spring (10) and a frame (4).

Inventor:
Isaac E. Palmer,
by Emily Booth, Janney and Vane,
Attys.

UNITED STATES PATENT OFFICE.

ISAAC E. PALMER, OF MIDDLETOWN, CONNECTICUT.

TEXTILE-CONDITIONING APPARATUS.

1,001,435.

Specification of Letters Patent. Patented Aug. 22, 1911.

Application filed June 1, 1911. Serial No. 630,547.

To all whom it may concern:

Be it known that I, ISAAC E. PALMER, a citizen of the United States, and a resident of Middletown, in the county of Middlesex and State of Connecticut, have invented an Improvement in Textile-Conditioning Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to textile conditioning apparatus of general application, but is more particularly intended for use in connection with dyeing, starching, washing or other machines for treating textile material, or for the treatment of textile material incidental to its treatment by machines for dyeing, starching, washing or similarly acting upon such material.

The invention is more particularly directed to improved mechanism for squeezing or expelling the liquor from the material delivered thereto in band, skein or rope form and constitutes an improvement upon the invention disclosed in my Patent No. 959,067, May 24, 1910.

In order that the principles of the invention may readily be understood, I have disclosed certain types or embodiments thereof in the accompanying drawing, wherein—

Figure 1 is a vertical section of textile conditioning apparatus embodying my invention; Fig. 1^a is a diagrammatic representation of the textile material as accumulated in zigzag form in the chute of the apparatus; Fig. 2 is a view partially in front elevation and partially in vertical section of the apparatus shown in Fig. 1; Fig. 3 is a view similar to the upper portion of Fig. 3 of a modified form of my invention; and Figs. 4 and 5 are vertical sectional views of modified forms of the invention.

In my Patent No. 959,067 I have set forth that textile material in band, skein or rope form and materially narrower than the length of the squeezing rolls or other squeezing surfaces, may be directed thereto by a guide to which a short to and fro motion is imparted lengthwise of the rolls and that the speed of travel of the rolls and the speed of the to and fro movement of the guide may be so proportioned with relation to each other that the resulting change in direction of the traversed material in passing between the rolls is thereby rendered so abrupt as to

maintain a substantially edgewise delivery of the material between the rolls; that is to say, the material is thereby delivered between the rolls in a zigzag formation. This enables me to drive the squeeze rolls at a materially lower speed than had heretofore been accomplished and materially to reduce the wear upon the surfaces of said rolls while at the same time securing as high or even an increased output of material from between the rolls. By delivering the material substantially edgewise between the rolls, the liquid was thereby expelled by said rolls from the material in a direction substantially normal to the edges of the material instead of being forced substantially lengthwise thereof into succeeding portions of the material from which it is expelled or driven in a lengthwise direction as the operation progresses. I have discovered that I may dispense with the guide disclosed in said patent and positively feed the material to a chute, receptacle, or other conveyer of suitable length at a somewhat greater speed than the material is carried through the squeeze rolls, thus permitting the accumulation of sufficient material between the feed rolls and the squeeze rolls to result in a zigzag folding of the material, so that it is delivered in this condition to the squeeze rolls and passes between them in such condition. The chute, receptacle, or other conveyer should for the best results be comparatively narrow from front to rear to maintain the piled up material in compact form.

In certain cases, I provide suitable means to assist in effecting the zigzag disposition of the material in the chute or receptacle, such means being of any suitable nature, but preferably of the form herein shown.

Instead of feeding the entire material in a substantially edgewise condition as described, I may between adjacent branches of the described zigzag formation interpose a short stretch or length of material delivered lengthwise.

It is apparent that the invention may be embodied in various types of apparatus. Preferably, and as herein shown I employ squeeze rolls, though I desire it to be understood that in using the term "rolls" in the specification and claims, I contemplate suitable cooperating squeezing surfaces which may be, for example, in the form of endless belts or other preferably endless devices to which the material may be delivered

in order that the liquor may be expelled therefrom.

Referring more particularly to the drawings, and first to that form of my invention shown in Figs. 1 and 2, the framing of the mechanism is illustrated at 1, it being of any suitable structure adapted to support the operating parts of the apparatus. Mounted in the framing, I have represented a lower squeeze roll 2 adapted to be rotated through pulley 3 by power derived from any suitable source. Cooperating with and preferably contacting with the squeeze roll 2 is a squeeze roll 3 driven from the former at any suitable speed. Anterior to the squeeze rolls 2, 3, I provide a receptacle or chute 4 preferably substantially upright, and if desired having its lower end 5 deflected to guide or direct the material to the bight of said squeeze rolls. The said chute or receptacle may be of any suitable type and is preferably comparatively narrow from front to rear; that is, from right to left viewing Fig. 1. It may be of any suitable width, but preferably of a width substantially equaling the effective length of the squeeze rolls 2, 3. This chute may be of any suitable material, but preferably is of material such as disclosed in my Patent No. 971,778, October 4, 1910; that is to say, the rear and lower wall at least of said chute or receptacle is of anti-friction material. Said receptacle or chute constitutes one type of conveyer.

Anterior to and preferably adjacent the upper or receiving end of the chute 4 is a pair of feed rolls 5, 6, the lower one of which is here shown as driven by a pulley 7 receiving power from any suitable source not indicated. The said feed rolls 5, 6 are thereby positively driven at a speed somewhat that is, slightly greater than the squeeze rolls 2, 3, so as to permit an accumulation of material in said chute. The excess superficial speed of the feed rolls 5, 6 over that of the squeeze rolls 2, 3 is, of course, susceptible of variation, but should not be so great as to choke the chute 4 with the accumulated material. It should be and is so proportioned to the delivery of the squeeze rolls as merely to form the textile material into more or less regular zigzag folds, such as indicated in Fig. 1^a. This zigzag formation is preserved by the front and rear walls of the chute and the material is therefore delivered in substantially this condition to the squeeze rolls 2, 3, and passes in such condition between them for subsequent manipulation or treatment.

If desired, I may employ a folder or other suitable means merely to assist in securing the zigzag or transverse formation of the textile material in the chute 4. In Figs. 3 and 4, I have represented a suitable means for this purpose consisting of a rotatable

shaft 8 having two blades 9, 10 extending in opposite directions therefrom and inclined as indicated at 11, 12 in Fig. 3. The shaft 8 is driven in any suitable manner, as by a pulley 13 at proper speed to effect the zigzag positioning of the material. As the blade 10 with its inclined edge 11 is brought into substantially the position indicated in Fig. 4, the tendency of said inclined edge is to cause the material to slip gradually in the direction of the arrow shown in Fig. 3, toward or substantially to the left hand side of the chute 4, viewing said Fig. 3. Upon continued rotation of the shaft 8, the blade 9 with its inclined edge 12 assumes the position formerly assumed by the blade 10, and thereupon the said inclined edge 12 causes the material to slip in the direction of the arrow adjacent thereto, that is, toward the right viewing Fig. 3. This to and fro or zigzag movement of the textile material is continued as the blades 9, 10 succeed each other, and thus the said blades co-act with the squeeze rolls 2, 3 and feed rolls 5, 6 to effect the zigzag positioning of the material in the chute 4.

If I employ a folder for the purpose stated, it may be of any suitable construction. In Fig. 5, I have represented a folder generally similar to that shown in Fig. 4, excepting that it is provided with four arms 14, 15, 16 and 17, which act in the same manner as the blades 9, 10.

The speed of the folder or other auxiliary or assisting traversing means is, of course, so proportioned to the speed of rotation of the squeeze rolls 2, 3 and feed rolls 5, 6 as to effect the described zigzag positioning of the material in the chute or receptacle 4.

It will be evident from the foregoing description that I have produced an exceedingly simple yet effective device for the purpose stated. I am enabled to do away with the traversing means disclosed in my said Patent No. 959,067, and to employ simply squeeze rolls and feed rolls to effect the described zigzag positioning of the material.

Having thus described one illustrative embodiment of my invention, I desire it to be understood that although specific terms are employed, they are used in a generic and descriptive sense and not for purposes of limitation, the scope of the invention being set forth in the following claims.

Claims.

1. Textile conditioning apparatus comprising in combination a pair of co-acting squeeze rolls for operating upon wetted bands or ropes of material narrow in comparison with the length of said rolls, means for driving at least one of said rolls, a substantially upright chute through which said bands or ropes may be delivered to said squeeze rolls, feeding means for positively delivering the said bands or ropes into said

chute, and means for driving said feeding means at a sufficiently greater speed than said squeeze rolls to permit the accumulating textile material within said chute to assume a general zigzag condition, thereby to effect a crosswise delivery of the material between the squeeze rolls.

2. Textile conditioning apparatus comprising in combination a pair of co-acting squeeze rolls for operating upon wetted bands or ropes of material narrow in comparison with the length of said rolls to expel liquid therefrom and to discharge the said material, means for driving at least one of said squeeze rolls, a substantially upright chute to deliver the textile material to said rolls, a pair of feed rolls for delivering the textile material into said chute, and means for driving said feed rolls at a slightly greater surface speed than said squeeze rolls, whereby the textile material may be sufficiently accumulated in said chute to receive a zigzag formation and to be delivered crosswise to and between the squeeze rolls.

3. Textile conditioning apparatus comprising in combination a pair of co-acting squeeze rolls for operating upon wetted bands or ropes of material narrow in comparison with the length of said rolls to expel liquid therefrom and discharge the said material, driving means for at least one of said rolls, a substantially upright chute to deliver the textile material to said rolls, said chute being relatively narrow from front to rear, a pair of feed rolls at the upper entrance end of said chute, and means to drive said rolls at a somewhat greater surface speed than said squeeze rolls, so as to permit sufficient accumulation of the textile material in the chute to effect a zigzag or crosswise delivery of the said textile material to and between the rolls.

4. Textile conditioning apparatus comprising in combination a pair of co-acting squeeze rolls for operating upon wetted bands or ropes of textile material narrow in comparison with the length of said rolls to expel liquid therefrom and to discharge the said material, driving means for at least one of said rolls, a substantially upright chute comparatively narrow from front to rear to receive the textile material and direct it toward said squeeze rolls, a pair of feed rolls

to feed the textile material into said chute, means to drive one or both of said feed rolls at a somewhat greater speed than said squeeze rolls to permit an accumulation of textile material in said chute, and a rotatable folder adjacent the discharge side of said feed rolls and shaped to assist in effecting the traverse of the textile material from side to side of said chute.

5. Textile conditioning apparatus comprising in combination a pair of co-acting squeeze rolls for operating upon wetted bands or ropes of material narrow in comparison with the length of said rolls to expel liquid therefrom and to discharge the said material, driving means for at least one of said squeeze rolls, a substantially upright chute to receive the textile material and to direct it toward said squeeze rolls, a pair of feed rolls to deliver the textile material into said chute, means to drive one or both of said feed rolls at a somewhat greater surface speed than said squeeze rolls to permit the accumulation of the textile material in said chute, and a folder having a plurality of blades inclined to the axis of rotation of said folder to assist in effecting the to and fro folding of the material in said chute.

6. Textile conditioning apparatus comprising in combination a pair of co-acting squeeze members for operating upon wetted bands or ropes of material narrow in comparison with the extent of said members, means for imparting squeezing motion to at least one of said members, a conveyer by which said bands or ropes may be delivered to said squeeze members, feeding means for positively delivering said bands or ropes to said conveyer, and means for driving said feeding means at a sufficiently greater speed than the squeeze motion of said squeeze member to permit the accumulating textile material delivered by said conveyer to assume a general zigzag condition, thereby to effect a crosswise delivery of the material between the said squeeze members.

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

ISAAC E. PALMER.

Witnesses:

REUBEN M. BURR,
GEO. C. HAINS.