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KARL-PETER LOPATA
SAFETY DEVICE, ESPECIALLY FOR USE IN CONNECTION
WITH THE WET SQUEEZING OF TEXTILES
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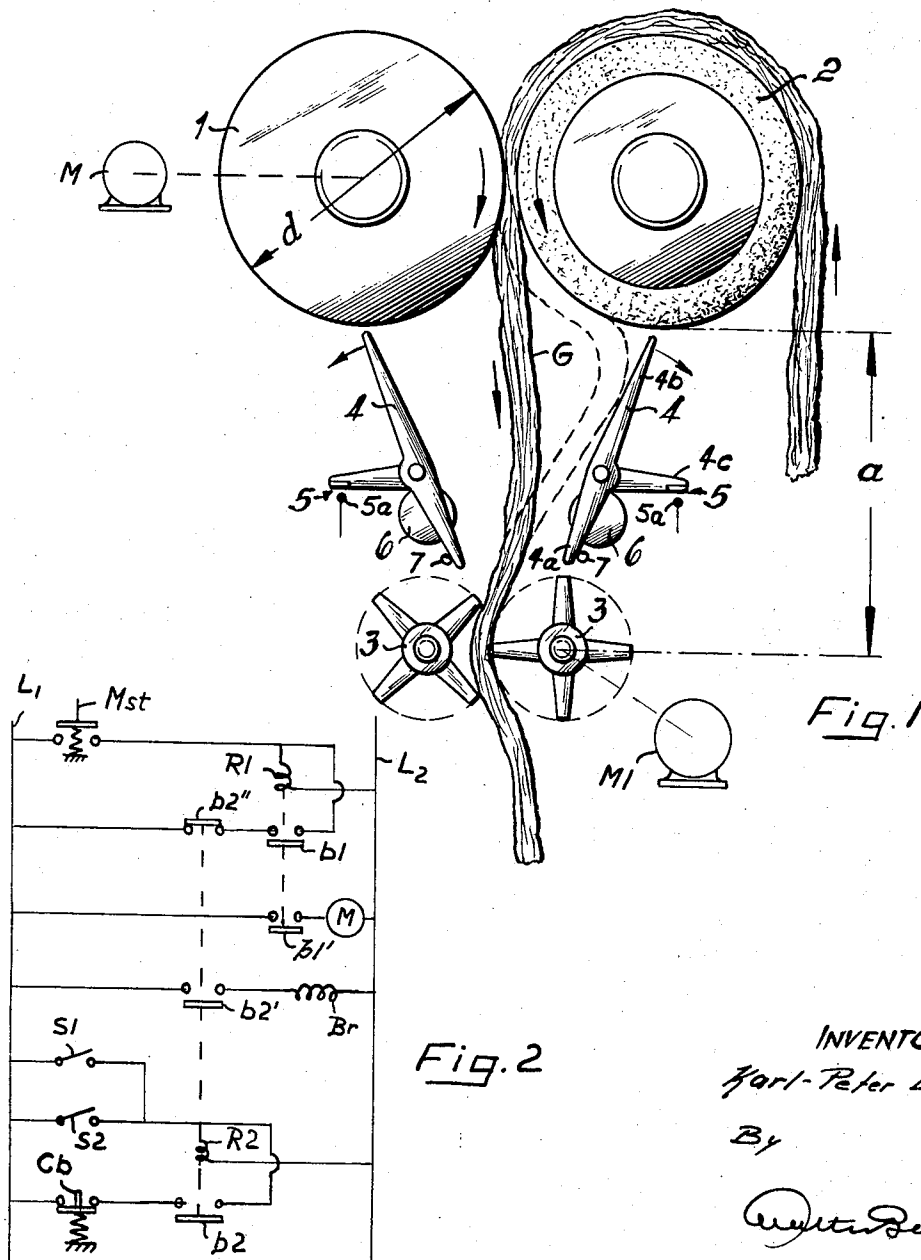


Fig. 1

Fig. 2

INVENTOR
Karl-Peter Lopata

By

Walter Deuky.

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Karl-Peter Lopata, Krefeld-Urdingen, Germany, assignor to Joh. Kleinewefers Sohne, Krefeld, Germany

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The present invention relates to a safety device for use in connection with wet squeezing devices for treating textiles and, more specifically, concerns wet squeezers for squeezing off treating liquor from textiles in the form of strands or wide webs.

With ever increasing working speed at which machines of this type are operated in textile finishing plants, the draw-back has been encountered that the goods passing between the two squeezer rollers frequently do not rectilinearly continue their movement at the exit side but, due to the sticking effect of the wet goods, stick to one of the two rollers and are wound up upon the same. As a result, breaking of the strands of goods, damages to the machines and work stoppages were unavoidable.

In an effort to remedy this situation, fixed guiding rails or guiding funnels have been provided, but without any material success because the goods also stuck to these parts and formed tappings or pads.

It is, therefore, an object of the present invention to provide a device which will overcome the above mentioned drawback.

It is another object of this invention to provide a safety device for wet squeezing wet goods, which will assure a proper passage of the goods through the squeezer rollers and will, in case of a return winding of the goods, automatically slow down or interrupt the movement of the goods and will stop the squeezing mechanism.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawing, in which:

FIG. 1 diagrammatically illustrates a device according to the present invention.

FIG. 2 is an electric diagram for a control for use in connection with the arrangement of FIG. 1.

The device according to the present invention is characterized primarily in that below each of the squeezer rollers there are provided an outwardly tiltable strip adapted to carry out a tilting movement and extending closely to the surface of the respective squeezer roller. The said strip is adapted, when the goods are deviated beyond a certain extent or when a return winding of the goods occurs, to tilt so as to close a contact which in its turn brings about a shutting off of the squeezing mechanism.

For purposes of improving the pull exerted upon the goods in order to pass the same through between the squeezer rollers, according to a further feature of the present invention, two intermeshing beater rollers known per se are arranged below the squeezer rollers. The speed and spacing of these beater rollers from the squeezer rollers is approximately from 1.2 to 1.5 times the circumferential speed of the squeezer rollers and the diameter thereof respectively.

Referring more specifically to the drawing, the squeezer mechanism comprises a steel roller 1 and an elastic roller 2. Below said rollers 1 and 2 there are arranged two interengaging beater rollers 3 for pulling the goods through between the squeezer rollers 1 and 2. Numerous tests have proved that a return winding of the goods onto the beater rollers can be avoided with great safety when arranging the beater rollers at a

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distance a from the squeezer rollers, said distance amounting to approximately from 1.2 to 1.5 the diameter d of roller 1. These tests also have proved that for best results the circumferential speed of the beater mechanism 3, 3 should be approximately from 1.2 to 1.5 times the circumferential speed of the squeezer mechanism 1, 2.

According to a further development of the present invention, the squeezer mechanism has associated therewith a safety device which comprises tiltable means respectively arranged below said squeezer rollers 1 and 2. According to the specific showing in the drawing, these tiltable means consist each of an eccentrically journaled strip 4 which by means of a weight 6 is continuously urged into and held in its zero position at which the lower arm 4a engages an abutment 7 which may be adjustable. Similarly, also the weight 6 may be adjustable on said strip 4 in any convenient manner, for instance by a screw. The upper arm 4b of strip 4 extends upwardly close to the circumference of the respective squeezer roller.

As will be seen from the drawing, strip 4 has a third arm 4c which carries a contact 5 for cooperation with a contact 5a. These contacts 5 and 5a, on one side of FIG. 1, are represented in the diagram of FIG. 2 by the switch S1, while the contacts 5 and 5a on the other side of FIG. 1 are represented in FIG. 2 by the switch S2. In FIG. 2 the network is represented by the lines L1 and L2. The diagram of FIG. 2 furthermore comprises a normally open manual starter which M_{st} and a normally closed circuit breaker switch C_b .

The operation of the device is as follows. It may be assumed that the squeezer mechanism is at a standstill and is now to be started. To this end, manual starter switch M_{st} is temporarily closed. This closes the energizing circuit for relay R1 so that its blades $b1$ and $b1'$ close. Closure of $b1$ establishes the holding circuit for R1 so that the return of manual starter switch M_{st} to its open position after it has been released will not affect the energization of R1. Closure of $b1'$ closes the energizing circuit for motor M so that the squeezer will now start its operation.

Assuming now that during the operation of the squeezer, for some reason, the wet goods G tend to stick and deviate toward the right (with regard to the drawing) into the dash line position of FIG. 1 so as to tilt adjacent strip 4 into closing direction with the result that switch S1 (contacts 5, 5a) closes. Closure of switch S1 closes the energizing circuit for relay R2. As a result thereof, relay blades $b2$ and $b2'$ pertaining to relay R2 close while at the same time blade $b2''$ of relay R2 opens. Closure of blade $b2$ establishes the holding circuit for relay R2 so that the possible subsequent opening of switch S1 will not affect the energization of R2. Opening of relay blade $b2''$ breaks the energizing circuit for relay R1, and blades $b1$ and $b1'$ will open. The opening of blade $b1$ has no further effect at this time. The opening of blade $b1'$ breaks the energizing circuit for the motor M driving squeezer roller 1. As mentioned above, also relay blade $b2'$ is closed when relay R2 is closed. The closure of relay blade $b2'$ closes the energizing circuit for the electric brake Br which now brakes and stops motor M. The entire mechanism thereupon comes to a standstill and the disorder can be remedied.

After the disorder has been remedied, the switch C_b is temporarily opened thereby breaking the energizing circuit for relay R2 and consequently causing blades $b2$ and $b2'$ to return to their open position and blade $b2''$ to return to its closing position. The situation is then the same as shown in FIG. 2 and the device can be started again as outlined above. It will be evident from the circuit that if instead of switch S1 switch S2

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were closed, the operation is precisely the same as described above.

For purposes of improving the sliding of the squeezed material over the tiltable strips 4, at least the inner surface thereof may be coated with a fluorized synthetic material, as for instance the material known under the trademark Teflon.

It may also be mentioned that the drive of the beater rollers 3 may be effected by a separate motor M₁, or by motor M through a transmission.

It is, of course, to be understood that the present invention is, by no means, limited to the particular arrangement shown in the drawing but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. A squeezing mechanism, which includes: a pair of rotatable squeezer roller means for passing therebetween and squeezing wet textile material, motor means operatively connected to said squeezer roller means for selectively driving the same, rotatable pulling means arranged below said squeezer roller means in spaced relationship thereto for grasping squeezed textile material and exerting a pull thereon in the direction away from said squeezer roller means, and control means including means interposed between said rotatable pulling means and said squeezer roller means and operable to reduce the speed of said squeezer roller means in response to squeezed textile material passed through between said squeezer roller means tending to wind back on one of said squeezer roller means.

2. A squeezing mechanism according to claim 1, in which said rotatable pulling means are formed by two intermeshing star drums operable to grasp squeezed strand or web material therebetween.

3. A squeezing mechanism according to claim 1, in which the distance between said rotatable pulling means and said squeezer roller means is within the range of

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from 1.2 to 1.5 times the diameter of one of said squeezer roller means.

4. A squeezing mechanism according to claim 1, in which said means forming part of said control means and being located between said pulling means and said squeezer roller means comprises two strip members pivotally supported on opposite sides of the path of movement of squeezed textile material from said squeezer roller means to said pulling means, each of said strip members being tiltable from a first position into a second position by squeezed textile material attempting to wind back on one of said squeezer roller means, and means arranged adjacent said strip members and operable by the latter in the second position thereof to interrupt operation of said motor means.

5. A squeezing mechanism according to claim 4, in which one side of one of said strip members faces one side of the other strip member, and in which said two faces of said strip members which face each other are coated with a fluorized synthetic material.

6. A squeezing mechanism according to claim 4, in which said strip members extend from close to the peripheral surface of said squeezer roller means to close to the peripheral surface of said pulling means.

7. A squeezing mechanism according to claim 4, in which said motor means for driving said squeezer roller means is an electric motor, and in which said strip members are provided with switch means operable in the second position of the respective strip member to bring about de-energization of said motor.

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