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MACHINE FOR THE WET TREATMENT OF FABRICS

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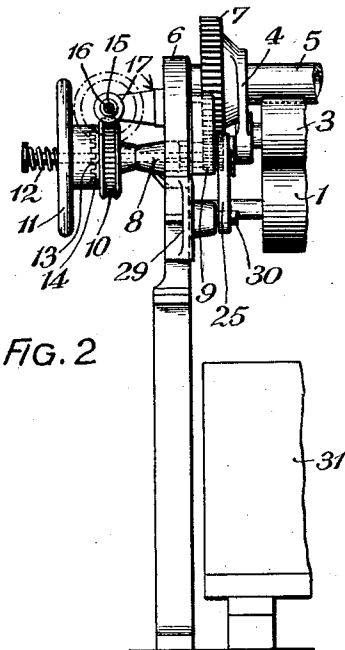


FIG. 2

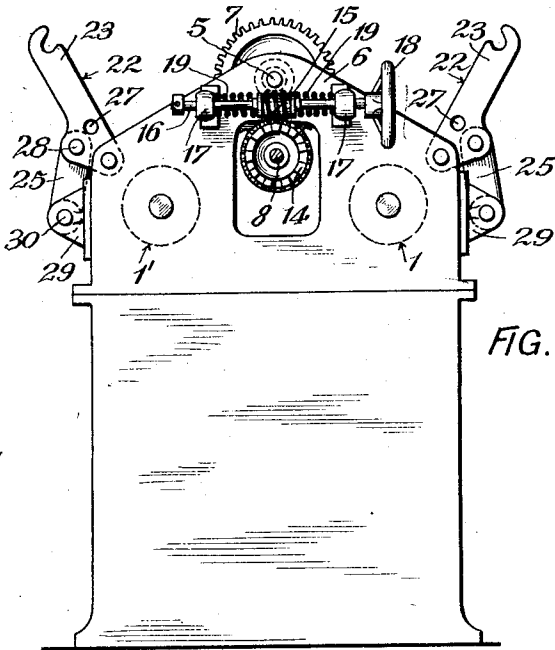


FIG. 3

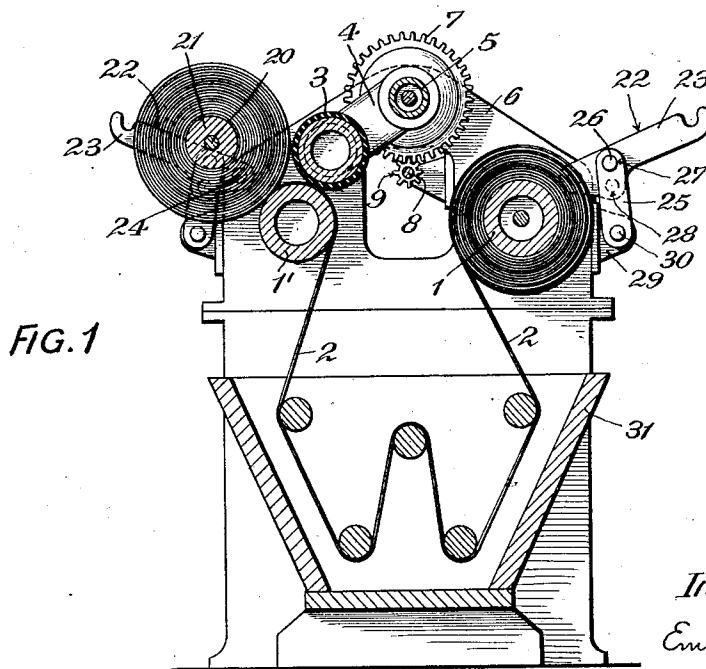


FIG. 1

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MACHINE FOR THE WET TREATMENT OF FABRICS

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The present invention relates to improvements in machines for the wet treatment of fabrics such as dyeing, washing, impregnating or the like during their winding over from one roller to another in the open state with return movement of the fabric. With machines of this type it is known to provide squeezing rollers adapted to be swung from one winding roller to the other either by means of a worm gear or a spur gear.

A worm gear having a big ratio permits to exert a strong pressure, however, it presents the disadvantage that the squeezing roller can only be comparatively slowly swung from one winding roller to the other. With spur gears the ratio is essentially smaller so that the device displaces quicker a squeezing roller of a smaller weight. However, only a small pressure can be exerted if no additional weights are used for loading the squeezing roller after it has been swung into its new position.

The present invention provides an elastic squeezing exerting device which permits thick seams to pass without trouble and which obviates the disadvantages of the above described devices. Large pressures may be exerted and yet the squeezing roller is quickly displaceable.

A constructional example of the subject matter of the present invention is illustrated on the accompanying drawings, in which

Fig. 1 is a vertical section through the machine,

Fig. 2 is part of a side elevation of the machine and

Fig. 3 is an end-view.

Referring now to the drawings 1 and 1' are the two winding rollers the drive of which is periodically reversed and on and from which respectively the fabric 2 is wound. The drive of the rollers including the reversing apparatus is not shown in the drawings of the present invention as it is well known in the art.

A squeezing roller 3 lined with soft rubber is easily turnable in the arms 4 which in their turn are fixed to the shaft or the tube 5 rotatably mounted in the standards 6. One of the arms 4 is connected with a gear wheel 7

meshing with a pinion 9 fixed on the shaft 8. On the latter a worm wheel 10 is loosely turnable but not displaceable in the axial direction; the hand wheel 11 is axially displaceable on a feather of the shaft 8 and thus takes part in the rotation of the shaft. The spring 12 urges the serrations 13 of the hand wheel 11 into the serrations 14 of the worm wheel 10. A worm 15 cooperates with the worm wheel 10 and is fast on the shaft 16, the latter being turnably and displaceably mounted in the two bearings 17; a hand wheel 18 is fixed on the shaft 16. Two equal coil springs 19 are inserted between the worm 15 and the bearings 17 and serve for causing and for finely regulating a high pressure between the squeezing roller and the winding roller in the manner described hereinafter. When winding up the fabric the shaft or gudgeon 20 of the then take-up roller 21 moves along the edge 22 of the arm 23, the latter being turnable about the pin 24 and adjustable into different inclinations as is shown in Figs. 1 and 3 depending on whether the pin 26 of the link 25 is inserted in the hole 27 or 28. The link 25 is turnable about the pin 30 mounted on the bracket 29.

The operation of the machine is the following:

When the fabric 2 is lead from the right hand roller 1 (Fig. 1) or from a batch roller 21 to the right of the roller 1 over guide rollers through the vat 31 and over the left hand winding-up roller 1' to the left hand taking-up roller 21 the squeezing roller 3 may be swung towards the left by displacing the hand wheel 11 on the shaft 8 against the pressure of the spring 12 so that the claw coupling 13—14 is out of action. By turning the hand wheel 11 and thereby the spur gear 9 and 7 the pressure roller 3 is quickly swung towards the left, whilst the worm drive 10, 15 is cut out. When the hand wheel is released the claw coupling 13, 14 is again rendered operative by the pressure of the spring 12.

By turning the hand wheel 18 any desired pressure between the squeezing roller 3 and the winding up roller 1' may be produced in the following manner: By turning the

hand wheel 18 in the clockwise direction the worm 15 fixed to the shaft 16 causes a clockwise turning movement of the worm wheel 10 and of the hand wheel 11, coupled to the worm wheel by means of the claw coupling 13, 14 and of the shaft 8.

By the transmission of the gear wheels 9 and 7 the shaft 5 and the arm 4 are turned counter-clockwise. As soon as the squeezing roller 3 bears strongly against the winding-up roller 1' the shaft 5 and thereby the shaft 8 can no longer turn; if the hand wheel 18 is nevertheless further turned the self-locking worm 15, which cooperates now with the stationary worm wheel 10, must displace itself from right to left and the extent of this displacement is equal to the pitch of the worm for a complete revolution of the hand wheel 18. The two springs 19, which abut on one side against the bearings 17 and on the other side against the worm 15 hold the latter in the mid-position between the two bearings 17 as long as the shaft 8 and the worm wheel 10 can be turned.

If, however, as has been mentioned above, the worm wheel 10 can no longer be turned as soon as the rollers 3 and 1' are pressed against each other, the worm 15 compresses the left hand spring 19 when it is displaced towards the left and simultaneously relieves the right hand spring 19. The reaction of the thus compressed spring acts through the intermediary of the worm tangentially on the worm wheel from left to right and causes a turning moment in the clockwise direction to be exerted on the worm wheel; as the latter is coupled to the pinion 9 by the claw coupling the same turning moment is exerted on the gear wheel 7 in the anti-clockwise direction whereby the squeezing roller 3 is pressed from above on the winding up roller 1' according to the reaction of the spring. Thereby between the squeezing roller and the winding up roller a very considerable and easily regulable pressure is obtained which on tests amounted to several 100 kg. At the same time this spring 19 acts as a yielding element if seams in the fabric have to pass between the winding up roller and the squeezing roller.

The adjustability of the arms 23 presents the following advantages: In utilizing the squeezing device the arms 23 may be set at such a small inclination that the fabric wound on the taking-up roller 21 is not in contact with the squeezing roller 3. This position may also be desirable without the use of the squeezing device if certain fabrics have to be wound up at a very small pressure, i. e. if the fabric 2 has to rest with only a small portion of its weight on the winding-up roller 1' during the winding. The small inclination of the arms 23 facilitates the insertion and removal of the batch rollers with the fabrics, as the latter do not need to be lifted as high as is the case with

much inclined arms 23. The great inclination of the arms 23 may, on the other hand, be desirable if without using the squeezing device a certain squeezing action has to be exerted on the fabric by the weight of the batch roller. The arm 23 may also be placed vertically whereby an abutment would have to be provided for the shaft of the batch roller.

I claim:

1. In a machine of the class described, the combination with a vat, two fabric winding rollers thereon and guide rollers in the vat, a squeezing roller, two swingably mounted arms on which said squeezing roller is mounted and adapted to be brought into cooperation with either of the two fabric winding rollers, spring means adapted to press said squeezing roller yieldingly against the cooperating empty fabric winding roller, and means for manually adjusting the pressure exerted by said spring means.

2. In a machine of the class described, the combination with a vat, two fabric winding rollers thereon and guide rollers in the vat, a squeezing roller, two arms on which said squeezing roller is mounted, a shaft on which said arms are fixed, a further shaft, a pair of spur gear wheels interposed between said two shafts for swinging said arms to bring the squeezing roller to bear against one or the other of said winding rollers, a worm wheel adapted to be brought into and out of driving engagement with said second shaft, a worm cooperating with said worm wheel and adapted to be axially displaced against the latter, springs acting in the axial direction against both ends of said worm, and means for causing an axial displacement of said worm and thereby a yielding pressure of said squeezing roller against the cooperating winding roller.

3. In a machine of the class described, the combination with a vat, two fabric winding rollers thereon and guide rollers in the vat, a squeezing roller, two arms on which said squeezing roller is mounted, a shaft on which said arms are fixed, a further shaft, a pair of spur gear wheels interposed between said two shafts for swinging said arms to bring the squeezing roller to bear against one or the other of said winding rollers, a worm wheel loosely mounted on said second shaft, a hand wheel in driving engagement on said second shaft, coupling means inserted between said worm wheel and said hand wheel, a worm cooperating with said worm wheel and adapted to be axially displaced against the latter, springs acting in the axial direction against both ends of said worm, and a hand wheel rigidly connected to said worm and adapted to cause an axial displacement of said worm and thereby a yielding pressure of said squeezing roller against the cooperating winding roller.

4. In a machine of the class described, the combination with a vat, two fabric winding rollers thereon and guide rollers in the vat, a squeezing roller, two swingably mounted
5 arms on which said squeezing roller is mounted and adapted to be brought into cooperation with either of the two fabric winding rollers, spring means adapted to press said squeezing roller yieldingly against the cooperating fabric winding roller, means for manually
10 adjusting the pressure exerted by said spring means, batch rollers for taking up the fabric, gudgeons on said batch rollers, arms on which said gudgeons of the batch rollers
15 freely roll, and means for altering the inclination of said arms, to bring the batch roller out of contact with the squeezing roller.

In testimony whereof I have signed my name to this specification.

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