May 5, 1931. M. HAHN 1,804,097

DECATIZING OF TEXTILE FABRICS

Filed Oct. 12, 1929

Fig. 1

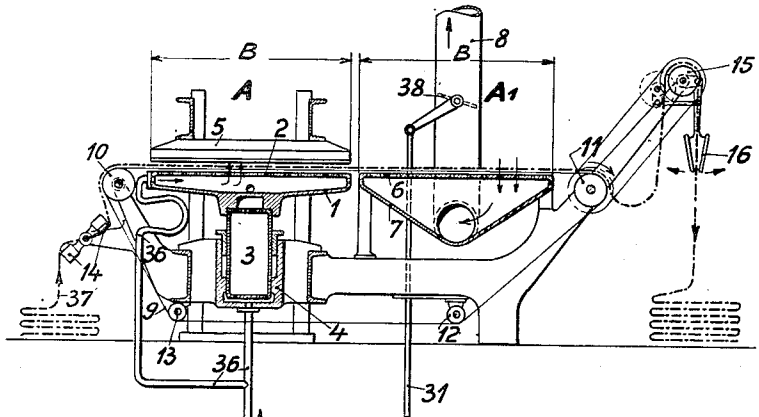


Fig. 2

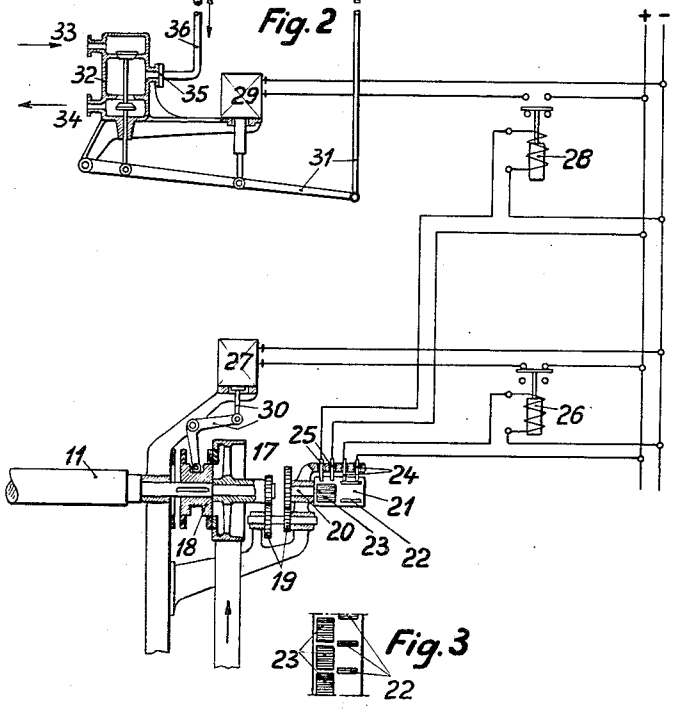


Fig. 3

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Patented May 5, 1931 1,804,097

UNITED STATES PATENT OFFICE

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DECATIZING OF TEXTILE FABRICS

Application filed October 12, 1929, Serial No. 399,336, and in Germany October 20, 1928.

That fabric treatment known as decatizing, which is a finishing operation wherein the fabric is steamed under pressure and then cooled, has been heretofore carried out by placing the fabric in numerous superimposed layers or folds between two pressing plates and while under pressure between these plates forcing steam through the pile of fabric. The admission of the steam generally takes place through the lower pressing plate which is perforated. For attaining an effective decatizing the pile of fabric thus steamed is allowed to cool under pressure. The pressure is thereupon relieved, the fabric pile unfolded and then folded again, this time in such a manner that the edges of the fabric folds which remained undecatized in the first operation now come into the middle of the pile, whereupon the steaming and cooling under pressure is repeated. This known process is complicated, takes much time and involves a considerable expenditure of wages.

According to the invention, it is proposed to decatize fabrics in a continuous working operation by moving the fabric web intermittently forward in a flat condition and steaming a portion of the fabric web under pressure and simultaneously cooling a corresponding previously steamed portion during the standstill between each two successive forward movements. The invention further consists in an apparatus for carrying the process into effect, this apparatus comprising a decatizing press, a cooling surface arranged immediately behind the press and a conveying device by means of which the fabric is intermittently moved through the press and across the cooling surface. A suitable control mechanism causes the movements of the conveying device and press to take place at the proper times.

The decatizing according to the invention can be practised with the same success as the known process but in a much shorter time and at considerably reduced cost.

In order to allow of the invention to be more clearly understood, it will now be described with reference to the accompanying drawing which illustrates an embodiment of the decatizing apparatus.

Fig. 1 is a side elevation of the apparatus, partly in section.

Fig. 2 shows the drives and control mechanism for the decatizing apparatus; and

Fig. 3 is a development of an electric contact drum forming part of the control mechanism.

A is the decatizing press and A^1 the cooling device which is arranged directly beside the press. The press and the cooling device are of the same breadth B. The decatizing press comprises a hollow bottom plate 1, which is provided with a perforated surface 2 and connected with a plunger 3 movable in a cylinder 4, and a fixed top plate 5 which has the same dimensions as the bottom plate. The cooling device consists of a suction box 7 which is covered by a perforated plate 6 forming the cooling surface for the fabric and connected with a pipe 8 leading to a suction fan (not shown). In the embodiment illustrated, the conveying means for the fabric comprise a permeable endless band 9, which passes over rollers 10, 11, 12 and 13, of which roller 11 is the driving roller. Arranged ahead of the press are stretching bars 14 and in rear of the cooling device a draft roller 15 and a plaiter 16.

The roller 11 is driven through a belt pulley 17 which is mounted loosely on an extension of the shaft of roller 11 and adapted to be coupled with the roller through an axially shiftable sleeve 18 (Fig. 2). The pulley 17 constantly drives through a toothed wheel gear 19 a shaft 20 which carries a contact drum 21. The contact drum 21 is provided with contacts 22 and 23. The contacts 22 cooperate with contact fingers 24 and the contacts 23 with contact fingers 25. The contact fingers 24 serve to open and close through a switch 26 the circuit for a lifting magnet 27, while the contact fingers 25 serve to open and close through a switch 28 the circuit for a lifting magnet 29. The lifting magnet 27 is operatively connected through rods 30 with the coupling sleeve 18, while the lifting magnet 29 is connected through rods 31 with a double valve 32 and with a flap 38 in the suction pipe 8. The casing of the double valve 32 is connected at 33 with a live steam sup-

ply conduit. At 34 is an exhaust pipe, while a branch 35 of the valve casing is connected through pipes 36 with the hollow press plate 1 and the power cylinder 4.

The operation of the described apparatus is as follows: The fabric 37 to be decatized is led over the stretching bars 14 to the conveying band 9 and after leaving the same over the roller 15 to the plaiter 16. In the position shown in Fig. 2, the lower cone of the double valve 32 is open so that the steam in the press plate 1 and power cylinder 4 escapes through the pipes 36, casing of valve 32 and branch 34. The lifting magnet 29 is de-energized and the flap 38 is closed. Therefore decatizing and cooling of the fabric do not take place in this position. The driving pulley 17 is constantly rotating. The lifting magnet 27 is energized and the pulley 17 is coupled through sleeve 18 with the driving roller 11 so that the fabric is being carried ahead by the conveying band 9. The contact drum 21 is being rotated through gear 19 in such a manner that, after an advance of the fabric by a distance corresponding to the breadth B of the pressing and cooling surface, the contact 22 has come out of touch with the contact fingers 24. The magnet 27 is thereby de-energized and the sleeve 17 shifted to the left, so that the driving connection between pulley 17 and roller 11 is interrupted and the movement of the fabric stopped. The contact drum 21 which continues rotating at uniform speed, now comes into engagement with the contact fingers 25 by one of its contacts 23. The circuit for the magnet 29 is thereby closed through switch 28 and the magnet 29 moves the double valve 32 upwardly so that the lower valve cone moves into closing position and the upper one into open position. Steam flows from branch 35 through the pipes 36 into the power cylinder 4 and press plate 1. The plate 1 and the fabric lying on the same are pressed against the top plate 5 and steam flows from the plate 1 through the perforated pressing surface 2 into the fabric while same is under the pressure acting in cylinder 4 on plunger 3. At the time the upper cone of the double valve 32 is opened, the flap 38 in suction pipe 8 is likewise opened and the draft of air set up by the fan is drawn through the fabric portion which is lying on the perforated surface 6 and which has previously been pressed and steamed in the press A. After the contact drum 21 has rotated so much that the contact fingers 25 are disengaged from the contact 23, the lifting magnet 29 is again de-energized, the press plate 1 moves down into its lower position and the supply of decatizing steam ceases. At the same moment, the contact fingers 24 again enter into touch with one of the contacts 22 of the drum 21, whereby another advance of the fabric by the breadth B is initiated, and so on. The decatizing effect can be changed by changing the duration of decatizing, which may be attained by altering the length of the contacts 23 of the drum 21 in the direction of the circumference or by changing the speed of rotation of the drum. The decatizing effect may further be changed by varying the pressure used in the cylinder 4. This last-said change may be performed within any desired limits by reducing through a pressure regulating valve the pressure of the steam supplied to the inlet 33. Instead of the lifting magnets there may also be used other electric devices, such as motors or the like. The operation of the double valve 32 and coupling 18 may also be effected by means of cams, grooved cylinders or other mechanical means, avoiding the use of electric current. The use of the endless band 9 for transporting the fabric through the decatizing apparatus permits forward movement of the goods in a condition free from strains and shrinking of the same in length and width during the cooling operation on the cooling surface 6.

Instead of using steam pressure for actuating the power cylinder 4 there may also be used hydraulic pressure or mechanically generated pressure, in which case the control means have to be modified accordingly.

In order to increase the output a plurality of fabric layers in superimposed relation may be simultaneously treated in accordance with the described process.

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

1. A method of steaming fabric consisting in intermittently moving the fabric in one direction in a flat condition, admitting live steam to a portion of the fabric under pressure during the periods intervening between the fabric moving periods, and simultaneously cooling a correspondingly previously steamed fabric portion.

2. An apparatus for steaming fabrics comprising a steaming press and a cooling surface on substantially the same level as and arranged in immediately adjacent and successive relation to the press, and conveying means for intermittently moving the fabric in a direction from the steaming press to the cooling surface, the operative effect of the steaming press and cooling surface being inaugurated with respect to the fabric in the intervals between the intermittent conveying movements.

3. An apparatus for decatizing fabrics, comprising a decatizing press having a fixed top plate and a vertically movable hollow bottom plate with a perforated top wall, a power cylinder for reciprocating the hollow press plate, means for simultaneously supplying steam to the power cylinder and to the hollow press plate, a cooling surface behind the

press, and conveying means for intermittently moving the fabric through the press and over the cooling surface.

4. An apparatus for decatizing fabrics, comprising a decatizing press, a suction box arranged in rear of the press and having its top wall provided with perforations for allowing air to be sucked from the atmosphere into the box, means for actuating the press and setting up a vacuum in the suction box, and conveying means for intermittently moving the fabric in a flat condition through the press and over the perforated top wall of the suction box.

5. An apparatus for decatizing fabrics, comprising a decatizing press having a fixed top plate and a vertically movable hollow bottom plate with a perforated top wall, a power cylinder for reciprocating the hollow press plate, means for simultaneously supplying steam to the power cylinder and to the hollow press plate, a suction box arranged in rear of the press and having its top wall provided with perforations for allowing air to be sucked from the atmosphere into the box, means for setting up a vacuum in the suction box, and conveying means for intermittently moving the fabric in a flat condition through the press and over the perforated top wall of the suction box.

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

MATHIAS HAHN.