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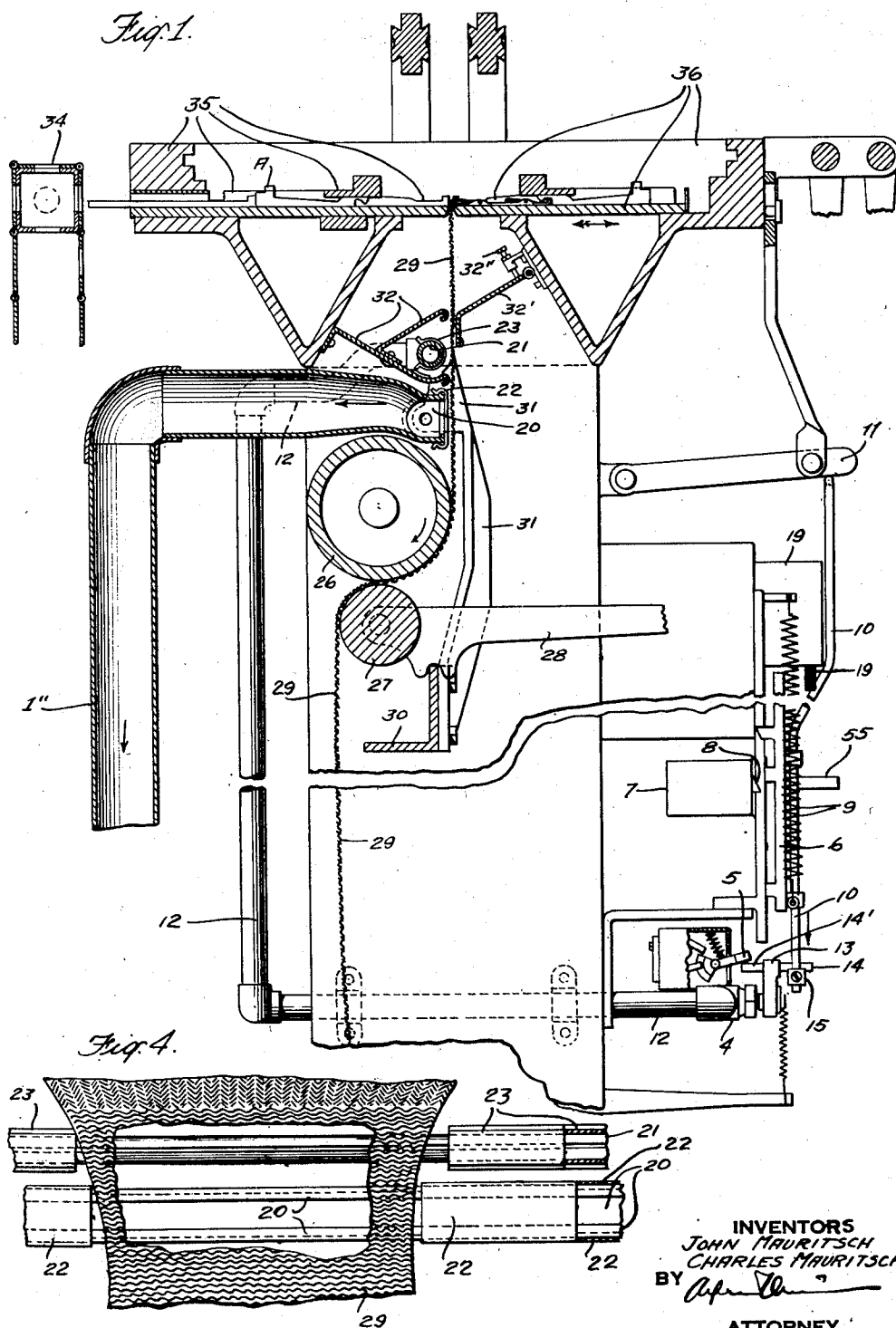
J. MAURITSCH ET AL

2,020,694

KNITTING AND SIMILAR MACHINE

Filed March 6, 1935

3 Sheets-Sheet 1



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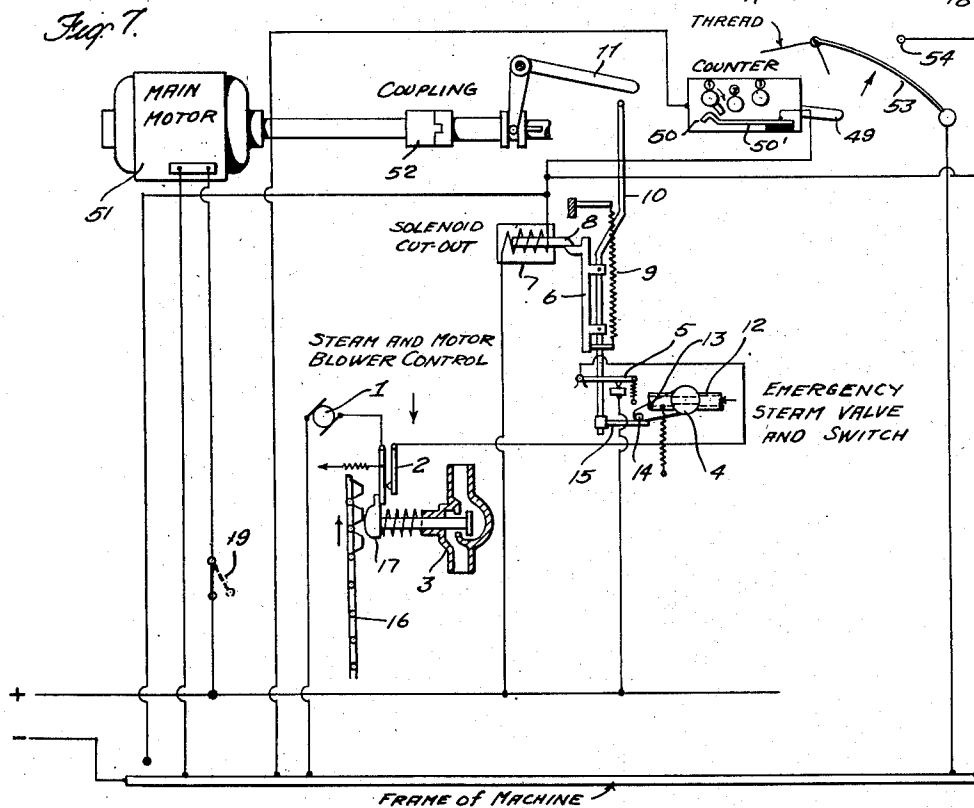
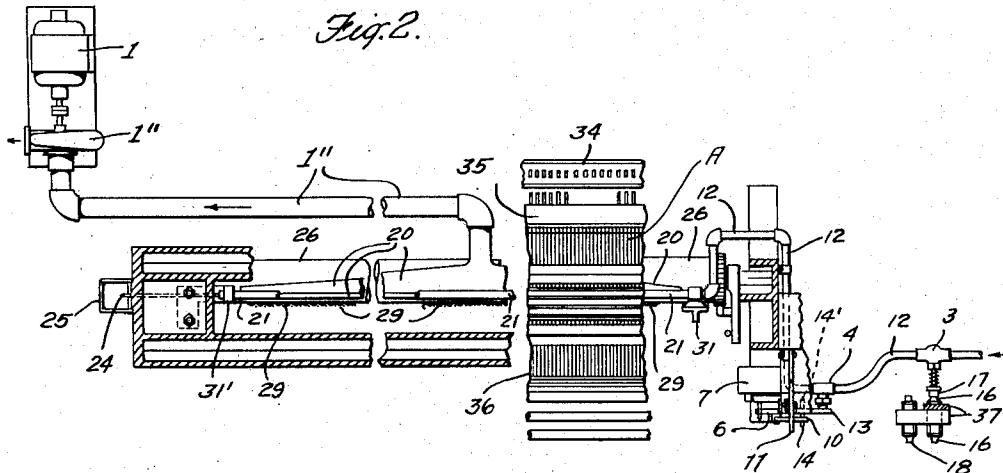
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KNITTING AND SIMILAR MACHINE

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3 Sheets-Sheet 2



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KNITTING AND SIMILAR MACHINE

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3 Sheets-Sheet 3

Fig. 3.

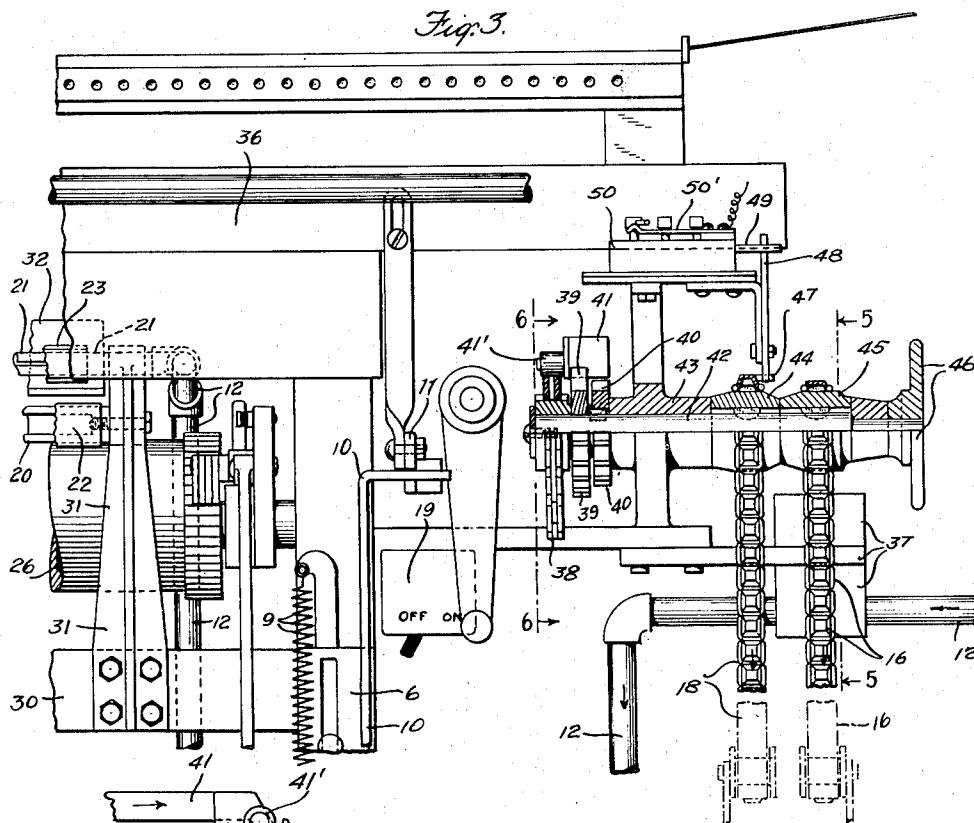


Fig. 6.

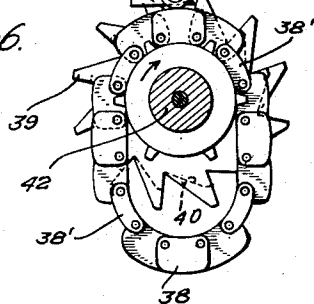
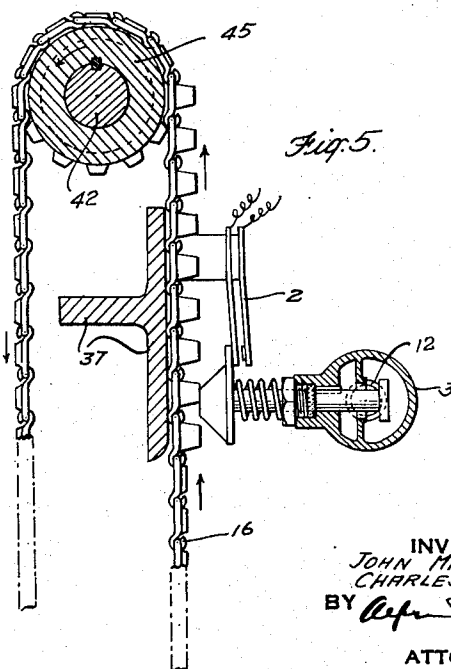


Fig. 5.



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KNITTING AND SIMILAR MACHINE

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9 Claims. (Cl. 66—147)

Our invention relates to machines used in the textile industry, but more particularly to knitting machines, for making knitted goods, such as sweaters, and the like.

One of the drawbacks of the knitting machines now in use is that the knitted material as it comes from the knitting needles curls, and one of the principal objects of our invention is to provide means whereby certain portions of the knitted material are subjected to a steaming operation immediately followed by a drying operation.

This we accomplish by disposing below the needle-beds lengthwise thereof a pipe having a narrow slot or slots, through which steam may escape supplied to said pipe from any suitable source. Below said pipe, hereinafter referred to as steam-nozzle, is arranged an air nozzle connected to an air conduit leading to a blower whereby continually air is sucked through said air nozzle. The said steam nozzle and air nozzle are so located, that the knitted material as it comes from the knitting needles passes directly in front of them.

Another object of our invention is to automatically control the steaming and drying operations so that only certain portions of the knitted material will be subjected to the action of the steam and the drying air, while other portions are not subjected thereto.

In the knitting of sweaters, for instance, it is desirable that the wrist portions at the ends of the sleeves and the bottom and neck portions retain their elasticity. Therefore, in the knitting of sweaters, the steaming and drying operations are so controlled that only the body portion of the sweater is steamed and dried.

Other objects of our invention will appear from the following description and the claims in which we have more definitely pointed out the various novel features of our improvement as applied to a knitting machine of the type described and shown, for instance, in Patent No. 1,824,320, in which two needle beds or needle plates are provided, one stationary and the other shiftable or adapted to be racked.

On the attached drawings, we have shown only so much of the knitting machine parts as found necessary to illustrate and describe our invention. On said drawings, Fig. 1 is a transverse section through a knitting machine of the type referred to, embodying our invention; Fig. 2 is a top plan view of the machine shown in Fig. 1; Fig. 3 shows the automatic pattern control and control for the steaming and drying operation;

Fig. 4 is a detail view of the steam-nozzle and the air-nozzle; Fig. 5 is a detail view, on an enlarged scale, of the chain forming part of the automatic control for the steam and air-nozzle; Fig. 6 shows the usual pattern control; Fig. 7 is a wiring diagram.

In Fig. 1, the machine frame is shown at A, while the two needle beds or needle plates are shown at 35 and 36. At 34 in Fig. 2 is also shown the Jacquard bar. The knitted material is indicated at 29, while at 26 is shown the feed roller, whereby the knitted material is fed along. 27 denotes an auxiliary clamping roller cooperating with the feed-roller 26 for feeding the knitted material. The clamping roller 27 is actuated by an arm 28 resting on the edge of an angle iron 30 forming a part of the machine frame.

At 21 is indicated the steam-nozzle comprising as shown a pipe having a narrow slot extending nearly throughout the entire length of the pipe. Below the steam-nozzle 21 is disposed the air-nozzle shown at 20 to which is connected an air-conduit 1' leading to a blower indicated at 1' driven by the motor shown at 1 in the wiring diagram of Fig. 7 and in Fig. 2. As shown in Fig. 1, the steam-nozzle 21 and the air-nozzle 20 are so disposed that the knitted material as it comes from the knitting needles passes directly in front of said steam-nozzle and air-nozzle. At 30 22 and 23 are indicated cover-plates adapted to be clamped or snapped respectively onto the air-nozzle and the steam-nozzle, to close certain portions of the same, as more clearly shown in Fig. 4.

The steam-nozzle 21 and the air-nozzle 20 are supported by brackets 31 and 31', which by bolts, or other suitable means, are secured to the above said angle iron 30. The two brackets 31 and 31' are also shown in Fig. 2. In said figure, on the left, there is also shown at 24 a lead-off pipe for the condensing steam, which is discharged into the box shown at 25.

At 32 in Fig. 1 is shown a fixed steam-shield confining the steam area, while at 32' is shown a pivoted steam-shield held under the tension of a spring (not shown) and provided for preventing steam from reaching the needle-beds. At 32'' is shown a set-screw extending through a small bracket, by which screw the position of the pivoted steam-shield relative to the knitted material can be adjusted.

Steam is supplied to the steam-nozzle 21 through a pipe shown at 12 in Figs. 1 and 2. At 4 is shown an emergency steam valve, while

at 5 is shown an emergency switch contact for the electric motor operating the blower connected through air conduit 1' with the air-nozzle 20. At 7 is indicated a solenoid having a core 8 formed as a latch adapted to cooperate with a movable latch bar shown at 6. At 9 is shown a tension spring attached to said latch bar 6 for moving the same to the position shown in Fig. 1 as soon as it is released by latch 8 of the solenoid 7.

At 10 is shown a latch-rod, while at 11 is shown the main motor yoke lever. At 13 is shown the steam valve arm having lugs 14 and 14' projecting from it on opposite sides. At 15 is shown a rod carried by the latch-rod 10 and adapted to cooperate with lug 14 of steam-valve arm 13. At 19 is shown the manual control switch for the main driving motor.

In Fig. 3 there is shown at 42 the shaft for the control- and pattern-chains 16 and 18 respectively. Shaft 42 is supported in brackets 43. 40 denotes a small fixed ratchet wheel on shaft 42, while at 39 is shown a large loose ratchet wheel. These two ratchet wheels are adapted to cooperate respectively with an eccentric controlled ratchet arm 41 and a ratchet roller 41'. At 44 is shown the gear for the pattern chain 18, while at 45 is shown the gear for the chain 16 controlling the steam supply and electrically operated blower switch. At 46 is shown a hand-wheel for the manual operation of shaft 42. The pattern control chain 18 is provided with a lateral projection, shown at 47 in Fig. 3, adapted to cooperate with a lever 48 operating the counter bar 49 of a counter shown at 50 provided with a counter contact 50'. The control chains shown at 16 and 18 in Fig. 3 are provided with chain weights (not shown).

In Fig. 6 is shown on an enlarged scale the pattern control, while in Fig. 5 is shown on an enlarged scale the control chain for the steam- and motor-blower-control. These chains, as appears from said figures, have high links and low links for the purpose hereinafter described.

The operation of our improvement can be easily followed from the wiring diagram of Fig. 7 in which at 51 is shown the main driving motor, while at 52 is shown the coupling. The motor for operating the blower connected with the air-nozzle is shown at 1.

While the needles of the needle beds 35 and 36 have been knitting the body portion of a sweater, both the steam-nozzle 21 and the air-nozzle 20 have been operating so that the knitted material, while passing in front of these nozzles has been subjected to both a steaming and an air-drying operation.

The control chain 16 for both the steam and motor-blower control is mounted on the same shaft (42) as the pattern control chain 18 as above described and as shown in Fig. 3, which shaft, by means of the ratchet 40 is stepwise rotated every time when roller 41' mounted on the eccentric arm 41 drops into one of the depressions 38' formed in the pattern control chain 38 shown in Fig. 6. This control chain 38 as shown obviously permits the loose ratchet wheel 39 to be moved stepwise three times, before the fixed ratchet wheel 40 is moved one step. This one-step movement of ratchet wheel 40 moves the pattern control chain 18 and the steam- and blower-control chain 16 one link. As the body portion of the sweater is about to be finished, the high links of the chain 16, which travels in the direction of the arrows shown in Fig. 5, have

nearly passed the chain-operated steam-valve 3, so that as the chain travels on, the head 17 provided on the stem of said valve drops off the high links with the result that the valve by means of the string encircling its stem is closed so that no more steam can pass through the pipe 12 to the steam-nozzle 21. At the same time, also the blower motor switch shown at 2 in Fig. 7 is opened, and the motor 1 operating the blower stops.

At 4 in Fig. 7 is shown an emergency steam valve, also shown in Figs. 1 and 2, while at 5 is shown an emergency motor blower switch contact. The operation of these parts is as follows:

Should during the knitting operation a thread break, then the thread-guiding arm shown at 53 in Fig. 7 will move in the direction of the arrow and close a contact 54, with the result that the solenoid 7 included in the circuit is energized. The core forming the latch 8 is then drawn inwards, i. e. toward the left in Fig. 7, releasing the latch-bar 6, which by the spring 9 is moved upwards to the position shown in Fig. 1. The latch-bar 6 being operatively connected with latch-rod 10 moves the latter upwards to the position also shown in Fig. 1, in which position the rod 10 operates the lever 11 and thereby unclutches the coupling 52 of the main driving motor 51.

By the arm 15 at the lower end of the latch rod 10 and the steam valve arm 13, the lug 14 of which is engaged by the said arm 15, the emergency steam valve shown at 4 is closed so that irrespective of whether the steam valve shown at 3 is open, no further steam will flow into and through pipe 12 to the steam nozzle 21. The latch rod 10 when moved upwards by the latch-bar 6 also by means of one of the laterally projecting lugs (14') on arm 13 of the emergency steam valve operates the switch arm 5 (Figs. 1 and 7) so as to break the contact and open the circuit with the result, that the motor 1 operating the blower for the air-nozzle 20 is stopped.

The same will occur when the pointer of the counter shown at 50 in Fig. 7 has reached a position, in which it makes contact with the contact arm 50', after a predetermined number of sweaters, for instance, has been produced. Also in that case, the solenoid 7 is energized, the emergency steam valve 4 is closed and the emergency switch 5 is operated to break the circuit.

Every time, after the latch-bar 6 and the latch-rod 10 have been operated by the release of the latch-bar 6 through the withdrawal of the solenoid controlled latch, the mechanism must be reset. For that purpose, we have provided a resetting arm shown at 55 in Fig. 1, which is fixed on the latch-bar 6, whereby the latter, together with the latch-rod 10, can be returned to the position shown in Fig. 7, while at the same time the tension spring 9 operating the latch-bar and latch-rod is placed under tension again.

While we have described and shown a complete embodiment of our invention, we do not, of course, thereby limit ourselves to this embodiment, because the same is obviously capable of various modifications and changes comprised within the essence of our invention.

We claim:

1. In a knitting or similar machine, the combination with the operating tools, a support therefor and a pattern control mechanism, of a steam-nozzle provided in the path of feed of the material produced by the machine extending across the same, an air-nozzle disposed below said

steam-nozzle and means operated by said pattern control for automatically controlling the steam supply to said steam-nozzle and the operation of said air-nozzle.

5 2. In a knitting or similar machine, the combination with the operating tools, a support therefor and a pattern control mechanism, of a steam-nozzle provided in the path of feed of the material produced by the machine extending across the same, an air-nozzle disposed below said steam-nozzle, means operated by said pattern control for automatically controlling the steam supply to said steam-nozzle and the operation of said air-nozzle, an electric circuit, an emergency steam valve and an emergency switch included in said circuit, movable means normally retaining said emergency steam valve and emergency switch in inoperative position, and an electrically operated means in said circuit adapted to be actuated upon the breaking of a thread, or the like, so as to release said retaining means thereby effecting the closing of said valve and the opening of said switch.

3. In a knitting or similar machine, the combination with the operating tools, a support therefor, a pattern control chain and a shaft carrying said control chain, of a steam-nozzle provided in the path of feed of the material produced by the machine, extending across the same, an air-nozzle disposed below said steam-nozzle, a control-chain mounted on the shaft carrying said pattern-control chain and having high and low links, means effecting a stepwise rotation of said shaft, and means operated by said second control-chain for automatically controlling the steam-supply to said steam-nozzle and the operation of said air-nozzle, an electric circuit, an emergency steam-valve and an emergency switch included in said circuit, movable means normally retaining said emergency steam-valve and emergency switch in inoperative position, and an electrically operated means in said circuit adapted to be actuated upon the breaking of a thread, or the like, so as to release said retaining means thereby effecting the closing of said valve and the opening of said switch.

4. The combination as specified in claim 3, including manual means for returning said mov-

able retaining means to their inoperative positions.

5. In a knitting or similar machine, means disposed to direct steam onto an article being produced by the machine, a pattern control mechanism, and means operated by said pattern control mechanism to cut off the supply of steam to said means prior to completion of the article and while the machine continues in operation producing the article.

6. In a knitting or similar machine, means for steaming an article being produced by the machine, means for subsequently drying the article, a pattern control mechanism, and means operated by said pattern control mechanism to stop the operation of said drying means prior to completion of the article and while the machine continues in operation producing the article.

7. In a knitting or similar machine, means for directing steam onto material produced by the machine, and means rendered operable by the breaking of a thread from which the material is being formed to cut off the steam supply.

8. In a knitting or similar machine, means to direct steam onto an article being produced by the machine, means for subsequently drying the article, and means rendered operable by the breaking of a thread from which the article is being formed to cut off the steam supply and to simultaneously render the drying means inoperative.

9. In a knitting or similar machine, a nozzle disposed to direct steam onto an article being produced by the machine, a valve controlling flow of steam to said nozzle, means tending constantly to close said valve, releasable means to hold said valve open, motor operated air suction means for drying the article, and a switch controlling operation of said motor, the machine including a pattern control mechanism, and means operable by said mechanism to release said valve holding means and to simultaneously actuate said switch to stop operation of the motor of said air suction drying means prior to completion of the article and while the machine continues in operation producing the article.

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