June 9, 1931. C. E. BEAN 1,809,398

STOP MECHANISM FOR CLOTH DRYING MACHINES

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Fig. 1.

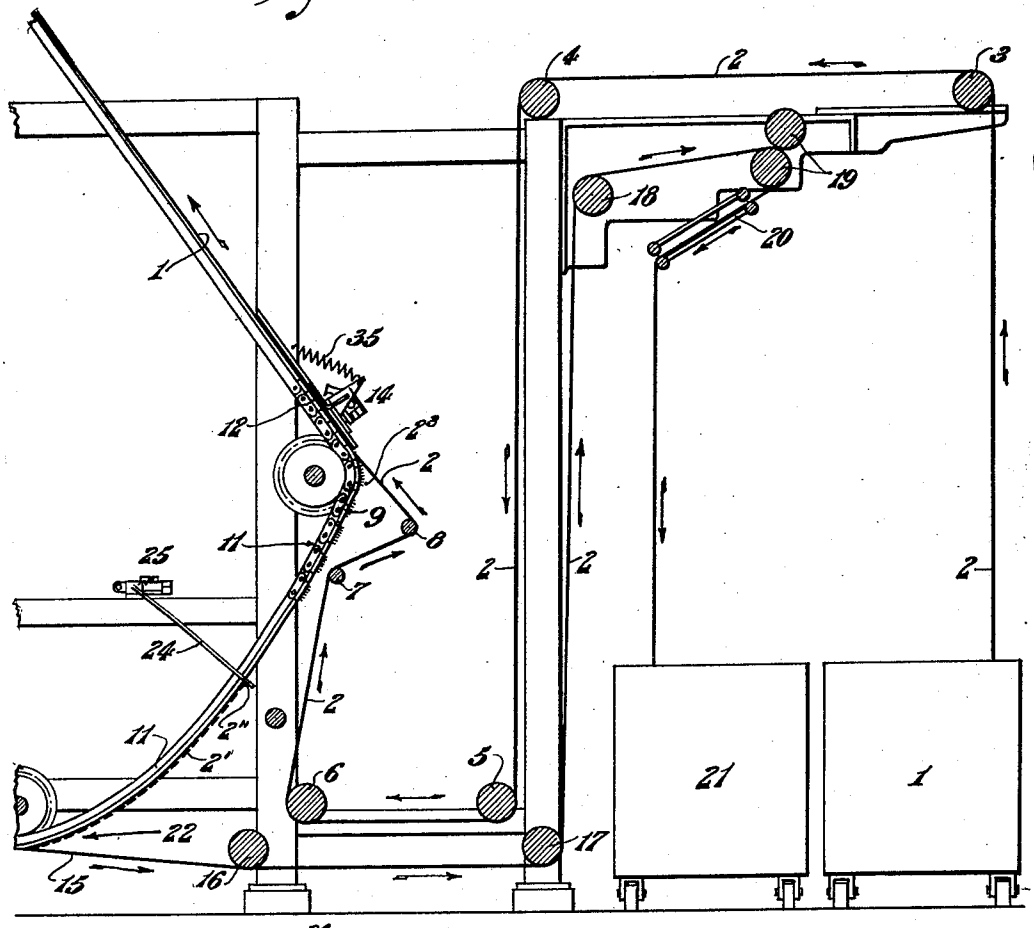
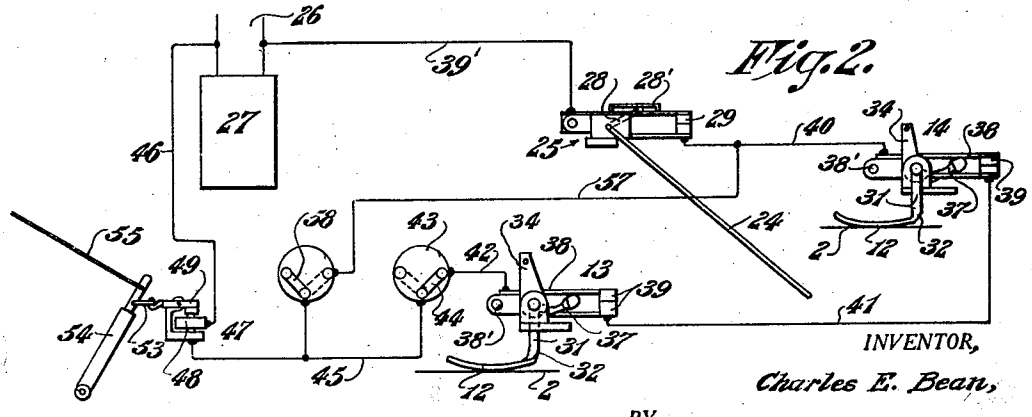


Fig. 2.



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Fig. 3.

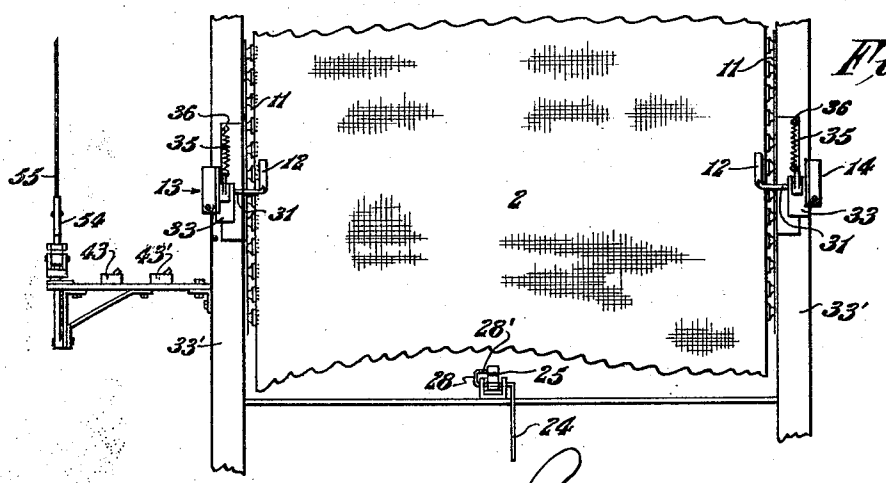


Fig. 4.

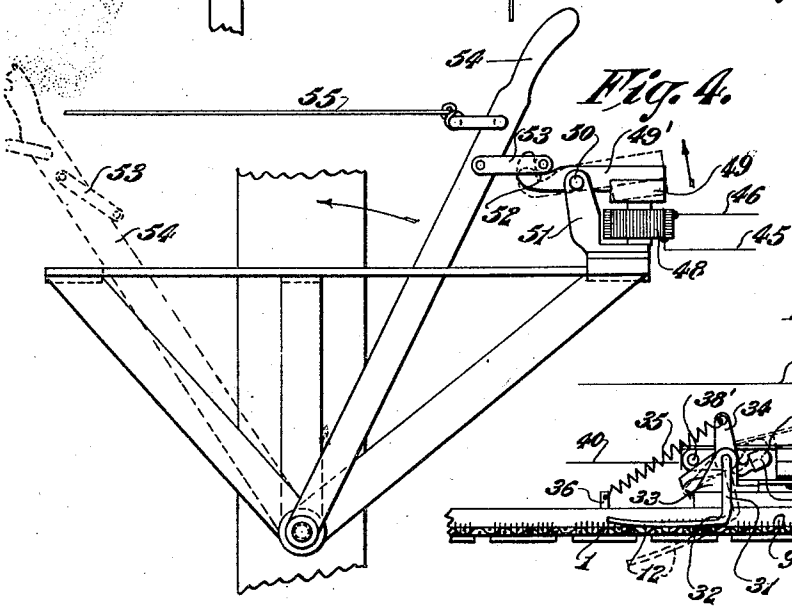
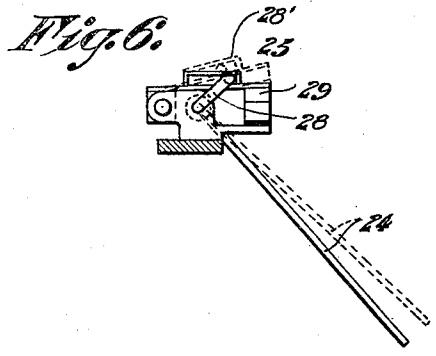


Fig. 5.

Fig. 6.



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UNITED STATES PATENT OFFICE

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STOP MECHANISM FOR CLOTH DRYING MACHINES

Application filed May 18, 1928. Serial No. 278,719.

This invention relates to improvements in cloth drying machines. An object of the invention is to provide means for automatically stopping the machine in the event that the piece of moving cloth becomes detached from the endless carrier chain or the length of the cloth is not long enough to fill the machine.

Referring to the drawings:

Fig. 1 is an end elevational view showing the entrance end of one strand or portion of the cloth and the return end of another strand or portion, also illustrating two of the automatic electric cutout switches.

Fig. 2 is a diagrammatic view of the electric circuits showing the three automatically operated switches; one for stopping the machine when the end of the cloth reaches the end of its travel, also, the two electric switches located at the opposite sides of the machine which may be cut out if the length of cloth is too short yet permits the machine to operate.

Fig. 3 is a plan view of a portion of Fig. 1 illustrating the two switches located at the opposite sides of the machine and the centrally located switch at the end of the travel of the cloth.

Fig. 4 is a view of the electro-magnet for releasing the lever which operates the belt shipper to stop the machine when the circuit is broken.

Fig. 5 is a detailed view of one of the electric switches that is located at the opposite sides of the machine, and

Fig. 6 is a detail view of the switch that is located in the center part of the machine, at the end of the travel of the cloth.

Referring to the drawings in detail:

1 designates a supply box on a truck 1′, in which the cloth to be dried is stored in a moist or damp condition. 2 designates a strand of the damp cloth being withdrawn from the supply box. It passes over the rollers 3, 4, 5 and 6 and rods 7 and 8. From the rod or roller 8 it passes to and is attached to the sharp needle points 9 that are secured to the links 10 of the carrier chain 11. It is then threaded under the pivotal arm 12 of the two side switches 13 and 14 as shown in Fig. 3. From this point the cloth passes upward and through a large drying room in the usual manner, not shown. From this room it returns at the bottom of the machine indicated at the point 15 and passes upward as indicated at 2′, where its end 2″ strikes the arm 24, which operates the electric switch 25 that is included in the main electric circuit from the source of power, indicated at 26, in Fig. 2. 27 designates a switch box or manually operated switch.

When the electric switch 25 opens the main circuit and stops the cloth drying machine by operating the belt shipper the operator now detaches the end 2″ of the cloth from the pins 9 and threads it over the rollers 16, 17, 18 and 19 to the folder 20; from this point it is delivered into the receiving box 21. The switch 25 is important as the operator cannot see the end 2″ of the cloth when the machine is running by reason of the fact that the entrance or strand 2 obstructs his view. If the machine was not stopped the end 2″ would be carried upward and under the strand 2 at 2^3. Obviously, then, the machine must be stopped before this occurs. The switch 25 prevents this occurrence by stopping the machine.

When the arm 24 is operated by the end of the cloth 2″ the switch 25 is opened by means of the arm 28 which is located under the U-shaped piece 28′ that supports the movable contact 29 shown in the dotted line position in Fig. 6. The belt shipper is now operated, as will be described.

The switches 13 and 14 that are located at the opposite side edges of the cloth, shown in Fig. 3, comprises a rigid arm 12 which is connected to the arm 31 at 32. The arm 31 is pivotally mounted in the block 33 which is supported on the side frame pieces 33′ of the main frame. Attached to the arm 31 is an upwardly extending part 34 to one end of which the spring 35 is connected. The other end of this spring is attached to the post 36. This spring operates to move the arm 12 against the moving cloth and for retaining it in contact with the moving cloth as shown in Fig. 5. In the event that the cloth becomes detached from the needle pins 9 the

arm 12 of either the switches 13 and 14 will drop into the dotted line position shown in Fig. 5. The spring 35 will then actuate the arm 37 which is attached to the arm 31. The arm 37 now engages the contact arm 38 and opens the contacts 39 as shown in the dotted line position. This will automatically open the main power circuit as shown by the circuits in Fig. 2 and stop the machine. The arm 38 is pivoted at 38′ to the fixed part.

The electric circuit connections are shown in Fig. 2. Wire 39′ leads from the source of power lines 26 to the switch 25 that is centrally located with relation to the width of cloth, (see Fig. 3). 40 designates a wire extending from the switch 25 to the right hand side switch 14. 41 designates a wire extending from switch 14 to the other or left hand side switch 13. 42 is a wire connecting the switch 43 having the manually operated throwout switch arm 44. 45 is a wire connected to the belt shipper mechanism 47, which when it is operated serves to shift a belt shipper from the fast to the loose pulley which is the usual construction. 48 is an electro-magnet in the circuit wires 45 and 46. 49 is an armature which is normally held down in the full line position shown in Fig. 4 by the current in the electro-magnet. 49′ is a latch pivoted at 50 on the post 51. The arm 49 is formed with a recess 52 to receive the latch 53 on the hand lever 54 to which the cord 55 is connected that extends to the shipper lever that operates to move the belt from the fast to the loose pulley. 55 is a cord connecting the lever 54 with the belt shipper lever.

The operation may be described as follows:

The manually operated switch 58 in wire 57 is opened. Consider the cloth 2 as being located and moving under the two levers 12 of the side switches 13 and 14. If the cloth becomes detached from the needle pins 9 at either side, the lever arm 12 of either switch drops into the dotted line position shown in Fig. 5. Current from the main line is broken, at either switch, as for example, at switch 14, Fig. 2 and the shipper lever 54 is operated, as the arm 49 drops, which unlatches this lever 54 (see Fig. 4.) If the switch 13 should be opened by the arm 12 dropping and opening, the contacts 39, the machine would be stopped by reason of the magnet 48 being demagnetized.

The manually operated contact arm 58 is for the purpose of cutting out the two switches 13 and 14, when it is moved into the dotted line position. Normally, it is placed in the full line position, whereby the switches 12 and 13 are in series, so that should the cloth become detached from the needle points 9 on either side, the machine will, therefore, be stopped. When the manually operated switch arm 43 is placed in the dotted line position, the two switches 13 and 14 are then cut out and inoperative and the centrally located arm 24 alone will operate to break the circuit through the electro-magnet 48 and stop the machine. If the manually operated contact switch lever 44 is moved into the open dotted position, current will flow through the wires 39′, 57, manually operated switch arm 58 if closed, and wires 45 and 46 to the electro-magnet 47. When the manually operated switch lever 44 is open and the manually operated contact arm 58 is closed, the machine can operate, even if there is no cloth under the levers 12 of the switches 13 and 14. The machine will continue to operate until the end 2″ of the cloth engages the lever arm 24, which falls into the dotted line position which then opens the contact 29, thus stopping the machine by demagnetizing the electro-magnet 48, whereby the belt shipper lever is operated through the lever 54, cord 55, as readily understood.

It will therefore be seen that I have provided a safety stopping device for a cloth drying machine that operates to stop the machine either when the cloth becomes detached from the carrier chain, or, when the end of the cloth reaches the end of its travel.

What I claim is:

1. In combination with a cloth drying machine including a carrier chain and driving mechanism including a belt shipper, means for automatically stopping the machine should the cloth become detached from the carrier chain, said means comprising an arm for engaging the moving cloth, a contact operated by the arm, an electric circuit, an electro-magnet in the circuit, an armature for the electro-magnet, means operatively connected to the armature and belt shipper to release the belt shipper when the armature is demagnetized by the opening of the circuit by said arm becoming disengaged from the moving cloth.

2. In combination with a cloth drying machine including a carrier chain and driving mechanism including a belt shipper, means for stopping the movement of the cloth thereon when the front end of the cloth reaches a definite point in its travel which is a point at or near the point where the carrier chain receives the cloth, said means comprising an arm located in the path of the end of the cloth, a switch operated by the end of the moving cloth, an electric circuit in which the switch is included, an electro-magnet in the circuit, and means when the circuit is broken for operating the belt shipper.

3. In a cloth drying machine including a carrier chain and driving mechanism including a belt shipper, in combination, electric switches located adjacent the sides of the moving cloth, an arm normally engaging the cloth for holding the switches closed but operating to open the electric switches when not in contact with the cloth, a second switch

having an arm 24 which is located in the path of the cloth and centrally with relation to its width, a switch operatively connected to the second arm, an electric circuit in which the said switches are located, a cross connection 57 in the circuit, a switch therein, the construction and arrangement being such that when the switch arm is closed only the arm of the second switch will be operated by the moving cloth.

4. In combination with a cloth drying machine including a carrier chain and driving mechanism including a belt shipper lever, switches located at the sides of the moving cloth, each switch having a part that engages the cloth, a second switch having an arm that is located at the end of travel of the cloth for operating the second switch, the said switches being connected in series in an electric circuit, a cross connection in the circuit, a switch therein, a third switch in the series connection, an electro-magnet in the series circuit for controlling the third switch that operates the belt shipper, the construction and connections being such that when the switch in the cross connection is closed and the third switch is open the second switch only is operative to stop the machine by deenergizing the electro-magnet of the belt shipper switch.

5. In combination, a device for automatically stopping a cloth drying machine, having a carrier chain conveying mechanism including a belt shipper which comprises an upwardly movable arm located centrally of the machine and in the path of the return end of the cloth, an electric switch operated by the upwardly movable arm, an electric circuit in which the switch is included, an electro-magnet in the circuit, an armature therefor, and operatively connected to the belt shipper, the construction and arrangement being such that when the electromagnet is deenergized by the opening of the circuit when the arm is lifted directly by the end of the moving cloth the belt shipper will be operated to stop the machine for preventing the return of the cloth from being drawn into the machine by the carrier chain.

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