Dec. 15, 1953 T. A. DOURDEVILLE 2,662,767

MECHANISM FOR MAINTAINING ALIGNMENT OF AN APRON IN A TEXTILE MACHINE

Filed April 4, 1951 2 Sheets-Sheet 1

Fig. 1

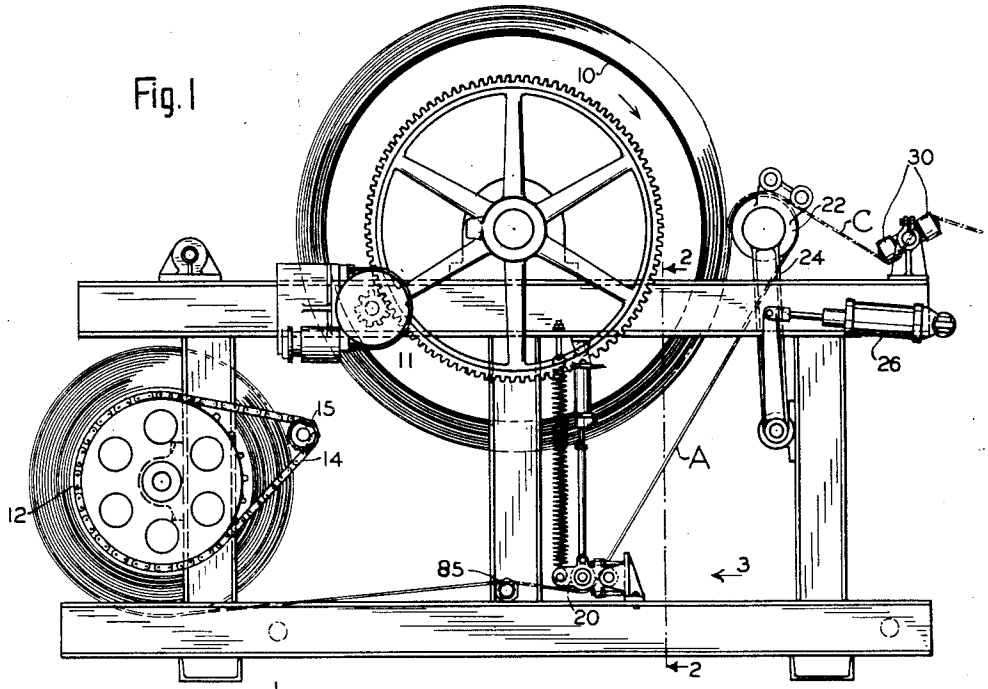




Fig. 3

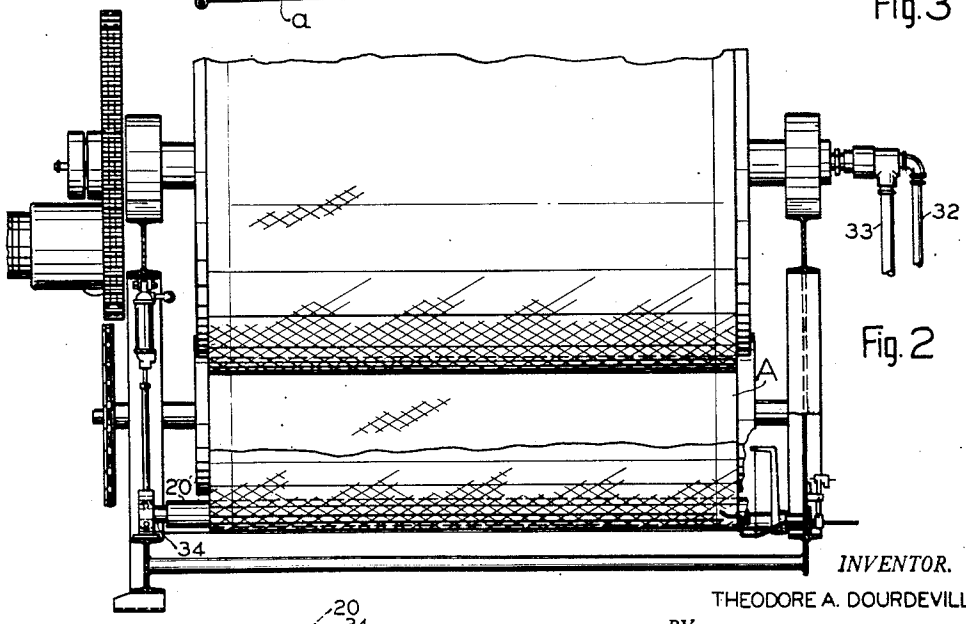


Fig. 2

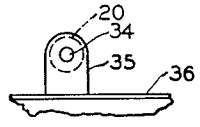


Fig. 3a

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Dec. 15, 1953 T. A. DOURDEVILLE 2,662,767

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Filed April 4, 1951 2 Sheets-Sheet 2

Fig. 5

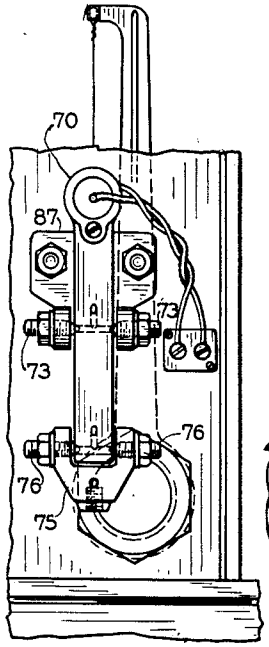


Fig. 4

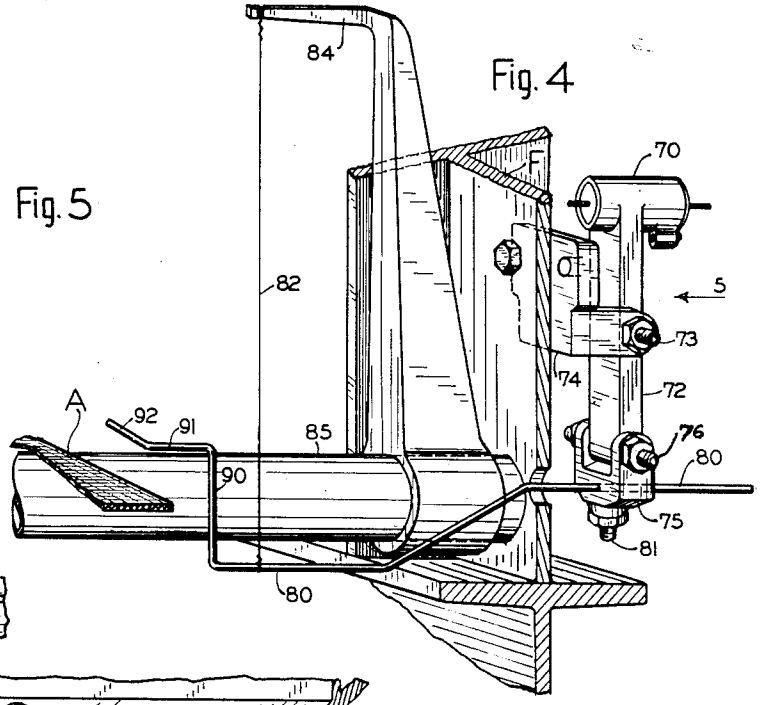


Fig. 6

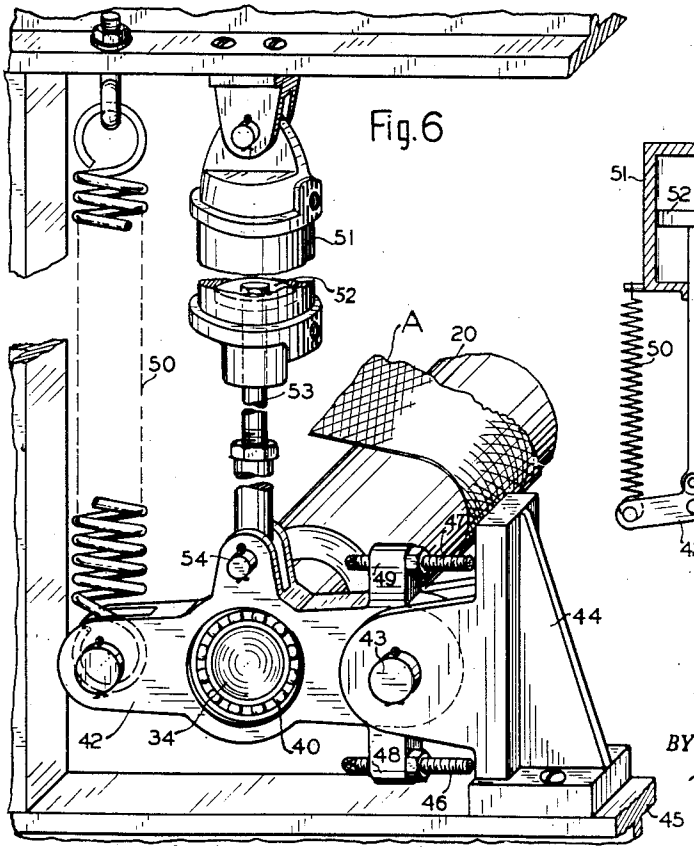
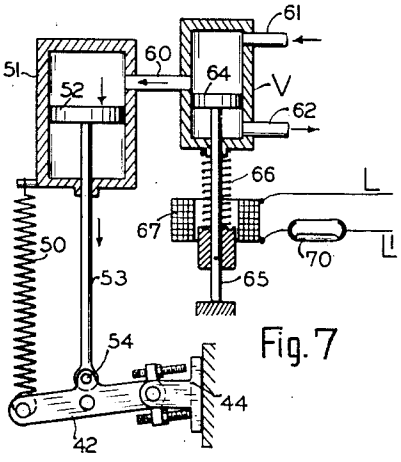


Fig. 7



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MECHANISM FOR MAINTAINING ALIGNMENT OF AN APRON IN A TEXTILE MACHINE

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Application April 4, 1951, Serial No. 219,235

1 Claim. (Cl. 271—2.6)

1

This invention relates to mechanism for maintaining alignment of an apron in a textile machine and more particularly in a cloth finishing machine. In such machines, the cloth to be treated is wound onto a large cylinder or drum, in conjunction with an apron which may be several hundred feet in length.

It has been found difficult to make this apron travel in a straight line, and great care and constant attention are necessary to prevent the apron from shifting its path of travel axially of the drum, and particularly as the diameter of the roll of fabric increases. Frequently, also, the selvage portions of such an apron are purposely woven soft and flexible for better sealing of the cloth during a steaming operation, and these soft and flexible selvages increase the difficulty of accurately guiding the apron.

It is the general object of my invention to provide simplified mechanism for maintaining apron travel in a desired alignment and for preventing substantial axial deviation therefrom.

To the attainment of this general object, I have provided a movably mounted guide-roll, together with an improved feeler device and automatic means to change the angular position of the guide-roll in accordance with any substantial transverse deviation of the apron from the desired path of travel.

My invention further relates to arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claim.

A preferred form of the invention is shown in the drawings, in which

Fig. 1 is a partial side elevation of a cloth finishing machine embodying my invention;

Fig. 2 is a sectional end view, taken along the line 2—2 in Fig. 1;

Fig. 3 is a diagrammatic view illustrating the shifting of the guide-roll axis and as it would appear when looking in the direction of the arrow 3 in Fig. 1;

Fig. 3*a* is a detail view to be described;

Fig. 4 is a perspective view of the feeler device and associated parts;

Fig. 5 is a side elevation thereof, looking substantially in the direction of the arrow 5 in Fig. 4;

Fig. 6 is a perspective view of the supporting bearing for the opposite end of the guide-roll and also showing means for raising and lowering the bearing; and

Fig. 7 is a diagrammatic view of the operating connections between the feeler switch and the hydraulic devices for raising and lowering the roll bearing.

2

Referring to Figs. 1 and 2, I have shown my invention as embodied in a cloth finishing machine having a large perforated cylinder or steam drum 10, a hydraulic motor 11 for rotating the drum, and a storage roll 12 adapted to be rotated by a chain 14 and sprocket 15 from any usual source of power.

An apron A is drawn from this storage roll 12 and is wound on the drum 10 after passing over a guide-bar 65, approaching a guide-roll 20 substantially horizontally, passing under said guide-roll 20 (Fig. 1) and around a pressure roll 22 which is mounted in the upper ends of swinging arms 24 and which may be pressed against the apron and fabric as it is wound on the drum, such pressure being applied by a hydraulic cylinder and piston indicated generally at 26.

The cloth C is guided to the drum 10 around tension bars 30 and over the roll 22, so that the cloth and apron are wound simultaneously on the drum 10 and in superposed layers. The angular disposition of the bars 30 may be shifted to vary the cloth tension.

Steam supply and drainage connections 32 and 33 (Fig. 2) provide for preheating the cylinder or drum 10 and removing condensation therefrom.

My present invention relates particularly to the means provided for supporting the guide-roll 20 and for vertically shifting the angular position of the axis of the roll in accordance with apron deviation.

At its right-hand end, as viewed in Fig. 2, the shaft 34 of the roll 20 is loosely mounted in a fixed bearing 35 (Fig. 3*a*) on a bottom frame member 36 of the machine. The roll shaft 34 has a slightly loose fit in the bearing 35, so that the opposite end of the roll and shaft can be slightly raised or lowered without causing the shaft 34 to bind in its bearing 35.

At the opposite or left-hand end of the roll 20 as viewed in Fig. 2, the roll shaft 34 (Fig. 6) is supported in a bearing 40 mounted in an arm 42 pivoted on a stud 43 fixed in a bracket 44 mounted on a bottom frame member 45. The bearing 40 is preferably of an antifriction type which will permit raising and lowering of the arm 42 without binding the roll shaft 34.

Stop screws 46 and 47 are threaded in lugs 48 and 49 on the arm 42 and may be adjusted to limit the upward or downward swinging movement of the arm 42, check nuts being provided to maintain the adjustment.

A heavy coil spring 50 tends to swing the arm 42 upward and to raise the adjacent end of the roll 20, while a single-acting hydraulic cylinder

51 and piston 52 act through a piston rod 53 and cross pin 54 to push the arm 42 downward.

The operating connections for the cylinder 51 are shown in Fig. 7 and comprise a pipe 60 connected to a three-way valve V which has a supply pipe 61 for liquid under pressure and an exhaust pipe 62. A piston 64 in the valve V is mounted on a piston rod 65 which is normally pushed downward by a spring 66 but which may be drawn upward by a solenoid 67 when a circuit therethrough is completed at a switch 70. The switch 70 (Figs. 4 and 5) is preferably of the mercury type and is fixed at the upper end of a lever 72 mounted on pivot studs 73 in a bracket 74 bolted to a fixed upright frame member F of the finishing machine.

A block 75 is connected to the lower end of the arm or lever 72 by pivot studs 76, and a feeler rod 80 is adjustably secured in the block 75 by a binding screw 81. The left-hand end of the feeler rod 80, as viewed in Fig. 4, is held in a desired vertical position by a light flexible cord 82, the upper end of which is connected to an arm or bracket 84 which is clamped on an adjacent fixed cross rod 85.

At its free end, the feeler rod 80 is bent upward as indicated at 90 and then laterally at 91, and is inclined upwardly at 92. The upright portion 90 is positioned for engagement with the adjacent selvage edge of the apron A, and the disposition of the parts is as shown in Fig. 4, when the apron is travelling slightly to the left of mid-position.

If the apron A deviates to the right in Fig. 4, the arm 72 will be turned anti-clockwise, thus closing a circuit from the line wire L (Fig. 7) through the solenoid 67 and switch 70 to the line wire L'. The solenoid 67 then draws the piston rod 65 and piston 64 upward to close off the supply pipe 61 and to connect the upper end of the cylinder 51 to the exhaust pipe 62. This allows the spring 50 to swing the arm 42 and the adjacent end of the cylinder 20 upward.

As the apron A always tends to travel to the higher end of the guide-roll 20, the apron will now travel to the left in Fig. 4 until the feeler rod 80 has returned to the position shown in Fig. 4, thereby breaking the circuit through the switch 70.

The spring 66 will then depress the piston 64 and connect the cylinder 51 to the supply pipe 61. The piston 52 will then act to swing the arm 42 and the adjacent end of the roll 20 downward and the apron will start a return travel to the right.

In the ordinary operation of the machine, the roll 20 is shifted downward or upward, within relatively close limits but does not at any time operate in exactly horizontal position.

The successive operative positions of the axis of the roll 20 are as indicated in Fig. 3, in which the full line *a* indicates the position of the guide-roll axis with the parts as shown in Fig. 7, and the dotted line *b* indicates the position of the guide-roll axis when the circuit has been completed through the switch 70 and the cylinder 51 is open to exhaust.

Obviously the successive shifting of the roll 20 above or below horizontal position may produce a slight "hunting" action of the apron but this is too small to be objectionable, and this construction is much simpler than would be required to bring the apron back to exact mid-position after each transverse deviation.

This mechanism has been thoroughly tested commercially and has been found to be extremely satisfactory and reliable when in operation under the rather difficult conditions herein set forth.

Having thus described my invention and the advantages thereof, I do not wish to be limited to the details herein disclosed, otherwise than as set forth in the claim, but what I claim is:

In a mechanism for winding a strip of material, feeler apparatus comprising a pivotally mounted arm, circuit-closing means controlled by said arm, a block swiveled to one end of said arm, a rod mounted in an opening in said block and extending horizontally a substantial distance therefrom, means to secure said rod in adjusted axial position in said block, said rod having an offset end portion positioned to be engaged by an adjacent edge of said strip of material, a fixed support, and flexible means depending from said support and sustaining the outer end of said rod for free swinging and substantially horizontal movement toward and away from the path of travel of the edge of said strip of material.

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