June 26, 1945. C. D. BROWN 2,378,895

LOOM STOPPING MEANS

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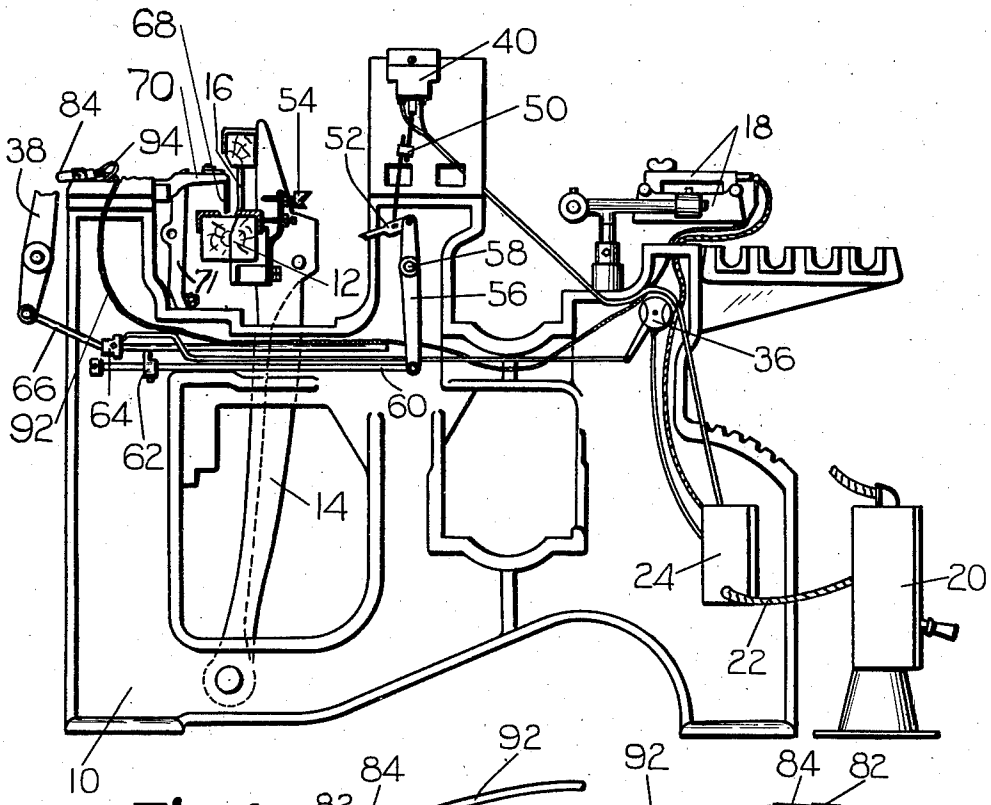


Fig. 1.

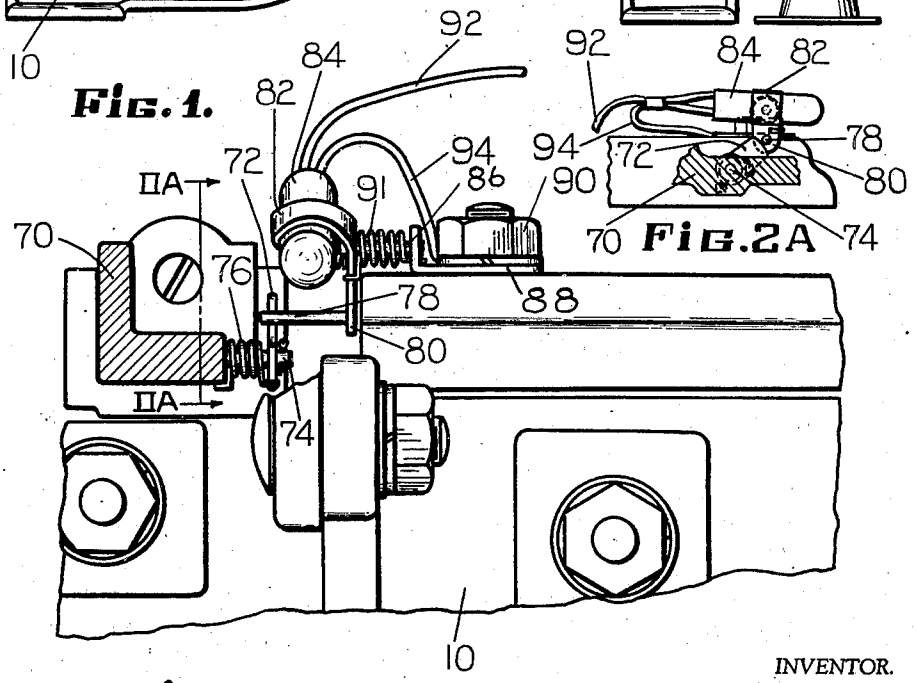


Fig. 2.

Fig. 2A

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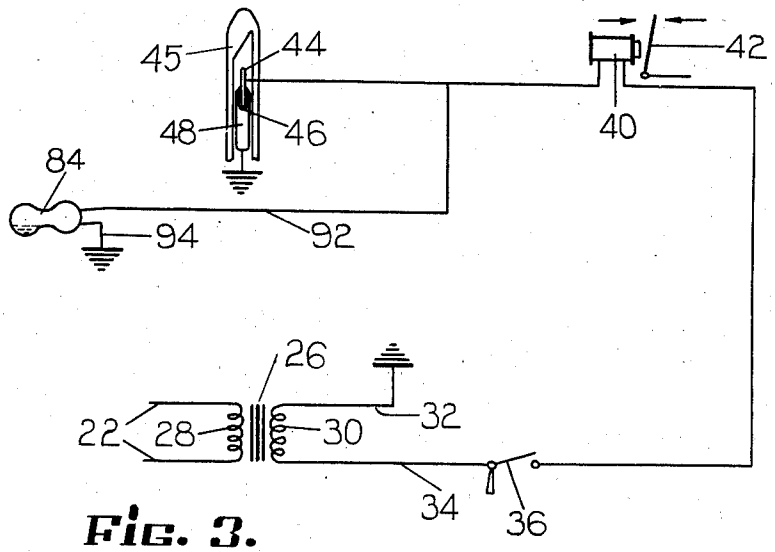


Fig. 3.

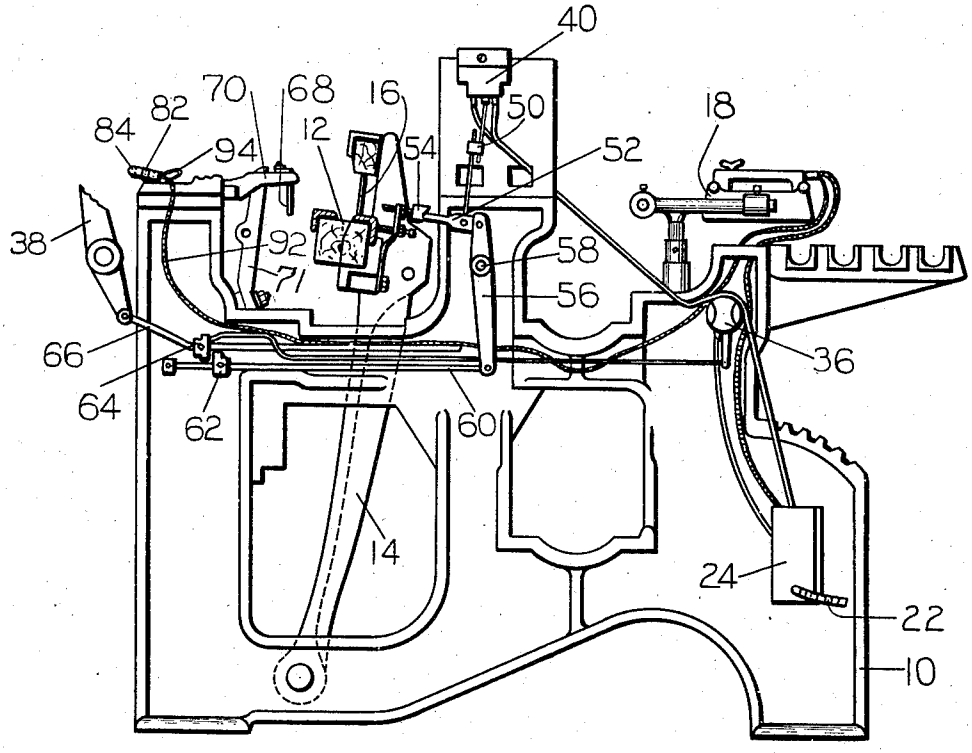


Fig. 4.

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Patented June 26, 1945 2,378,895

UNITED STATES PATENT OFFICE

2,378,895

LOOM STOPPING MEANS

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Application June 2, 1944, Serial No. 538,477

4 Claims. (Cl. 139—377)

The present invention relates generally to looms and, as illustrated herein, relates more particularly to means for stopping the loom upon the occurrence of a filling failure.

It is common practice to provide means for stopping the loom when there is a filling failure due, for example, to fillling breakage. Detection of such failure takes place in many cases at the filling replenishing side of the loom and stopping of the loom is accomplished through a filling fork feeler mechanism which operates through connections to the other side of the loom to move the shipper handle out of holding position and into stopping position to throw power from the loom. Such connections, however, sometimes fail to effect stopping of the loom because of excessive lost motion between the parts.

One object of the present invention is to provide a stopping means for a loom which will avoid the use of a great number of mechanical connections. To this end and in accordance with one feature of the invention, the filling fork feeler mechanism is provided with means for closing an electrical circuit and thus energizing a solenoid which forms a part of an electrical warp stop motion used in automatic looms. As illustrated, a circuit closing switch is provided which is arranged to be closed by forward movement of the filling fork slide thus closing the solenoid circuit and raising the knock-off into position to be engaged by a bunter fixed to the lay and thus stop the loom.

With the above and other objects and features in view, the invention will now be described with particular reference to the accompanying drawings which illustrates a preferred embodiment of the invention and in which:

Fig. 1 is a view in side elevation of the right hand side frame of the loom with the filling replenishing mechanism removed:

Fig. 2 is a view in front elevation, on a somewhat enlarged scale, of the circuit closing mechanism;

Fig. 2A is a view partly in section, taken along line IIA—IIA of Fig. 2;

Fig. 3 is a circuit diagram; and

Fig. 4 is a view similar to Fig. 1 but illustrating the position of the parts just before the loom is stopped.

The loom shown in the drawings is of usual construction and includes a loom frame **10**, having a reciprocating lay **12**. The lay is mounted on swords **14** and carries a usual reed **16**. The loom is also provided with a usual electric warp stop motion which comprises end supports **18** carrying electrodes (not shown) through which the circuit is completed by usual drop wires which normally are held out of contact with said electrodes by the warp threads.

The electrical system can best be described by reference to Fig. 3 which shows a diagram of the circuit. The loom is usually provided with a switch box **20** (Fig. 1) having a conduit **22** leading to a transformer box **24**. The box **24** contains a transformer **26** having a primary winding **28** and a secondary winding **30**. The transformer transforms from 110 volts to twelve volts. One of the leads **32** from the secondary is grounded on the machine frame **10**. The other lead **34** is connected to one pole of a switch **36** which is opened and closed upon manipulation of the shipper **38** to stop and start the loom. The other pole of the switch **36** is connected to one terminal of a solenoid **40** having an armature **42** associated therewith. The other terminal of the solenoid is connected by a lead to an electrode **44** which is insulated from the machine frame by insulation **46**. The electrode **48** is grounded on the machine frame. The circuit so far described is old and well known in the art.

When a drop wire **45** engages both electrodes **44** and **48**, the circuit is closed and the armature **42** is actuated and through connections **50** lifts a knock-off finger **52** into the path of movement of a bunter **54** fixed to the rear face of the lay **12**. The finger **52** is pivotally secured to the upper end portion of a knock-off lever **56** pivoted at **58** to the loomside **10**. A rod **60** is pivoted to the lower end of the lever **56** and carries a block **62** arranged to engage a block **64** on a rod **66** pivotally secured to the lower end of the shipper **38** to move the shipper to off position and through suitable connections disengages the clutch and applies the brake to stop the loom. When the shipper is moved from the "on" position shown in Fig. 4 to the "off" position shown in Fig. 1, the switch **36** is also opened so that no current flows through the circuit when the loom is stopped, thus avoiding the possibility of shock to the operator while working on the loom to repair damage which caused stoppage of the loom.

The parts so far described are old and well known in the art and need not be described in further detail herein.

The above mechanism is effective to stop the loom only in the event of warp breakage but the present invention contemplates the use of this mechanism to stop the loom in the event of filling failure thus avoiding the use of the many me-

chanical connections necessary between the means for detecting filling failure and the clutch of the loom. To this end, the loom is provided with a usual filling fork detecting mechanism including a filling fork 68, a filling fork slide 70, and the usual mechanism for reciprocating the slide. When the lay moves forwardly the filling fork 68 is engaged by the filling and is tilted to prevent operative connection between the slide 70 and the operating lever 71 therefor. If no filling is present, the fork 68 will not be tilted and the lide 70 will be moved by lever 71. The fork 68, slide 70 and lever 71 differ from corresponding parts of substantially all domestic single shuttle looms only in the addition of parts hereinafter described.

As shown best in Figs. 2 and 2A, the slide 70 is provided with an upstanding latch 72 mounted on a pin 74 and held in position by a spiral spring 76. The latch 72 is arranged, upon movement of the slide 70, to engage a pin 78 extending laterally from a depending arm 80 formed as a part of a support 82. The support 82 is formed of sheet metal and is formed into a cylindrical shape to receive and hold a mercury switch 84 of usual construction. The support 82 is pivotally mounted on a pin 86 fixed in a holder 88 secured to the loom frame 10 by a nut 90. The mercury switch 84 is normally maintained in the tilted position shown in Fig. 2 by a spiral spring 91 but is arranged to be tilted in the opposite direction by engagement with the latch 72 when the slide 70 is moved forwardly upon the occurrence of a filling failure. The mercury contained in the switch 84 will then flow and close the circuit across the electrodes (not shown) which are connected to flexible leads 92, 94. The closing of the circuit is only momentary since the latch 72 will pass from under the pin 78 and the spring 91 will return the switch 84 to its normal position. On return movement of the slide 70, the latch 72 will yield when it engages the pin 78.

The lead 92 is connected into the solenoid circuit between the solenoid 40 and the electrode 44. The lead 94 is grounded on the loom frame. Thus, when the switch 84 is tilted, the circuit is closed and the solenoid energized to attract the armature 42 thus raising the knock-off finger 52 and stopping the loom when it approaches back center.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a loom, electric stop mechanism for stopping the loom upon warp failure, a filling feeling fork, a slide on which said fork is pivoted, means for operating said slide upon filling failure, a trip member on said slide, and circuit closing means tripped by said trip member upon movement of said slide to close the electric circuit controlling said stop mechanism to stop the loom.

2. In a loom, warp stop mechanism for stopping the loom, electrically operated means for controlling the operation of said warp stop mechanism upon warp failure, a filling fork for detecting filling failure, a slide on which said fork is pivoted and which is arranged for movement upon detection of filling failure by said fork, and an electric switch member arranged to be tripped to close the electric circuit of said electrically controlled means upon movement of said slide.

3. In a loom, warp stop mechanism for stopping the loom, electrical means for controlling the operation of said stop mechanism, an electric circuit for energizing said electrical means, means for closing said circuit upon the occurrence of warp failure, a filling feeling fork, a slide on which said fork is pivotally mounted, means for moving said slide upon detection of filling failure by said fork, trip means on said slide, and a mercury switch in said circuit arranged to be engaged by said trip means and moved into circuit closed position upon movement of said slide.

4. In a loom, warp stop mechanism for stopping the loom, electrical means for controlling the operation of said stop mechanism, an electric circuit for energizing said electrical means, means for closing said circuit upon the occurrence of warp failure, a filling feeling fork, a slide on which said fork is pivotally mounted, means for moving said slide upon detection of filling failure by said fork, trip means on said slide, a mercury switch, and a pivotally mounted bracket supporting said switch and having a depending arm arranged to be engaged by said trip means and moving said switch into circuit closed position upon movement of said slide.

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