

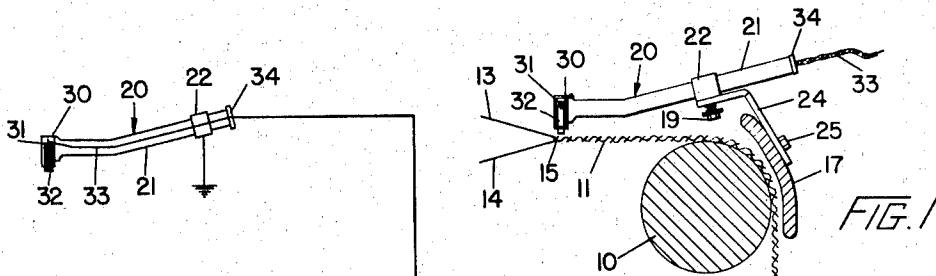
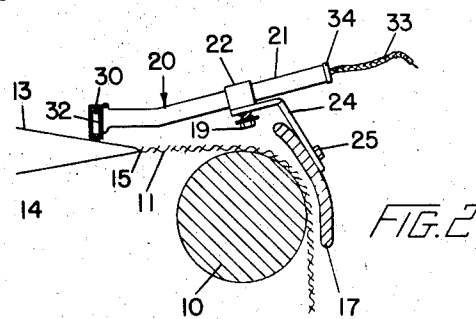
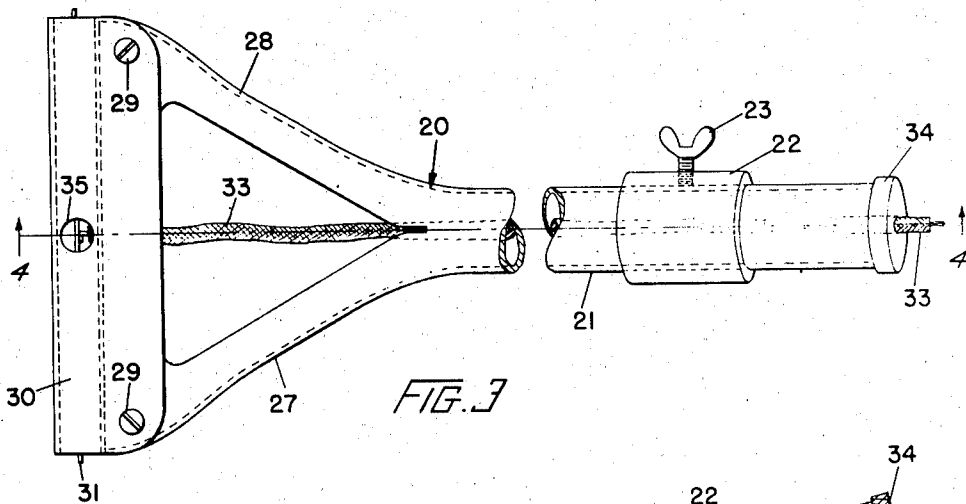
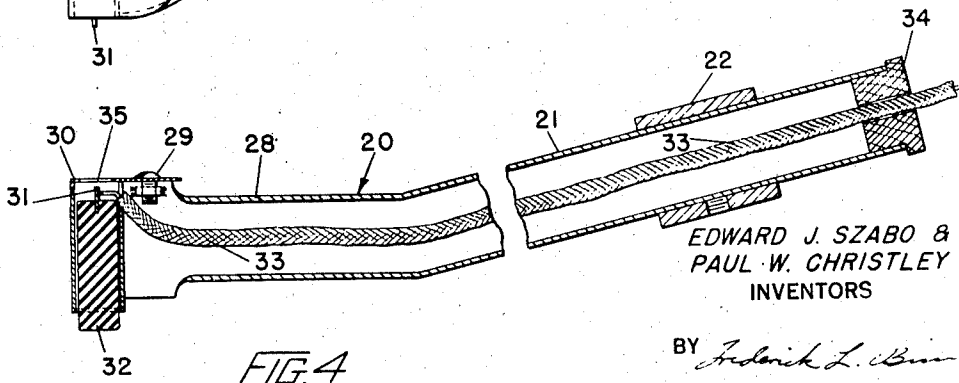
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LOOM STOPPING MEANS

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## LOOM STOPPING MEANS

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This invention relates to looms and, more particularly, to means for stopping a loom upon the occurrence of a filling failure.

Looms are generally provided with a mechanical stopping means in the event of a filling failure, and an electric stop motion in the event of a warp end failure. The mechanical filling failure detecting and loom stopping means comprises a filling fork feeler device and an associated mechanism which cooperate to displace the loom shipper handle out of its operating position into a loom stopping position. Due, however, to the vibration of the loom, and the wear of the feeler device and associated parts, the mechanical stop motion occasionally fails to operate to stop the loom, which will continue to function until it is manually stopped by an operator. It is, of course, desirable to prevent such a condition from happening.

This invention advantageously provides a supplementary filling failure loom stopping means. It is an electrically operated loom stopping means which is actuated by separated warps whose separated condition is due to the lack of a filling or because of the failure of the filling. This additional stop motion insures the stoppage of a loom in the event of a filling failure irrespective of the operating condition of the mechanical stop motion.

Generally, the electrical filling stop motion of this invention comprises a single lead low voltage circuit that is grounded to the loom frame in which a filling detector is positioned. The detector is adapted to close the electrical circuit when a filling failure occurs, energizing a solenoid whose armature actuates an associated mechanism which is adapted to stop the loom by dislodging the shipper handle from its operating position. The shipper handle, when dislodged, also is adapted to throw open a switch in the circuit as a precautionary measure. The loom stopping, filling detector is advantageously made responsive to warps that are separated because of the lack of a filling.

The loom harness, in the normal course of operation of the loom, is adapted to spread the warps to permit a shuttle carrying a filling material to traverse the loom. The normal length of the spread is, of course, equal to the distance between the harness and the position of the last filling. This distance will become longer should there be no filling material at the usual position. Then, as the spread warps move in the loom this spread condition will substantially immediately close the detector of the loom stop motion which is advantageously positioned just above the moving

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material at about the point of the last filling. The detector is advantageously positioned at about the end of the forward stroke of the lay, or, under normal conditions, at about the last filling position.

The filling failure stop motion will be described in greater detail in the following specification taken in connection with the accompanying drawing where:

Figure 1 represents a filling detector in a normal inoperative position;

Figure 2 represents the filling detector in a circuit closing position;

Figures 3 and 4 show the detecting device in greater detail, in plan and sectional elevation, respectively; and

Figure 5 represents an electric stop motion circuit in which the detector is positioned.

In the drawing there are shown only such parts of the loom as are necessary for a complete understanding of the invention. Referring to Figure 1 of the drawing, there is shown in section a breast roll 10, over which a woven material 11, composed of at least two warps 13 and 14, and a filling 15, is adapted to pass. On a breast beam 17 and extending inwardly of the loom there is a loom stopping, filling detecting device 20 which is responsive to any lack of filling between the warps.

The loom stopping, filling detector 20 comprises a suitably curved current conducting tubular arm 21 which is supported in a clamping arrangement mounted on the breast beam 17. The tubular arm may suitably be made of ordinary iron tubing or of any other current conducting material. The means for holding the arm 21 may suitably consist of a tubular clamping section 22 having a wing stud 23 in its side adapted to bear against the tubular arm 21. The tubular clamping section 22 is, further, attached by means of another stud 19 to an angular, current conducting supporting member 24 which is bolted or otherwise secured to the breast beam 17, such as by means of a bolt 25. The angular, supporting member 24 may be desirably slotted to permit the adjustment of the arm 21, relative to the passing woven material 11.

The tubular arm 21, as shown in Figure 3, is advantageously bifurcated at one end. The diverging sections 27, 28, forming the bifurcation, have attached to them by means of studs 29 a substantially rectangular, bottom opening, current conducting, cross-head 30. Further, as shown in Figure 4, the head 30 encloses a contact strip 31 which is embedded in the top of an

insulating bar 32 which is positioned adjacent the moving material 11. Further, the insulating bar 32 is positioned in the cross-head 30 in such a manner as to be freely movable between its rest position and the upper part of the head 30.

To the contact strip 31 there is attached a lead wire 33. The lead wire 33 desirably extends into and through tubular arm 21 and through an insulating end plug 34 to join, as diagrammatically shown in Figure 5, the loom stopping circuit. To permit the inspection of the point of attachment of the lead wire 33 to the contact strip 31 there is provided an opening 35 in the top of the cross-head 30.

Because of the adjacent position of the bar 32 to the woven material, the bar 32 is adapted to be raised by warp that has become separated because of the lack of filling. Upon being lifted by the separated warp the bar 32 effects contact of the head 30 with the contact strip 31, to energize the loom stopping circuit in a manner to be hereinafter described.

The circuit of Figure 5 of which the detector of this invention is a part is a low voltage circuit, e. g. about 12 to 14 volts, which is grounded to the loom. The circuit includes, in addition to the detector herein described, a switch 39 which is operable by the loom shipper handle and a solenoid 36 whose energized armature 37 is adapted to actuate a member 38 which with other associated mechanism (not shown) is adapted to dislodge the loom shipper handle. The circuit becomes energized when the open warp raises the contact strip 31 into contact with the cross-head 30. The solenoid armature 37 is adapted to actuate the member 38 which in turn actuates an additional suitable associated mechanism to dislodge the loom shipper handle to stop the loom, and to open the circuit switch 39. Power for energizing the circuit is derived from a transformer 40 which transforms the shop circuit to one of about 12 volts.

Further, the non-conducting bar 32 of the detector is advantageously made of such a width so as to contact a plurality of warp ends. By being responsive to a plurality of raised warp ends assurance of a positive contact between the head 30 and contact strip 31 is had. Also, by being positioned substantially at the point of the final position of a filling as determined by the forward stroke of the loom lay, the device 20 is substantially immediately responsive to a filling failure inasmuch as the open or divergent warps at once raise the bar 32 which lifts strip 31 into a contact with the head 30 to close the circuit. There is thus provided by this invention a positive acting and sensitive contact device which is advantageously adaptable to looms for effecting their stoppage in the event of a filling failure.

We claim:

1. The combination of a loom, an electric stop motion circuit in said loom, a detector in said electric stop motion circuit positioned transversely to the warp of said loom and substantially at the fell, said detector energizing the electric stop motion circuit when actuated by a separated warp continuing beyond the position of the detector.

2. In an electric loom stop motion circuit a fill-

ing detector comprising, means sensitive to the continuing separation of warp due to lack of filling, said means being positioned adjacent to the warp and substantially at the fell, a circuit closing device, said means being adapted when raised by the separated warp beyond the position of the detector to close said circuit closing device.

3. In combination, a loom, an electric stop motion in said loom, a filling detector in the circuit of said electric stop motion positioned transversely of the warp of the loom being responsive to the separation of warp due to the lack of filling, said detector comprising, a head composed of current conducting material, a contact element in said head, a non-conducting member in said head supporting said contact element, said non-conducting member extending outwardly of said head to adjacent the warp so as to be actuated by the separated warp to thereby raise the contact element into contact with the detector head to close the circuit of said loom stop motion.

4. In combination, a loom, an electric stop motion circuit in said loom, a device adapted to close the electric circuit of said electric stop motion comprising, an adjustably positioned metallic member positioned on and grounded to said loom, a metallic head on one end of said member being positioned transversely to the direction of warp passing in said loom, a bar of non-conducting material in said metallic head positioned adjacent to and above the warp, a metallic contacting strip on said non-conducting bar, a current conducting lead joining said contact strip to said electric loom stop motion circuit, said non-conducting bar being adapted to be raised by the separation of warp due to the lack of filling to thereby effect contact between said contacting strip and said metallic head to energize the loom stop motion circuit to stop the loom.

5. In a loom stop motion circuit, a filling detector positioned transversely to the direction of warp moving through the loom comprising, an arm of current conducting material having a bifurcated end, means of current conducting material for adjustably supporting said arm, said supporting means being positioned on the loom frame, a cross-head of current conducting material attached to the bifurcated ends of said arm, a non-conducting vertically movable bar in said cross-head being adapted to be positioned above the moving warp, a contact strip in the top of said non-conducting bar, said contact strip being adapted to contact said cross-head when said non-conducting bar is raised by warp lacking a filling, and a conductor joining said contact strip to said loom stop motion circuit.

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