Oct. 26, 1948. G. H. CADY ET AL 2,452,223

STOPPING MECHANISM FOR TEXTILE APPARATUS

Filed Aug. 22, 1945 3 Sheets-Sheet 1

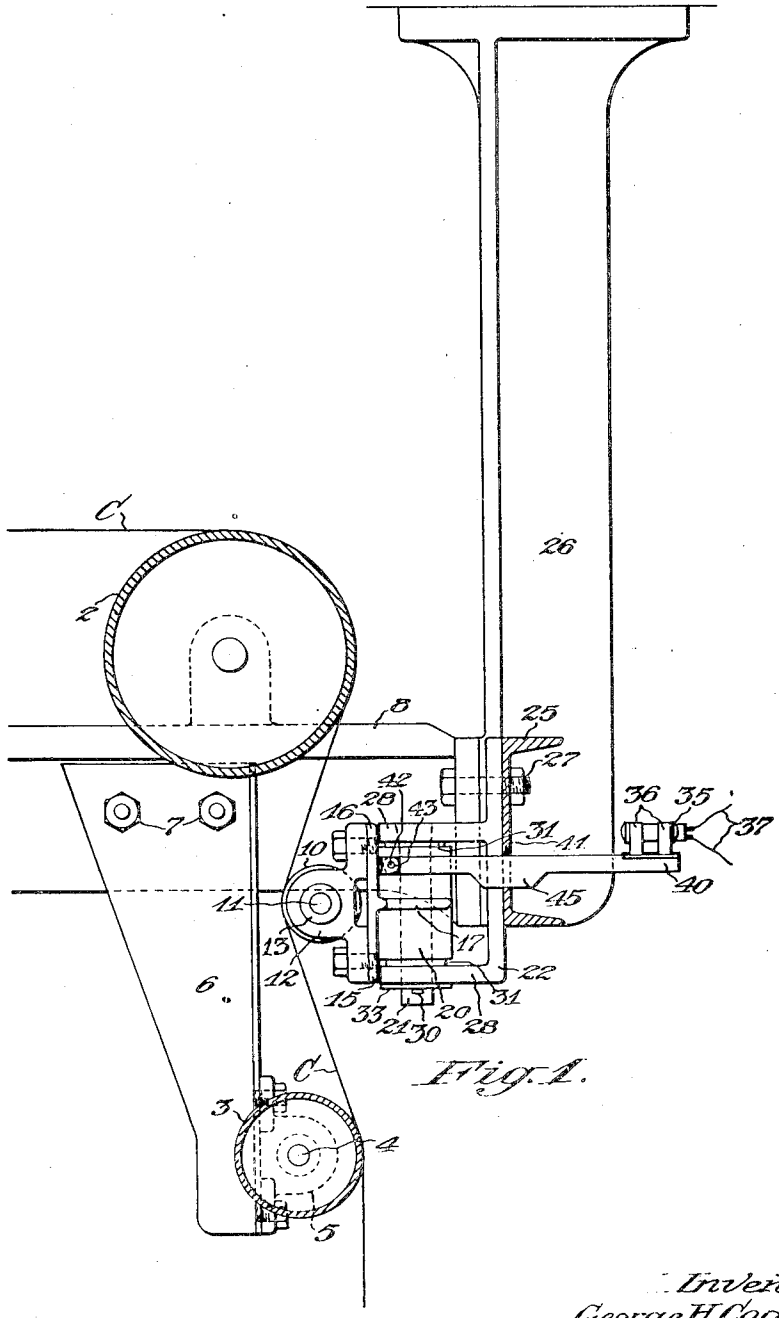


Fig. 1.

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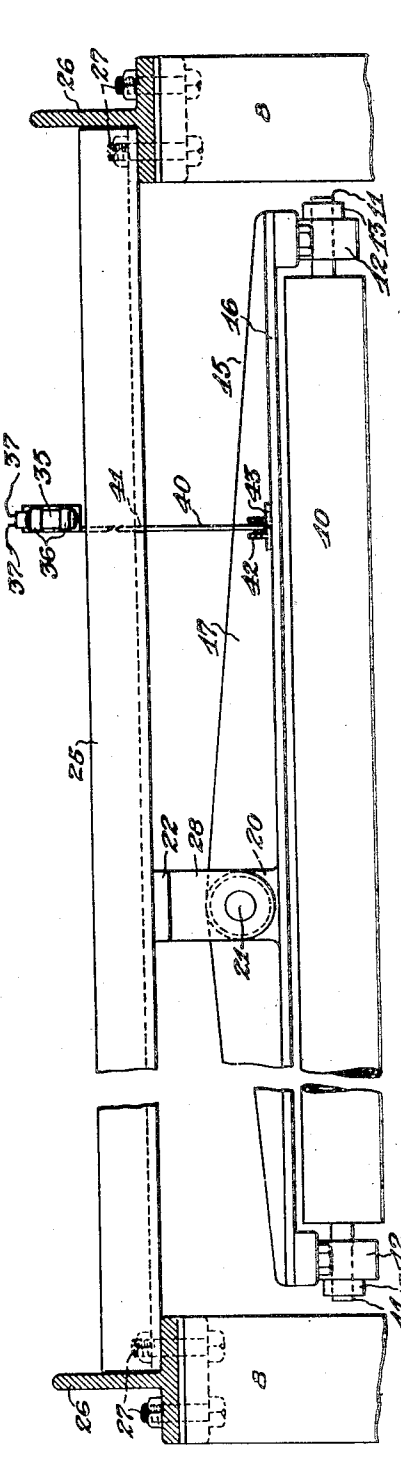


Fig. 2.

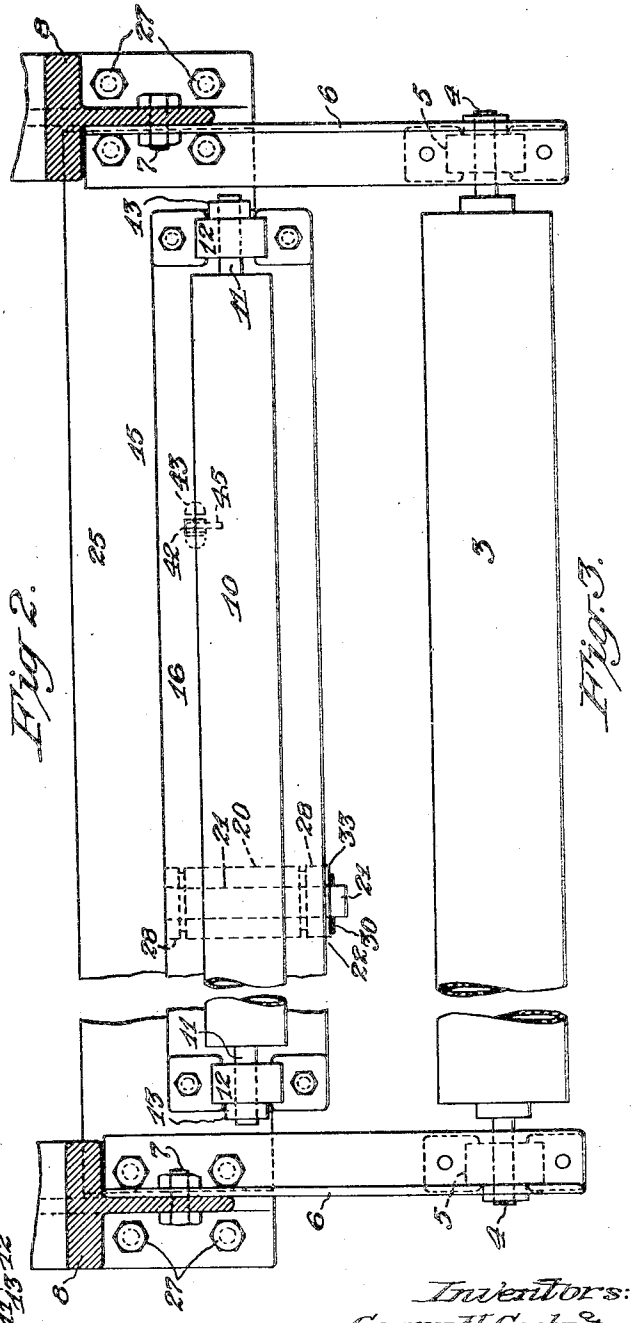


Fig. 3.

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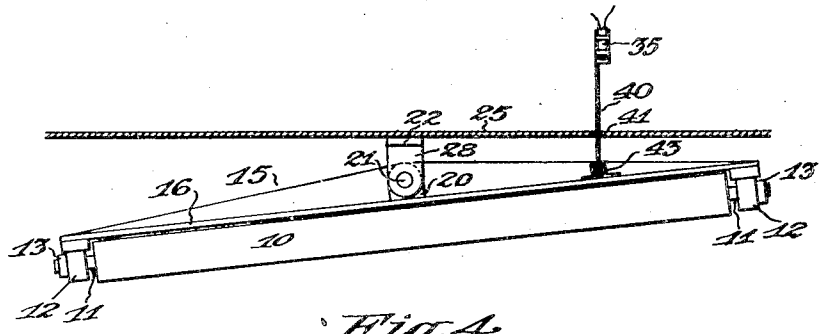


Fig. 4.

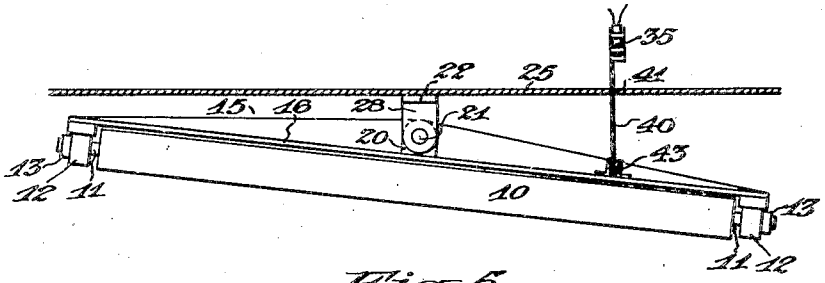


Fig. 5.

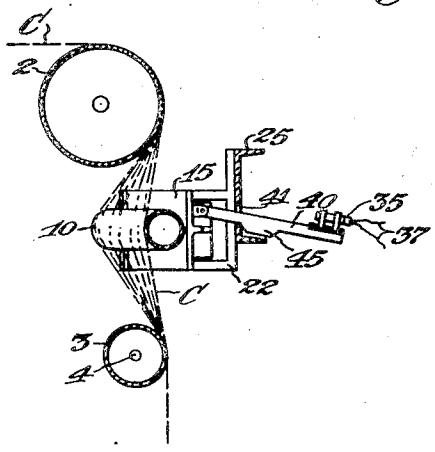


Fig. 6.

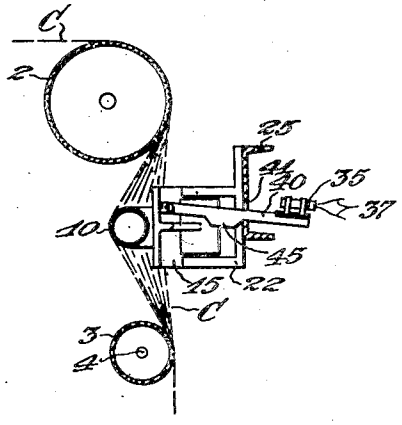


Fig. 7.

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UNITED STATES PATENT OFFICE

2,452,223

STOPPING MECHANISM FOR TEXTILE APPARATUS

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Application August 22, 1945, Serial No. 611,966

4 Claims. (Cl. 192—127)

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This invention relates to an improved stopping mechanism for use in the continuous feeding and finishing of fabrics, more particularly in cooperation with the scutcher rolls which take the fabric in a more or less rolled, folded and twisted condition and open out the folds and twists to deliver it in smooth condition to various processing apparatus.

One object of the invention is to provide an improved stopping mechanism for arresting the feed of the fabric to the processing apparatus to prevent it from delivering thereto in folded or twisted condition.

Another object is to provide a stopping mechanism which is adapted to control the operation of one or a series of processing machines or apparatus to arrest the operation thereof when the delivery of the fabric thereto is halted.

Another object is to provide a stopping mechanism having means for detecting any abnormal thickness in the fabric due to twist or folds therein or caused by the feeding therewith of extraneous pieces of the material or other matter foreign thereto and to act promptly thereupon to arrest the feed and also the operation of the finishing machines or apparatus.

Another object is to provide a stopping mechanism including an electric switch actuated by a feeler or detecting means to interrupt the current to a motor or motors for operating the feeding means and driving the finishing machines or apparatus.

Another object is to provide an extremely sensitive feeler or detecting device which is prompt in action and efficient in operation for the purposes specified.

Further objects of the invention are set forth in the following specification which describes a preferred form of construction of the stopping mechanism, by way of example, as illustrated by the accompanying drawings.

In the drawings:

Fig. 1 is an end elevational view of the device showing guide rolls for the fabric and the feeler or detector roll which cooperates therewith to actuate the electrical switch to break the circuit to the driving means.

Fig. 2 is a top plan view of the detector roll showing its connection to the electrical switch;

Fig. 3 is a side elevational view showing the detector roll and one of the guide rolls for the fabric;

Fig. 4 is a schematic view showing the detector roll as rocked or swung in one direction to actuate the electrical switch;

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Fig. 5 is a similar view showing the detector roll as rocked or swung in the opposite direction;

Fig. 6 is an end view of the detector roll shown as rocked in the direction indicated in Fig. 4 and illustrating its actuation of the mercury switch-lever to break the electric circuit; and

Fig. 7 is a similar view corresponding to Fig. 5 illustrating the position of the detector roll indicated therein and its effect on the switch-lever to open the electrical circuit.

In modern textile mills it is the practice to feed continuous lengths of fabric from one location to another for processing the cloth in various types of machines to apply a finish to the goods. For example, the cloth may be fed from one department to another continuously and during the finishing treatment it is usually essential that it be handled in a smooth, flat condition without twist, wrinkles or folds therein. In most cases the fabric is received primarily in a more or less folded and twisted condition and fed through a scutcher, so-called, to cause it to be straightened and delivered in a perfectly smooth, unwrinkled condition for operations such as dyeing, washing, drying, singeing and other finishing processes. The present improved stopping mechanism is particularly adapted to be employed adjacent the scutcher, but it may be applied to use in any other location such as in advance of one or a series of finishing machines.

As shown in Fig. 1 of the present drawings, the stopping mechanism is mounted in position adjacent a guide roll 2 which receives the material as it feeds from the scutcher rolls, not herein shown. Arranged below the guide roll 2 is a second smaller guide roll 3 having its gudgeons 4 journaled in bearings 5 bolted to depending brackets or angle-iron arms 6 which may be fastened at 7 to a pair of beams or other supports 8 on which the upper guide roll 2 is mounted, see also Fig. 3.

Arranged between the upper and lower guide rolls 2 and 3, respectively, is a third cylindrical roll 10 which may be termed the feeler or detector roll. The feeler roll 10 has gudgeons 11 at its opposite ends journaled in bearings 12 of conventional type which, as shown in Figs. 1, 2 and 3, are bolted to the ends of a rockable cross-arm or beam 15. The bearings 12 are preferably of friction-reducing character such as ball or roller bearings, not herein illustrated in detail, and the roll 10 is held in place by collars 13 fastened to the ends of the gudgeons 11 and engaging the sides of the bearings. The cross-arm 15 may be of T-beam construction, see Figs. 1 and 2, com-

prising a vertical front plate 16 with a central projecting rib 17 at the rear, tapering from the center outwardly toward its ends. At the center of the beam 15 is a cylindrical bearing 20, see Figs. 1 and 2, which is journaled on a pivot-pin 21 held in a bifurcated or U-shaped bearing bracket 22.

The bearing bracket 22 is welded or otherwise suitably secured to the back of a channel-iron strut or stringer 25 extending horizontally between and supported from a pair of hangers 26 depending from any overhead support such as rafters or the like. The hangers 26, see Figs. 1 and 2, are of generally T-iron shape with their lower ends bolted at 27 to the beams 6, part of the framework on which the scutcher guide roll 2 is mounted. The central bearing 20 of the beam 15 is pivoted between the opposite arms 28 of the bracket 22 with the pivot-pin 21 passing through said arms and the bore of the bearing. The head of the pin 21 is tapered as shown in Fig. 1 to engage a similarly tapered hole in the upper arm 28 and provided with a hole at its lower end through which a cotter-pin 30 projects whereof to secure the pin in place in the bracket. Washers 31 abut the ends of the bearing 20 and the opposed faces of the arms 28 and an additional washer 33 may be applied to the under side of the lower arm above the cotter-pin 30. By means of the above bearing construction the feeler or detector roll 10 is mounted to swing or rock about a vertical axis on the pivot-pin 21 for a purpose to be explained later. It will be noted from Fig. 1 that the detector roll 10 is offset laterally from a plane passing over the peripheries of the upper guide roll 2 and lower guide roll 3 so that when it is in parallel relation thereto it will form a bend or bight in the fabric C feeding between the rolls as shown in Fig. 1.

The feeler or detector roll 10 is adapted to be swung or rocked about its pivot under the pressure of any abnormal thickness in the fabric delivering over the guide rolls 2 and 3 and such rocking motion serves to actuate a switch for interrupting the electric current to the motor or motors which drive the scutcher and also any processing machines arranged in series therewith. Preferably, a "mercoid" or mercury type switch is provided in the circuit to the motor or motors, such a form of switch 35 being illustrated in Figs 1 and 2 as mounted in clips 36 attached to the end of a lever 40. Suitable conductors such as the wires 37 are connected in the electrical circuit for the motor or motors referred to above. The lever 40 projects through an opening or slot 41 in the web of the channel-iron stringer 25 which supports the bracket 22 with its end hingedly connected by a pivot-pin 42 to a bearing 43 welded or otherwise fastened to the back of the cross-arm or beam 15. The lever 40 is formed with a depending lug or projection 45 having tapered ends and a horizontal lower edge which normally rests against the bottom of the opening or slot 41 in the stringer 25 as shown in Fig. 1. When, however, the cross-arm or beam 15 is rocked about its pivot the lever 40 will be projected through the slot 41 in one direction or the other in accordance with the direction in which the beam rocks, thereby causing the lug 45 to be disengaged from the lower edge of the slot 41 so that the outer end of the lever will swing downwardly into the position illustrated in Figs. 6 and 7. Such descent or dropping of the lever 40 will tilt the switch 35 to cause the mercury contained in its tube to flow away from one of the contacts whereby to break the electrical circuit in the manner well known in the art. In this way the circuit to the motor or motors is opened or, in other cases, an electrical device at each apparatus may be actuated by the switch to arrest the drive. In some instances the interruption of the electrical current to any particular machine may be adapted to cause actuation of other devices, for example, to shut off the gas for the burners in a singeing machine; these devices not being herein shown and described as they form no part of the present invention. The method of operation of the present stopping mechanism is explained in detail as follows:

Referring to Fig. 1 and the schematic views, Figs. 4 to 7, inclusive, the fabric or cloth C is normally delivered from the scutcher rolls in smooth, flat condition to feed around the guide roll 2 and downwardly across the smaller guide roll 3. During normal operation the fabric C passes across the periphery of the feeler or detector roll 10 in flat condition and is diverted from a straight course to form a bend or bight therein. The tension of the feeding fabric when in a smooth, flat, full width condition will normally maintain the detector roll 10 in parallel relation to the peripheries of the guide rolls 2 and 3. However, if the cloth becomes folded, twisted, wrinkled, torn, cut or has an open seam at the joinder of the strip, it will assume an abnormal thickness at some point, being bunched or rolled adjacent one selvage or the other or even centrally of its width. In such case the thickened portion of the material will cause rocking of the feeler or detector roll 10 and beam 15 in one direction or the other as indicated in Figs 4 and 5. Even though the fabric may be bunched at points intermediate the ends of the roll 10 it will upset the equilibrium of the detector roll 10 and cause it to rock the beam 15 one way or the other. When the beam 15 is rocked in the manner illustrated in Fig. 4 it will slide the lever 40 forwardly through the slot 41 in the web of the stringer 25 to release the projection or lug 45 from the lower edge of the slot as shown in Fig. 6. Consequently, the lever 40 will drop or be rocked downwardly by the force of gravity to tilt the mercoid switch 35 to open the electrical circuit in the manner explained above.

Likewise, if the fabric is folded, torn, cut, open at a seam, bunched or doubled on itself toward the opposite end of the detector roll 10 it will cause the latter to rock in the manner indicated in Fig. 5 to draw the lever 40 through the slot 41 and release its lug 45 from the lower edge thereof to tilt the switch 35 in the same manner. The roll 10 thus acts as a feeler to detect any abnormality in the feeding cloth, whether it be caused by a folded or twisted condition or otherwise, to cause it to respond thereto to promptly arrest the feeding action and, in certain cases, control the operation of the processing machines as by interrupting the drive therefor. Besides irregularities caused by the twisting, folding or bunching of the cloth, it has been the experience that in some instances extraneous matter may be carried along with the fabric. The ends of separate pieces of fabric taken from the looms are usually joined together by sewing to form a continuous strip and the projecting ends at the seams are usually sheared therefrom. Sometimes through carelessness, these waste strips are left on the feeding strip and carried along by the fabric beyond the scutcher and it is necessary to remove them before they reach the processing machines which finish the goods.

Heretofore, the human element has been depended upon to straighten and smooth the fabric to clear it of folds and twists escaping through the scutcher, or to remove loose pieces or other obstructions carried on the strip before they reach the processing apparatus. However, such manual attention for correcting irreguarities is not entirely dependable so that the present stopping mechanism has been provided to insure the proper inspection of the feeding cloth and prompt arrestment of the feed should abnormalities appear therein. The improved stopping mechanism acts promptly to arrest the feeding of the fabric and interrupt the operation of the machine or machines to which it is delivering so as to prevent any irregularities in the processing which might result in defects in or spoilage of the finished goods. The arrestment of the feed and stopping of the various processing apparatus acts as a signal to inform the attendant that a fault has occurred and thus enable prompt correction of the condition so that the fabric may be started to feed again by straightening and clearing the fabric and releasing the detector roll 10 so that it can swing back into parallel relation to the guide rolls 2 and 3 in position for further operations when required.

It will be observed from the foregoing specification that the present invention provides an extremely simple and ingenious stopping mechanism for arresting the feeding of continuous lengths of fabric and stopping the processing machinery to guard against its improper operation on the goods liable to result in defects or spoilage. While the stopping device is herein shown and described as embodied in a preferred form of construction, it is to be understood that various modifications may be made in the structure and arrangement of its mechanism without departing from the spirit or scope of the invention. Therefore, without limiting ourselves in this respect, we claim:

1. In a stopping mechanism for textile machines, a pair of guide rolls for feeding a strip of fabric, a detector roll intermediate the guide rolls in laterally offset relation to the peripheries thereof for forming a bend in the feeding fabric, means for pivoting said detector roll to adapt it to rock on an axis normal to the axis of said roll, an electrical circuit, a switch in said circuit, and means operative by the rocking of the detector roll to actuate the switch to control the electrical circuit.

2. In a stopping mechanism for textile machines, a pair of guide rolls for feeding a strip of fabric delivered thereto, a detector roll arranged intermediate the guide rolls in laterally offset relation to the peripheries thereof, a cross-arm for rotatably mounting the detector roll at its ends, means for pivoting said cross-arm to adapt it to rock on an axis normal to the axis of the detector roll, an electrical circuit, a switch in said circuit, and means movable by and with the rocking motion of the cross-arm when the detector roll is influenced by an abnormal condition in the fabric feeding thereacross to actuate the switch to control the electrical circuit.

3. In a stopping mechanism for textile machines, a pair of rolls for guiding a strip of fabric feeding thereacross, a beam pivoted to rock on a fixed axis, a detector roll journaled on said beam and extending across the width of the fabric feeding between the guide rolls to contact therewith, a lever pivotally connected to the beam, means for normally supporting said lever in horizontal position while adapting it to swing downwardly when the beam is rocked in either direction, a mercury switch mounted on said lever, and an electrical circuit connected to the switch.

4. In a stopping mechanism for textile machines, means for feeding a strip of fabric, a feeler roll arranged to bear against the fabric to divert it from a straight course, a rockable beam for supporting the feeler in contact with the fabric while adapting it to swing in a plane normal thereto, a lever pivotally connected to the beam and formed with a projection on its under side, a support engageable with said projection for normally maintaining the lever in elevated position, a mercury switch on said lever, and an electrical circuit connected to the switch, said lever being movable by the swinging motion of the feeler roll under the influence of any irregularity in the fabric feeding thereacross to release its enlargement from the support and cause the lever to drop to open the circuit at the switch.

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