Dec. 7, 1943. M. WACHSMAN 2,335,979

STOP MECHANISM FOR KNITTING MACHINES

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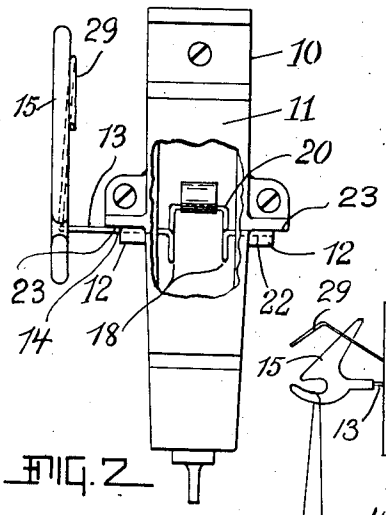


FIG. 2

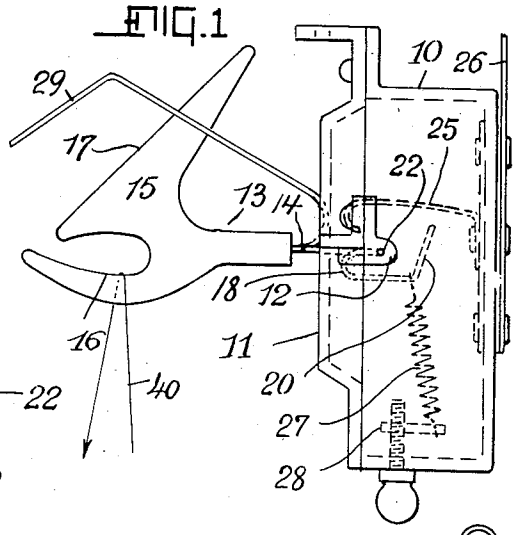


FIG. 1

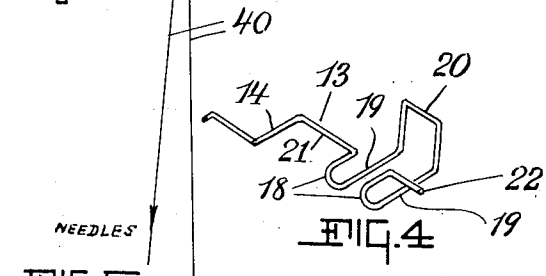
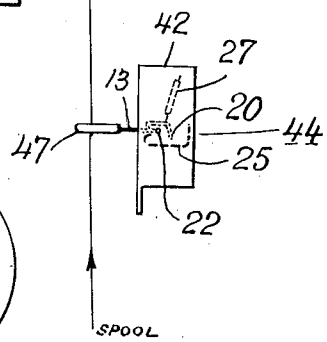


FIG. 5

FIG. 4



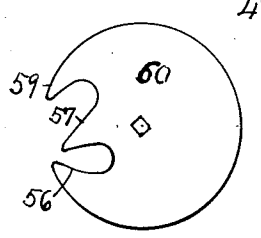


FIG. 7

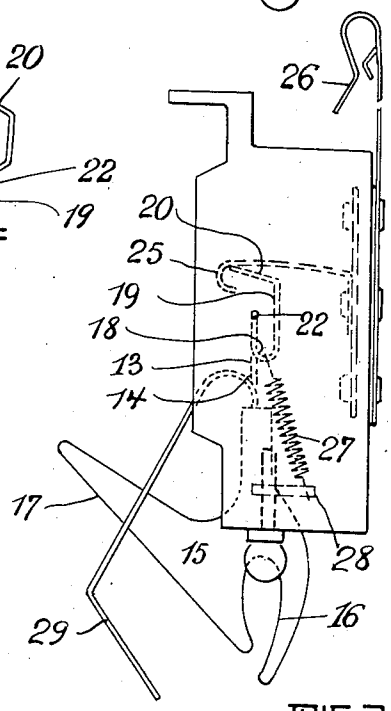


FIG. 3

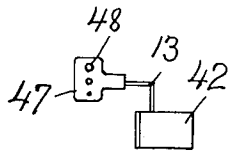


FIG. 6

INVENTOR.

Michael Wachsman

BY

Ivan E. A. Konigsberg

Atty.

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STOP MECHANISM FOR KNITTING MACHINES

Michael Wachsman, Brooklyn, N. Y.

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5 Claims. (Cl. 66—163)

This invention relates to improvements in stop mechanisms for knitting machines of the type in which pivoted levers under the control of the travelling thread are operated to close a normally open electric circuit when the thread breaks, runs out or a knot occurs in the thread. The closure of the electric circuit serves to actuate a stop device for stopping the knitting machine. A stop mechanism of this general type is disclosed in my Patent 2,121,375; June 21, 1938. The general construction and operation of such mechanisms are known in the art.

The object of the present invention is to provide certain improvements in such mechanisms whereby the operation thereof is generally improved and made more efficient and whereby the same mechanism may be used for both a knot detector and an end detector mechanism, these terms being well understood in the art. One object is to provide a novel guard on the detector lever whereby rethreading is facilitated. Another object is to provide a stop mechanism in which the position of the detector lever functions as a visible signal to indicate to the operator that a break has occurred so that the troublesome spot can be located quickly. In the accompanying drawing illustrating the invention

Fig. 1 is a side view of a knot detector stop mechanism embodying the invention.

Fig. 2 is a front view with parts broken away.

Fig. 3 is a side view with details omitted and showing the detector lever in circuit closing position.

Fig. 4 is a detail perspective view of the wire portions of the detector lever.

Fig. 5 is a diagrammatic view showing the invention applied to both a knot detector and an end detector.

Fig. 6 is a plan view of the end detector.

Fig. 7 illustrates a modification.

The stop mechanism comprises a box 10 closed by a removable cover 11. The box is formed with bearings 12 and stops 23 on the sides. In the bearings there is pivoted a detector lever marked generally by the reference number 13. The lever consists of a bent wire which as shown in Fig. 4 is formed to provide two alined pivot portions 21 and 22, forward loop portions 18, horizontal arms 19 and a contact heel 20. A portion 14 is bent forward and outward and carries a porcelain detector 15. The detector 15 is formed with a thread supporting hook 16 and an inclined threading surface 17 as shown. A spring 27 is hooked onto one of the arms 19 and to an adjustable keeper 28 in the usual manner. Above the lever 13 there is mounted a spring contact 25 suitably connected to a fixed terminal 26 on the box. As is well known in the art the box and the lever 13 form one terminal of the operating electric circuit. The member 26 is the other terminal. The electric circuit is not shown because it is a well known element in stop mechanisms for knitting machines. With the parts in the position shown in Fig. 1 the stop circuit is open, there being a space between the contact heel 20 and the spring contact 25.

The spring 27 slidingly engages the arm 19 and serves to maintain the lever 13 in upper normal operating position against the stop 23. As stated, in this position the circuit is open and the thread 40 runs normally over the hook 16 from the spool to the needles of the knitting machine, not shown.

When a knot or other obstruction on the thread occurs the detector lever 15 is pulled down and swings forwardly and downwardly around the pivot 22. Hence the operating horizontal arms 19 are tipped forwardly and downwardly with the result that the spring 27 slides forward into the loop 18 and with a quick pull swings the detector lever down into the position shown in Fig. 2. The contact heel 20 is swung upward and into contact with the spring 25 and the circuit is closed. The machine stops.

In this position, Fig. 3, the detector lever remains in circuit closed position. Heretofore the arrangement has been such that the detector lever, after contact having been made, was pulled back again into circuit open position. This operation necessarily resulted from the fact that the spring 27 never passed beyond dead center under the pivot 22. Therefore when the machine stopped there was nothing to indicate to the operator where the thread had failed in operation. The present construction eliminates this disadvantage and the detector lever in this down position serves as a clear signal to the operator so that he can locate the trouble. Another advantage is that inasmuch as the stop circuit remains closed, the machine cannot be accidentally or intentionally started before the thread has been repaired. As soon as the detector lever has been moved down sufficiently to allow the spring 27 to pass forwardly past the pivot 22, the lever is swung down with a snap and the thread quickly slides off the hook 16.

The detector lever carries a spring threading guard 29 which hugs the side of the porcelain detector very closely as shown in Fig. 2. In placing the repaired thread back upon the hook 16

the operator uses a forked stick with the thread placed in position straddling the fork. He lifts the stick so that the thread is positioned between the thread guard and the porcelain lever. The thread engages the guard and lifts the lever. As soon as the lever lifts above the pivot 22 the spring 27 pulls the lever back into normal position and the thread then slides down the incline 17 and onto the hook as will be understood.

The mechanism described above may also be used as an end detector by simply turning the box upside down. This is illustrated in Fig. 5 in which the upper box 42 is in the same position as the box in Fig. 1, whereas the lower box 42 is turned upside down. The upside down position of the mechanism is clearly indicated by the positions of the parts 13, 27 and 25. When used upside down as an end detector the porcelain member 15 and the guard 29 are omitted and the lever 13 supports a flat porcelain plate 47 having holes 48 of different diameters for threads of different thicknesses.

When a knot occurs on the thread, the thread cannot pass through its hole in the plate 47. The plate is then lifted and swung completely upward by operation of the spring 27 the same as described above for the movement downward of the detector lever. The circuit is then closed and the machine stops. Sometimes the machine does not stop immediately but continues to run due to its momentum. Thus the downward pull from the thread continues. The end detector will then be operated to release the thread as described above and the thread will not break.

Fig. 7 shows a modification in which the thread supporting hook 56, the incline 57 and the guard 59 are all integral parts of a disk 60 which may be suitably secured upon the shaft portion of the lever.

The stop mechanism as disclosed possesses advantages over prior devices in having enclosed long bearings for the wire lever portions which provide for easier operation and less wear. The release of the thread from the detector lever is much faster because of the action of the spring 27. The abnormal circuit closing position of the detector lever serves as a clear signal to the operator. The long contact spring 25 provides good contact. The threading guard facilitates quick rethreading of the mechanism.

By comparing Fig. 4 with Fig. 2 it would appear impossible to mount the wire lever in the box. However, in assembling the parts the wire portions 21 and 14 are not bent but in a straight line and the porcelain detector 15 is not attached to the wire. In assembling the parts the long wire portion 21—14 is first pushed through the bearing 12 to the left in Fig. 2. Then the wire loops 18 and operating arms 19 are squeezed together so as to place the wire portions within the box and permit the short shaft portion 22 to be slipped into the bearing 12 on the right side of the box. This construction has the advantage of providing relatively long bearings for the wire lever and prevents protruding ends or the like from being caught in the thread.

I claim:

1. In a stop mechanism under the control of a travelling thread, a box, a lever pivoted in the box and including a thread supporting arm outside the box extending forwardly to one side of the lever pivot and an operating arm inside the box extending to both sides of the lever pivot below the latter, a spring secured to the box within the same and to the said operating arm in slidable engagement therewith for maintaining said lever and thread supporting arm in active thread supporting position and for moving said lever and thread supporting arm into an inactive position with relation to the thread, said spring maintaining said lever and thread supporting arm in said inactive position.

2. In a stop mechanism under the control of a travelling thread, a box, a fixed contact member in the box, a lever pivoted in the box and including a thread supporting arm outside the box extending forwardly thereof to one side of the lever pivot and an operating arm inside the box extending to both sides of the lever pivot and spaced below the same, a contact heel on said operating arm at the end thereof, a spring secured in said box and connected to said operating arm in slidable engagement therewith for maintaining said lever substantially horizontal in active thread supporting position and for moving said lever downward into a predetermined inactive position extending below the said box with said contact heel in engagement with said contact member.

3. In a stop mechanism under the control of a travelling thread, a box, a lever pivoted in the box including a thread supporting porcelain arm extending outside the box forward thereof and an operating arm inside the box, said lever being adapted to be swung on its pivot from an active thread supporting position in front of the box to an inactive position with said porcelain arm extending below the box and a spring within the box operatively engaging said operating arm for maintaining the thread supporting porcelain arm in either of the said two positions and for moving the lever from the active to the inactive position in which latter position the said porcelain arm serves as a visible signal for the purpose described.

4. A thread supporting member for stop mechanisms comprising a wire bent to form lever pivots, operating arms between and below said pivots and a contact heel between said arms extending upwards therefrom above the lever pivots, said lever being bent to extend forward of the lever pivots parallel to the said arms and a porcelain thread supporting member secured to said last named forward extension.

5. A thread supporting detector member for stop mechanisms comprising a lever, a porcelain member thereon including a thread supporting hook and a threading inclined surface directed towards the hook, a threading guard for said detector member, said guard being a wire supported on said detector member and extending forwardly thereof across said inclined surface touching the side thereof, the outer end of said guard being bent parallel to the said inclined surface.

MICHAEL WACHSMAN.