Oct. 14, 1947. M. WACHSMAN 2,429,004

FABRIC CONTACTING CIRCUIT CLOSER FOR KNITTING MACHINES

Filed Feb. 20, 1947 2 Sheets-Sheet 1

FIG. 1

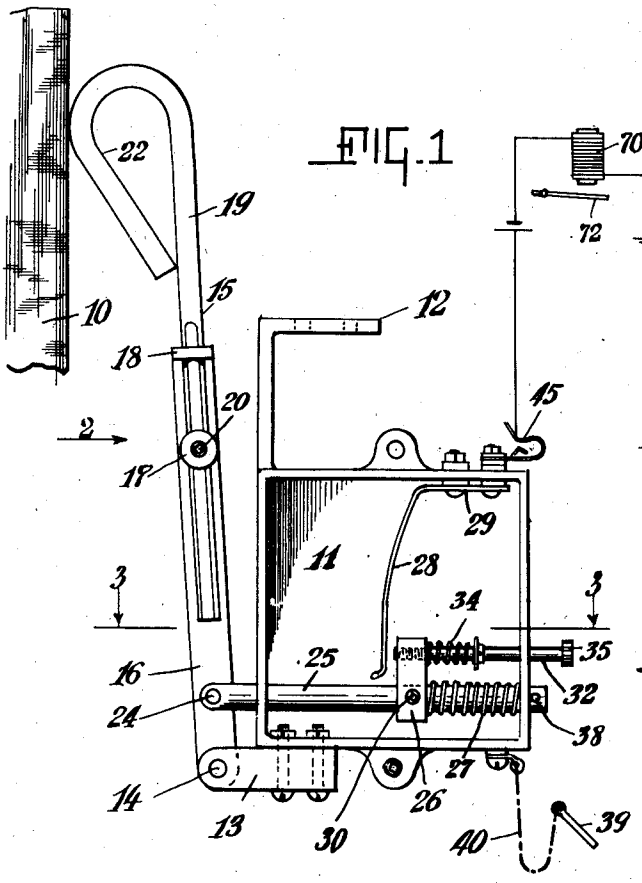
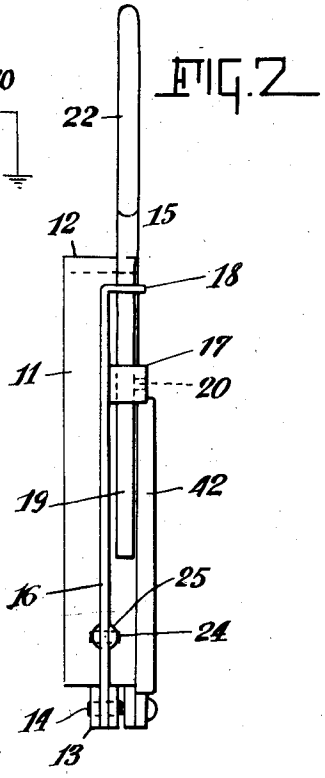


FIG. 2



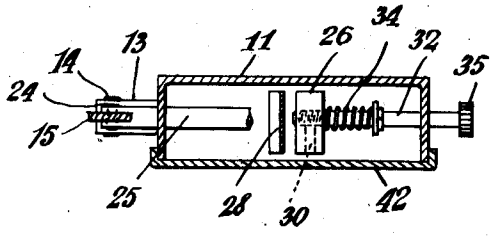


FIG. 3

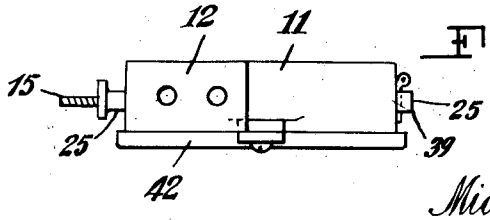


FIG. 4

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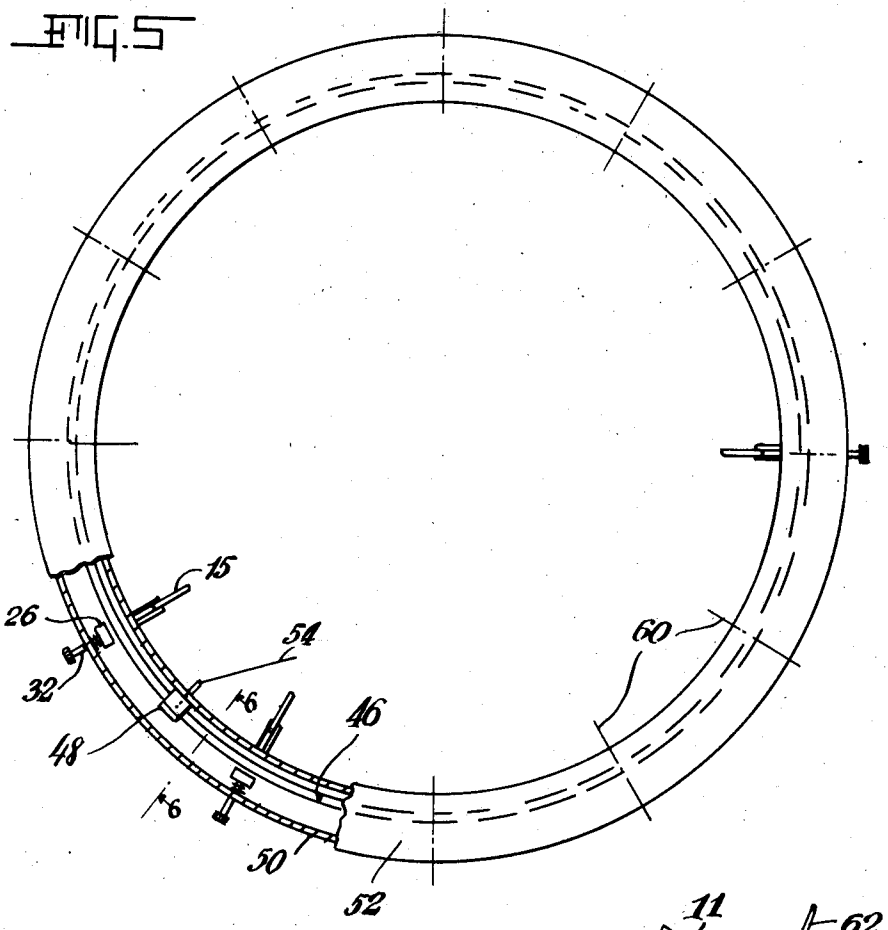
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Oct. 14, 1947. M. WACHSMAN 2,429,004

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Filed Feb. 20, 1947 2 Sheets-Sheet 2

FIG. 5



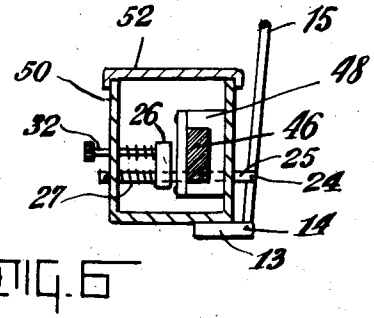


FIG. 6

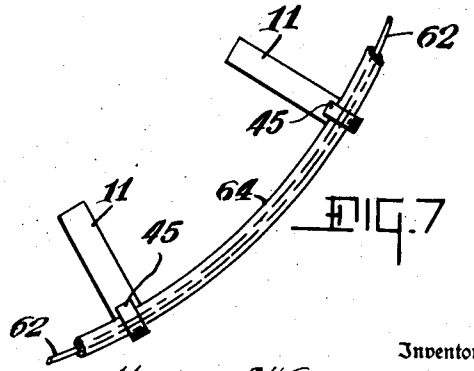


FIG. 7

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UNITED STATES PATENT OFFICE

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FABRIC CONTACTING CIRCUIT CLOSER FOR KNITTING MACHINES

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Application February 20, 1947, Serial No. 729,696

4 Claims. (Cl. 66—166)

1

The object of this invention is to provide a novel and improved fabric contacting circuit closer for knitting machines for closing an electric stop circuit to actuate a knitting machine stopping device when a tear, a run, a dropped stitch or other irregular or abnormal condition appears or occurs in the fabric.

More particularly it is the object of this invention to provide a fabric contacting circuit closer of a generally improved design and construction embodying certain novel features to be pointed out hereinafter. This invention is an improvement on the fabric contacting circuit closer disclosed in my pending application filed Aug. 10, 1946, Ser. No. 689,735. In the accompanying drawing illustrating the invention

Fig. 1 is a view of the circuit closer mounted in a box with the cover of the box removed.

Fig. 2 is a view of Fig. 1 looking in the direction of the arrow 2.

Fig. 3 is a sectional view of Fig. 1 on the line 3—3 thereof, with parts removed and parts broken away.

Fig. 4 is a plan view of the box and illustrates a modified detail.

Fig. 5 is a plan view, partly diagrammatic, showing a plurality of circuit closer arranged in an annular casing.

Fig. 6 is a sectional view on line 6—6 of Fig. 5.

Fig. 7 illustrates one feature of the invention relating to electrical connections.

Fabric contacting circuit closers, or fabric controls as they are sometimes called, are switches in an auxiliary electric circuit which is normally open. When a fault occurs in the fabric, the switch is actuated to close the circuit which in turn operates a shipping lever or the like to cut off the power from the knitting machine. Then the machine stops and the accident can be attended to. My Patent No. 2,168,755, dated Aug. 8, 1939, discloses the operation of such fault detecting devices and is hereby referred to for details not described herein because they are no part of this invention.

Referring to the drawings, Figs. 1 to 4, the fabric as it comes down from the knitting mechanism, not shown, is represented at 10. The detector is built in the form of a unit comprising a box 11 having a bracket 12 for mounting the detector on a knitting machine, not shown. The box has a bearing member 13 and to the latter is pivoted at 14 a detector arm 15 which is spring pressed outward from the box into contact with the fabric. The detector arm is made in two portions. One portion 16 is pivoted on the bearing 13 and carries a post 17. The end of the portion 16 is bent to form a support 18 for the outer slidable part 19 of the arm 15. The part 19 passes through the support 18 and through the post 17 for lengthwise adjustment. A set screw 20 in the post maintains the two parts in adjusted positions. The part 19 is formed with a relatively large looped end portion 22 which is completely closed. This design of the end of the arm 15 is of advantage in that it prevents the fabric from being caught in the arm. The loop 22 also adds weight to the arm.

2

The detector arm is at 24 pivotally connected to a contact rod 25 slidably mounted in the box 11. The rod carries a contact block 26 and a spring 27 between the block and the box urges the rod outward from the box and serves the purpose of moving the contact block 26 into circuit closing contact with a fixed spring contact terminal 28 which is secured in the box at 29. The spring keeps the detector arm in steady frictional contact with the fabric.

The contact block 26 is adjustably secured upon the rod 25 by a set screw 30. Hence the position of the block with relation to the terminal may be accurately adjusted to suit the speed of the knitting machine. In addition, a fine adjustment is provided in that a screw 32 is threaded into the block and spring held in adjusted position by a spring 34. The screw may therefore be screwed into the block and held by the spring in adjusted position so that the end of the screw may project from the block toward the terminal 28 to provide quicker contact therewith. The screw 32 is operated by a knurled knob 35.

The rod 25 has a hole 38 and a pin 39 is attached to the box by a chain 40. When the detector arm has been operated to close the circuit and thereafter is manually detached from the fabric so the fault can be attended to, the pin 39 is placed in the hole 38 to hold the detector arm away from the fabric and in circuit open position, Fig. 4. The chain and the pin also serve as a signal in that the operator in inspecting the detector boxes can easily judge from the position of the chain, up or hanging down, whether a box is ready for operation. This is an advantage in knitting machines where many complicated parts are apt to obscure the view of the several devices.

A cover 42 closes the box and a terminal wire connector 45 of known design is connected to the terminal 28 and of course insulated from the box. When a fault occurs in the fabric so that it no longer forms a resistance against the outward movement of the detector arm, the two terminals

26 and 28 will engage and close the stop circuit. The latter includes an electromagnet 70 which operates a stop lever or like member 72 which functions to stop the knitting machine.

In some installations it is desirable to mount a plurality of detector units in a circle around the fabric. A construction as disclosed in Figs. 5–7 will serve the purpose.

Referring to Figs. 5 and 6 it will be seen that the fixed terminal member within the box (the contact 28 in Fig. 1) is in the form of a ring 46 mounted in insulating blocks 48 within an annular casing 50 having a cover 52. Preferably there will be one insulating support or block 48 between each pair of detectors 15, Fig. 5. In all other respects the detector elements in Figs. 5 and 6 are like the same elements described above and bear the same reference numbers and operate in the same manner. At one of the insulating supports 48 a wire 54 is connected so as to include the ring 46 in the electric circuit. The several detectors are otherwise indicated by their operating axes 60.

An especially advantageous form of electrically connecting a plurality of individual detector units is shown in Fig. 7. A strong wire 62 is passed through all the connectors 45 and between the units the wire is passed through a flexible insulating tube 64. This provides for good insulation between the units and is quickly installed.

I claim:

1. A fabric contacting circuit closer for knitting machines comprising a box, a detector arm pivoted on said box and extending upwardly from said pivot and including a fabric engaging portion adjustably secured to said arm, a rod slidably mounted in said box and extending to the outside thereof, a pivotal connection between said rod and said detector arm adjacent to and above the pivotal connection between the arm and the box, a normally open electric circuit for the knitting machine, a fixed contact in said circuit supported

in the box, a contact block carried by said slidable rod and adapted to engage said fixed contact to close said circuit when an abnormal condition in the fabric causes a termination of the contact between said fabric engaging portion and the fabric, and a spring on said slidable rod for forcing the same and the detector arm toward the fabric and for forcing said contact block into engagement with the said fixed contact to close said circuit.

2. A device according to claim 1 including a contact screw adjustably carried by said contact block to vary the distance between said block and the said fixed contact during the normal operation of the device.

3. A device according to claim 1 including a hole in the said slidable rod and a pin attached to said box and adapted to be inserted into said hole to maintain said slidable rod and the detector arm in inactive positions and maintain the said electric circuit open, the position of said pin in said hole serving to signalize the operative condition of the detector device.

4. A fabric contacting circuit closer for knitting machines comprising an annular box, a plurality of detector units pivotally mounted in said box in spaced circumferential relation, each of said units comprising a detector arm pivoted on the box, a rod slidably mounted in the box, a pivotal connection between said arm and said rod adjacent to and above said pivotal connection between the arm and the box, a normally open electric circuit for the knitting machine, a fixed annular contact in said box connected in the said circuit, a contact block carried by each of said slidable rods and adapted to engage said annular fixed contact and a spring on said slidable rod for urging the pivoted detector arm toward the fabric within said annular box and for forcing the said contact block into circuit closing engagement with the said annular fixed contact in the box.

MICHAEL WACHSMAN.