Oct. 4, 1949. J. H. HOAG 2,483,541

STOP DEVICE FOR KNITTING MACHINES

Filed April 30, 1948

FIG. 1.

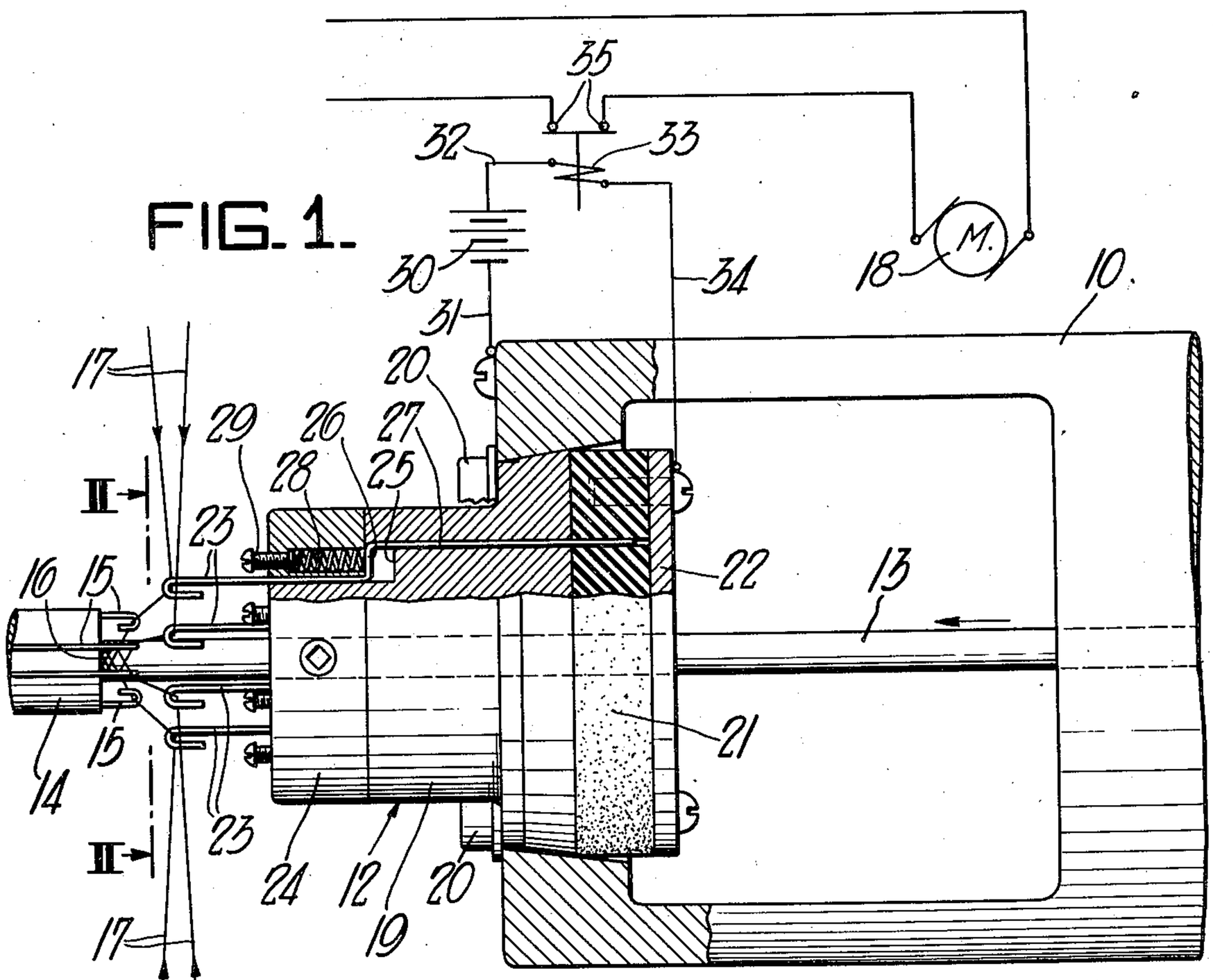
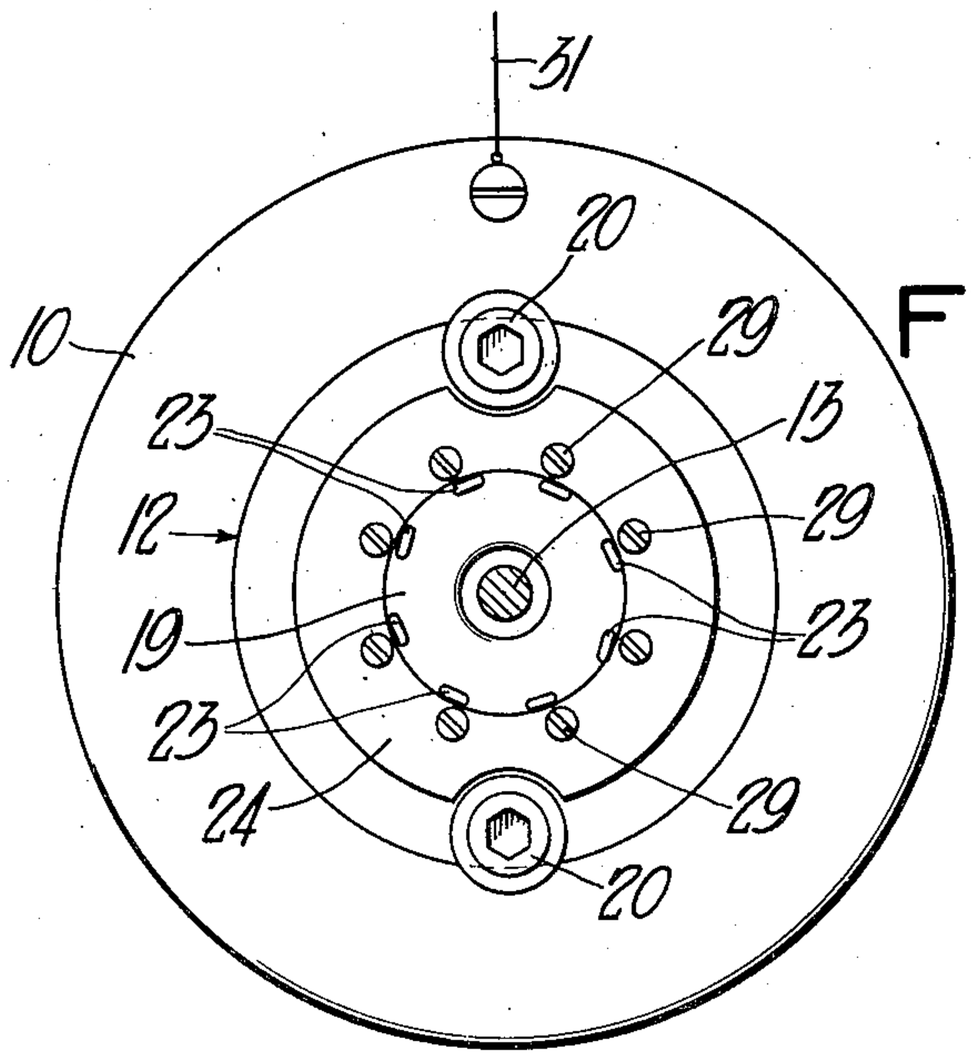


FIG. 2.



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2,483,541

STOP DEVICE FOR KNITTING MACHINES

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6 Claims. (Cl. 66—163)

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This invention relates to improvements in stop devices for knitting machines, particularly for machines that knit fabric covers on elongated cores, such as wires, cables or the like.

Knitting machines commonly are equipped with stops that continuously engage the incoming threads and automatically halt the machine when a thread snarls or breaks. As far as I am aware, previous stops used with machines that knit fabric covers on wires, cables or the like engage the threads remote from the knitting needles, and consequently have a disadvantage that they do not always stop the machine in response to breaks or snarls that occur close to the needles.

An object of the present invention is to provide in knitting machines of the aforementioned type improved stops that engage the incoming threads immediately adjacent the knitting needles, and thus overcome the disadvantages of previous stops with which I am familiar.

A further object of the invention is to provide in knitting machines of the aforementioned type an improved unitary mechanism that combines both the usual thread guides and the stops.

A further object of the invention is to provide in knitting machines of the aforementioned type improved combined thread guides and stops, which are situated immediately adjacent the knitting needles, and which automatically retract to open the electric circuit to the drive motor of the machine when a thread breaks or snarls irrespective of the location of the break.

In accomplishing these and other objects of the invention, I have provided improved details of structure a preferred form of which is shown in the accompanying drawing, in which:

Figure 1 is a side elevational view, partly in section and partly schematic, showing a portion of a knitting machine having an improved combined thread guide and stop embodying features of the present invention; and

Figure 2 is an end elevational view of the thread guide and stop taken substantially on line II—II of Figure 1.

Referring more in detail to the drawing:

In Figure 1 there is shown a portion of a knitting machine frame 10. A combined thread guide and stop 12 is fixed to the forward end of said frame. A core 13, commonly a wire, cable or the like, is pulled through the machine by suitable feeding mechanism not shown, the core moving from right to left as viewed in Figure 1. Beyond the combined guide and stop 12 there is a knitting head 14 that rotates about the core as an axis. Said knitting head has a plurality of reciprocable needles 15 that knit a fabric covering 16 on the core, the incoming threads being indicated at 17. The core feeding mechanism and the knitting head are motivated by an electric drive motor 18 shown schematically.

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Apart from the combined thread guide and stop of the present invention, the other structure is of a known design and hence is not shown in greater detail. For a more complete showing of knitting machines of the type described, reference may be made to Meiwald Patents No. 2,016,870 and No. 2,144,887.

The improved guide and stop of the present invention comprises a tubular metal sleeve 19 fixed to frame 10 as by bolts 20 and through which the core passes just ahead of the knitting needles. An insulating block 21 and a conducting plate 22 are fixed to the rear face of sleeve 19, plate 22 thus being electrically insulated from the sleeve. A plurality of retractable guide fingers 23 are slidably mounted in longitudinal passages in sleeve 19. Said guide fingers are uniformly spaced in a circular pattern surrounding the sleeve bore, there being one such guide finger for each knitting needle 15. The guide fingers terminate in hook portions over which the incoming threads pass closely adjacent the knitting needles.

The forward end of the sleeve has a circumferential recess. An annular collar 24 is fitted over the sleeve within the recess and furnishes forward abutments that limit sliding movement of guide fingers 23. The longitudinal passages in sleeve 19 have shoulders 25 that furnish rearward abutments. Guide fingers 23 are offset as indicated at 26, and have segments 27 that extend rearward of said offsets, through the passages in the sleeve, and through extensions of said passages in insulating block 21. In their extended position as shown in Figure 1, segments 27 of the guide fingers terminate short of conducting plate 22.

Compression springs 28 for each guide finger 23 are mounted within bores in collar 24 and bear against offsets 26 of the fingers. Said compression springs normally urge the fingers into retracted position, in which their rear ends contact conducting plate 22. Preferably the compressive force in springs 28 may be adjusted as by set screws 29.

Threads 17 pass over the hooks of fingers 23 before reaching knitting needles 15. As long as there is tension in the threads, they hold fingers 23 in extended position against the action of springs 28. Whenever a thread breaks and tension is released, a spring 28 retracts the particular finger until its rear end contacts conducting plate 22.

An electric circuit is provided for automatically opening the circuit to motor 18 whenever any finger 23 contacts plate 22 and thus brings sleeve 19 into electrical contact with plate 22. Such circuit includes a battery or other source of current 30. A line 31 connects frame 10 and sleeve 19 with the battery; a line 32 connects the battery with a relay coil 33; a line 34 connects the relay coil with plate 22. The relay has normally

closed contacts 35 in the circuit to motor 18. Said contacts open whenever coil 33 is energized and thus break the circuit to the motor.

It is seen that the present invention combines the usual thread guide and stop into a single unitary mechanism. The stops are located immediately adjacent the knitting needles. Therefore any thread breaks in this region or elsewhere are effective to operate the stop and halt the machine. Thus I have not only simplified the knitting machine by eliminating one mechanism, but I have also provided a more effective stop than those previously used with which I am familiar.

While I have shown and described only a single embodiment of the invention, it is apparent that modifications may arise. Therefore I do not wish to be limited by the disclosure set forth but only by the scope of the appended claims.

I claim:

1. In a machine for knitting fabric covers on elongated cores, a combined thread guide and stop mechanism for halting the machine when a thread breaks comprising a stationary tubular sleeve through which the core passes just ahead of the knitting needles, a plurality of retractable guide fingers slidably mounted in said sleeve close to the knitting needles and over which the incoming threads pass, spring means urging said guide fingers to retracted position, the threads normally holding said guide fingers extended against the action of said spring means, and electric means actuated by retraction of any of said guide fingers for halting the machine.

2. In a machine for knitting fabric covers on elongated cores, a combined thread guide and stop mechanism for halting the machine when a thread breaks comprising a tubular sleeve through which the core passes just ahead of the knitting needles, an electrically conductive plate fixed to the rear of said sleeve and insulated therefrom, longitudinal passages in said sleeve surrounding its bore and communicating with said plate, retractable guide fingers slidably mounted in said passages and terminating in hook portions closely adjacent the knitting needles and over which the incoming threads pass, spring means urging said guide fingers to retracted position in which their rear ends contact said plate, the threads normally holding said guide fingers extended against the action of said spring means, and electric means connected with said plate and said sleeve and actuated by retraction of any of said guide fingers for halting the machine.

3. In a machine for knitting fabric covers on elongated cores, a combined thread guide and stop mechanism for halting the machine when a thread breaks comprising a tubular sleeve through which the core passes just ahead of the knitting needles, an electrically conductive plate fixed to the rear of said sleeve and insulated therefrom, longitudinal passages in said sleeve surrounding its bore and communicating with said plate, retractable guide fingers slidably mounted in said passages and terminating in hook portions closely adjacent the knitting needles and over which the incoming threads pass, offsets in said guide fingers, a collar on the forward end of said sleeve, springs bearing on said collar and said offsets urging said guide fingers to retracted position in which their rear ends contact said plate, the threads normally holding said guide fingers extended against the action of said springs, and electric means connected to said plate and said sleeve and actuated by retraction of any of said guide fingers for halting the machine.

4. In a machine for knitting fabric covers on elongated cores, a combined thread guide and stop mechanism for halting the machine when a thread breaks comprising a tubular electrically conductive sleeve through which the core passes just ahead of the knitting needles, an electrically conductive plate fixed to the rear of said sleeve and electrically insulated therefrom, uniformly spaced longitudinal passages in said sleeve forming a circular pattern surrounding its bore and communicating with said plate, retractable guide fingers slidably mounted in said passages and being in electrical contact with the sleeve and terminating in hook portions closely adjacent the knitting needles and over which the incoming threads pass, offsets in said guide fingers, a collar on the forward end of said sleeve, compression springs bearing on said collar and said offsets urging said guide fingers to retracted position in which their rear ends contact said plate, the threads normally holding said guide fingers extended against the action of said springs, and electric means connected to said plate and said sleeve and actuated by retraction of any of said guide fingers for halting the machine.

5. In a machine for knitting fabric covers on elongated cores, a combined thread guide and stop mechanism for halting the machine when a thread breaks comprising a stationary electrically conductive sleeve through which the core passes just ahead of the knitting needles, an electrically conductive plate fixed to said sleeve but insulated therefrom, a plurality of electrically conductive retractable guide fingers slidably mounted in said sleeve close to the knitting needles and over which the incoming threads pass, spring means normally urging said guide fingers to retracted position in which they make electrical contact with said plate, the threads normally holding said guide fingers extended against the action of said spring means, and an electric circuit including said sleeve, said fingers and said plate which when completed by contact of any one of said fingers with said plate halts the machine.

6. A combined thread guide and stop mechanism for machines for kitting fabric covers on elongated cores comprising a tubular electrically conductive sleeve, an electrically conductive plate fixed to the rear of said sleeve and electrically insulated therefrom, said sleeve having uniformly spaced longitudinal passages surrounding its bore and communicating with said plate, retractable guide fingers slidably mounted in said passages and being in electrical contact with the sleeve and terminating in hook portions, offsets in said guide fingers, a collar on the forward end of said sleeve, and compression springs bearing on said collar and said offsets urging said guide fingers to retracted position in which they contact said plate.

JOHN H. HOAG.

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