Jan. 26, 1954 J. F. JECKERT 2,667,134

AUTOMATIC STOP MECHANISM FOR SEWING MACHINES

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Fig. 1.

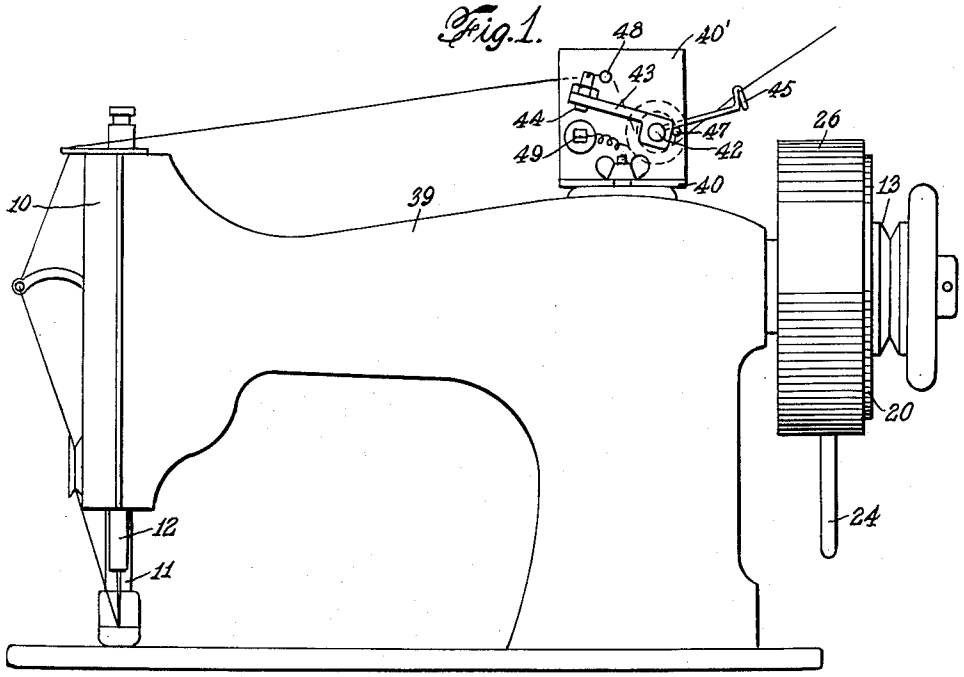


Fig. 2.

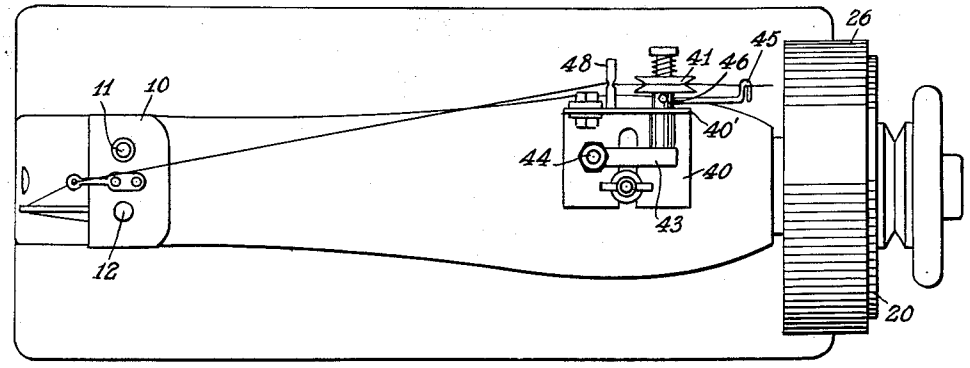
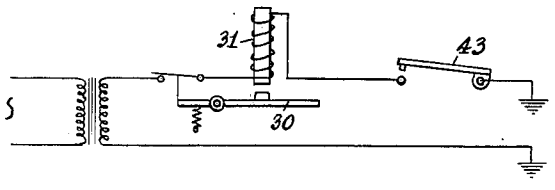


Fig. 3.



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Fig. 4.

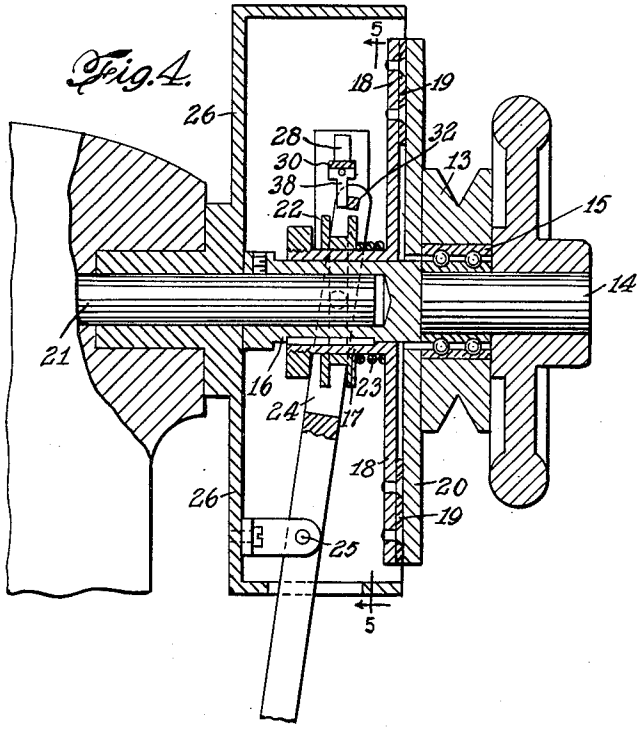
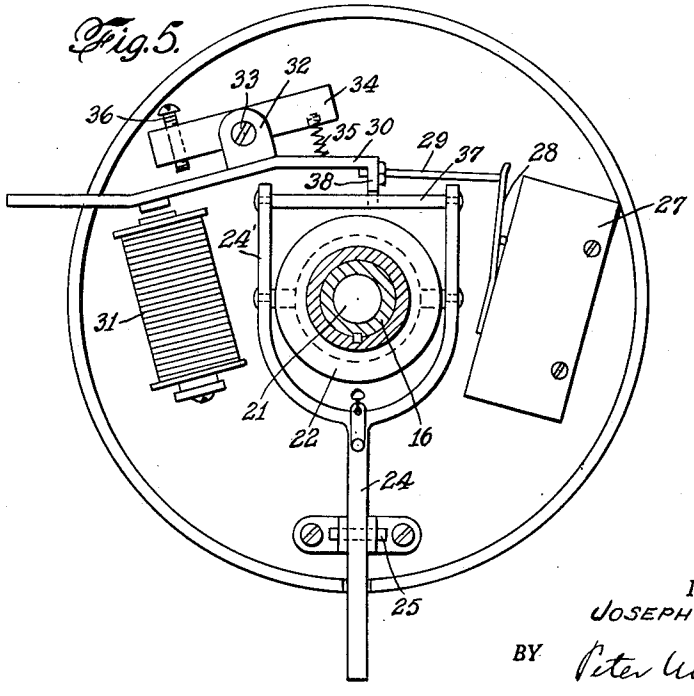


Fig. 5.



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2,667,134

AUTOMATIC STOP MECHANISM FOR SEWING MACHINES

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Application December 19, 1950, Serial No. 201,624

1 Claim. (Cl. 112—219)

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This invention relates to an automatic stop mechanism for sewing machines and has for its object to provide a mechanism for automatically stopping a sewing machine when either the bottom or top thread breaks or runs out.

Another object of the invention is to provide a stop mechanism which may be readily actuated by the operator, as by means of a clutch operating lever.

With the above and other objects in view, this invention consists of the novel features of construction, combination and arrangement of parts, hereinafter fully described, claimed and illustrated in the accompanying drawings forming part of this application, and in which similar characters of reference indicate corresponding parts in all views, and in which:

Figure 1 is a front elevation of a sewing machine embodying the present invention.

Figure 2 is a top view thereof.

Figure 3 is a wiring diagram showing the electrical connections.

Figure 4 is a vertical section of the clutch mechanism, while

Figure 5 is a view on the line 5—5 of Figure 4.

Referring more particularly to the drawing, the numeral 10 indicates the head of the machine having the usual presser foot bar 11 and needle bar 12 driven by a suitable mechanism (not shown).

A pulley 13 driven by the usual motor (not shown) is mounted on a co-axial shaft 14 having ball bearings 15; said shaft 14 has a tubular extension 16 which receives the end of the drive shaft 21, and on said tubular extension a clutch sleeve member 17 is slidably mounted; a disc 18 extends from said clutch sleeve member 17 and carries on its periphery a friction member 19 adapted to engage a second disc 20 attached to the pulley 13, so that said pulley 13, shaft 14 and the extension 16 of the shaft 14 will rotate as a unit to drive shaft 21, which, in turn, actuates the needle bar 12.

A deep grooved clutch pulley 22, is slidably mounted upon the clutch sleeve member 17; said clutch pulley 22 is urged away from the disc 18 by a spring 23 and has an operating lever 24 pivoted at 25 in a clutch housing 26; the said housing has mounted thereon a switch 27 formed with a leaf 28, which extends into the path of a rod 29 fixedly secured to a lever 30, and said lever, in turn, extends into the path of the pole of an electromagnet 31. The lever 30 has ears 32 pivoted at 33 on a block 34 fastened to the housing 26, said block 34 has a spring 35 interposed

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between it and the lever 30, at the other end. The block 34 has further an adjustable stop 36 whereby to limit the movement of the lever 30 on its pivot 33, when the electromagnet is deenergized.

The operating lever 24 has a yoke 24' on its upper end provided with a cross bar 37, which extends in the path of an angular extension 38 of the lever 30; the purpose of this is to retain the clutch disc 18 in contact with the disc 20; upon energizing the magnet 31, the lever 30 will be attracted and pulled down at which time the angular extension 38 will be lifted out of engagement with the cross bar 37 and, due to this movement, the rod 29 moves out of engagement with the leaf 28 of the switch 27 to open the circuit.

Mounted upon a sewing machine arm 39 is an angular support 40 which carries a tension device 41, arranged on a shaft 42, the latter carries an arm 43 provided on its end with a contact 44; the shaft 42 has a thread guide 45 adapted to rotate on a sleeve 46, the movement of said guide 45 is limited by a stop pin 47. A perforated rod 48 fixed to the upright 40' of the angular support 40 serves to accommodate the thread which passes through said perforated rod.

A flat support 40 is attached to the machine head at the top thereof and this is provided with a vertical plate 40', and on this vertical plate a shaft 42 is mounted to turn, and on this shaft a V-grooved pulley or thread tensioning device 41 is mounted. From the shaft 42 a thread tensioning arm 45 extends, which is provided with the usual terminal thread loop. On the end of the shaft 42 an arm 43 is mounted, and the outer end of this arm is provided with a contact element 44, which engages the contact 49, mounted on the support plate 40'. A stop pin 47 is provided for limiting the play of the tensioning arm 45. The tensioning pulley or spool 41 is supported in line with a horizontal arm or bar 48, the inner end of which is secured to the plate 40', and this arm or bar is formed with a single hole through which the thread extends.

The arm or bar 48 is located above the horizontal plane of the shaft 42, and the thread passes under the tensioning spool or pulley 41 and thence through the hole of the arm or bar 48, and the tension of the thread acts to hold the contact 44 of the arm 43 normally elevated above the stationary contact 49. When the thread breaks the arm 43 drops and the contact 44 engages the contact 49, which closes the circuit through the magnet 31, and as this magnet is energized the lever 30 is attracted by the pole of the magnet,

and the lug or finger 38 of this lever 30 is disengaged from the cross bar 37 of the yoke 24'. When this takes place the spring 23 acts on the yoke lever 24 to cause the spanner yoke to shift the pulley 22 away from the disc 20, and as the pulley 22 is shifted the disk 18 is displaced from the disc 20, thus disengaging the shaft 21 from the motor pulley 13.

As the lever 30 is actuated by the magnet 31 the bar 20 attached to the lever 30 engages the switch arm or leaf 28 and operates the switch 27, to break the circuit through the motor which drives the pulley 13, thus stopping the rotation of the pulley 13.

My improved whirl stop mechanism is adapted to control all types of sewing machines, home and industrial, and provides an automatic control for stopping a machine when the thread breaks, which does not call for changes in the mechanism of the sewing machine itself.

It is obvious that changes may be made in the form, construction and arrangement of the several parts, as shown, within the scope of the appended claim, without departing from the spirit of the invention, and I do not, therefore, wish to limit myself to the exact construction shown and described herein.

What I claim, as new, and desire to secure by Letters Patent of the United States, is:

In combination with a sewing machine having an operating shaft and needle reciprocating mechanism driven thereby, an extension for the drive shaft having a motor driven pulley mounted to rotate on said extension and a clutch disc carried by said motor driven pulley, a companion clutch disc slidable on said shaft extension, a pulley mounted on said companion clutch disc to move therewith, a spanner yoke having engagement with the pulley last-named, a lever connected with said spanner yoke, a spring engaging the lever to actuate the yoke in one direction, a lever pivoted to swing close to the yoke and provided with a finger to engage the yoke to hold the clutch discs normally engaged, a magnet for actuating the lever, a switch having circuit connections with the magnet to energize the same, said switch having a movable arm, and thread tensioning means for holding said arm in an open circuit position, whereby said switch will close the circuit through the magnet when the thread breaks, to cause the movable clutch disc to disengage from the other clutch disc.

JOSEPH F. JECKERT.

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