Sept. 23, 1930. W. P. PAXTON 1,776,478

STOP MECHANISM FOR SEWING MACHINES

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Fig. 1

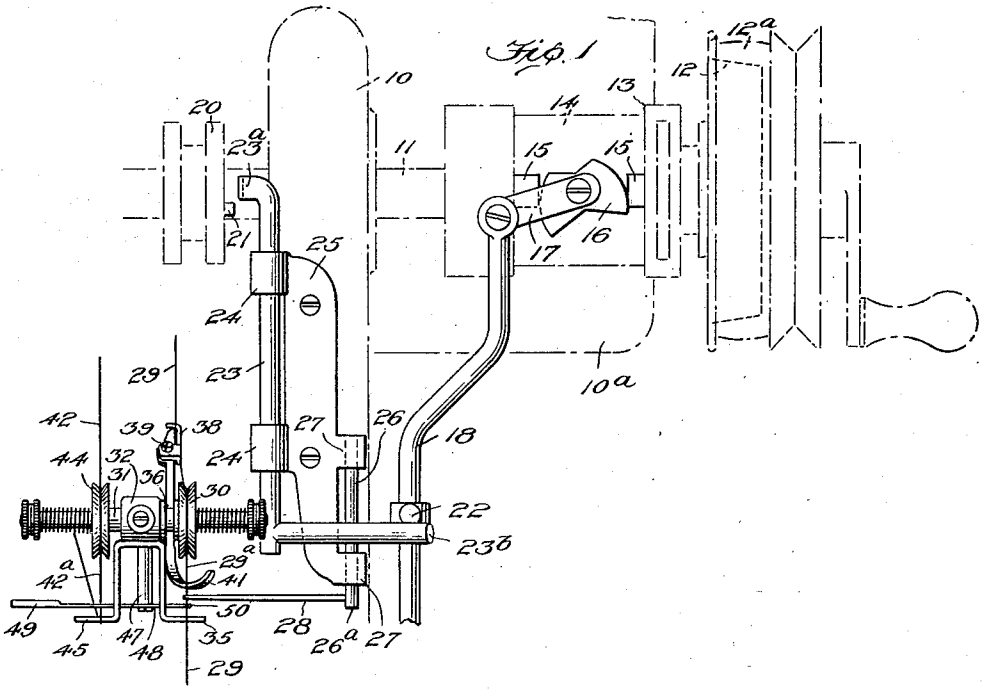
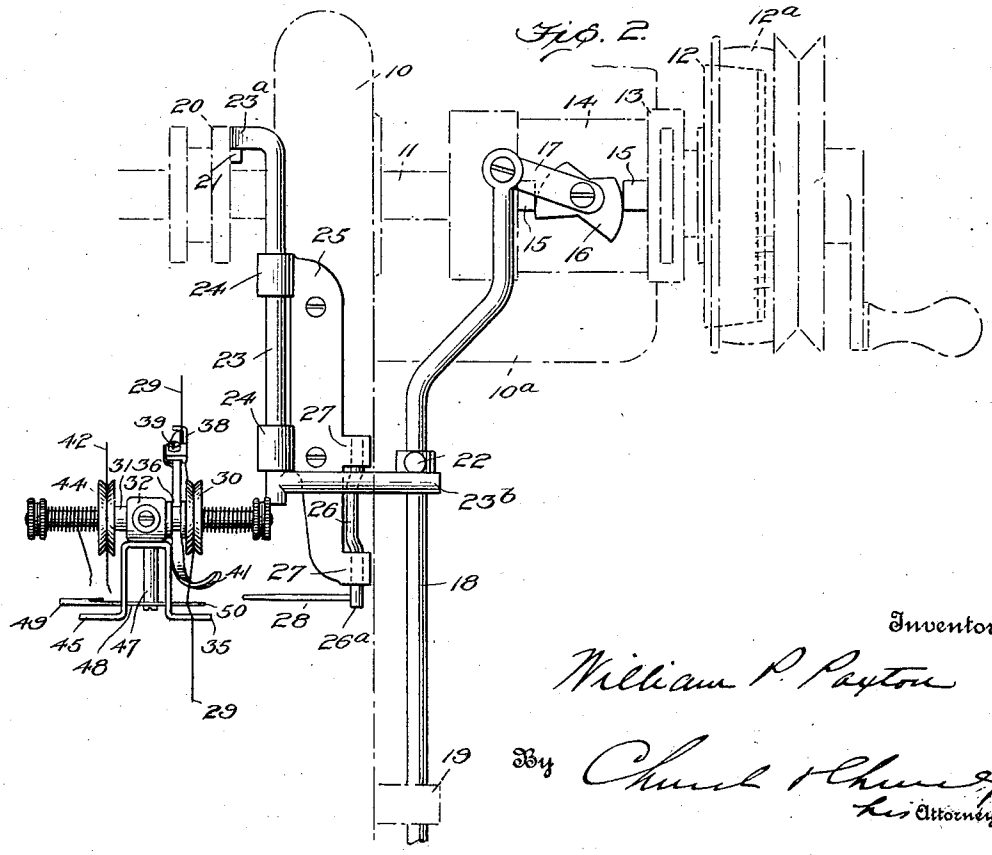


Fig. 2.



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Fig. 3

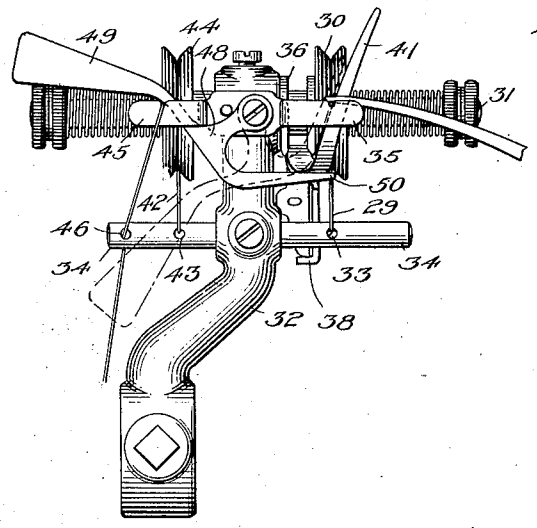


Fig. 4

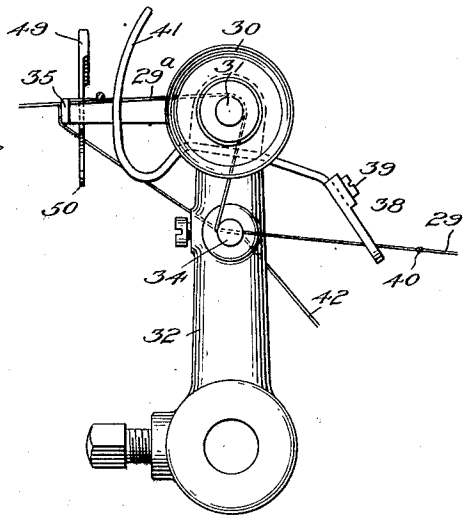


Fig. 5

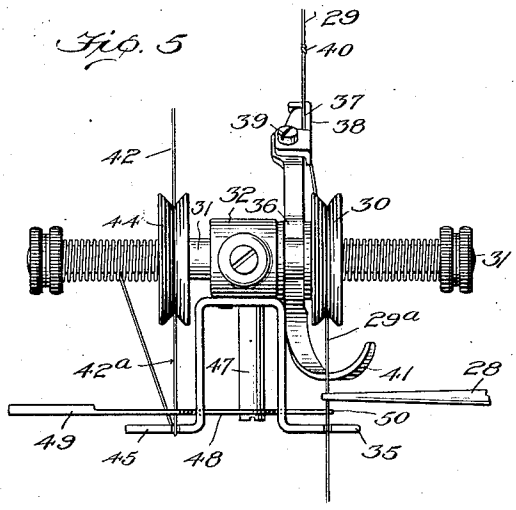
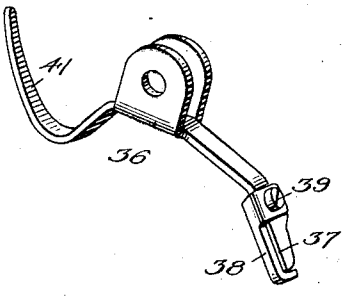


Fig. 6



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UNITED STATES PATENT OFFICE

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STOP MECHANISM FOR SEWING MACHINES

Application filed December 21, 1927. Serial No. 241,596.

This invention relates to improvements in stop mechanism for sewing machines, the present embodiment of the invention being particularly designed and adapted for use in connection with that class or type of sewing machines commonly known as "dial loopers."

An object of the invention is the provision of a stop motion attachment which may be readily attached to or detached from the ordinary or conventional form of dial looper without interfering in any way with the normal operation of the latter.

In the dial looper machine, there is, as is well known, a thread which is fed to the needle of the machine and a second thread that is fed to the looper or that member of the actual stitching devices which forms a loop through which the needle thread is carried. Stop mechanisms operable upon depletion or breakage of this needle thread have heretofore been proposed but there has, usually, been no means for rendering the stop mechanism operative in the event of breakage or depletion of the looper thread. For this reason the present invention is more particularly directed to the provision of the stop mechanism that may be rendered operative upon depletion or breakage of either the looper thread or the needle thread.

More specifically, the present invention contemplates the stop mechanism including a trip device normally supported in inoperative position on the needle thread, said trip being adapted to fall by gravity to a position to render the stop mechanism operative upon breakage or depletion of the thread or upon occurrence of a knot in the thread. When the thread breaks the trip will, of course, be free to fall, and when a knot occurs in the thread said thread is deflected so as to move from beneath the trip, thereby permitting the latter to fall. In the present instance, means are also provided for deflecting the needle thread from beneath said trip when the looper thread breaks or becomes depleted. Preferably, this latter means consists of a member pivoted intermediate its ends with one end supported on the looper thread and its opposite end positioned to engage and deflect the needle thread from beneath the tripping device when the looper thread is broken or depleted.

With these and other objects in view the present invention consists in certain novel details of construction and combinations and arrangements of parts, all as will be herein after more fully described and the novel features thereof particularly pointed out in the appended claims.

In the accompanying drawings,—

Figure 1 is a top plan view of a sewing machine of the dial looper type equipped with stop mechanism constructed in accordance with the present invention, the old or conventional machine parts being shown in dotted lines.

Fig. 2 is a top plan view of the looper equipped with the stop mechanism, the parts being shown in their connected, fully shifted, clutch releasing, position as upon the occurrence of a broken thread.

Fig. 3 is an end elevation of the attachment, showing the trip devices for rendering the stop mechanism operative.

Fig. 4 is a side elevation of the parts shown in Fig. 3.

Fig. 5 is a top plan view of the same.

Fig. 6 is a perspective view of the knot detector for deflection of the thread, supporting the trip device of the stop mechanism.

In Figs. 1 and 2 the present attachment is shown applied to a sewing machine of ordinary dial looper type having a bed plate on which the usual overhanging dial supporting arm 10 is mounted. The machine is provided with suitable driving and clutch shifting mechanism consisting, in the present instance, of a driving shaft 11 mounted on the bed plate and extending through the base portion of the overhanging arm 10 at right angles thereto.

The clutch driving mechanism comprises relatively, circumferentially, fixed and movable clutch members 12, 12[a], respectively, on the end of the driving shaft 11. Longitudinally movable but circumferentially fixed clutch member 12 is movable or shiftable by means of a slide or shift member 13 operat-

ing in a sleeve or guard 14 and provided with spaced bearing members 15 adapted to be positively moved to and from the relatively engaged and disengaged positions by means of an interposed cam 16 horizontally movable on a suitable bearing, said cam being provided with an actuating arm or lever 17.

The clutch shifting mechanism includes a longitudinally movable clutch shifter 18, consisting preferably of a shifter rod extending forwardly and parallel with overhanging arm 10 and supported in a suitable guide bracket 19. As a means for positively actuating the clutch shifter mechanism when the stop mechanism hereinafter referred to is brought into action, the driving shaft 11 is provided at one side with the drive wheel 20 which, in the present instance, is in the form of a rotary channel-shaped member having a driving pin or projection 21. The clutch shifter member or rod 18 is also provided with a sleeve or projection having a stud 22 thereon adapted to be engaged by the thread controlled link of the stop mechanism when said link is engaged by the abutment or projection 21 of the drive wheel 20 all as will hereinafter be more fully described.

A link device adapted, when in one position, to clear the said driving and clutch mechanism, and when in another position, to connect therewith and shift said clutch mechanism to open the clutch to stop the driving mechanism, as well as the various devices connected therewith, is provided, the same preferably consisting of a longitudinally and transversely movable link 23, whose body portion may take the form of a rod or shaft, journaled in suitable bearings 24 of a supporting and attaching plate 25. In the present instance, plate 25 is attached at the top with overhanging arm 10 by means of suitable fastening elements such as ordinary screws. The rod or link 23 is readily movable longitudinally in its bearings and is also free to be rocked or tilted through the control arms or levers to be now described. The relatively movable link 23 is provided at one end with a depending arm or lever 23^a and at the other end with a horizontally extending arm or lever 23^b, the latter extending above the clutch shifter 8 and the projection 22 carried thereby, the position of said lever 23^b being such that when it is permitted to drop somewhat, as will hereinafter be described, it will be in a position to engage said projection 22. Referring to Fig. 1 it will be noted that lever 23^a is to one side of the path of movement of the projection 21 on wheel 20 and it will be understood that lever 23^b is in a position above projection 22, as just described. In other words, this is the inoperative position of the connections. As a means for holding the link 23 with its arms or levers 23^a and 23^b in this inoperative or neutral position with respect to the driving and clutch shifting mechanism during the normal sewing operation, a suitable thread controlled or trip mechanism is provided consisting, in the present instance, of a cam member 26 pivotally mounted at one side of the attaching plate 25 and arranged to engage beneath the arm 23^b. In its normal position member 26 is adapted to sustain the arms 23^a and 23^b in their neutral positions, (Fig. 1) and in another position said arms are adapted to be engaged by the projection 21 and to engage and shift the clutch shifter 18 as shown in Fig. 2. This cam member 26 may be of any suitable form. For instance, it may be formed as an offset portion of a shaft 26^a journaled in bearings 27 on the plate 25, said cam or shaft being provided with a horizontally extending arm 28 having its free end normally sustained or supported by the needle thread 29 at a point just beyond where the thread passes through the tension device or disk 30 arranged on the disk stud 31. The thread tension device may be of the usual construction, as shown, and mounted on the usual tension post or pedestal 32. The needle thread 29 after passing through the tension disk 30 and an opening or eye 33 in a post 34 carried by pedestal 32 is led from the tension disk 30 over a thread guide 35 after which it is passed down to the sewing mechanism. By being so arranged a horizontal taut portion 29^a is maintained between the thread tension disk and the thread guide 35 for conveniently supporting the thread controlled arm 28 of the cam member 26.

With this arrangement it will be appreciated that upon depletion or breakage of the needle thread 29 the arm 28 of cam member 26 will be free to fall by gravity, turning the offset portion of the cam member 26 as indicated in Fig. 2, whereupon the link member 23 will be free to turn in its bearings to connect the shifter rod 18 with the drive wheel 20 as also illustrated in said figure. As a means for causing these parts to function in the same manner upon the occurrence of a knot in the needle thread, a thread controlled knot catcher and trip device is provided. Preferably, said device consists of an oscillatory member 36 adapted to rock on the disk stud 31, said member 36 being provided at one end with a knot catcher consisting of a slot 37 formed between the end portion of said member and a plate 38 positioned to one side of said member and attached thereto by suitable fastening means such as a screw 39. As a means of engaging and deflecting the taut thread portion 29^a away from the thread sustaining trip arm 28, in the event of a knot 40 coming into engagement with the knot catcher, the thread controlled or actuated member 26 is provided at its opposite end, located near the arm 28, with an upwardly and outwardly disposed thread intercepting and moving portion 41. Upon engagement

of a knot in the knot catcher, member 36 will be turned on its pivotal center and its end portion 41 raised with the result that the taut portion 29^a of the thread will be deflected to such an extent as to clear the end of the trip arm 28, thereby allowing the latter to drop with result that the stop mechanism will be rendered operative as in the case of the thread becoming depleted or broken. Practically all of the structure thus far described is fully shown and described in Patent No. 1,677,673, dated July 17, 1928, and assigned to applicant's assignee.

The mechanism heretofore described has to do with rendering the stop mechanism operative upon depletion or breakage of the needle thread or upon occurrence of a knot in that thread. In the present construction, however, additional means are provided for rendering this stop mechanism operative upon depletion or breakage of the looper thread 42. As shown, looper thread 42, is passed through an opening 43 in the post 34 and thence over the tension disk 44 on post 31. From the tension disk it passes over the guide 45 and thence to another opening 46 in post 44. In this way a taut portion 42^a is maintained between the tension disk 44 and the guide 45. Mounted on the pedestal 32 is a stub shaft 47 and pivoted on said shaft is a thread deflector 48. Member 48 is pivoted intermediate its ends and its heavier end 49 normally rests on the taut portion 42^a of the looper thread 42, while its opposite and lighter end 50 is so positioned with respect to the taut portion 29^a of the needle thread that when the looper thread is broken or becomes depleted the end 49 of said deflector will drop and its end 50 will be elevated, engaging the taut portion 29^a of the needle thread and moving it to one side so as to clear the trip arm 28, permitting the latter to fall or drop. This, as before described, results in the stop mechanism being rendered operative. With this arrangement it will be seen that upon either the looper thread or the needle thread becoming broken or depleted, the stop mechanism will be rendered operative by the falling of trip arm 28 and, likewise, upon occurrence of a knot in the needle thread, said stop mechanism will also be rendered operative.

What I claim is:

1. In a sewing machine adapted to utilize a needle thread and a looper thread, the combination with a drive and drive control, of a stop motion mechanism comprising a trip device having an element supported in inoperative position by the needle thread, and means engaging the looper thread and movable into engagement with the needle thread upon depletion or breakage of the looper thread for deflecting the needle thread to a position to clear said trip device element.

2. In a sewing machine adapted to utilize a needle thread and a looper thread, the combination with a drive and drive control, of a stop motion mechanism comprising a trip device having an element supported in inoperative position by the needle thread, and means supported by the looper thread and movable to deflect the needle thread from beneath said trip device element upon breakage or depletion of the looper thread.

3. In a sewing machine adapted to utilize a needle thread and a looper thread, the combination with the drive and drive control, of a stop motion mechanism comprising a trip device adapted to be rendered operative upon depletion or breakage of the needle thread, and means engaging the looper thread at a point in advance of the needle and operable through the needle thread to render said trip device operative upon depletion of the looper thread.

4. In a sewing machine adapted to utilize a needle thread and a looper thread, the combination with the drive and drive control mechanism, of a stop motion mechanism including a thread control device for controlling said drive control mechanism, said thread control device embodying an element normally supported in neutral position by the needle thread, means engageable by a knot in the needle thread for deflecting the said thread and moving it from the position in which it normally supports said element, and means operable by gravity upon depletion or breakage of the looper thread for likewise deflecting said needle thread.

5. In a sewing machine adapted to utilize a needle thread and a looper thread, the combination with the drive and drive control, of a stop motion mechanism comprising a trip device having an element supported in inoperative position by the needle thread, thread deflecting means operable by occurrence of a knot in the needle thread for moving said thread from the position in which it supports said trip device element, and a second thread deflecting member supported at one end on the looper thread and movable by gravity upon depletion or breakage of said looper thread to move said needle thread from the position in which it normally supports said trip device element.

6. In a sewing machine adapted to utilize a needle thread and a looper thread, the combination with the drive and drive control, of a stop mechanism comprising a trip device having an element supported in inoperative position by one of said threads, whereby said trip will be rendered operative upon depletion or breakage of the thread by which said element is normally supported, and means engaging the other thread in advance of the needle for rendering said trip operative upon breakage or depletion of said other thread.

7. In a sewing machine adapted to utilize a needle thread and a looper thread, the com-

bination with a drive and drive control, of a stop motion mechanism comprising a trip device having an element supported in inoperative position by one of said threads, said element being movable to operative position upon breakage or depletion of the thread by which it is supported, and means normally engaging the other thread and movable into engagement with the first mentioned thread at a point in advance of the needle for rendering said element operative upon breakage or depletion of said other thread.

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