Nov. 8, 1949 W. T. MAXANT 2,487,718

STOP MOTION MEANS FOR SEWING MACHINES

Original Filed May 20, 1940 2 Sheets-Sheet 1

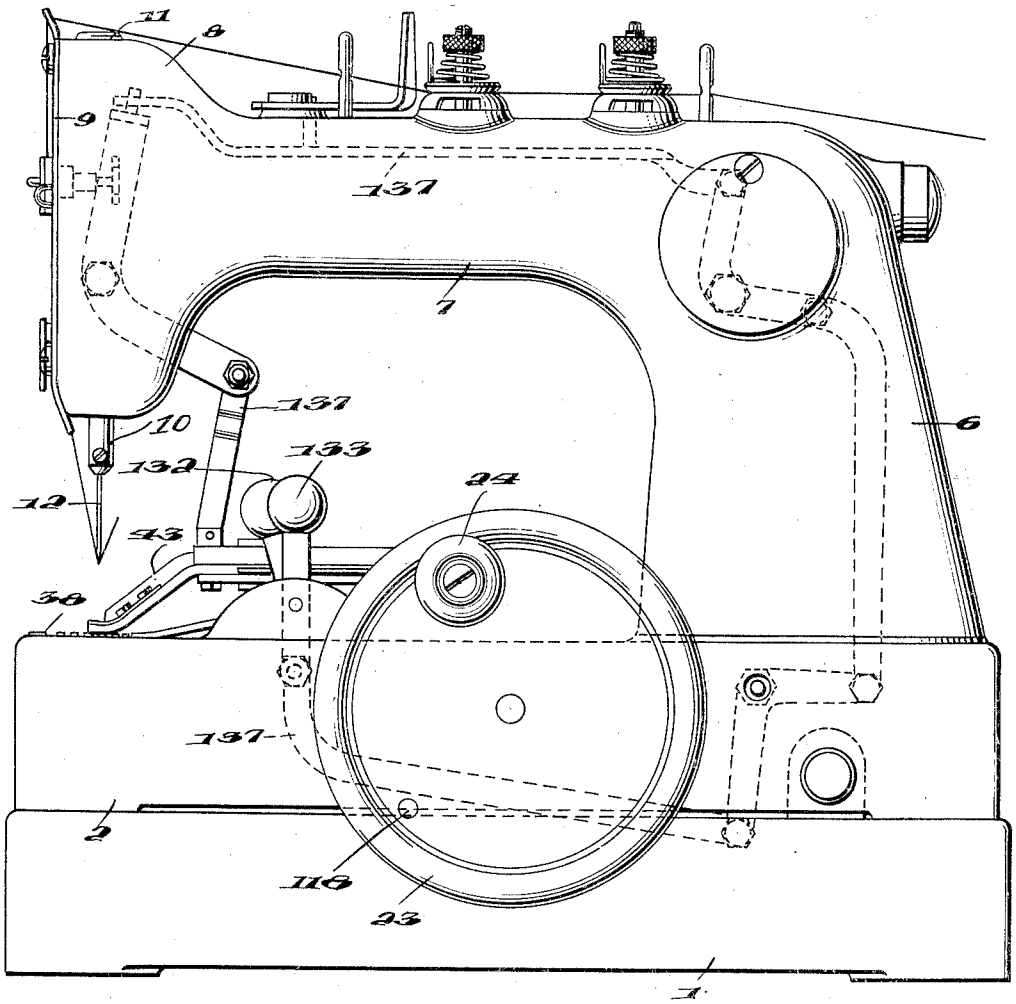


Fig. 1.

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Fig. 2.

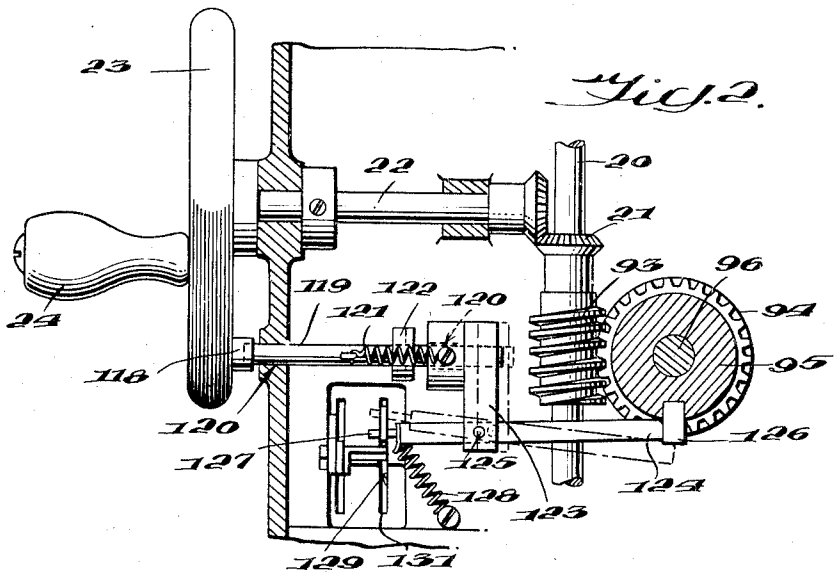


Fig. 3.

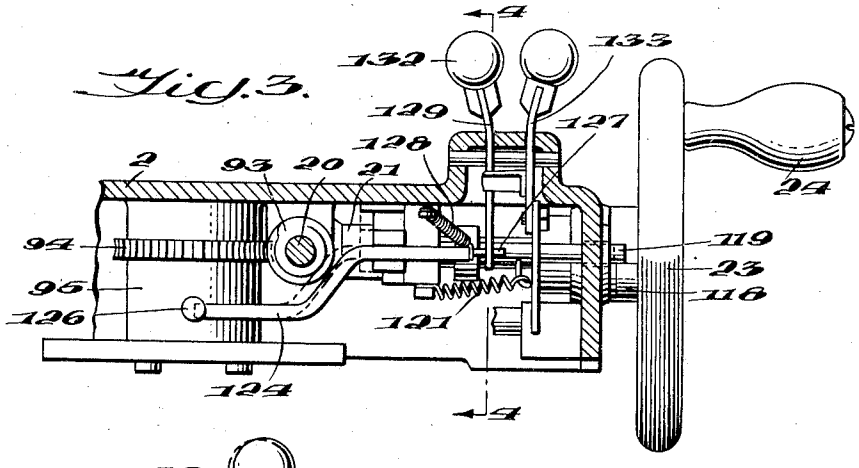
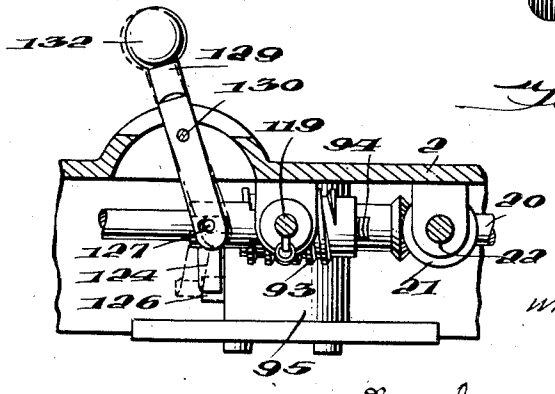


Fig. 4.



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STOP MOTION MEANS FOR SEWING MACHINES

William T. Maxant, Ayer, Mass.

Original application May 20, 1940, Serial No. 336,248. Divided and this application December 3, 1943, Serial No. 512,693

6 Claims. (Cl. 112—219)

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This invention relates to an improvement in stop motion means for button sewing machines of the character used for sewing buttons on work of various kinds, particularly cloth and various articles of clothing.

This application is a division of my prior application on Button sewing machines, Serial No. 336,248, filed May 20, 1940, now Patent No. 2,383,875, granted August 28, 1945.

The principal object of the invention is to improve the stop motion means of machines of this character, to simplify its construction, reduce the cost of manufacture, while yet providing for the efficient and effective application of buttons, either of the two-hole or four-hole type, to work, by the manual actuation of the machine by the operator.

The principal improved feature of the machine is an improved and efficient stop motion for the machine acting on a gear attached to the drive shaft and on the hand wheel providing for the effective control of the machine at the end of the sewing operation, which is nevertheless released for repeat operation by a handle or lever which operates through the top of the base frame.

Many other improved features are incorporated in the machine relating to the various operating parts of the mechanism, the assembly thereof and the manner of handling the work in the operation.

These features are incorporated in a preferred embodiment of the invention illustrated in the accompanying drawings, in which—

Fig. 1 is a side elevation of a sewing machine with the improved stop motion means operatively associated therewith;

Fig. 2 is a detail horizontal sectional view in bottom plan with parts in elevation, of the machine stop motion;

Fig. 3 is a vertical sectional view therethrough; and

Fig. 4 is a similar view at right angles thereto, substantially on the line 4—4 of Fig. 3.

Referring to the drawings in detail, the machine is designed for manual operation and is adapted to be supported on a table, workbench, or the like, for which purpose it is provided with a supporting machine bed designated generally by the numeral 1. Mounted on the machine bed 1 is a hollow base 2.

The base 2 has mounted on one end thereof an upstanding standard portion 6 of a sewing machine arm, from the upper end of which standard 6 extends the lateral arm portion 7, carrying at the free end thereof the usual sewing head 8.

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These parts comprising the standard 6, arm portion 7 and sewing head 8 are preferably cast integral, and either secured rigidly to the base 2, or cast integral therewith. The outer side of the sewing head 8 is usually open, but closed by a cover plate 9.

The sewing head 8 has the usual needle bar 10, mounted therein in a guide sleeve 11 for reciprocating movement, carrying a needle 12 at the lower end thereof.

For the purpose of reciprocating the needle bar 10 axially thereof, link connections and intergeared shafting extend through the arm portion 7 and standard 6, and are operated by a drive shaft 20 that extends horizontally in the base 2 and is journaled in bearings therein. The drive shaft 20 is connected through bevel gearing 21 (Fig. 2) with a jack shaft 22, extending at right angles thereto through a side of the base 2, within which said jack shaft is journaled. A hand wheel 23 is fixed to the outer end of the jack shaft 22, externally of the base 2, as shown in Figs. 1, 2 and 3, and said hand wheel 23 is provided with a projecting handle 24 thereon in position to be grasped by the operator at one side of the machine to rotate the hand wheel 23 and operate the drive shaft 20 and the several parts of the machine to accomplish the sewing operation.

The forward end of the drive shaft 20 carries the usual rotary looper that cooperates with the needle 12 in performing the sewing operation.

The base 2 has a cloth plate 38 fixed thereon adapted to receive the fabric to which the button is to be applied. Mounted on the base 2 above the cloth plate 38 is a button clamp, generally designated at 43, adapted to hold a button in proper position to be stitched onto the cloth. This button clamp 43 is adapted to be operated in properly timed relation with the sewing operation, as described and claimed more in detail in my application Serial No. 336,248, filed May 20, 1940, now Patent No. 2,383,875. The button clamp 43 is also adapted to be raised and lowered by linkage extending through the base 2 and through the standard 6 and arm 7, as generally indicated at 137, which linkage is connected with a manually shiftable lever 133 pivotally mounted in the base 2.

The drive shaft 20 also carries a worm 93 which meshes with a worm gear 94 having an elongated hub 95 journaled on a pin 96 rigidly fixed to the top of the base 2, as shown in Fig. 3, for controlling the action of the stop motion mechanism.

At the completion of the button stitching cycle, provision is made for automatically stopping the

machine with the needle elevated or withdrawn from the button to permit ready removal of the material and button from the machine. For this purpose, the hand wheel 23 is provided with an inwardly extending stop pin 118 in position to be engaged by a sliding bolt 119 (Figs. 2 and 3) mounted in bearings 120 in the base 2. A coiled spring 121 is connected with one of the bearings 120 and with the bolt 119 tending to hold said bolt in a retracted position as indicated in dotted lines in Fig. 2, where it is withdrawn out of the path of movement of the stop pin 118, and an abutment 122 is secured on the bolt 119 in position to engage a side of the bearing 120 and limit the inward movement of the bolt relative thereto.

The inner end of the bolt 119 is rigidly secured to a yoke 123 which extends laterally therefrom and receives therein a lever 124 which is pivoted in the yoke at 125, intermediate the ends of said lever. One end of the lever extends in position to be engaged by a pin 126, rigidly fixed to the hub 95, while the opposite end of said lever has a reduced portion 127, with which a coiled spring 128 is connected, which coiled spring normally tends to swing the lever 124 to the full line position shown in Fig. 2, in which the inner end thereof is in position to be engaged by the pin 126 on the hub 95. Thus, the hub 95 may be rotated through a complete revolution by a turning movement of the hand wheel 23, during which said hand wheel will be turned through several revolutions but at the completion of the single revolution of the hub 95, its pin 126 will engage the inner end of the lever 124 and move said lever lengthwise bodily to thereby slide the bolt 119 outwardly from the base frame 2 into the path of the stop pin 118 and thus limit the turning movement of the hand wheel 23 and of the operating shaft 20. These parts are arranged so that the operating shaft is stopped when the needle is in its elevated position withdrawn from the button and cloth.

For releasing the bolt 119, a handle lever 129 is provided as shown in Fig. 4, which handle lever is pivoted at 130 and extends through a slot 131 in the top of the base frame 2, being provided with a knob 132 on the upper end thereof. The lower end of the handle lever 129 engages pivotally with the reduced end 127 of the lever 124, the connection being loose to permit lengthwise movement of said reduced end through an orifice in the handle lever 129 to accommodate for the lengthwise movement of the lever 124. The hand lever 129 may be moved to swing the lever 124 from the full line position in Fig. 2, to the dotted line position therein, upon which swinging movement the spring 128 is arranged to pull inwardly on said lever 124 to carry its inner end partially over the end of the pin 126 and thus release it from engagement by the pin which is facilitated by the inward pull of the coiled spring 121, which acts to withdraw the bolt 119 inwardly, out of the path of the stop pin 118.

To recapitulate, with the lever bar 124 in the full-line position in Fig. 2, the rotation of the gear 94 by the hand wheel 23 causes the movement of the pin 126 into contact with the end of the lever bar 124, moving the latter endwise to the left in Fig. 2. The lever bar 124 is connected by the block 123 with the bolt 119. Thus, the aforesaid movement of the lever bar 124 pushes the bolt 119 forward so that its outer end projects into the path of the stop pin 118 on the hand wheel, thereby blocking further rotation of the hand wheel.

When the operation of the machine is thus blocked, a forward pull on the lever 129 will swing the lever bar 124 on its pivot 125 to disengage the end of said lever bar 124 from the pin 126. The spring 121 acting on the bolt 119 tends to move the same, and also the lever bar 124, endwise to the dotted line position in Fig. 2, when the lever bar is thus released by the pin 126. This action causes the lever bar 124 to overlie the end of the pin 126, bearing thereagainst. In this position, the bolt 119 remains out of blocking position, and the machine may be operated then by the hand wheel through another revolution. As the pin 126 rotates from under the lever bar 124, the spring 128 will act to move the free end of the lever bar 124 back against the hub 95 of the gear where it will be in position for reengagement by the pin 126 upon completion of said revolution, repeating the stop action as described.

Before starting the sewing operation, the material is placed beneath the button clamp upon the cloth plate 38 when the button clamp is in an elevated position. The button is then inserted into the clamping jaws of the button clamp 43, and the handle lever 133 is moved in a clockwise direction in Fig. 1 to lower the button clamp onto the work.

The hand wheel 23 is then rotated by the operator (the bolt 119 having been previously withdrawn upon the raising movement of the button clamp), the drive shaft 20 is operated to accomplish the stitching of the button material, in the usual way. The needle is manipulated and a predetermined number of stitches are placed alternately through the holes of the button as the button is shifted by movement of the thread clamp. With a four-hole button, a predetermined number of stitches are placed alternately through one pair of holes in the button, then the button is moved automatically to present the other pair of holes and the stitching is continued until just before the completion of the stitching cycle when the button is shifted back to the first pair of holes, the needle taking two strokes through one hole at the completion of the cycle to provide the knotting stroke.

The complete sewing cycle involves rotation of the hand wheel 23 through a sufficient number of turns to accomplish the desired sewing operation, whereupon the pin 126 on the hub of the worm gear 94 shifts the sliding bolt 119 into the path of the stop pin 118, attached to the hand wheel 23 and stops the sewing operation just after the knotting stitch has been formed and with the needle raised to an elevated position out of the work and button.

Thereafter, the operator merely pulls forward on the handle lever 133 to raise the button clamp. The work may then be removed or shifted to another position ready for the sewing of another button.

The structure and operation of this raising and lowering means are claimed in my application, Serial No. 336,248, filed May 20, 1940, now Patent No. 2,383,875.

I claim:

1. In a sewing machine, the combination with a rotary device adapted to make a predetermined number of revolutions, of a stop motion mechanism therefor comprising a bolt slidably mounted for movement to a projected position in the path of rotation of said rotary device, resilient means connected with the bolt normally tending to withdraw the same, a lever, means mounting said lever on the bolt for pivotal movement and for

lengthwise bodily movement to slide the bolt to a projected position, means connected with an operative part of the sewing machine for bodily moving said lever lengthwise in one direction against the tension of said resilient means for projecting movement of the bolt, yieldable means normally urging said lever toward said operative part for engagement by said last means, and a hand lever operatively connected with the first mentioned lever for releasing said lever from said last mentioned means whereby the bolt may be withdrawn by the first mentioned resilient means.

2. In a sewing machine having a rotary member and a rotary power device for operating said rotary member, the combination of stop motion mechanism therefor comprising a slidable bolt mounted for movement into the range of a portion of the power device for stopping said power device, yieldable means connected with the bolt for normally retracting the bolt, a lever bar pivotally connected with said bolt, and means connected with said rotary member for engaging the lever bar and moving said bar and the bolt.

3. In a sewing machine having a rotary member and a rotary power device for operating said rotary member, the combination of stop motion mechanism therefor comprising a slidable bolt mounted for movement into the range of a portion of the power device for stopping said power device, yieldable means connected with the bolt for normally retracting the bolt, a lever bar pivotally connected with said bolt, means connected with said rotary member for engaging the lever bar to move said bar and the bolt, and means operatively connected with said lever bar for swinging the same out of engagement with the engaging means.

4. In a sewing machine having a rotary member and rotary power device for operating said rotary member, the combination of stop motion mechanism therefor comprising a slidable bolt, guiding means for said bolt, means for normally holding the bolt in retracted position, a support attached to the bolt and extending laterally therefrom, a lever pivotally mounted on said support, means connected with the rotary member for bodily moving the lever to move the support and bolt, and means for swinging the lever relative to said moving means.

5. In a sewing machine having an enclosed base with a top wall, a rotary member and a rotary power device for operating said rotary member, the combination of stop motion mechanism therefor, comprising a slidable stop member, guiding means for said stop member, means normally holding the stop member in retracted position, means operatively connected with the stop member and operated automatically in timed relation to the rotation of the rotary member for causing projecting movement of the stop member into restraining relation with the rotary member, a hand lever projecting upwardly in upstanding relation through the top of the base with a hand grip portion thereabove and pivotally mounted in the base for forward and backward swinging movement, and means connecting the lower end of said lever with the means for projecting the stop member to release said means upon swinging movement of the lever in one direction for withdrawing action of the stop member.

6. A stop motion mechanism for a sewing machine including a rotary power device adapted to make a plurality of rotations in a sewing cycle and a rotary member operatively connected with the power device for operation thereby and adapted to make a single rotation in said sewing cycle, said stop motion mechanism comprising a stop member mounted for movement into the path of the power device, resilient means normally tending to withdraw said stop member, a lever, means pivotally mounting said lever intermediate the ends thereof and connecting the lever with the stop member, means connected with the rotary member engaging one end portion of said lever for actuating the lever to project the stop member, and means for releasing the lever from said engaging means to withdraw the stop member by the action of the resilient means.

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