March 30, 1937. H. GUNTHER 2,075,759

STOP-MOTION DEVICE FOR SEWING MACHINES

Filed June 27, 1935 2 Sheets-Sheet 1

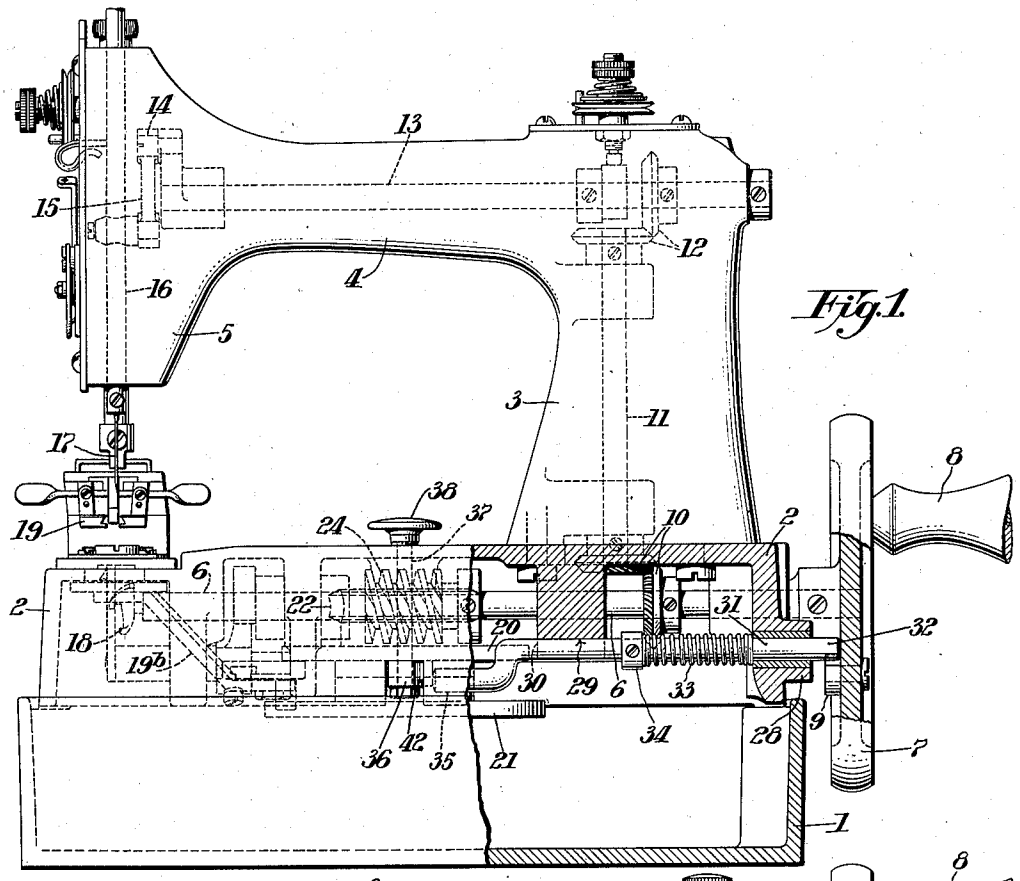


Fig. 1.

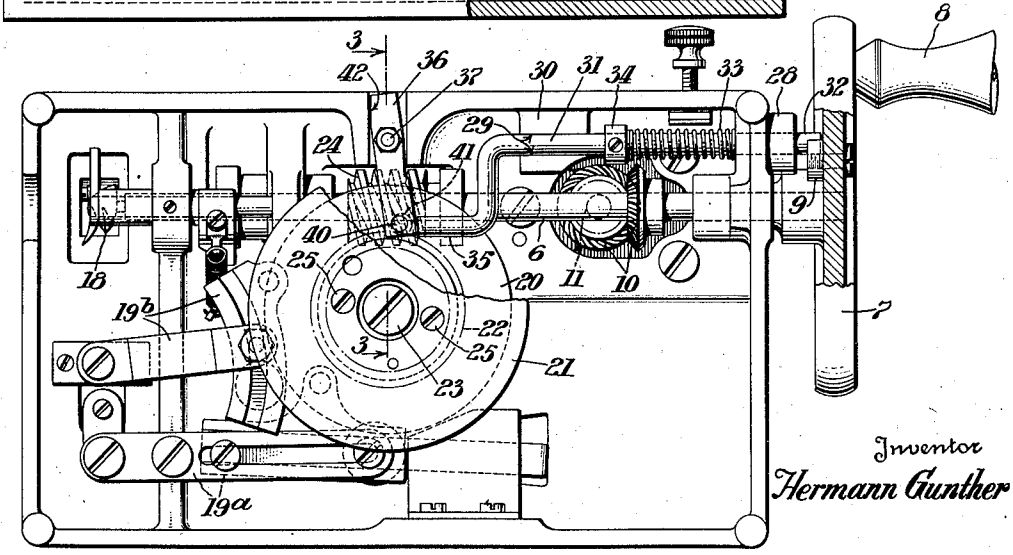


Fig. 2.

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STOP-MOTION DEVICE FOR SEWING MACHINES

Filed June 27, 1935 2 Sheets-Sheet 2

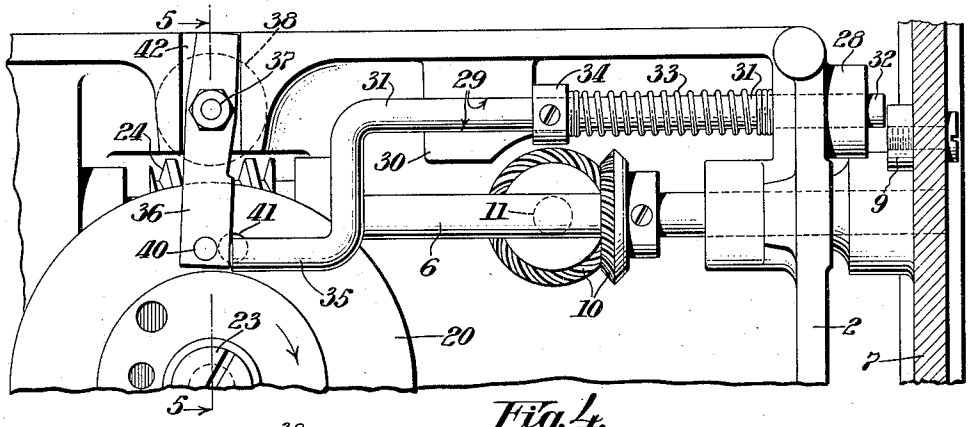


Fig. 4.

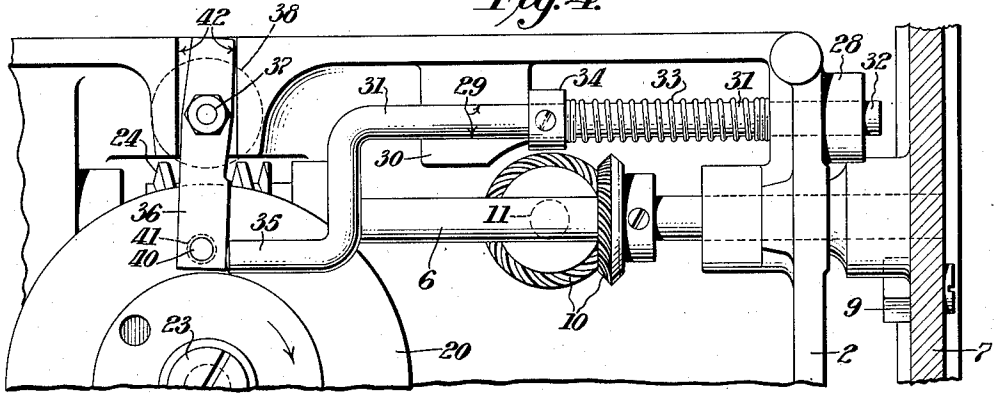


Fig. 6.

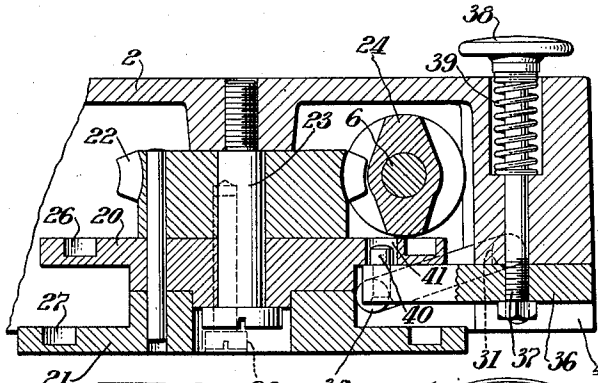


Fig. 3.

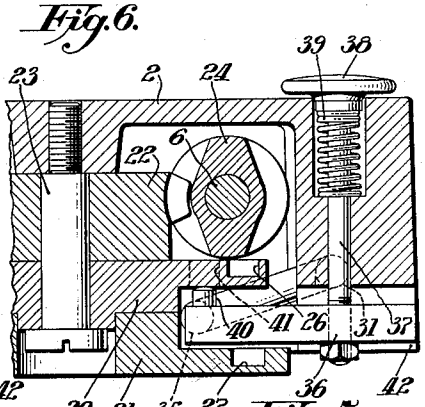


Fig. 5.

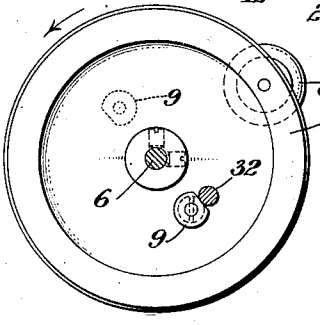


Fig. 7.

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UNITED STATES PATENT OFFICE

2,075,759

STOP-MOTION DEVICE FOR SEWING MACHINES

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Application June 27, 1935, Serial No. 28,651

2 Claims. (Cl. 112—219)

This invention relates to sewing machines, more particularly of the type adapted to sew a group of stitches in a predetermined order or arrangement. Machines of this type are usually provided with stitch-forming mechanism including a reciprocatory needle, a work-clamp, and a feed-cam and connections for relatively moving the stitch-forming mechanism and work-clamp to place a predetermined number of stitches in the desired order or arrangement. Such machines are commonly used for sewing on buttons, tacking and barring operations, attaching labels, etc.

The invention has for an object to provide a sewing machine of the general type in question with a simplified, compact and effective device to stop the machine at the completion of a predetermined number of stitches or when the group-stitching cycle of operations is completed.

The invention also aims to provide a simplified stop-motion device for a hand-driven sewing machine which positively prevents over-driving or over-running of the machine, without danger of cramping or unduly straining any of the parts of the machine.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations, and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

Fig. 1 is a front side elevation of a sewing machine embodying the invention with the parts in stopping position. Fig. 2 is a bottom plan view of the machine with the parts in stopping position. Fig. 3 is an enlarged sectional view substantially on the line 3—3, Fig. 2. Fig. 4 is an enlarged bottom plan view of the stop-motion parts tripped to running position. Fig. 5 is a section substantially on the line 5—5, Fig. 4. Fig. 6 is a bottom plan view similar to Fig. 4, but at a time near the close of a sewing cycle when the feed-cam is first engaged by the stop-mechanism preparatory to movement of the parts to stopping position, Fig. 2, and Fig. 7 is an inner face view of the hand-wheel showing the stop-element in dotted lines at the period of the cycle shown in Fig. 6, and in full lines at the period of the cycle shown in Fig. 2.

The machine comprises a supporting pan 1 upon which rests the machine bed 2 from which rises the standard 3 of the overhanging bracket-arm 4 terminating in the head 5. Journaled in the bed 2 is the main shaft 6 to which is fixed the hand-wheel 7 carrying the hand-driving crank 8 and the stop-lug 9. The main shaft is geared at 10 to the vertical shaft 11 which is geared at 12 to the upper horizontal shaft 13 having at its forward end the crank 14 connected by the link 15 to the reciprocatory needle-bar 16 carrying the needle 17 of the stitch-forming mechanism. Cooperating with the needle 17 in the formation of stitches is the usual rotary chain-stitch looper 18 which is mounted on the forward end of the main shaft 6.

The work-clamp 19 is of the usual construction for holding flat buttons and has stitch-positioning movements imparted to it by the usual connections with the feed-cam disks 20, 21 which are mounted for rotation on the worm-gear 22; the latter being journaled on the stud-screw 23 and slowly driven from the main shaft by means of the worm 24. The feed-cam disks 20, 21, are rigidly secured to the worm-gear 22 by screws 25 and are formed in their upper faces with the feed-cam grooves 26 and 27, respectively.

Through suitable connections 19a, 19b, such as shown in the U. S. Patent application of Harold W. Morris, Serial No. 682,216, filed July 26, 1933, the feed-cams 20, 21 impart the necessary motions to the button-clamp 19 to present the various holes of the button (either two-hole or four-hole) in stitch-receiving position relative to the needle 17.

My improved stop-motion device is a further development of that disclosed in U. S. Patent to Michael McCann No. 2,005,679, dated June 18, 1935, and is preferably constructed as follows:

Slidably mounted in a boss 28 and in a slot 29 in the lug 30 on the bed 2, in parallelism with the main shaft 6, is a stop-element or rod 31 the end 32 of which is movable into and out of the range of the rotary stop-lug 9 on the balance-wheel 7. A coil-spring 33 surrounding the rod 31 and interposed between a wall of the bed 2 and a collar 34 on the rod 31 urges the latter to running position, Fig. 4, in which the end 32 of the rod is out of range of the stop-lug 9 and the collar 34 is in engagement with the side of the guide-lug 30.

The rod 31 is formed at its inner end with an offset portion 35 the end of which is engaged by one side face of an arm 36 fixed to the lower end of a vertical rod 37 mounted in the bed 2 for free sliding as well as rocking movement. The rod 37 carries a push-button 38 at its upper end between which push-button and the bed 2 is in-

terposed a coil-spring 39. The arm 36 carries a pin 40 which, at a predetermined point in the cycle of operations of the machine, snaps into or enters the hole 41 in the feed-cam disk 20. It will be observed that the arm 36 is received within a clearance slot 42 in the bed 2 which slot is somewhat wider than the arm 36 and allows the latter to partake of a limited lateral rocking movement.

The operation is as follows:

With the machine at rest and the parts in the relative positions shown in Figs. 1, 2 and 3, the pin 40 being in the hole 41 in the feed-cam and the stop-rod 31 being within the range of and engaged by the stop-lug 9 on the hand-wheel 7, blocking forward movement of the latter, the operator places a button and material in the work-clamp 19 and then presses downwardly upon the push-button 38.

The down-pressure upon the push-button 38 withdraws the pin 40 from the hole 41 and the spring 33 immediately shifts the stop-rod 31 and arm 36 to the position shown in Figs. 4 and 5 in which the end 32 of the stop-rod is out of range of the stop-lug 9 on the hand-wheel and the pin 40 is displaced to one side of the hole 41 in the feed-cam and cannot reenter such hole when pressure by the operator upon the push-button 38 is relieved. Hence it is not necessary for the operator to hold the push-button depressed until after the hand-wheel 7 has been turned.

The machine is now free to be driven by the operator through a sewing cycle during which the feed-cams 20, 21 make one complete rotation. When the hole 41 has nearly completed its excursion about the axis of the stud 23 and reaches a position in register with the pin 40, Fig. 6, the pin 40 snaps into the hole 41. At the time of this occurrence, the stop-lug 9 on the hand-wheel is about 180° from its final stopping position, as shown in dotted lines in Fig. 7. Continued movement of the hand-wheel 7 causes the feed-cam 20 to drive the parts from the position shown in Fig. 6 to the final stopping position shown in Fig. 2, the stop-rod 31 being projected by lateral movement of the feed-cam-driven arm 36 into the range of the stop-lug 9 on the hand-wheel to block movement of the latter beyond the full-line position shown in Fig. 7.

It will be observed that, in the stopped position of the parts, the arm 36 is clear of the side walls of the slot 42 in the bed 2 and is not cramped against such side walls; the strain of stopping the machine being borne directly by the shaft 6 and not by the feed-cam and worm-gearing 22, 24.

It will be understood by those skilled in the art that modifications may be made in the forms and arrangements of parts shown and described, within the spirit of the invention. The claims appended hereto as defining the scope of the invention are therefore not to be construed as limited to a button-sewing machine or to details of construction and relative arrangements of parts disclosed in the described embodiment of the invention, except in so far as the prior art may require.

Having thus set forth the nature of the invention, what I claim herein is:—

1. A sewing machine having, in combination, a frame, stitch-forming mechanism, a work-clamp, a main shaft, a feed-cam disk geared down from and driven by said main shaft, means actuated by the feed-cam disk to relatively move the switch-forming mechanism and work-clamp to sew a group of stitches, a stop-element rotating with the main shaft, a cooperating spring biased stop-element movable against the resistance of its biasing spring into the path of the first mentioned stop-element, an arm engaged by said cooperating stop-element and mounted in the frame of the machine for swinging movement about a fixed axis and for bodily movement longitudinally of said axis toward and away from the plane of said feed-cam disk, means on said feed-cam disk for swinging said arm about said fixed axis, and manually operated means for moving said arm bodily longitudinally of said axis out of engagement with said feed-cam disk.

2. A sewing machine having a frame including a bed and an overhanging bracket-arm, a main shaft journaled in said bed, a balance-wheel mounted on said shaft and having a stop-lug, a stop-rod cooperatively related to said stop-lug, stitch-forming mechanism incorporated in said frame and driven by said main shaft, a work-clamp, a feed-cam and connections for relatively moving the stitch-forming mechanism and work-clamp to sew a group of stitches, a manually operated spring-biased push-rod slidable vertically in said bed, a push-button carried at the upper end of said rod, an arm extending laterally from the lower end portion of said rod and engaged by one end of said stop-rod, and means on said feed-cam to swing said arm about the vertical axis of said manually operated push-rod to shift said stop-rod to stopping position.

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