W. L. BARRON AND F. E. OSOL.

THREAD CUTTING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED AUG. 3, 1916.

1,336,808. Patented Apr. 13, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

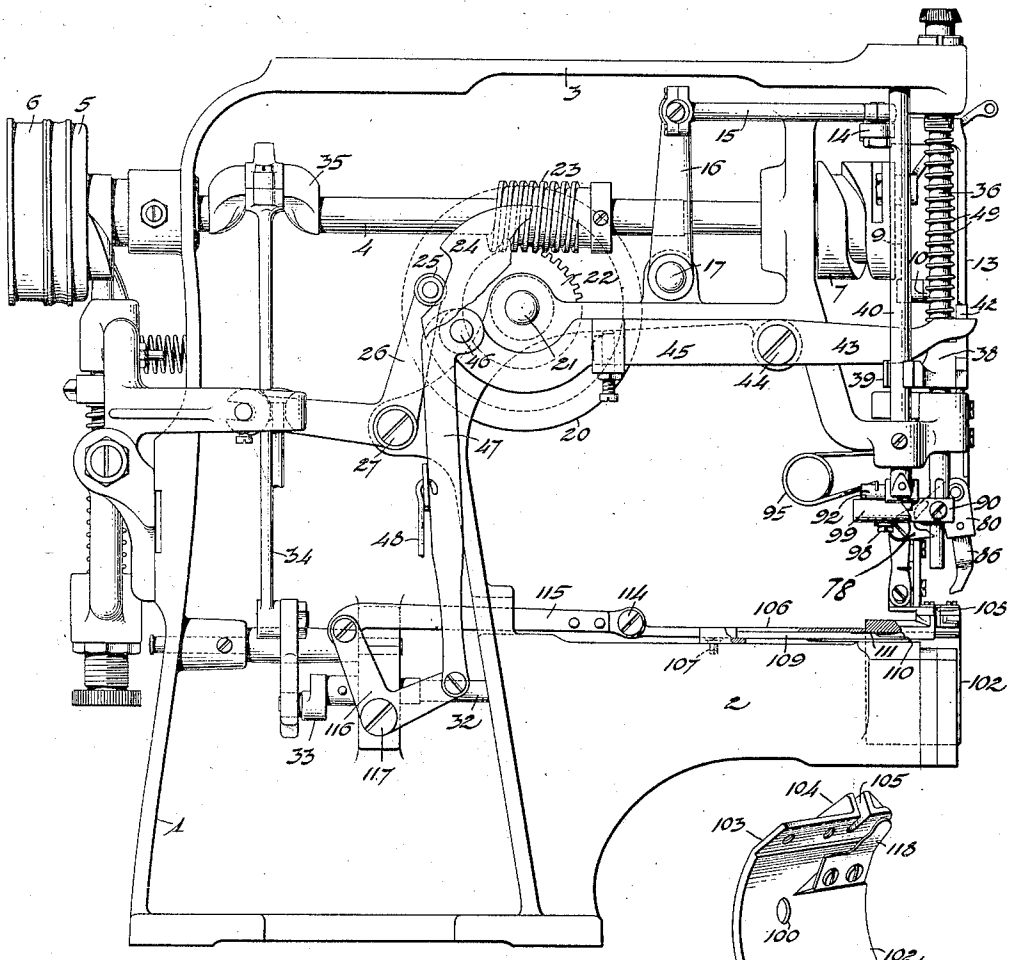


Fig. 4.

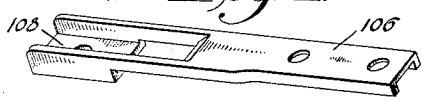
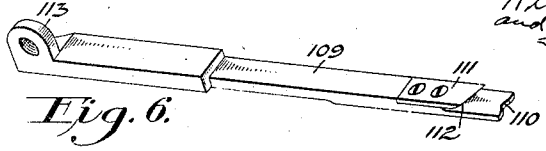


Fig. 5.

Fig. 6.



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2 SHEETS—SHEET 2.

Fig. 2.

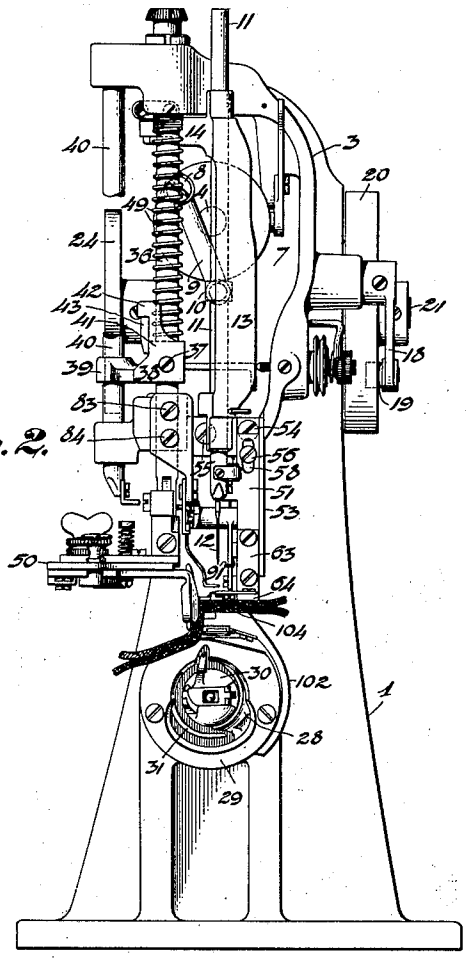


Fig. 3.

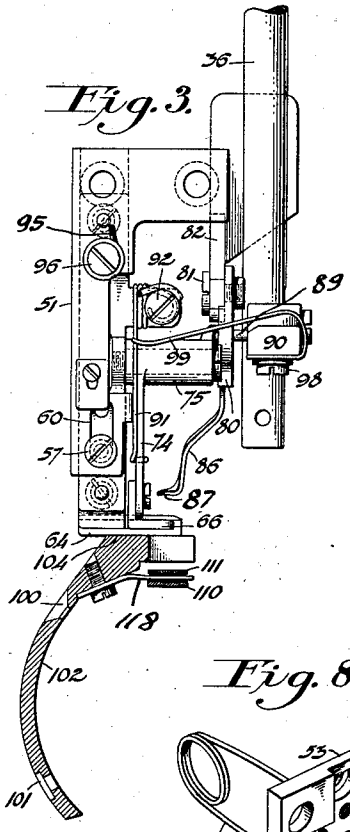


Fig. 8.

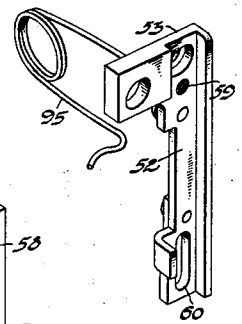


Fig. 9.

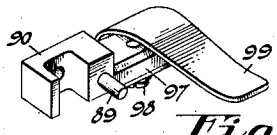


Fig. 10.

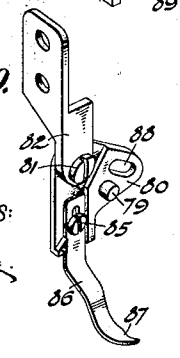


Fig. 11.

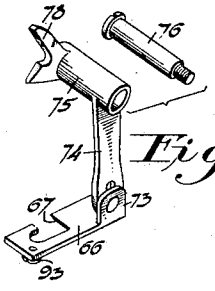
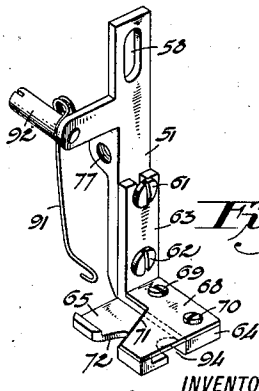


Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM L. BARRON, OF NEW YORK, N. Y., AND FRITZ E. OSOL, OF ELIZABETH, NEW JERSEY, ASSIGNORS TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

THREAD-CUTTING MECHANISM FOR SEWING-MACHINES.

1,336,808. Specification of Letters Patent. Patented Apr. 13, 1920.

Application filed August 3, 1916. Serial No. 112,907.

To all whom it may concern:

Be it known that we, WILLIAM L. BARRON and FRITZ E. OSOL, citizens of the United States, residing, respectively, at New York, in the county of New York and State of New York, and Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Thread-Cutting Mechanisms for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to improvements in thread pull-off and cutting mechanisms for sewing machines and especially for that class of sewing machines in which the mechanism is automatically stopped after production of a predetermined number of stitches, as for example in button sewing machines.

The objects of the present invention are to provide means to lift the work-gripping elements and to pull off a sufficient quantity of the upper and lower threads of a two-thread sewing machine for the beginning of a succeeding sewing operation and to sever said threads.

In its preferred embodiment this improvement has been applied to a button sewing machine employing separate button-holder and presser-foot bars having common lifting means, and comprises a needle-thread pull-off arm, fulcrumed on a bracket sustained by the frame of the machine and actuated by the lifting of the button-holder presser-bar, and a needle-thread severing device supported by the presser-foot bar and actuated by the movement of the pull-off arm. A shuttle-thread pull-off and severing device is provided comprising a bar reciprocable in a suitable guideway of the work-support and actuated by connection with the button-holder and presser-foot lifting means. The forward end of the bar is provided with a thread pull-off portion and backward thereof with a thread-severing knife to first pull off a sufficient quantity of shuttle-thread and then sever the same.

In the accompanying drawings, Figure 1 is a rear side elevation and Fig. 2 a front end elevation of a button sewing machine embodying the present invention. Fig. 3 is a rear view of the presser-foot supporting bracket with the lower-thread cutter sustaining bracket shown in section. Figs. 4 and 5 are detail perspective views of the component parts of the lower-thread cutter guiding and sustaining bracket. Fig. 6 is a detail perspective view of the lower-thread cutter and pull-off bar. Fig. 7 is a detail perspective view of the presser-foot and its supporting bar. Fig. 8 is a detail perspective view of the presser-foot bar guiding bracket. Fig. 9 is a detail perspective view of the presser-foot bar lifting spring and its supporting collar. Figs. 10 and 11 are detail perspective views respectively of the needle-thread pull-off arm and of the needle-thread cutter.

The machine, as shown, is constructed with a frame comprising a hollow standard 1 with the lateral work-sustaining arm or horn 2 and the hollow overhanging arm 3 in which latter is journaled the main-shaft 4 carrying at its rearward end the fast and loose pulleys 5 and 6 and at the forward end the take-up cam cylinder 7. This cam-cylinder is provided with a crank-pin 8 connected by means of the pitman 9 with the usual stud upon the collar 10 fixed upon the needle-bar 11 which carries the eye-pointed needle 12. The reciprocating needle-bar 11 is journaled in the swinging frame 13, fulcrumed within the head of the bracket-arm and provided with a lateral arm 14 operatively connected by means of a link 15 with a lateral arm 16 carried by one end of a rock-shaft 17. The rock-shaft 17 at its opposite end carries an arm 18 having a roller-stud 19 entering a cam-groove formed in a cam-wheel 20. The cam-wheel 20 is carried by a transverse shaft 21 suitably rotated from the main-shaft 4 by means of a worm-wheel 22 and worm 23.

The shaft 21 also carries a stop-motion controlling cam 24, shown partly in full and partly in dotted lines. The surface of the controlling cam 24 contacts with a roller-stud 25 carried by a bellcrank-lever 26, fulcrumed at 27 upon the frame 1 of the machine and suitably connected with an ordinary form of stop-motion device.

Coöperating with the needle 12 is the oscillating shuttle 28 journaled in the race 29 and provided with the thread-case 30. The shuttle is actuated by means of the driver 31

at the forward end of the rock-shaft 32 mounted within the horn 2 and having at its rearward end the crank 33 actuated in a well-known manner by means of the pitman 34 connected with the crank 35 of the main-shaft 4.

The button-holder supporting presser-bar 36 is journaled in the head of the bracket-arm and has adjustably secured thereto by means of the set-screw 37 the collar 38, having a forked arm 39 embracing the guide-rod 40 and the upwardly projecting arm 41 having a lateral lug 42 adapted for engagement by the forward arm 43 of a lifting lever mounted upon the fulcrum screw-stud 44 sustained by the frame of the machine. The lifting lever has a rearwardly extending arm 45 and pivoted thereto by means of the screw 46 is a link 47 to which is attached a rod 48 having suitable connection with a treadle. Surrounding the presser-bar 36 is a spring 49 interposed between the collar 38 and the upper bearing of the bar. The presser-bar 36 sustains the button-holder 50 more fully disclosed in another application filed simultaneously herewith.

The presser-foot supporting presser-bar 51 is mounted for vertical reciprocation in a guideway 52 formed in a bracket 53 secured by means of screws 54 and 55 to the frame of the machine and is slidingly maintained in the guideway by screws 56 and 57, the shank of the screw 56 passing through an elongated slot 58 formed in the presser-bar and entering a threaded aperture 59 formed in the bracket 53, and the screw 57 passing through an elongated slot 60 formed in the bracket and entering a threaded aperture in the rear side of the presser-bar 51. The presser-bar 51 has secured thereto by means of screws 61 and 62 the shank 63 of the presser-foot 64 serving to hold the work in position during the sewing operation and formed with a guideway 65 for the needle-thread severing knife-blade 66.

The knife-blade 66 is provided with a cutting edge 67 and is maintained in the guideway 65 by means of a retaining plate 68 secured by screws 69 and 70 to the presser-foot and provided with a stationary cutting edge 71 against which the movable knife-edge 67 acts to sever the needle-thread extending upwardly from the work to the eye of the needle through the cut-out needle-slot 72 formed in the presser-foot. The knife-blade 66 is formed with an upstanding ear 73 having loose pivotal connection with a depending arm 74 of a sleeve 75 journaled on the fulcrum screw-stud 76 threaded into an aperture 77 in the presser-bar 51.

The sleeve 75 has a lateral projection 78 adapted for engagement by a stud 79 projecting laterally from the plate 80 pivotally attached by means of the screw 81 to a bracket 82 secured, as by screws 83 and 84, to the frame of the machine. Adjustably secured to the plate 80 by means of the screw 85 is the needle-thread pull-off arm 86 provided with the thread-engaging nose 87 adapted to be swung across the needle-path and to engage the needle-thread when the button-holder is lifted at the completion of a sewing operation and to pull off a sufficient quantity of thread through the eye of the needle to restart the sewing operation. To impart the vibratory pull-off movements to the arm 86 the plate 80 is provided with an elongated slot 88 entered by a pin 89 projecting from the collar 90 secured to the button-holder presser-bar 36. Consequently, as the plate 80 swings on its pivot, the pin 79 engages the projection 78, thereby rocking the sleeve 75 on its fulcrum-stud and actuating the knife-blade 66 to sever the needle-thread close to and above the work, sufficient clearance being provided between the pin 79 and the projection 78 to properly time the thread-severing action subsequently to the pull-off action. A spring 91 secured to a laterally projecting stud 92 on the presser-foot bar 51 engages the depending arm 74 and serves to retract the knife-blade 66 after its cutting action, a stop-screw 93 carried by the knife-blade limiting its retracting movement by engagement with a shoulder formed by a notch 94 in the presser-foot.

The presser-foot 64 is normally held yieldingly against the work under the action of the spring 95 of which one end is secured to the presser-foot bar bracket 53 by means of the screw 96 and of which the other end bears downwardly upon the stud 92. In order to lift the presser-foot when the button-holder is lifted, the collar 90 is provided with a projecting arm 97 to which is secured by means of the screw 98 one end of the bent plate-spring 99 of which the other end is adapted to engage the under side of the stud 92 carried by the presser-bar 51. The actuation of the lifting lever 43, 45 therefore causes the lifting of the button-holder and of the presser-foot and causes the needle-thread to be successively pulled off and severed.

Secured to the forward end of the laterally projecting horn 2 by screws passing through apertures 100 and 101 is a curved bracket-plate 102 having a flattened portion 103 provided with a raised work-supporting seat 104 formed with a needle-slot 105. Secured to the portion 103 of the bracket 102 is one end of a guide-bar 106 attached at its other end to the horn 2 by means of the screw 107. This guide-bar is formed with a slideway 108 that supports and guides the lower-thread pull-off and severing bar 109 formed at its forward end with a pull-off edge 110 and carrying backwardly thereof the thread-cutting blade 111 having a knife-

edge 112. The rearward end of the bar 109 is provided with an ear 113 pivotally connected by means of the screw 114 with one end of the link 115 of which the other end is pivotally connected to an arm 116 of a bellcrank-lever fulcrumed at 117 to the frame of the machine and having its other arm connected to the link 47 provided with the treadle-actuated rod 48.

At the completion of a sewing operation, the operator depresses the treadle-actuated rod 48 and thereby rocks the bellcrank-lever 116 on its fulcrum and actuates the bar 109, so that its forward end 110 will engage the thread extending from the loop-taker to the work and pull off a quantity of thread against the inner edge of the tongue 118 which is secured to the under side of the bracket-plate 102 so as to enter the space between the knife-blade 111 and the pull-off portion 110 of the bar 109, as illustrated in Fig. 3 of the drawings. In the continued forward movement of the bar 109, the knife-edge 112 engages the taut thread and severs the same. The depression of the rod 48 also rocks the lifter-arm 45 on its fulcrum 44 and lifts the button-holder 50 and the presser-foot 64 through the connections previously described, thereby actuating the arm 86 to pull off the needle-thread and the blade 66 to sever the same against the stationary knife-edge 71.

The present improvement therefore provides simple upper and lower thread pull-off and severing elements actuated by a single treadle-connection that is adapted also to lift the button-holder and presser-foot for releasing the work. When the treadle is released the several parts are restored to their initial positions under the actions of their controlling springs.

It is to be understood that all of the constructive features of a patentable nature which are shown and described herein are of our invention.

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

1. In a button sewing machine, the combination with a button-holder, a work-holding presser-foot, and upper and lower thread pull-off and severing devices, of button-holder lifting means and connections therewith for lifting the presser-foot and actuating the pull-off and severing devices.

2. In a button sewing machine, the combination with stitch-forming mechanism including a needle, a button-holder, a work-holding presser-foot, a needle-thread pull-off device and a needle-thread severing device, of means for lifting said button-holder and means brought into action by the lifting of said button-holder for lifting the presser-foot and for pulling off and severing said needle-thread.

3. In a two-thread button sewing machine, the combination with a button-holder, a work-holding presser-foot movable relatively to said button-holder, and lower-thread pull-off and severing elements, of means for lifting said button-holder and connections therewith for lifting said presser-foot and for actuating said lower-thread pull-off and severing elements.

In testimony whereof, we have signed our names to this specification.

WILLIAM L. BARRON.
FRITZ E. OSOL.