

L. J. SCHAEFFER.
 STOP MECHANISM FOR BUTTONHOLE SEWING MACHINES.
 APPLICATION FILED JULY 20, 1910.

1,025,650.

Patented May 7, 1912.

2 SHEETS-SHEET 1.

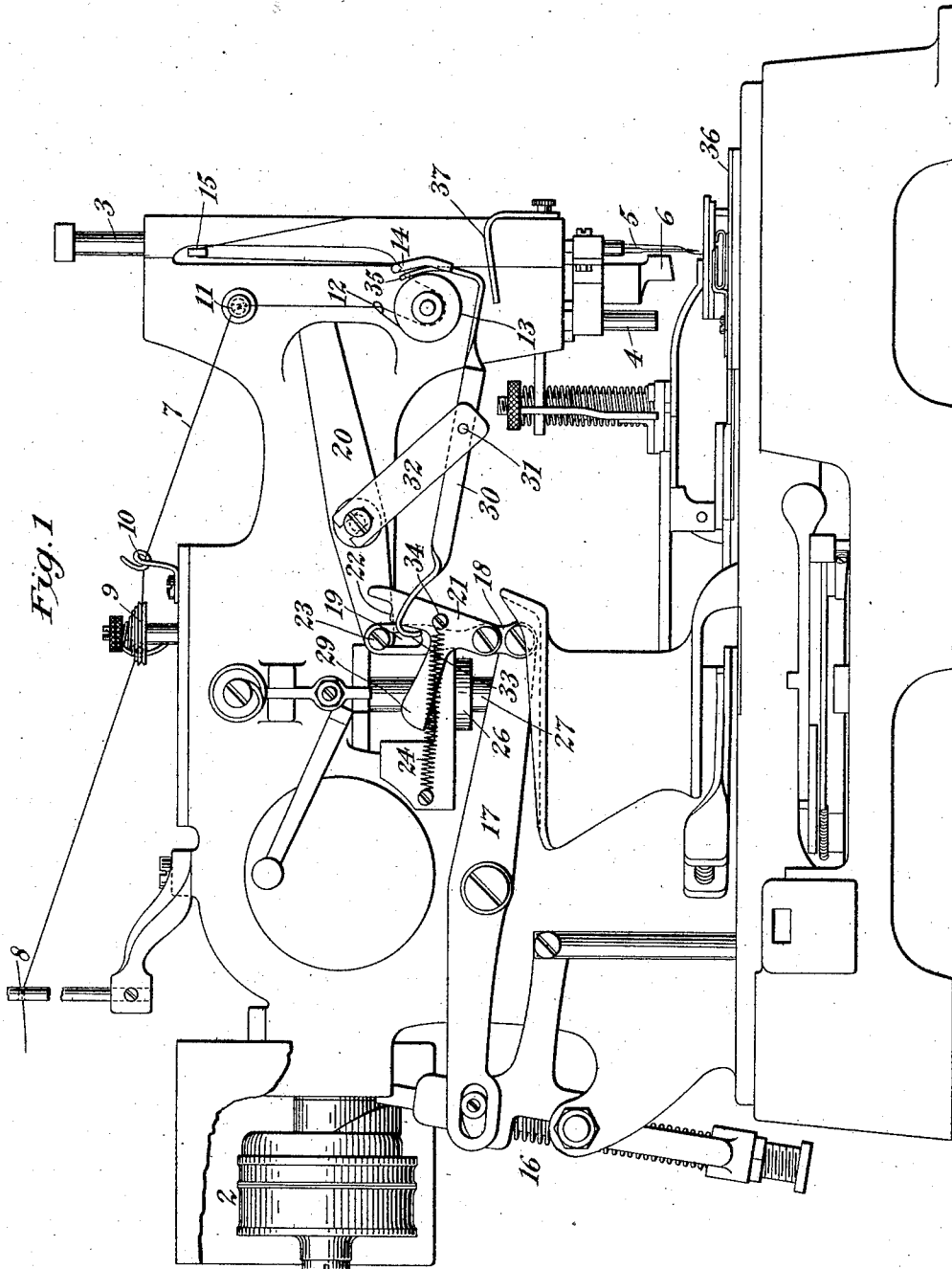


Fig. 1

Witnesses:

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 Chas. Hadfield

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2 SHEETS-SHEET 2.

Fig. 2

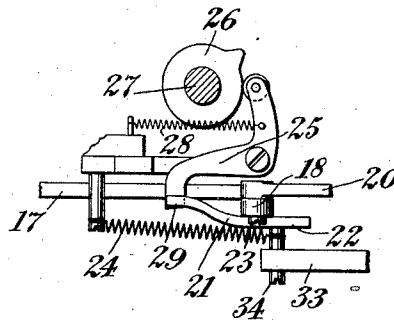
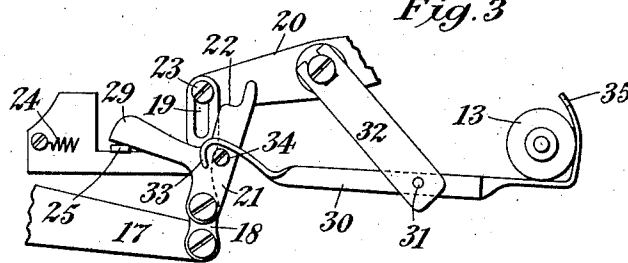


Fig. 3



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UNITED STATES PATENT OFFICE.

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STOP MECHANISM FOR BUTTONHOLE-SEWING MACHINES.

1,025,650.

Specification of Letters Patent.

Patented May 7, 1912.

Application filed July 20, 1910. Serial No. 572,806.

To all whom it may concern:

Be it known that I, LOUIS J. SCHAEFFER, a citizen of the United States, and a resident of West New York, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Stop Mechanism for Buttonhole-Sewing Machines, of which the following is a specification.

10 This invention relates to stop mechanism for button-hole sewing machines, and the main object of the invention is to provide means for preventing the operation of a button-hole cutter of a button-hole forming mechanism in case of breakage of the thread by which the stitching of a button-hole is accomplished.

15 In the making of button-holes in fabric by button-hole sewing machines it is customary to stitch the button-hole first and afterward pierce the fabric within the loop of button-hole stitching by means of a cutter for the purpose of finishing the button-hole. It has been found that in making button-holes in this way that the thread will frequently break and the operation of the mechanism will continue and the fabric will be pierced by the cutter to form the opening in the loop of button-hole stitching and that this cutting action will take place before the stitching of the button-hole has been completed. In such cases it is extremely difficult, if not impossible, to finish the button-hole stitching in a satisfactory manner because the threads of the fabric having been pierced by the cutter do not coact in a normal manner with the threads of the button-hole sewing mechanism and do not receive or support the stitching properly. It is particularly difficult to prevent this cutting of the fabric when the sewing machine is operated at high speed, as is usually the case, especially when used on continuous strips or tapes of narrow fabric, such for example as are used in the manufacture of continuous strips of button-holes such as disclosed in Patent No. 870,998, granted November 12th, 1907, to Louise S. Newcomb.

50 The principal object of this invention is to provide means for preventing the operation of the cutter in such cases, whatever may be the character of the fabric operated upon, and enable the operator to stop the machine

or to proceed at reduced speed and continue the stitching of the button-hole which was interrupted by the breakage of the thread and complete such stitching before the fabric is pierced by the cutter. It has been found in practice that by providing suitable means for this purpose an incomplete loop of button-hole stitching resulting from the breakage of the thread can be completed in such a manner that the finished loop of stitching will be practically as perfect in appearance and finish as in the case of loops of stitching completed without breakage of the thread. Without some means for enabling loops of button-hole stitching to be completed properly notwithstanding the breakage of the thread before the finishing of the loop a considerable loss would result, as the product would be inferior or there would be a waste of material and labor due to the rejection of goods having imperfect button-holes.

In the drawings I have illustrated one embodiment of my invention, Figure 1 showing automatic stop mechanism for preventing operation of a cutter of a button-hole sewing machine of the Singer type; Fig. 2 a detail in sectional plan of a portion of said automatic stop mechanism, and Fig. 3 a detail in side elevation of the same and other parts.

My invention may be applied to any suitable type of button-hole sewing machine and may be employed in connection with sewing the button-holes in fabrics or garments of any kind, but for convenience I have illustrated it in connection with a Singer sewing machine and as applied to the stitching of button-hole loops in continuous strips of fabric for the purpose of forming continuous strips of ready-made button-holes such as disclosed in the aforesaid patent.

As most of the features of the machine illustrated in Fig. 1 are of well-known construction they need not be described herein in great detail. Said machine embodies the usual main driving-wheel 2, which through the usual or suitable driving connections operates a needle-bar 3 and a cutter-bar 4 carrying respectively a needle and a cutter 6. The needle-thread 7 is brought in the usual manner from a suitable spool through suitable thread-guides and

tensioning devices, such as 8, 9, 10, 11, 12, 13, 14 and 15 to the eye of the needle 5. The usual operating devices or connections may be employed for normally actuating the cutter 6 and the cutter-bar 4 by which it is carried. These connections comprise the spring-pressed controlling member 16, a main operating lever 17, a link 18 connected to the forward end of the lever 17 and having at its upper end a long slot 19, and a lever 20 connected with the upper end of said link and operatively connected at its forward end with the cutter-bar 4 in the usual manner. In addition to the link connection between the levers 17 and 20 there is a rock-arm 21 pivoted on the link 18 near the lower end of the link and having a shoulder 22 adapted to engage the under side of the pin 23 by means of which said link 18 and lever 20 are connected. When this shoulder 22 is in engagement with the pin 23 the lever 20 will be operated by the lever 17 through the rock-arm 21, but when it is in the position shown in Figs. 1 and 3 the lever 20 will not be operated by said rock-arm, and the link 18 will have a controlling movement corresponding to the length of the slot 19. The rock-arm 21 is normally shifted to its working position by means of a spring, such as 24, and is held in its inoperative position by a stop on a rock-arm 25 controlled by a cam, such as 26, on a vertical shaft 27 operated by the driving mechanism of the machine. A spring 28 serves to hold the stop-arm 25 normally in position for maintaining the rock-arm 21 in the position shown in Figs. 1 and 3 if said rock-arm has been shifted to that position. Momentarily in each cycle of operations the rock-arm 25 is withdrawn from the extension or finger 29 of the rock-arm 21, and when so withdrawn the spring 24 is released and immediately becomes effective to shift the arm 21 to its operative position with the shoulder 22 under the pin 23. The parts just described are those of the ordinary Singer sewing machine and permit the manual withdrawal of the rock-arm from under the pin 23 to prevent operation of the lever 20 by which the cutter 6 and its cutter-bar are immediately actuated.

For the purpose of automatically preventing the working stroke of the lever 20 and hence of the cutter-bar and cutter, I make use of suitable automatic means for preventing the descent of said cutter on the breaking of the thread. The preferred means employed by me coöperates with the parts just described for the purpose of preventing descent of the cutter 6 on the breaking of the needle-thread 7. Any suitable means may be employed for this purpose. That shown herein embodies as its main element a cutter-controlling device in the form of a lever 30, which is here illustrated as

pivoted at 31 on an arm 32 secured to the lever 20 at the fulcrum of said lever. At its rear end said lever is shown as having a hooked portion 33 adapted to coöperate with a pin or stop 34 on the rock-arm 21; while at its front end said lever is shown as having a thread-guide or eye 35 through which the needle-thread is intended to be passed. The position of this eye is such that when the machine is in operation the tensioned needle-thread 7 will normally hold down the forward end of the lever 30 and correspondingly elevate the rear end or hooked member 33. The lever 30, however, is so constructed and balanced—being pivoted to turn freely and being slightly counter-weighted at its rear end—that on the breaking of the thread 7 the forward end of said lever 30 will immediately rise as a result of the relaxing of the tension at the eye 35 and the consequent movement of the counter-weighted rear end of said lever. When this occurs the hooked portion 33 drops into engagement with the stop 34 and the rotation of the cam 26 by the shaft 27 will then be ineffective to release the rock-arm 21 and permit it to be returned by its spring 24 to its normal position with its shoulder 22 under and in engagement with the pin 23. Hence when the pin 34 is so engaged the rock-arm 21 will be continuously held in its inoperative position shown in Figs. 1 and 3 until the parts have been released and reset by hand, and this will not take place until after the needle has been re-threaded. The rock-arm 21 will normally be held out of action until the completion of a loop of button-hole stitching, at which time the nose of the cam 27 will become effective to release said rock-arm and permit the cutter to be operated; and said rock-arm will be held out of action by the hook 33 after the nose of the cam 26 releases the stop-arm 25 if the thread breaks before said cam becomes effective to release said stop-arm.

After the machine has been stopped on the breakage of a thread the working-plate 36 may be adjusted relatively to the needle to bring that point in the loop of button-hole stitching at which the thread broke opposite the needle, and the operation of continuing and completing the loop of button-hole stitching may be proceeded with from that point. This is readily done by a skilful operator.

A suitable stop is shown at 37 for limiting the movement of the forward end of the lever 30. This stop may be secured in place at any suitable point at the forward end of the machine and may be adjustable in position if desired.

It will be obvious from the foregoing that if a needle-thread breaks the hook 33 will drop into engagement with the pin 34 and by holding the rock-arm 21 out of action

will prevent the descent of the cutter 6 and thus give the operator an opportunity to complete the making of a perfect loop of button-hole stitching in the manner just described before said cutter is permitted to descend and puncture the cloth. This cutter will of course be held out of action in this manner whatever may be the point in the loop of button-hole stitching at which the thread breaks.

The other operations of the button-hole sewing machine illustrated herein which will be brought into operation as required are of the usual construction and perform their usual functions, and it is believed require no specific description.

What I claim is:

1. In a button-hole sewing machine, the combination with stitch-forming mechanism, of work-holding means, button-hole cutting mechanism including a button-hole cutter, and automatic means operative independently of the other mechanism for preventing operation of said cutter on the breaking of a thread.

2. In a button-hole sewing machine, the combination with needle-thread mechanism, of work-holding means, a needle-thread tensioning device, and button-hole cutting mechanism including a button-hole cutter and also including a cutter controlling device normally held out of action by the tensioned needle-thread and movable into action independently of the other mechanism on the breaking of said thread to prevent operation of said cutter.

3. In a button-hole sewing machine, the combination with needle-thread mechanism, of work-holding means, a needle-thread tensioning device, and button-hole cutting mechanism including a button-hole cutter and also including a counterweighted cutter-controlling device normally held out of action by the tensioned needle-thread and movable into action independently of the other mechanism on the breaking of said thread to prevent operation of said cutter.

4. In a button-hole sewing machine, the combination with needle-thread mechanism, of work-holding means, a needle-thread tensioning device, and button-hole cutting mechanism including a button-hole cutter and also including a cutter-controlling device having an eye through which the needle-thread passes and by which it is normally deflected to an inoperative position and movable independently of the other mechanism to an operative position on the

breaking of said thread to prevent operation of said cutter.

5. In a button-hole sewing machine, the combination with needle-thread mechanism, of work-holding means, a needle-thread tensioning device, and button-hole cutting mechanism including a button-hole cutter and also including a pivoted controlling lever having an eye at one end through which the needle-thread passes and by which it is normally deflected to an inoperative position and having its opposite end hooked and counterweighted and movable on the breaking of said needle-thread into operative position with the hook in engagement with a member of the button-hole cutting mechanism for preventing operation thereof.

6. In a button-hole sewing machine, the combination with needle-thread mechanism, of work-holding means, button-hole cutting mechanism including a button-hole cutter, means for normally operating said button-hole cutting mechanism automatically in predetermined timing, and automatic means operative independently of the other mechanism for putting an element of said button-hole cutting mechanism out of action on the breaking of a thread.

7. In a button-hole sewing machine, the combination with needle-thread mechanism, of work-holding means, button-hole cutting mechanism including a button-hole cutter, means for normally operating said button-hole cutting mechanism automatically in predetermined timing, and automatic means operative independently of the other mechanism for rendering said button-hole cutting mechanism ineffective on the breaking of a thread.

8. In a button-hole sewing machine, the combination with needle-thread mechanism, of work-holding means, normally ineffective button-hole cutting mechanism including a button-hole cutter, automatic means for normally rendering said button-hole cutting mechanism effective on the completion of a button-hole, and automatic means operative independently of the other mechanism for maintaining said mechanism ineffective on the breaking of a thread.

Signed at New York, in the county of New York, and State of New York, this 14th day of July, A. D. 1910.

LOUIS J. SCHAEFFER.

Witnesses:

LAURA E. SMITH,
C. S. CHAMPION.