

May 23, 1961

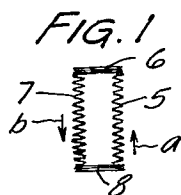
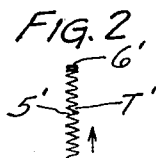
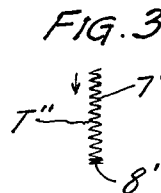
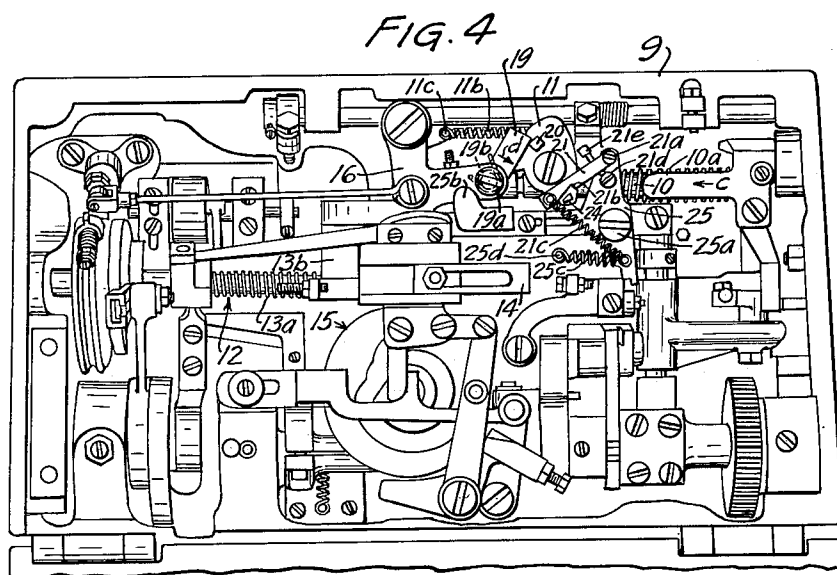
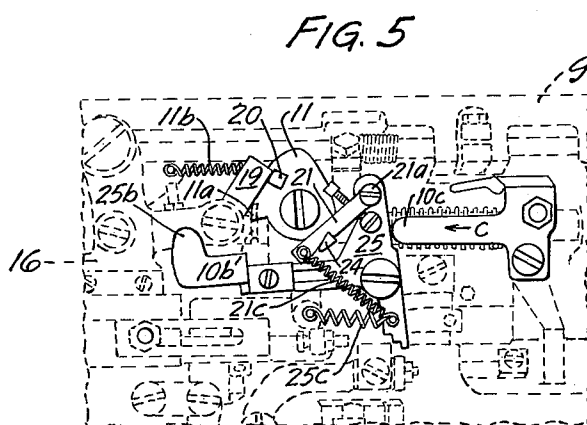
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2,985,123

TACK-PRODUCING ATTACHMENT FOR BUTTONHOLE MACHINES

Filed Aug. 18, 1958

2 Sheets-Sheet 1



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FIG. 6

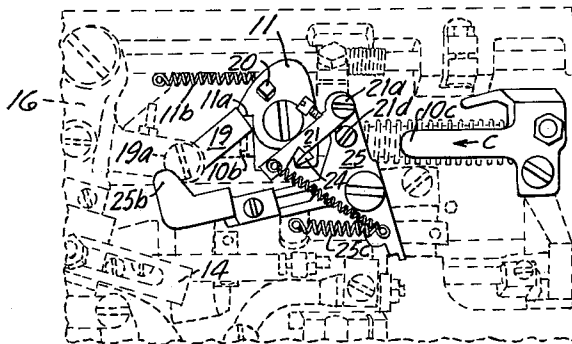


FIG. 7

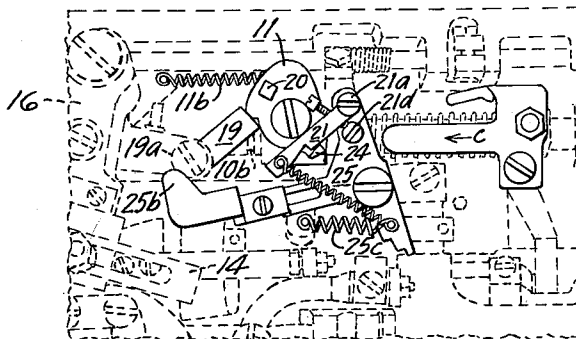


FIG. 8

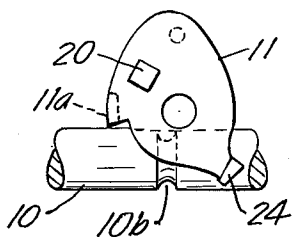
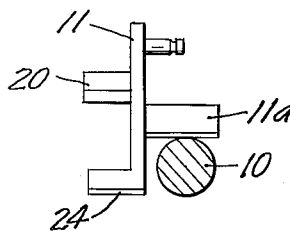


FIG. 9



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## TACK-PRODUCING ATTACHMENT FOR BUTTONHOLE MACHINES

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3 Claims. (Cl. 112—67)

This invention relates to sewing machines and more specifically relates to an attachment for a buttonholing machine for adapting the machine for use as a tacker.

In many types of buttonholing machines, a cycle of operation will commence with sewing a first row of stitches along one side of the buttonhole, and when this is completed, a number of barring stitches are produced at the end of the buttonhole, and then a second row of stitches is produced at the other side of the button hole, and finally, a second series of barring stitches is produced at the other end of the buttonhole to complete the sewing cycle. Most machines are adjustable so as to permit the length and width of the buttonhole to be varied. In varying the width, the spacing between the first and second row of stitches will be varied, and the length of the barring stitches will be correspondingly varied. In at least some machines, the relative positions of the first and second rows of stitches may be varied to the extent of causing the second row of stitches to be superimposed on the first row. In this condition the barring stitches will have the same length as the other stitches.

It should be understood that the cycle of forming a buttonhole is substantially continuous, and once the machine is set into operation the entire cycle is carried out. Although various mechanisms might be used to control application of power to the sewing and cycle control mechanism, it is common practice to allow the motor to run continuously and to slip the drive belt onto and off the drive pulley to start and stop operation of the sewing and cycle control mechanism. To accomplish such movement of the belt, a suitable control is provided which may be initially treadle-operated and may be held during the buttonholing cycle by a latching mechanism, which is released by a tripping device operating in response to completion of the second or final barring operation. The control is then allowed to return to normal and to move the drive belt off the pulley and thereby stop the sewing operation.

An object of my invention is to provide a new and improved attachment of simple and inexpensive construction and operation for adapting a buttonholing machine to perform a tacking operation.

Another object of my invention is the provision of a novel buttonholing machine attachment which will interrupt the buttonholing cycle intermediate the normal beginning and end of the cycle to permit the formation of a single row tack.

A further object of my invention is to provide an improved and novel mechanism for use in a buttonholing machine which will interrupt operation of the sewing after the first row of stitches has been sewn and after completion of the first barring operation.

A still further object of my invention is to provide a new and novel mechanism for use in a buttonholing machine which will interrupt the sewing operation after the first row of stitches and the first barring stitches have been completed to cause the formation of a single row tack, and which mechanism will thereafter permit the

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machine to be operated again to complete the normal cycle of operation for producing a second tack.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views and in which:

Fig. 1 is a diagrammatic sketch of a buttonhole of the type produced by the machine with which the present invention is concerned;

Figs. 2 and 3 are diagrammatic sketches of tacks produced by the machine through the use of the present invention;

Fig. 4 is a bottom plan view of the sewing machine and showing the machine in stopped condition before stitching of the tacks is commenced;

Fig. 5 is a detail bottom plan view of a portion of the mechanism shown in Fig. 4 and showing the parts which are of substantial importance to the present invention in full lines and showing the remainder of the parts in dotted lines, and in this view the mechanism is in operating condition during the production of the first tack;

Fig. 6 is a view similar to Fig. 5, but showing the machine in stopped condition as the first tack has been completed;

Fig. 7 is a view similar to Fig. 5 and showing the machine in operation while sewing the second tack; and

Figs. 8 and 9 are respectively detail front and side elevation views of the latch member which holds the machine in operating condition.

One form of the invention is shown in the drawings and is described herein. The buttonholing machine with which the present invention is concerned, will normally produce a buttonhole in the fashion shown in Fig. 1. During the cycle of operation of the buttonhole machine, a row of stitches 5 is first produced by stitching in the direction of the arrow *a*. The second phase of the cycle comprises the production of a plurality of barring stitches 6 which are actually superimposed on each other, but for clarity of the drawings, these stitches are shown spread slightly. Then, a row of stitches 7 is produced in the direction of arrow *b*, and finally a series of barring stitches 8 completes the buttonhole.

As previously indicated, an adjustment is available for varying the position of the rows 5 and 7 of stitches with respect to each other so as to vary the length of the barring stitches 6 and 8, and the width of the buttonhole may be so adjusted as to allow superimposition of the row 7 upon the row 5, and in this situation, the barring stitches 6 and 8 are substantially identical in length with the zigzag stitches of the rows 5 and 7. Figs. 2 and 3 show the tacks T' and T'' which may be produced by the present machine when employing the attachment comprising the present invention. It will be noted that the tack T' is formed by sewing in the direction of the arrow a row of stitches 5' and then producing a series of barring stitches 6' which are identical in length to the zig zag stitches in the row 5'. The tack T'' is produced by the other half of the buttonholing cycle described in connection with Fig. 1, and is produced by sewing a row of stitches 7' in the direction of the arrow and then producing a series of barring stitches 8' which are identical in length to the zigzag stitches in the row 7'.

For simplicity, only a portion of the control mechanism of the buttonhole machine is shown in the drawings. The mechanism for controlling the buttonhole machine includes a frame structure or supporting structure 9 and a longitudinally reciprocable shaft 10 which may be treadle operated to shift in the direction of arrow *c* against the pressure of spring 10a which tends to move the shaft 10 in the direction opposite to arrow *c*. The shaft 10

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has an annular groove 10b therein to define a shoulder surface or abutment.

A rotatably oscillatable latch member 11 is mounted adjacent the shaft 10 and has a tooth 11a which is rotatable into the groove 10b for holding the shaft 10 in inwardly shifted position, against the pressure of spring 10a. It should be noted that the shaft 10 controls application of power to the sewing mechanism by holding the main drive belt on the drive pulley when shifted in the direction of arrow c and for moving the drive belt off the pulley when shifted in the opposite direction.

Latch member 11 is biased in a counterclockwise direction by means of a tension spring 11b which is anchored to the latch member 11 at one end and is anchored to a pin 11c which is fixed to the frame structure 9. The spring 11b urges the tooth 11a of latch member 11 into the groove of 10b when the groove is brought into alignment with the tooth 11a. As long as the shaft 10 is held in its inwardly shifted position, the sewing operation of the buttonhole machine will continue.

The buttonhole machine, which, in the specific form shown is substantially identical to the machine known as the Button Hole Model S2-PH, manufactured and sold by the Reece Corporation, Waltham, Massachusetts. The machine includes in general mechanism indicated in general by numeral 12 for controlling the stitching of the rows 5 and 7 of the buttonhole and this mechanism includes the screw 13a and a nut thereon 13b which causes movement of the slide 14 which controls the length of the row of stitching. A barring mechanism indicated in general by numeral 15 and as the barring stitches 6 are being produced, a rocker carriage 16 swings in a clockwise direction through an arc of approximately 30°, and when the barring stitches 8 are being produced, the rocker carriage 16 swings a counterclockwise direction through a similar arc. The counterclockwise swinging of the rocker carriage 16 is conventionally employed for causing the latch member 11 to be tripped so as to release the shaft 10 and allow the spring 10a to return the shaft 10 to its normal position and thereby stop the sewing action of the machine. To accomplish this shifting action, a shift device or bar 19 is swingably mounted on the rocker carriage 16 for engaging and abutting against a post 20 which is affixed to the latch member 11. The trip bar 19 is swingably mounted on the carriage 16 by means of a screw 19a and is biased in a clockwise direction as indicated by the arrow d by means of a spring 19b so as to bear inwardly against the post 20 and swing into alignment with the post when the carriage 16 is cocked in a clockwise direction. It will be noted that the end surface of the trip bar 19 is flat and the corresponding abutting surface on post 20 is also flat and is arranged so as to swing with the latch 11 when pushed by the trip bar and allow the bar 19 to slip to one side of the post 20 after the latch 11 has been operated. The bar thereby moves into inoperative position and will permit the latch member 11 to swing counterclockwise into latching position when the shaft 10 is again operated.

The control mechanisms hereinbefore described are conventional to the Reece machine to cause operation thereof in the normal fashion and cause the shaft 10 to be released at the end of a normal operating cycle wherein the button hole machine produces in sequence, the row of stitching 5, the barring stitches 6, the row of stitching 7 and the barring stitches 8 to complete the buttonhole-producing cycle.

The present invention, hereinafter described operates to release the shaft 10 and thereby stop the stitching operation after the completion of the first row of stitches 5' and after the production of the first series of barring stitches 6', to thereby produce a tack T'.

The present invention comprises an attachment which includes a second post or abutment 24 affixed on the latch member 11, and in the form shown, the post 24 has

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a substantially triangular shape. A rocker arm 25 is swingably mounted by means of a screw 25a on the supporting structure 9 of the machine, and the rocker arm 25 has an actuating end portion 25b which is disposed adjacent to an abutment or screw head 19a on the carriage 16 so as to cause the rocker arm 25 to swing in a counterclockwise direction when the carriage 16 is swung or rocked in a clockwise direction. The rocker arm 25 is normally biased by means of a spring 25c which is connected at one end to a pin on the rocker arm and is connected at the other end to a pin 25d on the supporting structure 9.

A trip arm or device 21 is swingably mounted by means of a screw 21a on the rocker arm 25, and the trip bar or device 21 is normally oriented substantially tangentially with respect to the direction of rotary oscillation of the latch member 11. The trip device 21 has a notch 21b therein to engage and bear against the post 24. The trip arm 21 is biased in a counterclockwise direction by means of a spring 21c which is secured at one end to a pin on the trip arm and is secured at the other end to a pin on the rocker arm 25. An abutment 21d is provided on the rocker arm 25 to limit counterclockwise swinging of the trip arm 21 and a screw 21e is threaded through the trip arm 21 and has its inner end bearing against the abutment 21d so as to adjust the position of the trip arm 21 with respect to the rocker arm 25 and with respect to the post 24. When the machine is in normal operating condition, the screw 21e is adjusted so as to permit the notch 21b to receive the post 24 in the fashion shown in Fig. 5 so as to cause the trip arm 21 to bear against the post 24 and to swing the post 24 and latch member 11 in a clockwise direction for releasing shaft 10 when the rocker arm 25 is swung in a counterclockwise direction by the clockwise swinging of the carriage 16. The abutting surfaces of the trip arm notch 21b and post 24 are oriented with respect to each other to permit the trip arm to pass by the post 24 after the latch member has been swung sufficiently to release the shaft 10 substantially in the manner shown in Fig. 6.

An actuating finger 10c is connected rigidly with the shaft 10 to move longitudinally therewith. The finger 10c is aligned to engage the rocker arm 25 when the shaft is shifted inwardly in the direction of arrow c by the treadle operation. Ordinarily in the operation, the shaft 10 is shifted inwardly during the start of the cycle and the finger 10c will engage the rocker arm 25 to swing the same in a counterclockwise direction and shift the notch 21b of trip arm 21 past the post 24, and when the latch 11 swings inwardly and after the shaft-operating treadle is released, the post 24 will slip into the notch 21b. Immediately upon inward shifting of shaft 10, the sewing of the first row of stitches 5' commences and when the row of stitches has been produced, the barring operation starts. During the barring operation, the carriage 16 commences swinging in a clockwise direction toward the position shown in Fig. 6. When the carriage 16 starts its swinging, the abutment screw 19a engages the end 25b of rocker arm 25 so as to swing the rocker arm 25 in a counterclockwise direction. The carriage 16 continues to swing in a clockwise direction until the barring operation is completed, at which time, the rocker arm 25 has been swung sufficiently far to move post 24 and rotate latch 11 into the position for releasing shaft 10, whereupon the spring 10a moves shaft 10 outwardly, opposite the direction of arrow c and causes the belt to be slipped off the drive pulley, whereupon the sewing operation ceases. The tack T' is then completed and the fabric may be moved under the presser foot of the machine for the formation of another tack. When the fabric has been moved, the treadle operated shaft 10 is again shifted inwardly in the direction of arrow c and sewing commences again to produce the row of stitches 7' of tack T''. When the row of stitches 7' is completed, the barring mechanism 15 operates to commence the bar-

ring operation to produce the stitches 8', whereupon the carriage 16 swings in a counterclockwise position from the position shown in Fig. 7, back to the position shown in Fig. 4. When the carriage 16 completes its swinging, the trip bar 19 will have moved against the post 20 to cause swinging of the latch 11 and cause releasing of the shaft 10. At this time, the trip bar 19 slips off the side of post 20 and lays along the side of the post 20. When the latch 11 has been swung, the shaft 10 moves outwardly opposite to the direction of arrow *c* and causes the drive valve to slip off the drive pulley. The second tack T'' is then completed.

If it is desired to permit the machine to complete a full cycle of operation so as to produce a buttonhole, the adjustment screw 21*e* is screwed inwardly so as to swing the trip arm 21 away from the abutment 21*d* and also away from the post 24 so that the notch 21*b* is shifted out of alignment with the post 24, and when the rocker arm 25 is swung in a counterclockwise direction by movement of carriage 16, the notch 21*b* will pass by the post 24 and there will be no releasing of the shaft 10 at this time. The cycle of operation will continue until the latch 11 is released by the trip bar 19.

It will be seen that I have provided a new and improved attachment of a buttonhole machine to permit the production of a single row tack, and by simple adjustment, the machine may be adapted for producing a complete buttonhole.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention which consists of the matter shown and described herein and set forth in the appended claims.

What is claimed is:

1. In a control mechanism of a buttonhole machine of the type producing a row of stitching at each side of the buttonhole and a series of barring stitches at each side of the buttonhole the combination of a supporting structure, a spring-pressed control member shiftable into a first position against the spring pressure, and said control member also being shiftable under influence of the spring pressure to a second position from said first position, means mounting said control member for shifting toward and away from said first and second positions said control member having a keeper, a rotatably oscillatable latch member spring-pressed against said keeper when the control member is in said first position for maintaining the control member in said first position, means mounting the latch member on the supporting structure, said latch member having abutment means, a movable carriage moving in a first direction when the first series of barring stitches are produced and moving in a second direction when the second series of barring stitches are produced, trip means connected with said carriage and engaging said abutment means for rotating said latch member out of engagement with the keeper when the carriage is moved in said second direction, a second trip device movably mounted on the supporting structure and engaging said abutment means, said second trip device having a rocker arm engaging the carriage to be swung thereby and swinging when the carriage is moved in said first direction to move the second trip

device against the abutment means and thereby rotate the latch member out of engagement with the keeper to thereby allow the control member to return to said second position.

2. In a control mechanism of a buttonhole machine of the type producing a row of stitching at each side of the button hole and a series of barring stitches at each end of the button hole, the combination with a supporting structure, a longitudinally shiftable control shaft having a transverse shoulder surface, means mounting the shaft for longitudinal shifting, a spring urging the shaft outwardly, a rotatably oscillatable latch adjacent the shaft and having a tooth swingable into and out of engagement with said shoulder surface on the shaft, means mounting the latch on the supporting structure, a rocker carriage on the supporting structure, said carriage rocking in a first direction when the first series of barring stitches are produced and said carriage rocking in a second direction when the second series of barring stitches are produced, means on the carriage and latch for rotating the latch out of engagement with the shaft during movement of the carriage in said second direction, said carriage having an abutment thereon, a rocker arm, means mounting the rocker arm adjacent the carriage and latch on the frame structure, said rocker arm disposed adjacent said abutment on the carriage and positioned to be engaged and moved thereby when the carriage is moved in said first direction, a post on said latch adjacent said rocker arm, a trip arm extending substantially tangentially of the rotary oscillation of said latch member and having an abutment shoulder engageable with said post for swinging said latch out of engagement with the shaft, means swingably mounting the trip arm on the rocker arm to rock the shoulder of the trip arm into engagement with the post when the rocker arm is moved by the carriage, and means urging the trip arm toward the post, whereby to release said control shaft when said rocker carriage is moved in said first direction.

3. The invention set forth in claim 2 and including an abutment on the rocker arm and an adjustment screw on the trip arm and engaging the rocker arm abutment and being arranged to swing the trip arm away from said post whereby when screw is adjusted, the trip arm is moved out of engagement with the post so as to prevent tripping of the latch and release of the shaft when said rocker carriage is moved in said first direction and thereby allow completion of both rows of stitching and both series of barring stitches producing a buttonhole.

#### References Cited in the file of this patent

##### UNITED STATES PATENTS

|           |         |               |
|-----------|---------|---------------|
| 1,247,139 | Nelson  | Nov. 20, 1917 |
| 1,497,215 | Kiewicz | June 10, 1924 |
| 1,532,301 | Connors | Apr. 7, 1925  |
| 1,591,657 | Carlson | July 6, 1926  |
| 1,892,895 | Kiewicz | Jan. 3, 1933  |
| 2,359,330 | Pikul   | Oct. 3, 1944  |
| 2,367,187 | Collins | Jan. 16, 1945 |
| 2,577,230 | Chipman | Dec. 4, 1951  |
| 2,580,511 | Branchu | Jan. 1, 1952  |