June 16, 1959 H. N. JOHNSON ET AL 2,890,668

BUTTONHOLE ATTACHMENT FOR SEWING MACHINES

Filed Feb. 27, 1958 3 Sheets-Sheet 1

Fig. 1.

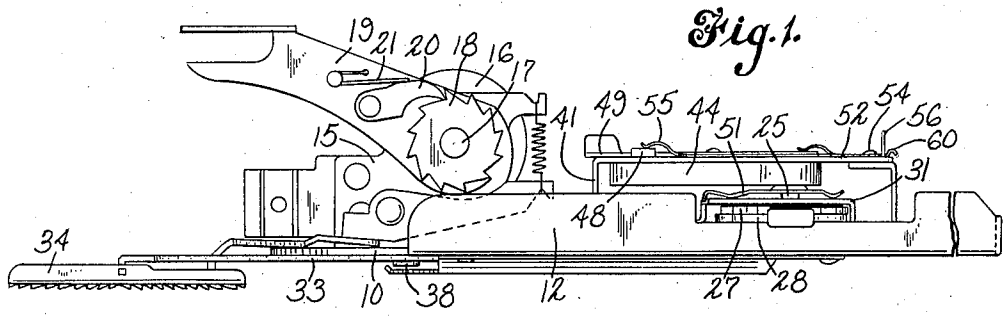


Fig. 2.

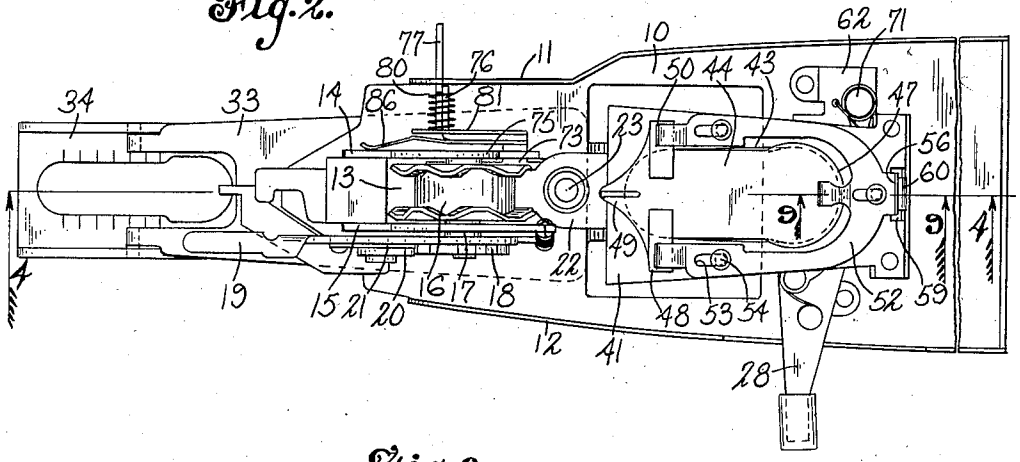
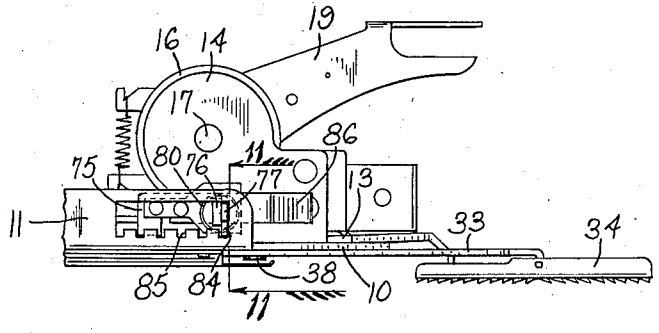


Fig. 3.



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BUTTONHOLE ATTACHMENT FOR SEWING MACHINES

Filed Feb. 27, 1958 3 Sheets-Sheet 2

Fig. 4.

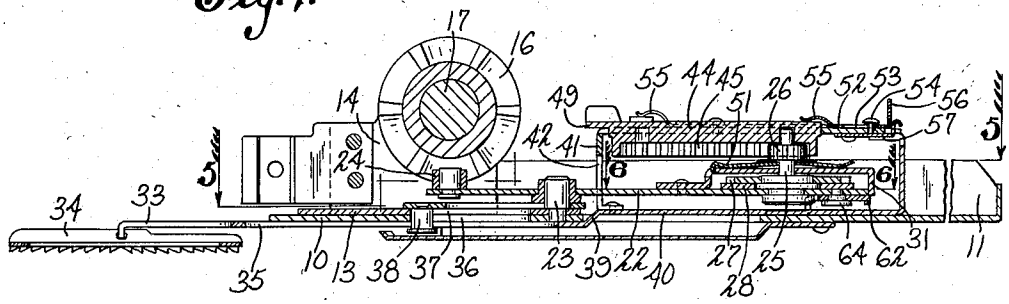


Fig. 5.

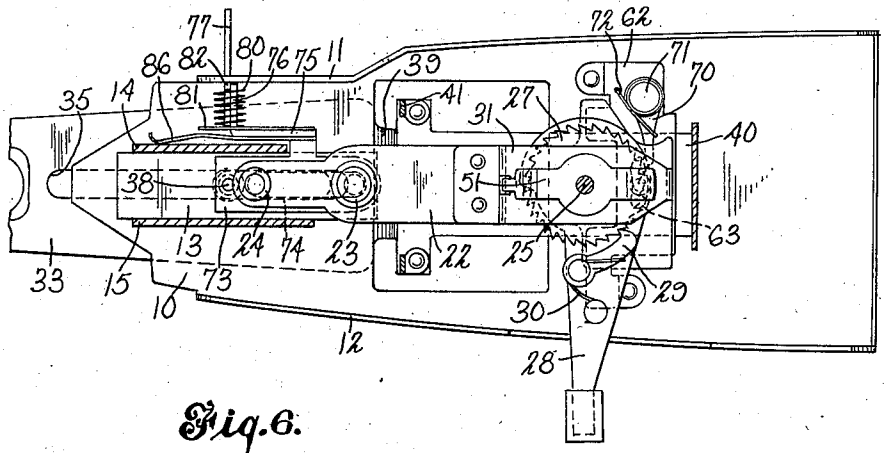


Fig. 6.

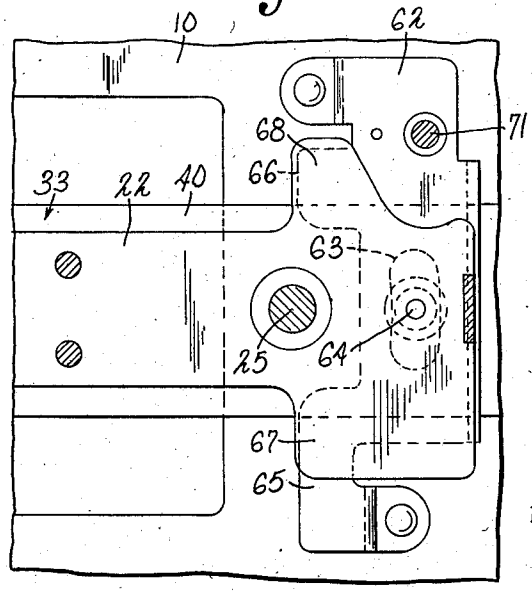
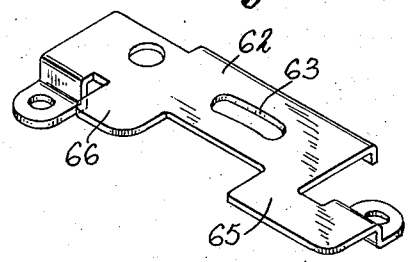


Fig. 7.



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June 16, 1959 H. N. JOHNSON ET AL 2,890,668

BUTTONHOLE ATTACHMENT FOR SEWING MACHINES

Filed Feb. 27, 1958 3 Sheets-Sheet 3

Fig. 8.

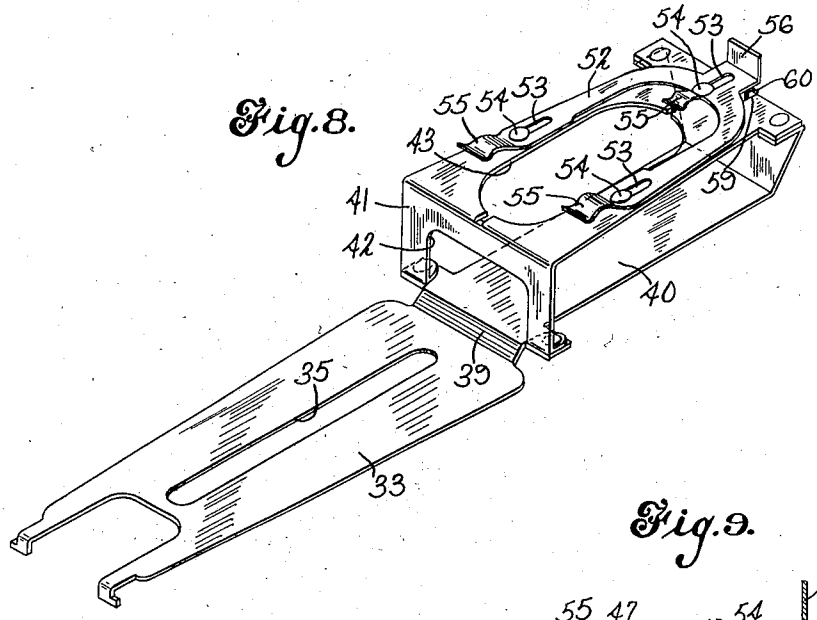


Fig. 9.

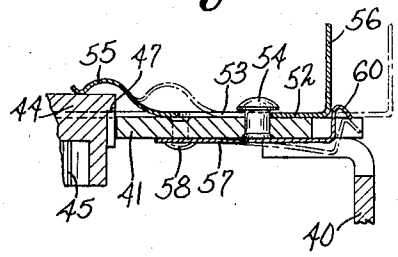


Fig. 10.

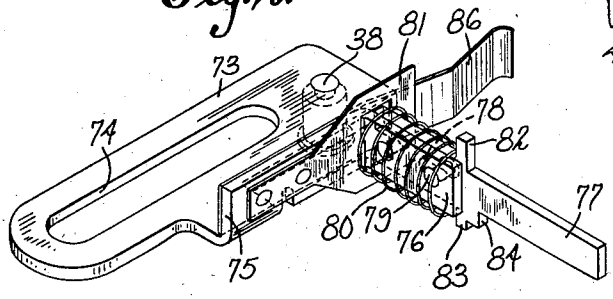
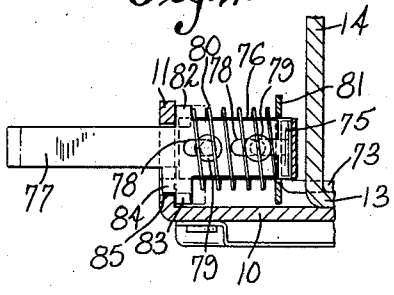


Fig. 11.



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BUTTONHOLE ATTACHMENT FOR SEWING MACHINES

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Application February 27, 1958, Serial No. 717,891

7 Claims. (Cl. 112—77)

This application relates to sewing machine attachments, and more particularly to an attachment for making buttonholes in the material of a garment. In devices of this character a frame or supporting body is commonly provided which is attached to the presser bar of the sewing machine. A forkarm is pivoted on this frame to be actuated by the needle bar, this forkarm serving as the power member for the working parts of the attachment.

As illustrated, the attachment is provided with a feed blade which is moved longitudinally of the frame in a reciprocating movement to move the cloth in an oblong path with respect to the needle of the sewing machine. During this movement the feed blade which controls the movement of the cloth is also given a lateral reciprocating movement to effect the stitches back and forth along the edge of the buttonhole. At the ends of the buttonhole where the longitudinal movement is reversed, the feed blade is also moved laterally so that stitches will be made along one edge of the buttonhole and then along the other edge.

The present structure provides mechanism for effecting the above movements and provides certain improvements in the mechanism shown in the Baehr and Johnson Patent No. 2,804,035.

One object of the present invention is to provide a new and improved buttonhole attachment for household sewing machines.

A further object of the invention is to provide improved means for adjusting the lateral throw of the feed blade to adjust the width of the stitch made by the attachment.

Still another object of the invention is to provide improved means for supporting and holding in place the template which controls the longitudinal or reciprocating movements of the feed blade as will be hereinafter explained.

To these and other ends the invention consists in the novel features and combinations of parts to be hereinafter described and claimed.

In the accompanying drawings:

Fig. 1 is a side elevational view of a buttonhole attachment embodying our improvements;

Fig. 2 is a top plan view thereof;

Fig. 3 is a partial elevational view showing the forward end portion of the attachment from the side opposite that shown in Fig. 1;

Fig. 4 is a sectional view on line 4—4 of Fig. 2;

Fig. 5 is a sectional view on line 5—5 of Fig. 4;

Fig. 6 is a sectional view on line 6—6 of Fig. 4;

Fig. 7 is a perspective view of a supporting bracket employed in the attachment;

Fig. 8 is a perspective view of the feed blade;

Fig. 9 is an enlarged sectional view on line 9—9 of Fig. 2;

Fig. 10 is a perspective view of the device for adjusting the lateral throw of the feed blade; and

Fig. 11 is a fragmentary sectional view on line 11—11 of Fig. 3.

To illustrate one embodiment of the invention, there is shown in the drawings a main frame member 10 having upstanding flanges 11 and 12 along its side edges. Mounted upon this frame member is a U-shaped bracket having a base portion 13 lying flatly upon the top surface of the frame member 10 and upstanding spaced brackets 14 and 15. A cam member 16 is secured to a shaft 17 rotatably mounted in the brackets 14 and 15, and to the end of this shaft is secured a ratchet 18. A forkarm 19 is pivoted upon the shaft 17 and upon this arm is pivoted a pawl 20 urged into contact with the ratchet 18 by the spring 21.

An actuating lever 22 is pivoted at 23 upon the main frame 10 and carries at its forward end a cam follower 24 which lies in the track of the cam 16 so that, when the cam is rotated, the lever 22 is reciprocated. The lever 22 extends rearwardly from its pivot point and journaled therein is the shaft 25 of a pinion 26. Secured to the shaft 25 is a ratchet wheel 27, and pivoted upon this shaft and disposed below the ratchet wheel is a lever 28 to which is pivoted a pawl 29 urged into engagement with the teeth of the ratchet wheel by a spring 30. The lever 28 may be manually operated to rotate the ratchet wheel and, therefore, the pinion 26 as the ratchet wheel is secured to the shaft 25.

The shaft 25 has an upper bearing in a bracket 31 secured upon the upper face of the lever 22 and in spaced relation thereto so that the ratchet wheel lies between the bracket and the upper surface of the lever.

A feed blade 33, shown particularly in Fig. 8, pivotally carries a feeding foot 34 at its forward end. The forward end of this feed blade lies below the frame member 10 and is provided with an elongated slot 35 which registers with slots 36 and 37 in the frame 10 and bracket base 13 respectively. A pivot pin 38 (Fig. 4) extends through these registering slots and pivotally connects the feed blade 33 to the base 10. This pin may be adjusted as will be hereinafter explained to adjust the lateral throw or bite of the feed blade.

Adjacent its intermediate portion the feed blade is stepped upwardly, as shown at 39 (Fig. 8), so as to rise above the frame member 10 and is provided with a rear portion 40 lying upon the frame. A cage or housing 41 is carried at the rear portion of the feed blade, the upper part of which is spaced from the blade and is provided with an opening 42 in its forward end through which the lever 22 extends rearwardly. This housing is provided with an opening 43 in its upper face within which may be dropped a template 44 (Fig. 1) which is provided with internal rack teeth 45 engaged by the pinion 26. As will be understood the shape of the rack 45 of the template determines the shape and size of the buttonhole.

The template 44 is provided with a lip or flange 47 adjacent its rear end and with flanges 48, 49 and 50 adjacent its front end which overlie the edges of the opening 43 so that the template is supported upon the housing 41 in inverted position as illustrated. A bowed spring 51 is mounted upon the bracket 31 and engages the lower surface of the pinion 25 to hold the latter against play.

In order to conveniently and releasably hold the template in place a bifurcated or U-shaped spring member 52 is slidably mounted on the upper surface of the housing 41 by means of slots 53 and pins 54. At its rear end this member is provided with a flange 56 by which it may be manipulated. It is also provided with spring holding clips 55, one adjacent each of the forked ends and one adjacent the bight portion. The latter is adapted

to engage over the rear portion of the template, as shown in Figs. 2 and 4, and the members **55** at the forward ends of the spring member are adapted to engage over the lugs or flanges **48** and **50** respectively so as to clamp the template in place when this spring member is moved forwardly, as shown in Fig. 2. When the spring member is moved rearwardly, the template is released and may be removed to be replaced by another.

As shown more especially in Fig. 9, a spring latch member **57** is secured by the rivet **58** to the lower surface of the housing **41**, this member projecting rearwardly through an opening **59** in the housing and is turned upwardly at its rear end to extend behind the lower end of the member **56**, as shown at **60**, and releasably hold the locking member **52** in position. It will be understood that the engaging surfaces of the members **56** and **60** are rounded so that when the locking slide **52** is pulled rearwardly, the spring latch member **57** will be cammed downwardly to a releasing position. Likewise, when the member **52** is pushed forwardly, the latch member will automatically spring upwardly to latching position, as shown in full lines in Fig. 9.

A bracket **62** (Fig. 7) is secured to the frame **10** adjacent the rear end thereof, the body of this bracket being disposed within the housing **41**. The bracket is provided with an arcuate slot **63** within which rides a pin **64** secured to the actuating lever **22** so that this lever will be properly held in place and guided in its movements about the pivot **23**. This bracket is provided with bearing surfaces **65** and **66** upon which ride laterally extending portions **67** and **68** (Fig. 6) at the rear end of the lever **22**.

A pawl **70** is pivoted at **71** upon the bracket **62** and held in engagement with the ratchet wheel **27** by a spring **72**. When the lever **22** is reciprocated and the ratchet wheel which is mounted thereon is moved laterally of the frame, this pawl engages the teeth of the ratchet wheel and effects step-by-step rotation of the latter, thereby rotating the pinion **26** and effecting movement of the feed blade as the teeth of the platen follow the pinion.

In order to adjust the bite or throw of the feed blade in a lateral direction about the pivot pin **38**, this pin is mounted upon a slide **73** (Figs. 5 and 10). This slide is disposed above the plate **13** and is provided with a longitudinal opening or slot **74** in which is received the pivot pin **23** so that the slide will be guided in its movements. Adjustment of this slide in a direction longitudinally of the attachment adjusts the pin **38** in the slots **36** and **37** of the plates **10** and **13** and also in the slot **35** of the feed blade so as to vary the pivot point of the latter and thereby adjust the lateral throw of the feeding foot **34** and the bite of the stitch.

As shown more especially in Figs. 10 and 11, the slide **73** is provided with an upstanding flange **75** adjacent one edge thereof and this flange is turned outwardly in L-shaped form as shown at **76**. Slidably mounted on the out-turned end **76** of the flange **75** is a manually engageable plunger **77**. This member is provided with slots **78** engaging pins **79** in the member **76** so as to limit relative sliding movement between these parts. A spring **80** acts between a spring support **81** secured to the flange **75** and vertical extensions **82** and **83** to normally urge the plunger member **77** outwardly. This member is also provided with a detent **84** adapted to engage serrations **85** (Fig. 3) in the flange **11** of the base **10**. A leaf spring **86** is secured to the flange **75** and engages the member **14** to guide the slide in its movement.

It will be apparent that when the member **77** is pushed inwardly toward the spring stop **81**, the detent **84** will be disengaged from the serrations **85** and thus permit the slide **73** to be moved longitudinally of the attachment so as to vary the position of the pivot **38**.

While we have shown and described one embodiment of our invention, it will be understood that it is not to be limited to all of the details shown, but is capable of modification and variation within the spirit of the invention and within the scope of the claims.

What we claim is:

1. A buttonhole attachment for sewing machines comprising a frame, a feed blade slidably mounted on the frame, means for effecting sliding movement of said feed blade including a toothed rack member carried by the feed blade in a position spaced above the same, a supporting member carried by the feed blade having an opening within which the rack member is received, said rack member having flange portions overlying the edges of said opening to be supported by the supporting member, and a forked locking slide carried on the upper surface of said supporting member adjacent said opening for bodily slidable movement, and said slide having means adapted to be moved to position to engage over the rack member to hold the latter in place.

2. A buttonhole attachment as in claim 1 wherein the rack member is provided with laterally extending lugs above the supporting member, and the locking slide is provided with spring clips engaging over said lugs.

3. A buttonhole attachment as in claim 1 wherein a spring latch member is carried by the supporting member to engage said locking slide and releasably hold the latter in a position in which it engages the rack member.

4. A buttonhole attachment as in claim 1 wherein a spring latch member is carried by the supporting member to engage said locking slide and releasably hold the latter in a position in which it engages the rack member, the engagement between said locking slide and latch member being such that the slide is released when a force is applied thereto in a direction to move it to disengaging position.

5. A buttonhole attachment for sewing machines comprising a frame, a feed blade mounted on the frame for pivotal and slidable movements, means for effecting such movements including an actuating lever pivoted on the frame, an adjusting slide having an elongated slot therein in which the pivot of the actuating lever is received to guide the slide in its movements, a pivot pin carried by said slide upon which the feed blade is pivoted, and said feed blade being provided with an elongated slot in which said pivot pin is slidably received whereby, when the slide is adjusted, the pivot point about which the feed blade moves may be varied.

6. A buttonhole attachment as in claim 5 wherein a spring-pressed plunger is movably carried by the slide and is provided with means to engage the frame and releasably hold the slide in adjusted positions.

7. A buttonhole attachment as in claim 5 wherein a resilient member is secured at one end to the slide, and has a free end urged by the resilience thereof against the frame to guide the slide in its movement.

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