Nov. 24, 1953 H. H. RUSSELL 2,660,138

BUTTONHOLE ATTACHMENT FOR SEWING MACHINES

Filed Oct. 14, 1950

Fig. 1.

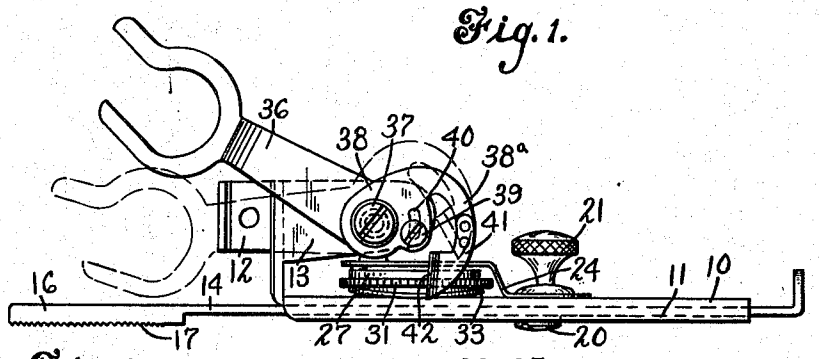


Fig. 2.

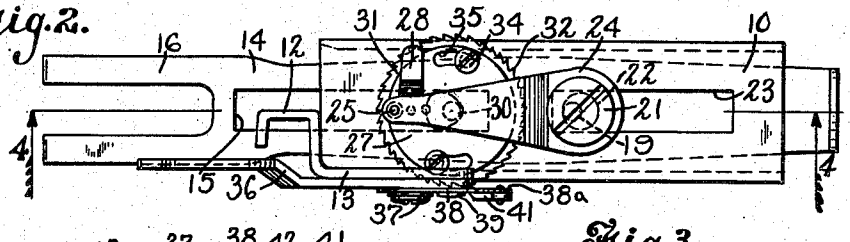


Fig. 3.

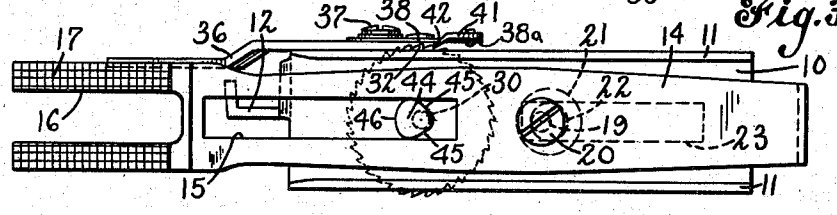


Fig. 4.

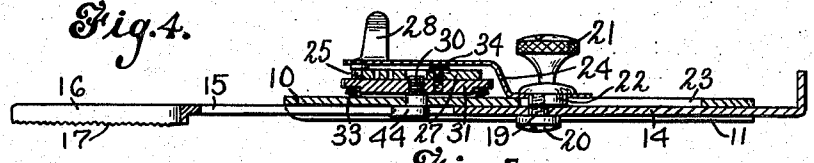


Fig. 5.

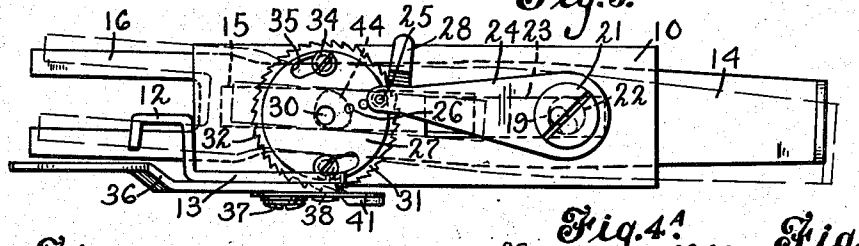


Fig. 6.

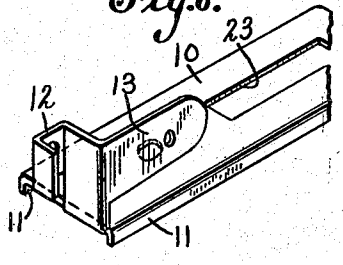


Fig. 7.

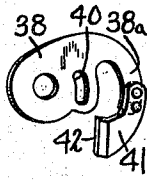


Fig. 4A.

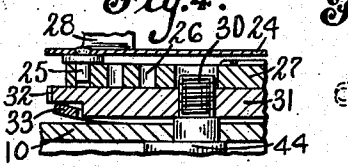
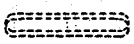


Fig. 8.



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BUTTONHOLE ATTACHMENT FOR SEWING MACHINES

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7 Claims. (Cl. 112—77)

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This invention relates to sewing machine attachments, and more particularly to a buttonhole attachment for sewing machines. It is contemplated to provide a relatively simple and inexpensive device for attachment to the usual household sewing machine in place of the presser foot, which device may be employed to effect buttonhole stitching.

In the making of a buttonhole attachment, provision must be made for moving the cloth in an oblong path so as to sew a stitch around the buttonhole, the stitching following down one side of the opening, then moving over transversely and traveling down the other side of the opening. Also it is more or less usual in such attachments to provide means for making zig-zag stitches instead of the usual straight stitching, this zig-zag stitching following the oblong path just described.

The work effected by the device of the present invention differs from that described above in that, while the stitching performed by the attachment follows an oblong path so as to sew around the buttonhole, no provision is made for zig-zag stitching, so that the elliptical or oblong path followed by the line of stitching is effected by straight stitching of the machine.

As no mechanism need be provided for effecting zig-zag movements of the feeding foot, the mechanism can be greatly simplified and a relatively light and inexpensive device may be made which will, however, be quite useful in this type of work.

In addition to providing mechanism which will stitch in an oblong path, provision is also made for adjusting the length of this path for buttonholes of different length, and an adjustment is also made for varying the exact position of the stitching, so that, if desired, a double-stitch buttonhole may be effected, the second line of stitching being displaced slightly with respect to that of the first so that one line of stitching will not be superposed on the other.

One object of the present invention is to provide a buttonhole attachment for household sewing machines which will be relatively light in weight and relatively inexpensive to manufacture.

A still further object of the invention is to provide a buttonhole attachment for sewing machines which, in its operation, will automatically effect a straight stitching in a piece of material over an oblong path so as to effect the stitch upon each side of the buttonhole and also at each end thereof.

Still another object of the invention is to provide a buttonhole attachment for sewing machines such that the position of the line of stitching may be varied in order that, if desired, a second stitching of the buttonhole may be effected slightly spaced from the first stitching, in order to effect a double stitch around the buttonhole with one line of stitching not being superposed upon the other.

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A still further object of the invention is to provide a relatively inexpensive buttonhole attachment of the character described, the parts being so designed that they may be made by stamping operations so as to lessen the cost of the device.

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

In the drawings:

Fig. 1 is a side elevational view of a buttonhole attachment for sewing machines embodying my invention;

Fig. 2 is a top plan view thereof;

Fig. 3 is a bottom plan view of the device;

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

Fig. 4A is an enlarged sectional view showing the connection of the feed blade to the operating ratchet wheel;

Fig. 5 is a view similar to Fig. 2 but showing the parts in another position;

Fig. 6 is a perspective view of a portion of the frame of the device;

Fig. 7 is a detail view of the pawl mechanism; and

Fig. 8 is a diagrammatic view showing the stitching effected by the device.

To illustrate a preferred embodiment of my invention I have shown in the drawings a buttonhole attachment for sewing machines comprising a main frame consisting of a base plate 10, which has a pair of downwardly projecting flanges 11 at its side edges. Secured to and upstanding from the base plate is the usual adapter 12 by which the device may be secured to the presser bar of the sewing machine, and extending rearwardly from this adapter is an arm 13 for supporting a part of the mechanism, as will be hereinafter described.

Slidably mounted adjacent the under side of the base plate 10 is the feed blade 14, this member being provided with a slot 15 (Fig. 3) the use of which will be described hereinafter, and also provided at its forward end with a bifurcated feed foot 16. The two parts of this foot may be roughened or serrated on their under sides, as shown at 17, so that they will cling to the material and effect the movement thereof in its longitudinal forward and reverse feeding movements, and also in its lateral movements at the end of the buttonhole.

This feed blade 14 is pivoted to the base plate 10 by means of the pivot pin 19, which pin has an enlarged head 20 on its lower side to clamp the

blade, or at the end of the forward and rearward strokes.

It may sometimes be desirable to make a second stitching around the buttonhole in a path slightly spaced from that of the first. If this is desired, the adjusting knob 21 is rotated so as to rotate the eccentric 22 in the slot 23, and therefore move the pivot pin 19 laterally with respect to the base 10. This will move the pivot of the feed blade 14 to a slight extent, and therefore affect the position of the feeding foot 16, which position is, of course, determined by the position of the pivot pin and the cam 44. Thus, as shown in Fig. 8, the second line of stitching made after adjustment of the knob 21 will not be superposed over the first, and will strengthen the buttonhole.

While I have shown and described a preferred embodiment of my 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 I claim is:

1. A buttonhole attachment for sewing machines, comprising a frame having a base plate, a feed blade carried by the plate for lengthwise reciprocating movement, means for effecting reciprocation of said blade comprising a ratchet wheel mounted on the plate, a fork arm pivoted on the frame and engaged with the ratchet wheel to effect step-by-step rotation of said wheel, a member adjustably connected to said wheel, an arm eccentrically pivoted to said member and pivoted to the feed blade to effect reciprocation of the latter, and means secured to said ratchet wheel to effect lateral movements of said blade.

2. A buttonhole attachment for sewing machines, comprising a frame having a base plate, a feed blade carried by the plate for lengthwise reciprocating movement, means for effecting reciprocation of said blade comprising a ratchet wheel mounted on the plate, a fork arm pivoted on the frame and engaged with the ratchet wheel to effect step-by-step rotation of said wheel, a member connected to said wheel and pivoted to the feed blade to effect reciprocation of the latter, said blade having a longitudinal slot therein, and a cam member secured to said ratchet wheel and disposed within said slot to effect lateral movements of said blade.

3. A buttonhole attachment for sewing machines, comprising a frame having a base plate, a feed blade carried by said plate for lengthwise reciprocating movement relatively thereto, means for effecting reciprocation of said blade including a ratchet wheel rotatably mounted on the plate to rotate about a vertical axis, a fork arm pivoted on the frame and engaged with the ratchet wheel to effect step-by-step rotation thereof, an arm eccentrically pivoted to said ratchet wheel at one end and having its other end pivoted to said blade, and a cam member secured to said ratchet wheel to be rotated thereby, said feed blade having a slot in which said cam member is disposed whereby said cam engages the sides of the slot and effects lateral movement of the feed blade.

4. A buttonhole attachment for sewing machines, comprising a frame having a base plate, a feed blade carried by said plate for lengthwise reciprocating movement relatively thereto, means for effecting reciprocation of said blade including a ratchet wheel rotatably mounted on the plate to rotate about a vertical axis, a fork arm pivoted on the frame and engaged with the ratchet wheel to effect step-by-step rotation thereof, an arm eccentrically pivoted to said ratchet wheel at one end and having its other end pivoted to said blade, said feed blade having a slot therein, a cam member secured to said ratchet wheel and disposed within said slot, and a pivot pin connecting said arm with the blade and disposed rearwardly of said cam member.

5. A buttonhole attachment for sewing machines, comprising a frame having a base plate, a feed blade carried by said plate for lengthwise reciprocating movement relatively thereto, means for effecting reciprocation of said blade including a ratchet wheel rotatably mounted on the plate to rotate about a vertical axis, a fork arm pivoted on the frame and engaged with the ratchet wheel to effect step-by-step rotation thereof, an arm eccentrically pivoted to said ratchet wheel at one end and having its other end pivoted to said blade, said feed blade having a slot therein, a cam member secured to said ratchet wheel and disposed within said slot, and a pivot pin connecting said arm with the blade and disposed rearwardly of said cam member, said plate having a slot therein and said pivot pin extending slidably through said slot.

6. A buttonhole attachment for sewing machines, comprising a frame having a base plate, a feed blade carried by said plate for lengthwise reciprocating movement relatively thereto, means for effecting reciprocation of said blade including a ratchet wheel rotatably mounted on the plate to rotate about a vertical axis, a fork arm pivoted on the frame and engaged with the ratchet wheel to effect step-by-step rotation thereof, an arm eccentrically pivoted to said ratchet wheel at one end and having its other end pivoted to said blade, said feed blade having a slot therein, a cam member secured to said ratchet wheel and disposed within said slot, a pivot pin connecting said arm with the blade and disposed rearwardly of said cam member, said plate having a slot therein and said pivot pin extending slidably through said slot, and an eccentric on said pivot pin within said slot whereby the pivotal connection of the arm with the blade may be adjusted laterally relatively to the plate.

7. A buttonhole attachment for sewing machines, comprising a frame having a base plate, a feed blade carried by the plate for lengthwise reciprocating movement, means for effecting reciprocation of said blade comprising a ratchet wheel mounted on the plate, a fork arm pivoted on the frame and engaged with the ratchet wheel to effect step-by-step rotation of said wheel, a member connected to said wheel and pivoted to the feed blade to effect reciprocation of the latter, the pivotal axis of said fork arm being at right angles to that of said ratchet wheel, and a resilient sheet metal pawl rigidly secured to said fork arm and urged by its resiliency into engagement with the teeth of the ratchet wheel.

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