April 12, 1932. J. KIEWICZ 1,853,432

BUTTONHOLE SEWING MACHINE

Filed Aug. 14, 1930 2 Sheets-Sheet 1

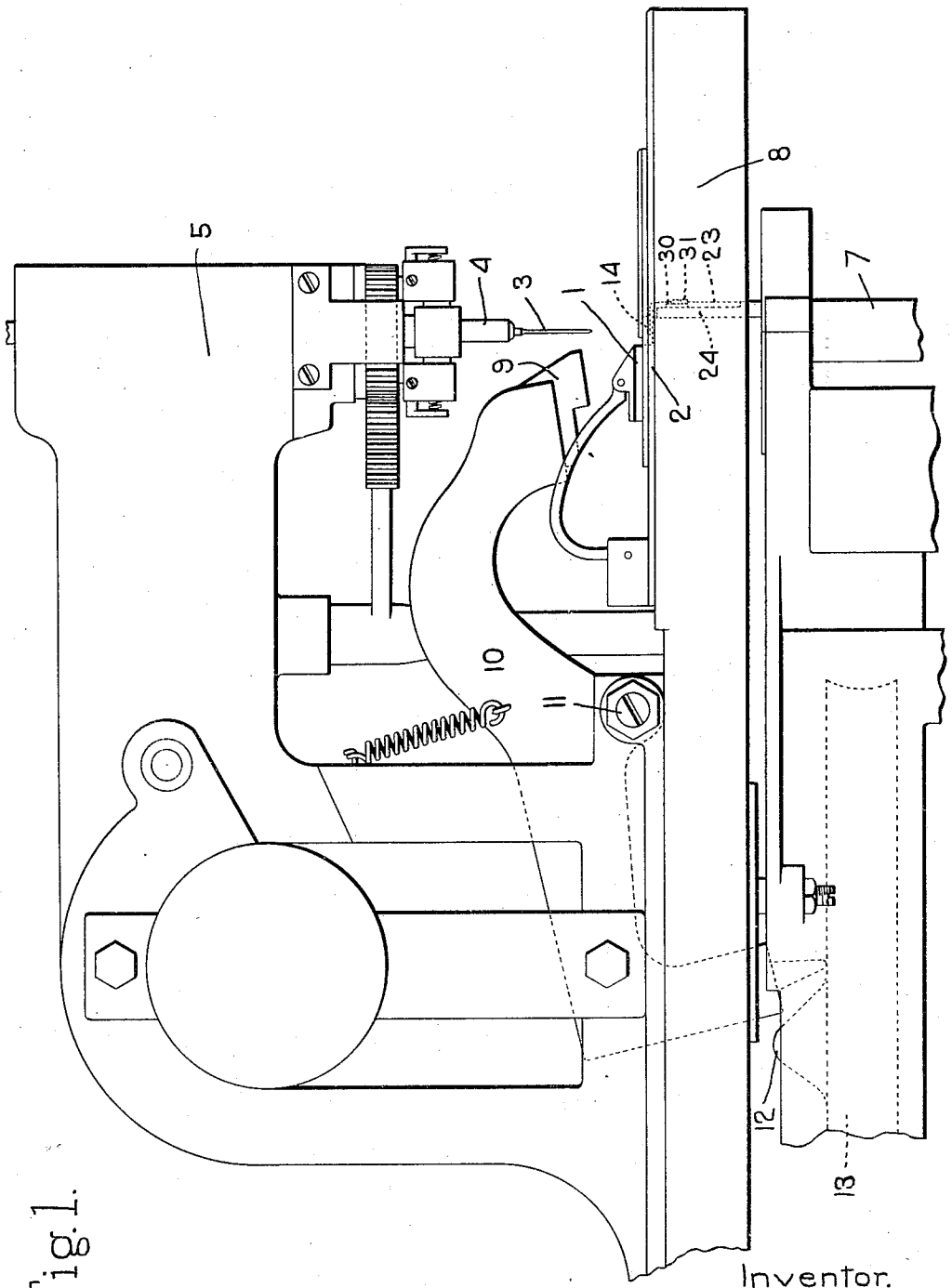

Fig. 1.

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Fig.2.

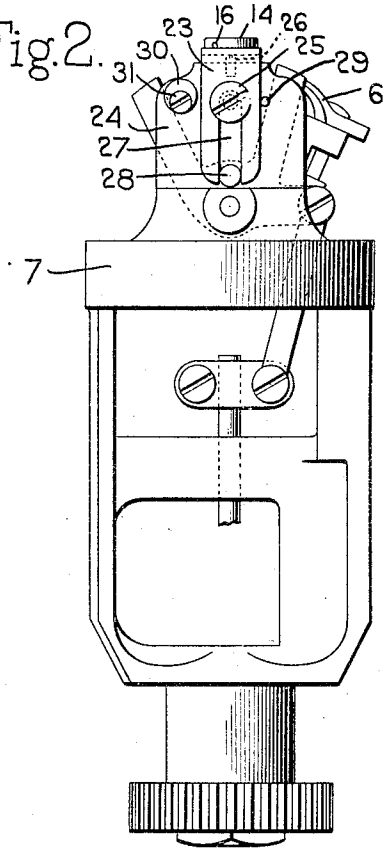


Fig.3.

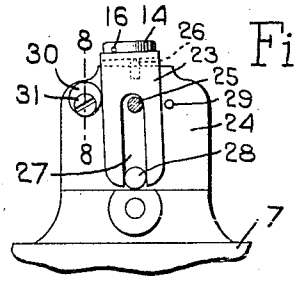


Fig.4.

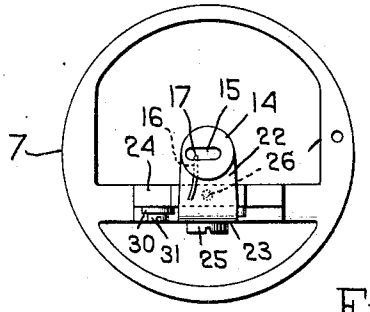


Fig.5.

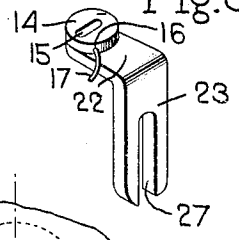


Fig.6.

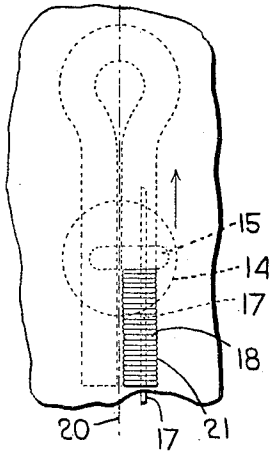


Fig.7.

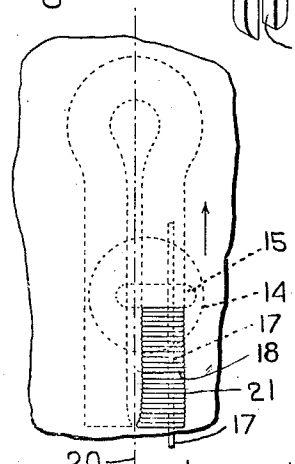
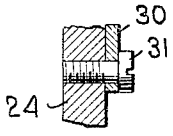


Fig.8.



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Patented Apr. 12, 1932 1,853,432

UNITED STATES PATENT OFFICE

JOHN KIEWICZ, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE REECE BUTTON HOLE MACHINE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE

BUTTONHOLE SEWING MACHINE

Application filed August 14, 1930. Serial No. 475,198.

This invention relates to buttonhole sewing machines.

Buttonhole sewing machines are commonly constructed to lay a cord around the edge of the buttonhole beneath the buttonhole stitches as the latter are formed, and the present invention relates particularly to the means for guiding the cord and has for its object to provide a novel means for guiding or controlling the cord which is equally applicable to buttonhole sewing machines that are designed to cut the buttonhole before the sewing as to buttonhole sewing machines that are designed to cut the buttonhole after the sewing.

Where a buttonhole sewing machine is set or adjusted for sewing a buttonhole which is to be cut after the sewing is completed it is common practice to adjust the stitch-forming mechanism so that the depth stitch will be at a lesser distance from the center line of the buttonhole than where the sewing machine is set and adjusted for sewing a buttonhole after the buttonhole slit has been cut. In the latter case the alternate thrusts of the needle are through the buttonhole slit and the other thrusts are through the work at a distance from said slit, this distance being further from the center line of the buttonhole than in the case of a buttonhole sewing machine which is adjusted for sewing the buttonhole before the slit is cut. In either case, it is desirable that the cord should be laid near the outer edge of the line of stitching which requires that the guide for the cord should be positioned differently in a buttonhole sewing machine that is designed to cut the buttonhole after the stitching has been completed from what it is in a buttonhole sewing machine designed to cut the buttonhole before the stitching is made.

Heretofore it has been the common practice to employ a special cord-guiding means for each of the above-mentioned types of buttonhole sewing machines.

The present invention, however, aims to provide a novel cord-guiding device which can be used with either of said types of buttonhole sewing machine. This is provided for by making a cord-guiding device so that it can be adjusted laterally with reference to the center line of the buttonhole thereby to enable it to lay the cord at different distances from said center line depending on whether the sewing machine is operating as a "cut before" or "cut after" machine.

In order to give an understanding of the invention I have illustrated in the drawings a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claims.

Fig. 1 is a side view of a buttonhole sewing machine embodying my invention;

Fig. 2 is a side view of the turret carrying the under thread mechanism and which also carries my improved cord-guiding device which in the present embodiment is associated with the throat;

Fig. 3 shows the manner of adjusting the cord-guiding element;

Fig. 4 is a top plan view of the turret shown in Fig. 2 but with the loopers and other under thread handling mechanism omitted;

Fig. 5 is a perspective view of the throat showing the manner in which it functions to guide the cord;

Fig. 6 is a view showing the manner in which the cord is laid in sewing a buttonhole which is cut after the sewing is completed;

Fig. 7 is a similar view showing the manner in which the cord is laid where the buttonhole is cut before the sewing is completed;

Fig. 8 is an enlarged section on the line 8—8, Fig. 3.

In Fig. 1 I have shown generally a buttonhole sewing machine which is provided with the usual work-holding means herein shown in the form of work clamps 1 adapted to clamp the work against clamp plates 2 and which is also provided with the usual stitch-forming mechanism, the latter including a needle 3 carried by a needle bar 4 which reciprocates in the head 5, and the under thread manipulating mechanism in the form of loopers 6 which are mounted on a turret 7 that is situated beneath the bed 8. The sewing machine also includes a buttonhole cutter of usual type including a cutting element 9 carried by a lever 10 pivoted at 11, said lever being actuated by a cam hump 12 carried by the main cam 13 from which the operations

of the sewing machine are controlled. It will be understood, of course, that the stitch-forming mechanism and the work-holding means have a relative movement to provide for laying the stitches along the sides of the buttonhole, and further that the forming of the stitches around the eye end of the buttonhole is provided for by rotating the turret 7 and the needle bar 4, this being a common practice in buttonhole sewing machines.

These buttonhole sewing machines are commonly provided with some means for guiding a cord to the buttonhole as the sewing proceeds, and in forming the buttonhole the buttonhole stitches overlie and cover the cord. In the present construction the means for guiding the cord is associated with the usual throat plate 14 which is carried by the turret 7 and on which the work is supported at the sewing point, said throat being formed with the usual sewing opening 15 through which the needle 3 reciprocates.

This throat is provided with a cord-guiding aperture 16 which extends laterally from the outside of the throat to the sewing opening and through which the cord 17 extends. This aperture constitutes a means for guiding the cord as it is delivered to the work and determines the position of the cord relative to the center line of the buttonhole.

In accordance with my present invention the throat 14 with its cord-guiding aperture 16 is capable of adjustment laterally so as to provide for laying the cord 17 nearer to or further from the center line of the buttonhole depending upon whether the sewing machine is operating as a "cut after" or "cut before" machine, that is, a machine which cuts the buttonhole after it is sewed or cuts it before it is sewed.

Figs. 6 and 7 illustrate the sewing of these two types of buttonholes. Fig. 6 shows the position of the cord in a buttonhole which is cut after the sewing is completed while Fig. 7 illustrates the position in a buttonhole which is cut before the sewing is commenced. In Fig. 6 the buttonhole stitches which are formed are indicated at 18, the full lines showing a partially completed hole and the dotted lines indicating the outline of the stitches upon completion of the buttonhole.

The throat 14 with its sewing opening 15 which is situated underneath the work, is shown in dotted lines and this figure also shows in dotted lines the approximate position of the cord 17. Where the buttonhole is one which is to be cut after the sewing is completed the throat will be adjusted into substantially the position shown in Fig. 6 relative to the center line 20 of the buttonhole and in this position the cord 17 will be laid slightly nearer the outer edge 21 of the line of stitches than the center of the buttonhole.

If, on the other hand, the buttonhole is one which is cut before the stitching begins then the stitch-forming mechanism will be adjusted so that the outer edge 21 of the line of stitches, or the line in which the needle penetrates the goods back from the buttonhole slit, will be further from the center line 20 of the buttonhole than in the case of the buttonhole shown in Fig. 6.

This adjustment is made partly because since the buttonhole is cut before the sewing begins said buttonhole will tend to separate slightly as shown in Fig. 7, and partly because where the buttonhole slit is cut first it is desirable to use a longer stitch so that the needle will penetrate the goods further from the center line of the buttonhole in order to avoid any possibility of the fabric fraying. This is especially true if the fabric is of a loose weave or is a knitted fabric.

For sewing a buttonhole which is cut first the throat 14 is adjusted laterally to place the thread-guiding aperture 16 at a greater distance from the center line of the buttonhole as indicated in Fig. 7 and this will provide for laying the cord 17 near the outer edge 21 of the line of stitches.

While various ways may be provided for adjusting this throat I have herein shown a simple construction. The throat 14 is carried on the offset end 22 of a stem 23 which lies against the face 24 of the turret and is clamped thereto by a clamping screw 25. The throat is held in its vertical position by means of a supporting pin 26 which rises from the turret and on which the offset portion 22 of the stem rests.

The stem 23 is slotted as shown at 27 and the lower end of the slot embraces a positioning pin 28 extending from the portion 24 of the turret. The clamping screw 25 extends through the slot at the upper end. Said clamping screw is of smaller diameter than the width of the slot but the positioning pin 28 fills the slot. This provides for a slight lateral shifting movement of the throat about the pin 28 as a center.

The turret is provided with a fixed stop 29 which limits the swinging movement of the stem 23 in one direction and it is provided with an adjustable stop 30 which limits the swinging movement in the opposite direction. When the stem is in engagement with the fixed stop 29 as shown in Fig. 2 the cord-guiding aperture 16 will be properly positioned to lay the cord for a buttonhole which is to be cut after the sewing is completed as shown in Fig. 6. On the other hand, when the throat is adjusted laterally to the left, Fig. 2, against the stop 30 as shown in Fig. 3, then the thread-guiding aperture will be properly positioned for laying the cord for a buttonhole which is to be cut before the sewing commences. The throat will be held in either adjusted position by the action of the

clamping screw 25 which clamps the stem firmly against the face 24 in either position.

The stop 30 is shown as an adjustable stop, it being in the form of an eccentric which is mounted on a clamping screw 31 that screws into the turret. By loosening the screw 31 the eccentric 30 can be turned about the screw thereby to adjust its position and when it is in the proper adjusted position it may be held therein by tightening the screw 31.

The exact adjustment of the stop 30 will depend somewhat on the character of the goods which is being sewed. In coarse knit goods or loosely woven goods a greater adjustment of the throat is desirable than with more firmly woven goods. However, after the stop 30 has been adjusted for any character of goods then the throat can be adjusted for the "cut before" or "cut after" operation by simply loosening the clamping screw 25 and shifting the stem against the stop 30 for the "cut before" operation, and against the stop 29 for the "cut after" operation. It will be noted that the sewing opening 15 is in the form of a slot and that the adjustment of the throat plate is in the direction of the length of the slot.

While I have illustrated herein a selected embodiment of the invention I do not wish to be limited to the constructional features shown. Furthermore, while I have herein shown the cord-guiding element as forming part of the throat yet it is not essential that this element should be part of the throat as the invention contemplates broadly the idea of an adjustable cord-guiding means to provide for laying the cord for either the "cut before" or "cut after" operation.

I claim.

1. In a buttonhole sewing machine, the combination with stitch-forming mechanism, of a throat plate having means to guide a cord and lay it around the buttonhole as the stitching progresses, said throat plate with its guiding means being adjustable laterally of the center line of the buttonhole slit, whereby the cord may be laid closer to or further from said center line.

2. In a buttonhole sewing machine, the combination with stitch-forming mechanism, of a throat having a sewing opening and also a cord-guiding aperture, and means supporting the throat for adjustment laterally with respect to the center line of the buttonhole.

3. In a buttonhole sewing machine, the combination with stitch-forming mechanism, of a turret beneath the work on which under thread mechanism is supported, a cord-guiding element stationarily mounted on the turret and adapted to lay a cord around the buttonhole as the stitching proceeds, said element being adjustable laterally with respect to the center line of the buttonhole and means to clamp said cord-guiding element in adjusted position.

4. In a buttonhole sewing machine, the combination with stitch-forming mechanism including a needle operating above the work and under thread mechanism, of a turret beneath the work carrying the under thread mechanism, a throat mounted on the turret and having a cord-guiding aperture, said throat being adjustable on the turret laterally with respect to the center line of the buttonhole.

5. In a buttonhole sewing machine, the combination with stitch-forming mechanism including a needle operating above the work and under thread mechanism, of a turret beneath the work carrying the under thread mechanism, and a throat plate mounted on said turret and provided with an elongated sewing opening, said throat plate being adjustable on the turret in the direction of the length of the sewing opening, and means to clamp the throat plate in its adjusted position.

In testimony whereof I have signed my name to this specification.

JOHN KIEWICZ.