J. KIEWICZ.

BUTTONHOLE SEWING MACHINE.

APPLICATION FILED FEB. 12, 1921.

1,437,847.

Patented Dec. 5, 1922.

2 SHEETS—SHEET 1.

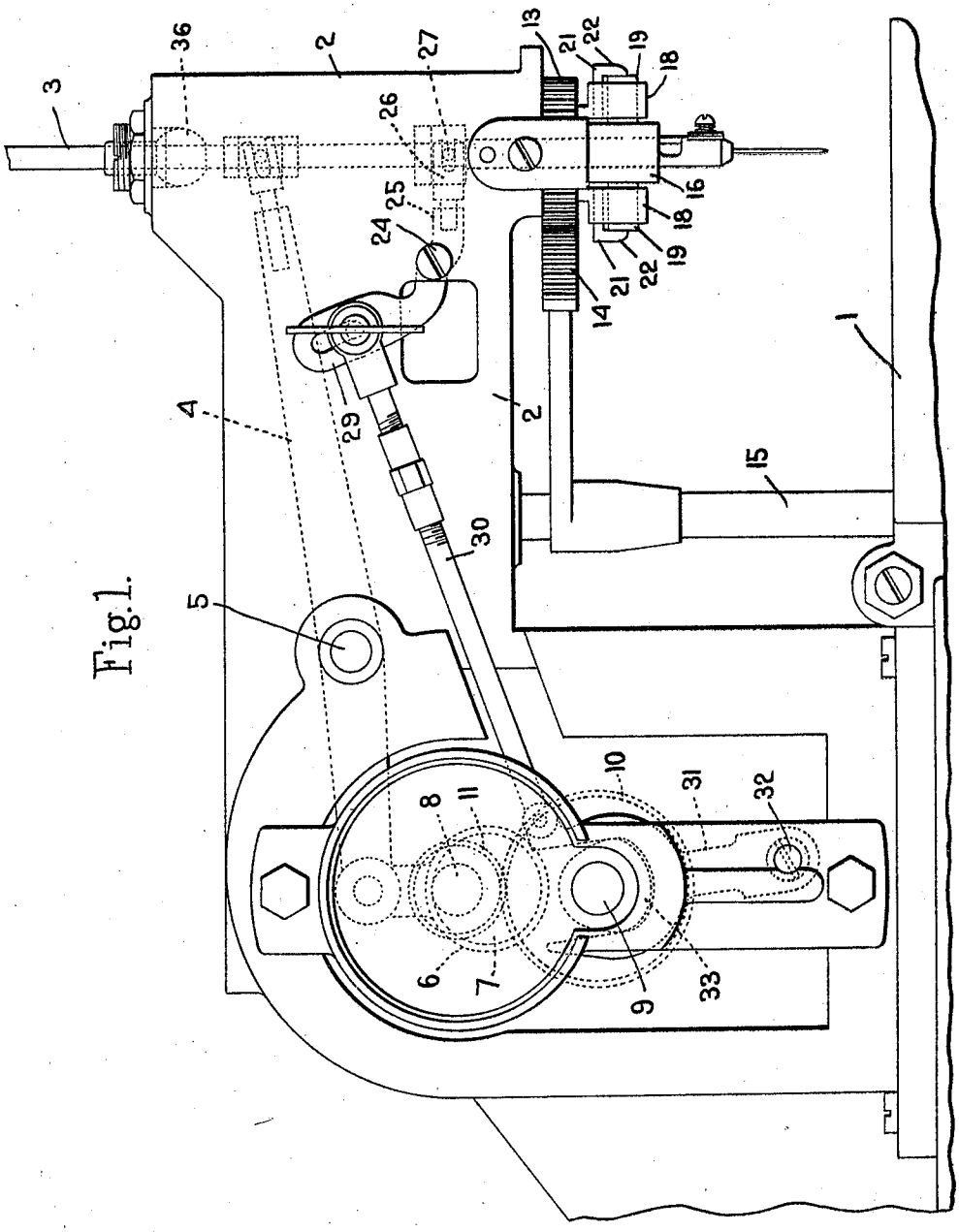


Fig. 1.

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2 SHEETS—SHEET 2.

Fig.2.

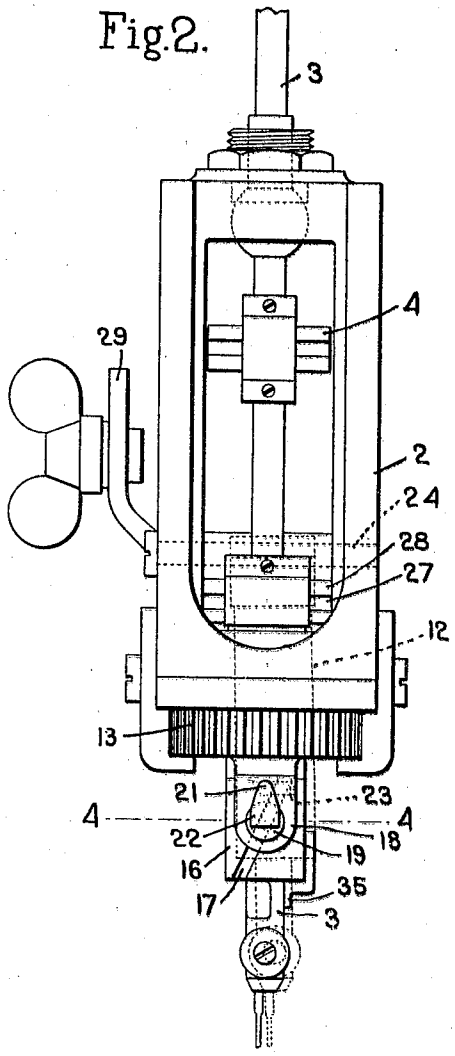


Fig.3.

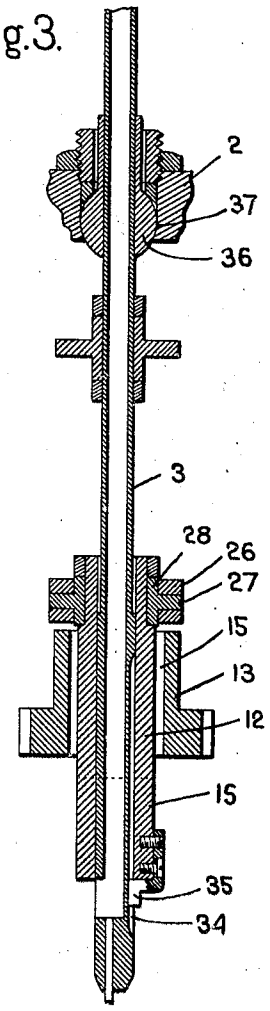
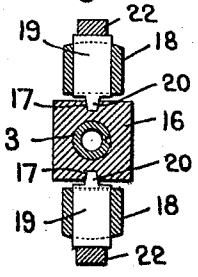


Fig.4.



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UNITED STATES PATENT OFFICE.

JOHN KIEWICZ, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE REECE BUTTONHOLE MACHINE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE.

BUTTONHOLE-SEWING MACHINE.

Application filed February 12, 1921. Serial No. 444,310.

To all whom it may concern:

Be it known that I, JOHN KIEWICZ, a citizen of the United States, and resident of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Buttonhole-Sewing Machines, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to buttonhole sewing machines of that type in which the needle bar is given a lateral jogging movement so that the needle thrusts are made alternately at the slit of the buttonhole and at a distance back from the slit, and in which the needle bar is rotated during the stitching around the eye of the buttonhole.

The object of the invention is to provide an improved means for giving the needle its lateral vibratory movement.

In the present invention the needle bar extends axially through a sleeve which in turn is situated axially of the rotary block or gear by which the needle bar is given its rotative movement, and said sleeve and block are so constructed that the sleeve not only can reciprocate through the block but can have a lateral movement relative thereto. The portion of the sleeve which extends below the block is provided with inclined grooves and the gear member is formed with projections which are received in said grooves, the construction being such that the reciprocation of the sleeve through the gear member will cause the sleeve to be shifted laterally.

In order to give an understanding of my 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 portion of a sewing machine embodying my invention.

Fig. 2 is a front view of the head.

Fig. 3 is a central sectional view through the needle bar.

Fig. 4 is a section on the line 4—4, Fig. 2.

In the drawings, 1 indicates the bed of a buttonhole sewing machine and 2 the head or overhanging arm in which the needle bar 3 reciprocates. The needle bar is given its reciprocation by means of a lever 4 pivoted to the frame at 5 and connected at one end to the needle bar by suitable means and having the other end connected to an eccentric strap 6 embracing an eccentric 7 carried by the shaft 8. This shaft 8 is driven from the driving shaft 9 by means of suitable gears 10 and 11, said gears being so arranged that the shaft 8 will make two rotations for each rotation of the driving shaft 9.

The parts thus far described are all as usual in sewing machines and form no part of my present invention. The needle bar extends axially through and reciprocates in a sleeve 12, and this sleeve 12 in turn extends axially through a gear member 13, which is journaled in the head 2 and which meshes with a gear sector 14 carried by a shaft 15. This shaft 15 is turned by suitable mechanism when the stitching is being done around the end of the buttonhole, all as usual in buttonhole sewing machines of this type, thereby to rotate the gear 13 and turn the needle bar 3 upon its axis.

The opening 15 through the gear 13 which is occupied by the sleeve 12 is larger than the sleeve so as to permit the latter to have a lateral movement and means are provided whereby vertical reciprocating movement of the sleeve 12 relative to the gear 13 will cause the sleeve to vibrate laterally, thus giving the desired lateral vibrating movement to the needle bar. The portion 16 of the sleeve which extends below the gear 13 is rectangular in cross section, as shown in Fig. 4, and it has an inclined groove 17 formed on each of two opposite faces. The gear member 13 has two ears 18 depending therefrom on opposite sides of the sleeve and each ear carries a block 19 having at its inner end a projection 20 which enters one of the inclined grooves 17. These blocks 19 are loosely placed in the ears 18 and they are held in position by L-shaped retainers 21 carried by the ears 18 and having portions 22 which overlie the ends of the blocks. These retainers are held in adjusted position by said screws 23.

With this arrangement it will be observed that a vertical movement of the sleeve 12 relative to the gear 13 will cause the sleeve to

be shifted laterally, the amount of shift depending upon the inclination of the grooves 17 and the extent of the vertical movement of the sleeve. When the sleeve is in its lowered position, shown in full lines, Fig. 3, then the needle bar will occupy the full line position, but if the sleeve is raised into the dotted line position, the action of the projections 20 in the grooves 17 will cause the sleeve to be shifted laterally into the dotted line position, thus giving a lateral shifting movement to the needle bar.

Means are provided for giving the sleeve 12 one reciprocation for each two reciprocations of the needle bar. Journalled in the head 2 is a shaft 24 having an arm 25 which is flexibly connected to the sleeve, said arm being provided with a forked portion 26 which embraces the sleeve and each arm of the fork being slotted to receive a pin 27 extending from a collar 28 that is swivelled on the sleeve. The shaft 24 is also provided with an arm 29 which is connected by a link 30 to a forked lever 31 pivoted to the frame at 32, the fork of the lever embracing a cam 33 fast on the shaft 9.

The rotation of the shaft 9 will therefore result in giving vertical reciprocation to the sleeve 12, but since the sleeve 12 is reciprocated from the shaft 9 while the needle bar is reciprocated from the shaft 8, the needle bar will reciprocate twice as fast as the sleeve. Consequently the needle bar will have a complete reciprocation each time the sleeve is moved downwardly and another complete reciprocation each time the sleeve is moved upwardly and as a result the alternate thrusts of the needle will be in the full line position, Fig. 2, while the other thrusts will be in the dotted line position, Fig. 2.

The connection between the sleeve and the gear is such that the rotation of the gear will be communicated to the sleeve, and to communicate this rotation to the needle bar the latter is provided with a groove 34 in which is received a key 35 carried by the sleeve. This construction permits the needle bar to reciprocate freely in the sleeve but insures that the needle bar and sleeve will always rotate in unison. The upper end of the needle bar reciprocates through a ball member 36 which is received in a suitable socket 37 formed in the head 2, this ball and socket construction permitting the shogging movement of the needle in all positions around the buttonhole.

The construction herein shown is relatively simple and provides for the necessary shogging movement of the needle, not only while the stitches are being formed along the side of the buttonhole but also when the stitches are being formed around the eye of the buttonhole.

I claim—

1. In a buttonhole sewing machine, the combination with a frame, of a gear member rotatably mounted therein, a sleeve extending axially through the gear member but capable of a lateral movement relative thereto, a needle bar reciprocating through the sleeve, means to reciprocate the needle bar, means to reciprocate the sleeve in the gear member, one of the latter parts having inclined grooves, projections carried by the other of said parts and operating in said grooves, whereby the reciprocating movement of the sleeve through the gear member will move said sleeve laterally relative to the gear member.

2. In a buttonhole sewing machine, the combination with a frame, of a gear member rotatably mounted therein, a sleeve extending axially through the gear member but capable of a lateral movement relative thereto, a needle bar reciprocating through the sleeve, means to reciprocate the needle bar, means to reciprocate the sleeve in the gear member, ears depending from the gear member and projections carried by said ears, said sleeve having inclined grooves in which said projections operate, whereby the reciprocating movement of the sleeve will move the latter laterally relative to the gear member.

3. In a buttonhole sewing machine, the combination with a frame, of a gear member rotatably mounted therein, a sleeve extending axially through the gear member but capable of a lateral movement relative thereto, a needle bar reciprocating through the sleeve, means to reciprocate the needle bar, means to reciprocate the sleeve in the gear member, ears depending from the gear member and projections adjustably carried by said ears, said sleeve having inclined grooves in which said projections operate, whereby the reciprocating movement of the sleeve will move the latter laterally relative to the gear member.

4. In a buttonhole sewing machine, the combination with a frame, of a reciprocating needle bar therein, a sleeve through which the needle bar extends, a rotatable gear member through which the sleeve extends and by which the needle bar is rotated in stitching around the end of a buttonhole, said sleeve being capable of a lateral movement relative to the gear member, means to reciprocate the needle bar, means to reciprocate the sleeve through the gear member, said sleeve having inclined grooves, and projections adjustably carried by the gear member and operating in said grooves, whereby the reciprocating movement of the sleeve will move the latter laterally relative to the gear member.

5. In a buttonhole sewing machine, the

combination with a frame, of a gear member rotatably mounted therein, a sleeve extending axially through the gear member but capable of a lateral movement relative thereto, a needle bar reciprocating through the sleeve, means to reciprocate the needle bar, means to reciprocate the sleeve in the gear member, said sleeve having inclined grooves, and projections carried by the gear member and operating in said grooves, whereby the reciprocating movement of the sleeve will move the latter laterally relative to the gear member.

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

JOHN KIEWICZ.