

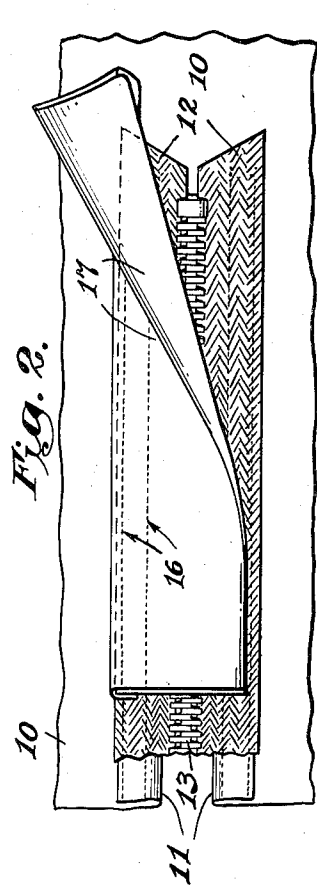
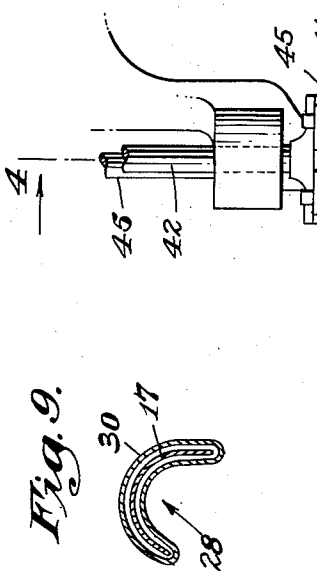
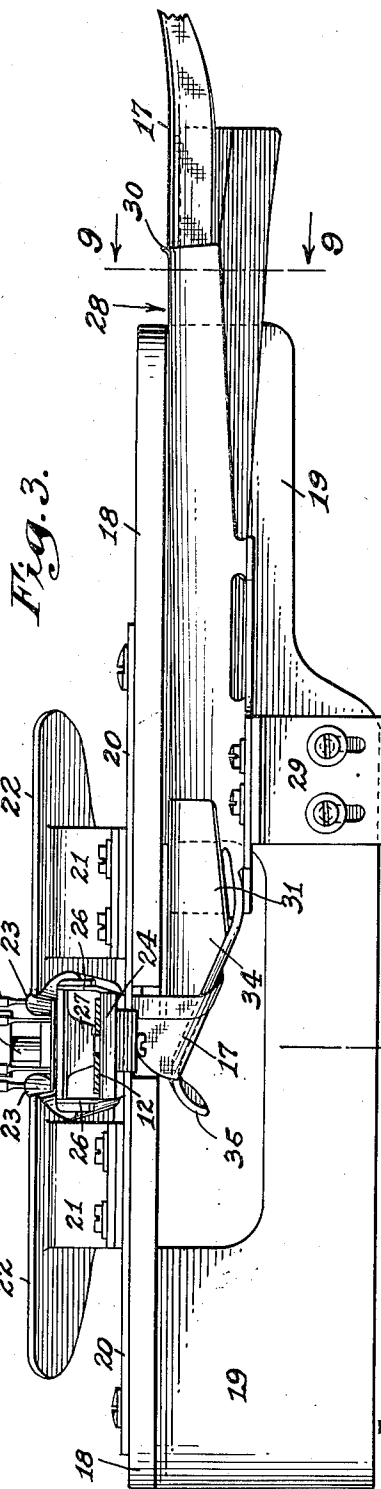
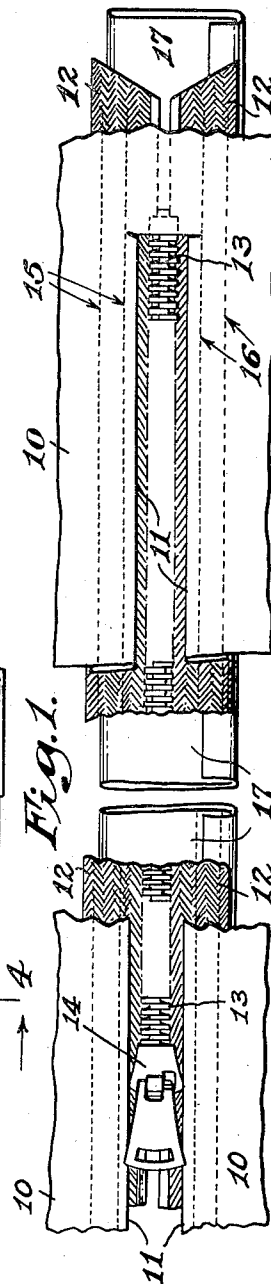
May 11, 1937.

M. BLUMENKRANTZ
SEWING MACHINE AND METHOD

2,079,834

Filed July 11, 1935

4 Sheets-Sheet 1



INVENTOR
Max Blumenkrantz
BY Ramsey, Kent
Chisholm and Lutz
ATTORNEYS

May 11, 1937.

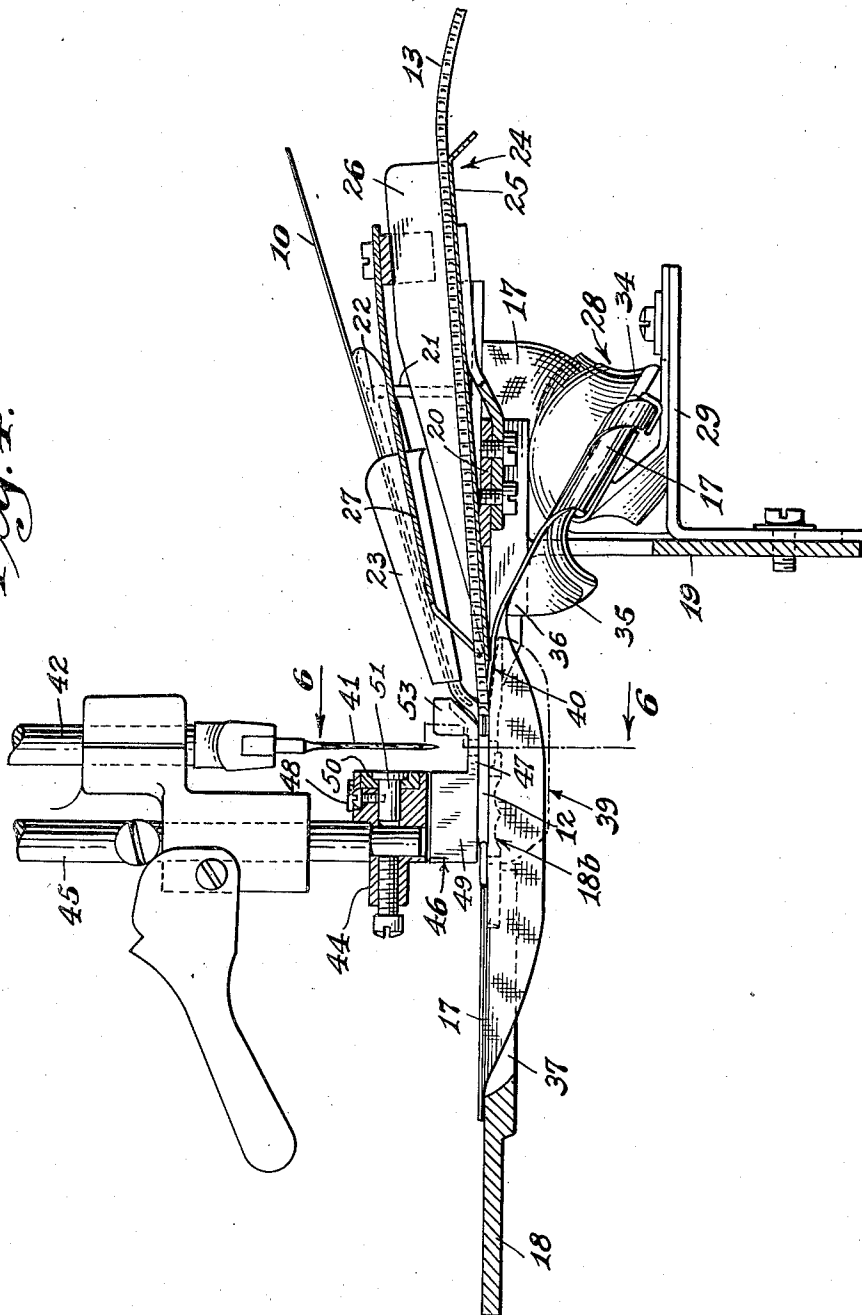
M. BLUMENKRANTZ
SEWING MACHINE AND METHOD

2,079,834

Filed July 11, 1935

4 Sheets-Sheet 2

Fig. 4.



INVENTOR
Max Blumenkrantz
BY Ramsey, Kent,
Chisholm and Lutz
ATTORNEYS

May 11, 1937.

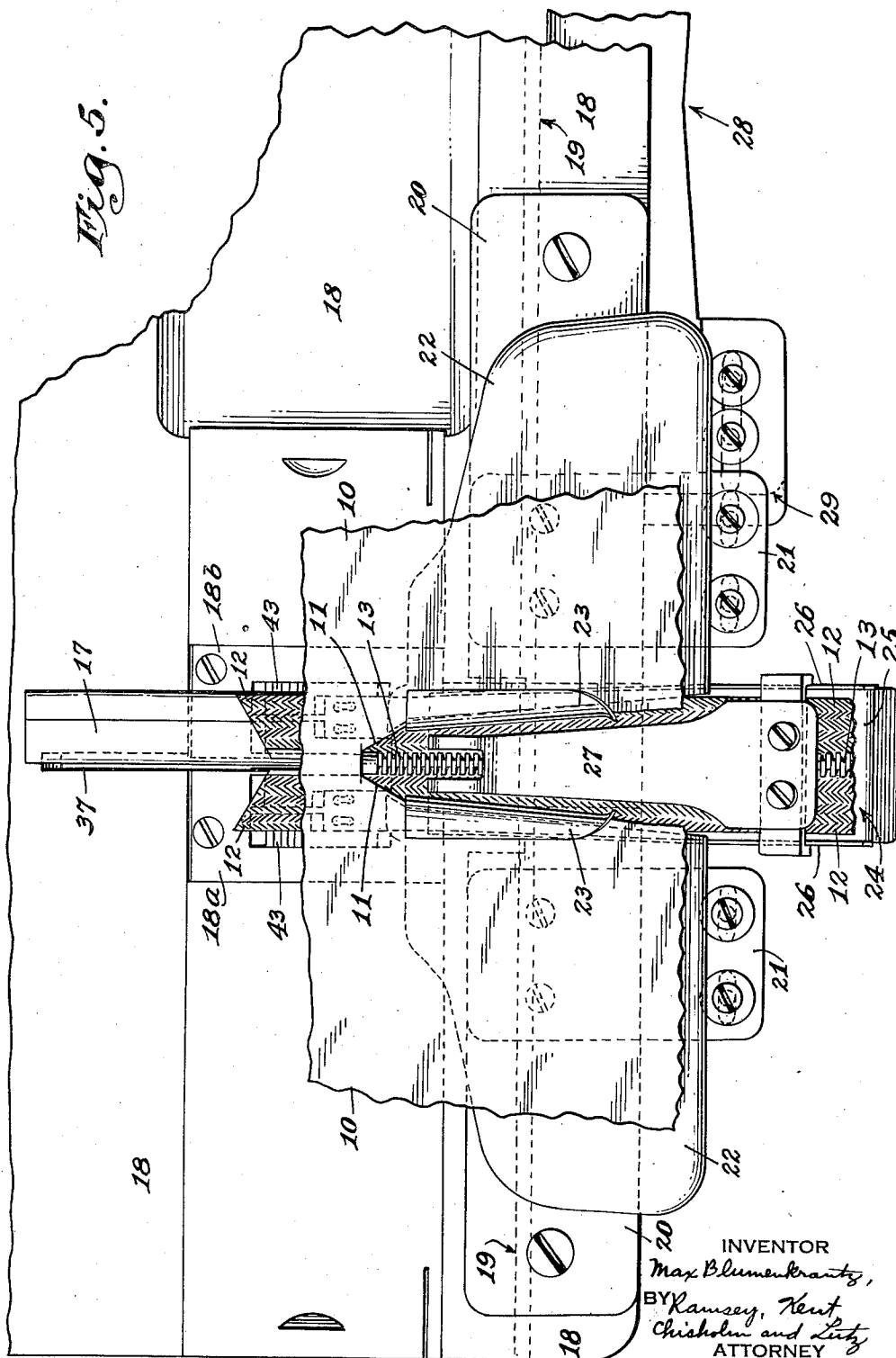
M. BLUMENKRANTZ

2,079,834

SEWING MACHINE AND METHOD

Filed July 11, 1935

4 Sheets-Sheet 3



May 11, 1937.

M. BLUMENKRANTZ

2,079,834

SEWING MACHINE AND METHOD

Filed July 11, 1935

4 Sheets-Sheet 4

Fig. 6.

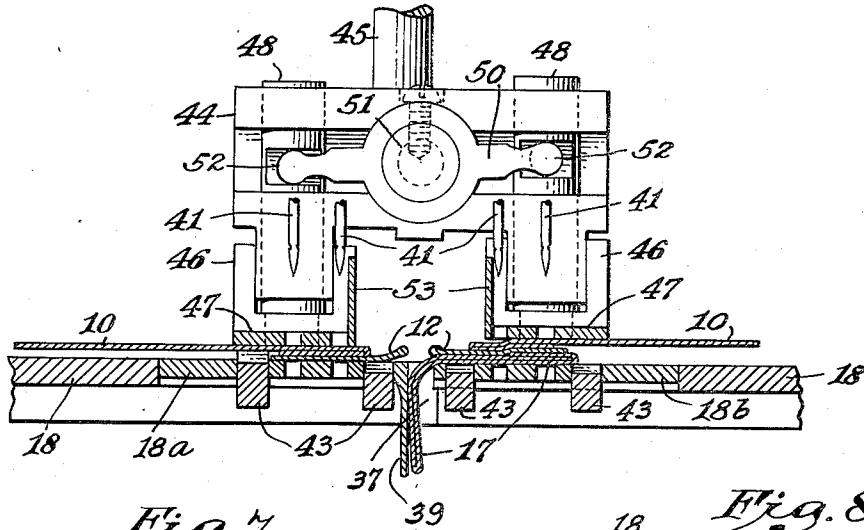


Fig. 7.

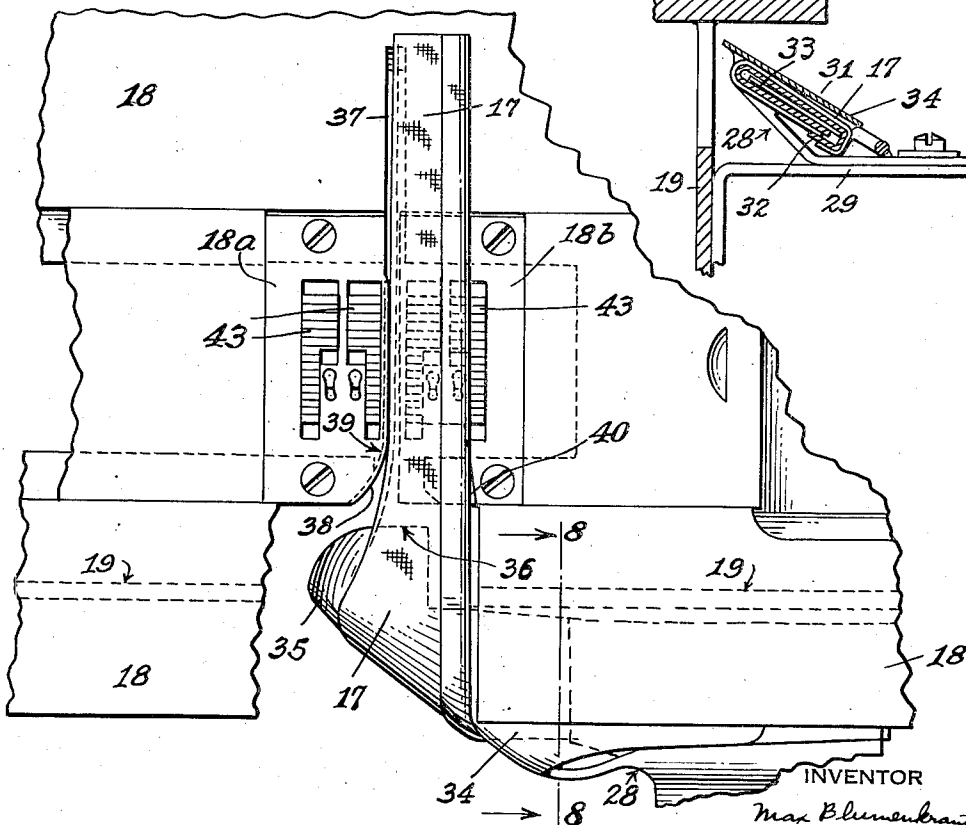
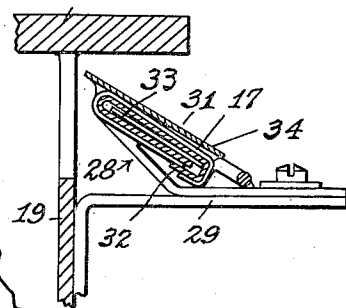


Fig. 8.



INVENTOR
Max Blumenkrantz
BY Ramsey, Kent
Chisholm and Lutz
ATTORNEY

UNITED STATES PATENT OFFICE

2,079,834

SEWING MACHINE AND METHOD

Max Blumenkrantz, New York, N. Y.

Application July 11, 1935, Serial No. 30,807

13 Claims. (Cl. 112—2)

This invention relates to slide fasteners of a well-known type in which two parts are held together by a plurality of interlocking engagements or hooks that can be engaged or disengaged by a sliding lock.

The object of the invention is to provide an improved method and machine for attaching such slide fasteners to garments.

In attaching such slide fasteners to garments it is advantageous to protect the inner side of the slide fastener by a flap or liner. The present invention provides a method and machine whereby the slide fastener and the liner can be attached to a garment simultaneously in a single passage through a special sewing machine.

While a preferred form of the invention is disclosed herein, it will be clear that various changes may be made in the structure without departing from the spirit of the invention as hereinafter set forth and claimed.

In the drawings:

Fig. 1 is a front view partly broken away, showing a liner as attached to a garment by the present invention.

Fig. 2 is a rear view of the structure illustrated in Fig. 1.

Fig. 3 is a front elevation showing part of a sewing machine with the special attachments used in carrying out the invention.

Fig. 4 is a section on line 4—4 of Fig. 3.

Fig. 5 is a plan view partly broken away of the arrangement shown in Fig. 3.

Fig. 6 is a section on line 6—6 of Fig. 4.

Fig. 7 is a partial plan view of the bed plate of the machine.

Fig. 8 is a section on the line 8—8 of Fig. 7.

Fig. 9 is a section on line 9—9 of Fig. 3.

Referring to the drawings more particularly, the reference numeral 10 indicates part of a garment, such as a shirt front, and 11 is a slit or opening formed in the garment. The slide fastener is attached to opposite sides of the opening to provide easy means for opening and closing the opening in the well-known manner. Fabric strips 12 carry fastener elements 13 which are opened and closed by a slide lock 14. One of these fabric strips 12 is attached by a double row of stitches 15 to one side of the opening, and the other fabric strip 12 is attached by a double row of stitches 16 to the other side of the opening.

In order to prevent contact of the slide fastener with the underclothing of the person wearing the shirt, a flap or liner 17 is attached on one side only of the opening. This liner is formed from a flat piece of material folded to tubular

shape and is attached to the garment by the double row of stitching 16. By properly guiding and positioning the liner the joint of the tube lies between the two rows of stitching forming the seam 16 and is therefore completely covered and concealed.

Method

Having thus described the structure resulting from the operation of the invention, I will now explain the method of carrying out the invention. The method consists primarily in passing the part of the garment through a sewing machine, and simultaneously passing the slide fastener and the liner 17 through the machine. Suitable guides are provided to assemble the parts and bring them to the proper positions before the needles of the sewing machine. While the parts are passing through the sewing machine, one side of the liner 17, which is to be the free side in the finished article, is held away from the needles so that it is not stitched to the garment.

In sewing the parts together it is preferable to use a double row of stitching on each side of the opening 11, and while this gives the preferred product, it is possible to carry out the method with one or more rows of stitching on each side of the opening if desired.

Machine

The main part of the sewing machine, that is, the mechanism for forming the stitches and feeding the material, is well-known in the art and is therefore not illustrated and described in detail. The bed plate of the sewing machine is indicated by the reference character 18, and the front apron by the reference character 19.

Guide for fastener and shirt

The first special attachment for the machine is the guide for the parts of the slide fastener and the garment, which is clearly shown in Figs. 3, 4 and 5. This attachment includes a plate 20 secured to the top of the bed plate 18 and which carries upright supports 21 to which are attached the tables 22 which incline downwardly toward the needles. The inner edge of each of these inclined tables carries a curved hem guide 23 which acts to turn over a hem on the sides of the shirt along the opening 11 in the well-known manner. The tables 22 are adjustably mounted so that the distance between them can be varied to produce the desired width of opening in the shirt material.

This attachment also carries the chute 24 for

guiding the slide fastener. This chute has a bottom 25 that is inclined slightly and brings the slide fastener to the level of the bed plate just before reaching the needles. The chute 24 is provided with tapering sides 26, and the width is such as to receive the assembled slide fastener. A suitable spring guide finger 27 is fastened over the chute in such a position that its forward bifurcated end engages on opposite sides of the slide fastener, thereby serving to center and guide the slide fastener during its passage to the needles. This spring guide finger is sufficiently yieldable to move upwardly and permit passage of the side lock as the end of the slide fastener passes through the machine.

Guide for liner

The next special attachment for the sewing machine is the guide which takes a piece of liner material of suitable width, folds it into flat tubular form, and feeds it in proper position to the needles. This guide 28 is attached to the apron 19 by a bracket 29. The entrance end 30 of this guide is formed with a crescent-shaped opening, the concaved side of the crescent pointing downwardly as shown in Figs. 3 and 9. The shape of this guide is gradually flattened toward the delivery end by moving the points of the crescent toward each other so that the delivery end 31 has a flattened shape shown in Fig. 8. This delivery end has an opening 32 where the sides of the guide overlap, and to avoid duplication of metal a single septum 33 separates the inner walls of the fabric tube 17.

The fabric 17 moves directly from a supply roll into the entrance opening of the guide 28, and as it passes through the guide it is folded into a flattened tube with an overlap on the bottom side adjacent one of the edges, as clearly shown in Fig. 8.

Attached to the upper side of the delivery end of guide 28 is a plate 34 provided with an edge inclined both vertically and horizontally, and the folded liner after merging from guide 28 passes around and over this inclined edge, as shown in Figs. 3, 4 and 7, and is thus presented to the needles in a position with the overlap uppermost and along the right-hand edge. The liner is kept from moving too far toward the left of Fig. 3 by a curved lip 35 formed on plate 34.

The guide 28 is located below the level of the bed plate 18, and the inclined extension 36 of plate 34 delivers the folded liner to the needles at the level of the bed plate, underneath the chute for the zipper, as is clear from Figs. 3 and 4.

Bed plate construction

In order to permit assembling the liner on the under side of the zipper and attaching it by stitches along one edge only, a special construction of the bed plate is provided. Needle plates 18a and 18b are set in the bed plate 18 on each side of a slot 37 in said bed plate and suitably secured by screws therein.

A guard plate 39 extends downwardly from the needle plate 18a along the left-hand side of slot 37. Beginning at the curved edge 38 and extending rearwardly past the needles and the feeding mechanism. The right-hand forward corner of the needle plate 18b has its upper surface cut away to form a forwardly sloping inclined guide 40 for the liner 17.

As the folded liner moves across the plate 34 toward the needles, its left-hand edge is bent downwardly and guided through slot 37 while its

right-hand edge passes across the needle plate 18b and is engaged by the needles, as shown in Fig. 6. By thus depressing the left-hand edge of the liner and by providing the guard plate 39, this side of the liner is held free of the needle or other operating mechanism of the sewing machine, while the right-hand edge is engaged by the needles and is stitched to the other parts, as will be more fully explained later on.

Presser foot construction

As previously explained, the machine preferably forms four rows of stitching, and is provided with four needles 41 operated by a conventional needle bar 42. A feed dog 43 cooperates with each needle and moves the parts forward in a manner well understood in the art.

A presser foot frame 44 carried by the presser bar 45 has mounted on it two presser feet 46. These presser feet are mounted on the presser foot frame in such a way as to permit them to operate at different levels to compensate for the presence of three layers of liner fabric under the right-hand presser foot.

This compensating action of the presser feet is provided by forming each presser foot in the form of a shoe 47 mounted on a vertical bar 48, and guided for straight vertical movement by lateral guides 49. Pressure is applied from the presser foot frame to the presser feet by an oscillating beam 50, which is pivoted at 51 to the presser foot frame, and at 52 to each of the vertical bars 48. The pivotal connection at 52 is provided by forming the end of beam 50 with a rounded end which engages in a cross slot formed in bar 48, thus permitting lateral play to compensate for angular positions of bar 50. This construction insures equal pressure on both presser feet, even although the right-hand foot is operating at a higher level than the left-hand foot.

In order to prevent the zipper lock from contacting with the needles as it passes through the machine, each of the presser feet is formed at its forward inner edge with a guard plate 53.

Operation

In the operation of the machine the folded liner 17 is drawn through the guide tube 28 and thence around plate 34 with its forward end under the presser feet and ready to pass under the right-hand needles as shown in Fig. 7. The forward end of the slide fastener is then passed through chute 24 and under spring guide finger 27 to a position with its right-hand fabric strip overlying the liner 17, as shown in Fig. 5. The garment part 10 is then placed in position (Fig. 5) with its opening 11 over the zipper guide, and the opposite sides of the opening engaged with the curved hem guide 23 of the inclined tables 22.

After the parts are in the position shown in Fig. 5 the operator lowers the presser foot and runs the machine, causing the four needles to produce four rows of stitches. The two rows of stitches 15 on the left-hand side (Figs. 6 and 1) pass only through the folded garment edge and the fastener fabric, while the two rows of stitches 16 on the right-hand side pass in addition through the folded liner.

As the parts pass through the sewing machine, the garment is passed down over the top of the slide fastener, and the liner is fed up below the slide fastener, as clearly shown in Fig. 4.

As the sewing operation nears completion the slide lock 14 pushes the spring guide finger 27

upwardly and passes thereunder, and as it passes between the needles, is prevented from contacting with the needles by the protector plates 53.

When the stitching reaches the end of the slide fastener fabric 12, the machine is stopped and the liner fabric is cut off, just in front of the needle. The free end of the liner fabric thus remains in folded condition ready for attachment to the next piece of work.

I claim:

1. The process of sewing a slide fastener and a liner to a garment part having a slitted opening therein which comprises sewing the slide fastener to both sides of the slitted opening and simultaneously sewing the liner to one side only of the slitted opening.

2. The process of sewing a liner and a slide fastener having fabric strips to a garment part having a slitted opening therein which comprises passing the parts through a sewing machine provided with a plurality of needles, running at least one line of stitches along one side of the opening, said stitches extending through the garment, one of the fabric strips of the slide fastener, and one edge of the liner, and simultaneously running at least one line of stitches along the other side of the opening, the last-named stitches extending only through the garment part and the other fabric strip of the slide fastener.

3. The process of sewing a liner and a slide fastener having fabric strips to a garment part having a slitted opening therein which comprises passing the parts through a sewing machine provided with four needles, running a double row of stitches along one side of the slitted opening, said stitches extending through the garment, a fabric strip of the slide fastener, and one edge of the liner and simultaneously running a double row of stitches along the other side of the opening, the last-named stitches extending only through the garment and the other fabric strip of the slide fastener.

4. The process of sewing a liner and a slide fastener having fabric strips to a garment part having a slitted opening therein which comprises assembling the parts with the slide fastener and the liner coinciding with the slitted opening, the garment part being on one side of the slide fastener and the liner being on the reverse side of the slide fastener, and simultaneously sewing the parts together, the slide fastener being stitched to both sides of the slitted opening and the liner being stitched to one side only of the slitted opening.

5. The process of sewing a slide fastener and a liner to a garment part having a slitted opening therein which comprises folding the liner into tubular form, passing the parts through a sewing machine provided with four needles, while assembling the parts with the slide fastener and the liner coinciding with the slitted opening, the garment being on one side of the slide fastener and the liner being on the reverse side of the slide fastener, running a double row of stitches along one side of the slitted opening, said stitches extending through the garment part, a fabric strip of the slide fastener, and the overlapped edge of the liner, and simultaneously running a double row of stitches along the other side of the slitted opening, the last-named stitches extending only through the garment part and the other fabric strip of the slide fastener.

6. In combination with a sewing machine having a plurality of needles, means for guiding a garment part having a slitted opening so as to

produce one line of stitching on each side of said opening, means for guiding a slide fastener having two fabric strips to a position below the garment part so that each of its fabric strips will be engaged by one of said lines of stitching, and means for guiding a liner to a position below the slide fastener so that the liner will be engaged by said stitching along only one of its edges.

7. In combination with a sewing machine provided with four needles, means for guiding to said needles a garment part having a slitted opening so as to produce a double row of stitches on one side of said opening and a double row of stitches on the other side of said opening, means for guiding a slide fastener having two fabric strips to a position below the garment part so that each of its fabric strips will be engaged by one of said double rows of stitches, and means for guiding a liner to a position below the slide fastener so that the liner will be engaged by only one of said double rows of stitches.

8. In combination with a sewing machine provided with four needles, means for guiding to said needles a garment part having a slitted opening, so as to produce a double row of stitches on each side of said opening, means for turning under a hem along each side of said opening, each hem being engaged by one of said rows of stitches, means for guiding a slide fastener having two fabric strips to a position below the garment part so that each of its fabric strips will be engaged by one of said double rows of stitches, means for folding a strip of flat liner material into tubular form, and means for guiding the folded liner to a position below the slide fastener so that the liner will be engaged by only one of said double rows of stitches.

9. In combination with a sewing machine provided with four needles, means for guiding a slide fastener having two fabric strips past the needles so as to produce a double row of stitches through each of its fabric strips, means for guiding a garment part having a slitted opening to a position facing one side of said slide fastener, means for turning a hem along each side of said opening, said garment guiding means being so disposed as to cause each of said hems to be engaged by one of said double rows of stitches, means for folding a strip of flat liner material into tubular form, means for guiding the folded liner to a position facing the side of the slide fastener reverse to that faced by the garment, and means for holding one edge of the liner away from the needles, so that the folded liner will be engaged by only one of said double rows of stitches.

10. In combination, a sewing machine having at least two needles, guiding means to cause a slide fastener having a slide lock to travel between the needles, and guard means to keep the slide lock from contacting with the needles.

11. In combination, a sewing machine having at least two needles, guiding means to cause a slide fastener having interlocking elements and a slide lock to travel between the needles, said guiding means comprising a floor and a resiliently mounted guide finger engaging the slide fastener on each side of the interlocking elements and adapted to lift and permit passage of the slide lock.

12. In combination, a sewing machine having a bed plate formed with a slot running rearwardly from the front edge thereof, at least one needle on each side of said slot, means for guiding to said needles a garment part having a slit-

ed opening so as to produce a row of stitches on each side of said opening, means for guiding a slide fastener having two fabric strips to a position below the garment part so that each of its fabric strips will be engaged by one of said lines of stitching, means for guiding a liner to a position below the slide fastener with one edge extending downwardly through the slot in the bed plate so that the liner will be engaged by the stitches along only one of its edges.

13. A sewing machine comprising needles and feeding mechanism, a bed plate formed with a slot running rearwardly from its front edge thereof, one front corner of the bed plate adjacent the slot being rounded off, the bed plate carrying a depending guard along the rounded-off side of the slot, said guard extending from the rounded corner to a point rearwardly of the feeding mechanism.

MAX BLUMENKRANTZ. 10