Oct. 31, 1961 A. J. McNAMARA 3,006,302

METHOD FOR MOUNTING A CONCEALED SLIDE FASTENER INTO A CLOTH ARTICLE

Filed Dec. 15, 1958 2 Sheets-Sheet 1

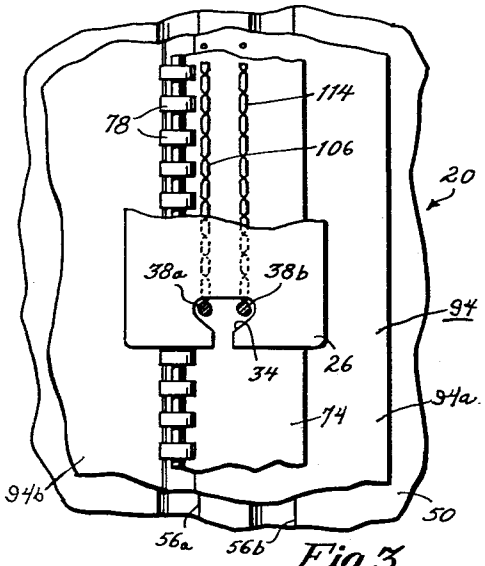


Fig. 3.

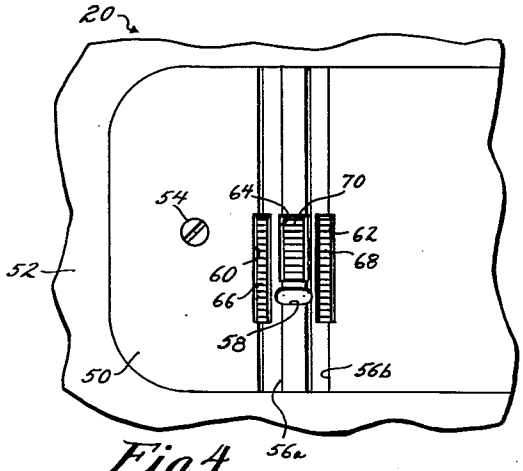


Fig. 4.

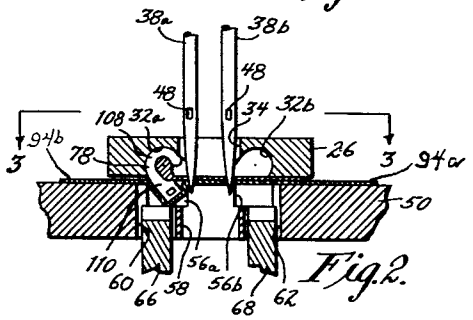


Fig. 2.

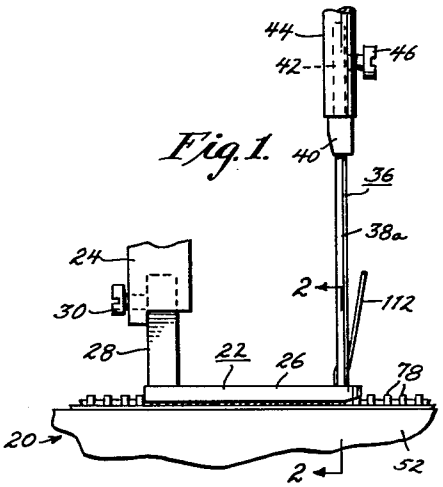


Fig. 1.

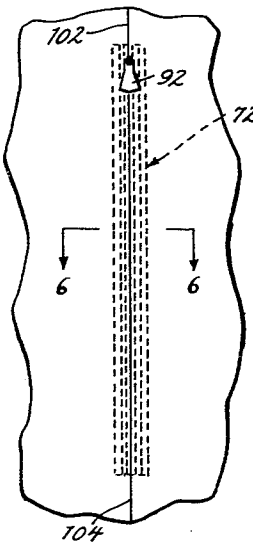


Fig. 5.

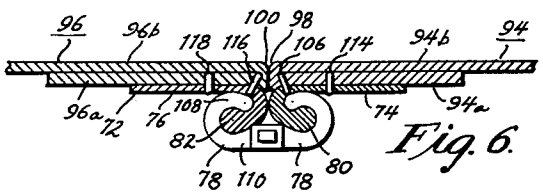


Fig. 6.

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METHOD FOR MOUNTING A CONCEALED SLIDE FASTENER INTO A CLOTH ARTICLE

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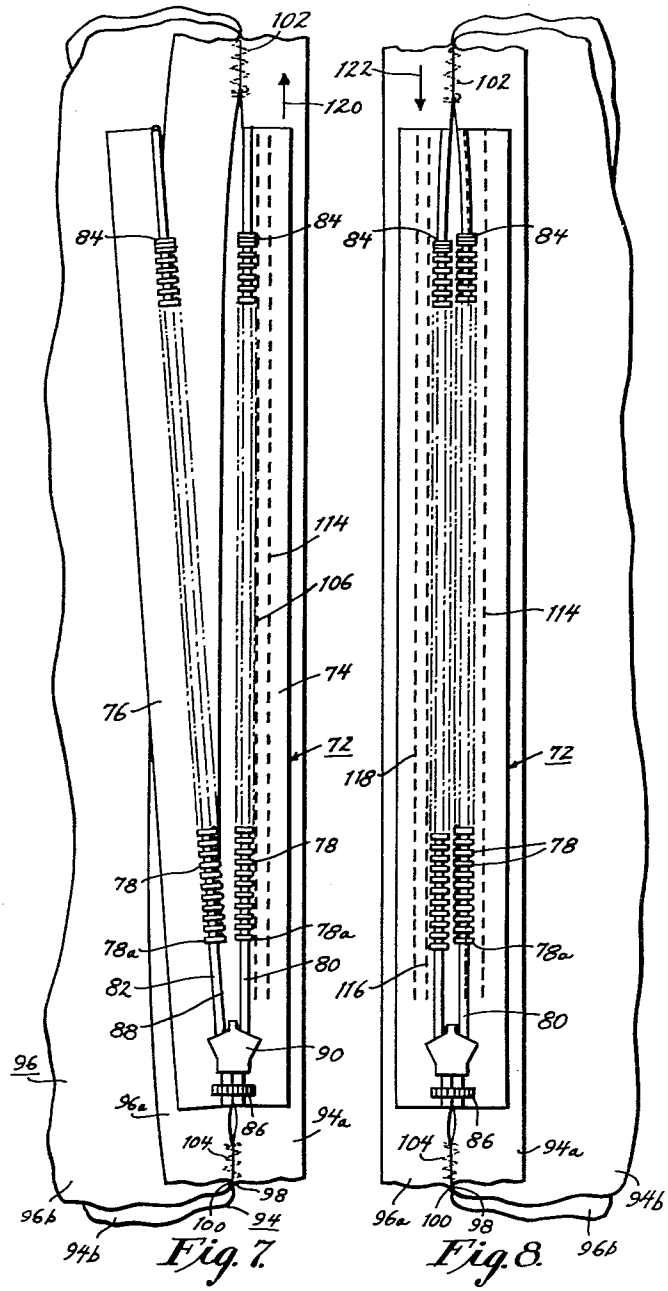


Fig. 7.

Fig. 8.

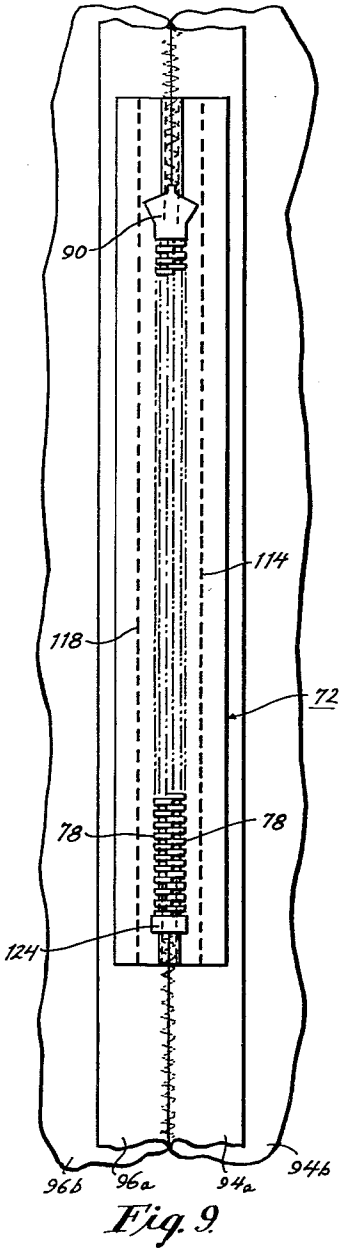


Fig. 9.

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3,006,302

METHOD FOR MOUNTING A CONCEALED SLIDE FASTENER INTO A CLOTH ARTICLE

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Filed Dec. 15, 1958, Ser. No. 780,443
9 Claims. (Cl. 112—262)

The present invention relates to a method for mounting a concealed slide fastener into a cloth article, and more particularly to a method for inserting a concealed slide fastener in such manner that it is substantially concealed from view and closely simulates a seam when its elements engage each other, namely when the slide fastener is closed and the slide fastener elements of one of the tapes engage the slide fastener elements of the other of the tapes.

In articles of wearing apparel where fashion is important, it has long been desirable to conceal slide fasteners, so that the same are not revealed when the garment is worn with the slide fastener in its closed disposition. In particular, it has long been desirable to provide garments, such as dresses, with a concealed slide fastener which in its closed disposition closely simulates a seam. For example, the concealed slide fastener may be collinear with a true seam in the garment and appear to be a portion of such seam when the slide fastener is in its closed disposition.

The accomplishment of the aforesaid desiderata has been impeded by a number of problems. Thus, it is necessary to sew the tapes on which the slide fastener elements are carried onto the garment, and the concealment of the lines of stitching which are parallel to the simulated seam effected by the closed slide fastener has proven to be difficult. Moreover, to effect the optimum mounting of a concealed slide fastener it is necessary that the line of stitching joining the tape carrying the slide fastener elements and the juxtaposed cloth of the garment be as close as possible to the slide fastener elements. This has proved to be a most difficult problem since present day demands upon the clothing industry require the high speed installation of slide fasteners.

This invention has as an object the provision of a method for sewing concealed slide fasteners onto a juxtaposed cloth.

This invention has as another object the provision of a method for sewing concealed slide fasteners onto juxtaposed cloth at a rapid rate with a minimum of manual operation.

This invention has as yet another object the provision of a method for sewing concealed slide fasteners onto a cloth so that the line of stitching joining the concealed slide fastener to the cloth is concealed.

This invention has as still another object the provision of a method for sewing concealed slide fasteners onto cloth in such manner that when the concealed slide fasteners are in their closed disposition the appearance of a genuine seam is closely simulated.

This invention has as a further object the provision of a method for sewing concealed slide fasteners onto a juxtaposed cloth in which the line of stitching joining the tape carrying the slide fastener elements and the juxtaposed cloth of the garment is as close as possible to the slide fastener elements.

This invention has as yet a further object the provision of a method for sewing concealed slide fasteners onto a juxtaposed cloth in which each of the tapes carrying the slide fastener elements are joined to the juxtaposed cloth of the garment by two parallel lines of stitching.

Other objects will appear hereinafter.

For the purpose of illustrating the invention there is shown in the drawings a form which is presently preferred; it being understood, however, that this invention is not limited to the precise arrangements and instrumentalities shown.

Referring to the following drawings, wherein like reference characters refer to like parts:

FIGURE 1 is a side elevational view of the presser foot, needle plate portion, and contiguous bed portion of a sewing machine, and revealing the manner in which a tape bearing slide fastener elements is stitched to cloth by the method of the present invention.

FIGURE 2 is a sectional view taken on line 2—2 of FIGURE 1.

FIGURE 3 is a plan fragmentary view taken along line 3—3 of FIGURE 2.

FIGURE 4 is a plan fragmentary view, viewed from above, of the needle plate portion, and contiguous bed portion of the sewing machine shown in FIGURE 1.

FIGURE 5 is a view demonstrating the appearance of a concealed slide fastener when the same is in its closed disposition attached to cloth, such view demonstrating the seam-like appearance of such slide fastener.

FIGURE 6 is a view taken on line 6—6 of FIGURE 5.

FIGURE 7 is a perspective view revealing the first stage of the process of the present invention.

FIGURE 8 is a perspective view revealing a later stage in the process of the present invention.

FIGURE 9 is a perspective view revealing the concealed slide fastener mounted into the cloth article, such view being taken from the rear of the cloth article which carries the concealed slide fastener.

Referring to the drawings, and initially to FIGURES 1 through 4 inclusive, the sewing machine is generally designated as **20**. Such machine may comprise a flat bed sewing machine having a reversible feed. For the sake of simplicity and clarity of presentation, only those portions of the machine needed to comprehend the present invention will be described herein, it being understood that the remainder of the machine may be of conventional construction.

The machine **20** includes a presser foot **22**, which is retained in operative disposition by means of a presser bar **24** of conventional construction.

The presser foot **22** includes a foot **26**, and a shank **28** extending upwardly from the heel of the foot **26**. The upper end of shank **28** fits into a hole in the bottom of the presser bar **24** and is secured to the presser bar **24** by a setscrew **30**.

Foot **26** is provided with a pair of spaced, parallel grooves **32***a* and **32***b* in the bottom surface of the foot **26**. Grooves **32***a* and **32***b* extend longitudinally along the foot **26** for the entire length of the foot **26**. As shown in FIGURE 2, grooves **32***a* and **32***b* are tilted at an angle with regard to the vertical and away from each other, for reasons which will be explained below. Foot **26** is provided with a needle hole **34** therethrough adjacent the toe of the foot **26**. Needle hole **34** is positioned between the grooves **32***a* and **32***b*, and is of a width wider than the distance between the grooves **32***a* and **32***b* so that the needle hole **34** opens into the grooves **32***a* and **32***b*.

The needle unit, generally designated as **36**, comprises a pair of spaced, parallel needles **38***a* and **38***b* secured together at their upper ends by a head **40**. A shank **42** extends upwardly from the head **40**. Shank **42** fits into a hole in the bottom of a needle bar **44**, and is secured to the needle bar **44** by a setscrew **46**. Each of the needles **38***a* and **38***b* is provided with an eye **48** which extends from front to rear rather than from side to side. The significance of having the needles **38***a* and **38***b* provided with an eye **48** that is disposed in the front to rear disposition shown will be explained below. Needles

38*a* and 38*b* are spaced apart a distance such that the distance between the outer edges of the needles 38*a* and 38*b* is substantially equal to the width of the needle hole 34 in foot 26. Thus, as shown in FIGURE 2, the needles 38*a* and 38*b* pass through the needle hole 34 closely adjacent the sides of the needle hole 34, and thereby pass through the inner edges of the grooves 32*a* and 32*b*.

The presser foot 22 is disposed above the needle plate 50 of the sewing machine 20. Such needle plate 50 is disposed upon the flat bed 52 on the sewing machine 20. Such bed 52 extends for an appreciable distance on all sides of the needle plate 50 and provides support for the cloth member undergoing stitching with the sewing machine 20. As shown in FIGURE 4, the needle plate 50 is threadably secured to the bed 52 by means of screws 54, only one of which is shown. Removal of the screws 54 will enable the needle plate 50 to be raised, thereby permitting access to the contents within the bed 52 of the sewing machine 20, such contents forming no part of the present invention.

Needle plate 50 comprises a planar plate which is disposed upon the bed 52 with the upper surface of the needle plate 50 being substantially flush with the surface of the bed 52.

Needle plate 50 has a pair of spaced, parallel grooves 56*a* and 56*b* in its upper surface. Grooves 56*a* and 56*b* extend from the front edge to the rear edge of needle plate 50 in the direction that the cloth is advanced across the needle plate 50. Grooves 56*a* and 56*b* are spaced apart a distance equal to the distance between the grooves 32*a* and 32*b* in the bottom of foot 26. The grooves 56*a* and 56*b* are positioned such that groove 56*a* is parallel to and beneath groove 32*a*, and groove 56*b* is parallel to and beneath groove 32*b*.

Needle plate 50 has a needle hole 58 therethrough between the grooves 56*a* and 56*b*. Needle hole 58 is wider than the ditsance between the grooves 56*a* and 56*b* so that the needle hole 58 opens into the grooves 56*a* and 56*b*. Needle hole 58 is located directly under needle hole 34 in foot 26.

Needle plate 50 is provided with feed slots 60, 62, and 64 on each side of and to the rear of needle hole 58. Feed claws 66, 68, and 70 project through feed slots 60, 62, and 64 respectively, such feed claws 66, 68, and 70 being of conventional construction and serving the purpose of advancing the cloth undergoing stitching in the direction between the front edge and the rear edge of needle plate 50.

Referring to FIGURE 7, the slide fastener 72 shown therein is preferably of the type disclosed in the United States patent application of Philip E. Crystal, Serial No. 740,257, entitled "Slide Fastener," which was filed on June 6, 1958.

The slide fastener 72 comprises a pair of element-carrying tapes 74 and 76 which carry mating slide fastener elements 78 on respective welts 80 and 82 (see FIGURE 6 for welts 80 and 82 in cross-section).

The slide fastener 72 is provided with the top stops 84 adjacent the uppermost elements 78, the top stops 84 being spaced from the uppermost edges of the tapes 74 and 76. Preferably, the top stops 84 comprise non-mating slide fastener elements, thus in the illustrated embodiment the top stops 84 comprise a plurality of nesting slide fastener elements.

The slide fastener 72 is devoid of a bottom stop, the bottommost slide fastener elements 78*a* of each of the tapes 74 and 76 being spaced from the bottommost edges of the tapes 74 and 76 by an appreciable distance.

The tapes 74 and 76 of slide fastener 72 are joined together closely adjacent to their bottommost edges by means of the bar tack 86 which maintains the welts 80 and 82 of tapes 74 and 76 in even parallel alignment in the portion of slide fastener 72 which comprises the gap 88 intermediate the bottommost slide fastener elements 78*a* and the bar tack 86. Gap 88 is devoid of elements 78.

The slider 90 is reciprocally movable on the slide fastener 72 from the top stops 84 down to the bar tack 86, the slider 90 being readily movable along the welts 80 and 82 in the gap 88. As seen in FIGURES 7 and 8, the gap 88 has a length appreciably greater than the slider 90, namely a length in the illustrated embodiment of more than double the length of the slider 90.

As seen particularly in FIGURE 6, the welts 80 and 82 are on the folded-in inner edges of the tapes 74 and 76. Thus, the elements 78 are disposed behind the inner edge portions of the tapes 74 and 76, and since the slider 90 rides on the inside and outside of the elements 78, when the concealed slide fastener 72 is closed (see FIGURE 5) substantially only the tab 92 is exposed to view.

FIGURES 2 and 3 reveal the joinder of tape 74 to cloth 94. As shown in FIGURE 7, cloth 94 comprises a relatively narrow inner flap 94*a* and a relatively wide outer flap 94*b* which is presented to view when the cloth article is worn. Thus, in the case of a garment, the outer flap 94*b* is presented to view when the garment is worn. The cloth 94 is joined to the cloth 96 which likewise comprises an inner flap 96*a* and an outer flap 96*b*. The tape 76 is to be joined to the inner flap 96*a* of the cloth 96.

The cloth members 94 and 96 are folded along parallel abutting fold lines 98 and 100 to form the respective inner and outer flaps 94*a* and 94*b*, and 96*a* and 96*b*. The cloth members 94 and 96 are joined together in the illustrated embodiment by an upper seam 102 and by a bottom seam 104, such seams 102 and 104 being collinear.

Referring now particularly to FIGURES 2 and 3, the stitching of tape 74 to cloth 94 is shown. It is essential if the slide fastener 72 is to be concealed from view as shown in FIGURE 5 that the line of stitching 106 be as close as possible to the slide fastener elements 78. Thus, the needle 38*a* which forms the line of stitching 106, should be positioned as close as possible to the elements 78, and even can be in rubbing contact with the elements 78.

The tape 74 and the cloth 94 are fed between the needle plate 50 and the foot 26 with the elements 78 passing through the opposed grooves 32*a* and 56*a* in the foot 26 and needle plate 50 respectively, and the tape 74 and the inner flap 94*a* of the cloth 94 extending across the needle holes 34 and 58. To permit the elements 78 to pass through the grooves 32*a* and 56*a*, the elements 78 are tilted so that the inner ends 108 of the elements 78 fit into the groove 32*a* in the foot 26, and the outer ends 110 of the elements 78 fit into the groove 56*a* in the needle plate 50. Thus, the elements 78 extend both above and below the inner flap 94*a* of the cloth 94. Since the groove 32*a* in the foot 26 is tilted away from the needle hole 34, the elements 78 will be tilted to the extent that the outer ends 110 of the elements 78 will be close to the needle 38*a*, or may in fact be in rubbing contact with the needle 38*a*. Thus, the portion of the tape 74 juxtaposed to the elements 78 will be exposed so that the line of stitching 106 can be placed very close to the elements 78.

If the elements 78 are tilted to such an extent that the outer ends 110 of the elements 78 extend into the path of the needle 38*a*, the needle 38*a* will be deflected slightly away from the elements 78 when the needle 38*a* hits the outer ends 110 of the elements 78. However, the needle 38*a* picks up the thread of the warp of the cloth 94 before it hits the elements 78 so that if the needle 38*a* is deflected it moves the thread of the warp of the cloth 94 over and lays the stitch as close as possible to the elements 78. When the needle 38*a* moves up out of the cloth 94, the deflected thread of the warp of the cloth 94 will by its own resiliency return to its normal position.

The disposition of the eye 48 of the needle 38*a*, which as above-indicated is from the front to the rear, enables the thread 112 to be passed through the eye 48 of needle

38*a* without interfering with the positioning of the needle 38*a* closely adjacent to the elements 78. Thus, where a needle having an eye extending from side to side is used, the thread will be interposed between the needle and the elements and will interfere with the positioning of the needle closely adjacent to the elements and/or will be broken when the needle is positioned closely adjacent the elements.

Since the line of stitching 106 must be as close as possible to the elements 78, the major portion of the tape 74 would be free. It has been found that if the major portion of the tape 74 is left free, the tape 74 may curl up and either interfere with the proper operation of the slide fastener 72 and/or form an unsightly bulge in the garment. However, in the method of the present invention, the second needle 38*b* provides a second line of stitching 114 spaced from and parallel to the line of stitching 106, to prevent the tape 74 from curling up.

As shown in FIGURE 7, the lines of stitching 106 and 114 extend from the topmost edge of tape 74 to a point about midway in the gap 88. Such lines of stitching 106 and 114 are parallel to the elements 78.

During the insertion of the lines of stitching 106 and 114, the slider 90 is disposed in the bottom portion of the gap 88 and does not interfere with the installation of the lines of stitching 106 and 114. The bar tack 86 aligns the tapes 74 and 76, and also serves to prevent the slider 90 from becoming disengaged from the slide fastener 72.

Heretofore, in the sewing of concealed slide fasteners, when the stitching of one of the tapes of the slide fastener to the cloth was completed, it was necessary to turn the garment completely around in order to stitch the other tape of the slide fastener to the cloth. Also, it was necessary that both tapes and their associated cloths be fed through the sewing machine in the same direction. These steps in the sewing of the slide fastener were time consuming so that they slowed down the operation of sewing the slide fastener.

In the method of the present invention, when the stitching of tape 74 to cloth 94 is completed, it is not necessary to turn the garment around, but the garment is merely moved over to bring the tape 76 and the cloth 96 over the needle plate 50. The tape 76 and cloth 96 are then fed between the foot 26 and needle plate 50 with the elements 78 on the tape 76 passing through the opposed grooves 32*b* and 56*b* in the foot 26 and needle plate 50 respectively, and the tape 76 and inner flap 96*a* of cloth 96 extending across the needle holes 34 and 58. In the stitching of the tape 76 to the cloth 96, the needle 38*b* provides the row of stitching 116 which is as close as possible to the elements 78, and the needle 38*a* provides the second row of stitching 118 (see FIGURE 8). Also since the sewing machine 20 is a reversible feed machine, tape 76 and cloth 96 can be fed under foot 26 in the direction opposite to the direction that tape 74 and cloth 94 were fed under foot 26. Thus, if tape 74 and cloth 94 were fed under foot 26 in the direction of arrow 120 in FIGURE 7, tape 76 and cloth 96 can be fed under foot 26 in the direction of arrow 122 in FIGURE 8. Therefore, with the method of the present invention a concealed slide fastener can be sewn onto juxtaposed cloth at a more rapid rate and with a minimum of manual operation.

As shown in FIGURE 8, the lines of stitching 116 and 118 extend from the uppermost edge of tape 76 to a point within the gap 88. During the sewing-in of lines of stitching 116 and 118, the slider 90 is positioned within the gap 88 so that such slider 90 does not interfere with the insertion of the lines of stitching 116 and 118.

The bar tack 86 maintains the tapes 74 and 76 in alignment facilitating the insertion of such tapes so that the same are mounted in such disposition that when their elements are engaged, the center line of the slide fastener 72 is collinear with the seams 102 and 104.

It is desirable that the bottommost ends of the lines of stitching 106, 114, 116, and 118 extend to the same distance, However, this is not absolutely essential.

After both tapes 74 and 76 have been sewn to the cloths 94 and 96 respectively, the slider 90 is withdrawn from the welts 80 and 82 in the gap 88 and is moved along the elements 76 of the tapes 74 and 76. As shown in FIGURE 9, the slider 90 is moved to a disposition adjacent the top stops 84. However, it is not necessary for the slider 90 to be moved all the way to the top of the slide fastener elements 76, but it is only necessary that the slider 90 be moved a sufficient distance onto the slide fastener elements 76 so that the slider 90 is out of the gap 88 and spaced a sufficient distance therefrom so as not to intefere with the manipulations in the gap 88 set forth below.

In the next stage of the process of the present invention, the bottom portions of the tapes 74 and 76 below the ends of the lines of stitching 106, 114, 116, and 118 are cut away, as shown in FIGURE 9. This can be readily accomplished with shears or other simple hand tools.

In the next stage in the process of the present invention, seam 102 is extended to the top stops 84 and seam 104 is extended to the bottommost elements 78*a*, as shown in FIGURE 9. The slide fastener 72 will then present the appearance of a seam which is continuous with and collinear to such seams 102 and 104.

In the final stage of the process of the present invention, the bottom clip 124 is applied to the welts 80 and 82 of tapes 74 and 76 adjacent the bottommost elements 78*a*. Such bottom clip 124 may be formed of pliable sheet metal and may be readily secured to the welts 80 and 82. The bottom clip 124 serves as a bottom stop and prevents the withdrawal of the slider 90 from the slide fastener 72.

The appearance of the installed slide fastener is shown in FIGURE 5. When viewed from the front with the elements of the tapes 74 and 76 engaged, the slide fastener 72 presents the appearance of a continuation of the seams 102 and 104.

The present invention may be embodied in other specific forms without departing from the spirit or essential attributes thereof and, accordingly, reference should be made to the appended claims, rather than to the foregoing specification as indicating the scope of the invention.

I claim:

1. In a method for mounting a slide fastener upon the adjacent flaps of a cloth article which slide fastener comprises a pair of mating fastener element-carrying tapes, each of which tapes carries its elements on a welted inside edge, said slide fastener lacking a bottom stop adjacent the bottommost slide fastener element on each of its tapes, said slide fastener including an element free gap on its tapes having a length appreciably greater than the length of the slide fastener's slider, with said gap being disposed between the bottommost slide fastener elements on each of the tapes and the bottom end portion of the slide fastener, and said slide fastener including means joining the bottom end portions of the tapes together, the steps which comprise placing the slider on said tapes in said gap, applying a first line of stitching to join one fastener element carrying tape of the slide fastener to one flap of the cloth article while maintaining the slider of the slide fastener within the gap and spaced from the bottommost element of said one tape, said first line of stitching extending into the gap a spaced distance above the slider, applying a second line of stitching to join the other fastener element carrying tape of the slide fastener to the adjacent flap of the cloth article while maintaining the slider of the slide fastener within the gap and spaced from the bottommost element of said other fastener element carrying tape, said second line of stitching extending into the gap a spaced distance above the slider, said first line of stitching being applied by passing said one tape and flap under the needle of a sew-

ing machine in one direction, and said second line of stitching being applied by passing said other tape and flap under the needle of the sewing machine in the opposite direction, moving the slider a spaced distance from the gap onto the slide fastener elements of the slide fastener so that the slider is carried upon the stitched portions of the tapes a spaced distance from the gap, with mating elements of the tapes intermediate the gap and the slider joining the tapes together, cutting off the bottommost portion of the slide fastener along a line extending through the gap a sufficient distance below the bottommost slide fastener elements on each of the tapes to provide room for a bottom stop below the bottommost slide fastener elements on each of the tapes while the elements of the tapes intermediate the slider and the gap are matingly engaged, and applying a bottom stop to the inside welted edges of the tapes adjacent the bottommost slide fastener elements on each of the tapes.

2. A method in accordance with claim 1 in which said lines of stitching are applied parallel to and contiguously to the fastener elements carried by the tapes of the slide fastener.

3. A method in accordance with claim 2 in which the elements carried by each of said tapes of the slide fastener in the normal disposition of said elements overlie their tape, and said lines of stitching are applied while the elements of the tape which is undergoing stitching are pivoted through an angle greater than ninety degrees from their normal disposition so as to expose the portion of the tape underlying the elements.

4. A method in accordance with claim 3 in which the elements in their pivoted disposition extend partly above and partly below the flap of the cloth to which the tape carrying said elements is being stitched.

5. A method in accordance with claim 1 in which each of said tapes of the slide fastener is joined to its respective flap of the cloth by a pair of parallel, spaced lines of stitching.

6. A method in accordance with claim 5 in which one line of stitching of each of said pairs of lines of stitching is applied parallel to and contiguously to the fastener elements carried by the tapes of the slide fastener.

7. A method in accordance with claim 6 in which the elements carried by each of said tapes of the slide fastener in the normal disposition of said elements overlie their tape, and said lines of stitching are applied while the elements of the tape which is undergoing stitching are pivoted through an angle greater than ninety degrees from their normal disposition so as to expose the portion of the tape underlying the elements.

8. A method in accordance with claim 7 in which the elements in their pivoted disposition extend partly above and partly below the flap of the cloth to which the tape carrying said elements is being stitched.

9. In a method of sewing a slide fastener to adjacent flaps of a cloth article comprising providing a pair of slide fastener tapes having a gap devoid of fastener elements at one end, placing a slider on said tapes in said gap, joining one tape to one flap of said cloth article by a line of stitching by moving said one tape in one direction relative to a needle, moving said tapes relative to said needle in a direction substantially perpendicular to said line of stitching so that said other tape is below said needle, joining said other tape to a flap of said cloth article by a line of stitching by moving said other tape in a direction opposite to said one direction, then moving said slider out of said gap thereby joining some of the fastener elements on said tapes, and securing the tapes by applying a bottom stop adjacent the bottommost slide fastener elements on each tape.

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