Oct. 7, 1952 R. J. SAILER 2,612,855

FRENCH SEAMING ATTACHMENT FOR SEWING MACHINES

Filed July 26, 1949 3 Sheets-Sheet 1

Fig. 1.

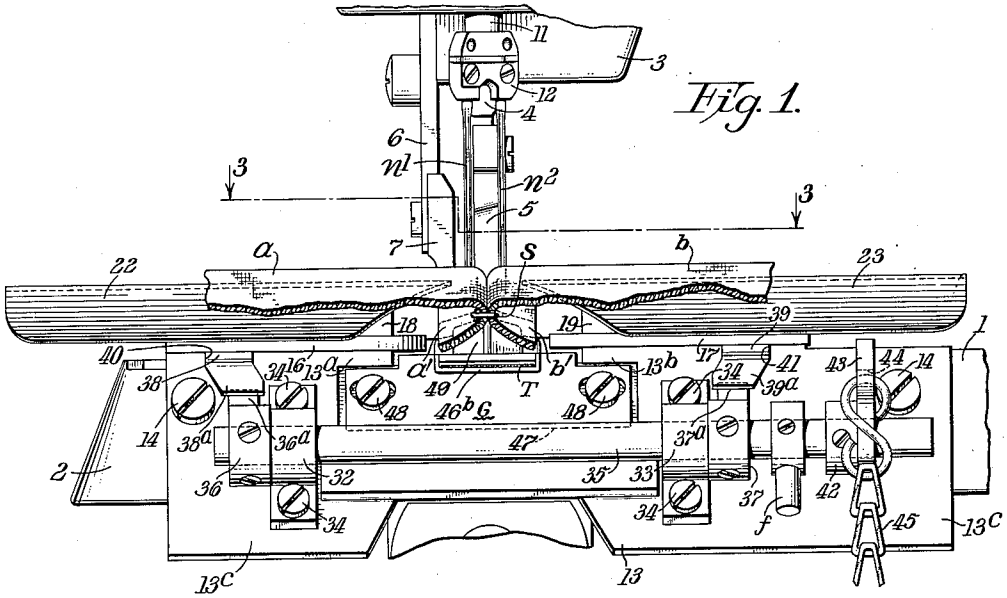
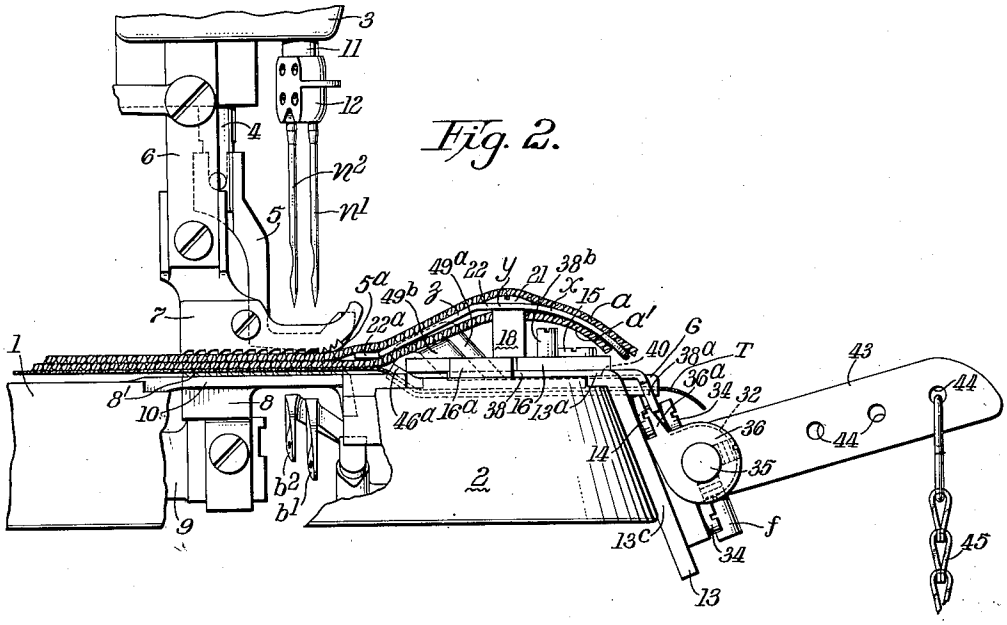


Fig. 2.



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Oct. 7, 1952 R. J. SAILER 2,612,855

FRENCH SEAMING ATTACHMENT FOR SEWING MACHINES

Filed July 26, 1949 3 Sheets-Sheet 2

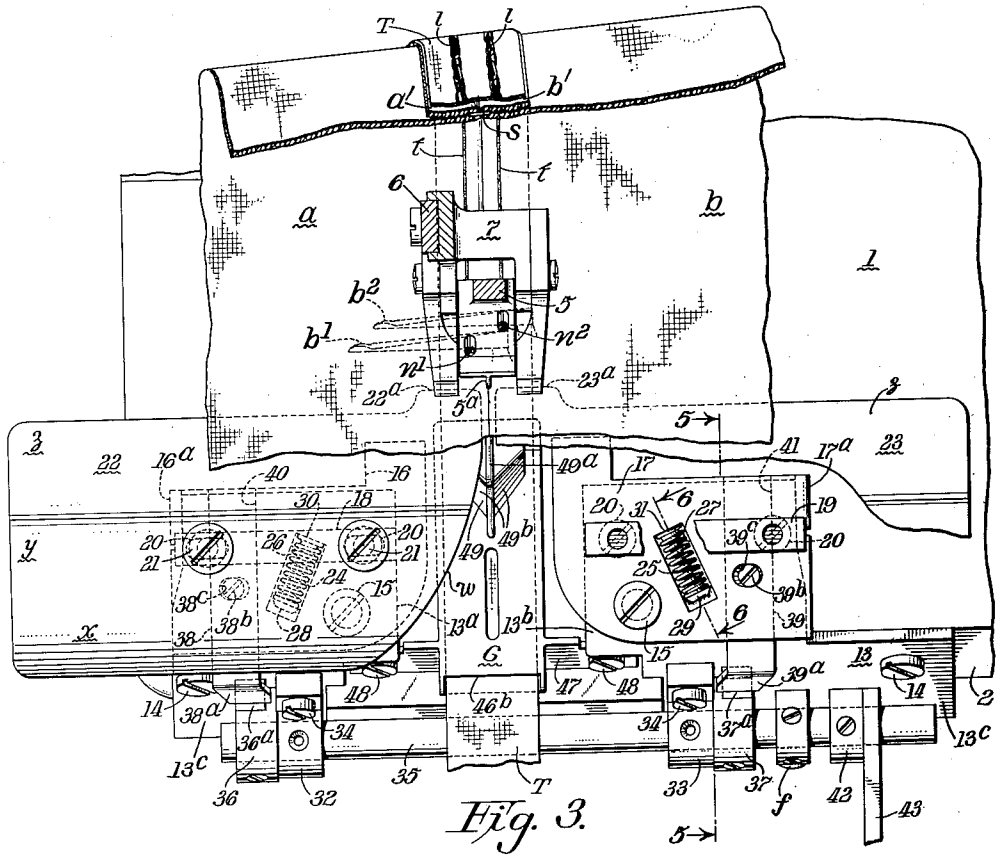


Fig. 3.

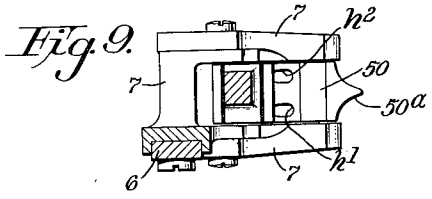


Fig. 9.

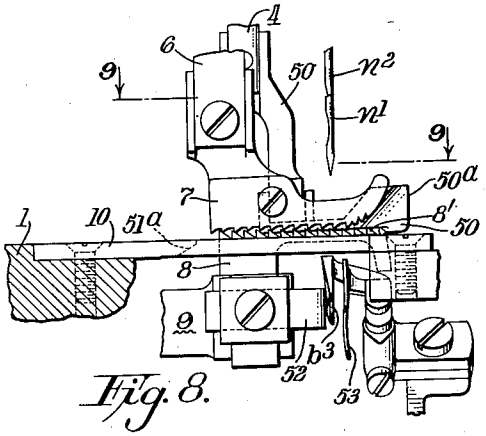


Fig. 8.

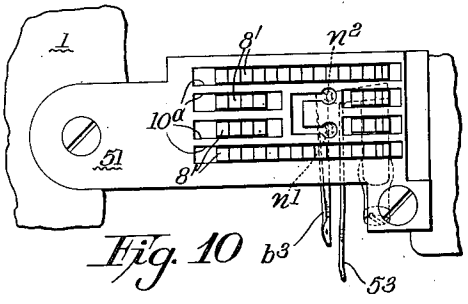


Fig. 10

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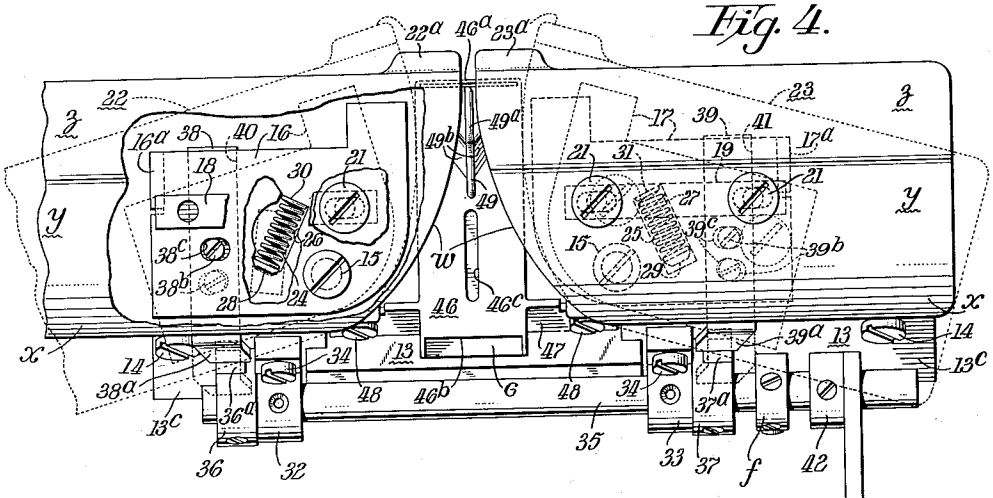
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FRENCH SEAMING ATTACHMENT FOR SEWING MACHINES

Filed July 26, 1949 3 Sheets-Sheet 3

Fig. 4.



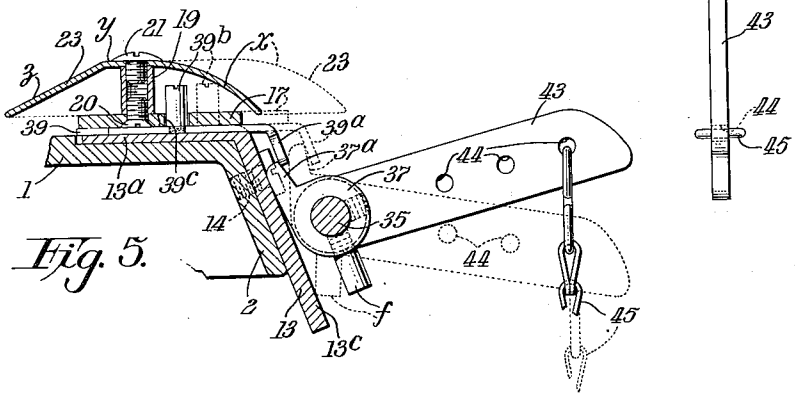


Fig. 5.

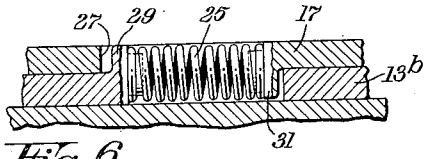


Fig. 6.

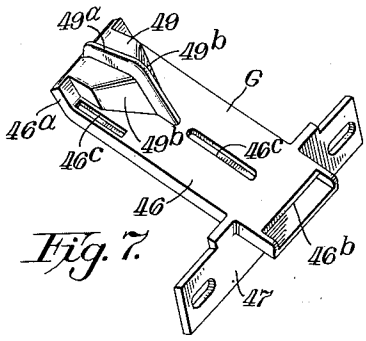


Fig. 7.

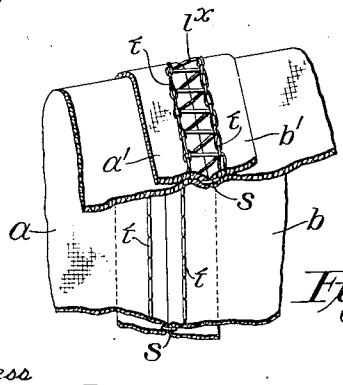


Fig. 11.

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UNITED STATES PATENT OFFICE

2,612,855

FRENCH SEAMING ATTACHMENT FOR SEWING MACHINES

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Application July 26, 1949, Serial No. 106,895

4 Claims. (Cl. 112—147)

1

This invention relates to attachments for sewing machines and more particularly to means designed to be applied to such machines to adapt the machines to perform French seaming either with or without a reinforcing tape secured to the under side of the seam.

Seams of this nature are used for many purposes such, for example, as the uniting of cloth sections in the making of automobile upholstery and the like.

In making such seams, two plies of material are first united, face-to-face by a seam sewed through the two plies at a suitable distance from the edges of the plies. The united plies are then opened up along the line of the ply-uniting seam and the marginal portions which extend beyond the seam are folded back on the under side of their respective plies. In this position the work is presented to a two-needle sewing machine each needle of which sews through one of the plies and through its backwardly folded marginal portion.

In some instances, the machine which performs the final sewing operation also sews a reinforcing tape along the under side of the seam. In other instances the tape is omitted and the two rows of needle thread loops are connected together by a single under thread which lies back and forth across the seam joint.

This invention has as an object to provide improved means, applicable to conventional two-needle sewing machines, for performing either of the two above described French seaming operations, i. e. either with or without a reinforcing tape.

Another object of the invention is to provide an improved attachment for this purpose which will accurately guide, to the stitch forming mechanism of a two-needle machine, the two united work-piece sections, and, if desired, a reinforcing tape.

Another object is to provide an attachment of this nature which will automatically adapt itself to work of various thicknesses.

A still further object of the invention is to provide a French seaming attachment, for two-needle sewing machine, the work-engaging parts of which are adapted to be manually shifted out of operative position to facilitate handling of the work under certain conditions as, for example, when turning or finishing closed corners of

2

articles such as automobile seat covers and the like.

With the above and other objects in view, as will hereinafter appear, the invention comprises the devices, combinations and arrangements of parts hereinafter set forth and illustrated in the accompanying drawings of a preferred embodiment of the invention, from which the several features of the invention and the advantages attained thereby will be readily understood by those skilled in the art.

In the drawings:

Fig. 1 is a front view of a portion of a two-needle, two-looper chain stitch sewing machine embodying the present invention as used when applying a reinforcing tape to the under side of the work lengthwise of the seam, with the work and the tape in section.

Fig. 2 is an end elevation, partly broken away, as viewed from the left in Fig. 1.

Fig. 3 is a horizontal section taken substantially on the line 3—3 of Fig. 1 and showing the upper and under sides of a work-piece having a French seam covered by a reinforcing tape.

Fig. 4 is a plan view of the present attachment, with portions thereof broken away to disclose certain underlying portions.

Fig. 5 is a vertical sectional view taken substantially on the line 5—5 of Fig. 3.

Fig. 6 is an enlarged vertical section taken substantially on the line 6—6 of Fig. 3.

Fig. 7 is a perspective view of the tape guide and an inverted seam-guiding plow carried thereby.

Fig. 8 is a view similar to a portion of Fig. 2, but showing the machine fitted with modified looper arrangement, presser-foot, throat-plate, feed-dog and needles to adapt the machine to produce French seaming without the reinforcing tape and with a single looper thread concatenated with both needle threads and lying back and forth across the seam joint.

Fig. 9 is a horizontal section taken along the line 9—9 of Fig. 8 showing particularly the presser-foot which is used in connection with the arrangement shown in Fig. 8.

Fig. 10 is a plan view of the throat-plate, feed-dog and looper used in connection with the arrangement shown in Figs. 8 and 9.

Fig. 11 is a perspective view showing the upper

and under sides of a work-piece having a French seam as made by a sewing machine fitted with two needles and one looper, as illustrated in Figs. 8, 9 and 10.

Referring more specifically to the drawings, and first to the construction illustrated in Figs. 1 to 7 inclusive, the invention is disclosed as embodied in a sewing machine having a work-supporting plate 1 provided with a downwardly extending flange 2. The machine also includes the usual standard and overhanging bracket-arm (not shown), which bracket-arm terminates in a bracket-arm head, a portion of which is designated as 3 in Figs. 1 and 2. Mounted in the head 3 is a spring-depressed presser-bar 4 which carries a presser-foot 5. Also carried by the head 3 is a vertically and horizontally movable upper feed-bar 6 which carries an upper feeding foot 7. Cooperating with the foot 7 in the feeding of the work is a lower feed-dog 8 carried by a feed-bar 9 having vertical and horizontal movements in timed relation with the movements of the feeding foot 7. The teeth 8' of the feed-dog 8 operate through slots 10^a formed in a throat-plate 10 secured to the work-plate 1.

Also mounted in the bracket-arm head 3 is the reciprocating needle-bar 11 to the lower end of which is secured a needle-clamp 12 carrying two eye-pointed thread-carrying needles n^1 and n^2. These needles are set oblique to the direction of the feed of the work through the machine and cooperate, respectively, with thread-carrying loopers b^1 and b^2 in the formation of stitches.

As hereinbefore stated, in the making of French seams the two pieces of material, designated *a* and *b*, respectively, in Figs. 1, 3 and 11, are first placed face-to-face and united in a single needle sewing machine by a seam *s* along a line spaced a relatively short distance from the adjacent edges of the two pieces. The pieces *a* and *b* are then opened up and the marginal portions *a'* and *b'*, thereof, which project beyond the uniting seams, are folded back on the under side of their respective pieces. In this condition the united pieces are passed through a two-needle sewing machine having the present improved attachment and the French seam is formed, either with or without a reinforcing tape.

The attachment includes an angular base-plate 13, comprising horizontally spaced upper walls 13^a, 13^b fitted into the work-supporting plate 1, and an inclined side wall 13^c which is secured to the downwardly extending flange 2 of the plate 1 by screws 14. Pivotally mounted on the walls 13^a and 13^b, as by screws 15, are horizontally disposed plates 16 and 17, respectively, which carry supporting blocks 18 and 19 held thereto by screws 20 (see Fig. 5). To the upper faces of the blocks 18 and 19 are adjustably secured, by screws 21, horizontally disposed work-supporting and -guiding members, 22 and 23, preferably of sheet metal. As shown most clearly in Figs. 2 and 5, these members are each formed with an upwardly and rearwardly curved front portion *x*, adapted to guide the body of the work up and over the attachment, a horizontal portion *y* where the plate is attached to its supporting block, and a downwardly and rearwardly inclined portion *z* formed with extensions 22^a and 23^a, respectively, which assist in directing the work beneath the presser-foot 5 and the feeding-foot 7.

The adjacent edges of the members 22 and 23 are spaced apart and are curved in opposite directions, as indicated at *w* in Figs. 3 and 4. At their rear edges, adjacent the extensions 22^a and 23^a, the members 22 and 23 are spaced apart a distance sufficient to permit the insertion therebetween of the pieces *a* and *b* of the body material at the line of the uniting seam *s*. Thus the plates guide the united work-pieces to the stitch-forming mechanism, the extensions 22^a and 22^b lying between the body of the work-piece and the backwardly turned marginal portions *a'*, *b'*.

The plates 16 and 17 and the members 22, 23 carried thereby are normally biased to the position illustrated in full lines in Fig. 4 by coil springs 24 and 25 located, respectively, within cavities 26 and 27 formed in the walls 13^a and 13^b of the supporting bracket and in the plates 16, 17. At one end the springs 24 and 25 bear against lugs 28 and 29 struck upwardly from the horizontal portions 13^a, 13^b, of the stationary base plate 13 and at their opposite ends against downturned lugs 30 and 31 carried by the pivoted plates 16 and 17. The pressure exerted by the springs 24, 25 normally hold the parts in the position shown in full lines in Figs. 3 and 4 with downturned flanges 16^a and 17^a on the plates 16, 17 in engagement with the outer edges of the walls 13^a, 13^b.

The pivotal mounting of the plates 16 and 17 permits the members 22, 23 carried thereby to be swung outwardly from the position shown in full lines in Figs. 3 and 4 in accordance with increases in the thickness of the work passing between the members.

Likewise the plates 16 and 17 and the members 22, 23 may be shifted outwardly to the positions shown in dotted lines in Fig. 4, for insertion or manipulation of the work, by a treadle-controlled means now to be described. Journaled in bearings 32 and 33, secured by screws 34 to the side wall 13^c of the base plate 13, is a rock-shaft 35 which carries collars 36 and 37 having offset cam fingers 36^a and 37^a, respectively. These fingers engage the rear surfaces of downturned ends 38^a and 39^a of bars 38 and 39 slidingly mounted in guideways 40, 41 formed in the upper surfaces of the horizontal walls 13^a and 13^b of the base plate 13. The bars 38 and 39 carry upstanding pins 38^b and 39^b which pass through slots 38^c and 39^c in the plates 16 and 17. Thus endwise movements of the bars cause swinging movement of the plates 16, 17 and the members 22, 23 carried thereby, about the axes of the pivot screws 15.

Also secured to the rock-shaft 35 is a collar 42 to which is secured an arm 43 having a series of apertures 44, in any one of which may be attached one end of a chain 45. The chain is connected at its other end to a suitable treadle (not shown) by means of which the arm 43 may be manually shifted from the position shown in full lines in Fig. 5 to the position indicated in dotted lines, thereby turning the rock-shaft 35 and consequently shifting the members 22 and 23 from the position shown in the full lines in Fig. 4 to the position indicated in dotted lines. A stop member *f*, secured upon the shaft 35 and adapted to contact the wall 13^c of the base plate 13, serves to limit the turning movement of the shaft and consequently the outward movement of the members 22 and 23.

As hereinbefore stated, a reinforcing tape may be attached to the under side of the work and lengthwise of the seam simultaneously with, and by the same rows of stitches *t*, which unite the marginal portions *a'*, *b'* to the body material. This is effected by guiding a tape T beneath the work and in line with the paths of reciprocation

of the needles n^1, n^2. The tape is led in through a tape guide G, shown in perspective in Fig. 7, comprising a flat, horizontally disposed tube 46 having an upturned delivery end 46ª which delivers the tape to the under side of the work slightly in advance of the toe of the presser-foot as shown most clearly in Figs. 2 and 3. The tube 46 is supported by a flange 47 which is secured, by screws 48, to the flange 2 of the work-supporting plate 1.

The upper wall of the tape-guiding tube 46 is cut away at its intake end, as at 46ᵇ, to facilitate insertion of the end of the tape, and with slots 46ᶜ through which the tape may be engaged, by a suitable instrument, to thread the tape through the tape guide. Adjacent its delivery end the tape guide G is provided with an inverted seam-opening plow 49 including an upstanding rib 49ª which tracks the groove between the folded back marginal portions a', b' of the united work-pieces. The plow 49 also includes oppositely incined walls 49ᵇ which iron out the marginal portions a', b'.

The presser-foot 5 also is provided at its front end with a plow portion including a rib or fin 5ª which tracks the groove between the two pieces of material a and b, above the uniting seam s.

From the foregoing it will be understood that the construction disclosed in Figs. 1 to 7, inclusive, is adapted to form French seams as shown in Fig. 3 with the reinforcing tape T secured to the under side of the work by the rows of stitches comprising the needle threads t and the complemental looper-threads l.

By slight modifications the construction above described may also be used to produce French seams such as shown in Fig. 11, that is, without the reinforcing tape and with a single lower thread concatenated with both needle threads and extending back and forth across the seam joint.

To produce the seam shown in Fig. 11, the needle clamp 12 is turned on the needle-bar 11 to cause the needles n^1 and n^2 to lie abreast and perpendicular to the line of seam formation as shown in Figs. 8 and 10. The presser-foot 5, hereinbefore described, is replaced by a presser-foot 50, which as shown in Fig. 9, has needleholes h^1 and h^2 arranged side-by-side to accommodate the new position of the needles. The presser-foot 50 is provided, at its front end, with a plow portion including a rib or fin 50ª which tracks the groove between the two pieces of material a and b, above the uniting seam s. Likewise the throat-plate 10 is replaced by a modified throat-plate 51 (Fig. 10) which also has needle holes positioned to accommodate the side-by-side relation of the needles. Next the two loopers b^1 and b^2 are replaced by a single thread-carrying looper b^3 which is adapted to pass its thread through the thread-loops cast out by both of the needles n^1, n^2 thereby concatenating the single looper thread l^x with the needle threads t as shown in Fig. 11. When the single looper b^3 is used in conjunction with the two needles, it is desirable also to use a needle-guide 52 carried by the feed-bar 9 and a combined needle-guide and loop-positioner 53 carried by the looper carrier to insure the proper cooperation between the needles and the looper.

Having thus set forth the nature of the invention, what I claim herein is:

1. A sewing machine attachment comprising a base-plate adapted to be secured to the work-plate of a sewing machine; a pair of opposed work-supporting and -guiding members pivotally mounted on vertical axes on said base-plate, each of said members having a horizontally disposed portion constructed and arranged to lie between a work-piece and a folded back marginal portion thereof; spring means acting on said members to turn them inward in opposite directions about their pivots to cause them to engage the work therebetween; a pair of endwise movable slide-bars slidingly mounted on said base-plate and operatively connected with said work-supporting and -guiding members; a rock-shaft journaled on said base-plate; manually actuated means for turning said rock-shaft; and operative connections between said rock-shaft and said slide-bars.

2. A sewing machine attachment comprising a base-plate adapted to be secured to the work-plate of a sewing machine; a pair of opposed work-supporting and -guiding members pivotally mounted on vertical axes on said base-plate, each of said members having a horizontally disposed portion constructed and arranged to lie between a work-piece and a folded back marginal portion thereof; spring means acting on said members to turn them inward in opposite directions about their pivots to cause them to engage the work therebetween; a pair of endwise movable slide-bars slidingly mounted on said base-plate and operatively connected with said work-supporting and -guiding members; a rock-shaft journaled on said base-plate; manually actuated means for turning said rock-shaft; cam members on said rock-shaft; and operative connections between said cam members and said slide-bars.

3. An attachment comprising, an elongated supporting plate adapted to be secured to the frame of a sewing machine, a substantially V-shaped plow carried upon the upper face and intermediate the two ends of said plate with the longitudinal axis of the V being disposed crosswise of said plate, a pair of elongated work-guiding wings of which each is pivotally mounted upon said supporting plate about an axis disposed at right angles to the plane of said plate and with each wing being lengthwise aligned with said plate and being located adjacent one side of said plow so as substantially to cover one-half of said plate, a pair of springs with each disposed entirely between a respective one of said wings and said plate for biasing said wings in opposite directions about their pivot axes, a rock-shaft journaled on said plate at a location beneath the level of said wings, means including a pair of endwise movable bars connecting said rock-shaft with each of said wings, and manually actuated means for turning said rock-shaft thereby to turn said wings in opposition to the action of their springs.

4. An attachment comprising, an elongated supporting plate adapted to be secured to the frame of a sewing machine, a unitary box-like tape-guiding conduit adjustably mounted lengthwise of and upon the upper face and intermediate the two ends of said plate with the conduit axis disposed crosswise of said plate, a substantially V-shaped plow carried upon the upper face of said conduit, a pair of elongated work-guiding wings of which each is pivotally mounted upon said supporting plate about an axis disposed at right angles to the plane of said plate and with each wing being lengthwise aligned with said plate and being located adjacent one side of said plow so as substantially to cover one-

half of said plate, a pair of springs with each disposed entirely between a respective one of said wings and said plate for biasing said wings in opposite directions about their pivot axes, a rock-shaft journaled on said plate at a location beneath the level of said wings, means including a pair of endwise movable bars connecting said rock-shaft with each of said wings, and manually actuated means for turning said rock-shaft thereby to turn said wings in opposition to the action of their springs.

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