April 3, 1951 F. W. BREUL 2,547,562

WORK-GUIDING ATTACHMENT FOR SEWING MACHINES

Filed Nov. 12, 1948 2 Sheets-Sheet 1

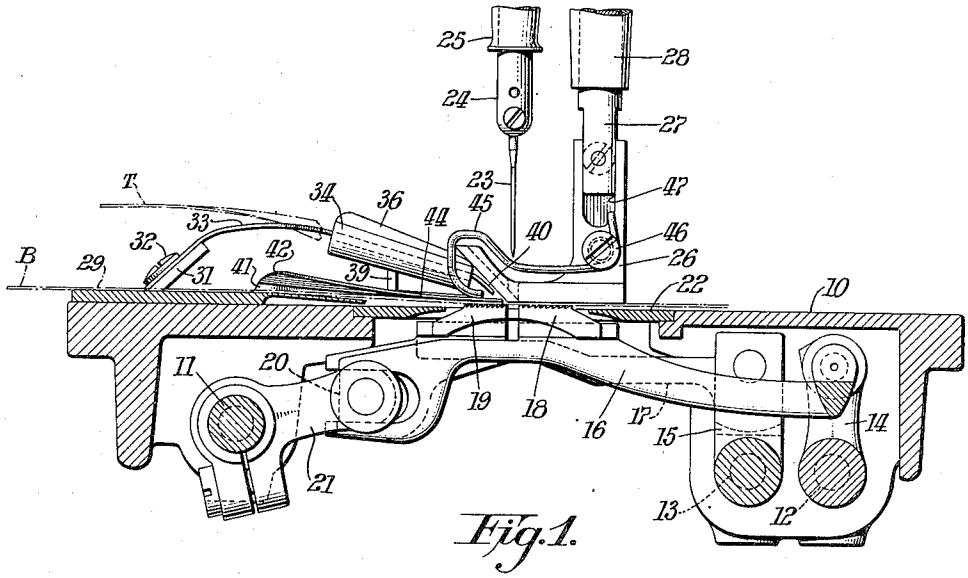


Fig. 1.

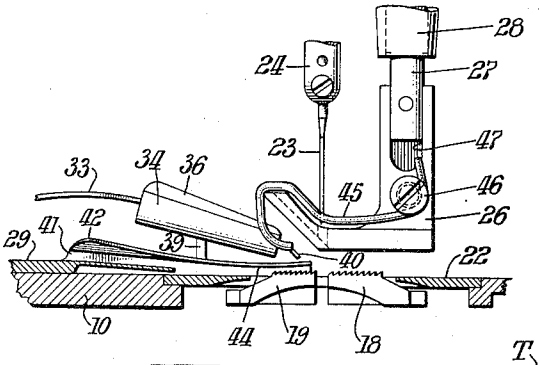


Fig. 2.

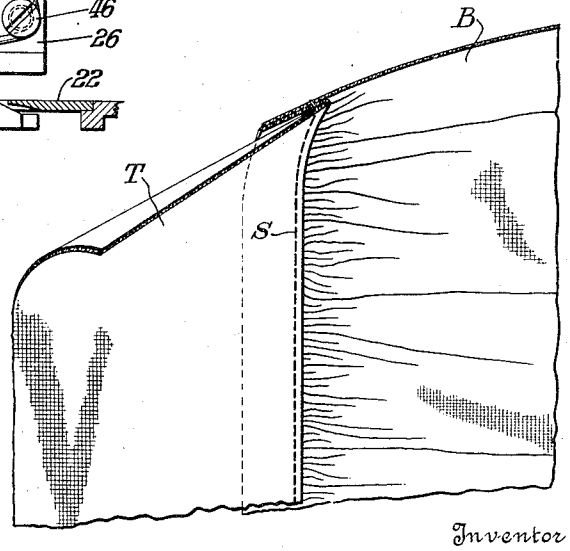


Fig. 3.

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WORK-GUIDING ATTACHMENT FOR SEWING MACHINES

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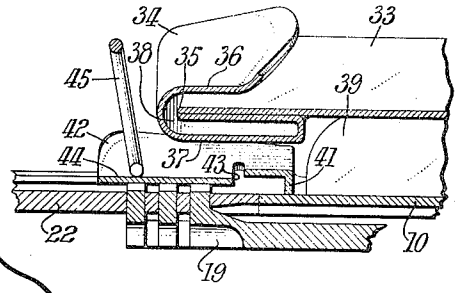


Fig. 5.

Fig. 4.

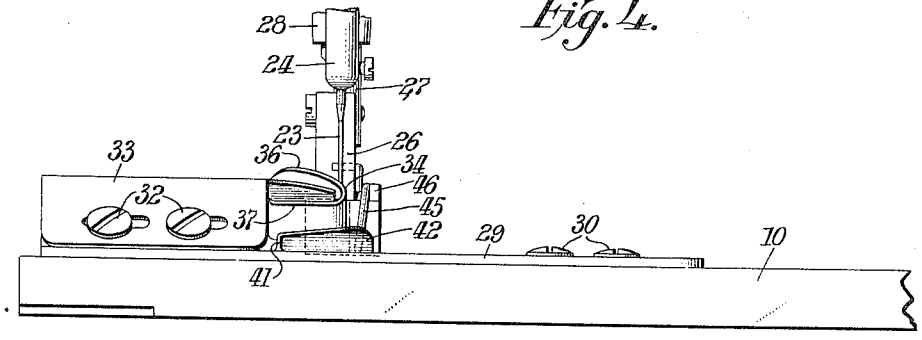


Fig. 6.

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2,547,562

WORK-GUIDING ATTACHMENT FOR SEWING MACHINES

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Application November 12, 1948, Serial No. 59,676

4 Claims. (Cl. 112—147)

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This invention relates to work-guiding attachments for sewing machines having a differential work-feeding mechanism and has to do particularly with an attachment designed to underfold the marginal edge of a top ply of material upon the edge-guided margin of a bottom ply of material which is continuously ruffled by the action of the differential feed, the two plies of material being secured by one or more lines of stitches.

The primary object of the present invention is to provide a work-guiding attachment of the above described type into which the various plies of material can be readily introduced without the necessity of considerable manipulation of the plies of material to be sewn together.

Another object of the present invention is to provide an improved attachment of the above described character which is simple in design and which can be easily manufactured.

Still another object of the present invention is to provide a work-guiding attachment of the class described which can be conveniently applied to the bed of a differential feed sewing machine without requiring any alteration of the bed save the provision of several tapped holes.

With the above and other objects in view, the invention will be more fully described as illustrated in the accompanying drawings, which show a preferred embodiment of the device, and particularly pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is a vertical transverse section of a differential feed sewing machine equipped with a preferred form of the present improvement, the presser-foot being shown in its normal lowered position.

Fig. 2 is a view similar to Fig. 1, but with the presser-foot raised, permitting the resilient separator-plate to yield upwardly away from the rear feed-dog of the differential feed.

Fig. 3 is a perspective view illustrating the two plies of material in assembled relation with the underfolded marginal edge of the top ply superposed on the ruffled marginal edge of the bottom ply.

Fig. 4 is a top plan view, with the presser-foot shank in section, of the attachment mounted in operative position on the sewing machine bedplate.

Fig. 5 is an enlarged section taken substantially along the line 5—5, Fig. 4.

Fig. 6 is a front elevation of the sewing machine, showing the mouth or receiving end of the attachment.

Referring more in detail to the drawings, the

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improved attachment is shown as applied to a sewing machine comprising a bed 10 supporting a feed-lift rock-shaft 11 and a pair of parallel feed-advance rock-shafts 12 and 13 to which are fastened the feed-rockers 14 and 15 pivotally supporting the feed-bars 16 and 17 carrying, respectively, the primary front feed-dog 18 and the secondary rear feed-dog 19. Both the feed-bars are forked at one end to embrace a common slide-block 20 carried by a feed-lift rock-arm 21 clamped on the feed-lift rock-shaft 11. The primary and secondary feed-dogs 18 and 19 have the regular serrated work-engaging surfaces disposed to operate through the usual feed-dog slots in a throat-plate 22 secured on the bed 10. The throat-plate 22 is apertured to receive the usual thread-carrying needle 23 carried by the lower end of an endwise reciprocatory needle-bar 24 journaled in a bearing bushing 25 secured in the machine-head (not shown). Cooperating with the needle 23 may be any form of lower stitch-forming mechanism suitable for making lock-stitches or chain-stitches. Yieldingly opposing the primary feed-dog 18 is a presser-foot 26 secured to the lower end of a manually liftable presser-bar 27 vertically slidable in a bushing 28 carried in the machine-head. The machine thus far described is of conventional design, the differential feeding mechanism of which is of the same general type as that forming the subject of U. S. Patent No. 1,042,333, issued to J. S. Finch, October 22, 1912.

The preferred embodiment of the improved work-guiding attachment comprises a base-plate 29 secured for limited sidewise adjustment, by screws 30, on the bed 10 of the sewing machine. Bent upwardly from the base-plate 29 is a folder-supporting ear 31 (Figs. 1 and 4) to which is adjustably fastened by screws 32 the work-supporting apron 33 of an edge-folder 34 adapted to inturn the margin of a top ply of material. As shown in Fig. 5, the edge-folder 34 includes a body-member bent about an edge 35 of the work-supporting apron 33 to provide top and bottom walls 36 and 37, the edge 35 functioning as an arbor and forming with the top and bottom walls a U-shaped fabric passageway 38. The delivery end of the edge-folder is maintained at proper elevation with respect to the base-plate 29 by a lip 39 bent upwardly from the base-plate, the lip 39 acting as a vertical spacer against the top of which the work-supporting apron yieldingly rests. To accurately position the fold in the ply of material passing through the edge-folder, the arbor-edge 35 terminates at the de-

livery end of the folder in a downwardly inclined tongue 40 (Figs. 1 and 4) and this tongue is shaped and disposed so that as the material emerges from the delivery end of the folder it is sharply bent about the tongue and thus directed accurately to the needle 23. It will be seen in Fig. 1 that the delivery end of the folder terminates beneath the inclined toe of the presser-foot 26 and thus the presser-foot takes control of the inturned margin of the top ply of material as it emerges from the edge-folder 34.

Disposed beneath the edge-folder 34 is an edge-guide 41 for directing the marginal edge of a bottom ply of material. This edge-guide is soldered or otherwise secured to the base-plate 29 and can be adjusted laterally relative to the needle by virtue of the clamp-screws 30. Bent horizontally from the top of the edge-guide 41 is a ply-separating plate 42 extending beyond the edge-folder both in the direction of seam-formation and sidewise to the right as viewed in Fig. 4. The ply-separating plate is notched, as at 43 (Fig. 4), to provide a lower-ply-engaging resilient plate 44 bent so that it normally is spaced vertically above the throat-plate 22 when the presser-foot 26 is raised as can be seen readily in Fig. 2. The free end of the lower-ply-engaging plate 44 is extended in the line of seam formation sufficiently far to lie directly above the secondary or rear feed-dog 19 and is biased downwardly into cooperative work-feeding relation with the rear feed-dog, when the presser-foot 26 is lowered, by an element preferably in the shape of a spring-wire member 45 shaped to extend from beneath the level of the sole-plate of the presser-bar, up and over the toe of the latter and about a securing screw 46 threaded into the shank of the presser-foot. The other end of the spring-wire member 45 is anchored in the lower end of the presser-bar socket-slot 47. When the lower-ply-engaging plate is depressed by the spring-wire member 45, it yieldingly opposes the rear feed-dog 19 and thus renders the feed-dog effective in feeding the lower ply of material clamped between it and the ply-engaging plate 44. After passing between the plate 44 and the rear feed-dog 19, the lower ply also passes between the presser-foot 26 and the front feed-dog 18, which front feed-dog 18 has a shorter feed-advancing stroke than the rear feed-dog 19. The difference in the length of the feed-advancing strokes of the two feed-dogs results in a gathering or ruffling of the lower ply of material as is well understood by those skilled in the art.

Fig. 3 discloses the finished seam produced by a lock-stitch sewing machine equipped with my improved work-guiding attachment. The top ply T of material has its marginal edge inturned and superposed upon the ruffled margin of a bottom ply B of material, the two plies being secured together by a single line of lock-stitches S.

When it is desired to insert the plies of material into the attachment, the presser-foot is raised so that the parts assume the position illustrated in Fig. 2. The bottom ply B is introduced laterally from the right beneath the ply-separating plate 42 and into contact with the edge-guide 41. This introduction of the work can be accomplished with ease for the reason that the ply-engaging plate 44 flexes upwardly when the presser-foot 26 is raised, affording a space between the rear feed-dog 19 and the plate 44 considerably greater than the thickness of the bottom ply. The top ply T is then inserted into the edge-folder and brought into proper register with the bottom ply B, following which the presser-foot 26 is lowered upon the beginning ends of the two superimposed plies. When the presser-foot 26 is lowered, the spring-wire member 45 engages the ply-engaging plate 44 and forcibly flexes it downwardly to a position in which it forces the bottom ply B down against the rear feed-dog 19. The presser-foot itself clamps the top and bottom plies in feeding relation with the front feed-dog 18. In other words, when the presser-foot 26 is in its normal operating position, the front and rear feed-dogs are effective to feed and, at the same time, gather the bottom ply of material, while the upper ply of material is led over the ply-engaging plate 44 and beneath the presser-foot. Obviously, only the front feed-dog 18 engages the upper ply of material and therefore it is not gathered.

From the foregoing, it will be appreciated that I have invented a work-guiding attachment which can be easily applied to a differential feed sewing machine adapting the machine for what is commonly referred to in the trade as "top-stitching and ruffling." The attachment is designed so that the two plies of material can be conveniently introduced into the attachment by merely sliding the two plies of material toward each other transversely of the line of seam formation. No obstruction to the lateral introduction of the plies is encountered for the reason that, when the presser-foot is elevated, the ply-engaging plate 44 is likewise raised to afford ample clearance for the bottom ply of material. Also, the edge-folder is constructed so that the margin of the top ply of material can be readily loaded into it. The clamping screws 30 provide means for adjusting the entire attachment laterally of the needle, while the clamping screws 32 provide for independent adjustment of the edge-folder 34 relative to the edge-guide 41.

While the attachment has been described in connection with a differential feeding mechanism set to gather the bottom ply of material, it will be understood that it can be used to good advantage in combination with a differential feed set to stretch the bottom ply of material. For example, in the manufacture of women's slips cut on the bias, the side seams must be stitched with a seam which will not interfere or limit the extent of stretch incident to the bias cut of the material. When using the improved attachment the primary and second feed-dogs 18 and 19 stretch the biased cut bottom ply while the operator manually stretches the edge-folded top ply during the stitching operation. The seam thus obtained when relaxed contains considerable sewing thread which allows the bias cut material to stretch without breaking the sewing thread.

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

1. A work-guiding attachment adapted for use on a sewing machine having a presser-foot and a differeneial feed provided with first and second feed-dogs, comprising a guide for directing the margin of a top ply of material between said presser-foot and said first feed-dog, a second guide disposed to direct the margin of a bottom ply of material beneath the margin of said top ply of material and over said first and second feed-dogs, a flexible ply-engaging member carried by said second guide and spaced above said second feed-dog, and a yieldable member attached to said presser-foot which, when the presser-foot is lowered, is adapted to bear on

said ply-separating member and depress it to a position in which it forces the bottom ply of material into contact with said second feed-dog.

2. A work-guiding attachment for sewing machines having a presser-foot and a differential feeding mechanism including first and second feed-dogs, comprising a guide for directing the margin of a top ply of material between said presser-foot and said first feed-dog, an edge-guide disposed to direct the margin of a bottom ply of material beneath the margin of said top ply of material and over said first and second feed-dogs, a horizontally arranged flexible ply-engaging plate extending from said second guide to a point spaced directly above said second feed-dog, and a spring-wire member carried by said presser-foot and having its free end disposed so that when the presser-foot is lowered it bears on said ply-engaging plate and depresses the latter into opposed work-feeding relation with said second feed-dog.

3. A work-guiding attachment for sewing machines having a presser-foot and a differential feeding mechanism including first and second feed-dogs, comprising a folder for edge-folding the margin of a top ply of material and directing said edge-folded margin between said presser-foot and first feed-dog, an edge-guide disposed beneath said folder and disposed to direct the margin of a bottom ply of material beneath the margin of said top ply of material and over said first and second feed-dogs, a flexible ply-engaging plate extending from said edge-guide toward the delivery end of the attachment in spaced relation to said second feed-dog, and a yieldable member carried by said presser-foot and disposed so that when the presser-foot is lowered said yieldable member bears on said ply-engaging plate and depresses the latter into opposed work-feeding relation with said second feed-dog.

4. A work-guiding and gathering attachment for sewing machines having stitch-forming devices, a work-supporting surface and a differential feed mechanism including first and second feed-dogs; comprising a plate adapted to be carried by the work-supporting surface and extending forwardly of the stitching point, an edge-guide extending upwardly from said plate along a line substantially parallel with the direction of feed, a flexible ply-engaging member carried by said edge-guide normally parallel to said plate in spaced relation over said second feed-dog, said ply engaging member and said edge-guide together defining means to direct the marginal edge of a bottom ply of fabric to the second feed-dog, a second guide member adapted to direct the edge of a top ply of fabric over the ply-engaging member to the main feed-dog in lapped relation with the guided marginal edge of the bottom ply, said second guide means disposed to extend over only one side of said ply-engaging member leaving the other side thereof exposed, a presser-foot adapted to oppose only the first feed-dog, and a yieldable element carried by the presser-foot and disposed so that when the presser-foot is lowered said yieldable element bears on the exposed portion of said ply-engaging member and depresses the latter into opposed work-feeding relation with said second feed-dog.

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