April 19, 1955 C. GROSSMAN 2,706,460

BLIND STITCHING DEVICE

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FIG. 1.

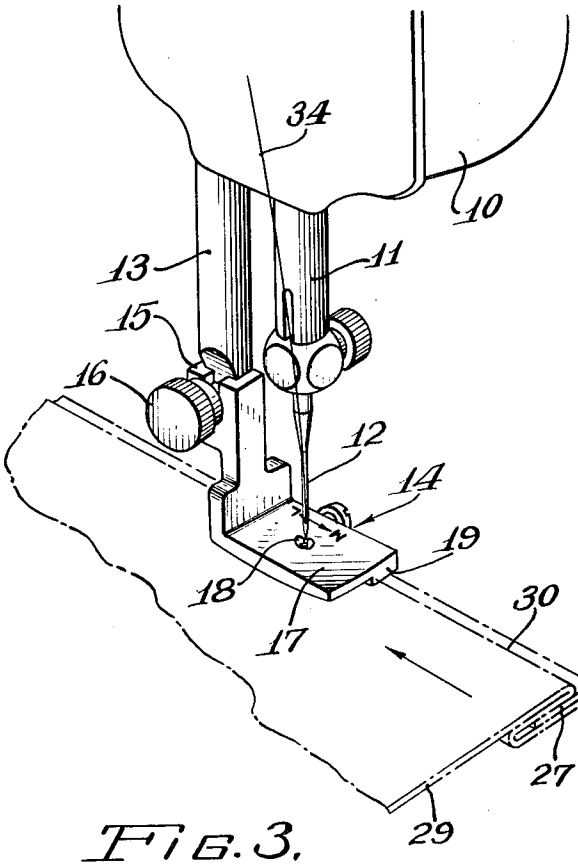


FIG. 2.

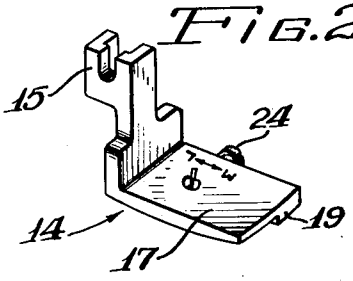


FIG. 4.

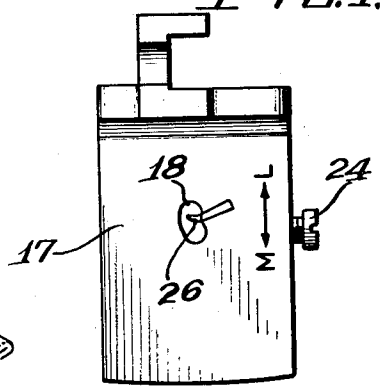


FIG. 3.

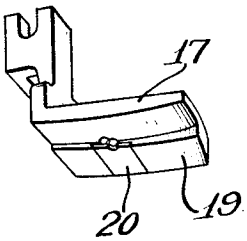


FIG. 6.

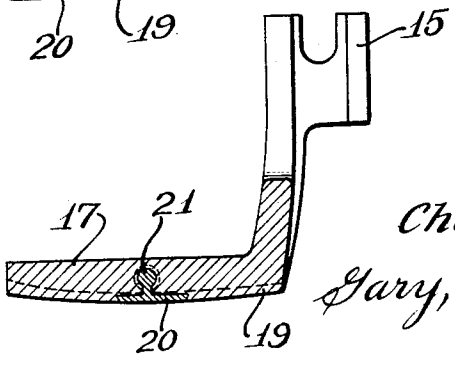
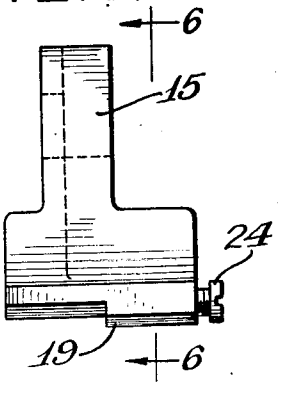


FIG. 5.



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FIG. 7.

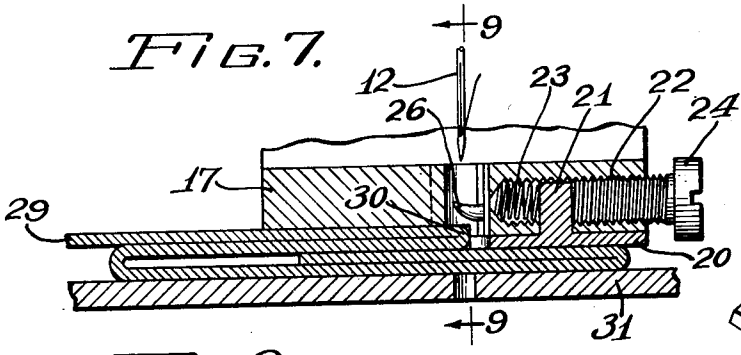


FIG. 8.

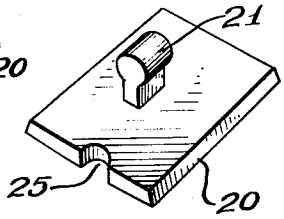


FIG. 9.

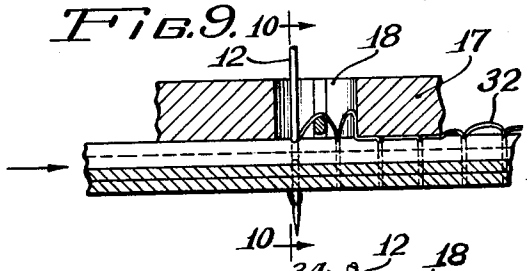


FIG. 12.

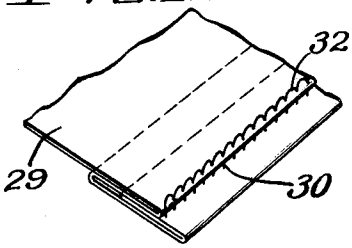


FIG. 10.

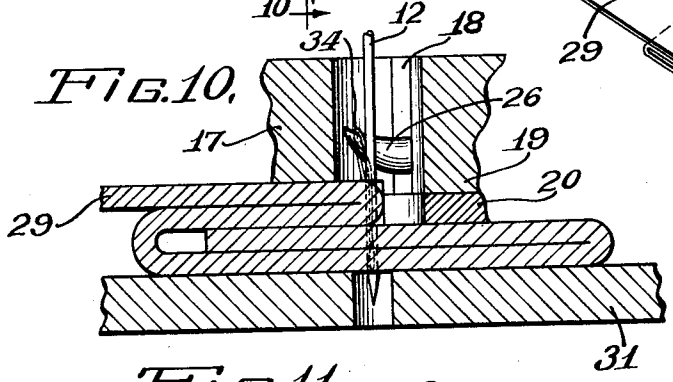


FIG. 11.

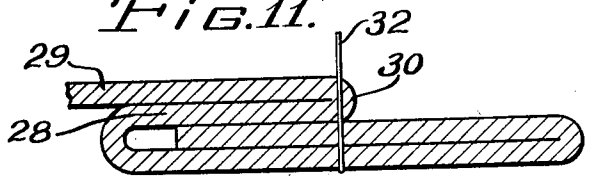
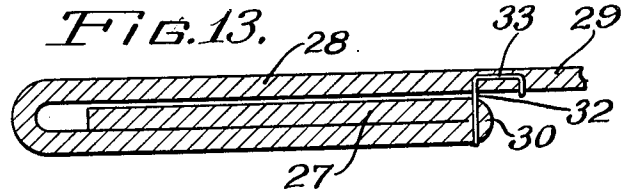


FIG. 13.



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2,706,460

BLIND STITCHING DEVICE

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Application October 10, 1952, Serial No. 314,109

7 Claims. (Cl. 112—235)

This invention relates to a new and improved presser foot adapted for use with conventional domestic or industrial sewing machines.

More particularly the present invention is directed to a presser foot constructed for accomplishing blind stitching in an improved manner.

It is an object of the present invention to provide a blind stitching attachment of simple construction and a minimum number of parts, and which consequently will not only present an economy of construction, but in addition will permit use by the housewife and industrial operator with equal facility and accuracy of result.

In addition to the fact that blind stitching attachments which have previously come to my attention are composed of numerous parts of varying degree of complexity and generally require skill in attachment, adjustment and use beyond that of the ordinary domestic user, I have further found that the prior blind stitching devices, even though they may include means for varying the degree of blind stitching or thickness of fabric being stitched at a folded edge, invariably form a tight stitch. This tight stitching, even though the thickness of folded material penetrated by the needle has been closely and carefully controlled, results in pulling or indentation of the fabric at its outer face, when the fold is opened, so that evidence of the stitching is not fully blind or thoroughly concealed from view.

It is therefore an important object of the present invention to provide a novel device which forms a loose blind stitch and one which does not cause pulling or indentation of the exposed opened face at the line of blind stitching.

It is a further object of the present invention to provide an improved adjustable guide means to permit regulation in a simple manner of the distance from the outer folded fabric edge at which the needle makes the blind stitch or degree of folded edge thickness engaged.

Other objects relate to details of construction, arrangement of parts, and economies thereof, as will be apparent from a further consideration of the following specification and drawings, wherein:

Fig. 1 is a perspective view of a portion of a sewing machine with my novel blind sitch presser foot attached to the presser bar, and a piece of fabric, shown dotted, in operative position.

Fig. 2 is a perspective view of my novel presser foot per se, and

Fig. 3 is another perspective view thereof from its under side.

Fig. 4 is an enlarged plan view of my presser foot, and

Fig. 5 is an end elevational view thereof.

Fig. 6 is a section on the line 6—6 of Fig. 5.

Fig. 7 is a fragmentary, enlarged, transverse sectional detail view of my presser foot engaged over a piece of fabric to be blind stitched, supported on the throat plate of a sewing machine.

Fig. 8 is a perspective view of the guide plate of my device separated from the assembly.

Fig. 9 is a fragmentary sectional view on the line 9—9 of Fig. 7, and in a progressive movement of the needle illustrating the operation of forming a loose stitch.

Fig. 10 is an enlarged sectional detail on the line 10—10 of Fig. 9.

Fig. 11 is a sectional view of the fabric blind stitched with my device.

Fig. 12 is a perspective view of the stitched material of Fig. 11, and

Fig. 13 is a view similar to that of Fig. 11, after the stitched, folded material is straightened out for use.

Referring to the drawings, the reference numeral 10 indicates a conventional sewing machine head having a vertically reciprocable needle bar 11 to which is secured a needle 12, and a presser bar 13 to which is secured by novel blind stitching presser foot device generally indicated as 14.

My presser foot, in the form shown, is provided with a bifurcated attachment leg portion 15 for engagement to the bar 13 by means of the set screw 16, as is conventional in some commercial sewing machines. It will, however, be understood that the indicated leg portion may be otherwise formed for attachment to presser bars of other manufacture, and this detail is only for the purpose of illustration.

The characterizing component of my invention comprises the base portion 17 of the presser foot attachment, the face of which is not bifurcated or slotted, other than being provided with the needle throat or aperture 18. The under face of the portion 17 is formed with a downwardly projecting, longitudinally extending shoulder or fixed guide portion 19, the needle aperture 18 being disposed outwardly of but closely adjacent the edge of guide 19.

The portion 17 is further provided with the laterally adjustable or variable guide plate 20 seated in the shoulder 19 for movement transversely thereof adjacent the needle aperture 18, for close control of the thickness of fabric fold to be stitched, as will hereinafter be further explained. In the structure illustrated, the adjustable guide plate 20 seats in a slot extending across the face of shoulder 19, and is formed with the cylindrical key portion 21 slidably received in the threaded keeper slot 22 in the foot portion 17. The key portion 21 is shorter than the slot 22 and is retained in the latter between the compression spring 23 and the screw 24. Thus if it is desired to obtain closer control of the thickness of fabric fold to be stitched, and greater than that afforded by the fixed guide 19, the plate 20 may be extended beyond the edge of the shoulder 19 to a greater or lesser degree by manipulation of the screw 24, for example in the direction of the arrows shown in Fig. 2, M indicating more, and L indicating less. To aid in this operation, and to permit the plate 20 to be disposed closer to the needle 12, the effective edge of plate 20 may be formed with the recess 25.

For the purpose of forming a loose stitch, as will be hereinafter more fully explained, the needle aperture 18 is elongated in a direction generally longitudinally of the foot portion 17, and in the general direction of the movement of the fabric being sewn relative to the pressure foot. Likewise for the indicated purpose, there is formed on or secured within the foot portion 17 the prong or pointed hook 26, disposed so as to project into the aperture 18, spaced rearwardly of the path of needle reciprocation, and inclined upwardly and rearwardly. The root of prong 26 extends from the face of the aperture 18 adjacent guide 19 to project substantially medially of aperture 18 and intermediate the depth of the latter.

The drawings illustrate the employment of my device for the purpose of forming a blind stitched hem on a garment, and the manner in which the fabric to be sewn is conventionally folded for this purpose. Thus, as illustrated, the terminal edge 27 of a piece of fabric is folded over when it is desired to conceal the raw edge of the fabric, the face 28 of the fabric to be ultimately exposed to view is folded thereover, and the latter is then folded rearwardly as at 29, leaving a doubled edge portion 30 to be blind stitched to the fabric portions beneath, which may be of single or multiple thickness.

As shown in Figs. 1 and 7 to 10, the thus folded fabric, which may be temporarily basted together, is positioned on the machine, and over the throat plate 31, in a manner whereby the folded fabric edge 30 abuts against the foot guide portion 19. In some instances this fixed guide may

be adequate for controlling the thickness of the fabric to be sewn, i. e., the desired distance between the outer and inner edges of fold 30. When it is desired to control more closely or vary this distance, due for example to varying thickness of different fabrics being sewn, screw 24 may be manipulated to project the edge of plate 20 to a greater or lesser degree beyond the fixed edge 19, and this will effectively provide a new limit of abutment, adjacent the needle 12 and its path of reciprocation, for the folded fabric edge 30. This permits regulation of the degree of thickness of fabric to be engaged by the stitch, or to compensate for different thicknesses of fabrics being sewn.

In general sewing it is desirable that the stitches be tight and with the prior blind stitching devices the stitches likewise were tight, but this resulted in the undesirable effect of pulling or dimpling the sewn fabric at the ultimately exposed face, falling short of the sought-after goal of a truly concealed or blind stitch. In my present invention, by providing the prong 26, one is enabled to form a loose stitch and thereby overcome the indicated prior deficiency. This loose stitch is shown at 32 in Figs. 11 and 12. When the sewn fabric is straightened out for use, it will be observed that the portions 28—29 are enabled to remain slightly spaced from the portion 27 by the taking up of the slack in the loose loops 32, thereby permitting the thread to extend freely between the thickness of the fabric as at 33, which previously was the folded blind-stitched edge 30.

This loose stitching is effected by means of prong 26 which projects into the needle aperture 18. Thus while needle 12 and its engaged thread 34 reciprocates through the foot aperture 18, and between the hook 26 and the forward portion of the aperture, through the folds of the fabric and forms a stitch by engagement with the bobbin or shuttle thread beneath the lowermost layer of the fabric, not shown, the fabric is carried rearwardly for each succeeding stitch in the direction of the arrow shown in Fig. 1 or as shown in Fig. 9. The portion of thread drawn horizontally between each upward and downward thrust of the needle is here momentarily extended and caught around prong 26 on the upward thrust of the needle, and engaged over the prong in the form of a loop on the downward thrust of the needle and held thereon temporarily by reason of upward inclination of the hook, until completion of the stitch by engagement of the needle thread by the bobbin thread and until the next upward thrust of the needle, so as to prevent the thread from being drawn tightly against the surface of the fabric between stitches. As the fabric continues to be drawn rearwardly, and in the distance between the prong and the rearward defining edge of aperture 18, the loop is caused to drop off by reason of slight rearward inclination of hook 26, as shown in Fig. 4.

Even though these resulting loops are temporarily pressed down by the heel portion of foot 17, as shown in Fig. 9, they spring up to remain loose and elevated, as further shown in Figs. 11 and 12, and permit necessary movement and freeness for smoothly unfolding the blind-stitched fabric as shown in Fig. 13, without undue drawing of the engaged fabric.

Although I have shown and described the preferred embodiment of my invention, it will be apparent to those skilled in the art that various changes may be made in the details thereof without departing from the scope thereof as comprehended by the following claims.

I claim as my invention:

1. A blind stitch sewing device, comprising a presser foot adapted to be secured to the presser bar of a sewing machine, guide means on the under face of said presser foot forming an abutment shoulder for the folded edge of a fabric to be blind stitched comprising fixed spaced end portions and an intermediate portion engaged therebetween for slidable movement transversely of said foot, a needle aperture formed in said foot adjacent said slidable guide portion for receiving a vertically reciprocal needle, said needle aperture being elongated in a direction towards the heel of said foot and rearwardly of the path of needle reciprocation, and pointed hook means fixedly secured to and extending from a side defining wall of said needle aperture within said needle aperture and inclined rearwardly therein for engaging the needle thread and holding it elevated from the fabric being sewn between stitches.

2. A blind stitch sewing device, comprising a presser foot adapted to be secured to the presser bar of a sewing machine, guide means on the under face of said presser foot forming an abutment shoulder for the folded edge of a fabric to be blind stitched comprising fixed spaced end portions and an intermediate portion engaged therebetween for slidable movement transversely of said foot, a needle aperture formed in said foot adjacent said slidable guide portion for receiving a vertically reciprocal needle, said needle aperture being elongated in a direction towards the heel of said foot and rearwardly of the path of needle reciprocation, and laterally projecting and rearwardly inclined hook means fixedly secured to said foot and extending within said needle aperture for engaging the needle thread and holding it elevated from the fabric being sewn between stitches.

3. A blind stitch sewing device, comprising a presser foot formed with a needle aperture and adapted to be secured to the presser bar of a sewing machine, downwardly projecting guide means carried by said foot adjacent said needle aperture forming an abutment shoulder for the folded edge of a fabric to be blind stitched comprising fixed spaced end portions and an intermediate portion engaged therebetween for slidable movement transversely of said foot, means for laterally moving said slidable guide portion normally to the path of needle reciprocation, said needle aperture being elongated rearwardly toward the heel of said presser foot and including a generally laterally projecting and rearwardly inclined hook means fixedly secured to said foot and extending within said aperture elongation and rearwardly of the path of needle reciprocation for engaging the needle thread and intermittently holding it elevated from the fabric being sewn between successive engagement thereof by the bobbin thread.

4. A blind stitch sewing device, comprising a presser foot adapted to be secured to the presser bar of a sewing machine, said foot being formed with a needle aperture elongated rearwardly towards the heel of said foot and providing a path of vertical needle reciprocation adjacent the forward portion of said aperture and a loose stitch formation area adjacent the rear portion of said aperture, and laterally projecting and rearwardly inclined hook means fixedly secured to and extending from a side defining wall of said aperture for engaging the needle thread and holding it elevated from the fabric being sewn between stitches.

5. A blind stitch sewing device, comprising a presser foot adapted to be secured to the presser bar of a sewing machine, said foot being formed with a needle aperture elongated rearwardly towards the heel of said foot and providing a path of vertical needle reciprocation adjacent the forward portion of said aperture and a loose stitch formation area adjacent the rear portion of said aperture, and hook means fixedly secured to said foot and terminating in an upwardly and rearwardly inclined tip portion projecting into said aperture from a side defining wall thereof disposed rearwardly of and adjacent to the path of needle reciprocation for engaging the needle thread and intermittently holding it elevated from the fabric being sewn between successive engagement thereof by the bobbin thread.

6. A blind stitch sewing device, comprising a presser foot adapted to be secured to the presser bar of a sewing machine, said foot being formed with a needle aperture and including longitudinally extending downwardly projecting guide means on the underface of said foot forming an abutment shoulder for the folded edge of a fabric to be blind stitched comprising fixed spaced aligned end portions integral with the heel and toe portions respectively of said foot and an intermediate movable guide portion disposed between said fixed guide portions and in slidable engagement with said foot in a direction transversely thereof, and means for laterally moving said slidable guide portion outwardly of the aligned defining edges of said fixed guide portions for regulating the position of its defining edge with reference to the needle aperture.

7. A blind stitch sewing device, comprising a presser foot adapted to be secured to the presser bar of a sewing machine, said foot being formed with a needle aperture and including longitudinally extending downwardly projecting guide means on the underface of said foot forming an abutment shoulder for the folded edge of a fabric to be blind stitched comprising fixed spaced aligned end portions integral with the heel and toe portions respectively of said foot and an intermediate movable

guide portion disposed between said fixed guide portions, said movable guide comprising a plate including a cylindrical key projecting from its upper surface slidably received in a cylindrical threaded keeper slot formed transversely of said foot, spring means disposed in said slot for acting against said key for urging the defining edge of said movable guide in a direction away from said needle aperture, and screw means engaged in said threaded aperture for acting against said spring-pressed key for adjustably regulating the position of the defining edge of the movable guide with reference to the needle aperture.

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