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SEWING MACHINE HAVING FABRIC GUIDE MEANS

Filed March 23, 1962

2 Sheets-Sheet 1

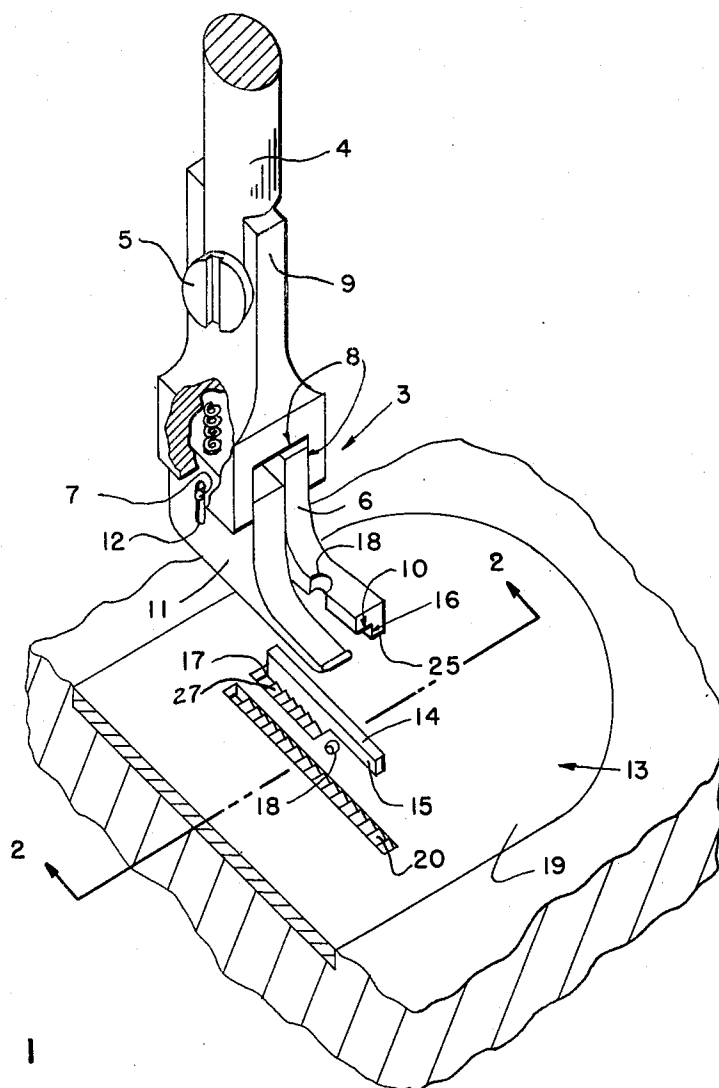


FIG. 1

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2 Sheets-Sheet 2

FIG. 2

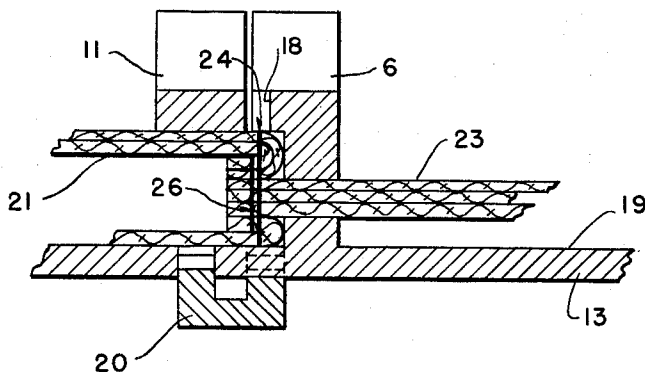


FIG. 3

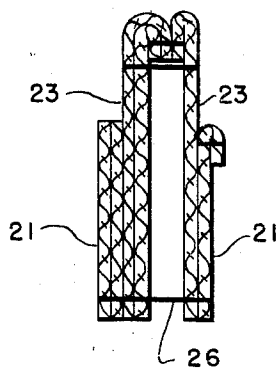
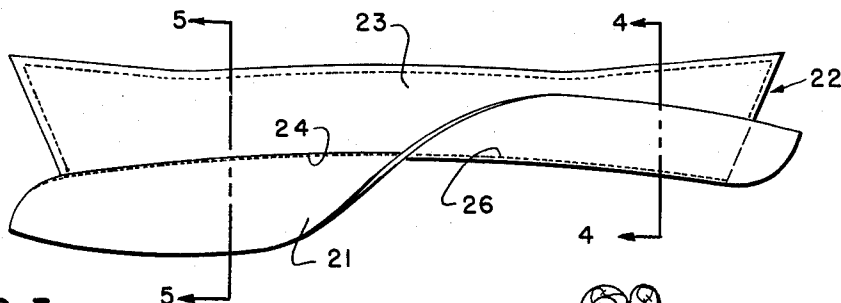


FIG. 4

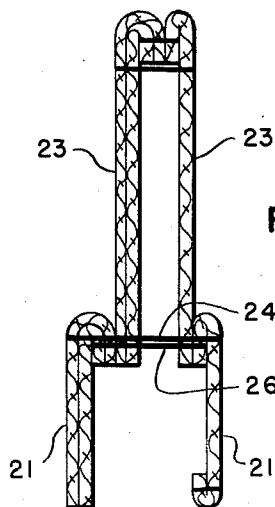


FIG. 5

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SEWING MACHINE HAVING FABRIC GUIDE MEANS

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1 Claim. (Cl. 112—151)

This invention relates to an improvement in the feeding mechanism of sewing machines and particularly to an improved feed dog, throat plate and presser foot assembly for band stitching garment collars.

In the manufacture of garments there is an ever increasing pressure to improve the quality of the article but at the same time effect a reduction in cost of operations. The reduction in cost resulting from the instant invention produces a higher quality garment at no increase in cost to the consumer.

In the assembly of shirt parts and particularly in the band stitching operation of a garment collar, as now practiced, the distance between the fold line of the neckband and the band stitching seam is relatively large and the fabric in this area is relatively loose or free. This relatively large amount of loose fabric is caused by present sewing methods and the free fabric has a tendency to ridge or pucker when the cape section of the collar is turned down and the neckband is curved as in wearing. These resultant ridges or puckers are referred to in the trade as "guttering" and cause discomfort to the wearer and also reduce the wear life of the garment.

I have found that one cause of "guttering" is the fact that the operator is unable to accurately and consistently exert an equal tension on both the neckband and cape sections of the collar during band stitching. This lack of an equal tension causes the looseness which results in "guttering." Another cause of "guttering" is the inability of the operator to see through the presser foot to determine the exact location of the folded down edge of the fold line of the neckband. Because the operator is unable to see the fold line, the operator spaces the seam a substantial distance in from the folded-down edge of the neckband to insure that the stitching doesn't run off or go beyond the folded-down edge of the neckband. The substantial distance thus allowed, provides a condition resulting in the puckering or "guttering" as indicated above.

Additionally, the introduction of resin treated wash and wear cotton fabrics and fabrics of man-made fibers and combinations thereof have increased the difficulty encountered by an operator, due to the inherent resistance of these fabrics to creasing or folding, to sew close to the fold line or to maintain the uniform tension required to eliminate "guttering." Attempts have been made to overcome this difficulty by obtaining a sharper fold through increasing the heat and pressure during the neckband fold-down operation prior to band stitching. It was found that chemical additives and storage in moisture controlled rooms prior to pressing was also necessary in order for the collars to retain any semblance of a crease whatsoever. This, however, did not solve the problem and the additional cost of this preconditioning made the whole process unattractive but necessary.

The instant invention renders all pretreatment, preconditioning and folding of wash and wear fabrics unnecessary and permits the operator to sew close to the edge of the fold line with a minimum of loose fabric between the stitch line and the fold line regardless of the fabric used. This is accomplished by the novel construction of the components of the feeding mechanism of the sewing machine to include upright guide surfaces on both the presser foot and the throat plate against which the opera-

2

tor feeds the fabric parts. Also, the feed dog mechanism is modified to cause the folded edge of the neckband to bear uniformly against the upright guide surfaces. The presser foot, throat plate and feed dog components so constructed thus allow feeding and stitching of the band seam with no tensioning of components required, during stitching of the seam, by the operator. As a result of the simplification of this operation, "guttering" is eliminated and a higher quality garment is provided for the user. The guide surfaces on the presser foot and on the throat plate are arranged to extend a vertical distance equal to slightly less than the thickness of two plies of the fabric being worked and they are positioned in vertical parallel alignment with each other and in parallel alignment with the direction of work travel of the sewing machine to provide the required action on the garment part during operation.

An object of the instant invention therefore is to provide an improved feed mechanism for band stitching collar bands to collar cape portions and which will provide a line of stitches at a minimum distance from the folded edge, thereby eliminating "guttering."

Another object is to provide an improved presser foot, throat plate and feed dog which will be relatively simple, practical, compact and inexpensive.

Various other objects and advantages will be apparent from the following description of the apparatus embodying the invention and the novel features will be particularly pointed out hereinafter in connection with the appended claim.

In the accompanying drawing:

FIG. 1 is an isometric view, partly in section, showing the presser foot, throat plate and feed dog of the present invention;

FIG. 2 is a section taken approximately along line 2—2 of FIG. 1 showing the presser foot, throat plate and feed dog relationship when in operating position with a garment collar therebetween;

FIG. 3 is an elevation of the band and cape assembly with one end of the neckband turned up to show the relative location of the plies before and after band stitching;

FIG. 4 is a view taken approximately along the line 4—4 of FIG. 3 showing the relative positions of the fabric layers after band attachment and prior to band stitching; and

FIG. 5 is a view taken approximately along the line 5—5 of FIG. 3 showing the relative positions of the fabric layers after band stitching.

In the illustrated embodiment of the invention the compensating presser foot, throat plate and feed dog are constructed in a novel way to improve their coaction and to therefore produce improved qualities in the garment part stitched with the improved assembly.

Referring particularly to FIG. 1, a compensating presser foot 3 is attached to a presser foot bar 4 of a standard sewing machine (not shown) by a screw 5. The foot 3, being a compensating foot, has a split work-engaging shoe, which in usual operation permits the two portions of the foot to react independently when different thicknesses of fabric are passed beneath two portions of the foot. The work-engaging members 6 and 11 of the foot 3 are pivotally mounted by a mounting pin 7 in a recessed yoke portion 8 of the foot shank 9.

On the lower work-engaging surface 10 of the pivotally mounted member 6 of the foot 3, I have provided a guide surface 25 having a vertically extending face 16. The face 16 may be of a height suitable for engaging a folded edge of a garment part and is preferably at least equal to the thickness of slightly less than two fabric plies being worked.

The other work-engaging member 11 of the foot 3 is a

standard spring loaded reciprocally mounted foot element which pivots on the pin 7 in the yoke area 8 of the foot 3. There is an elongated slot 12 in the spring loaded member 11 which allows the member 11 to reciprocate vertically as well as pivot on the mounting pin 7.

The throat plate 13 is modified to include a member 14 firmly attached to its work surface. The member 14 may be integral with the throat plate 13 or removably attached thereto in a suitable manner. The member 14 includes a vertically extending guide surface 15 which extends in direct vertical alignment with the vertical face 16 of the member 6, and also forms a vertical upward continuation of the feed dog slot 17 of the throat plate 13. It should also be noted that the feed dog slots in front of the needle hole 18 and to one side of the needle hole have been eliminated. This of course requires that the feed dog 20 has only one and one-half rows of teeth.

The use of one and one half rows of feed dog teeth and the alignment of the vertical surface 15 of the throat plate member 14 with an edge of the feed dog slot 17 creates a novel reaction on the collar assembly. When using the present improved mechanism the teeth of the feed dog 21, in imparting motion to the collar plies, retain the tightly folded-over edge of the band plies 21 about the band attaching seam 26 against the guide surface 15 of the throat plate 13 and of the presser foot member 6. When the short member 27 of the feed dog rises in operation, the diagonal force exerted by the feed dog teeth exerts a force on the fabric causing abutment of the fabric against both the vertical surface 15 of the throat plate guide member 14 and the vertical face 16 of the guide surface 25. The forcing of the collar assembly against these vertical surfaces causes the folded-over edge plies of the neckband to bend and fold back as sharply as possible about the neckband attaching seam 26 and holds the assembly in this position during the formation of the band stitch seam 24. As best shown in FIG. 2, when employing the instant invention to band stitch collars, the operator turns down the band 21 of the collar 22 and feeds the assembly beneath the foot 3 such that the cape section 23 is positioned between the surface 10 of the foot member 6 and the opposing surface of the throat plate guide member 14. It thus is no longer necessary for the operator to apply any tension whatsoever in any direction on any of the component parts of the collar assembly. The band-stitch seam 24 is thus applied as close to the attaching seam 26 as is mechanically possible and the stitching is applied at a fixed minimal equal distance from, and for the entire length of seam 24. This eliminates any loose fabric between the folded-over edge of the neckband and the band stitching seam and thus eliminates the major cause of "guttering."

It will be understood that various changes in the details, materials, and arrangement of parts, which have been herein described and illustrated in order to explain the nature of the invention, may be made by those skilled in the art within the principle and scope of the invention as expressed in the appended claim.

I claim:

In a sewing machine to perform the band stitching operation in the manufacture of collars, said sewing machine comprising a feeding mechanism including a throat plate having a needle hole, a compensating presser foot and a feed dog, the improvement in said machine comprising, a vertical guide surface at one side of the needle hole and in the throat plate, said vertical guide surface being attached to said throat plate and projecting upwardly from an upper face of said throat plate a distance equal to slightly less than two thicknesses of a fabric being worked, a vertical guide surface in a lower face of one of two lower faces of a compensating presser foot, said compensating presser foot having two independent pivotally mounted compressor levers, one of said levers being spring loaded in a perpendicular direction to the throat plate, said compensating presser foot vertical guide surface projecting downwardly from a lower face of said compensating presser foot a distance equal to at least three fabric thicknesses being worked, both vertical guide surfaces forming a vertical face at one side only of said needle hole, said throat plate, throat plate vertical guide surface, said compensating presser foot and compensating presser foot guide surface forming an enclosure having an open end opposite said vertical face, said vertical face being in parallel alignment to the direction of work travel of said sewing machine, said throat plate having a full length feed dog slot at another side of the needle hole, and a half length feed dog slot directly in back of said needle hole, one edge of said half length feed dog slot being in vertical alignment with said vertical face of said enclosure, said feed dog having only one and one half rows of teeth.

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