

Dec. 27, 1938.

H. DIAMOND

2,141,239

ELASTIC SEAM FOR GARMENTS

Filed June 30, 1937

3 Sheets-Sheet 1

Fig. 1

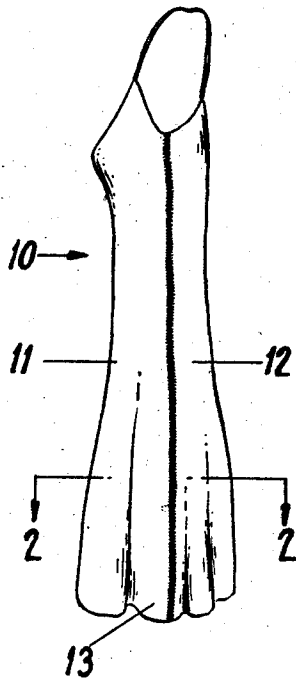


Fig. 3

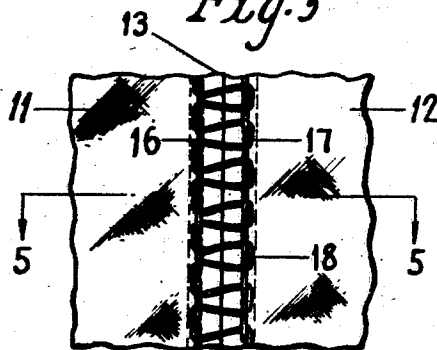


Fig. 4

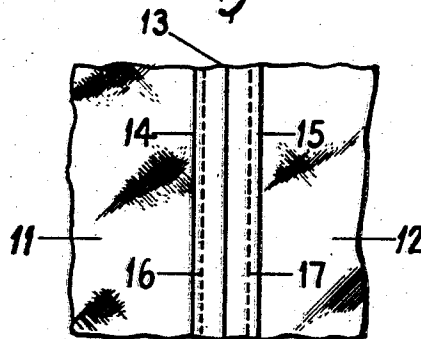


Fig. 2

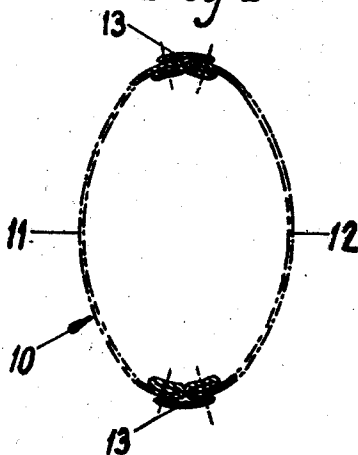
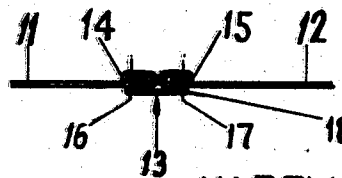


Fig. 5



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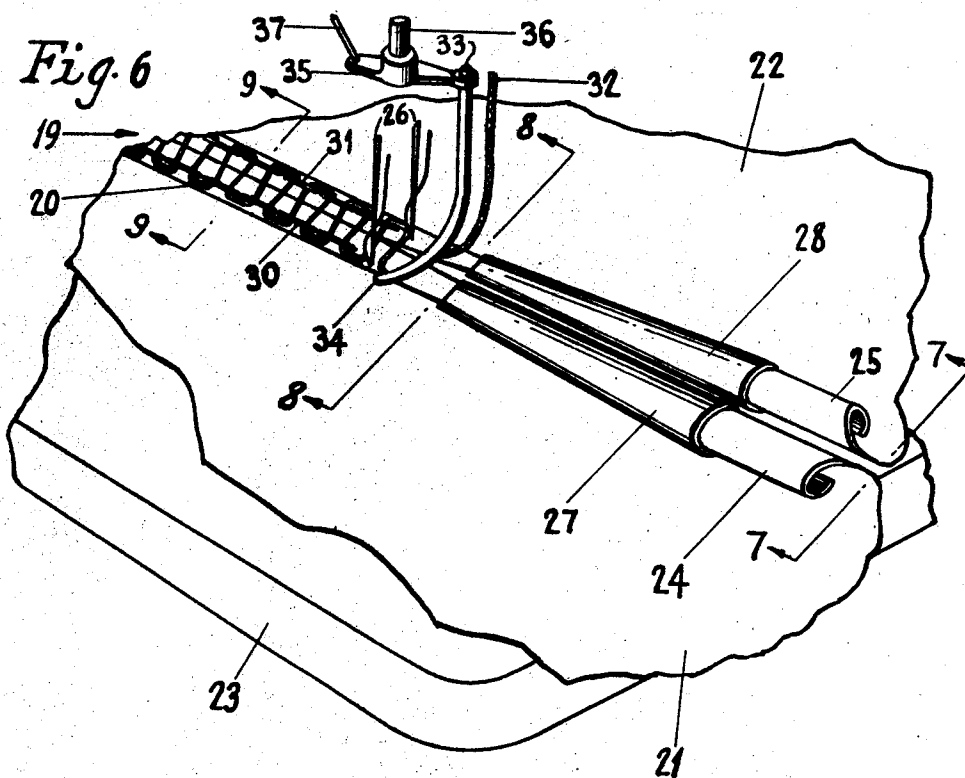


Fig. 9

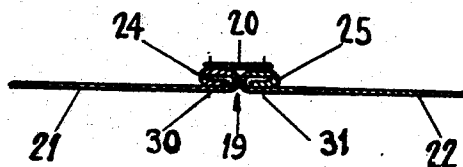


Fig. 8

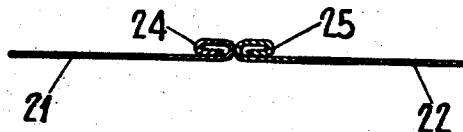
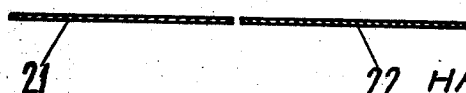


Fig. 7



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Fig. 10

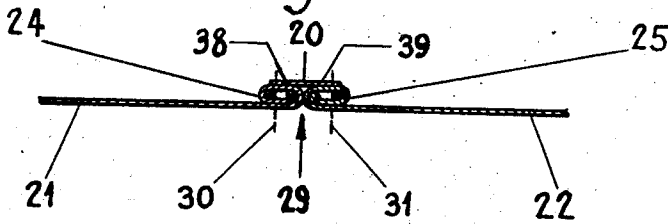


Fig. 11

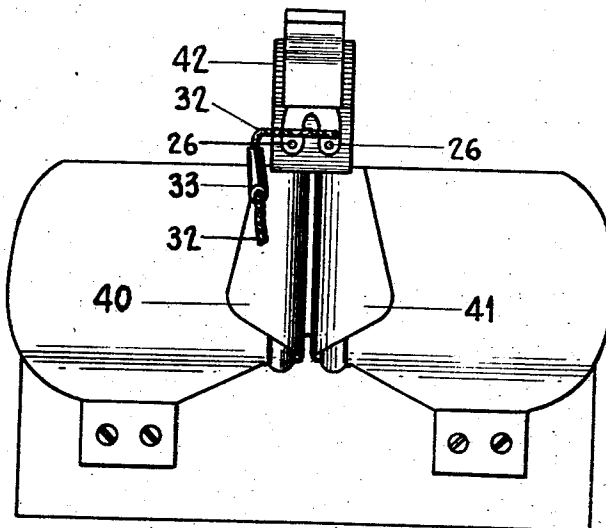


Fig. 12

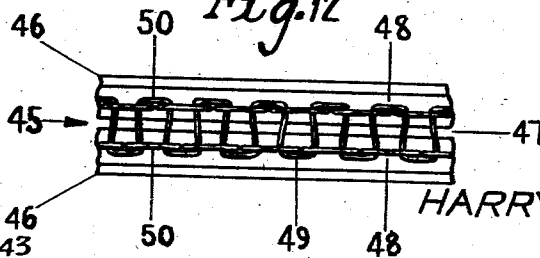
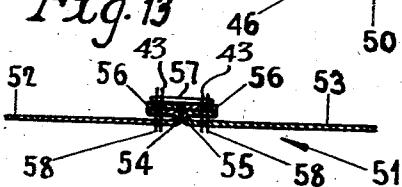


Fig. 13



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2,141,239

ELASTIC SEAM FOR GARMENTS

Harry Diamond, Cedarhurst, N. Y.

Application June 30, 1937, Serial No. 151,210

3 Claims. (Cl. 2-73)

This invention relates to improvements in garments of the close-fitting type and particularly to undergarments known as "slips".

An object of this invention is to provide a slip having front and rear panels which are connected at their side-edges by elastic seams having an elastic thread cross-stitch throughout the entire length of the garment so as to avoid tearing of the seams when the wearer changes from an upright to a sitting position.

Another object of this invention is to cut the woven fabric on the bias at the sides for the purpose of increasing the elasticity of the garment to a certain degree and then seam the sides together with an elastic thread cross-stitch, the said cross-stitch being held in position on the two panels beneath two parallel rows of straight-line stitching of non-elastic threads.

Another object of this invention is to hem the bias side-edges of the front and rear panels so as to reinforce the edges and adapt said edges for transmitting a part of the transverse pull to the two woven fabric panels without tearing the fabric.

Another object of this invention is to form the elastic seam with the hemmed edges in adjoining relation so that when the fabric is stretched transversely the side edges of the panels will temporarily be pulled apart and provide an opening for ventilation but will immediately close back to normal when the distending stresses are relieved.

Another object of this invention is to place a cord in each of the folded edges to prevent wrinkling of the hollow edges and to maintain the edges in parallel and distinct linear form indefinitely.

Another object of this invention resides in a method by which the elastic thread cross-stitched seam is formed in successive steps of upfolding the edges of two juxtaposed sections of fabric into adjoining relation, infolding and guiding the sections towards two needles spaced apart cross-wise of the line of seam formation, stitching both folded edges with non-elastic threads and uniting said sections into seam formation by interlacing an elastic thread cross-stitch between the two rows of straight line stitching and the sections of fabric.

This application is a continuation in part of my application Serial No. 89,031, filed July 6, 1936.

With the above and other objects in view, the invention will be hereinafter more particularly described, and the combination and arrangement of parts will be shown in the accompanying draw-

ings and pointed out in the claims which form part of this specification.

Reference will now be had to the drawings, wherein like numerals of reference designate corresponding parts throughout the several views, in which:

Figure 1 is a side view illustrating one type of garment to which the present invention is particularly adapted.

Figure 2 is an enlarged fragmentary sectional view, the section being taken as on line 2-2 in Figure 1.

Figure 3 is an enlarged fragmentary portion of two adjoining panels of the garment shown in Figure 1, showing one of the elastic seams and an illustrated cross-stitch as it appears on the normally exposed surface of the garment.

Figure 4 is an enlarged fragmentary portion of two adjoining panels of the garment shown in Figure 1, showing the elastic seam as it appears on the normally concealed surface of the garment.

Figure 5 is a cross-sectional view taken as on line 5-5 in Figure 3.

Figure 6 is a perspective view showing the manner of placing, infolding, stitching the folded edges with non-elastic thread and uniting the two fabric sections by interlacing an elastic thread cross-stitch between the straight-line stitching and the fabric in successive steps.

Figure 7 is a sectional view taken as on line 7-7 in Figure 6.

Figure 8 is a sectional view taken as on line 8-8 in Figure 6.

Figure 9 is a sectional view taken as on line 9-9 in Figure 6, showing the seam as it appears with the elastic thread cross-stitch positioned on the normally concealed surfaces of the fabric sections.

Figure 10 is an enlarged cross-sectional view of a modified elastic seam having a cord filling in each of the folded edges.

Figure 11 is a plan view of the hemmers.

Figure 12 is a plan view of an elastic ribbon-like trimming simulating a braid effect which may be readily attached either as an insert between panels or superimposed on a garment for the purpose of ornamenting wearing apparel.

Figure 13 is a sectional view of a modified reinforced elastic seam having facings in superposed relation on the folded edges of the fabric sections.

In the illustrated embodiments of the invention, Figure 1 shows a side view of a garment known as a woman's slip to which a seam con-

structed in accordance with the present invention is particularly adapted.

The slip comprises a front panel 11 and a rear panel 12, made of woven fabric. The panels are cut on the bias at the sides for the purpose of increasing the elasticity of the garment transversely to a certain degree. By "cut on the bias" or "on the bias line" is understood to be a line forming an angle of substantially 45° with the warp and filler threads. It is well known that a piece of woven fabric cannot be stretched to any appreciable extent in the direction of the warp threads or in the direction of the filler threads but can be stretched to an appreciable extent along a bias line.

As shown in Figure 2, the slip 10 has two seams 13, 13, at the sides of the garment. Each seam 13, best shown in Figure 5, comprises two side edges of adjacent panels. The side edges are separately folded to form hems 14, 15. The hemmed side edges are stitched by two parallel rows of straight-line stitching 16, 17 using non-elastic threads. This causes the raw edges of the fabric to be concealed inside the folds. The parallel rows of non-elastic straight-line stitching have been interlocked with a cross-stitch 18 using an elastic thread which is positioned intermediate the fabric and the straight-line stitching. The spaced rows of straight-line stitches serve for anchoring the cross-stitches to the woven material. The folded side edges of the panels 11 and 12 lie flat in a single plane and so that the seam 13 has no undue bulkiness. The hems 14 and 15 face in opposite directions.

It will be noted that the hemmed fabric edges are normally in adjoining or abutting relation so that when the two sections of fabric are stretched transversely the side edges of the panels will be temporarily pulled apart and provide a distinct linear opening for ventilation but will immediately close back to the normal adjoining relation when the distending stresses are relieved.

As shown in Figure 3, the length of each of the cross-threads is substantially the same as the distance between the two rows of straight-line stitching so as to normally connect and hold the folded edges in flat and abutting relation and prevent the edges from being spaced apart or from being in overlapping relation.

It will thus be seen that I have provided a woven fabric slip with an expansible seam for the purpose of relieving the slip fabric of distending stresses which are taken up by the seam itself.

While I have shown the cross-stitching 18 as being placed on the normally exposed surface of the garment 10, I may place the cross-stitching on the normally concealed surface of the garment and produce an equivalent distending effect. The transversely elastic thread seam herein described may be used for all kinds of garments having two or more panels and wherein it is desired to make it possible for the folded edges of the adjoining panels to be moved to and fro without rupture of the seams. Any portion of the seam 13 may be stretched transversely without affecting the other portions of the seam. It is to be noted that the hemmed edges may be folded twice so as to conceal the raw edge, as shown, or a hem may be used wherein the edge portion of the fabric is folded only once and wherein the edge may be trimmed and exposed.

As best shown in Figure 5, the parallel rows of straight line stitching 16 and 17 are not interlocked and act independently of each other. If

the lines of stitching 16 and 17 were interlocked and non-elastic threads were used, it would prevent the elastic thread cross-stitch 18 from being stretched transversely. It is however within the field of this invention to provide an elastic seam in which elastic cross-stitching may be used on the normally exposed as well as on the normally concealed surfaces of the fabric.

Referring to Figures 6 to 9 inclusive, which show a distensible seam 19 wherein the elastic thread cross-stitch 20 is positioned on the normally concealed surfaces of fabric sections, the method is carried out as follows: Two fabric sections 21, 22 are positioned flat and in juxtaposed relation on the base plate 23 of a combined two needle lock stitch and cross-thread laying sewing machine (not shown). The sections 21 and 22 have their edges 24 and 25 infolded and guided toward the needles 26 by two adjacent hemmers 27 and 28.

The needles 26 are spaced apart crosswise of the line of seam formation and form two parallel lines of lockstitch stitching 30 and 31 which are positioned parallel with and are respectively equally spaced from opposite sides of the seam. The elastic thread 32 is carried by a thread-finger 33 which has a bent lower end portion 34 at which end the thread is moved back and forth across the two lines of stitching so as to spread the elastic cross-stitch 20 beneath the needle-threads. The thread-finger is secured at its upper end to a lever 35 fulcrumed on a vertical rod 36 which, in practice, may be mounted in the head of the sewing machine. At the opposite end of the lever 35 is a rod 37 by which the lever and the attached thread-finger are swung laterally across and in front of the lower end of the needles 26.

Figure 10 shows a modified elastic seam 29 having a cord filling in each of the folded edges. When the upper and lower layers of the folded edges are pulled together taut by the stitching 30 and 31, the cords 38, 39, are gripped inside the folded fabric edges and held in the folds by frictional engagement and prevent wrinkling of the hollow edges and serve to maintain said edges in parallel and linear form. The cords 38 and 39 are composed of several strands twisted together and are of circular cross-section.

As shown in Figure 11 the hemmers 40, 41 are spaced apart so as to cause the centers of the adjoining folded edges to be substantially in line with the distance between the needles 26. The hemmers 40 and 41 are designed to fold down the fabric sections and so that the elastic thread cross-stitch is positioned on the normally exposed surfaces of the fabric sections, as shown in Figure 3. The thread-finger 33 is in practice designed to be moved laterally above the presser foot 42 in front of the needles 26 so as to lay the elastic thread 32 in position for stitching.

Figure 12 shows an elastic ribbon-like trimming or elastic seaming means 45 comprising two elongated strips of fabric 46, 46 which are positioned in parallel relation and spaced apart transversely to provide a permanent linear opening 47 between them. The adjacent edges at the middle of the trimming have been infolded as indicated by the numerals 48. The strips 46 have been united by an elastic thread cross-stitch 49 held in position by lock-stitching 50, 50.

It is to be noted that the elastic thread used for cross-stitching is of much greater diameter than that of the needle threads.

It is also to be noted that the claims to the

article of manufacture are not limited to the particular method herein described.

Figure 13 shows a modified elastic seam 51 comprising two juxtaposed fabric sections 52 and 53 having their edges 54 and 55 folded in opposite directions and being reinforced by first stitching a facing or tape 56 on each edge portion by lock-stitching 43 and then turning over and topstitching the folded edge on the tape. These two stitching operations are repeated on each fabric section. The reinforced sections are then united by an elastic cross-stitch 57 held together by lock-stitching 58.

I claim:

1. In a cross-stitched seam for an undergarment in the form of a slip, comprising two juxtaposed sections of woven fabric, each section having a folded flat edge, said folded edges facing in opposite directions and being in abutting relation, said folded edges being stitched by two parallel rows of straight-line stitching using non-elastic threads, said parallel rows of straight-line stitching being connected by a cross-stitch using an elastic thread, said elastic thread being positioned between said fabric and said straight-line stitching, each of said cross-stitches being of the same length as the distance between the two rows of straight-line stitching so as to normally connect and hold said folded fabric edges in flat and abutting relation, said elastic cross-threads being individually held taut by said non-elastic threads and being individually yieldable transversely to permit local transverse separation of said abutting edges and a localized linear opening for ventilation to be formed when said abutting edges are pulled apart.

2. In a cross-stitched seam for a garment, comprising two juxtaposed sections of fabric, each section having a folded edge, said folded edges

facing in opposite directions and being in parallel relation, said folded edges being stitched by two parallel rows of straight-line stitching using non-elastic threads, said parallel rows of straight-line stitching being connected by a cross-stitch using an elastic thread, said elastic thread being positioned between said fabric and said straight-line stitching, each of said cross-stitches being of the same length as the distance between the two rows of straight-line stitching so as to normally connect and hold said folded fabric edges in parallel relation, said elastic cross-threads being individually held taut by said non-elastic threads and being individually yieldable transversely to permit local transverse separation of said edges and a localized linear opening for ventilation to be formed when said parallel edges are pulled apart.

3. In a cross-stitched seam for a garment, comprising two juxtaposed sections of fabric, each section having a folded edge, said folded edges facing in opposite directions and being in parallel relation, each of said folded edges being reinforced by stitching a tape thereto, said reinforced edges being stitched by parallel rows of straight-line stitching using non-elastic threads, said parallel rows of straight-line stitching being connected by a cross-stitch elastic thread, said elastic thread being positioned between said taped fabric and said last mentioned straight-line stitching, said cross-stitches being of equal lengths so as to normally connect and hold said folded fabric edges in parallel relation, said elastic cross-threads being held taut by said non-elastic threads and being yieldable transversely to permit local transverse separation of said edges and a localized opening for ventilation to be formed when said parallel edges are pulled apart.

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