July 6, 1948. M. POPPER 2,444,467

ELASTIC SEAM WITH CONCEALED ZIG-ZAG STITCHING

Filed June 22, 1944

3 Sheets-Sheet 1

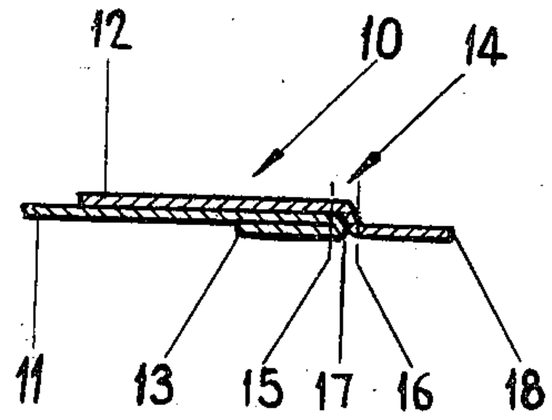

Fig. 1

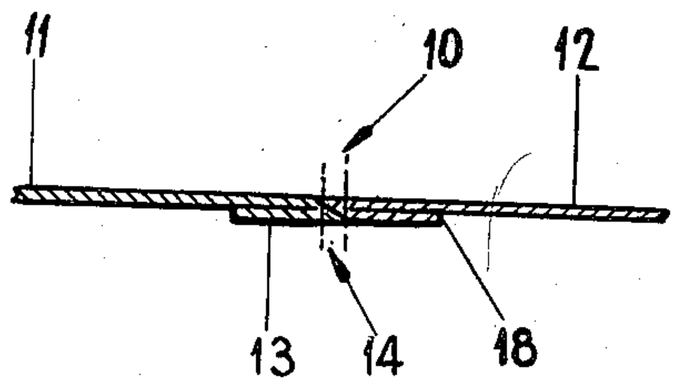

Fig. 2

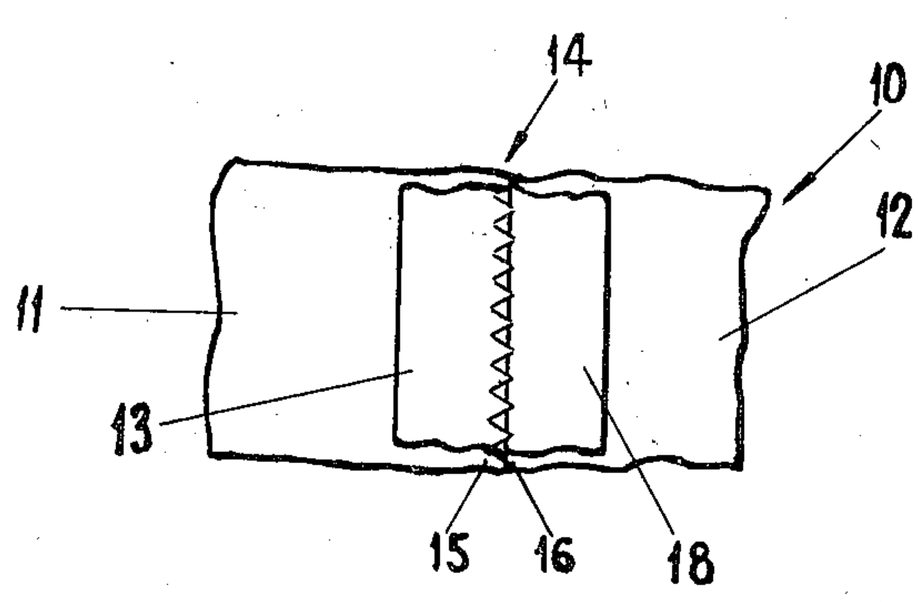

Fig. 3

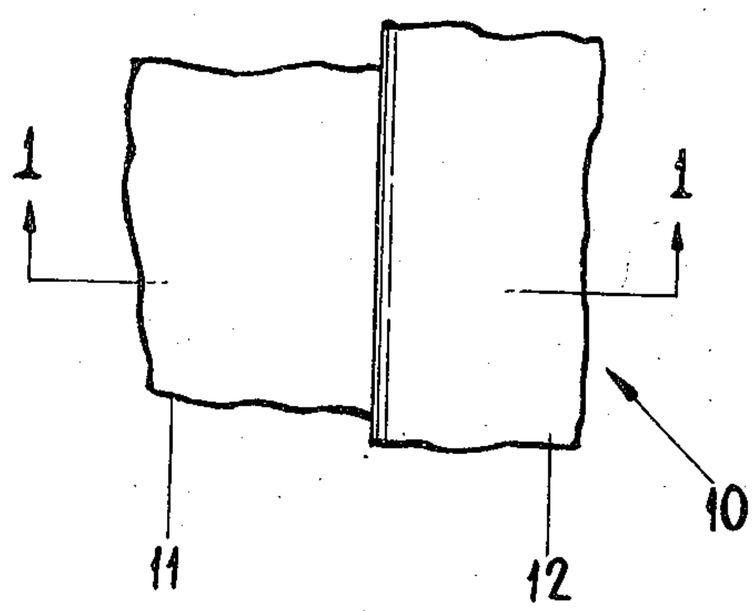

Fig. 4

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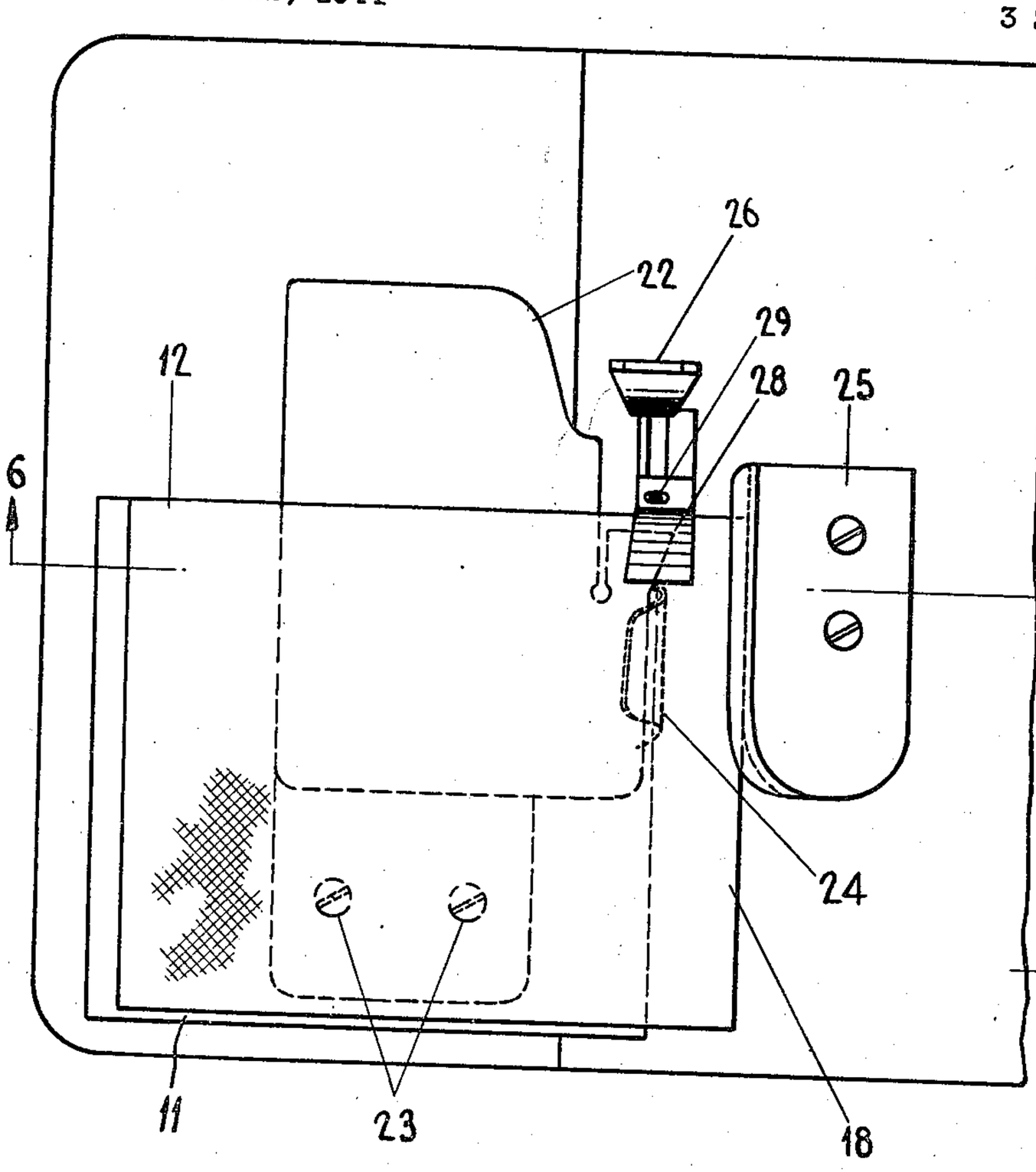

Fig. 5

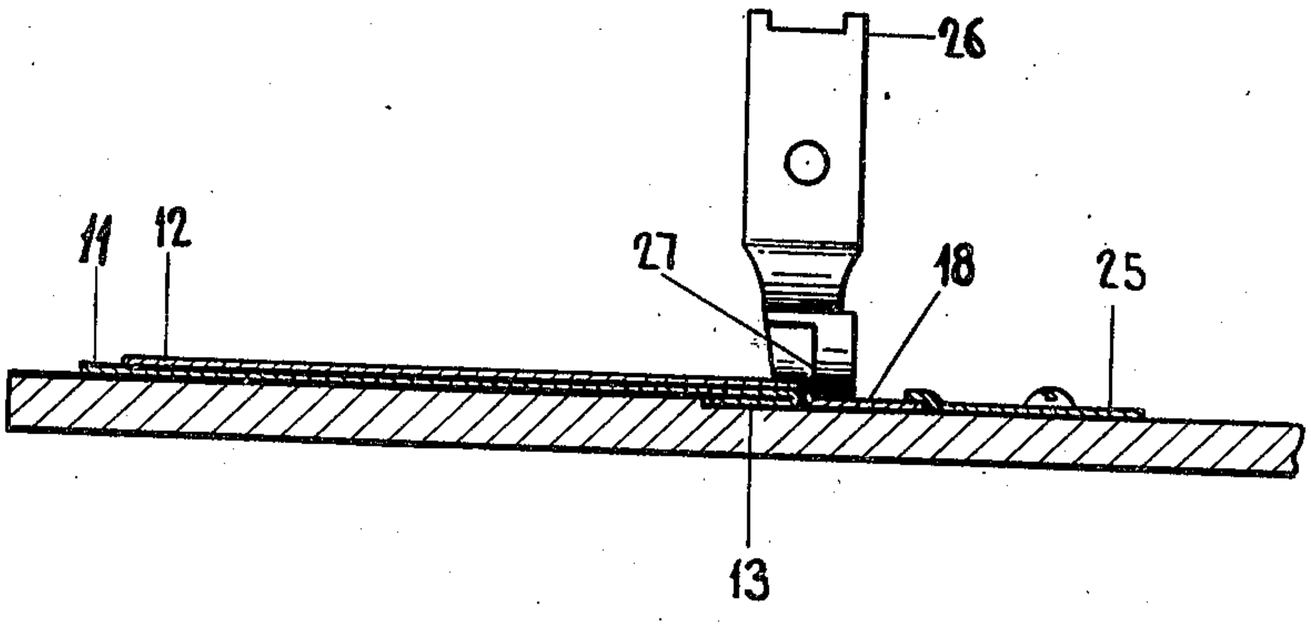

Fig. 6

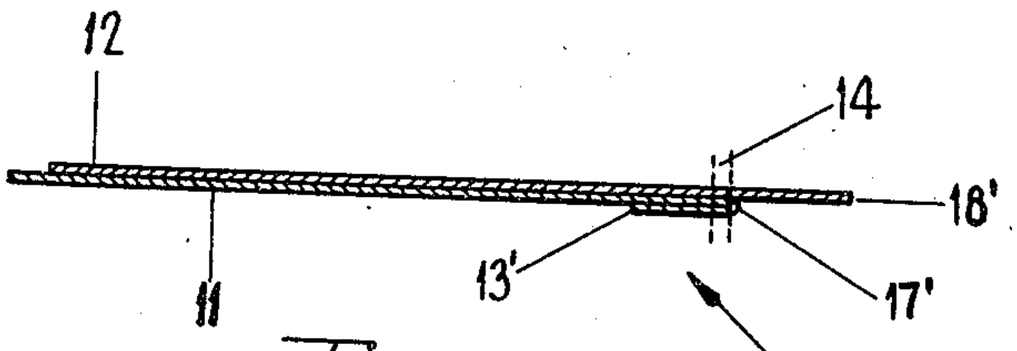

Fig. 7

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3 Sheets-Sheet 3

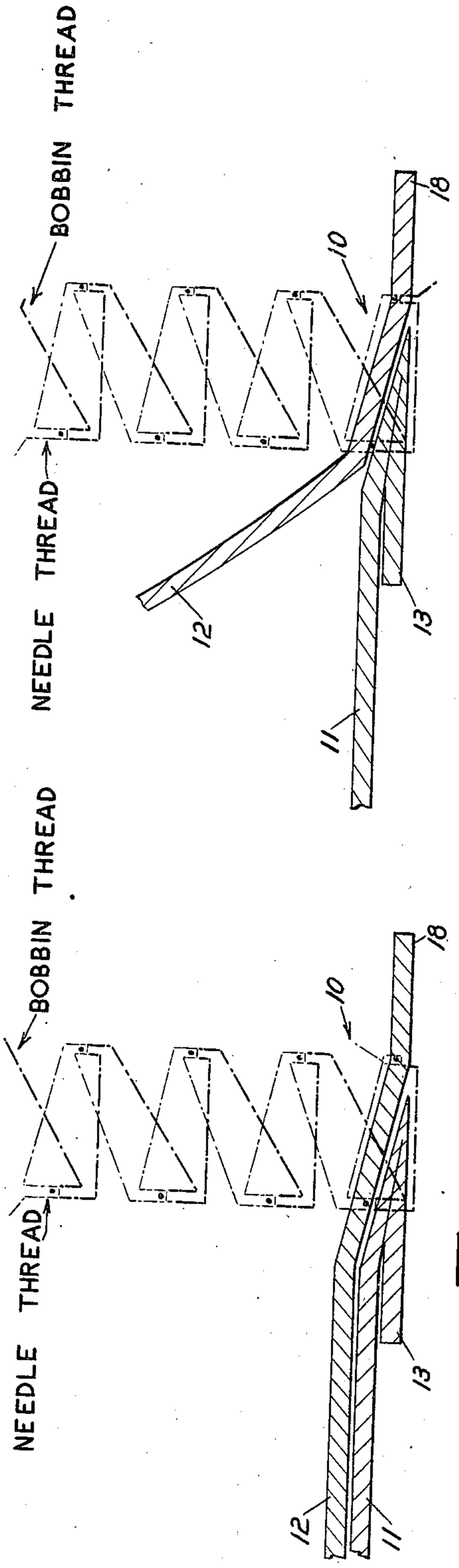

Fig. 10.

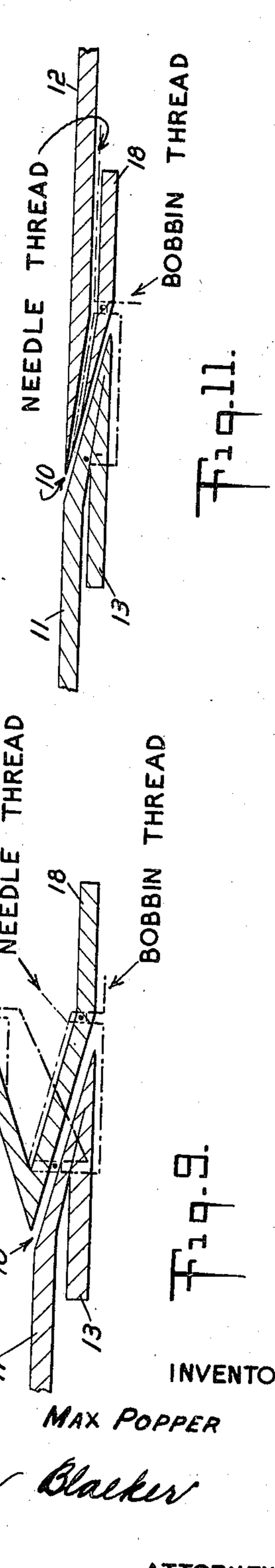

Fig. 11.

Fig. 8.

Fig. 9.

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ELASTIC SEAM WITH CONCEALED ZIGZAG STITCHING

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Application June 22, 1944, Serial No. 541,633

2 Claims. (Cl. 112—262)

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It is well known that straight line lock-stitching is inelastic and a seam formed with lock-stitching will rip and this is a major drawback to present day production of such seams because it cannot be used for ladies' undergarments known as slips and especially when the garments are cut on the bias.

In ladies' undergarments having seams formed by topstitching, the threads are visible on the right side (normally exposed surface) of the fabric sections. The exposed threads lie on top of the fabric and produce a rough surface at the seams which is objectionable to the production of undergarments of superior quality.

An object of this invention is to provide an elastic seam of superior quality for ladies' silk underwear and similar garments which does away with the tearing of the thread and continual ripping of seams in bias-cut garments.

Another object of this invention is to provide an elastic seam of the class described wherein the cross-wise zig-zag threads prevent the formation of a sharply defined folded edge in the finished product on the normally concealed surface.

Another object of this invention is to provide an elastic butterfly seam wherein the free edge portions of the fabric sections face in opposite directions and wherein the threads are not visible on the normally exposed surface of the garment.

Another object of this invention is to provide a superior trimmed butterfly seam which is adapted to have its free edges trimmed and simultaneously stitched with only very slight modification of known present-day combined trimming and stitching machines.

Another object of this invention is to so position the zig-zag stitching with relation to the garment seam to cause one line of the zig-zag stitching to extend over and beyond one of the seamed edges and thus provide triangularly disposed cross threads having inherent elasticity permitting the seam to yield in extended coacting relation with yielding of the bias-cut fabric sections.

Another object of this invention is to provide a ridgeless elastic butterfly seam having concealed zig-zag stitching on the normally exposed surface of the garment and wherein a single layer of fabric hinges over on zig-zag cross-threads to permit the formation of a substantially flat surface on the normally exposed face of the fabric after the garment is pressed.

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 drawings 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:

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Figure 1 is a cross-sectional view of an elastic seam made in accordance with this invention, the section being taken as on line 1—1 in Figure 4, before the top layer of fabric has been turned to the right.

Figure 2 is a cross-sectional view of the elastic seam shown in Figure 1, with the top layer of fabric folded to the right, and ironed over the stitching.

Figure 3 is a bottom plan view of the elastic seam shown in Figure 2.

Figure 4 is a top plan view of the seam shown in Figure 2, with the zig-zag stitching concealed from view.

Figure 5 is a top plan view of a presser-foot of a zig-zag sewing machine in alined relation with a folder which function jointly to fold a fabric edge and to position the edge fold in line with the needle of the zig-zag sewing machine.

Figure 6 is a cross-sectional view of the sewing machine shown in Figure 5, the section being taken as on line 6—6 in Figure 5.

Figure 7 is a cross-sectional view of a modified seam.

Figure 8 is a schematic drawing of the seam, showing the bobbin and needle threads in dot-and-dash lines.

Figure 9 is a schematic drawing, similar to that shown in Figure 8, and showing one folded edge slightly upturned.

Figure 10 is a schematic drawing showing the folded edge turned over to the opposite side of the seam.

Figure 11 is a schematic drawing, showing the folded edges downpressed.

In the illustrated embodiment of the invention, Figures 1 to 4 inclusive, show the elastic seam 10 comprising two superposed sections of fabric 11 and 12. The lower section 11 has an edge 13 folded against its lower surface.

The upper section 12 is shown in Figure 1 lying flat and in superposed relation over the lower section. In this superposed arrangement of the two fabric sections 11 and 12 the sections are united by zig-zag stitching 14 which, as best shown in Figure 3, comprises two spaced longitudinal lines 15, 16. The line 15 of the zig-zag stitching pierces the folded edge 17 while the line 16 of the zig-zag stitching pierces only the single layer of fabric 12.

As shown in Figure 2, the upper section of fabric 12 is turned over to the right after the zig-zag stitching 14 is completed. The overturned fabric section 12 conceals the stitching. This is best shown in Figure 4.

In its preferred form the seam 10 is bias-cut and has its edges 13 and 18 trimmed so as to ex-

tend substantially equally in opposite directions from the zig-zag stitching 14.

The line of zig-zag stitching 16 extends over and beyond one of the seamed edges and provides triangularly disposed cross threads having inherent elasticity which permits the seam to yield in extended coacting relation with yielding of the bias-cut fabric sections.

Figure 5 is a fragmentary plan view of a sewing machine base 21 having a folder 22 suitably fastened thereto by screws 23. The folder 22 has a scroll section 24 through which the bottom layer of fabric 11 passes and has its edge 13 turned downwardly. The upper layer of fabric 12 is guided by a gauge 25 so as to provide an extended edge 18 the same distance from the line of stitching as the downturned bottom edge 13.

A presser-foot 26 has a recessed toe or front portion providing a guide wall 27 in alinement with a tongue 28 of the folder 22. The presser foot guide wall 27 and the tongue 28 function jointly to fold the fabric edge 13 in line with the needle 29 of the zig-zag sewing machine.

Figure 7 is a cross-sectional view of a modified elastic seam 20 wherein the zig-zag stitching 14 does not extend over and beyond the folded edge 17'. The threads pass through all the layers of fabric and provide reinforcement to the seam.

It is to be noted that the presser-foot 26 has at its lower face two horizontal surfaces lying in different planes, a lower surface to the right which is in contacting relation with the single layer of fabric 18 and a higher surface which is in contacting relation with three layers of superposed fabric. This arrangement of the lower face portion of the foot 26 in different planes permits the bobbin thread (not shown) to pull the single layer of fabric 18 down to the plane of the folded lower edge 13. This down-pressing of the single layer edge portion 18 to the plane of the folded edge 13 permits the superposed single layer of fabric 12 to be hinged over to the right and so that the top surfaces of the layers 11 and 12 are substantially in a single plane. The superposed layer 12 is hinged over on the zig-zag cross-threads between the lines 15 and 16 and down-pressed over the stitching by the pressing action of an ironing machine so that in the top plan view shown in Figure 4 the fabric sections 11 and 12 appear in substantially a single plane and no zig-zag stitching is visible.

Figures 8 to 11, inclusive, show the steps in the production of the elastic seam herein described, the threads being invisible on the normally exposed surface of the garment.

In the process of making ladies' undergarments with the ridgeless elastic butterfly seams herewith disclosed, when all the seams are completed, the respective garments are turned inside out, providing substantially tubular enclosures. In this tubular form, the single layer of fabric hinges over to the opposite side over the zig-zag cross-threads. The pressing operation flattens and causes the outer fabric to envelope and substantially conceal the stitching from the normally exposed surface of the garment.

An elastic seam of the nature herein described is very desirable for making ladies' silk underwear and similar garments of fine texture, because very delicate fabrics are employed for such garments and it is very essential to prevent ripping of seams.

In accordance with the patent statutes I have described and illustrated the preferred embodiment of my invention, but it will be understood

that various changes and modifications can be made therein without departing from the spirit of the invention as defined by the appended claims.

I claim:

1. The method of forming a flat and ridgeless butterfly seam for a garment by joining together two bias-cut sections of fabric, which comprises folding an edge portion of one section against the bottom face of said section, placing the other section on top of the first section whereby the folded over portion of the first section appears below both of said sections, uniting said sections by two-thread zig-zag stitching in slightly spaced longitudinal lines, one longitudinal line extending over and beyond the folded edge and piercing only a single layer of downpressed fabric, and the other longitudinal line piercing both of said sections of fabric including said folded edge, said line of zig-zag stitching extending over and beyond the said folded edge holding said downpressed layer and providing triangularly disposed cross-threads having inherent elasticity and permitting said seam to yield in extended coacting relation with yielding of said bias-cut fabric sections, said cross-threads serving to prevent the formation of sharply defined and ridged folded edges, turning the garment in which said seams are formed inside out and causing each single layer of fabric to hinge over said cross-threads, pressing said seamed portions to flatten said portions and with zig-zag stitching substantially concealed from view on said normally exposed surface.

2. In an elastic two-thread zig-zag stitched butterfly seam for garments for securing two sections of fabric with the stitching in concealed relation on the normally exposed surface of the garment, each section having a folded edge portion providing upper and lower layers, said folded edge portions facing in opposite directions and being in slightly superposed relation, said zig-zag stitching piercing said edges of said sections of fabric in slightly spaced longitudinal lines, one longitudinal line extending through and piercing only the lower layer of one of said fabric sections, and the other longitudinal line piercing said first mentioned layer of fabric and both layers of the other fabric section, each of said folded edges being trimmed so as to extend an equal distance from said zig-zag stitching and forming a trimmed butterfly seam, said zig-zag stitching providing triangularly disposed cross threads having inherent elasticity, permitting said seam to yield in extended coacting relation with yielding of said fabric sections, said folded edges when said garment is pressed, tending to lie substantially in a single plane with said zig-zag stitching concealed from view on the normally exposed surface of said garment.

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