Jan. 17, 1950 I. SHAMES 2,495,187

REINFORCED FABRIC STRAP

Filed March 4, 1947 2 Sheets-Sheet 1

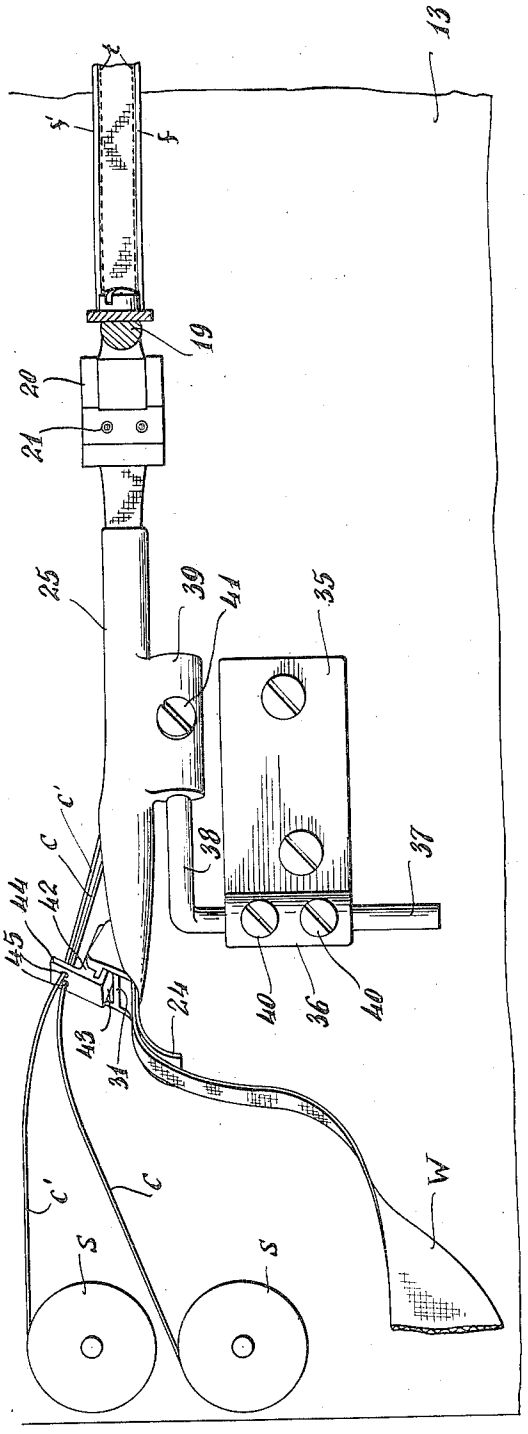


Fig. 1.

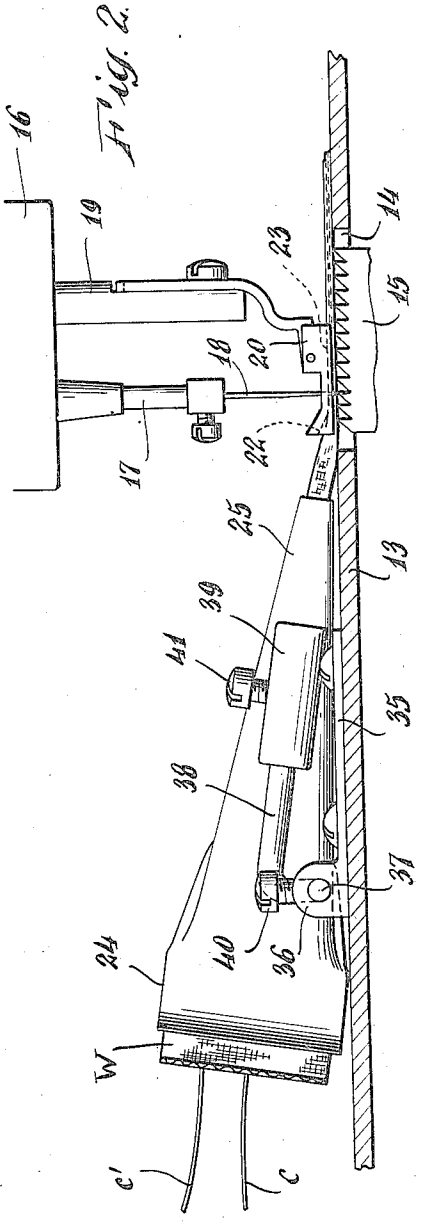


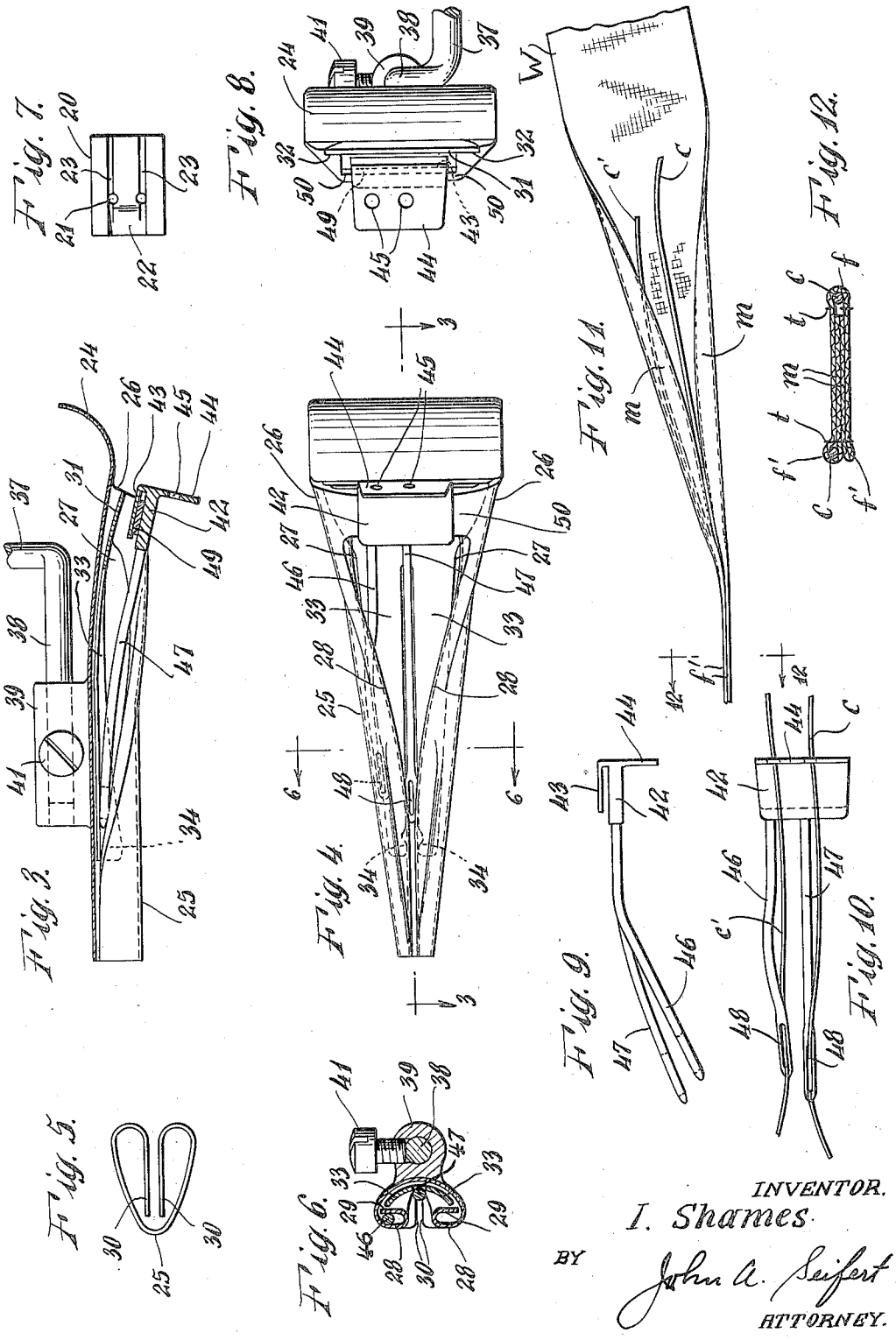
Fig. 2.

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REINFORCED FABRIC STRAP

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2 Claims. (Cl. 2—338)

1

This invention relates to a fabric strap having reinforced side edges and to a method and apparatus for making said strap.

It is an object of the invention to provide a strap having reinforced side edges which is simple and inexpensive to make.

It is another object of the invention to make a strap having reinforced side edges by providing a web of fabric, simultaneously folding the web longitudinally upon itself, folding the marginal portions of the web into the longitudinal fold and engaging reinforcing strands into the longitudinal fold and the fold of one of the marginal portions, and successively stitching the folded web parallelly of the folds and on the inner sides of the strands to retain the strands in the folds.

It is a further object of the invention to provide a folder arranged to fold a web longitudinally and fold the marginal portions into the longitudinal fold and a pair of members detachably mounted on the folder to guide reinforcing strands into the longitudinal fold and the fold of one of the marginal portions.

Other objects and advantages of the invention will appear in the detailed description thereof.

In the drawings accompanying and forming a part of this application, Figure 1 is a top plan view of a folder mounted on a double needle sewing machine and constituting means for carrying out the invention.

Figure 2 is a side elevational view of the folder mounted on the sewing machine looking at the bottom of Figure 1.

Figure 3 is a longitudinal sectional view of the folder showing the mounting of the strand guiding members on the folder.

Figure 4 is a view of one face of the folder looking at the bottom of Figure 3.

Figure 5 is an end view, on an enlarged scale, of the folder looking at the delivery end thereof.

Figure 6 is a cross sectional view taken on the line 6—6 of Figure 4 looking in the direction of the arrows to show the shape of the side walls of the folder and the positions of the strand guide members in the folder.

Figure 7 is a view of the bottom face of a presser foot showing grooves for the reinforced edges of a strap.

Figure 8 is an end view of the folder looking at the receiving end thereof.

Figures 9 and 10 are side and plan views, respectively, of the strand guide members.

Figure 11 is a diagrammatic view of a web illustrating the folding of the web and engaging of strands in the folds.

2

Figure 12 is a cross sectional view of the formed strap showing the reinforcing strands secured in the longitudinal fold and the fold of one of the marginal portions.

The embodiment of the invention is shown in the accompanying drawings associated with a sewing machine consisting of a support 13 having an opening 14 for the reciprocatory horizontal movement of feeding mechanism 15, as shown in Figure 2. A head 16 is mounted to extend in spaced relation above the support 13 and in vertical alinement with the opening 14, and a bar 17 reciprocates in a vertical direction in the head 16 and detachably carries a pair of needles 18. A bar 19 also reciprocates in a vertical direction in the head 16 at the rear of the needle bar 17 and detachably carries a pivotal presser foot 20 having a pair of openings 21 for the passage of the needles 18. The underface of the presser foot is arranged with a channel having a beveled face, as shown at 22 in Figure 7, at one end of the presser foot and a pair of grooves 23 merging with said beveled face 22 and extending through corresponding outer circumferential portions of the openings 21 to the opposite end of the presser foot. The feeding mechanism 15, needle bar 17 and presser bar 19 are operated in the usual manner.

In carrying out the invention as illustrated in the accompanying drawings, there is provided a folder including a one piece member having at one end a downwardly curved lip portion 24 constituting the receiving end of the folder and merging with a throat portion 25 tapering from the lip portion 24 to the delivery end of the folder and having side walls progressively curved inwardly from the lip portion 24 to the narrow delivery end of the throat portion, so that the side walls adjacent to the lip portion 24 are substantially vertical to the lip portion, as at 26 in Figure 3, with the edge sections folded downwardly, as at 27 in Figures 3 and 4. The side walls adjacent to the portions 26, 27 are extended in a horizontal plane, as at 28 in Figure 6, with the edge sections folded in parallel spaced relation, as at 29. The side walls are progressively formed from the portions 28, 29 to the narrow delivery end of the throat to vertical loop form with the edge sections extending in parallel spaced relation to one another, as at 30 in Figure 5. Throughout the length of the throat the side walls and their edge sections form a tubular structure along each side wall for progressively and simultaneously folding a web *w* longitudinally, as at *f*, and folding the marginal portions

m of the web w into the longitudinal fold, as at f' in Figures 11 and 12.

The web w is guided to and retained against the bottom wall, side walls and edge sections of the side walls of the throat portion of the folder by a bifurcated plate having a connecting portion 31 supported at the sides by the vertical side wall sections 26, as shown at 32 in Figure 8. Leg portions 33 extend in a downwardly curved direction from the connecting portion 31 to conform to the longitudinal curvature of the bottom wall of the folder, as shown in Figure 3, and curve longitudinally from an intermediate point to the extremities of said leg portions to conform to the curvature of the side walls of the throat portion, as shown in Figures 3 and 6. The extremities of the leg portions are slightly curved inwardly, as indicated at 34, and terminate at the point of commencement of the vertical edge sections 30 of the throat portion.

The folder is mounted upon the support 13 of the sewing machine by a bracket having a base plate 35 mounted on the support 13, as by screws, and a boss 36 at one end. The folder is adjustably supported on the bracket 35, 36 by an angular arm having one side portion 37 rotatably engaged in the boss 36 and the other side portion 38 offset from the first side portion 37 and adjustably engaged in a boss 39 on the bottom wall of the throat portion 25. The arm portion 37 is secured in adjusted position in the bracket boss 36 by set screws 40 and the arm portion 38 is secured in adjusted position in the folder boss 39 by a set screw 41. The adjustments of the arm 37, 38 in the bracket 35, 36 and of the folder 24—34 on the arm portion 38 permit positioning of the delivery end of the folder throat relative to the needles 18 and presser foot 20, as shown in Figures 1 and 2.

The web w is fed from a source of supply, such as a roll, supported by the support 13 or in any other suitable manner, not shown, and is guided to the receiving lip portion 24 by suitable guiding and tensioning means, not shown. The web w is fed through the folder by the feeding mechanism 15 of the sewing machine and other suitable feeding means, not shown, if deemed necessary.

During the folding of the web in the folder 24—34, reinforcing members, such as strands in the form of cords c, c' are fed from spools s rotatably supported by the support 13, as shown in Figure 1. The cord c is directed into the longitudinal fold, and the cord c' is directed into the fold f' of the uppermost marginal portion m during the forming of said folds by the throat portion 25 of the folder. The cords are guided into the throat portion 25 of the folder from the receiving lip portion 24 by a guide member comprising a plate portion 42 having a lip portion 43 extending from one end of the plate portion in spaced relation to one face of the plate portion 42 and a wall portion 44 extending from the same end of the plate portion and at a right angle from the opposite face of the plate portion and arranged with two openings 45, one opening being adjacent to a side edge of the wall portion 44 and the other opening being adjacent to the opposite side of the center of the plate portion, as shown in Figures 4 and 8. A pair of rods or needle shaped portions 46 and 47 are fixed at one end on the end of the plate portion 42 opposite the end of said plate portion arranged with the lip portion 43 and wall portion 44 in substantial alinement with the openings 45 in the wall portion 44. The opposite ends of the

rods or needle shaped portions 46 and 47 are arranged with slots 48. The section of the needle shaped portion 46 adjacent to the plate portion 42 extends in the plane of said plate portion and at an intermediate section is bent to extend from the face of the plate portion from which the wall portion 44 extends and also laterally of the adjacent side of the plate portion. The extremity of the needle shaped portion 46 is further bent inwardly to extend at the angle of taper of the throat portion 25 of the folder. The needle shaped portion 47 extends from the plate portion 42 in the plane of said plate portion and an intermediate section of said needle shaped portion 27 is bent from the face of the plate portion from which the wall 44 extends but to a lesser extent than the needle shaped portion 46, as shown in Figure 9. The cord guide member 42—48 is detachably mounted on the receiving end of the folder by slidably engaging the plate portion 42 and lip portion 43 on opposite faces of a bridge portion 49 fixed at the opposite ends to the vertical wall sections 26 of the folder and extended in spaced relation to the web guide connecting portion 31, as shown in Figures 3 and 8, with the wall 44 extending in a direction from the lip portion 24 of the folder. The exposed face of the bridge portion 49 is arranged with shoulders 50 at the opposite ends to engage the opposite sides of the plate portion 49 and retain said plate portion against lateral movement on the bridge portion. When the plate portion 42 is mounted on the bridge portion 49, the slotted end of the needle shaped portion 46 will extend into the tubular structure of one of the side walls of the throat portion 25 of the folder, as shown in Figure 4, and the slotted end of the needle shaped portion 47 will extend into the bifurcation of the web guide plate 31—34. The cords c, c' are extended from the spools s through the openings 45 and cord c' is extended between the needle shaped portion 46 and the wall of the throat portion 25 of the folder and passed through the slot 48 in said needle shaped portion 46 from the underside to the upperside of the needle shaped portion which will guide said cord into the fold f' of the upper marginal portion m, as shown in Figure 11. The cord c is extended from wall portion 44 along the needle shaped portion 47 and passed through the slot 48 in said needle shaped portion from the upperside to the underside of the needle shaped portion 47 which will guide said cord into the longitudinal fold f, as shown in Figure 11. The feeding mechanism 15 of the sewing machine will also feed the cords through the folder with the web w.

When the web w is discharged from the delivery end of the folder, it is completely folded with the cords in the proper folds f, f' and as the folded web with the engaged reinforcing cords c, c' leave the delivery end of the folder, the needles 18 form lines of stitching t through the folded web adjacent to and parallel of the folds f and f' and on the inner sides of the cords c, c', as shown in Figure 12.

The folded and stitched web when it leaves the presser foot 20 is in the form of a completed strap having the edges reinforced by the cords c, c'. Such a strap has various uses but it is particularly adapted for shoulder straps for women's undergarments, such as slips and brassières, for which purpose the strap after it is removed from the sewing machine is cut into desired lengths.

Having thus described my invention, I claim:

1. As an article of manufacture, a strap having substantially flat outer side faces and comprising a web folded longitudinally substantially centrally of its side edges, and the side portions folded inwardly into the longitudinal fold, the layers of material lying flat one against the other, the first longitudinal fold and the folds of the side portions forming the side edges of the strap, and strands engaged and secured in the first mentioned fold and in the fold of one of said side portions to reinforce the strap at its side edges.

2. As an article of manufacture, a strap having substantially flat outer side faces and comprising a web folded longitudinally substantially centrally of its side edges, and the side portions folded inwardly into the longitudinal fold, the layers of material lying flat one against the other, the first longitudinal fold and the folds of the side portions forming the side edges of the strap, and strands engaged in the first mentioned fold and in the fold of one of said side portions

to reinforce the strap at its side edges, and stitching along the folds of the web at each side marginal portion of the strap to secure the strands in said folds.

IRVING SHAMES.

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