Feb. 6, 1945. R. DASHER 2,369,026

METHOD OF MAKING FASTENING STRIPS

Filed July 8, 1943 4 Sheets-Sheet 1

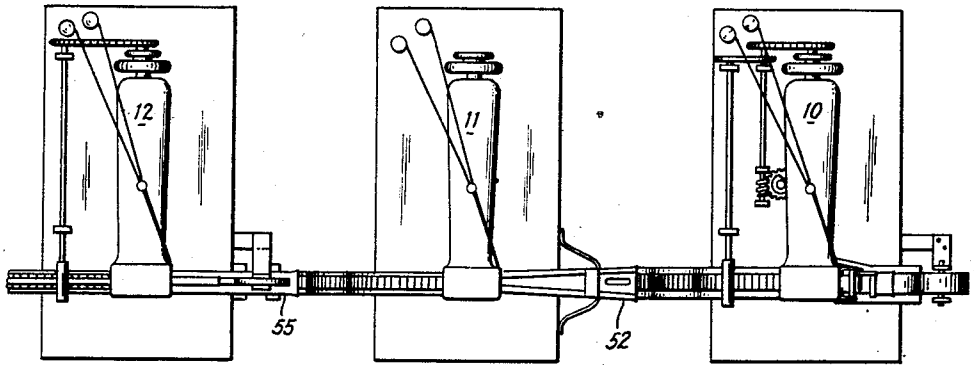


Fig. 1

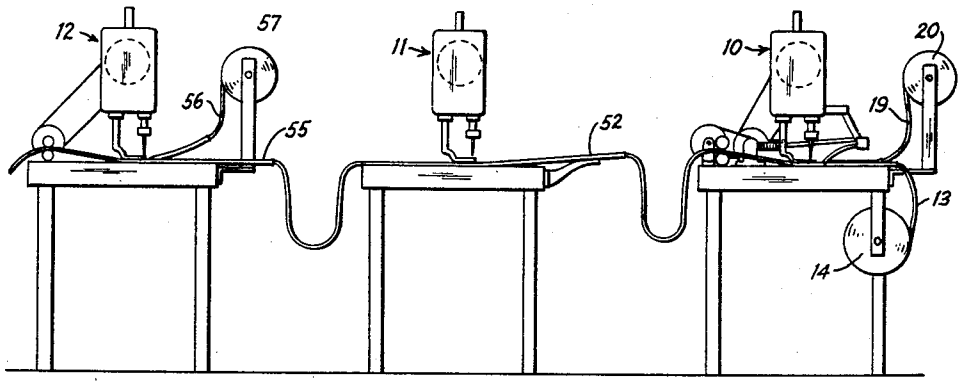


Fig. 2

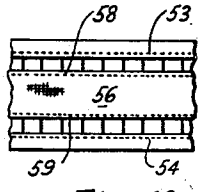


Fig. 10

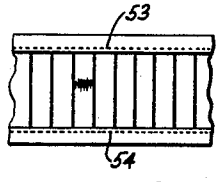


Fig. 9

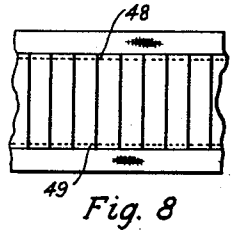


Fig. 8

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METHOD OF MAKING FASTENING STRIPS

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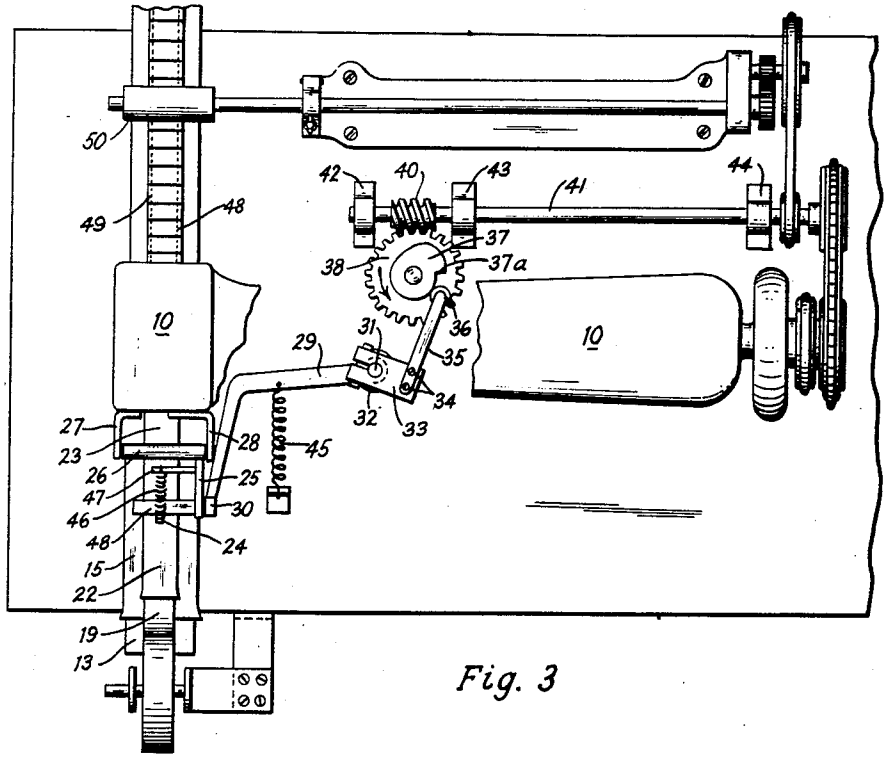


Fig. 3

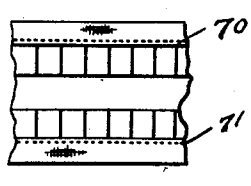


Fig. 12

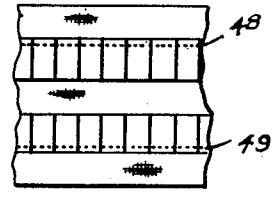


Fig. 11

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METHOD OF MAKING FASTENING STRIPS

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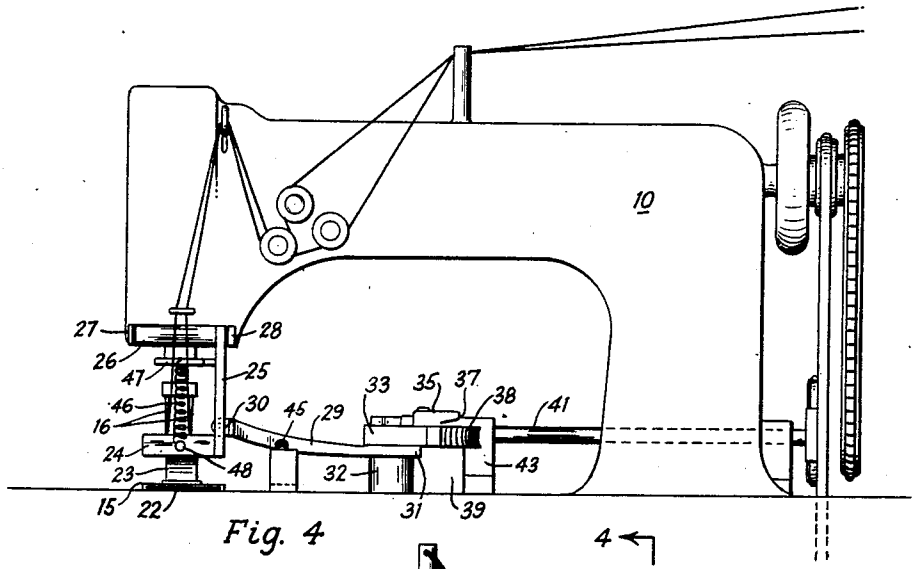


Fig. 4

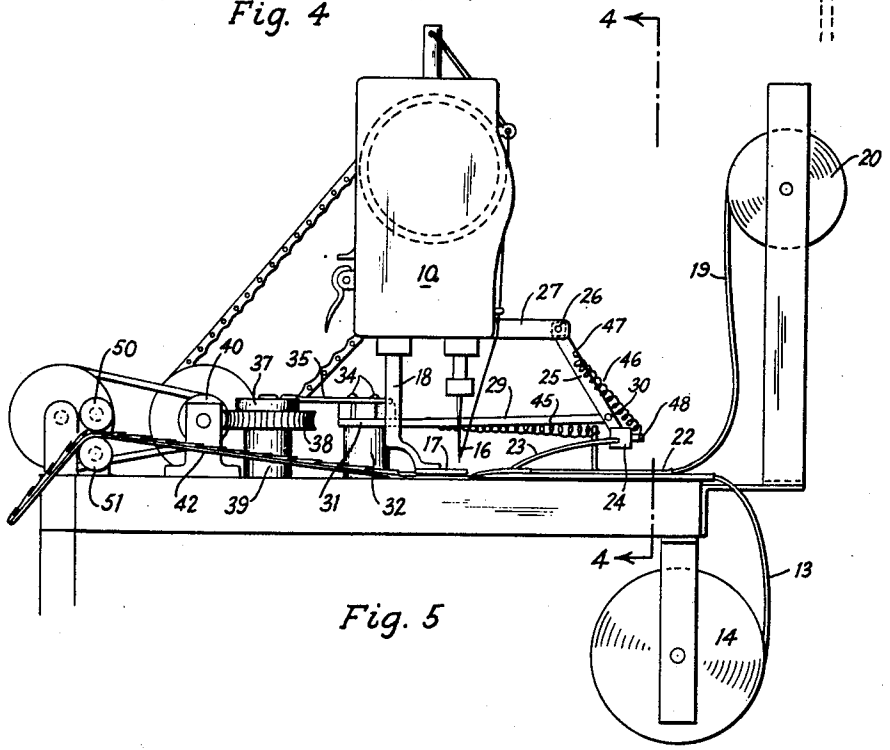


Fig. 5

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SEWING MACHINES Cross Reference Search Room

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METHOD OF MAKING FASTENING STRIPS

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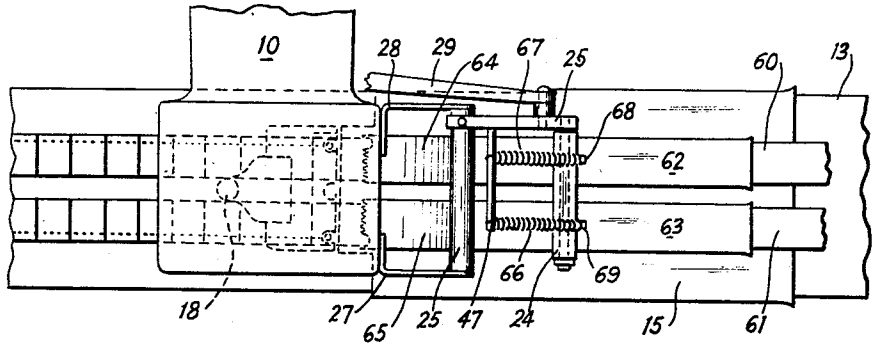


Fig. 6

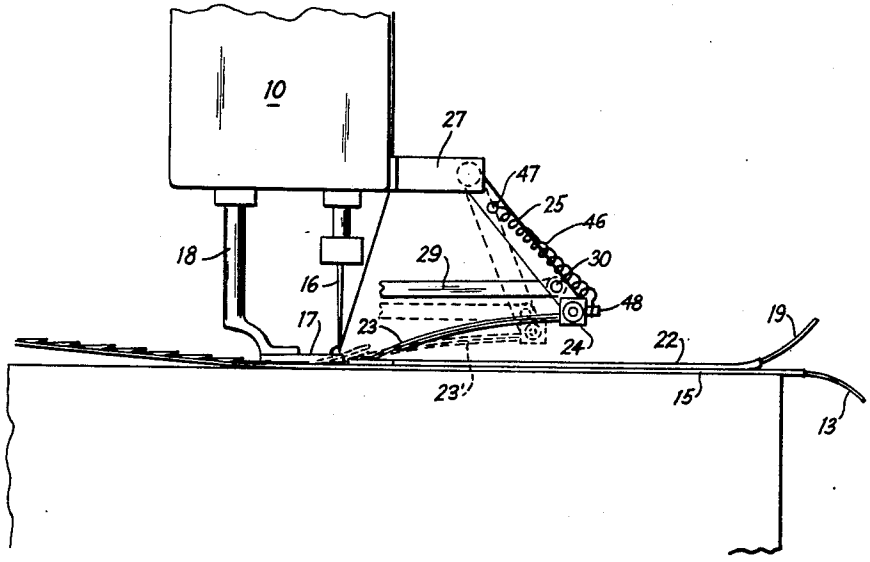


Fig. 7

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Patented Feb. 6, 1945 2,369,026

UNITED STATES PATENT OFFICE

2,369,026

METHOD OF MAKING FASTENING STRIPS

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Application July 8, 1943, Serial No. 493,839½

3 Claims. (Cl. 112—262)

This invention relates to a method and apparatus for making straps for garments, or the like. Garments, particularly women's garments, have often to be provided with fastening means that besides supporting the garment on the wearer, must also permit a ready adjustment of the garment to the form and dimensions of the parts to which the garment is to be applied. For this purpose, garments are commonly provided with straps secured to the opposite ends thereof and carrying cooperating means adapted to form an adjustable connection, such means consisting, for instance, in suitably spaced metal eyes, or the like, arranged on one of the straps for engagement with hooks carried by the other strap, or in snap-fastener arrangements, slide buckles, or similar devices. All of these devices require the use of a considerable number of metal parts that are no longer readily obtainable owing to the current shortages in metals.

In order to provide an efficient adjustable fastening means for ladies' garments such as corsets, girdles, brassières, or the like, that would greatly reduce the need for metal parts and could be advantageously substituted for the devices heretofore generally used for this purpose, there has been developed a new type of adjustable strap made entirely of fabric; this strap embodies a plurality of fabric-made pockets arranged longitudinally of the strap at suitably spaced intervals, and adapted to receive and to hold in engagement therewith cooperating means such as hooks. This strap affords a safe fastening through the contact of the coacting surfaces of the pockets and hooks, and has a wide range of adjustability limited only by the number of the pockets and the length of the strap itself. It can be said that this strap has proved to be not merely a handy substitute for the types of straps previously in general use, but a device of greater efficiency than the older types from the standpoint of a safe fastening, besides lending itself to speedier and more economical methods of construction.

This invention relates to a method and apparatus for making straps of the character described, and has for its general object to provide a method and apparatus for forming the strap in a simple and expeditious manner. More particularly, it is an object of the invention to provide means for making a strap entirely consisting of strips of fabric, said strips being rapidly assembled to form the strap by means of a few simple operations that can be partly performed by conventional sewing machines.

It is another object of the invention to provide a strap having a plurality of series of pockets concurrently formed during the assembly of the various strips.

It is a further object of the invention to form the pockets by folding one of the strips of fabric upon itself at spaced intervals and to transform the folds into pockets during the assembly of the various strips, and, further, to provide means for folding said strip that can be actuated by one of the sewing machines used in the construction of the strap.

These and other objects will become apparent while the description proceeds.

In the drawings:

Figure 1 is a plan view schematically showing the general arrangement of the apparatus for carrying out the method of making the strap according to my invention, and comprising a set of three conventional sewing machines and other means cooperating therewith.

Figure 2 is a front view of the same apparatus.

Figure 3 is a plan view of one of the sewing machines with part of the arm thereof broken off to show part of the means adopted for forming a series of folds in a strip of fabric passing through said machine.

Figure 4 is a side view, taken on line 4—4 of Figure 5, of the same machine and means for forming the folds.

Figure 5 is a front view of the same machine and means.

Figure 6 is a plan view of part of the means for forming the folds as employed in a modified form of the method of construction of the strap wherein series of folds are concurrently formed in two strips of fabric.

Figure 7 is a fragmentary front view, on a greater scale, of part of the same machine and means for forming the folds.

Figures 8 and 9 are plan views of fragments of a strap in different stages of construction.

Figure 10 is a plan view of a fragment of a completed strap made according to the method and with the apparatus that constitute the object of the invention.

Figures 11 and 12 are plan views of fragments of a strap according to the modified method, in different stages of construction.

Referring now in detail to the drawings, 10, 11 and 12 (Figures 1 and 2) indicate a set of three conventional double needle sewing machines, each of the machines cooperating with other means in successive phases of construction of the strap, as it will be explained.

A strip 13 of any suitable material passes from

roll 14 through a guide 15 to needles 16 of machine 10 which has a presser foot 17 and a presser bar 18; a further and narrower strip 19 of suitable material is led from roll 20 through guide 22 to needles 16 in superimposed relation to strip 13 and intermediate the side edges thereof, guides 15 and 22 having the purpose of insuring that the strips are fed to machine 10 in the aforementioned relation to one another, for the reasons that will later become apparent.

A blade 23 is mounted in a horizontal bar 24 and projects therefrom toward needles 16 in inclined relation to strip 19 to rest with its tip on said strip; bar 24 is pivotally mounted on the lower end of a lever 25 the upper end whereof is fastened to a horizontal bar 26 pivotally supported between brackets 27, 28 secured to the head of machine 10.

An elbow shaped lever 29 is connected at one end thereof to lever 25, intermediate the ends of this latter, as shown at 30, and has its other end 31 pivoted on a support 32 fastened to the base of the machine. End 31 of lever 29 carries a member 33 rigidly connected thereto; a lever 35 fastened to 33 by any suitable means, such as screws 34, projects from member 33 in the direction of a cam 37, and bears against this latter with its cam follower 36. Cam 37 is fastened to worm wheel 38 which is rotatably mounted on support 39 and meshes with worm 40 mounted on shaft 41; this latter is journaled at 42, 43 and 44, and is drivably connected to the driving means of the machine. For the sake of clearness, the position wherein the parts just described are shown in Figures 3 and 5, will be hereafter referred to as the "normal position" of said parts.

It will be readily understood from the foregoing description that whenever worm wheel 38 rotates in the direction of the arrow (see Figure 3) cam 37 will cause cam follower 36 to move from its normal position toward the periphery of worm wheel 38, lever 35 and member 33 will therefore cause end 31 of lever 29 to rotate about its pivot on support 32 so that the opposite end of lever 29 will be pulled forward thereby causing lever 25 to swing in the direction of needles 16 of machine 10 and blade 23 to advance in the direction of presser foot 17 to assume position 23' (shown in dotted lines in Figure 6) wherein the tip of the blade has advanced slightly beyond the forward edge of presser foot 17 and underneath the same. Coil spring 45 will return all parts to their normal position as soon as cam 37 reaches step 37a of cam 37.

As coil spring 46, which is connected to a pin 47 carried by lever 25 and to a stud 48 projecting from the back of pivotally mounted bar 24, urges the tip of blade 23 downwardly during the movement of blade 23 toward presser foot 17, the tip of said blade (which can be provided with teeth) firmly engages the upper face of strip 19 and causes the strip to move forward; therefore the portion of said strip comprises between the tip of the blade and the forward edge of presser foot 17 is folded upon itself, and as the tip of blade 23 slightly beyond the forward edge of the presser foot, underneath the same, the inner edge of the fold is closed to needles 16, as can be seen in Figure 6. It should be noted that while guide 22 of strip 19 obviously must not extend beyond the tip of blade 23 when the latter is in its normal position, said guide must however be provided with a tongue interposed between strip 19 and strip 13 (and extending toward presser foot 17 as far as possible without interfering with the formation of the fold) to prevent the tip of blade 23 from acting also upon strip 13.

It is clear that during operation of machine 10, cam 37 and the means cooperating therewith will cause the tip of blade 23 to move at fixed intervals between its normal and its most advanced position, acting at fixed intervals upon strip 19 in the manner described; if strips 13 and 19 have been initially fed to the sewing mechanism of machine 10, and stitched together, strip 19 will move forward by a certain amount during the interval between any two successive actions of the tip of blade 23 so that said tip will successively engage different portions of strip 19 and form a series of folds at spaced intervals. It will also be readily understood that, as soon as formed, the folds will be obliged to pass under needles 16 as strip 19 is constantly moving in the direction of the needles and the folds are formed close to said needles, as described; therefore a series of folds continuously formed and secured to strip 13 by means of lines of stitching 48, 49, as shown in Figure 3.

It may be noted that, as the direction of the movement of the tip of blade 23 is the same as the direction of the movement of strip 19, the speed of the tip of the blade must be greater than the speed of the strip, if the formation of a fold is to be obtained.

Strip 13 with the folds of strip 19 sewed thereon pass between rollers 50, 51 and are conveyed to machine 11 for the following phase of construction of the strap, which consists in folding over the side edges of strip 13 upon the marginal portions of folded strip 19, and in sewing said side edges to the underlying surface of strip 13 through the interposed marginal portions of folded strip 19.

For this purpose, the strips pass through a guide 52 having a mouth of substantially the same width as the broader strip 13 and a section progressively decreasing, so that the side edges of said strip are gradually caused to fold over and to overlap upon the marginal portions of folded strip 19 during passage of the strips in said guide 52. Sewing machine 11 then secures the overlapped side edges of strip 13 to the underlying surface of the strip by means of lines of stitching 53, 54 (see Figure 9). These lines of stitching also define one of the sides of the pockets that will be completed in the following and final phase of construction.

In this phase, strips 13 and 19 are fed to machine 12 through guide 55, and a further narrower strip 56 is concurrently fed to the same machine from a roll 57 through a guide 58, in superimposed relation to folded strip 19 and in spaced relation to the overlapped side edges of strip 13, so as to leave exposed part of the folds of strip 19; strip 56 being secured to strip 13 during their passage through machine 12 by means of lines of stitching 58, 59 close to the side edges of strip 56, as shown in Figure 10.

The completed strap therefore comprises two series of pockets at spaced intervals longitudinally of the strap, the sides whereof are defined by lines of stitching 53, 58, and 54, 59, respectively.

Figures 7, 11 and 12 relate to a modification of the method and apparatus, according to which there are employed two narrower strips of fabric 60, 61 instead of a single strip 19. Said strips are fed to machine 10 through guides 62, 63 to be folded upon themselves at spaced intervals and secured to strip 13 in a manner similar to that hereinbefore described and by means of similar devices. However, instead of a single blade 23, it may be advisable to employ two sep-

arate blades 64, 65 one for each of the strips, both blades being mounted in horizontal bar 24 and being actuated by cam 37 through kinematic connections identical with those described. Instead of a single coil spring 46 there may be provided two coil springs 66, 67 connected to a bar 47 carried by lever 25 and to studs 68, 69 fastened to bar 24.

Obviously, if sewing machine 10 is a double-needle conventional machine, each of strips 60, 61 will be secured to strip 13 by means of a single line of stitching, as shown at 70, 71 in Figure 11.

The operations performed by machines 11 and 12 and cooperating means are identical with those hereinbefore described.

It will be understood that I do not intend to be limited to the exact means herein set forth, and that many modifications may be made in the method and in the apparatus described without departing from the spirit of the invention or exceeding the scope of the claims.

I claim:

1. A method of making garment straps having series of spaced pockets arranged longitudinally of the strap, which comprises moving a strip of fabric in one direction, concurrently moving a second and narrower strip of fabric in the same direction and continuously folding said second strip transversely upon itself to form a continuous series of folds therein, progressively sewing said folds as they are formed to the first strip in superimposed relation thereto intermediate the side edges thereof, folding over said side edges of the first strip in overlapping relation to the marginal portions of the folds of the second strip and sewing said side edges to the underlying surface of the first strip during the continuing conjoint movement of the two strips, conveying a third and narrower strip onto the moving interconnected strips in superimposed relation to the folds of the second strip and in spaced relation to the folded-over side edges of the first strip, and progressively sewing said third strip to the second strip and the underlying surface of the first strip, whereby to progressively define series of pockets at the folds of the second strip.

2. A method of making garment straps having series of spaced pockets arranged longitudinally thereof, which comprises continuously advancing a strip of fabric in one direction, moving a second and narrower strip of fabric in the same direction and concurrently folding said second strip transversely upon itself to form a continuous series of spaced folds therein, progressively sewing said folds as they are formed to the first strip in superimposed relation thereto and centrally thereof by means of lines of stitching close to the longitudinal edges of said folds, folding over the side edges of the first strip to cause the same to overlap the marginal portions of the folds and to cover said lines of stitching, progressively sewing said side edges to the underlying surface of the first strip during the continuing movement of this latter, conveying a third and narrower strip of fabric onto the folds of the second strip in spaced relation to the folded over side edges of the first strip, and progressively securing said third strip to the folds and to the underlying surface of the first strip by means of lines of stitching close to the side edges of the third strip, whereby to define series of spaced pockets at the folds of the second strip.

3. A method of making garment straps having series of spaced pockets arranged longitudinally thereof, comprising continuously moving a strip of fabric in one direction, concurrently forming continuous series of folds of fabric and progressively sewing said folds as they are formed upon the moving strip intermediate the side edges of this latter by means of lines of stitching close to the outer longitudinal edges of said folds, folding over the side edges of the strip to cause the same to overlap said outer longitudinal edges of the folds and to cover said lines of stitching, securing said side edges to the underlying surface of the strip during the continuing movement of this latter by means of lines of stitching passing through said folds, applying a further strip of fabric upon said folds in spaced relation to the folded over side edges of the first strip, and progressively sewing said further strip to the folds and the underlying surface of the first strip by means of lines of stitching closely parallel to the side edges of said further strip, whereby to define series of spaced pockets at the folds.

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