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2,797,656

SEWING APPARATUS AND METHODS

Filed Aug. 19, 1954

3 Sheets-Sheet 1

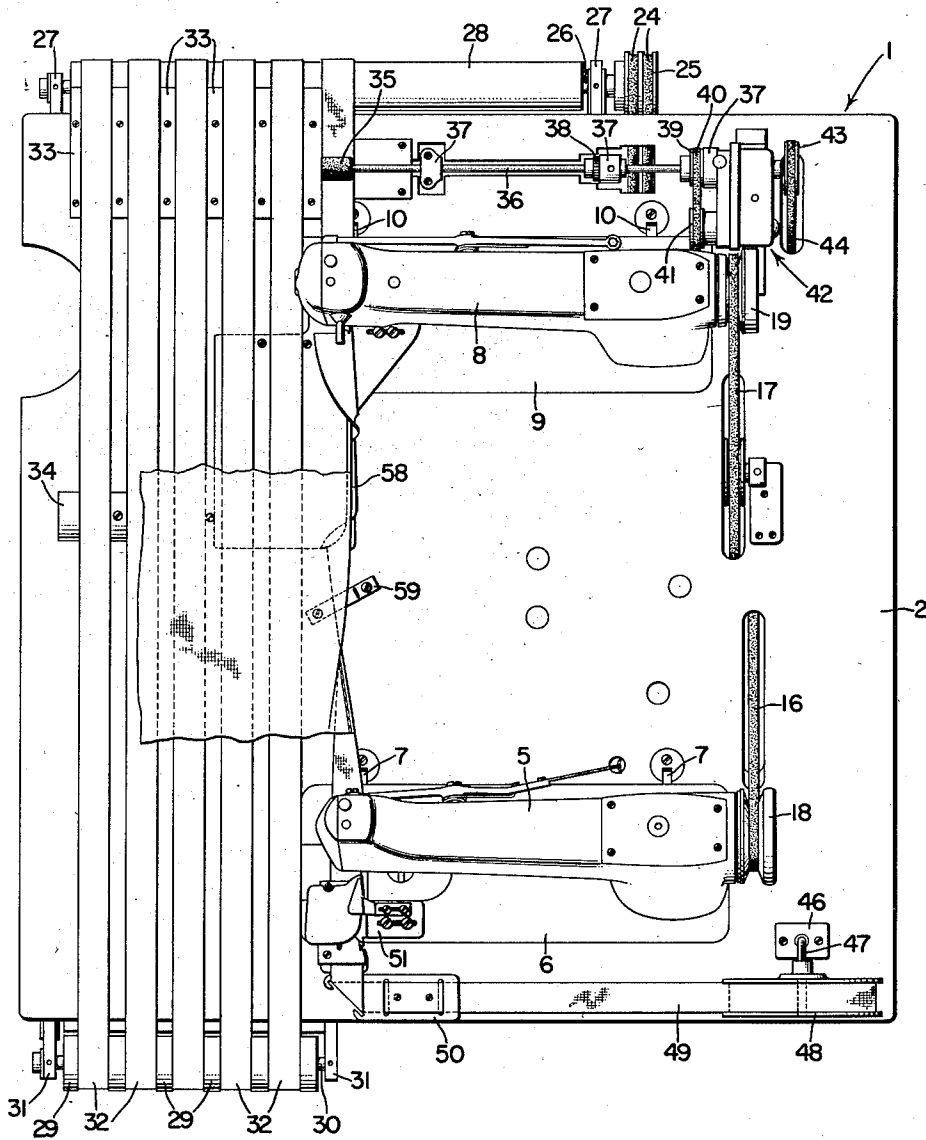


Fig. 1

WITNESS
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3 Sheets-Sheet 2

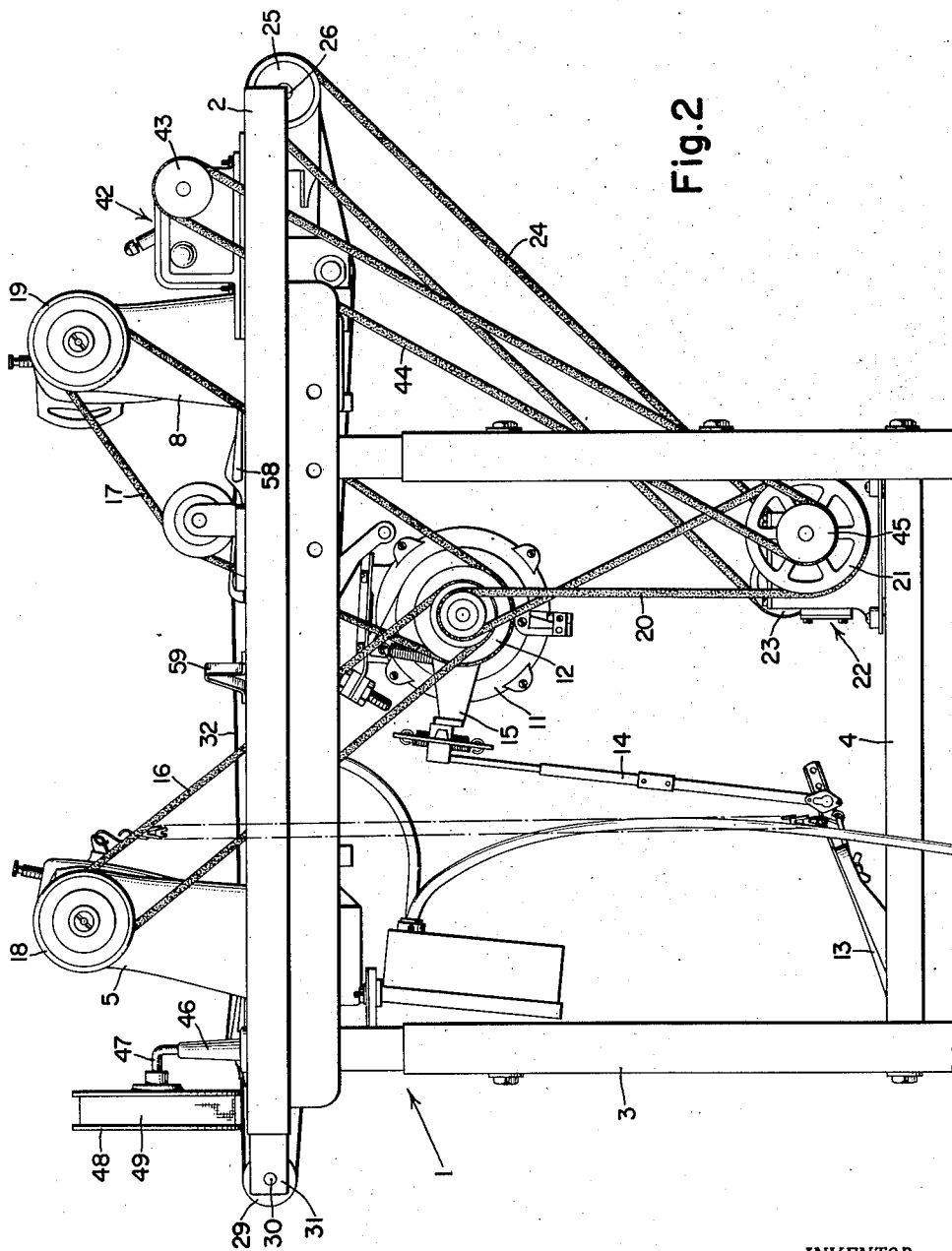


Fig. 2

WITNESS

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Fig.3

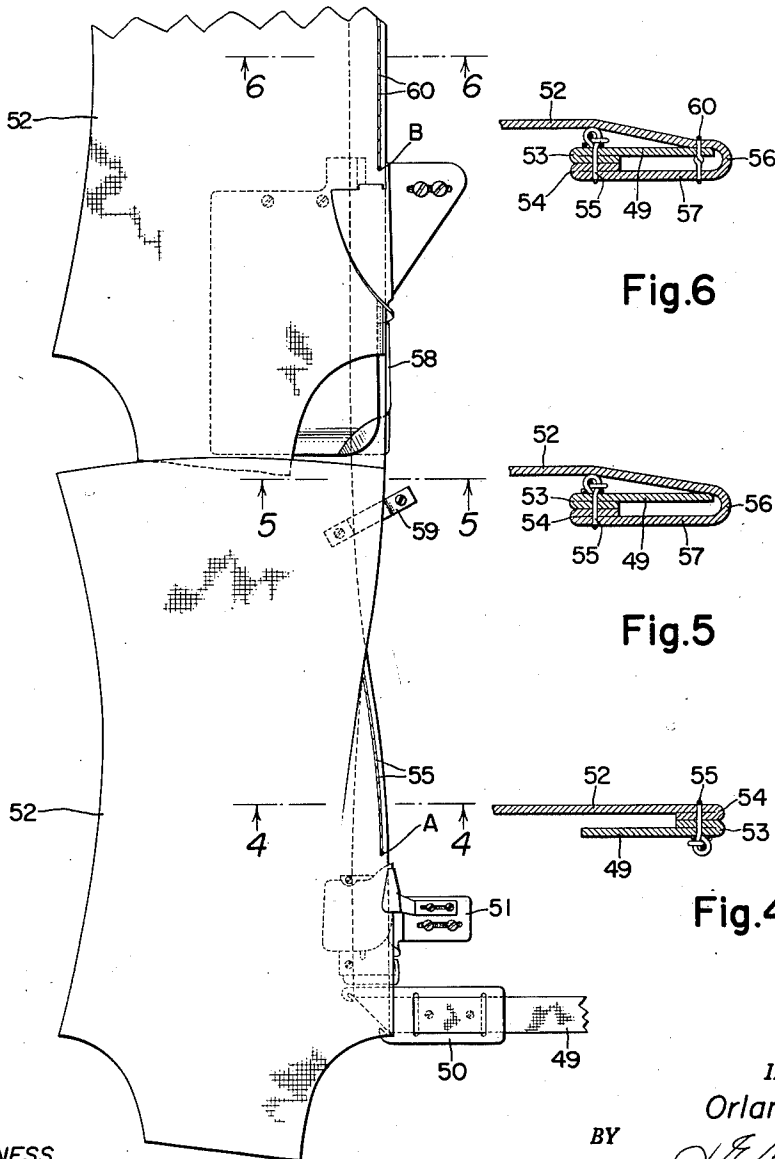


Fig.6

Fig.5

Fig.4

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SEWING APPARATUS AND METHODS

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Application August 19, 1954, Serial No. 450,885

6 Claims. (Cl. 112—2)

The present invention relates to the manufacture of garments and has for a primary object to provide a new and improved method of an apparatus for performing a sewing operation.

The use of tandem-arranged sewing machines is old and well-known, for example, as disclosed in the patent of Webb, No. 1,980,603. Such an arrangement has considerable advantage in that there is eliminated the operator that would normally be employed for the second machine, and in addition, there is eliminated the intermediate handling. However, the use of tandem-arranged sewing machines has been very restricted because of the difficulties experienced in adapting it to use, such as synchronizing the two machines to obtain proper feeding of the work so that the desired amount of tension will be placed on the work as it moves through the sewing apparatus and so that the work will be held in proper relationship as it is moved past the stitching mechanisms. Other inherent difficulties, such as proper guides, devising methods adaptable to the use of tandem-arranged sewing machines for sewing two successive operations, will be obvious to those skilled in the art.

Accordingly, it is an object of the present invention to provide a sewing apparatus in which the synchronization of the two machines has been facilitated and in which the proper feeding of the work past the stitching mechanism has been insured. One of the specific objects of this invention is to provide a method of an apparatus for securing the lining strip to an edge of a body material, for example, as in shirt fronts.

Having in mind the above and other objects that will be evident from an understanding of this disclosure, the invention comprises the devices, combinations and arrangements of parts as illustrated in the presently preferred embodiment of the invention which is hereinafter set forth in such detail as to enable those skilled in the art readily to understand the function, operation, construction and advantages of it when read in conjunction with the accompanying drawings in which:

Fig. 1 is a top plan view of a sewing apparatus constructed in accordance with the present invention.

Fig. 2 is a side elevation view of the sewing apparatus illustrated in Fig. 1.

Fig. 3 is a fragmentary top plan view of the sewing apparatus of Fig. 1, which view is designed to illustrate the work as it progresses through the sewing apparatus.

Figs. 4, 5 and 6 are fragmentary schematic sectional views of the work as it progresses through the sewing apparatus, the views being taken respectively on the lines 4—4, 5—5 and 6—6 of Fig. 3.

With reference to the drawings, there is illustrated a table or support 1 having a top 2, depending supporting legs 3 and a cross-brace 4. A first sewing machine 5 is mounted upon said support 1 in the usual manner, i. e., the machine 5 has a bed 6 that is pivotally secured to the top 2 by hinges 7 and received within an aperture formed in the top 2 whereby the upper surface of the bed will be flush with the upper surface of the top 2. A second

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sewing machine 8 having a bed 9 is mounted upon said support 1 in a similar manner by hinges 10. While the present invention is not limited thereto, the sewing machines 5 and 8 as herein employed are designed to produce, respectively, a two-thread chain-stitch and a lock-stitch, and each is provided with an adjustable lower four-motion feed. The details of the machines 5 and 8 are not further described herein since the specific details form no part of the present invention. However, they may be made, for example, as illustrated generally in the patent of Kaier, No. 2,206,285 and the patent of Clayton, No. 2,345,327.

An electric transmitter 11, such as disclosed in the patent of Hale, 2,546,393, is mounted beneath the top 2 and is provided with a multi-grooved pulley 12. The transmitter 11 is controlled in the usual manner by means of a foot-treadle 13 connected by an adjustable arm 14 to the actuating lever 15 of the transmitter. Belts 16 and 17 are entrained about the pulley 12 and each of them about one of the pulleys 18 and 19 on the sewing machines 5 and 8, respectively, for delivering power to the machines. A third belt 20 is entrained about the pulley 12 and about a pulley 21 on a reduction gear unit 22 mounted on the cross-brace 4 and delivers power thereto. The gear unit 22 has a pulley 23 which is connected by means of a belt 24 with a pulley 25 secured to the end of a roller shaft 26. The shaft 26 is journaled in brackets 27 fixed to the underside of the top 2 at the rear edge thereof, and has mounted thereon a roller 28. A second roller 29 complementary to the roller 28 is mounted upon a shaft 30 journaled in brackets 31 fixed to the front edge of the top 2. A plurality of conveyor belts 32 are entrained about the rollers 28 and 29, which belts are held in spaced relation by spacers 33 and which are run over a bridge-piece 34 to hold the same out of direct sliding contact with the upper surface of the top 2.

There is provided a conventional puller-feed mechanism including an upper feed-roller 35 mounted upon a shaft 36 journaled in suitable bearings 37 and carrying a gear 38 which meshes with a similar gear mounted on a cooperating lower feed-roller shaft (not shown). A pulley 39 is mounted on the shaft 36 which is connected by means of a belt 40 with a pulley 41 mounted upon the driving shaft of a conventional variable torque converter unit 42. The unit 42 also includes a driven shaft upon which is mounted a pulley 43 that is connected by a belt 44 with a pulley 45 on the reduction gear unit 22.

Mounted upon the top 2 is a stand 46 having a horizontal arm 47 upon which is journaled a tape reel 48. Tape 49, which in the present example comprises a lining strip, is drawn from the reel 48 and is introduced to a guide 50 which bends the same through a right angle and delivers it to a second guide 51 mounted upon the bed 6 of the sewing machine 5. A body material 52, which in the present illustration comprises shirt front pieces, is manually introduced by the operator to the guide 51 in the usual fashion. It is not believed to be necessary to describe the guide 51 in detail since the same could be readily duplicated from a description of the function thereof. With particular reference to Figs. 3 and 4, the guide 51 acts to in-fold the edges of the lining strip 49 and shirt front pieces 52 with the in-folded portions lying between the lining strip and shirt front pieces to define fold-edges 53 and 54, respectively, aligning the fold-edges, and presenting the work to the sewing machine 5 with the point of stitch formation, designated A in Fig. 3, spaced a short distance inwardly of the fold-edges. As hereinbefore mentioned, the sewing machine 5 is designed to produce a seam 55 of conventional two-thread chain-stitches.

After leaving the sewing machine 5, the lining strip 49 is twisted through an arc of 180° or, in other words, re-

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versed, with the strip remaining transversely in a flat condition during the twisting. As the lining strip 49 is twisted, the fold-edges 53 and 54 and the stitching 55 move initially in a direction away from the plane of the shirt front pieces 52, which in the drawings is toward the top 2, and then into a position underlying the body material as illustrated in Fig. 5. With the work thus twisted, the edge of the shirt front pieces 52, which is in effect wrapped around the lining strip 49, will be in-folded to define a fold-edge 56 and an in-folded strip portion 57 that is substantially equal in width to the width of the unfolded portion of the lining strip. As seen in Fig. 5, at this point the lining strip 49, except for the folded edges, lies flat between the shirt front piece and the in-folded strip portion 57 thereof.

The twisting of the work after leaving the machine 5 is accomplished by a guide 58 which is secured to the bed of the machine 8, and a strip-like tape abutment 59 that is secured to the top 2 of the support. It is not believed to be necessary to describe the guide 58 further since, like the guide 51, the specific details of construction will be obvious from an understanding of the function performed.

The guide 58 delivers the work to the sewing machine 8 with the fold-edges 56 arranged relative to the stitching point of the machine 8, designated B in Fig. 3, so that a seam 60 will be formed a short distance inwardly from the fold-edge 56. The seam 60 is also preferably passed through the free edge of the lining strip 49. As hereinbefore mentioned the sewing machine 8 is designed to produce, and the seam 60 therefore consists of conventional two-thread lock-stitches.

It will, of course, be understood that the feeding action of the feeding mechanisms of the sewing machines 5 and 8 and the feeding action of the puller feed-roller 35 will be synchronized to effect uniform feeding of the work. Preferably the feeding mechanism of the sewing machine 8 is partially disabled by decreasing the compression of the presser-bar spring so that the work may be pulled therethrough to a limited extent by the puller feed mechanism and thus hold the proper tension on the work in the space between the two machines.

Numerous alterations of the structure herein disclosed will suggest themselves to those skilled in the art. However, it is to be understood that the present disclosure relates to a preferred embodiment of my invention which is for purposes of illustration only and not to be construed as a limitation of the invention. All such modifications which do not depart from the spirit of the invention are intended to be included within the scope of the appended claims.

Having thus described the nature of the invention, what I claim herein is:

1. Sewing apparatus comprising supporting means, a first sewing machine mounted upon said supporting means and having stitching and feeding mechanisms, first guide means for directing to said first sewing machine a lining strip and a body material with the edges thereof aligned, said first sewing machine being operative to stitch through said strips and body material along a line parallel to and spaced inwardly a short distance from the aligned edges, a second guide means arranged on the discharge side of said first sewing machine for twisting said lining strip through an arc of 180 degrees in a direction to wrap said body material about said strip whereby the edge of said body material will be in-folded to define a fold-edge and to provide an in-folded strip portion on said body material that is substantially equal in width to the width of said lining strip and whereby the body portion of the lining strip will lie substantially flat between the body material and the in-folded strip portion thereof, a second sewing machine mounted upon said supporting means at the discharge of said second guide means and having stitching mechanism, said second sewing machine being operative to stitch through said lining strip and body

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material, and the in-folded edge of said body material along a line parallel to and spaced inwardly a short distance from said fold-edge, and a puller-feed mechanism disposed upon said supporting means on the discharge side of said second sewing machine.

2. Sewing apparatus in accordance with claim 1 having, in addition, conveyor means mounted upon said supporting means and disposed parallel to the lines of stitch formation of said sewing machines for conveying said body material bodily across said supporting means relative to said sewing machines.

3. Sewing apparatus in accordance with claim 2 having, in addition, common drive means mounted upon said supporting means and operatively connected with said sewing machines, said pulley feed mechanism and said conveyor means for driving the same.

4. Sewing apparatus comprising supporting means, a first sewing machine mounted upon said supporting means and having stitching mechanism and variable feeding mechanism, first guide means for aligning the edges of a lining and a body material and in-folding the aligned edges to lie between said strip and body material and for directing the same to said first sewing machine with the aligned edges arranged relative to the stitching mechanism thereof so that said first sewing machine will be operative to stitch through said strip and body material and the in-folded portions thereof along a line parallel to and spaced inwardly a short distance from the aligned edges, second guide means arranged on the discharge side of said first sewing machine for twisting said lining strip through an arc of 180 degrees in a direction to wrap said body material about said strip whereby the edge of said body material will be in-folded to define a fold-edge and to provide an in-folded strip portion on said body material that is substantially equal in width to the width of said lining strip and whereby the body portion of the lining strip will lie substantially flat between the body material and the in-folded strip portion thereof, a second sewing machine mounted upon said supporting means at the discharge of said second guide means and having stitching mechanism and feeding mechanism, said second guide means directing said strip and body material to said second sewing machine with the fold-edge of said body material arranged relative to the stitching mechanism thereof so that said second sewing machine will be operative to stitch through said strip and body portion and the in-folded strip portion thereof along a line parallel to and spaced inwardly a short distance from the fold-edge, and a puller-feed mechanism disposed upon said supporting means on the discharge side of said second sewing machine.

5. Sewing apparatus comprising supporting means, a plurality of sewing machines carried by said supporting means each of said sewing machines having stitch-forming mechanism adapted to perform an individual sewing operation upon work presented thereto, said sewing machines each having an adjustable feeding mechanism for advancing work past said stitching mechanism along a line of seam formation, an adjustable puller-feed mechanism carried by said support and disposed in the line of seam formation to the rear of said sewing machines, means for independently adjusting said puller-feed mechanism and each of said feeding mechanisms, and a common drive means connected to said sewing machines and said puller-feed for driving the same.

6. Sewing apparatus comprising supporting means, a plurality of sewing machines carried by said supporting means, each of said sewing machines having stitch-forming mechanism adapted to perform an individual sewing operation upon work presented thereto, said sewing machines each having an adjustable feeding mechanism for advancing work past said stitching mechanism along a line of seam formation, an adjustable puller-feed mechanism carried by said support and disposed in the line of

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seam formation to the rear of said sewing machines, means for independently adjusting said puller-feed mechanism and each of said feeding mechanisms, conveyor means mounted upon said supporting means and arranged parallel to and to one side of the line of seam formation for conveying work across said supporting means relative to said sewing machines, and a common drive means connected to said sewing machines, puller-feed, and said conveyor means for driving the same.

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