Nov. 6, 1951 M. K. ROHRLICK ET AL 2,574,351

METHOD FOR FEEDING AND STITCHING SLIDE FASTENER STRINGERS TO GARMENT FLY PIECES

Filed June 8, 1950 3 Sheets-Sheet 1

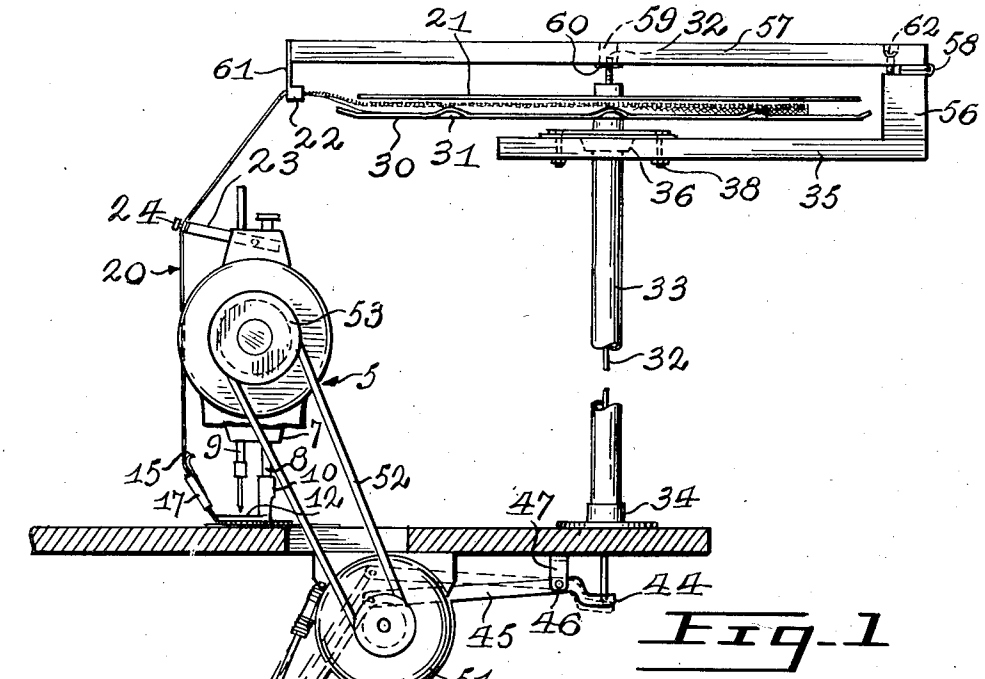


Fig. 1

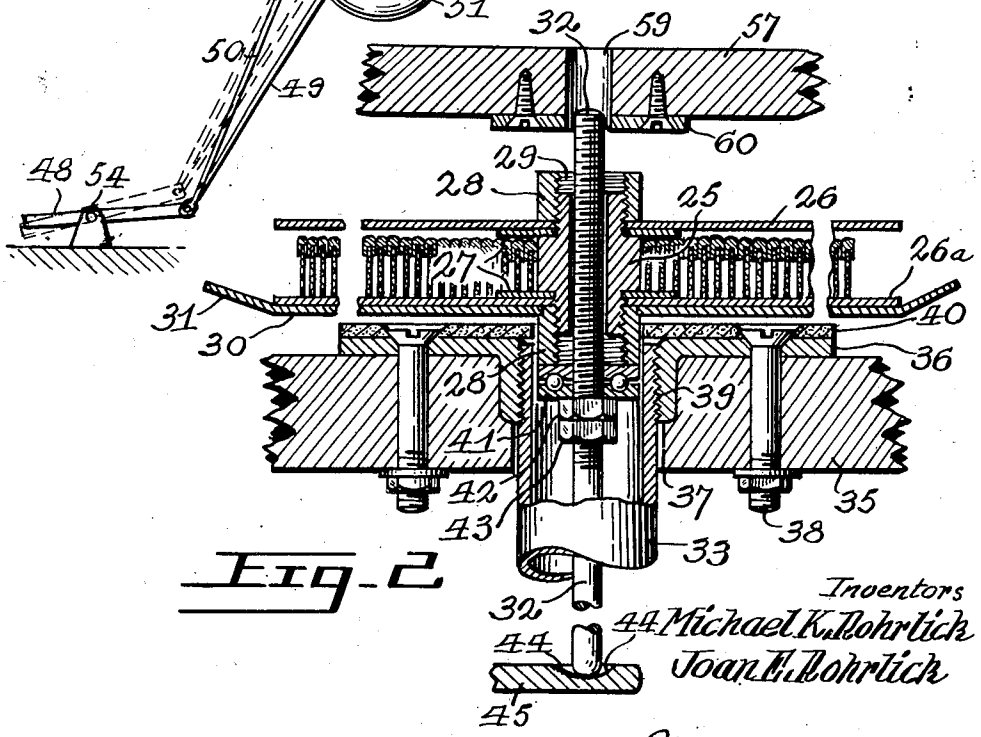


Fig. 2

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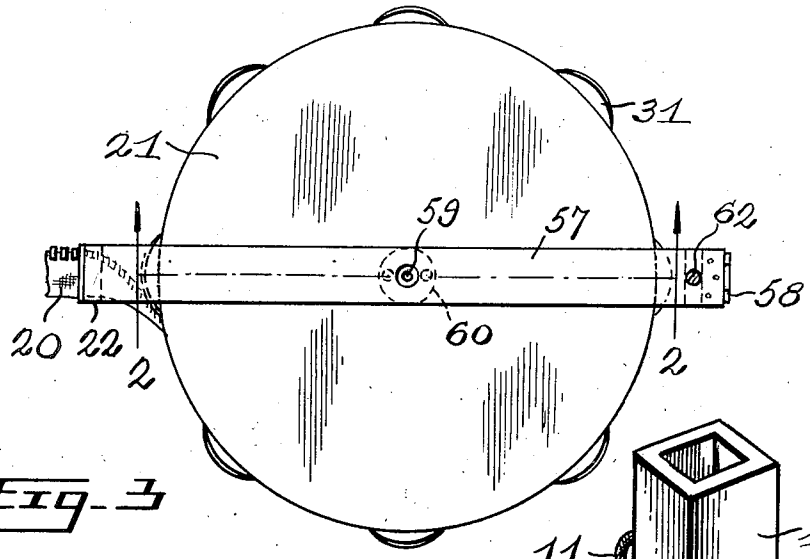


Fig. 3

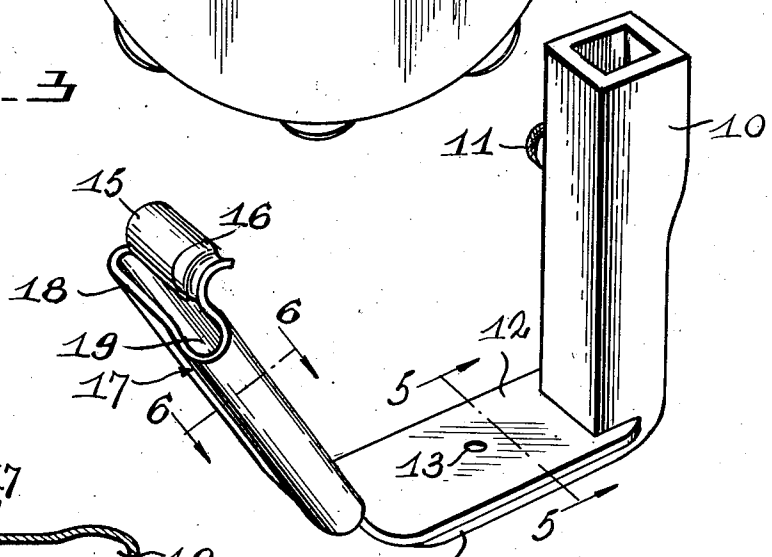


Fig. 4

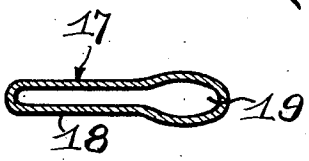


Fig. 6

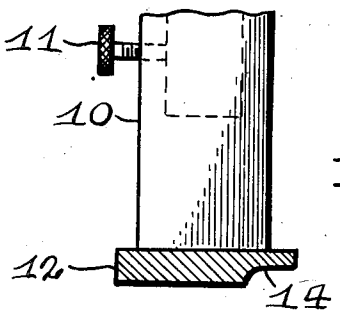


Fig. 5

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Filed June 8, 1950 3 Sheets-Sheet 3

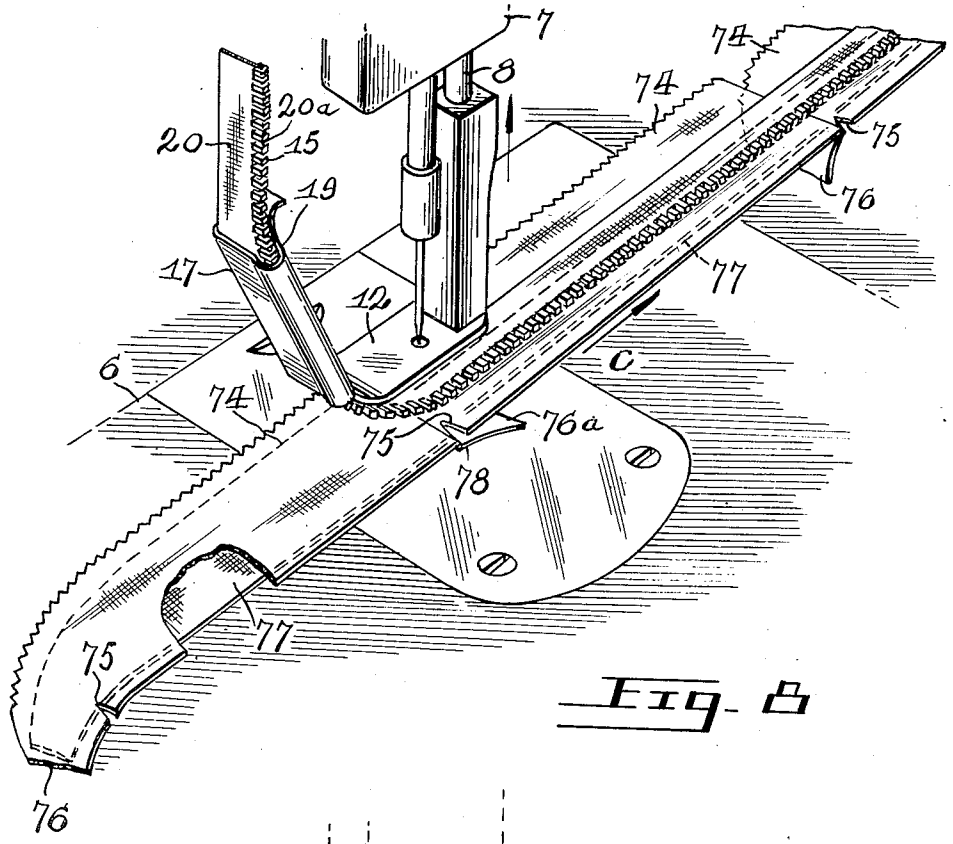


Fig. 6

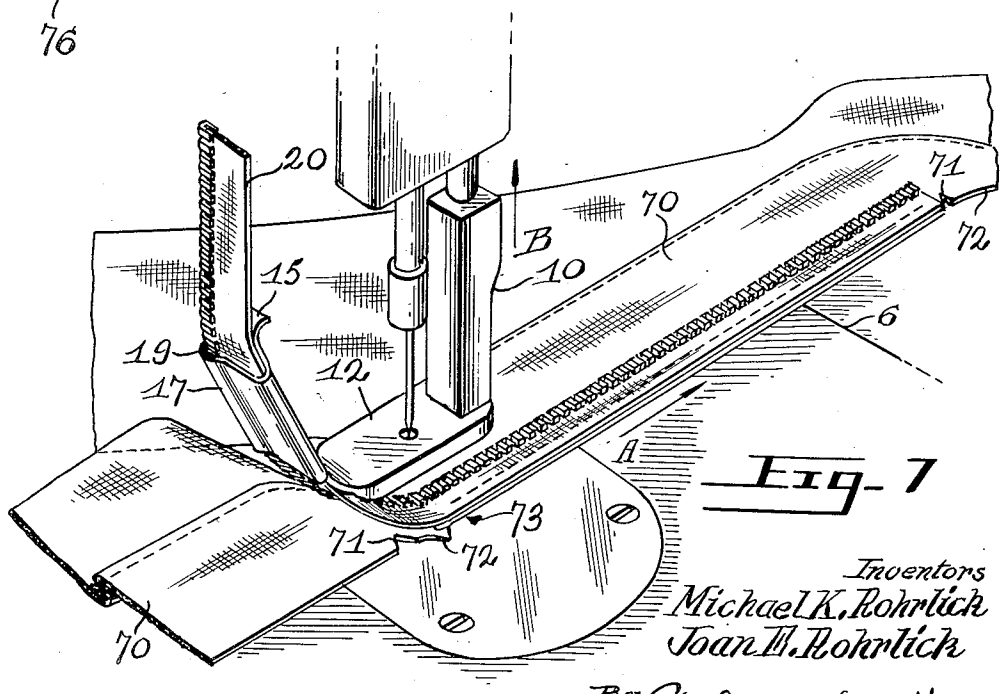


Fig. 7

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UNITED STATES PATENT OFFICE

2,574,351

METHOD FOR FEEDING AND STITCHING SLIDE FASTENER STRINGERS TO GARMENT FLY PIECES

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Application June 8, 1950, Serial No. 166,814

3 Claims. (Cl. 112—262)

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This invention relates to a method for feeding and stitching slide fastener stringers to garment fly pieces.

A particular object of this invention is to provide a method of feeding successive strips of garment flies to a working bed in end-to-end relation and to continuously feed a slide fastener stringer thereto so that the flies and stringer may be continuously stitched together throughout the length of the stringer.

Another object is to provide a means for continuously feeding the stringer to the work to be stitched together without the necessity of handling of the stringer by the operator.

A further object is to provide a method of continuously stitching a stringer to successive fly pieces so that there will be no waste of stringer material when separating the fly pieces.

A still further object is to provide a novel apparatus for continuously guiding a stringer to the working bed for stitching the stringer to successive fly pieces.

A still further object is to provide improved means for feeding and guiding a stringer to a working bed without manipulation by an operator during the sewing operation of the fly or other work pieces to the fly pieces.

The above and further objects and characteristic features of this invention will be understood more readily from the following detailed description taken in connection with the accompanying drawings, in which—

Fig. 1 is an end elevation view of an apparatus embodying the invention.

Fig. 2 is an enlarged sectional view partly broken of a portion of the apparatus indicated between the lines 2—2 of Fig. 3.

Fig. 3 is a top plan view of the unreeling apparatus shown in Fig. 1.

Fig. 4 is an enlarged detail of the presser foot and attached portions.

Fig. 5 is a detail taken along the lines 5—5 of Fig. 4.

Fig. 6 is a further detail along the lines 6—6 of Fig. 4.

Fig. 7 is a view showing the manner in which certain pieces of work are fed and sewn together.

Fig. 8 is a view showing the manner in which certain other pieces are fed and sewn together.

Referring more particularly to the drawings, 5 generally designates a conventional sewing machine including a working bed 6 and a sewing head 7, having the standard mechanical driving apparatus and stitch forming mechanism, including a presser foot bar 8 and needle bar 9. Al-

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though we have shown only a single needle type machine for illustrative purposes, a conventional double needle machine of this type may be employed where double rows of stitching are needed.

The presser foot bar has conventional mechanism (not shown) for lowering and raising the presser foot to operative and inoperative positions. The pressure foot employed in this invention includes a block 10 having an opening in which the presser foot bar 8 is secured by thumb screw 11 and flat presser foot plate 12 extending forwardly of block 10. Plate 12 is provided with a central needle opening 13 and is grooved along one side, as indicated at 14, accommodating the attached coupling links of a slide fastener stringer as the stringer passes beneath the presser foot plate. When using the double needle machine, the plate 12 will be provided with a pair of central needle openings but will be otherwise constructed the same as above described.

The forward end of plate 12 is provided with an upwardly curved stringer guide 15 for feeding the stringer directly beneath the presser foot. Guide 15 is grooved, as indicated at 16, along the under surface adjacent one side of the forward section of the guide and has an intermediate tubular section 17 which has its lower end disposed adjacent the presser plate 12. Tubular section 17 is substantially flattened, as indicated at 18, throughout a substantial portion of the width to receive the stringer and has a portion along one side outwardly expanded, as indicated at 19, to accommodate the attached coupling links of said stringer. The expanded tubular portion 19 is interposed between and aligned with the groove 16 along the under side of the forward section of guide 15 and the side groove 14 in the presser foot plate 12.

A slide fastener stringer 20, having coupling links 20a attached along one side edge, is fed from a reel 21 through a guide loop 22 mounted adjacent one side of the reel. A bracket 23 mounted on the sewing head 7 carries a conventional tension device 24 through which the stringer from the reel is passed to the presser foot guide 15. The slide fastener stringer 20 is wound about the hub 25 of the reel between upper and lower flange discs 26 and 26a which are fastened to hub 25 by washers 27 and clamping nuts 28 received on the threaded ends 29 of the hub. A disc-like pan 30 having upturned end extensions 31 is positioned adjacent the undersurface of lower disc 26a. Pan 30 is provided with a central opening which is complementary to the side surfaces of lower nut 28. The pan is

slidably fitted over the lower end of the hub 25 about the lower nut 28 so as to be rotated by the nut when the reel is rotated. When the pan is positioned adjacent disc 26a, the upturned extensions 31 project beyond the peripheral edge of disc 26a and serve to prevent the stringer 20 from side slipping off the reel.

The reel 21 with the pan 30 positioned adjacent thereto is mounted for rotation about the upper threaded end of a vertical spindle 32. The spindle is arranged for vertical movement in sleeve 33 mounted on a flanged collar 34 which is fastened to the upper side of the working bed 6. A supporting arm 35, having a second flanged collar 36 fitted in an opening 37 and secured thereto by bolts 38, is mounted on the upper end of sleeve 33 in screw-threaded engagement, as indicated at 39. A friction or brake disc 40 is secured to the upper surface of the flanged portion of collar 36 by bolts or other suitable means 38. When the reel is mounted on the spindle, the lower end of hub 25 projects into the sleeve 33 to rest on the upper surface of a ball bearing housing 41 which is supported on an adjusting nut 42. Nut 42 is movable on the upper threaded portion of spindle 32 for vertical adjustment of the reel and may be secured in position by a second nut 43.

The lower end of spindle 32 extends through a suitable opening in the working bed 6 and has its lower end supported in a cup 44 at one end of a lever arm 45 which is pivotally secured at 46 intermediate its length to a bracket 47 fastened to the under side of working bed 6. The other end of lever bar 45 is connected to a treadle plate 48 by suitable linking means 49. A switch actuating mechanism 50 connected at one end to treadle 48 operates a conventional switch (not shown) of a motor 51 which is connected by a belt 52 to the driving pulley 53 of the sewing machine.

When the rear end of treadle 48, which is pivoted at 54, is depressed, as shown in full line in Figure 1, the switch actuating mechanism 50 starts the sewing machine motor. At the same time, lever arm 45, through link 49, raises the spindle 32 thus releasing frictional pressure between the reel and the brake disc 40 allowing rotation of the reel for feeding the stringer to and beneath the presser foot during the stitching operation of the machine. When the rear end of the treadle is raised, as shown in dotted line, switch mechanism 50 shuts off the motor and at the same time the cup end 44 of lever arm 45 is lowered to provide frictional pressure of the reel against the brake disc 40. The frictional pressure is brought about by the weight of the reel on the pan 30 which rotates with the reel, the pan 30 bearing against brake disc 40 under pressure of the reel. When the motor is shut off and the sewing action ceases, the feeding from the reel of the stringer likewise ceases and rotation of the reel is prevented until a further sewing operation is commenced.

The supporting arm 35, which is rotatable on the upper end of sleeve 33, has one end extending beyond the outer periphery of the reel. The free end is provided with a spacer block 56 to which a centering arm 57 is hingedly secured, as indicated at 58. The centering arm 57 is provided with a central opening 59 in which the upper end of spindle 32 is received. A washer 60 is fastened to the under side of arm 57 about opening 59. The upper end of spindle 32 projects through the opening in the washer and into the opening 59

so as to centre the free end of the spindle. The free end of centering arm 57 is provided with a downwardly projecting bracket 61 to which the guide loop 22 is attached. A set-screw 62 projecting through the hinged end of centering arm 57 bears against spacer block 56 for vertical adjustment of the centering arm. The vertical adjustment is intended to prevent vertical movement of the reel beyond the vertical movement provided by the raising of the reel by the action of the lever arm 45 against the spindle 32.

The presser foot, as herein illustrated, is adapted for the feeding of stringers which are fed to a piece of work with the attached coupling links arranged along the right hand side edge of the stringer. It will be appreciated that for the feeding of stringers having the attached coupling links arranged on the left hand side, a reverse presser foot will be employed. The difference between such a presser foot and the one illustrated will consist in providing a guide groove 16, an expanded tubular portion 19 and presser foot plate groove 14 adjacent the opposite side edge thereof. With the employment of this apparatus, the stringer is continuously fed from the reel to and beneath the presser foot and is sewn onto the work without necessity of handling by an operator at any time during the sewing operation.

The main purpose of the apparatus is to provide an automatic feed of the slide fastener stringer without the necessity of handling the stringer so that the operator may be better able to feed successive pieces of work to the working bed and continuously stitch the stringer to the successive pieces of work.

A particular adaptation of the apparatus is in uninterrupted stitching of stringers to garment fly pieces.

As shown in Figure 7, the stringer 20 which is fed to the presser foot with the attached coupling links along the left hand side edge of the stringer, is stitched to a fly piece 70 which is known in the trade as a "white fly." In order to accomplish the continuous stitching, we have provided each of the white fly pieces 70 with a notch 71 at a point on the lower end of the fly piece where the zipper fastener normally terminates. It will be seen that there is an incurved extension 72 of the fly piece which is adapted to be connected to the crotch of the garment. This extension 72 is beyond the notch 71. In sewing the stringer to the white fly piece 70, the side edge of the stringer remote from the coupling links is disposed along the notched side edge of the fly. The fly piece is fed, lower end first. The lower end is fed under the presser foot in the direction indicated by the arrow A in Figure 7. The presser foot is then lowered and the stringer and fly are stitched together from the notch 71 to the remote end of the fly. The sewing operation is then suspended by the action of the foot treadle 48 which, at the same time, lowers the reel into frictional pressure with the brake disc, thus stopping rotation of the reel. The presser foot is then raised as indicated by the vertical arrow B and the next fly piece is inserted, bottom end, with the extension 72 underlying the adjacent end of the preceding fly piece 70, as indicated at 73. This next white fly is positioned with its notch 71 adjacent the end of the preceding fly and the presser foot is lowered and the stitching operation of the stringer to the second fly is repeated in the manner above described. Successive white fly pieces are sewn in end-to-

end relation in the above manner throughout the length of the stringer as the length of stringer is unwound from the reel and fed to the working bed beneath the presser foot. When this is accomplished, the operator will then cut the stringer at the notched point of the fly to separate the fly pieces. Since one end of each fly piece is adjacent the notched end of the successive fly pieces, there will be no waste of the stringer.

In Figure 8 we have shown separate pieces known in the trade as "black fly pieces." The black fly pieces 74 are notched at 75 along one side near the lower end in the manner described with reference to the white fly pieces, adjacent the lower crotch piece extension 76. The black fly piece is stitched to a stringer which is fed through a right hand presser foot so that the stringer will have its attached coupling links along the right hand side edge. The black fly 74 is fed along the working bed in the direction of the arrow C with a stay liner 77 underneath the black fly, the end of the black fly remote from the crotch extension 76 being fed first. The stringer is stitched to the top of the black fly centrally thereof with the coupling links on the side nearest the notched side of the fly. The stitching secures the stringer, fly and stay liner together throughout the length of the fly to the notch 75. The sewing operation is then suspended and the reel stopped, in the manner above described. Then the presser foot is raised as indicated by the vertical arrow D and the crotch extension 76 is folded under as indicated at 76*a*. The next black fly piece 74 and stay liner 77 are positioned with their ends 78 adjacent the notch of the preceding fly piece. The presser foot is then lowered and stitching and stringer feeding operations are continued down to the notch 75. Successive black fly and stay liners are fed and stitched in the same manner throughout the length of the stringer. The operator then cuts the stringer at points along its length indicated by the notch of each fly piece. With the above described positioning of the successive fly pieces there will be no waste of the stringer.

The stringers for the white and black flies are separately provided with male and female coupling links and the stringer of each fly piece is fed and secured to the separate fly pieces in such a manner as to provide interlocking of the male and female coupling links when the black and white fly pieces are assembled.

We claim:

1. Method of feeding and stitching slide fastener stringers to garment fly piece having upper and lower ends, which comprises feeding a garment fly piece endwise to a working bed and beneath a presser foot, stitching the stringer to the portion only of the fly piece between the upper end of the fly piece and a point close to but spaced from the lower end, bringing another fly piece endwise and in the same direction into position behind the first fly piece with the upper end of one of the fly pieces opposite such point of the other, positioning the portion of each fly piece between such point and the lower end beneath the previously stitched portion, and stitching the stringer continuously to such first portion of the second fly piece.

2. Method as claimed in claim 1, in which the fly pieces are fed upper end first, in which, after the stringer is stitched to such first portion of each fly piece, the remaining portion of the fly piece between such point and the lower end is folded under the first portion and the upper end of the next fly piece is brought into abutment with the fold so formed.

3. Method as claimed in claim 1, in which the fly pieces are fed lower end first, in which, after the stringer is stitched to such first portion of each fly piece, the portion of the next fly piece between the lower end and such point is introduced under the upper end of the stitched fly piece, and the stringer is then stitched to the first portion of the next fly piece.

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