United States Patent

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[54] APPARATUS FOR MAKING SLEEVE PLACKETS

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[52] **U.S. Cl.** **112/121.15**, 223/38

[51] **Int. Cl.** **D05b 21/00**

[58] **Field of Search** 112/147, 136, 121.15, 121.12, 112/121.11, 120; 223/38

[56] **References Cited**

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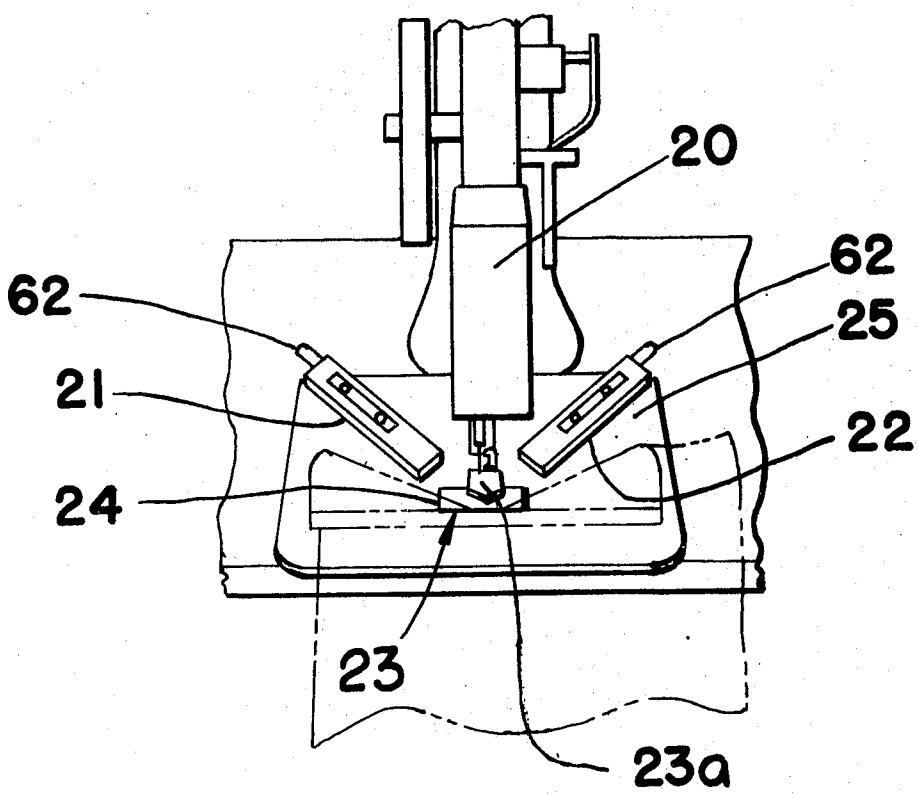
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[57] **ABSTRACT**

Apparatus for making a shirt sleeve placket, including two angled folder plates and a hold-down element for retaining the folded construction in shape for sewing on a profile sewing machine.

5 Claims, 12 Drawing Figures



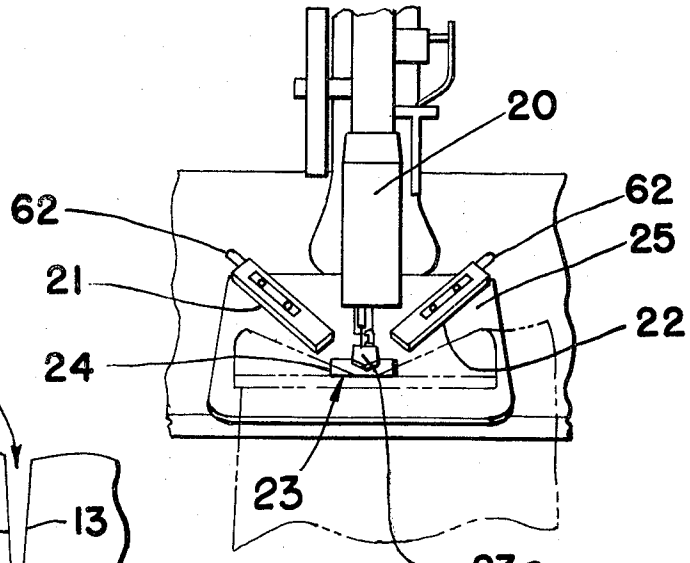


FIG. 2

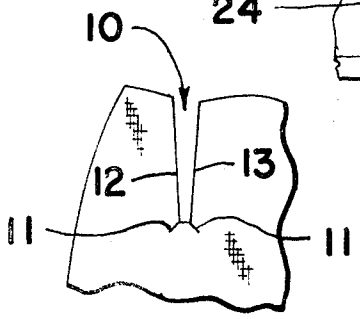


FIG. 1

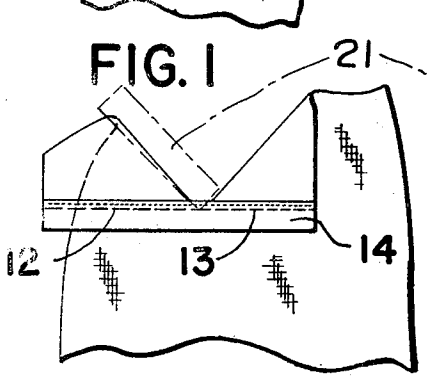


FIG. 3

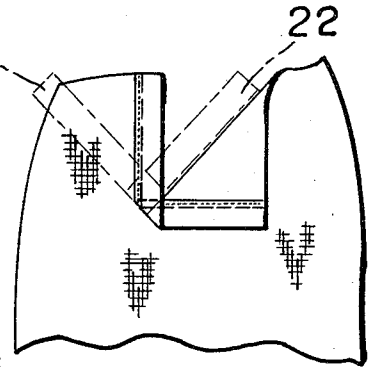


FIG. 4

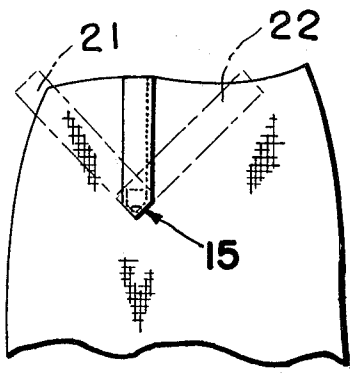


FIG. 5

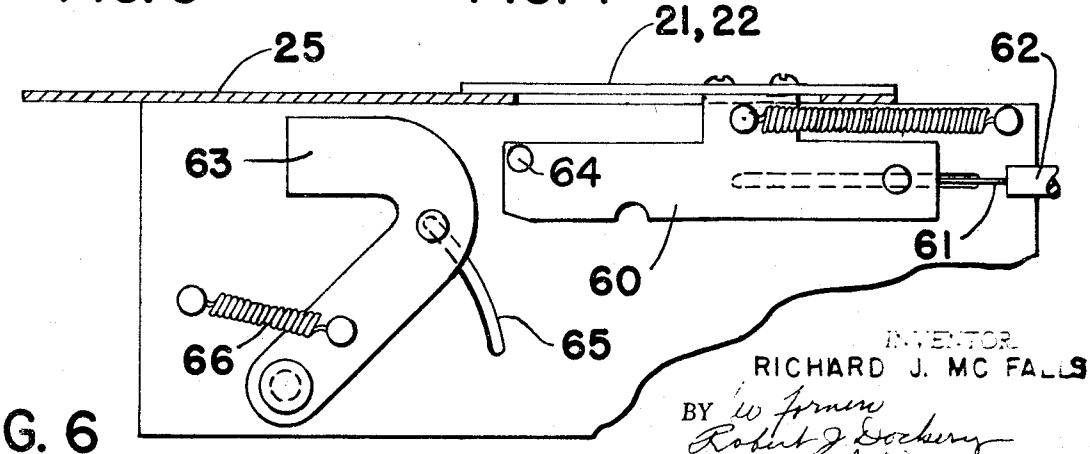


FIG. 6

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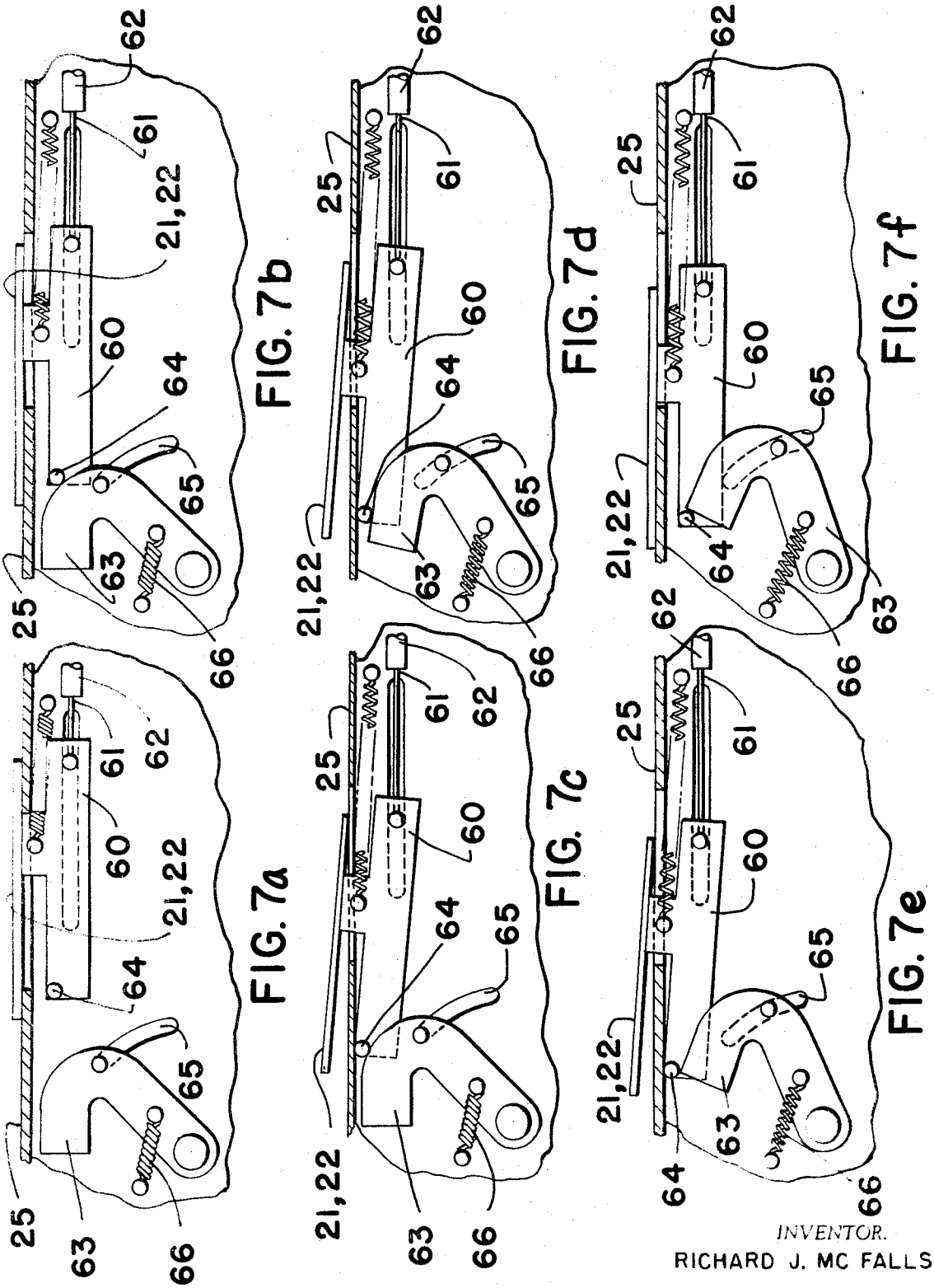


FIG. 7a

FIG. 7b

FIG. 7c

FIG. 7d

FIG. 7e

FIG. 7f

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APPARATUS FOR MAKING SLEEVE PLACKETS

BACKGROUND & SUMMARY

The field of the present invention is garment construction and more particularly, apparatus for making garment parts. In manufacturing garments, one of the problem areas is the sleeve placket which requires, under present methods, a great deal of expertise on the part of the sewing machine operator. It is desirable to simplify this operation if production is to be increased without increasing manufacturing costs.

It is, therefore, an aim of the present invention to provide a simplified and low cost apparatus for making sleeve plackets. In order to achieve this and other objects, the present invention, in accordance with one aspect thereof, includes two reciprocating folder bars over which the operator folds the cloth to form the placket and a hold-down element which clamps the folded cloth so that the placket may be sewn by movement of the sewing needle about the clamp.

THE DRAWINGS

For a more complete understanding of the invention reference should be made to the drawings wherein:

FIG. **1** shows a placket opening before the tape is attached;

FIG. **2** is a perspective front view of an apparatus according to the instant invention;

FIGS. **3**, **4** and **5** show the sleeve at three different stages in the forming of the placket;

FIG. **6** is a detail showing the means for actuating the folder blades shown in FIG. **2**; and

FIGS. *7a–7f* illustrate the operational sequence of the actuator of FIG. **6**.

The figures are to be understood to be more or less of a diagrammatic character for the purposes of illustration. Like characters identify the various elements in the several views.

DESCRIPTION OF PREFERRED EMBODIMENTS

The sleeve placket formed by the apparatus of the instant invention is the type described in U.S. Pat. No. 2,003,217 to C. E. Outhout. FIG. **1** shows the placket opening **10** with the tape or facing piece unattached. The opening is in the form of a rectangular notch. The inside corners of the opening have diagonal slits **11**. The slits allow spreading of the notch without bunching of the cloth at the corners. The sides of the notch **12** and **13** are separated until they lie flat, that is, 180° with respect to each other. The tape is then sewn on and the sleeve is ready for the placket fold.

The apparatus is also useful in forming such things as shirt fronts on pull-over shirts and also skirt and slack plackets. Additionally, one skilled in the art would realize there are a wide variety of uses other than the sleeve placket which is described for the purposes of illustrating the apparatus and its working.

FIG. **2** is a view of an apparatus constructed in accordance with the instant invention. The apparatus includes a sewing head **20**, a left folder bar **21**, a right folder bar **22**, a hold-down element **23** having a clamp **23***a*, a gage **24** and a work table **25**.

In FIG. **2**, the sleeve is shown aligned against gage **24** just prior to actuation of the folder bars. FIG. **3** illustrates the method of folding the sleeve. Tape **14** has been sewn onto the spread edges **12** and **13** which originally formed the rectangular notch **10**. The operator folds the tape over the rest of the sleeve so that a V is formed as shown in the figure.

The center portion of the tape is aligned against gage **24**. This part of the operation must be done carefully so that the folds will be symmetrical. Once the workpiece is aligned, the left folder blade is actuated and moves diagonally forward and over the tape. The left portion of the tape is brought up to a vertical position with the fold being made against the blade. Next the right blade is actuated and the right portion is folded against the right blade. The blades are so located when extended that the right and left portions of the tape, after the sequential folding, are juxtaposed as a double layer. The ends of the blades are adjusted so as to overlap when extended and cause the folded portions of the tape to form a tent-shaped area.

FIG. **4** shows the disposition of the tape after the first fold and FIG. **5** shows the formed placket after the second fold and illustrates the tent-shaped area **15** formed by the ends of the blades.

FIGS. **3**, **4** and **5** illustrates the position of the blades **21** and **22**. In FIG. **3** the left blade **21** is shown in place and ready to accept the left placket fold. FIG. **4** shows the left fold made and the right blade **22** ready to accept the right placket fold. FIG. **5** shows the both folds made.

The next step of the operation is the seating of the hold-down element clamp **23***a* which is brought down over the folded cloth and the blades. The blades are simultaneously retracted while the clamp holds the folded intersection in position for stitching. The sewing machine is cam operated so that the needle stitches the cloth about the periphery of the clamp to complete the placket construction.

Cam operated machines are widely available. Typically the hold-down element is slightly smaller than the area to be enclosed by the stitching which is begun on one side and is run toward the point of the clamp and then about the clamp to overlap the initial stitches. The needle remains free of the hold-down element by means of an offset in the piece that holds the clamp. The offset spins through 180° and is coordinated with the up and down movement of the needle so as to spin through the arc while the needle is up. Said another way, the needle makes a number of stitches across the back edge of the clamp and between one of these stitches, the piece with the offset spins so that the offset is now reversed and the needle can continue without interference. All of the foregoing is conventional and does not form a part of the instant invention.

The foregoing describes the making of a left sleeve. For a right sleeve, the sequence of operation of the blades is reversed so that the right blade is first extended and then the left.

FIG. **6** shows one means of achieving the desired motion for the folder blades. Each blade typically rides within an opening in the table **25**. The blade is carried in a bracket **60** to which the blade is affixed. The bracket is, in turn, attached to rod **61** of air piston **62**. As the piston extends, the bracket and blade are moved forward. A spring loaded cam **63** lies alongside the bracket **60** so that as the bracket moves past the cam follower **64**, which is simply a pin extending out perpendicularly from the side of the bracket, the follower rides up and over the cam. It can be seen that the motion of the blade is such that the blade will not engage the sleeve until it has generally completed its travel. If the blade were to simply slide along the table surface, it would tend to disturb the placement of the sleeve against the gage. Spring loaded cam **63** moves in arcuate slot **65**, located in work table **25**. Spring **66** maintains a tension on cam **63** as it moves in the slot.

FIGS. *7a–7f* show the various operational stages of a blade as it advances to its extended position. FIG. *7a* shows the apparatus in a neutral position with the blade unextended. In FIG. *7b*, piston rod **61** has partly extended driving bracket **60** and therefore blade **21**, **22** toward the sleeve, so that cam follower **64** just contacts cam **63**. As the piston rod continues to drive bracket **60** towards the sleeve, cam follower **64** begins to ride up the arcuate side of cam **63**. See FIG. *7c*. In FIG. *7d*, movement of the cam follower has caused the blade to move above the level of the table surface. When the blade had completed its travel so as to be above and adjacent to the sleeve portion to be folded, the cam follower has reached an apex of the cam as shown in FIG. *7e*. Further motion of the cam follower down the straight portion of the cam causes the cam to move in a generally downward path in slot **65**. This causes a corresponding downward motion of the blade so that it contacts the surface of table **25** and lies adjacent to the sleeve. (FIG. *7f*) After the placket has been formed, a simultaneous blade retraction is accomplished by timing the retracting of piston rod **61** of each blade to occur simultaneously rather than sequentially. A variety of means for accomplishing this are well known in the art.

After the sleeve with the sewn placket has been taken from the table, it is trimmed and stacked prior to sleeve insertion in

the body, felling of the side shirt seam and then attaching of the cuff.

Although the present invention has been described with reference to specific apparatus, it will be appreciated by a person skilled in the art that a wide variety of changes may be made without departing from the scope of the invention. For instance, certain features of the apparatus may be used independently of others and equivalents may be substituted for apparatus elements, all within the spirit and scope of the invention as defined in the appended claims.

I claim:

1. Apparatus for making a garment placket or the like comprising: a profile-stitch sewing machine; a work table having a gage for locating a workpiece, the gage located generally below the sewing machine head; a left folder blade, a right folder blade; means for sequentially extending each of said folder blades along mutually opposing paths and for simultaneously retracting said folder blades subsequent to forming said placket, said blades being so arranged as to partially overlap at their tips when extended, and a hold-down element including a clamp adapted to grip the workpiece at the placket fold during stitching after retracting said folder blades, said blades being angularly disposed with respect to each other and to a portion of said workpiece when extended to provide edges against which the workpiece is sequentially folded as each blade is moved into extended position to form the placket.

2. The apparatus of claim 6 wherein the gage is a raised block on the surface of the work table.

3. The apparatus of claim 6 wherein the respective folder blades are generally rectangular in shape and extend generally the length of the placket opening.

4. The apparatus of claim 6 wherein the paths of blade movement of the blades form an angle of approximately 90°.

5. The apparatus of claim 6 wherein the mutually opposing paths of blade movement are diagonal paths.

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