

[54] **METHOD AND APPARATUS FOR
AUTOMATIC CAPE JOINING**

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

[58] **Field of Search**....112/121.15, 121.12, 102, 262;
2/143; 223/1, 2, 3

[56] **References Cited**

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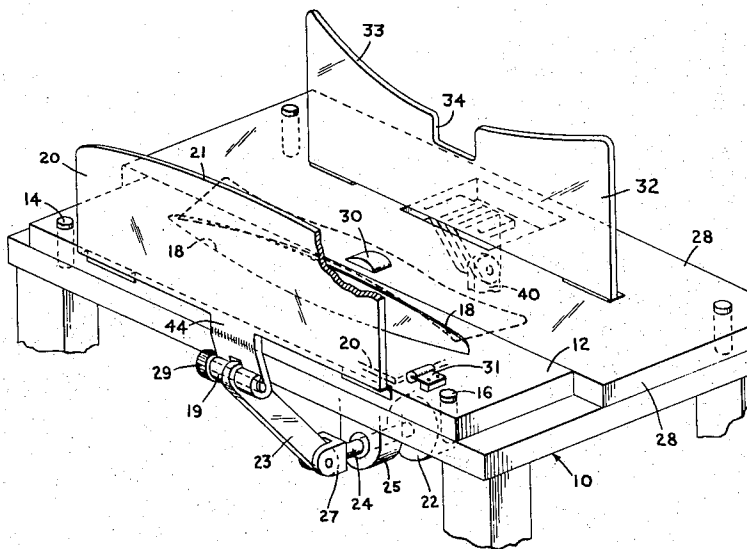
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[57] **ABSTRACT**

Method and apparatus for automatically joining the cape and neckband portions of a collar along a concurrent arc. The cape is distorted to permit alignment of the arced cape edge with the neckband edge prior to seaming.

6 Claims, 7 Drawing Figures



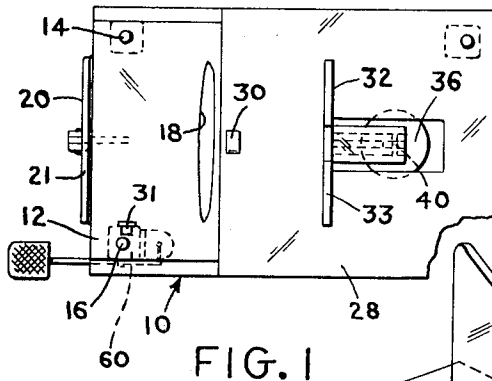


FIG. 1

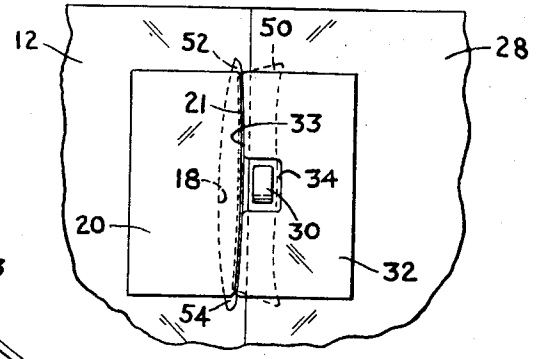


FIG. 7

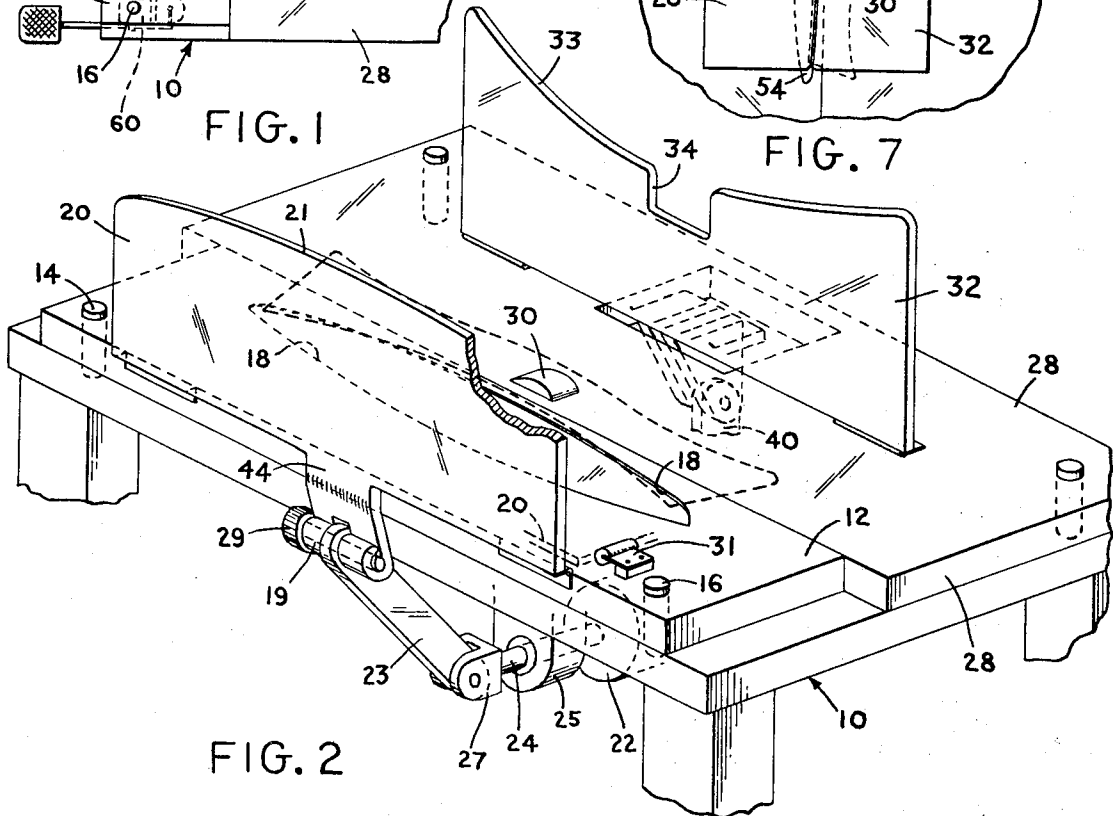


FIG. 2

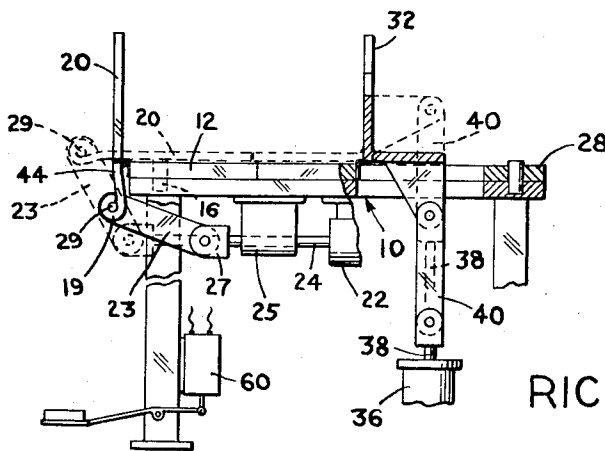


FIG. 3

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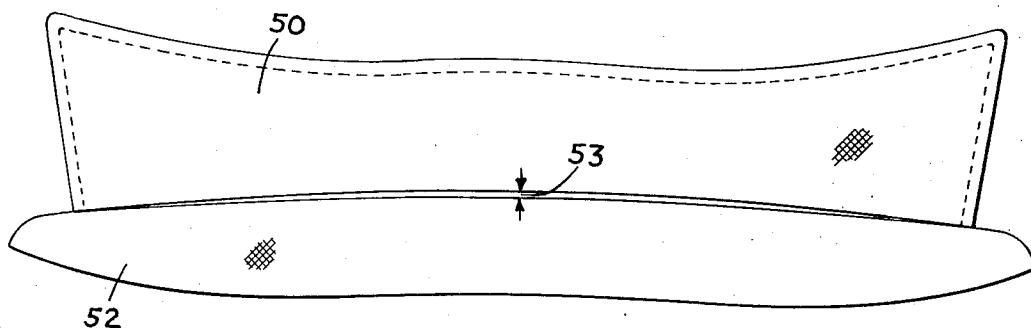


FIG. 4

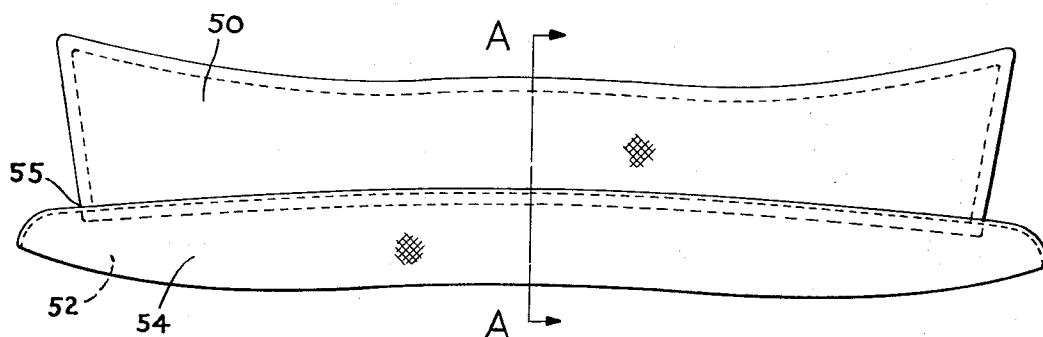


FIG. 5

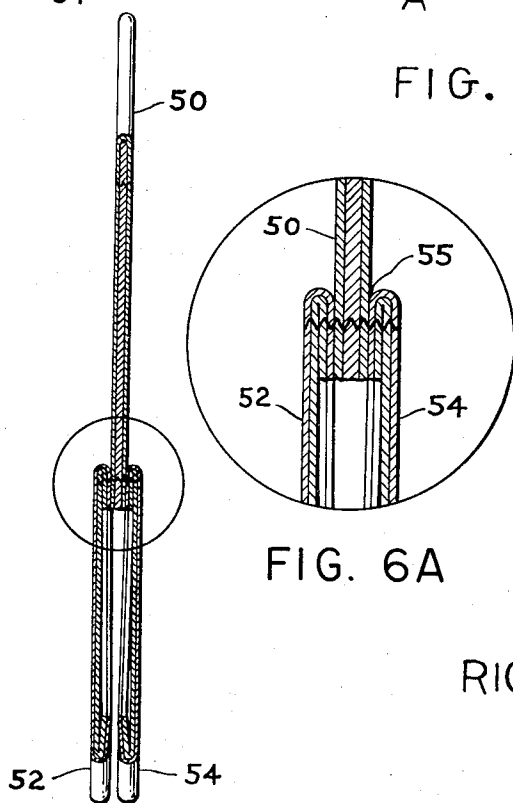


FIG. 6A

FIG. 6

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METHOD AND APPARATUS FOR AUTOMATIC CAPE JOINING

BACKGROUND OF THE INVENTION

The present invention relates to a method and apparatus for collar manufacture and more particularly, to the manufacture of two piece collars in which the collar top or cape and neckband are cut separately and joined together.

In fabricating the collar, it is necessary to impart a certain amount of "spring" to the collar top, i.e. cause the collar top to stand away from the band when folded over it, thereby providing adequate space for a necktie. Additionally, this "spring" improves the appearance and comfort of the collar.

Typical prior art methods of imparting "spring" to collars are disclosed in U.S. Pat. No. 44,022 to C. Spofford, U.S. Pat. No. 322,697 to C. H. Denison and U.S. Pat. No. 1,314,986 to J. T. Sipperley. The first two of these patents involve distortion of the collar unit after the top has been joined to the band. The patent to Sipperley discloses a method which involves a lateral modification of the collar top configuration. Another method of imparting "spring" is generally employed during the actual joining of the top to the band along a concurrent arc. This method utilizes a difference in curvature viz., the edge of the band is substantially straight or is curved much less sharply than the edge of the top to which it is joined. Because of this difference in curvature, the completed collar does not lie flat, resulting in a "spring" effect. In seaming the band and cape together along a concurrent arc, the operator manually distorts the collar top in order to align the cape edge with the band edge and then feeds the aligned parts into a sewing machine. Such a procedure has definite drawbacks, one being a lack of uniformity in the collars produced. Additionally, such a procedure requires highly skilled operators and fails to take advantage of automated cam or pantograph stitching equipment which can sew materials according to a predetermined pattern.

SUMMARY OF THE INVENTION

The present invention overcomes these and other disadvantages, and one of the features of the present invention is an automatic distortion of the collar cape so as to provide edge alignment with the band prior to joining. Another feature of the present invention is the production of two piece collars having uniform necktie space. Still another feature is the elimination of the skill and dexterity required to join cape and neckband portions along a concurrent arc.

Therefore, it is an object of the present invention to provide a machine for automatically distorting the cape portion to permit joining of the cape and neckband along a concurrent arc.

Another object is to provide two piece collars having uniform necktie space.

Another object of the present invention is to provide a cape joining machine which can be used in conjunction with automatic cam or pantograph sewing equipment.

A still further object of the present invention is to provide a machine for automatic cape joining which requires little or no skill to operate.

In accordance with one embodiment of the present invention, a pre-assembled outer and interliner ply portion of a neckband is placed in a recessed section of a jig. The cape is then laid upon a projecting element and is oriented so that the free unfinished edge slightly overlaps the recessed area and is in alignment with and covers the edge of the neckband. A pneumatically operated clamp holds the positioned parts stationary while a second pre-assembled outer and interliner ply portion is placed in juxtaposition with the first ply portion. A second pneumatically operated clamp locks the positioned components in place while a profile stitching machine seams the parts together to form a completed collar.

For a more complete understanding of the invention, reference should be made to the drawings, the accompanying detailed description and the appended claims.

IN THE DRAWINGS

FIG. 1 is a plan view of a machine constructed in accordance with the present invention.

FIG. 2 is a perspective view of the machine of FIG. 1.

FIG. 3 is a side elevation of the machine of FIG. 1.

FIG. 4 is a plan view of a cape and a neckband prior to alignment and joining.

FIG. 5 is a plan view of a constructed collar.

FIG. 6 is a vertical sectional view of the collar of FIG. 5 taken along line A—A in FIG. 5.

FIG. 6A is an enlarged illustration of a portion of FIG. 6.

FIG. 7 is a plan view of the machine of FIG. 1 with the collar parts in position for stitching.

DESCRIPTION OF PREFERRED EMBODIMENT

FIGS. 1, 2, and 3 show a frame 10 including a jig 12 removably mounted thereon. Jig 12 includes a recess 18 having a depth approximating the thickness of one outer ply and one interliner ply of a neckband. Pins 14 and 16 serve to locate jig 12 on the frame 10. Jig 12 can be interchangeable to accommodate neckbands of varying sizes. A flap 20, shown open, is hinged to jig 12 and may typically have an edge contour 21 similar to the neckband edge. Flap 20 clamps the assembled cape and neckband portions prior to seaming as will be described shortly. A pneumatic cylinder 22 is rigidly secured to frame 10. Referring to FIG. 2, cylinder 22 includes a piston rod 24 which is supported by guide 25. Flexible joint 27 is attached to the end of rod 24 and transmits axial rod motion to flap 20 thru link 23 and pin joint 19. Joint 19 includes a removable pin 29 to permit detachment of flap 20 from link 23. A leaf spring 31 is located on jig 12 and restrains flap 20 after the latter has been closed. Flap 20 includes a handle member 44 for transporting jig 12 away from the frame. A plate 28 having the same thickness as jig 12 is rigidly attached to frame 10 and is in alignment with the rear edge of the jig. Plate 28 includes a hump-like projection 30 which may typically be a segment of a cylinder. A second hinged flap 32 is shown in a neutral or open position and is operatively associated with flap 20. Flap 32 includes an edge 33 which complements edge 21 of flap 20. Flap 32 further includes a cut-out portion 34 which permits the flap to close without interference from projection 30. A second pneumatic cylinder 36 includes a piston rod 38 which is connected

to flap 32 by link mechanism 40. Floor switch 60 is operatively associated with pneumatic cylinders 22 and 36 and is actuated by the operator to open and close flaps 20 and 32. Typically, floor switch 60 may be of the multi-position type whereby initial actuation closes flap 32; a second actuation closes flap 20 and simultaneously opens flap 32 and a final actuation opens flap 20. However, any other suitable arrangement known to the art could be used to actuate and control the pneumatic cylinders.

FIG. 4 shows a cape 50 and an outer neckband and inter-liner ply 52 prior to alignment and joining. The arc of the neckband is flatter than the cape arc, creating approximately an one-eighth inch difference at the cape midsection indicated generally as 53.

FIGS. 5 and 6 show cape 50 joined to outer neckband and interliner plies 52 and 54 by seam 55.

FIG. 7 shows the parts of the collar clamped together and prior to stitching.

In a typical operating sequence, outer neckband and interliner ply 52 is placed by the operator into recess 18 with the interliner ply face up. A cape 50 is then laid upon the surfaces of plate 28 and jig 12 so that the free edge of the cape projects slightly into the area of the recess 18 and covers the edge of the neckband an amount sufficient to allow attachment by a seam. Projection 30 distorts the cape 50 in such a way that the cape edge becomes aligned with the neckband edge. The operator then presses floor switch 60 to actuate cylinder 36 causing flap 32 to secure cape 50 in its distorted position. A second outer neckband ply 54 is placed in juxtaposition with the first outer ply, sandwiching cape 50 therebetween. Cylinder 22 is actuated by switch 60; flap 20 clamps the positioned parts and simultaneously, flap 32 returns to its neutral or open position.

The parts are then joined together by a seam or, if desired, jig 12 may be removed from the frame and transported with the assembled parts to a profile stitching machine for subsequent joining.

Although the 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 this invention. Additionally, certain features may be used independently of others and equivalents may be substituted for the various apparatus elements and method steps all within the spirit and scope of the invention.

I claim:

1. In an apparatus for handling garment collars during the fabrication thereof, the improvement including a surface having a recess therein for receiving a first neckband part, a distorting member on the surface so located as to lie beneath a cape part when an edge thereof extends over the recess, a first clamp for securing the cape on the surface and a second clamp for holding the several collar parts for stitching after a second neckband part is aligned with said first neckband part.

2. The apparatus of claim 1 including a frame and wherein said surface is defined by a first base removably attached to said frame and having said recess therein and a second base rigidly attached to said frame and coplanar with said first base, said second base including said distorting member on the surface thereof, said first clamp being a first flap hingeably attached to said second base and said second clamp being a second flap hingeably attached to said first base.

3. The apparatus claim 2 wherein said distorting member is a segment of a cylinder.

4. The apparatus of claim 3 including means for sequentially moving said first and second flaps between open and closed positions.

5. The apparatus of claim 4 wherein said means for sequentially moving said first and second flaps includes a first pneumatic cylinder flexibly attached to said first flap, a second pneumatic cylinder flexibly attached to said second flap and a switch operatively associated with said pneumatic cylinders for actuating said cylinders in sequence.

6. A method of positioning cape and neckband parts prior to joining to form a completed collar including the steps of

- a. overlapping an arcuate edge of a first neckband part with an unfinished arcuate edge of a cape part;
- b. distorting the body of said cape part to change the curvature of said unfinished arcuate edge whereby said arcuate edges of said first neckband part and said cape are in alignment;
- c. aligning a second neckband part with said first neckband part so as to sandwich the cape therebetween;
- d. clamping said aligned parts to fix the positions thereof, and
- e. stitching the positioned parts together.

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