Jan. 24, 1956 G. WALDES 2,731,643

MANUFACTURE OF TROUSER FLIES

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FIG. 1

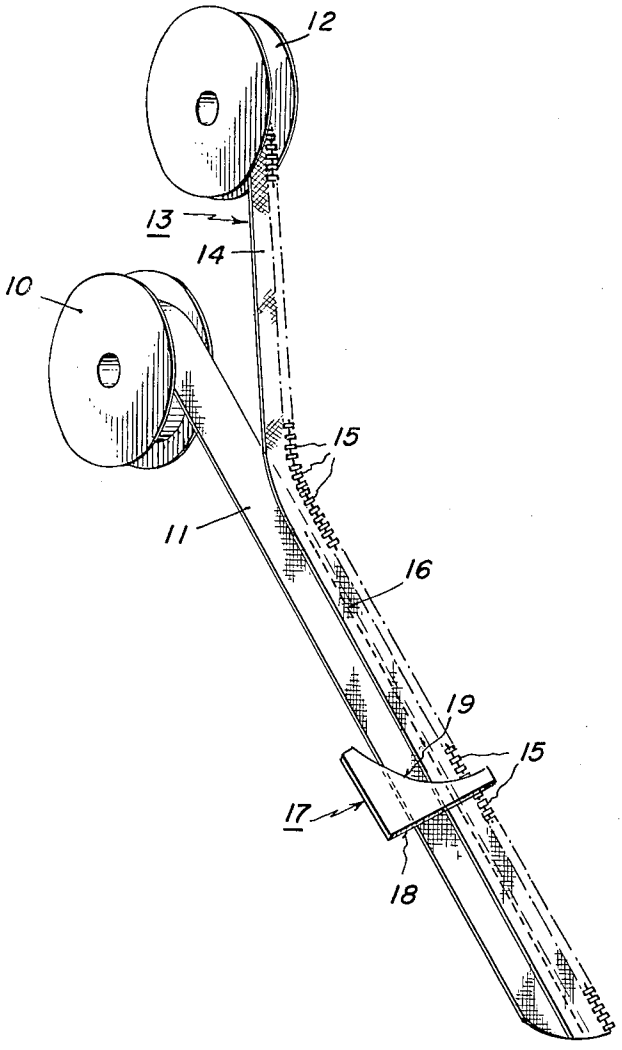
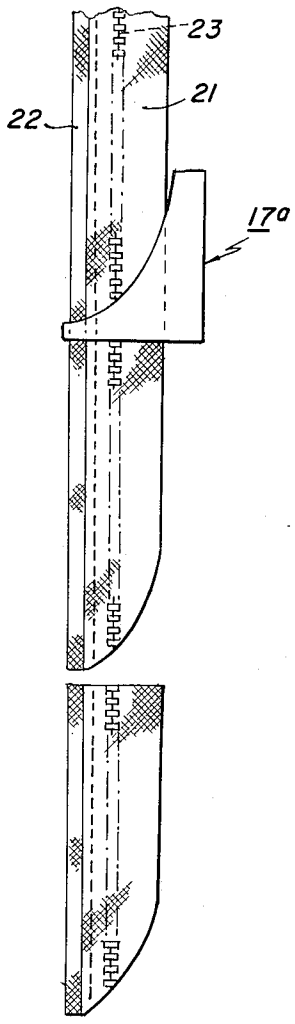


FIG. 2



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MANUFACTURE OF TROUSER FLIES

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2 Claims. (Cl. 2—234)

This invention relates to improvements in the manufacture of trouser flies, and, more particularly, to an improved method of assembling and attaching a slide fastener or so-called zipper closure on and to the fly strip of a trouser fly unit.

In the manufacture of zipper closures for trouser fly openings, it was earlier the usual practice to sew a complete zipper of the required length to a pair of fly strips which had been previously cut to desired length and to the required curvature at their crotch ends. To overcome the numerous handling and relatively time-consuming operations involved in the prior practice, it was later proposed to separately attach each of the zipper stringers to its fly strip by feeding successive lengths of a continuous zipper stringer, i. e. a stringer devoid of element-free spaces characterizing the conventional slide fastener stringer, from a roll or spool on to a preformed fly strip, thereupon sewing said parts together, and finally cutting the stringer to the length of the preformed fly strip. While improving the earlier procedure to some extent, the later procedure nevertheless also involved considerable handling of the fly strips both in their performing and in properly relating them to the continuous zipper stringer for the subsequent sewing and final cutting operations.

With the above in mind, a principal object of the invention is the provision of a method of attaching zipper closures to the fly strips of a trouser fly closure, which is simpler, faster and more economical in its practice than the prior methods as outlined in the foregoing.

A more particular object of the invention is the provision of a continuous method of assembling and attaching a zipper stringer on to a fly strip, which does away with any necessity of precutting and preforming either the stringer or fly strip to the length and shape required thereof for use as a trouser fly closure, prior to the sewing operation.

Another object of the invention is the provision of a method of forming trouser fly closures characterized in that the zipper stringer and fly strip components thereof are cut to desired length and shape in a single operation following attachment of the stringer to the fly strip, and wherein such attachment is effected in continuous manner.

The above and other objects and advantages of the improved method of this invention will be seen from the following detailed description taken with the accompanying drawing, in which:

Fig. 1 generally illustrates the manner in which the zipper stringer is continuously assembled with and attached to the fly strip, and the combined stringer and fly strip is thereupon fed to a cutting device functioning to sever complete fly units from the combined stringer and fly strip advancing thereto, the view illustrating the method followed in forming the right-side fly units; and

Fig. 2 is a view illustrating the same method of assembly, attachment and severance employed in the production of the opposite or left-side trouser fly units, the view additionally illustrating a complete left-side fly unit

severed from the combined zipper stringer and fly strip advancing to the cutting device.

Referring to Fig. 1, reference numeral **10** designates a reel or spool on which is wound an indeterminate length of fly strip material **11** and which is subsequently to be cut into lengths suitable for use as the fly strip of a trouser fly. Spaced from but operatively related to the spool **10** is another reel or spool **12** on which is wound an indeterminate length of a continuous slide fastener or zipper stringer **13**, as the term "stringer" is herein employed to include the zipper tape **14** carrying along one edge thereof a multiplicity of fastener elements **15** arranged at uniformly spaced intervals along the length of the edge to which they attach.

According to the invention, the zipper stringer **13** and the fly strip **11** are drawn from the spools **12** and **10**, respectively, at a uniform rate and are brought together in superimposed and laterally offset relation in advance of being run through a sewing machine, not shown. In passing through the sewing machine, the zipper stringer **13** is progressively sewn to the fly strip **11** by a longitudinal line of stitches **16**.

The combined stringer and fly strip leaving the sewing machine as a continuously moving web or strip may, for example, be wound on a spool and stored for use in making up individual fly units therefrom as required, in the manner hereinafter explained, or, as illustrated, it may be fed at the uniform rate at which it leaves the sewing machine directly to a cutting device generally designated **17**. Preferably, the cutting device has multiple cutting edges, of which the forward or leading edge is straight and disposed transversely to the length of the combined stringer and fly strip, and the rear or trailing cutting edge **19** has curvature corresponding to that required at the crotch end of a trouser fly unit. The cutting device **17** may be mechanically driven and its operation is timed to the rate of feed motion of the combined stringer and fly strip advancing to it, so that, on each stroke, its cutting edge **18** severs from the end portion thereof a length which corresponds to that required for the particular trouser fly unit being produced. Due to the straight and transverse disposition of the cutting edge **18**, the edge of the fly unit which it forms is straight and normal to the length of said unit, as required for the top edge of such a unit.

In addition to its severing or cutting-off function as aforesaid, the cutting device **17** through its trailing cutting edge **19** also forms the end edge of the combined stringer and fly strip resulting after the cutting-off operation aforesaid to the curvature required at the crotch of the fly unit. Thus, each operation of the cutting device **17** results not only in the production of a proper length of fly unit having a straight top edge, but it also forms the crotch-end edge for the next succeeding fly unit to be severed.

It will be understood from the illustrated curvature of the crotch-end edge formed as aforesaid that the fly unit produced according to Fig. 1 is for use as the right-side fly for the trouser opening. The left-side fly may be formed in similar manner, with the exception that, in assembling the fly strip **21** and fastener or zipper stringer **22**, the fly strip is preferably superimposed on the stringer, and said parts are related laterally so that the edge of the stringer tape which is devoid of the fastener elements **23** extends beyond the corresponding edge of the fly strip, so that the latter extends in covering relation to the fastener elements generally as illustrated. It is also to be understood that the cutting device **17*a*** employed in severing the right-side fly unit from the combined stringer and fly strip advancing to it is oppositely disposed as respects the cutting device **17**, with the result that the curved cutting edge **19*a*** thereof forms the crotch-

end edge to a curvature opposite that given by the cutting edge 19; that is to say, to the curvature required at the crotch end of a left-side trouser fly.

In actual practice of the above described method, it has been established that zipper-type fly units may be manufactured at a substantially faster rate and more economically than possible according to the prior methods. This follows from the fact that, according to the present method, it is no longer necessary to preform the fly strips in advance of sewing them to the required lengths of zipper or slide fastener stringers; or of cutting the stringers to the length of the preformed fly strips when the stringers are supplied in a continuous length. On the other hand, according to the present method, continuous lengths of both zipper stringer and fly strip may be sewn together uninterruptedly and thereupon continuously fed in a linear path to a cutting device which effects severance therefrom of a fly unit of required length and, simultaneously therewith, cuts the edge of the advancing combined stringer and fly strip which is to form the crotch end of the next fly unit to be severed to the required curvature.

As the method of the present invention may be varied without departing from the scope of the invention as defined in the appended claims, it is intended that all matter contained in the above description or shown in the accompanying drawing shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. A method of manufacturing trouser flies, which comprises the steps of progressively associating a continuous slide fastener stringer with a continuous strip of fly piece material, sewing said stringer and fly strip together in a continuous operation, causing the combined stringer and fly strip to move in a linear path, severing from the advancing end of said combined stringer and fly strip a succession of lengths thereof corresponding to the desired length of trouser fly, and in each said severing operation simultaneously forming a straight top-end edge on each severed length and a curved end edge on the advancing end of the combined stringer and fly strip, the curvature of which corresponds to that of the bottom crotch-end edge of a trouser fly.

2. A method as set forth in claim 1, wherein the continuous stringer and the continuous strip of fly-piece material are each drawn from an indeterminate length thereof arranged in roll formation.

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