United States Patent

Glassman

[15] **3,695,490**

[45] **Oct. 3, 1972**

[54] **FABRIC ARTICLE EVERTING DEVICE HAVING LATCHING MEANS WITH REMOTELY-ACTUATED RELEASE**

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[73] Assignee: **Pennsylvania Sewing Research Corp.**

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[21] Appl. No.: **55,473**

[52] **U.S. Cl.** **223/40**

[51] **Int. Cl.** **A41h 43/00**

[58] **Field of Search** 223/39–43, 75

[56] **References Cited**

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Primary Examiner—Jordan Franklin
Assistant Examiner—Geo. V. Larkin
Attorney—Le Roy Greenspan

[57] **ABSTRACT**

A device comprising a rigid tube adapted to receive a tubular fabric article thereon and a rod, slidable into the tube and adapted to evert the article into the tube. The device has a means for latching the rod at the end of its travel and means, remote from the latching means, for actuating the release of the rod to permit it to return to its original position.

4 Claims, 7 Drawing Figures

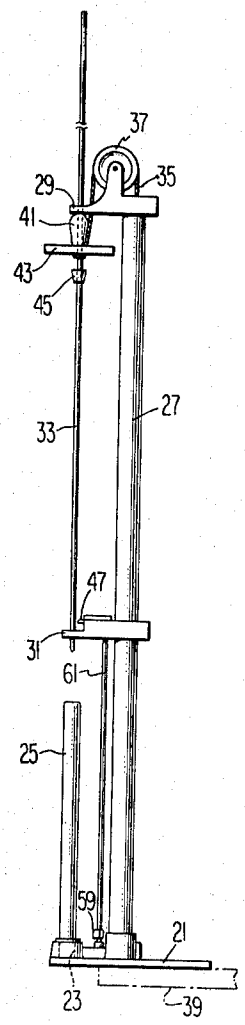


Fig. 1.

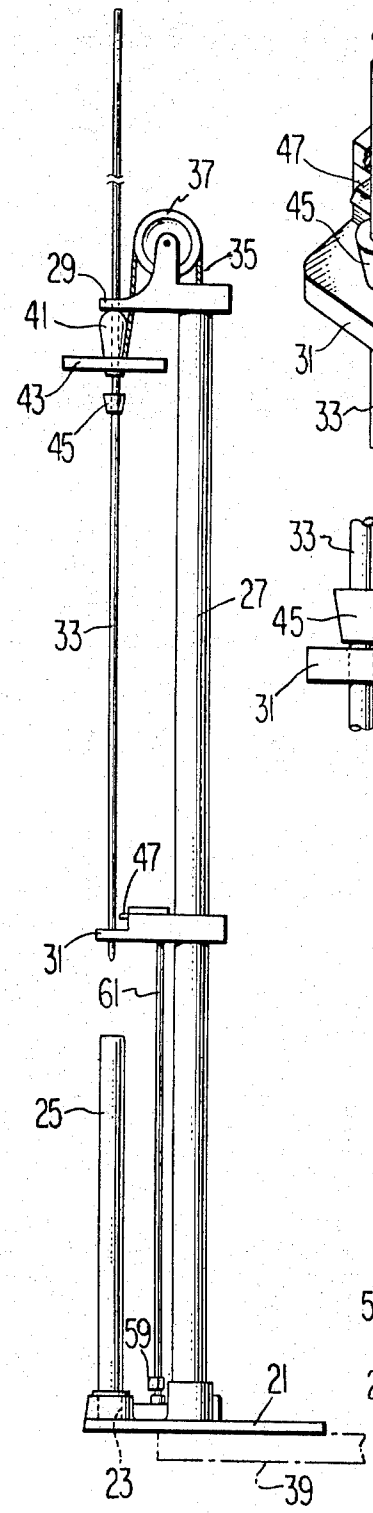
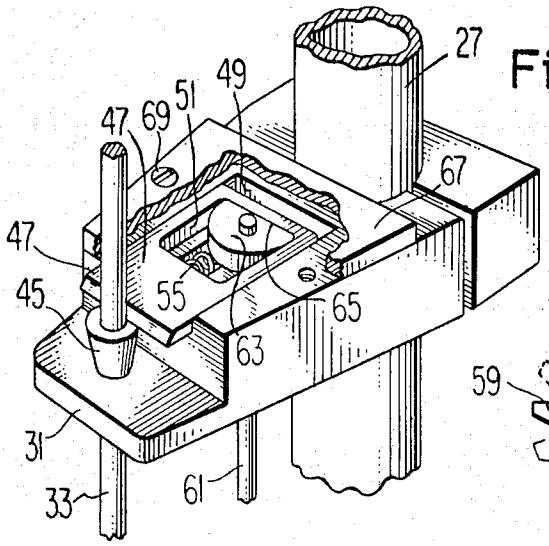


Fig. 2.



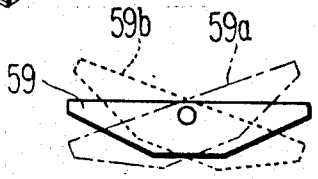


Fig. 4.

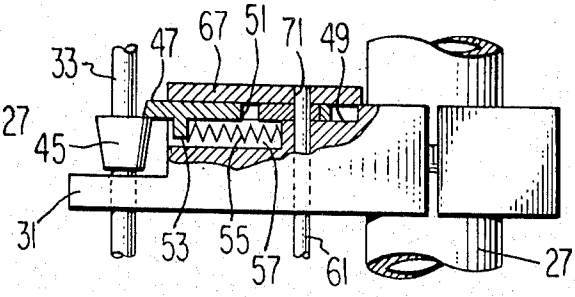


Fig. 3.

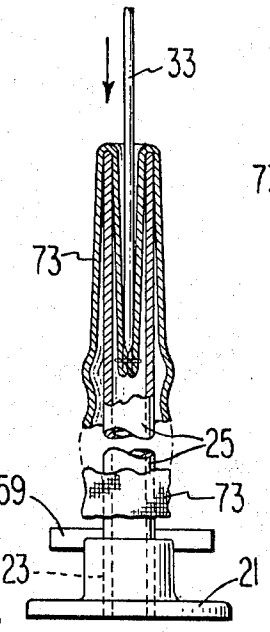


Fig. 5.

Fig. 6.

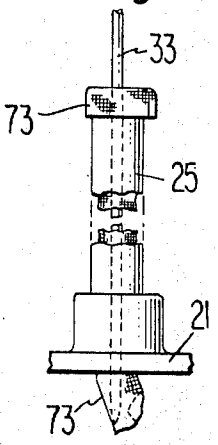
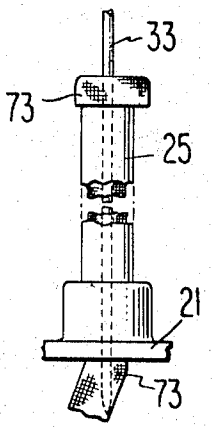


Fig. 7.



FABRIC ARTICLE EVERTING DEVICE HAVING LATCHING MEANS WITH REMOTELY-ACTUATED RELEASE

BACKGROUND OF THE INVENTION

This invention relates to an improved device for everting tubular fabric articles, such as belts, ties and other elongate articles.

Tubular fabric articles, such as fabric belts, are ordinarily sewn with their front sides faced inwardly. Then, the articles are turned or everted so that the front side of the fabric is faced outwardly. One method for achieving this turning or everting includes slipping the sewn article over a rigid tube, then sliding an everting rod into the tube, thereby pushing the article into the tube causing it to become everted. When the article protrudes from the tube, it is pulled through manually. One problem with this prior method is that the corners of the article are incompletely turned and must be pointed or otherwise worked out by hand after the article has been pulled through the tube.

In a previous everting device described in application Ser. No. 851,377 filed Aug. 19, 1969, by Aaron Glassman, and now U.S. Pat. No. 3,547,320, means are provided for releasably latching the rod with its end extended beyond the tube. In this position, the end of the everted article may be grasped manually and worked to complete eversion of the corners of the article. In operating this previous everting device, it was found disadvantageous to release the latch at a position adjacent the latch.

SUMMARY OF THE INVENTION

The novel device, as in the prior device, comprises a support member having a hole therein, a rigid tube mounted at one end thereof on the support over the hole, an everting rod slidable from a first position spaced from the other end of the tube to a second position within the tube and extending beyond the one end. There are also means for pulling the rod from the first position to the second position, means for returning the rod from the second position to the first position, and means for releasably latching the rod in the second position. In addition, the novel device includes means for actuating the latching means to release the everting rod from a position remote from said latching means.

In operation, an article to be turned is slipped over the tube and the everting rod is pulled from its first position to its second position until it is latched there. The pulling causes the article to become everted in the tube. Then, with the rod latched in its second position, the end of the article may be grasped manually and worked or pointed to complete the eversion in the corners of the article. Upon completion, the article is pulled through the tube, and the rod unlatched and returned to its first position by actuating the latching means to release the rod from a position remote from the latching means.

By providing a remote means for actuating the latching means to release the rod, the release can be actuated from a more convenient and advantageous position. Preferably, the release is actuated from a position adjacent the area where the pointing is completed.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view of the novel device with the everting rod in its first position.

FIG. 2 is a partially broken away perspective view of the latching means and lower rod guide of the device shown in FIG. 1 with the everting rod in its second position.

FIG. 3 is a partially broken away elevational view of the latching means of the device of FIG. 1 with the rod in its second position.

FIG. 4 is a plan view of the finger press for actuating release in the latching means of the device of FIG. 1.

FIG. 5 is a partially broken away elevational view of the tube of the device of FIGURE 1 with an article partially pushed through and everted by the rod.

FIGS. 6 and 7 are elevational views of the tube of the device of FIGURE 1 with an article pushed by the rod to its second position, illustrating how the corners are worked to complete the eversion.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The device illustrated in FIGURE 1 comprises a support member 21 having a hole 23 therein. One end of an elongate rigid tube 25 is mounted in an upright position on the support in the hole. A tubular column 27 is also mounted in an upright position on the support 21, and has thereon an upper rod guide 29 and a lower rod guide 31. An everting rod 33 passes through the upper and lower rod guides 29 and 31. The rod 33 is normally held in its "up" or first position by a woven nylon cording 35 attached (as by clamping a loop thereof about the rod) at one end to the rod 33 and which passes over a pulley 37 and then down within the tubular column 27, where the other end is attached to a return spring (not shown). The device is typically mounted on a table 39 with screws through the support member 21. The upward travel of the rod 33 is limited by a pull-down handle 43 fixedly mounted on the rod 33 and a resilient rubber bumper 41 between the handle 43 and the upper guide 29.

A conical tooth 45 is also fixedly mounted on the rod 33 just below the handle 43 with the narrow end down. Integral with and part of the lower rod guide 31 is a latching bar 47 which is urged toward the rod 33. When the handle 43 is pulled down, the rod slides from its first position shown in FIG. 1 downward against the spring tension applied through the cording 35. The rod 33 slides down to its "down" or second position, until the tooth 45 bears against the lower guide 31 as shown in FIGS. 2 and 3. As the tooth 45 passes the latching bar 47, the bar 47 slides over and behind the tooth 45, thereby latching the rod 33 in its second position. The latching bar 47 slides in a recess 49 in the lower rod guide 31. The bar has a window 51 cut therethrough and an integral finger 53 extending downwardly. The latching bar 47 is urged downward toward the rod 33 by a compressed latching bar spring 55 (FIGS. 2 and 3) mounted in a slot 57 within the lower guide 31.

The rod 33 may be unlatched by pressing the finger press 59 which comprises an actuating means is fixedly mounted near the lower end of a shaft 61. The shaft 61, which comprises a linkage, is mounted at its lower end in a hole in the support member and at its upper end in

a hole in the lower rod guide **31**. A cam **63** is fixedly mounted on the other end of the shaft **61** within the window **51** of the latching bar **47**. The cam **63** and the window **51** comprise a releasing means. The cam **63** has a flat surface **65** which engages a corresponding surface defining the window **51**. The recess **49** with the bar **47** and the cam **63** therein is closed by a cover plate **67** held in place by two screws **69**. The extreme end of the shaft **61** rides in a hole **71** in the cover plate **67**. When the finger press **59** is depressed so as to rotate the shaft **61** either counterclockwise or clockwise to positions **59a** or **59b** as shown in FIG. **4**, the cam **63** is rotated. Rotation of the cam **63** in either direction causes the latching bar **47** to be slid away from the rod **33** against the pressure of the bar spring **55**, thereby unblocking the tooth **45** and permitting the rod **33** to move back to the first position.

The eversion of an article in the device is illustrated in FIGS. **5**, **6** and **7**. In making a belt, a long narrow strip of fabric is folded and sewn along one side and one end with the front side of the fabric inward. The article which, in this case, is the sewn strip **73** is slipped over the tube **25**. The rod **33** is slid from its first position to its second position, pushing the material **73** ahead of it and everting the article as it slips over the edge of the tube **25** as shown in FIG. **5**. When the rod **33** reaches its second position, the latching bar **47** engages the conical tooth **45**, thereby preventing the rod from sliding back. At this position, the rod **33** and the material **73** are in the tube **25** and extend beyond and below the support member **21**, as shown in FIGS. **6** and **7**. The operator may grasp the material **73** with his fingers and move the material back and forth against the rod **33** until one corner (FIG. **6**) and then the other corner (FIG. **7**) of the material are completely everted. Then, the finger press **59** is depressed causing the latching bar to be withdrawn and the rod **33** is drawn to its first position by the spring tension acting through the cording **35**. Then, the material is simply pulled through the support member **21** and out of the device.

The novel device, because of the remote location of the means for actuating the release of the latching means, permits the operator to evert the corners of the fabric article in the device with the aid of the rod using one or both hands, and then to return the device for the start of the next cycle more quickly and with less effort than with previous devices. The articles may thereby be turned more quickly and cheaply than by the previous practice. Also, in the preferred embodiment, the unlatching means (including the finger press **59**, shaft **61** and cam **63**) may be operated either by the operator's right hand (counterclockwise rotation) or left hand (clockwise rotation).

I claim:

1. A device for everting tubular fabric articles comprising

a support member having a hole therein,

an elongate rigid tube, one end of said tube being mounted on said support member over said hole, said tube being adapted to receive thereover a fabric article to be everted,

an everting rod slidable from a first position spaced from the other end of said tube to a second position within said tube and extending beyond said one end of said tube,

means for pulling said rod from said first position to said second position,

means for returning said rod from said second position to said first position,

means for releasably latching said rod in said second position,

means for releasing the latching of said rod from said second position,

actuating means for providing mechanical movement for releasing said latching,

and a linkage connecting said actuating means and said releasing means, said linkage being adapted to transmit said mechanical movement from said actuating means to said releasing means.

2. The device defined in claim **1** wherein said latching means comprises a tooth on said rod, a latching bar for engaging said tooth when said rod is in said second position and a spring urging said bar toward said rod; and said releasing means comprises a mechanical member adapted upon actuation to move said bar away from said rod against the urging of said spring.

3. The device defined in claim **1** wherein said latching means comprises a cone shaped tooth fixed to said rod with the small end thereof toward said sleeve, a latching bar adjacent said rod, and a spring urging said latching bar against said rod, said bar having a recess therein, said recess being defined in part by a cam-engaging surface, said releasing means comprises a cam rotatably mounted in said recess on a shaft, said linkage comprises a shaft extending to a position remote from said latching bar, and actuating means comprises means for rotating said shaft attached to said shaft in said remote position.

4. The device defined in claim **3** wherein said cam is of such configuration that, when said shaft and cam are rotated either clockwise or counterclockwise, said cam engages said surface and moves said bar against the urging of said spring.

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