

[54] **APPARATUS FOR APPLYING HANG TABS TO ZIPPERS**

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[22] Filed: **Dec. 10, 1974**

[21] Appl. No.: **531,237**

[52] U.S. Cl. **29/211 R; 29/200 R; 29/208 R; 29/211 D**

[51] Int. Cl.² **B23Q 7/10**

[58] Field of Search **29/208 R, 200 R, 200 B, 29/211 R, 211 D**

[56] **References Cited**

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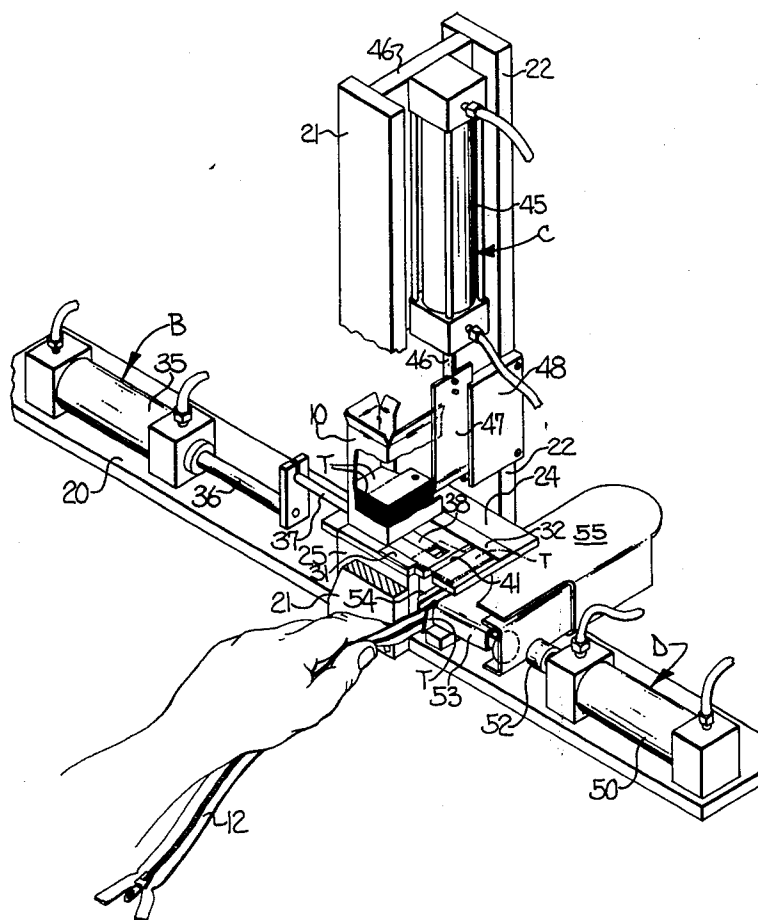
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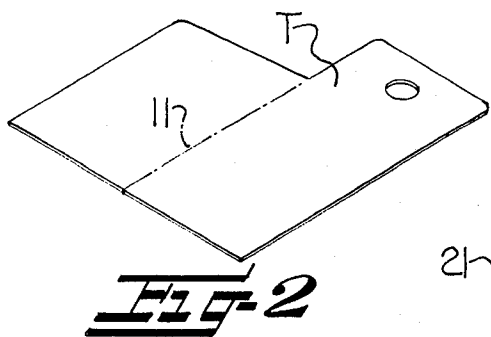
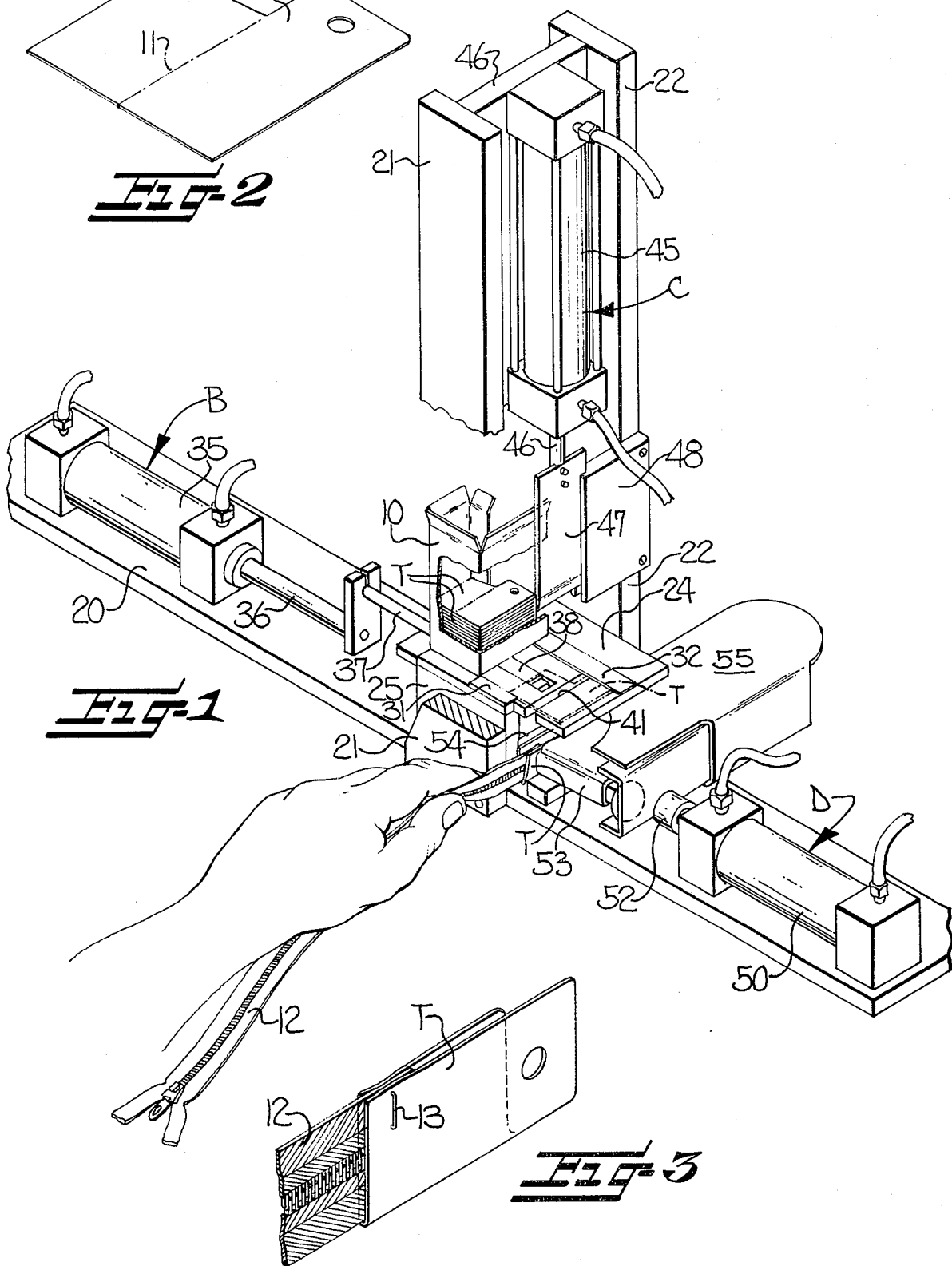
Primary Examiner—Victor A. Dipalma
Attorney, Agent, or Firm—Parrott, Bell, Seltzer, Park & Gibson

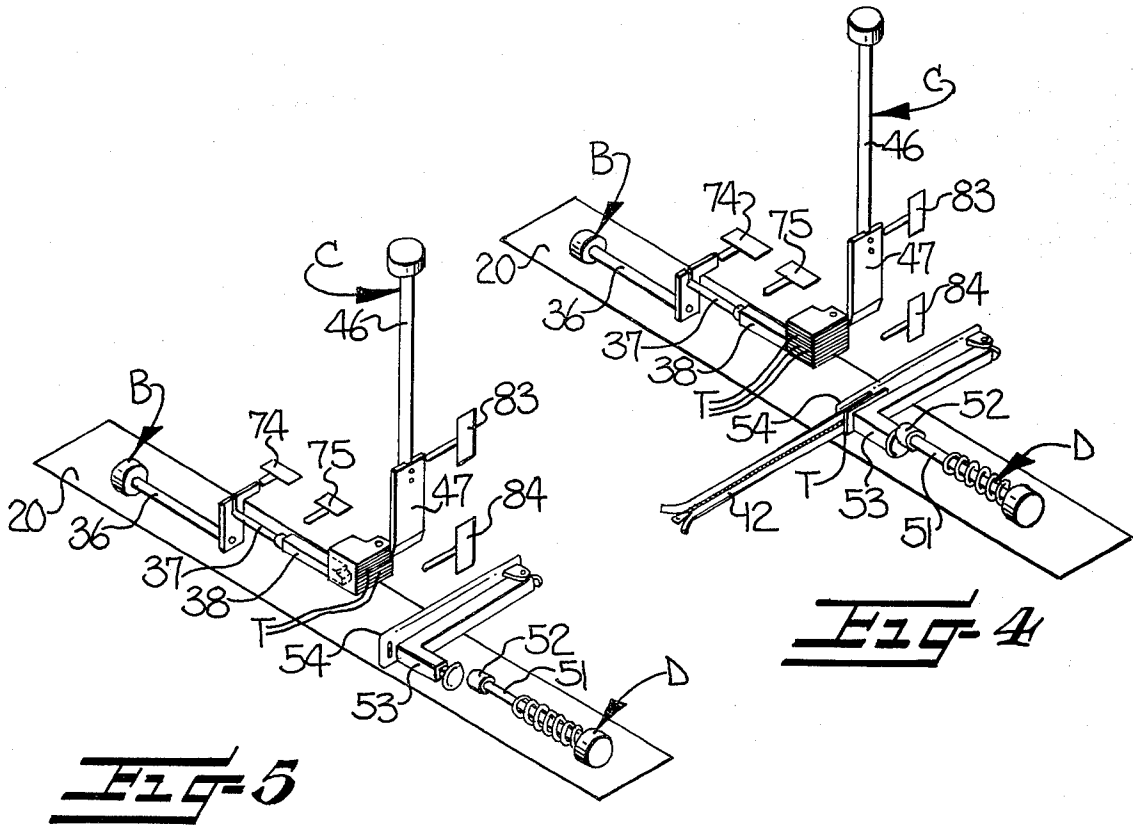
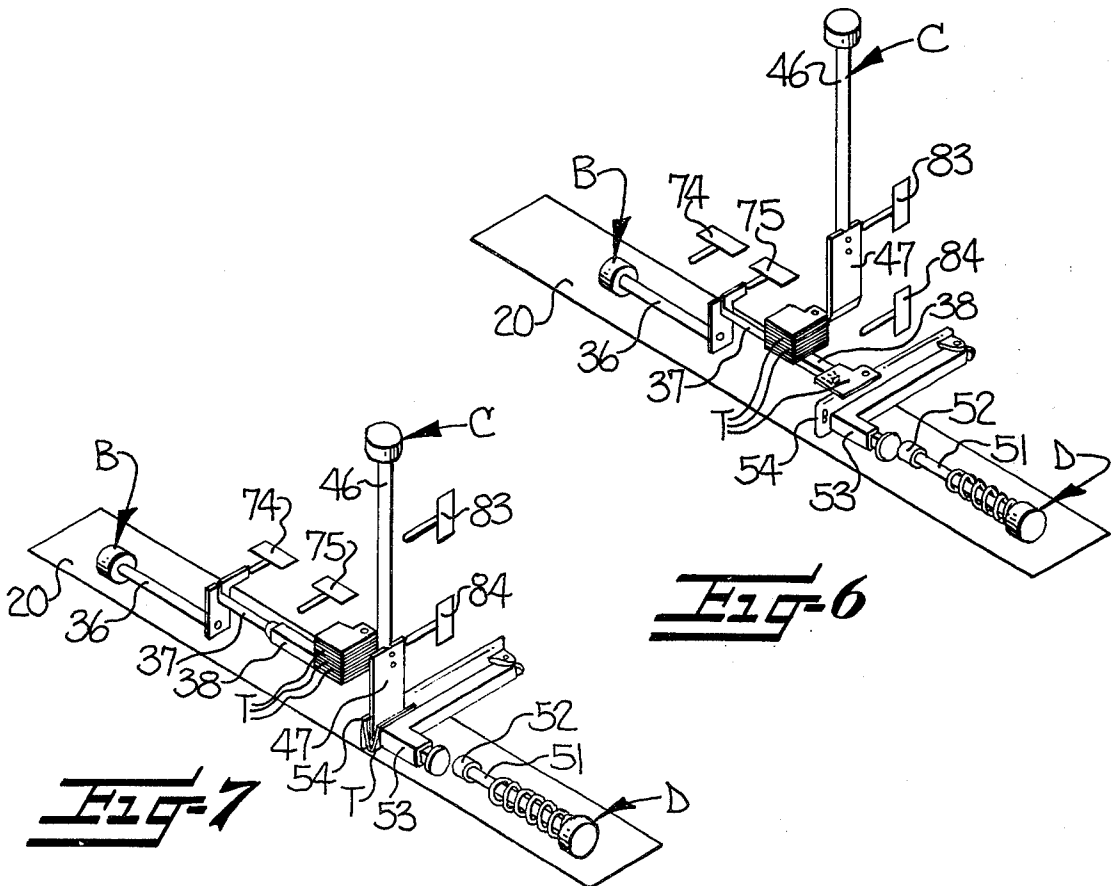
[57] **ABSTRACT**

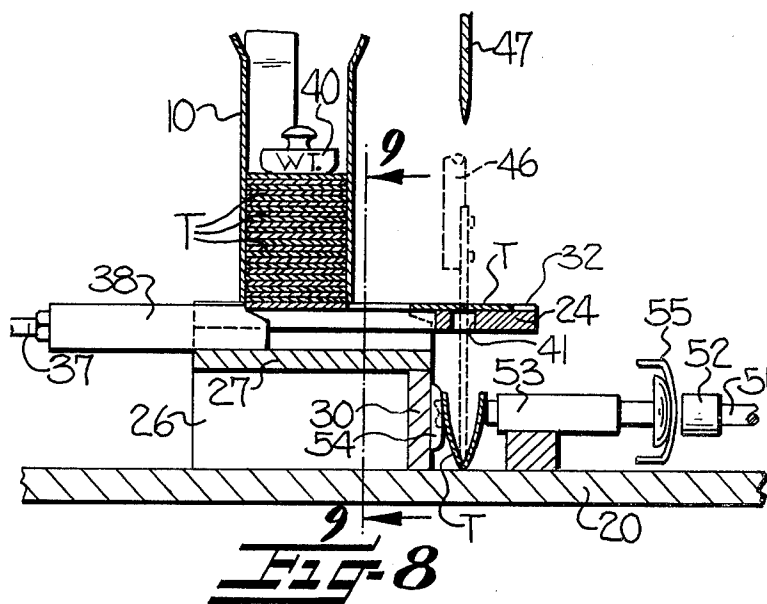
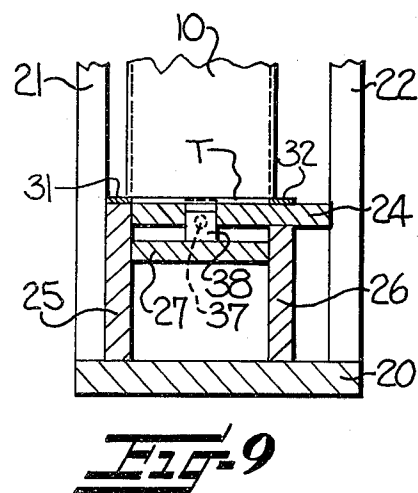
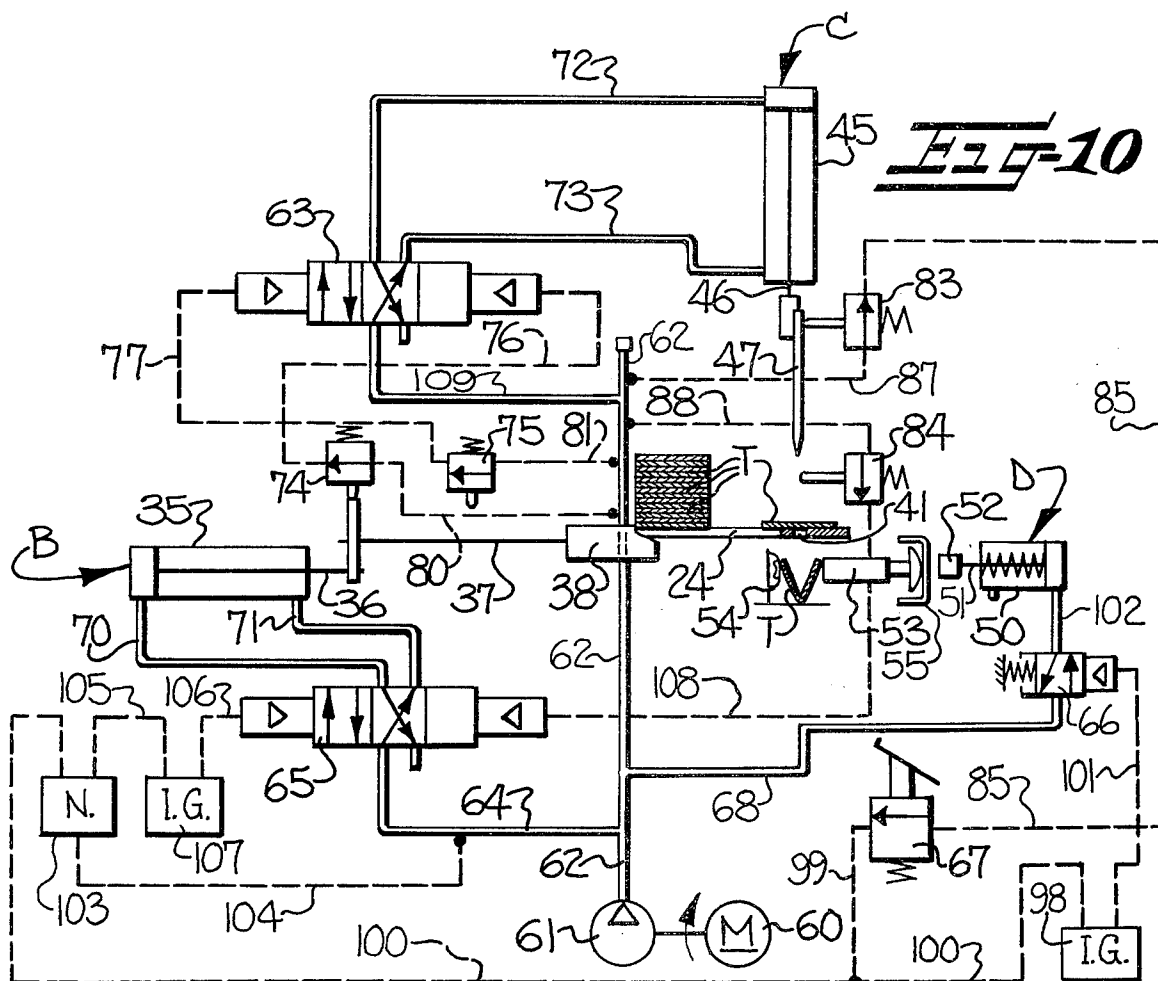
This apparatus includes a magazine for supporting a stack of hang tabs in flat condition and a reciprocating slide plate moves beneath the stack of hang tabs to successively remove the bottom hang tab from the stack and move the same to an adjacent folding station. A folding blade is supported for reciprocation in a vertical plane and moves down into engagement with the hang tab to fold the same medially and provide a pair of legs of substantially equal length into which the end of the zipper may be positioned by the operator. A staple head is supported beneath and in alignment with the folding station and a manual switch is provided for actuating the staple applying head to connect together the legs of the hang tab and to secure the end of the zipper therebetween.

8 Claims, 10 Drawing Figures









APPARATUS FOR APPLYING HANG TABS TO ZIPPERS

This invention relates generally to an apparatus for applying hang tabs to zippers and more particularly to an apparatus for folding the hang tab so that it may be stapled to the end of the zipper and provide a convenient display supporting hang tab at one end.

Zippers are usually displayed for sale purposes in paperboard packages which substantially cover the zippers and these packages are rather expensive to produce. This expensive type of package adds a substantial amount to the cost of the zippers and also increases the bulk of the zippers, thereby increasing the shipping cost.

It is an object of the present invention to provide an apparatus for economically applying an inexpensive hang tab to the zipper so that the cost of the zipper may be reduced and the hang tab provides an efficient means of displaying the zipper for easy selection by a prospective purchaser.

In accordance with the present invention, the present apparatus for applying hang tabs to zippers includes a magazine for supporting a stack of hang tabs in a flat condition. Means is provided for successively removing the bottom hang tab from the stack and moving the same to an adjacent folding station where means is provided for folding the hang tab along a line extending through the medial portion of the tab to provide a pair of legs of substantially equal length and for maintaining the hang tab in this folded condition to receive the end of a zipper spaced between the legs of the folded hang tab. Means is also provided for applying a staple through the legs of the hang tab and the end of the zipper positioned therebetween to connect together the legs of the hang tab and to secure the end of the zipper therebetween. The hang tab feeding means, the folding means and the staple applying means are each actuated by air cylinders which operate sequentially after an air switch is manually operated to apply the staple through the hang tab and the zipper.

Other objects and advantages of the invention will appear as the description proceeds when taken in connection with the accompanying drawings, in which:

FIG. 1 is a somewhat schematic isometric view of the hang tab applying apparatus, with parts broken away for purposes of clarity;

FIG. 2 is an isometric view of the type of hang tab which is applied to the zipper;

FIG. 3 is a fragmentary isometric view looking at one end of the zipper, with the hang tab applied thereto;

FIGS. 4-7 are somewhat schematic isometric views of the apparatus of the present invention and illustrating the operational sequence of steps carried out by the apparatus in applying the hang tabs to the zippers;

FIG. 8 is a vertical sectional view through the central portion of the apparatus illustrated in FIG. 1 with the hang tab being folded in position in front of the stapler head;

FIG. 9 is a transverse vertical sectional view taken substantially along the line 9-9 in FIG. 8; and

FIG. 10 is a somewhat schematic diagram illustrating the manner in which the various folding and stapling steps are carried out and the operation of the various air cylinders.

Generally, the apparatus of the present invention includes a magazine 10 for supporting a stack of hang tabs, indicated at T in FIG. 2, in flat condition. Each of

the hang tabs T includes a medially extending crease line, indicated by the dash-dot line 11 in FIG. 2, to aid in folding the hang tabs in a manner to be presently described. Means, broadly indicated at B in FIG. 1, is provided for successively removing the bottom hang tab from the stack and moving the same to an adjacent folding station. Means, broadly indicated at C in FIG. 1, is provided for folding the hang tab along the line 11 extending through the medial portion of the tab to provide a pair of legs of substantially equal length and for maintaining the hang tab in this folded condition to receive the end of a zipper 12 between the legs of the hang tab. Means, broadly indicated at D in FIG. 1, is provided for applying a staple 13 through the legs of the folded hang tab and the end of the zipper 12 positioned therebetween to connect together the legs of the hang tab and to secure the end of the zipper therebetween.

The apparatus includes a horizontal base plate 20 (FIG. 1) and a pair of vertical support plates 21, 22 which are fixed at their lower ends to opposite sides of the horizontal base plate 20. A horizontal label support plate 24 is supported between the frame members 21, 22 and on the upper ends of support plates 25, 26 (FIG. 9). A slide plate support plate 27 is fixed in spaced relationship beneath the plate 24, for purposes to be presently described. A transverse end support plate 30 extends between the side support plates 25, 26 (FIG. 8) and beneath the forward end of the slide plate support 27. A pair of side hang tab guide plates 31, 32 are supported on the upper plate 24 and extend outwardly from the hang tab support magazine 10.

The means B for successively removing the bottom hang tab from the stack and moving the same to an adjacent folding station includes a tab feeding air cylinder 35 including a reciprocating piston rod 36 which is connected at its free end to an operating rod 37 fixed on the rear end of a slide plate 38. The slide plate 38 is supported for reciprocation in a slot in the upper plate 24 and its forward end is provided with a notch which is adapted to engage the rear end of the lowermost hang tab T positioned in the magazine 10. The hang tabs 10 are fed downwardly by gravity and by means of a weight 40 (FIG. 8) supported on the upper end of the stack of hang tabs in the magazine 10. When the air cylinder 35 is actuated, in a manner to be presently described, the piston rod 36 moves the slide plate 38 forwardly, as schematically illustrated in FIG. 6, to remove the bottom hang tab T from the stack and move the same to an adjacent folding station.

The means C for folding the hang tab along the line extending through the medial portion includes a folding station formed by a forward extension of the upper plate 24 which is provided with a folding slot 41 (FIG. 8) therein. A tab folding air cylinder 45 (FIG. 1) is supported on a cross plate 46 which is supported between the vertical support plates 21, 22 and the air cylinder 45 is provided with a piston rod 46. A reciprocating folding blade 47 is fixed on the lower end of the piston rod 46 and one side edge is guided in a guide plate 48, fixed on the vertical support plate 22. When a hang tab T is removed from the stack in the magazine 10 and positioned at the folding station, across the folding slot 41, as illustrated in FIG. 8, the folding blade 47 is moved downwardly, as illustrated in dotted lines in FIG. 8, to move the tab through the slot 41 and form a medial fold across the hang tab. As the folded tab is

moved down by the blade 47, a pair of legs of substantially equal length is provided and the folded hang tab is positioned to receive the end of a zipper between the legs thereof, as shown in FIG. 8.

The means D for applying a staple through the legs of the folded hang tab and the end of the zipper positioned therebetween includes an air cylinder 50 which is fixed in position on the base plate 20 and is provided with a piston rod 51 having a resilient bunter 52 on the outer end thereof. A stapler, including a staple head 53 and an anvil arm 54 pivotally connected thereto, is supported beneath the folding station, as illustrated in FIG. 8. A support cover 55 extends over the staple head operating plunger and is at times engaged by the resilient bunter 52 to actuate the stapler and apply the staple 13 through the legs of the hang tab and the end of the zipper positioned therebetween to connect together the legs of the hang tab and to secure the end of the zipper therebetween, as illustrated in FIG. 3.

As illustrated in FIG. 10, air under pressure is supplied by a motor 60 and a compressor 61 to a main air line 62 connected to one side of a folding cylinder air valve 63. A branch air supply line 64 extends from the supply line 62 and is connected to one side of a tab feeding air valve 65. Another branch supply line 68 is connected to the supply line 62 and to one side of an air valve 66. An air supply line 102 is connected to the other side of the air valve 66 and to one side of the air cylinder 50 which operates the stapler head 53. Air lines 70 and 71 connect the valve 65 to opposite ends of the tab feeding air cylinder 35. Air lines 72 and 73 connect the air valve 63 to opposite ends of the folding air cylinder 45. Air switches 74 and 75 are connected to opposite ends of the air valve 63 by pilot or control air lines 76, 77. The air switches 74, 75 are connected to the air supply line 62 by pilot lines 80, 81. Air switches 83 and 84 are operated by the folding blade 47 and switch 84 is connected to one side of the valve 65 by a pilot line 108. The air switches 83, 84 are also connected to the respective air supply line 62 by respective pilot lines 87, 88.

A pilot line 85 connects the air switch 83 to one side of a manually operated air switch 67. A pilot line 99 is connected at one end to the other side of the switch 67 and is connected to a pilot line 100. One end of the pilot line 100 is connected to an impulse generator 98. A pilot line 101 connects the other side of the impulse generator 98 to an air valve 66. The other end of the pilot line 100 is connected to one side of a "not" element 103 which is connected to the air supply branch line 64 by a pilot line 104. A pilot line 105 connects the other side of the "not" element 103 to one side of an impulse generator 107. A pilot line 106 connects the other side of the impulse generator 107 to the valve 65. A pilot line 108 connects the other side of the air switch 84 to the other side of the valve 65. An air supply line 109 connects the air supply line 62 to the valve 63.

METHOD OF OPERATION

Assuming that the folded hang tab T is positioned as shown in FIGS. 1 and 8, the operator then places the end of the zipper 12 between the folded legs of the hang tab, as illustrated in FIG. 3, and actuates the manual switch 67 so that air will flow into line 99 from line 62, the air passing through lines 87, 85 and switch 83. Air will also flow through line 100 impulse generator

98 and line 101 to operate the valve 66. With the valve 66 in open position, air under pressure will enter the air supply line 68 and line 102 to operate the air cylinder 50 to operate the stapler head 53 and apply the staple 13 through the legs of the hang tab T and the end of the zipper positioned therebetween to connect together the legs of the hang tab and to secure the end of the zipper therebetween, as shown in FIG. 3.

When the operator releases the switch 67, the "not" element permits air to pass through lines 105, 106 and impulse generator 107 and shifts the valve 65 from left to right in FIG. 10. When the valve 65 is shifted, air from the line 64 will enter the line 70 and the rear or outer end of the tab feeding cylinder 35 to move the piston rod 36 and the slide plate 38 forwardly and remove the lowermost hang tab T and move it to the folding station, as illustrated in FIGS. 6 and 10.

When the slide plate 38 moves forwardly, the switch 75 will be opened by forward movement of the piston 36 to permit air to enter pilot line 81, pass through switch 75, and through line 77 to shift the valve 63. When the valve 63 is shifted, air can then enter through the line 109, valve 63, and line 72 and into the upper end of the folding cylinder 45 so that the folding blade 47 will be lowered to fold the hang tab and position it in the stapler, as illustrated in FIGS. 7 and 8. When the folding blade 47 reaches the lowermost position, the air switch 84 will be opened to permit air to pass through the pilot lines 88 and 108 and shift the valve 65 back to the position shown in FIG. 10.

When the valve 65 is shifted, air can pass from the supply line 64 to the line 71 and cause the air cylinder 35 to be retracted and the slide plate 38 will move back into position to feed the next hang tab to the folding station. The air switch 74 will be opened as the air cylinder 35 is retracted so that the air can pass through the pilot lines 80 and 76 to shift the valve 63 back to the position shown in FIG. 10. When the valve 63 is shifted, air under pressure will then enter the lower end of the cylinder 45 and raise the folding blade 47 so that air switch is opened, in preparation for the next folding and stapling operation.

The apparatus of the present invention thus provides a simple mechanism for folding a hang tab in preparation for applying a staple through the hang tab and the zipper. Controls are also provided for the sequential feeding of the hang tab to the folding station and the folding of the hang tab. The operator then merely places the end of the zipper in the folded hang tab and actuates the air switch to actuate the stapling operation. An inexpensive hang tab is thus applied to the zipper in an economical manner and the hang tabs may be conveniently displayed by hanging them on display pegs or pins so that the prospective customer may easily select the color and length of zipper required.

It is to be understood that hang tabs or labels of various sizes and shapes may be applied to the zippers with the apparatus of the present invention. Also, the hang tabs may be provided with any desired type of printed indicia to indicate brand names, sizes, price, etc.

In the drawings and specification, there has been set forth a preferred embodiment of the invention, and although specific terms are employed, they are used in a generic and descriptive sense only and not for purposes of limitation.

That which is claimed is:

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1. An apparatus for applying hang tabs to zippers comprising

- a. a magazine for supporting a stack of hang tabs in flat condition,
- b. means for successively removing the bottom hang tab from the stack and moving the same to an adjacent folding station,
- c. means for folding the hang tab along a line extending through the medial portion of the tab to provide a pair of legs of substantially equal length and for maintaining the hang tab in this folded condition to receive the end of a zipper between the legs thereof, and
- d. means for applying a staple through the legs of the hang tab and the end of the zipper positioned therebetween to connect together the legs of the hang tab and to secure the end of the zipper therebetween.

2. In an apparatus according to claim 1 wherein said means (b) comprises a reciprocating slide plate movable in a horizontal plane and beneath the stack of hang tabs.

3. In an apparatus according to claim 1 wherein said folding means (c) comprises a folding blade supported for reciprocation in a vertical plane, said folding blade being engageable with the medial portion of the hang tab when positioned at the folding station.

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4. An apparatus according to claim 1 wherein said staple applying means (d) comprises a staple head supported beneath and in alignment with said folding station, and including manually operable means for actuating said staple applying means upon the zipper being placed in the folded hang tab.

5. In an apparatus according to claim 2 including a feeding air cylinder operatively connected to said reciprocating slide plate and being operable to impart reciprocation to said slide plate.

6. In an apparatus according to claim 3 including a folding air cylinder operatively connected to said folding blade and being operable to reciprocate said folding blade.

7. In an apparatus according to claim 6 including air switches operable in response to movement of said slide plate by said feeding air cylinder for controlling operation of said folding air cylinder and said folding blade.

8. An apparatus according to claim 4 wherein said manually operable actuating means comprises a stapling air cylinder operable to engage said staple head, and wherein said manually operable means comprises a manually operated air switch for imparting movement to said stapling air cylinder.

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