Oct. 18, 1932. J. P. ALDRICH 1,882,696

METHOD OF AND APPARATUS FOR FORMING CLOSURES IN BAG TUBES

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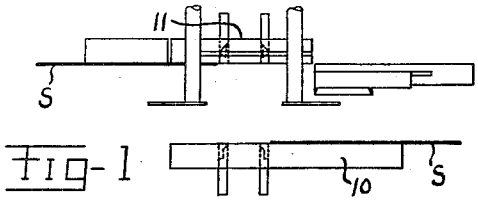


Fig-1

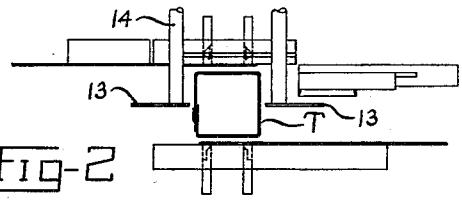


Fig-2

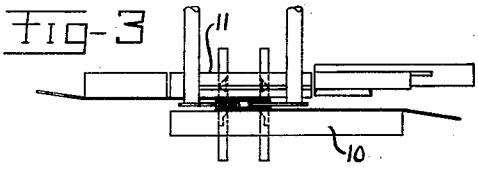


Fig-3

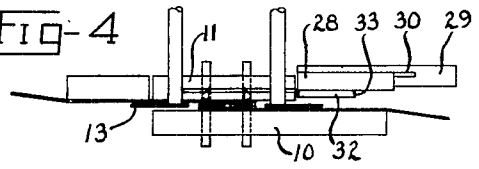


Fig-4

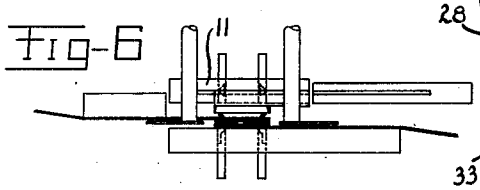


Fig-6

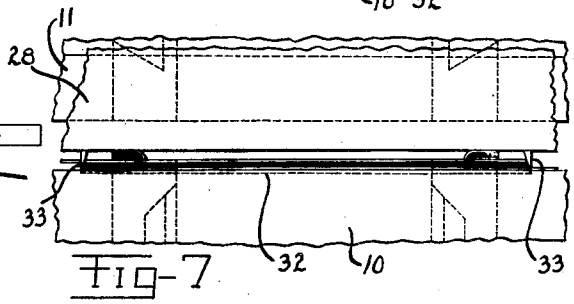


Fig-7

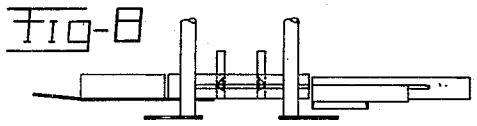


Fig-8

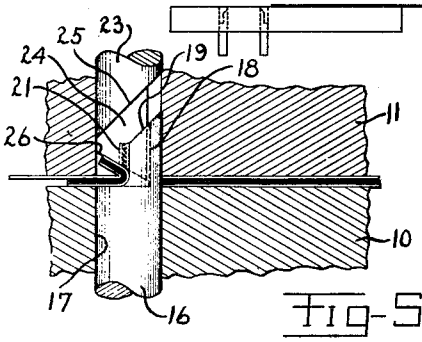


Fig-5

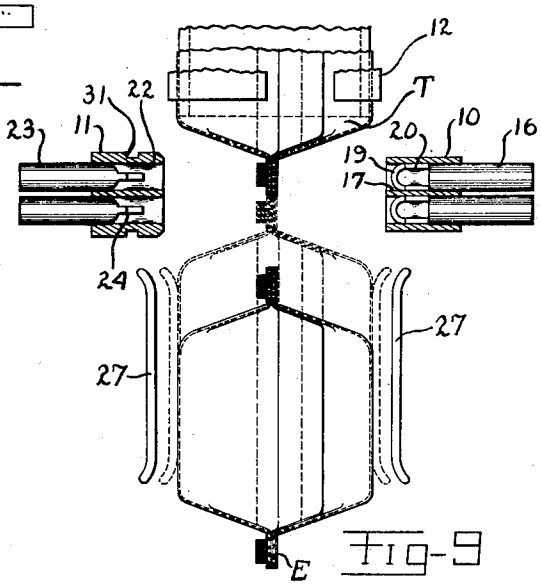


Fig-9

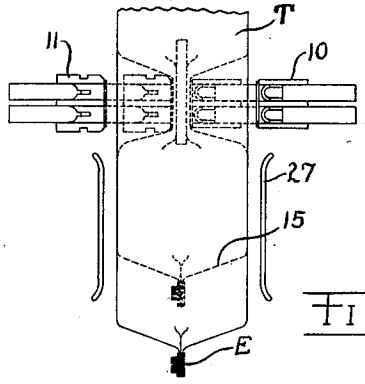


Fig-10

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UNITED STATES PATENT OFFICE

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METHOD OF AND APPARATUS FOR FORMING CLOSURES IN BAG TUBES

Application filed May 15, 1931. Serial No. 537,660.

This invention relates to apparatus or machines for making filled bags, but more particularly to method and apparatus for forming a pair of closures on a bag tube, one of which may constitute the top closure of a filled package, and the other the bottom closure for the next succeeding package.

An object of the invention is to produce a novel method of forming two closures across a bag tube by strips of metal or similar material disposed on opposite sides of the tube in such a manner that simultaneously two closures are formed, one of which may provide the top closure for a single package, and the other of which may provide the bottom closure for the next succeeding package.

Another object is to provide a novel method for forming one or more closures in a bag tube by extruding from the walls of the bag tube tabs or tongues which are pressed into closure retaining position.

Another object is to produce a simple and efficient apparatus for simultaneously forming two closures on a bag tube by means of strips of metal, or similar material, from which tabs or tongues are extruded.

A still further object of the invention is to provide a bag-closure-forming apparatus having the new and improved features of construction, arrangement and operation hereinafter described, and for purposes of illustration, but not of limitation, an embodiment of the invention is shown on the accompanying drawing, in which:

Figure 1 is a diagrammatic top plan view of an apparatus for forming two closures in a bag tube by means of binding strips, the parts being shown in their normal position out of use;

Figure 2 is a view similar to Fig. 1, the strips having been advanced to the desired position and a bag tube disposed in the proper position;

Figure 3 is a diagrammatic top plan view of the apparatus with the clamping members moved toward each other, the folding fingers having been actuated to form side folds in the bag tube;

Figure 4 is a view similar to Fig. 3 showing the folding fingers in retracted position, the extruding plungers having been actuated to cut out tabs or tongues in the binding strips and adjacent portions of the tube walls;

Figure 5 is an enlarged sectional view showing a pair of the cooperating plunger elements for extruding tabs and bending the same at an acute angle;

Figure 6 is a top plan diagrammatic view showing the knife carrier moved to operative position.

Figure 7 is an enlarged top plan view of the parts after the knife carrier has operated to sever the strips and bag wall and complete the folding of the tabs;

Figure 8 is a diagrammatic top plan view showing the parts returned to normal position;

Figure 9 is an enlarged sectional elevation of the bag tube after the closures have been formed and the severing operation complete; and

Figure 10 is a diagrammatic side elevation of the bag tube and associated parts showing in dotted lines the position of the parts when in closure forming position.

The illustrated embodiment of the invention comprises an apparatus for simultaneously forming two closures on a bag tube, and on the drawing the apparatus has in the main been shown diagrammatically. It is to be understood that this apparatus may be used to advantage in a machine as shown and described in my co-pending application Serial No. 527,715, filed April 4th, 1931, wherein a similar method and apparatus for forming closures in a bag tube are illustrated. The hereinafter described closure forming mechanism may be substituted for that shown and described in such application, and in order to avoid lengthy description and illustration of such machine reference is hereby made to my co-pending application, it being considered sufficient here to illustrate and describe only the specific closure forming mechanism.

Referring to the drawing, the closure forming mechanism comprises a pair of clamping members or blocks 10 and 11, which are movable toward and away from each other.

Elongate strips S of relatively thin sheet metal or like material are fed along the inner faces of the blocks 10 and 11 on opposite sides of a bag tube T, which is intermittently advanced through the space between the clamping blocks, being guided in such movement by guide plates 12. The bag tube T is shown in Fig. 2 as having been advanced to the desired distance, the lower end E (Fig. 10) thereof having previously been closed and a charge of filling material inserted through the tube against the closed end. Side folds are formed in the bag tube T by oppositely arranged folding fingers 13 mounted on shafts 14. An inward and an upward swinging movement is imparted to the finger 13 to form side folds in the bag tube T as indicated in Fig. 3. At the same time, the fingers 13 serve to lift the lower end of the bag tube from the full line position shown in Fig. 10 substantially to the dotted line position 15 shown in that figure.

As the folding fingers 13 are operating the clamping blocks 10 and 11 are moved toward each other, this movement being slightly interrupted to permit the fingers 13 to be swung away, whereupon the blocks 10 and 11 securely clamp the collapsed bag tube in position, holding the lower end of the tube in which filling material has already been inserted in the position shown by dotted lines in Fig. 10.

While the clamping members 10 and 11 retain the collapsed bag tube in place, two sets of cooperating tab-forming elements operate to punch or extrude and partially fold tabs or tongues from the opposed metal strips S and adjacent portions of the bag tube walls. As shown, extruding plungers 16 are reciprocable in openings 17 formed in the clamping blocks 10. Projecting outwardly from the outer end of each plunger 16 is an extension 18, which is of a size equal to about one-half the thickness of the plunger. The outer end of the extension 18 is cut diagonally as indicated at 19, providing a sharpened cutting edge. The inner wall of the extension 18 is curved or cupped out as indicated at 20. It will be apparent that when the plungers 16 are driven forwardly into engagement with the strips S and the bag tube wall that the extension 18 will pass therethrough and punch or extrude therefrom tabs or tongues, which, as shown at 21 in Fig. 5, will be disposed at substantially right angles to the adjacent portions of the strips and bag tube.

Reciprocable in openings 22 in the clamping member 11 are plungers 23 having reduced extensions 24, which extend forwardly from the central portions thereof. The shoulders 25 on opposite sides of the extensions 24 are inclined to correspond to the diagonal edge 19 of the plunger 16, and the extensions 24 are movable into the cup shaped inner walls 20 of the plungers 16. The outer edge 26 of the extension 24 is inclined inwardly from the extreme end thereof. After a plunger 16 has operated to extrude a tab from the strips S and bag tube wall the cooperating plunger 23 moves inwardly and the outer cam surface 26 thereof engages the tab in position 21 shown in Fig. 5, as it advances and bends or folds it to an acute angle substantially as shown in full lines in Fig. 5.

As above mentioned, two sets or series of cooperating plungers are employed, one set disposed above the other (Figs. 9 and 10). The upper set of flap forming devices contains at least two pairs of plungers 16 and 23 spaced laterally from each other adjacent opposite sides of the bag tube in order to form flaps in longitudinally spaced relation from the strips S. As shown in Figs. 6 and 7, the flaps on one side are folded in one direction and the flaps on the opposite side are folded in the opposite direction this being obtained by reversing the position of the plungers 16 and 23, as will readily be understood. The other set or series of flap folding devices which is disposed directly beneath the other set forms and partially folds flaps in the same manner as above described and simultaneously therewith. It will, therefore, be understood that in this instance four flaps are formed, arranged in vertically spaced pairs with the flaps of each pair folded in opposite directions.

After the flaps have been extruded from the strip and partially bent or folded in the manner above described the clamping block 11 moves away from the bag tube (Fig. 6), and in order to retain the parts in the desired position a pair of plates 27 are clamped against opposite sides of the depending bag tube, as shown in Fig. 9, and prevent the bag from dropping downwardly, and thereby displacing the parts from the desired position relative to the clamping blocks.

While the bag tube is so supported a knife carrier 28 suitably mounted on a support 29 and movable in grooves 30, is slid upon the clamping block 11, which is formed with transverse grooves 31, the grooves 31 having been moved into registration with the grooves 30. Carried by the front face of the knife carrier 28 is a longitudinally extending knife blade 32 and a pair of transverse or vertically disposed blades 33 disposed at opposite ends of the longitudinal blades.

After the knife carrier 28 has been moved to the position shown in Fig. 6, the clamping block 11 is moved toward the block 10, whereupon the knife blades 33 trim or cut the strip S into the desired lengths, and at the same time the knife 32 operates to sever the strip S between the clamping blocks 10 and 11 along a line of severance disposed between the two sets of closure tabs. The knife

carrier 20 also operates to complete the folding or bending of the tabs into intimate engagement with the adjacent side of the adjacent binding strip. Thereafter the retaining plates 27, which hold the depending filled package, are separated to release the package and the various parts return to their normal position as shown in Fig. 8. After the bag tube T has been advanced a predetermined distance the above described operation is repeated.

It is to be understood that numerous changes in details of construction, arrangement and operation may be effected without departing from the spirit of the invention, especially as defined in the appended claims.

What I claim as new and desire to secure by Letters Patent is:

1. The method of closing bag tubes which comprises applying strips to opposite sides of a bag tube, partially severing portions from the strips and adjacent walls of the bag tube to provide retaining tabs arranged in series spaced laterally of the strips, pressing the tabs against the juxtaposed strip for retaining same in place, and severing the strips and bag tube along a line of severance extending longitudinally of the strips between said series of tabs.

2. The method of forming closures on a bag tube which comprises folding in opposite sides of the bag tube, pressing the other sides of the bag tube against the folded in portions, partially severing portions from the bag tube while the sides are pressed together to form retaining tabs arranged in series spaced longitudinally of the bag tube folding over said tabs toward the adjacent side of the bag tube and severing the bag tube along a line of severance disposed between said series of tabs.

3. The method of forming a plurality of closures in a bag tube which comprises applying a metallic strip to opposite sides of the bag tube, pressing the strips and bag tube together to collapse the bag tube, partially severing portions from the strips and adjacent walls of the bag tube to form tabs projecting at one side thereof, forcing said tabs into intimate engagement with the juxtaposed strip and severing said strips and bag tubes along a line of severance extending longitudinally of said strips.

4. The method of forming a closure in a bag tube which comprises applying metallic strips to opposite sides of the bag tube, collapsing the bag tube by forcing said strips toward each other, partially severing portions from said strip and adjacent walls of the bag tube to form outwardly extending retaining tabs, and pressing said tabs against the outer side of the adjacent strip.

5. The method of forming closures for a bag tube which comprises applying a pair of strips to opposite sides of the bag tube, folding in the other sides of the bag tube, collapsing the bag tube by pressing the strips toward each other, partially severing portions from said strips and adjacent walls of the bag tube to form two series of tabs spaced laterally of said strips, pressing said tabs into intimate engagement with the outer sides of the adjacent strips with certain tabs extending in one direction and other tabs extending in another direction, and severing said strips and adjacent wall of the bag tube along a line of severance extending between said spaced series of tabs.

6. Apparatus for closing bag tubes comprising a pair of clamping members adapted to receive clamping strips on their inner faces, said members being movable toward and away from each other, means to guide a bag tube between said members, cooperating elements operable independently of said clamping members for punching closure-retaining tabs from the clamping strips and adjacent bag wall portions, means to press the tabs into intimate engagement with the outer side of the adjacent strip, and means to sever the strips and adjacent bag wall along a line of severance extending longitudinally of the strips.

7. Apparatus for closing bag tubes comprising a pair of clamping members adapted to receive and clamp together opposite sides of a bag tube, said clamping members being adapted to receive on their inner faces metallic closure strips, two sets of vertically spaced cooperating tab-forming members for extruding portions of the strips and adjacent bag tube walls, means to press the tabs into closure-retaining position, and means to sever the strips and adjacent bag tube walls along a line of severance between the tabs thereby to form simultaneously two closures for the bag tube.

8. Apparatus for closing bag tubes comprising a pair of clamping members adapted to receive and clamp together opposite sides of a bag tube, said clamping members being adapted to receive on their inner faces metallic closure strips, two sets of vertically spaced cooperating tab-forming members for extruding portions of the strips and adjacent bag tube walls, said tab-forming members being carried by and relatively movable with respect to said clamping members, means to press the tabs into closure-retaining position, and means to sever the strips and adjacent bag tube walls along a line of severance between the tabs thereby to form simultaneously two closures for the bag tube.

In testimony whereof I have hereunto signed my name to this specification.

JOHN P. ALDRICH.