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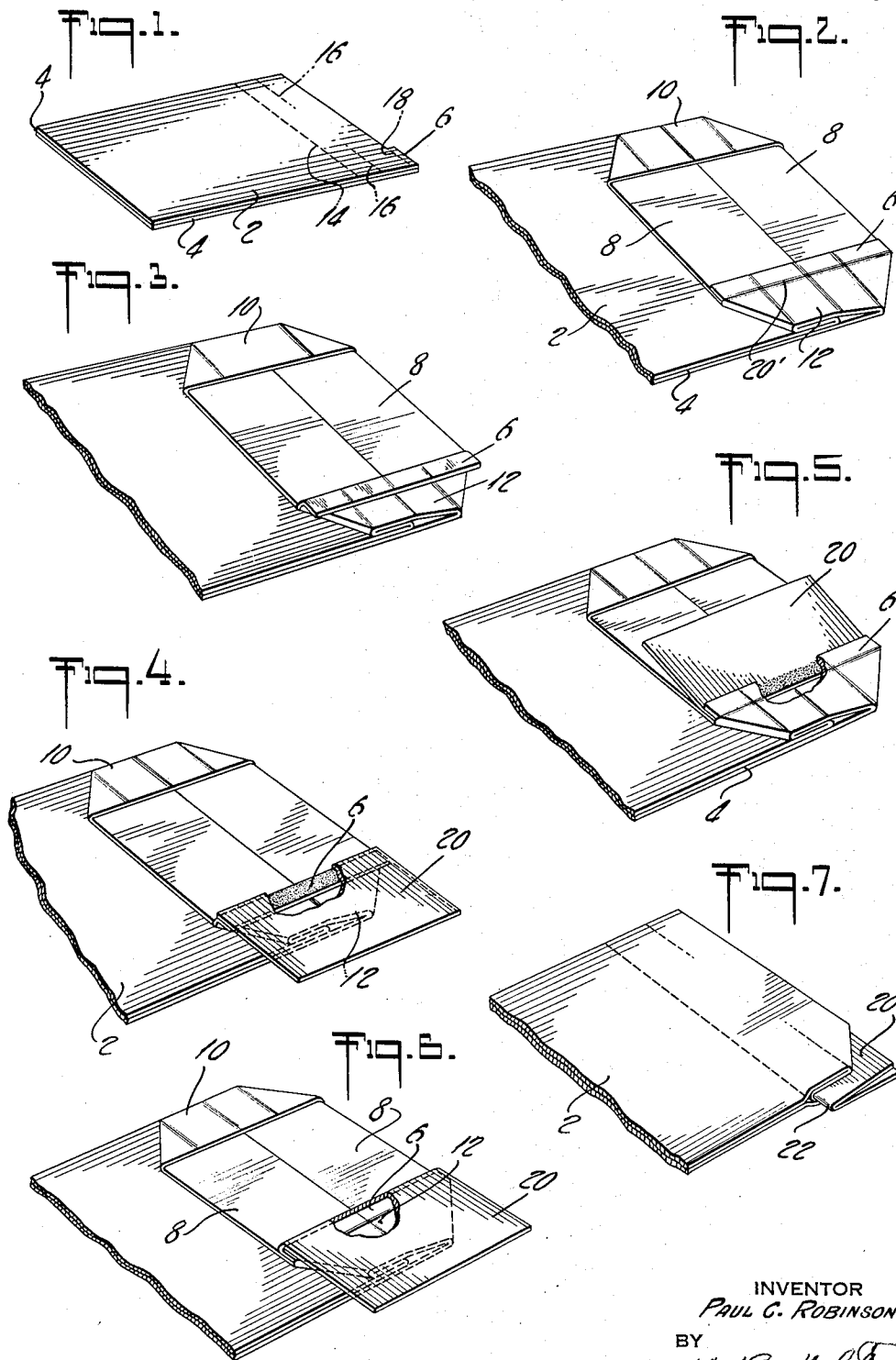
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MACHINE FOR MANUFACTURING VALVE BAGS

Filed Oct. 29, 1948

4 Sheets-Sheet 1



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Fig. 2.

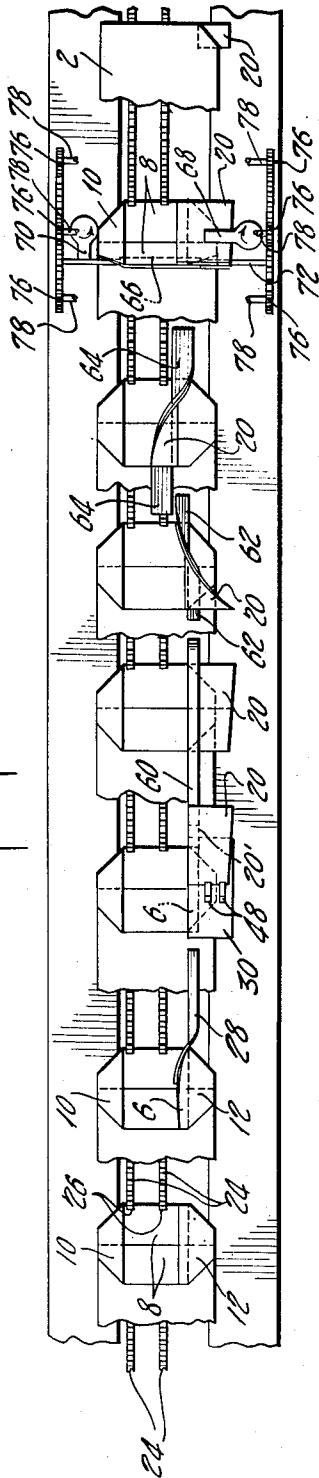
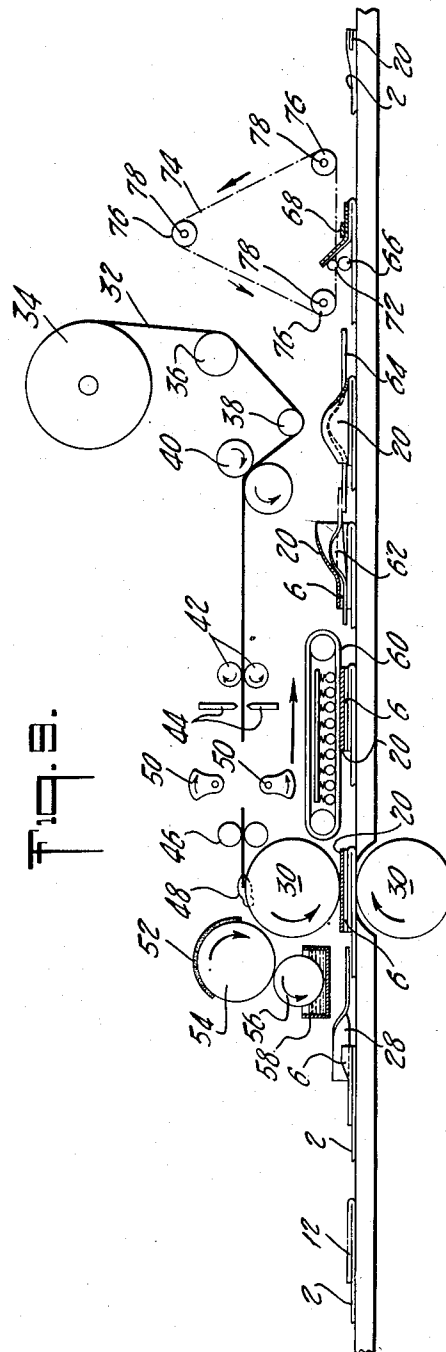


Fig. 3.



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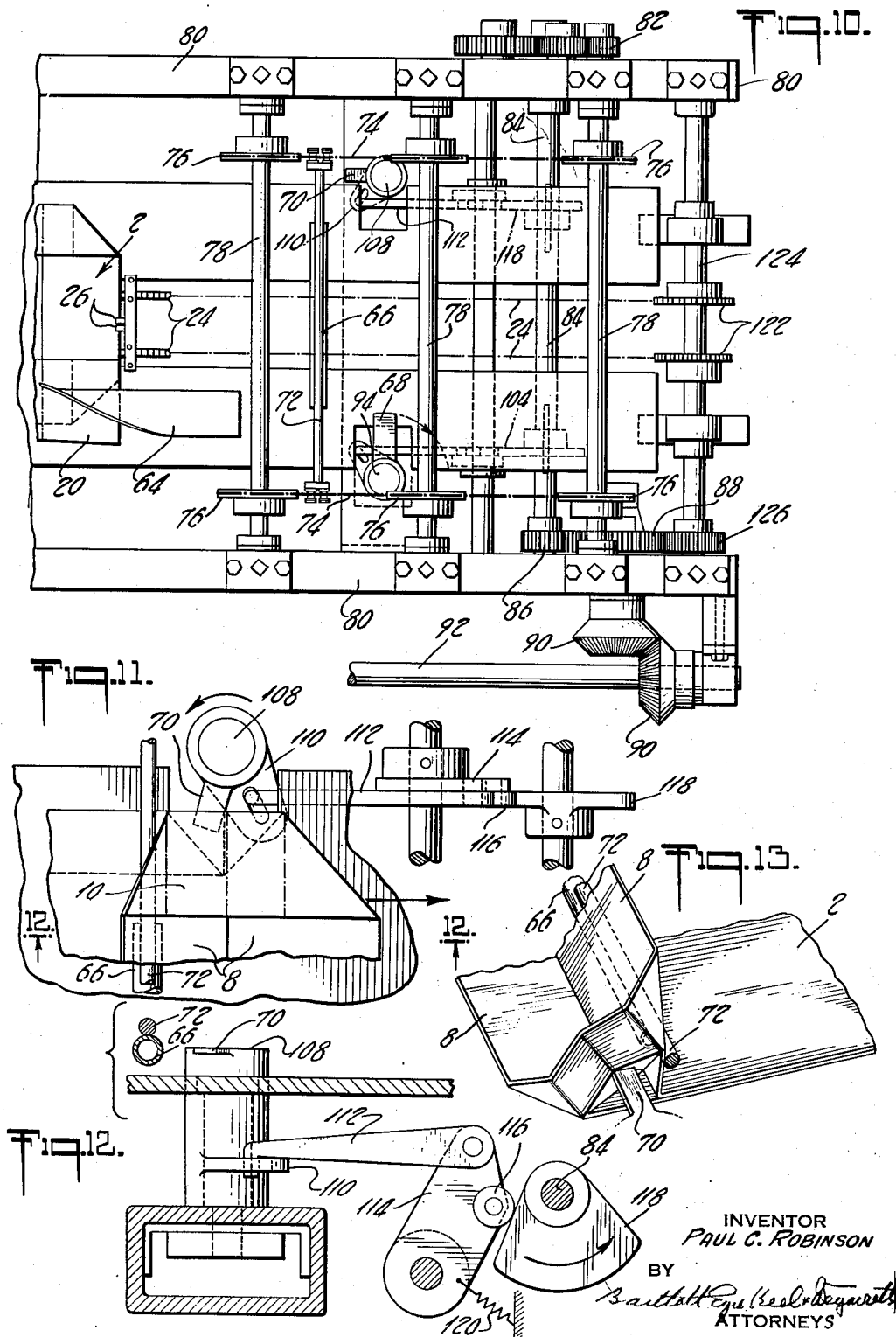
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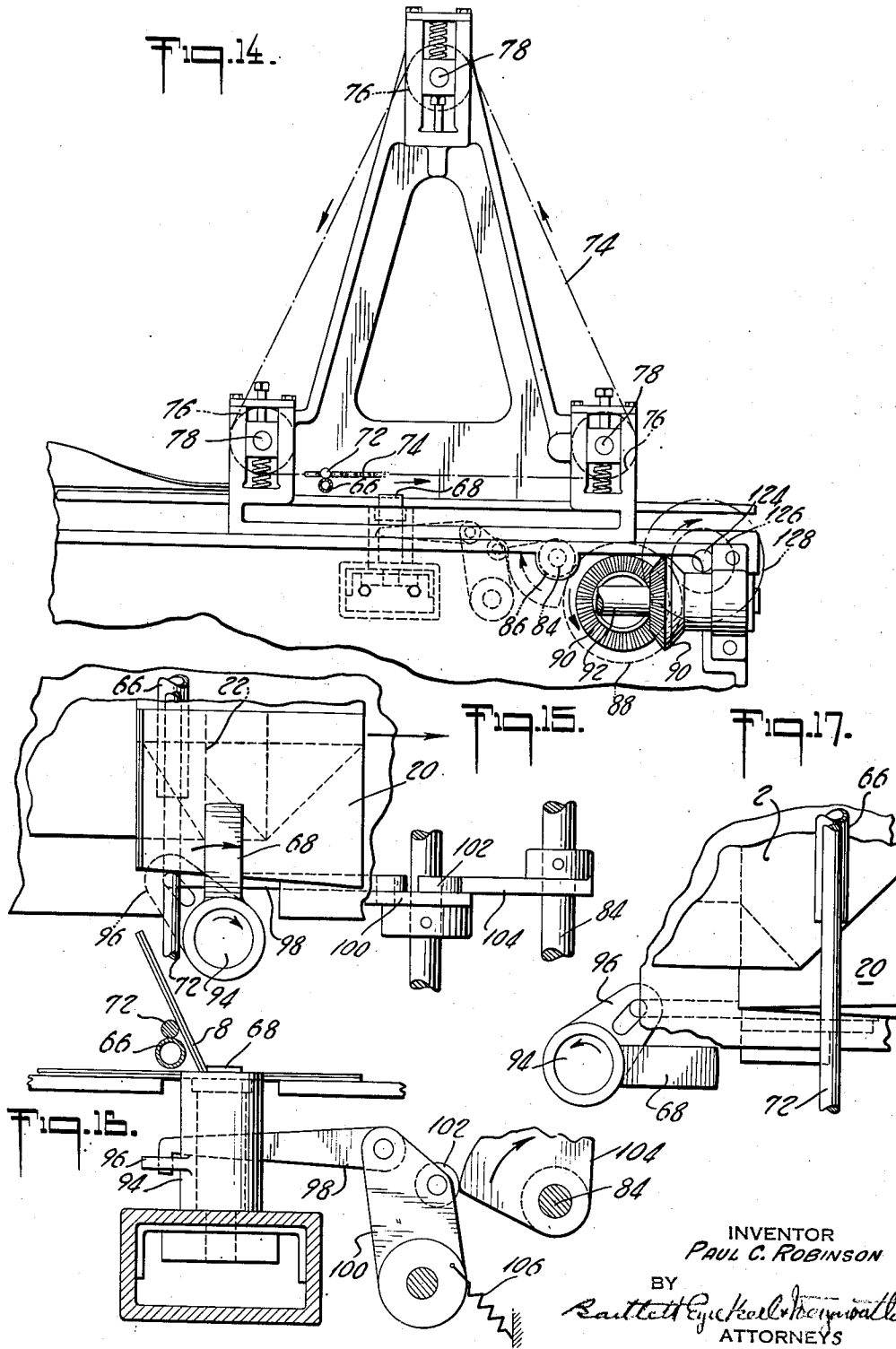
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UNITED STATES PATENT OFFICE

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MACHINE FOR MANUFACTURING VALVE BAGS

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The present invention relates to the manufacture of paper bags, and has special reference to machines for manufacturing multi-ply valve bags of the type in which a filling sleeve extends through the valve opening.

One of the objects of the invention is to provide a novel and improved machine of this character.

Another object of the invention is to provide a machine which is simple in construction and efficient in operation for forming the valve in the end of a bag tube and applying a supplemental sheet or patch to the valve to form a filling sleeve.

The several features of the invention, whereby these and other objects may be attained, will be readily understood from the following description and accompanying drawings, in which:

Figure 1 is a view in perspective of a gusseted bag tube having a valve extension that is particularly adapted to be operated upon by my improved machine and in accordance with my improved method to form a sleeve valve in one end thereof;

Figs. 2 through 7 are views in perspective of the upper end portion of the bag tube respectively illustrating different steps in carrying out my improved method;

Fig. 8 is a plan view, partly diagrammatical, and with parts broken away, of a machine embodying features of my invention in their preferred form, the machine being shown successively operating on a plurality of bag tubes;

Fig. 9 is a side view partly in section of the same;

Fig. 10 is a plan view, on an enlarged scale, of the rear end portion of the machine illustrated in Fig. 8;

Fig. 11 is a detail view, on an enlarged scale, of a portion of the machine illustrated in Fig. 10;

Fig. 12 is a sectional side view, taken substantially on the line 12—12 of Fig. 11;

Fig. 13 is a view in perspective of a portion of a bag tube and certain forming devices therefor illustrating one step in the manufacture of the completed bag;

Fig. 14 is a side view of the portion of the machine illustrated in Fig. 10;

Fig. 15 is a detail plan view, on an enlarged scale of a portion of the machine illustrated in Fig. 10;

Fig. 16 is a side view partly in section of the same; and

Fig. 17 is a view corresponding to a portion of Fig. 15 but with parts in a different position.

The machine as illustrated in the drawings, 55

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is particularly adapted for use in forming a sleeve valve in a multi-ply bag tube 2 (Fig. 1) having gusseted sides 4 and a valve extension 6.

In accordance with my improved method as preferably carried out, the end of the bag tube having the extension 6 is spread and flattened so as to provide side flaps 8 and end flaps 10 and 12 overlying the side flaps, the inner side flap 8 being folded back against the side wall of the bag tube. Such spreading of the end of the valve tube may be accomplished either by hand or by machine. Any suitable machine or mechanism may be employed for thus spreading and flattening the ends of the bag tube, such for example as the spreading and flattening mechanism illustrated and described in the patent to Potdevin 1,176,163, dated March 21, 1916. To assist in the easy spreading and flattening of the end of the bag tube, the tube may be provided with suitably arranged score lines 14 and 16 where the folds are made. Also the inner end of the valve extension may be scored on the line 18 to permit it to be easily folded back for the purpose hereinafter described.

After thus spreading and flattening the end of the bag tube, the valve extension 6 is folded back upon the underlying end flap 12. A sleeve patch 20 of the usual form is then applied to the folded valve extension 6 by adhesively securing the inner end thereof to the upwardly directed side of the extension (Fig. 4), the patch being scored on the line 20'. The valve extension 6 is then returned to its unfolded position (Fig. 5) and the patch 20 is folded back over the edge of the extension and over the end flap 12 with its outer or free end projecting beyond said end flap.

After thus applying the sleeve patch 20 the inner side flap 8 is then swung toward the other side flap to reclose the end of the bag tube (Fig. 7). During such movement of this side flap, the valve extension 6 and end flap 12 are centrally folded between the side flaps, and the sleeve patch 20 is folded on the line 22 between the sides of said end flap, thus positioning the longitudinal edges of the patch substantially flush with the end edges of the bag tube when closed. Also, during such closing movement of the inner side flap 8, the other end flap 10 is restored to its initial position forming continuations of the adjacent gusset and side walls of the bag tube.

In the machine illustrated in the drawing, the bag tubes are supplied to the machine with their upper ends in spread and flattened condition as illustrated in Fig. 2. The bag tubes are con-

veyed through the machine by any suitable devices as by means of a chain conveyor 24 having suitable gripping devices 26 which engage the upper or advancing end of one wall of each bag tube at spaced points (Figs. 8, 9 and 10).

As the tubes are thus conveyed, a suitable folder 28 is engaged by the valve extension 6 so as to cause the extension to be folded back upon the end flap 12. During the continued travel of each bag tube, the inner end of a sleeve patch 20 is applied to the upwardly directed side of the folded valve extension by means of rollers 30 between which the bag tube passes, the end of the patch previously having adhesive applied thereto so as to cause said end to adhere to the valve extension. The sleeve patches 20 may be successively cut from a strip 32 which is supplied from a roll 34. This strip passes down over idlers 36 and 38 between score rolls 40 which score the strip to form the score line 20' on the completed sleeve patch, and then passes between draw rolls 42, between cutting-off knives 44 and between draw rolls 46 which deliver each patch to a suitable gripping device 48 carried by the upper drum or roll 30. As each sleeve patch is cut off by the knives 44, rotating segments 50 engage the patch and feed it between the rolls 46. After each patch is gripped by the grippers 48, it is carried by the upper roll 30 to present the inner margin thereof to the valve extension, an adhesive pad 52 previously applying adhesive to the inner margin of the patch. The pad 52 is carried by a roll 54 and receives the adhesive from a roll 56 that extends into a paste or glue pot 58.

After the inner margin of the patch is thus adhesively applied to the folded valve extension 6, the bag tube passes beneath a pressure belt 60 so as to insure proper setting of the adhesive.

From the pressure belt 60, the bag tube carries the sleeve patch and the valve extension into engagement with a suitable folder 62 which returns the valve extension to its unfolded position, the sleeve patch being carried therewith as shown in Fig. 5.

The sleeve patch then rides over a suitable folder 64 which folds the patch back over the edge of the valve extension and over the end flap 12 (Fig. 6).

During the continued movement of each bag tube with the valve patch thus attached, a rod 56 engages beneath the inner side flap 8 of the bag tube and swings this side flap upwardly and downwardly toward the other side flap. As the inner side flap is acted upon by the rod 56, a blade 68 is swung against the base of the rising side flap, sleeve patch, and end flap 12 so as to insure proper central folding of these parts, and during the continued forward movement of the bag tube the blade 68 is retracted therefrom and out of the path of the bag tube and the rod 60.

Also, during such closing movement of the inner side flap 8, a blade 70 strikes against the outer edge of the end flap 10 below the gusset line thereof, and thus forces the gusseted portion of the flap inwardly so that during the continued closing movement of the inner side flap 8, this end flap is restored to its initial position as a continuation of the gusset and side walls of the adjacent longitudinal portion of the bag tube (Fig. 13).

After such reclosing of the bag tube with the valve formed therein and the valve patch applied, the bag tube may be discharged from the machine ready for final closing in the usual manner

by a line of stitches through the upper margins of the bag tube and the sleeve patch.

As shown, the side flap closing rod 66 may be secured on the underside of a supporting rod 72 having its ends secured to a pair of chains 74 which pass over sprocket wheels 76 that are mounted on shafts 78 having their ends journaled in bearings in the side frames 80 of the machine. The rear shaft 78 is driven so as to drive the chains 74 by means of gears 82 which connect it with a shaft 84 that is driven by a gear 86 thereon that is operatively engaged by a gear 88 which in turn is driven through miter gears 90 from the main drive shaft 92 of the machine (Figs. 10 and 14).

The blade 68 above described is secured on a pivot shaft 94 which has an arm 96 that is connected by a link 98 with a cam lever 100 carrying a cam roll 102 which is held in engagement with a cam 104 by means of a spring 106. The cam 104 is carried by the shaft 84 (Figs. 15 and 16).

The striker blade 70 (Figs. 11 and 12) is carried by a pivot shaft 108 which has an arm 110 which is operatively connected through a link 112 with a cam lever 114 that carries a cam roll 116 held in engagement with a cam 118 by means of a spring 120. The cam 118 is carried by the shaft 84. The conveyor chains 24 may be driven by sprocket wheels 122 carried by a shaft 124 that is driven through a gear 126 thereon from driving gear 38.

As will be evident to those skilled in the art, my invention permits various modifications without departing from the spirit thereof or the scope of the appended claims.

What I claim is:

1. In a machine for forming a sleeve valve bag of the class described, which comprises means for feeding gusseted bag tubes longitudinally one behind the other, each bag tube having a valve extension on the advancing end thereof and said end of the bag tube being spread and flattened to provide side flaps and end flaps overlying the side flaps, one of the side flaps being folded against the side of the body of the tube, a folder for causing the valve extension of each bag to be folded back upon the adjacent end flap as the bag reaches a predetermined point in its travel, devices for adhesively securing the inner end of a sleeve patch to the upwardly directed side of the folded valve extension as each bag tube reaches another predetermined point in its travel, folding means for returning said valve extension to its unfolded condition and folding said patch outwardly over the inner edge of said valve extension during the continued travel of each bag, means for restoring said side flaps to their initial closed position comprising a member traveling in the same direction but at increased speed with said bag tube engaging the underside of said folded side flap and riding over said side flap to fold it against the other side flap, and an oscillating arm for engaging the top side of said valve extension at the base of said folded side flap to cooperate with said member in restoring said side flaps to their initial closed position.

2. In a machine for forming a sleeve valve bag of the class described, which comprises means for feeding gusseted bag tubes longitudinally one behind the other, each bag tube having a valve extension on the advancing end thereof and said end of the bag tube being spread and flattened to provide side flaps and end flaps overlying the side flaps, one of the side flaps being folded

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against the side of the body of the tube, a folder for causing the valve extension of each bag to be folded back upon the adjacent end flap as the bag reaches a predetermined point in its travel, devices for adhesively securing the inner end of a sleeve patch to the upwardly directed side of the folded valve extension as each bag tube reaches another predetermined point in its travel, folding means for returning said valve extension to its unfolded condition and folding said patch outwardly over the inner edge of said valve extension during the continued travel of each bag, means for restoring said side flaps to their initial closed position comprising a member traveling in the same direction but at increased speed with said bag tube engaging the underside of said folded side flap and riding over said side flap to fold it against the other side flap, an oscillating arm for engaging the top side of said valve extension at the base of said folded side flap to cooperate with said member in restoring said side flaps to their initial closed position, and means comprising an arm acting automatically as said side flap is being closed to strike the gusseted portion of the other end flap to restore it to its initial position as continuations of the longitudinal gusseted portion and side walls of the bag tube.

3. In a machine for forming a valve bag of the class described, means for feeding longitudinally a gusseted bag having a valve extension on the advancing end thereof, said end of the bag tube being spread and flattened to provide side flaps and end flaps overlying the side flaps,

said valve extension being a continuation of one of said end flaps, one of the side flaps being folded against the side of the body of the tube, means acting automatically during the feeding of the tube for folding the last-mentioned side flap upwardly and then downwardly towards the other side flap with the valve extension and its associated end flap folded inwardly between the side flaps to form a valve, and a device for simultaneously restoring the gusseted portion of the other end flap to its initial position as a continuation of the gusset and side walls of the adjacent longitudinal portion of the bag tube.

4. A structure according to claim 3 in which the device for restoring the gusseted portion of the end flap to its initial position comprises an oscillating arm acting automatically in timed relation to the feeding of the bag tube to strike the base of said gusseted portion to force the longitudinal center thereof inwardly during the closing of the side flaps.

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