

March 29, 1955

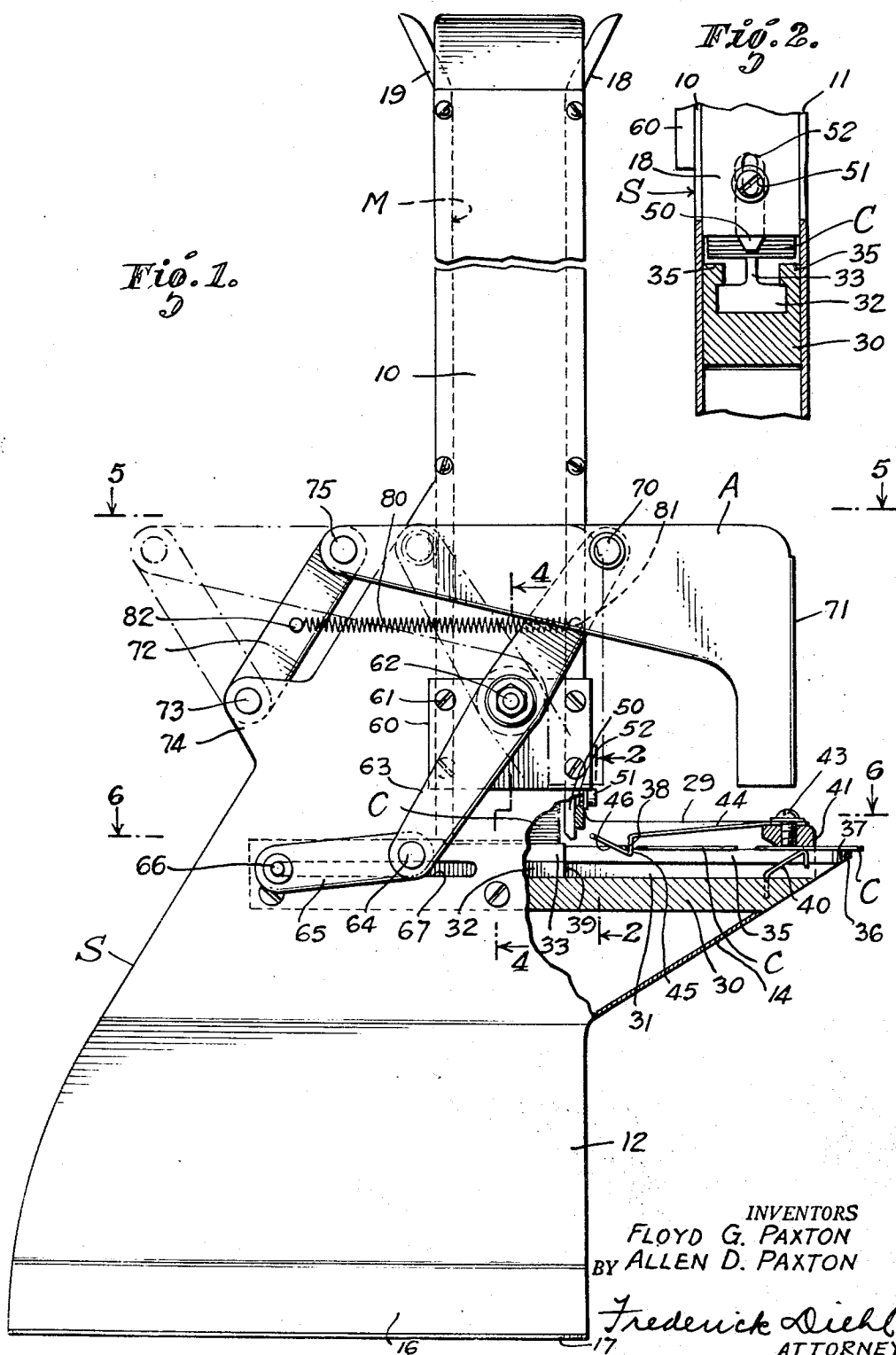
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BAG CLOSING METHOD AND CLOSURE DISPENSING MECHANISM

Filed Dec. 17, 1953

4 Sheets-Sheet 1



March 29, 1955

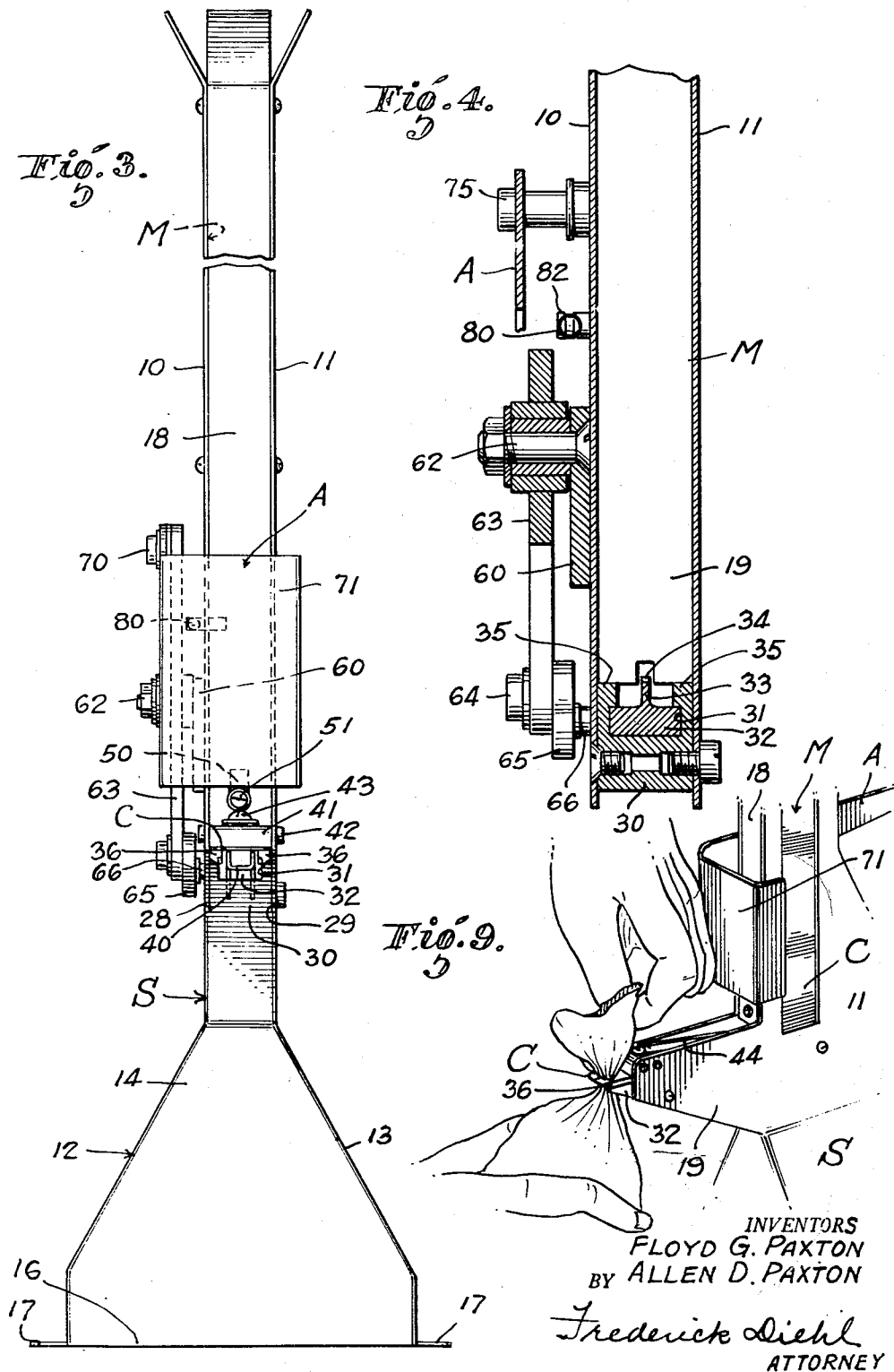
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BAG CLOSING METHOD AND CLOSURE DISPENSING MECHANISM

Filed Dec. 17, 1953

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March 29, 1955

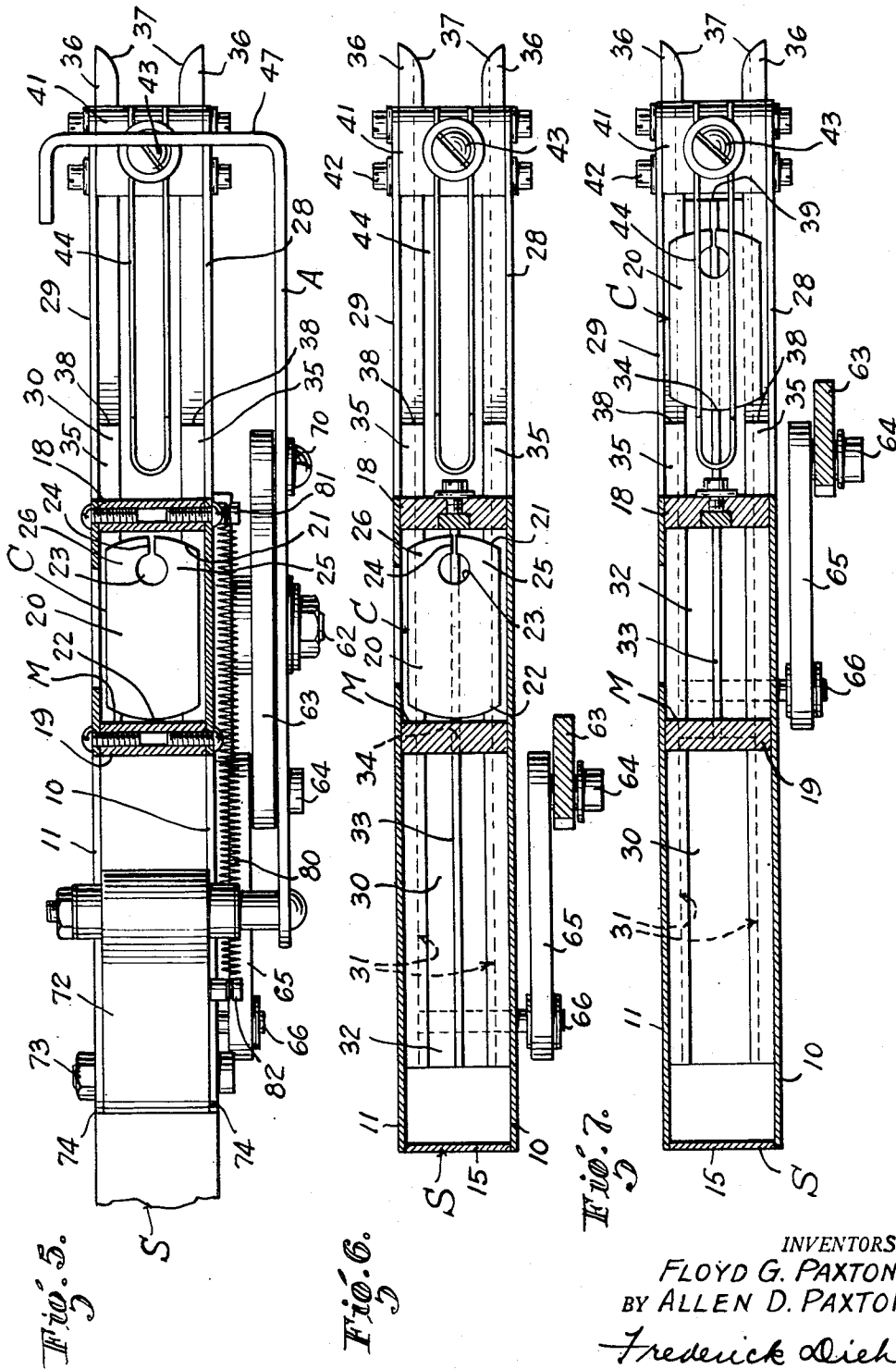
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BAG CLOSING METHOD AND CLOSURE DISPENSING MECHANISM

Filed Dec. 17, 1953

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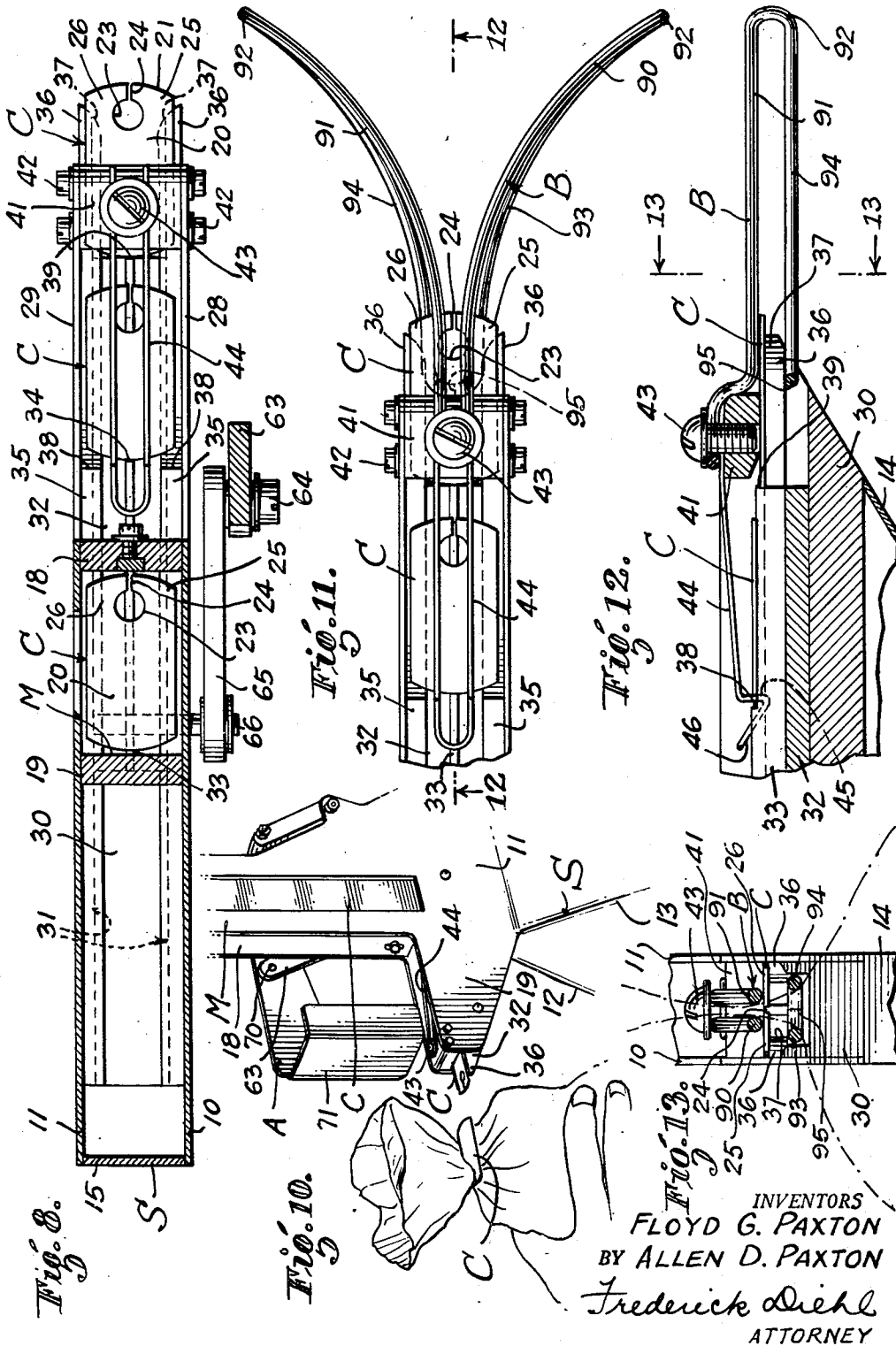
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BAG CLOSING METHOD AND CLOSURE DISPENSING MECHANISM

Filed Dec. 17, 1953

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INVENTORS
 FLOYD G. PAXTON
 BY ALLEN D. PAXTON
 Frederick Diehl
 ATTORNEY

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BAG CLOSING METHOD AND CLOSURE DISPENSING MECHANISM

Floyd G. Paxton and Allen D. Paxton, Riverside, Calif., assignors to Paxton Machines, Inc., Riverside, Calif., a corporation of California

Application December 17, 1953, Serial No. 398,760

6 Claims. (Cl. 226—56)

This invention relates to a bag closing method and device of the general character embodied in the co-pending application for Letters Patent of Floyd G. Paxton, Serial No. 371,229, filed July 30, 1953, and wherein is disclosed and claimed a bag closing method and a closure of flexible sheet material structurally characterized to enable it to be readily sprung or snapped over a tightly twisted or constricted portion of the bag mouth, in a manner to be securely maintained attached to the bag yet be readily removable and replaceable indefinitely, all so that the contents of the bag will be protected against loss therefrom and can be examined and replaced when required.

Thus, in the bagging of perishable commodities such as fruits and vegetables in a transparent bag, a defective or spoiled piece of the product can readily be removed to insure that the contents of the bag will be in first class marketable condition when displayed for sale.

An object of this invention is to provide a bag closing method and closure dispensing mechanism which greatly facilitates and expedites the application of an inexpensive flexible sheet closure to a bag by dispensing closures singly from a magazine and supporting the dispensed closure in a position for a loaded bag to receive the closure in response to a simple concurrent manipulation of the loaded bag and operation of the mechanism by the operator, to thus enable loaded bags to be closed with great rapidity and by unskilled labor so as to reduce the cost of such operation to a negligible minimum.

Another object of this invention is to provide a bag closure dispensing mechanism of the above described character which embodies an operating member capable of being simply and conveniently actuated to dispense a closure from a magazine by pressure of one hand of the operator when co-acting with the other hand to advance a loaded bag to a previously dispensed closure supported by the mechanism in a position to receive the constricted mouth portion of the bag and securely close the same, all in such manner that each bag closing operation will automatically dispense and support a closure for the next bag closing operation.

A further object of this invention is to provide a bag closure dispensing mechanism embodying means by which the closure can be applied to a bag without pre-twisting the bag mouth to close same, all so as to further simplify and expedite the bag closing operation, particularly in the case of small, lightly loaded bags the contents of which do not subject the closure to stresses tending to dislodge same.

With these and other objects in view, this invention resides in the method and in the combinations, arrangements and functional relationships of elements as set forth in the following specification and particularly pointed out in the appended claims.

In the accompanying drawings,

Figure 1 is a view showing a side elevation, partly in section, one form of bag closure dispensing mechanism embodying this invention;

Figure 2 is an enlarged fragmentary vertical sectional view taken on the line 2—2 of Figure 1;

Figure 3 is a view in front elevation of the bag closure dispensing mechanism shown in Figure 1;

Figure 4 is an enlarged fragmentary vertical sectional view taken on the line 4—4 of Figure 1;

Figures 5 and 6 are enlarged horizontal sectional views taken, respectively, on the lines 5—5 and 6—6 of Figure 1;

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Figures 7 and 8 are views similar to Figure 6 and illustrating different positions of the mechanism;

Figures 9 and 10 are perspective views illustrating successive steps in the bag closing operation in conjunction with the mechanism embodied in this invention;

Figure 11 is a fragmentary view similar to Figure 6 and illustrating a modified form of the mechanism for closing small, lightly loaded bags;

Figure 12 is a vertical sectional view taken on the line 12—12 of Figure 11; and

Figure 13 is a vertical transverse sectional view taken on the line 13—13 of Figure 12.

Referring specifically to the drawings and particularly to Figures 1 to 10, inclusive, this invention in its illustrated embodiment comprises a support S in the form of a sheet metal casing composed of side walls 10 and 11, the lower portions of which flare or diverge at 12 and 13, respectively, to co-act with front and rear panels 14 and 15, respectively, to provide a rectangular base 16 having side flanges 17 through openings in which suitable fastening members (not shown) may be passed to rigidly secure the support on a table or other work surface.

Above their flared lower portions, the side walls 10 and 11 rise vertically in parallelism and co-act with narrow front and rear walls 18 and 19, respectively, to form an article magazine M. In the present instance the magazine M is rectangular in cross section to receive a stack of closures C of the type disclosed and claimed in the co-pending application above identified.

For the present application it will suffice to state that these closures may be constructed from sheet plastic or fibrous material to provide an elongated, rectangular body 20 (Figures 5 to 8, inclusive) the gage and structure of which provide appreciable flexibility. The ends of the body 20 are rounded at 21 and 22, and adjacent to the end 21 the body has an opening 23 along its longitudinal center line.

Extending radially from the opening 23 and longitudinally of the body is a slit or narrow slot 24 which opens to the edge of the body at its end 21, all so as to form opposed flexible portions or arms 25 and 26, the confronting edges of which are defined by the walls of the opening 23 and slot 24.

At the bottom of the magazine M the side walls 10 and 11 are provided with extensions 28, 29, respectively, from the front of the magazine, to receive therebetween a guide element 30 in the form of a rectangular bar which extends horizontally to span the open bottom of the magazine and to project forwardly beyond the outer ends of the side wall extensions 28 and 29 as shown in Figure 1.

The upper portion of the guide element 30 is milled to provide a longitudinally extending inverted T-shaped guideway 31 for an article feeding element 32 in the form of a rectangular bar having a central, longitudinally extending rib 33 on which the lowermost article in the magazine M rests when the feeding element 32 occupies the retracted position shown in Figures 1 and 6.

The top edge of the rib 33 is provided with a feeding shoulder 34 of sufficient height to engage the rear edge of the lowermost article in the magazine and feed the article out of the magazine on the guide element 30 in response to movement of the feeding element 32 to the advanced position shown in Figure 7.

It will be noted that as a result of the guideway 31, the top of the guide element 30 is formed by two tracks 35 on which the article rides and is guided in a straight path by the side wall extensions 28 and 29. Beyond the outer ends of the extensions 28 and 29 the tracks 35 project to form spaced article rests 36 having their confronting sides rounded to diverge or flare relatively to the outer extremities of the rests as shown at 37 in Figures 5 to 8, inclusive, all for a purpose to be later described.

The tracks 35 are vertically stepped at 38 to provide an upper level beneath the magazine M, and a lower level on to which the lowermost article of a stack in the magazine is fed by the shoulder 34 for further feeding to the final position shown in Figure 8, by a second feeding shoulder 39 provided by the forward end of the

rib 33. In this final position of the article it is frictionally held by a spring 40 against a drag shoe 41 spanning and rigidly secured to the side wall extensions 28 and 29 by screws 42.

Secured by a screw 43 to the shoe 41 is one end of a stripper spring 44, the other U-shaped end of which is normally urged into the guideway 31 and is provided with article retaining shoulders 45 to engage the rear end of an article advanced by the feeding element 32 onto the lower level of the tracks 35, and prevent retrograde movement of the article during the return stroke of the feeding element to its retracted position.

The said other end of the spring 44 is upwardly inclined towards its free extremity to provide a cam surface 46, which, during advancing movement of an article, is engaged by the forward end of the article and cammed upwardly by the latter so as to permit passage of the article onto the lower level of the tracks 35.

A gate 50 is slidably mounted for vertical adjustment on the inner side of the front wall 18 to project below the bottom thereof so as to insure the feeding of only the lowermost article from the magazine M irrespective of friction between the articles tending to feed more than one. An adjusting and locking screw 51 is threaded into the gate 50 and passes freely through a vertical slot 52 (Figure 2) in the wall 18 so as to permit the gate to be raised or lowered to accommodate articles of various thicknesses.

A mounting plate 60 is secured by screws 61 to one side of the support S adjacent to the bottom of the magazine M, and pivotally mounted medially between its ends on the plate by a pivot pin 62 is a lever 63. One end of the lever 63 is pivotally connected at 64 to one end of a link 65, the other end of which is pivotally connected to a pin 66 projecting from the feeding element 32 freely through registering slots 67 (Figure 1) in the side wall 10 and guide element 30.

The other end of the lever 63 is pivotally connected at 70 to an actuating member A having a hand operated presser portion or plate 71 extending across and above the side wall extensions 28 and 29 as shown in Figures 1, 3 and 5. A second lever 72 is pivotally mounted at one end on a pin 73 between ears 74 projecting from the side walls 10 and 11 at the rear of the magazine M. The other end of the lever 72 is pivotally connected at 75 to the actuating member A for co-action with the lever 63 in mounting the actuating member for a parallelogrammatic form of movement between the extreme forward and rearward positions shown in full and broken lines, respectively, in Figure 1.

A coil spring 80 is connected at one end to a pin 81 projecting from a side of the magazine M. The spring 80 is connected at its other end to a pin 82 projecting from the lever 72, to thus urge the actuating member A to its forward position wherein the presser plate 71 is vertically disposed above the forward end of the guide element 30 as shown in Figures 1, 3 and 5, and to urge the feeding element 32 to its retracted position as shown in Figure 1.

The operation of the invention is as follows:

Assuming that the magazine M is supplied with a stack of the closures C arranged so that the end thereof having the opening 23 and slot 24 will be fed foremost from the magazine, the actuating member A is pressed once to discharge one closure C from the bottom of the stack in the magazine onto the lower level of the tracks 35 beyond the retaining shoulders 38 as shown in Figure 6, by means of the feeding shoulder 34 of the element 32. The actuating member A is now pressed again to discharge a second closure from the bottom of the stack in the magazine as the first discharged closure is advanced by the feeding shoulder 39 of the element 32 to its final position shown in Figure 7. In this final position the first discharged closure is frictionally held by the spring 40 against the shoe 41 with the forward open end of the closure projecting slightly beyond the ends of the rests 36 as clearly shown in Figures 1 and 7.

A loaded bag to which one of the closures C is to be applied, is now grasped by the operator and the mouth portion of the bag helically twisted closed. The operator now holds or supports the body of the bag with one hand and the twisted mouth portion of the bag with the other hand as the mouth portion is advanced downwardly towards and between the rests 36 until the twisted mouth portion strikes the forward end of the closure C

and laterally deflects its arms 25 and 26 downwardly between the rests 36 sufficiently for the twisted portion of the bag to pass through the slot 24 into the opening 23 as shown in Figure 9.

Concurrently with this operation, the hand of the operator holding the mouth portion of the bag strikes the presser plate 71 of the actuating member A and moves the latter from its forward position shown in full lines in Figure 1 to its rearmost position shown in broken lines, thus discharging a third closure from the bottom of the stack in the magazine and advancing the second closure on the tracks 35 to displace the first closure which is now attached to the twisted mouth of the bag and is securely locked thereon by the tendency of the twisted portion to untwist and expand tightly in the opening 23. With a closure applied to the bag as shown in Figure 10 for each operation of the mechanism, another closure is fed to its final position on the rests 36, all by a single continuous movement of the operator.

Reference will now be had to Figures 11, 12 and 13 wherein is shown a modified form of the dispensing mechanism which differs structurally from the form previously described by the provision of a bag mouth constricting or flattening element B which eliminates pre-twisting of the bag mouth and is suitable for relatively small and lightly loaded bags the contents of which do not impose severe stresses on the closure tending to dislodge same.

The element B is generally V-shaped in plan and may be constructed from a length of heavy wire bent to form oppositely curved upper fingers 90 and 91 in co-planar relationship rigidly secured at their closed inner ends to the top of the shoe 41 by means of the screw 43, and return bent at their outer ends as indicated at 92 to provide lower fingers 93 and 94 curved similarly to the fingers 90 and 91 and in spaced parallel relation to the respective upper fingers.

The inner ends of the lower fingers 93 and 94, which are spaced wider apart than the inner ends of the upper fingers 90 and 91 as shown in Figure 11, are rigidly secured together at 95. It will be noted also from this figure that the upper and lower fingers are symmetrically disposed in advance of a closure C on the rests 36, with the upper fingers immediately above the closure and the lower fingers beneath the closure. The lower fingers are free to be flexed about the return bends 92 as fulcrums in the operation of this form of the invention which is as follows:

To apply a closure C to a loaded bag, the untwisted mouth portion of the bag is advanced between the upper fingers 90, 91 and the lower fingers 93, 94, the upper fingers co-acting by their camming action upon the bag mouth to wedge or squeeze same together sufficiently for the bag mouth to be flattened and its leading edge or end engaged with the arms 25 and 26 of the closure C to laterally deflect the arms downwardly and relatively outwardly until the mouth bunches or folds upon itself into the opening 23.

The closure is thus applied to the bag with sufficient security to prevent its dislodgment by the contents of the bag, and without any helical pretwisting of the bag mouth, to thereby further facilitate and expedite the bag closing operation by unskilled labor. It will be understood that the dispensing of closures from the magazine M is accomplished concurrently with this bag closing operation in a manner identical to that previously described in connection with the first form of the invention.

It will be particularly noted that the lower fingers 93 and 94 co-act to prevent the contents of the bag from crowding the bag upwardly against the underside of the closure C on the rests 36 during the closure applying operation, so that the arms 25 and 26 of the closure will be left free to be laterally deflected downwardly and relatively outwardly from each other to receive therebetween the portion of the bag mouth contracted by the upper fingers 90 and 91 without interference by the contents of the bag.

We claim:

1. Mechanism of the class described comprising: a magazine for a stack of bag closures constructed to provide a body of flexible sheet material having an opening therethrough and a slot connecting the opening with an end of the body to define laterally flexible arms at opposite sides of the slot and opening; a feeding element movably mounted to engage and feed closures singly from

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the magazine to a closure applying position; means operable to support a closure in said position, with said arms of the closure left free to be laterally flexed away from each other by pressure of a contracted bag mouth against said closure at said slot thereof, so as to widen the slot sufficiently for the passage of the bag mouth into said opening of the body; relatively converging members co-acting to define a generally wedge shaped guideway arranged with its smaller end at the slotted portion of the closure in said position, and operable to flatten the mouth of a bag when advanced towards the closure, sufficiently for the bag mouth to be entered edgewise into said slot; and actuating means for said feeding element.

2. In a mechanism for dispensing closures constructed to provide a body of flexible sheet material having an opening therethrough and a slot extending from the opening to an edge of the closure to define laterally flexible arms at opposite sides of the slot and opening which comprises: a guide element having a guideway terminating at one end in rests spaced laterally from each other on which the side portions of the closure are supported while the central portion of the closure is left unsupported to render said arms of the closure free for flexing laterally outward from each other between said rests by pressure of a contracted bag mouth against said edge of the body at said slot thereof, so as to widen the slot sufficiently for the passage of the contracted bag mouth into said opening of the body, to thus apply the closure to the bag; and means correlated with said end of the guide element and operable in response to movement of the mouth of a bag towards said slot to guide the bag mouth to the slot and flatten the bag mouth sufficiently for it to be entered edgewise into said slot.

3. In a mechanism for dispensing closures constructed to provide a body of flexible sheet material having an opening therethrough and a slot extending from the opening to an edge of the closure to define laterally flexible arms at opposite sides of the slot and opening which comprises: a guide element having a guideway terminating at one end in rests spaced laterally from each other on which the side portions of the closure are supported while the central portion of the closure is left unsupported to render said arms of the closure free for flexing laterally outward from each other between said rests by pressure of a contracted bag mouth against said edge of the body at said slot thereof, so as to widen the slot sufficiently for the passage of the contracted bag mouth into said opening of the body; and relatively converging members co-acting to define a generally wedge shaped guideway arranged with its smaller end at the slotted portion of a closure supported by said rests, and operable to flatten the mouth of a bag when advanced towards the closure, sufficiently for the bag mouth to be entered edgewise into said slot.

4. In a mechanism for dispensing closures constructed to provide a body of flexible sheet material having an opening therethrough and a slot extending from the opening to an edge of the closure to define laterally flexible arms at opposite sides of the slot and opening which comprises: a guide element having a guideway terminating at one end in spaced rests on which the side portions of the closure are supported while the central portion of the closure is left unsupported to render said arms of the

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closure free for flexing laterally outward from each other between said rests by pressure of a bag mouth against said edge of the body at said slot thereof; relatively converging upper members co-acting to define a generally wedge shaped guideway arranged with the smaller end extending above the slotted portion of a closure supported by said rests, and operable to flatten the mouth of a bag when advanced towards the closure, sufficiently for the bag mouth to be entered edgewise into said slot; and relatively converging lower members co-acting to define a narrow guideway extending beneath the arms of the closure supported by said rests, and in spaced relation to the arms so as to prevent the contents of a bag from crowding the bag against the arms and interfering with the closure applying operation.

5. In a mechanism for dispensing closures constructed to provide a body of flexible sheet material having an opening therethrough and a slot extending from the opening to an edge of the closure to define laterally flexible arms at opposite sides of the slot and opening which comprises: a guide element having a guideway terminating at one end in spaced rests on which the side portions of the closure are supported while the central portion of the closure is left unsupported to render said arms of the closure free for flexing laterally outward from each other between said rests by pressure of a bag mouth against said edge of the body at said slot thereof; means correlated with said end of the guide element at one side of a closure supported by said rests and operable in response to movement of the mouth of a bag towards said edge of the closure at the slot thereof, to guide the bag mouth to the slot and flatten the bag mouth sufficiently for it to be entered edgewise into the slot; and means correlated with said end of the guide element at the opposite side of the closure being supported on said rests and operable to prevent the contents of the bag from crowding the bag against the arms of the closure and obstructing the lateral flexing of the arms as aforesaid during the closure applying operation.

6. The method of closing a flexible bag by utilizing a closure of flexible sheet material having an opening of a predetermined size and being slotted from the opening to an edge of the closure to provide opposed flexible arms, which comprises: guiding the open mouth portion of a loaded flexible bag laterally towards said edge of the closure at said slot thereof while supporting the closure; and concurrently flattening the mouth portion of the bag and presenting same edgewise against the slotted edge of the closure with sufficient force in a direction to laterally deflect the arms of the closure away from each other so that the flattened bag portion will pass edgewise through the slot and become bunched by folding into the opening of the closure, whereby to securely confine the bag mouth closed in the opening when the arms of the closure are relieved of said force.

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