

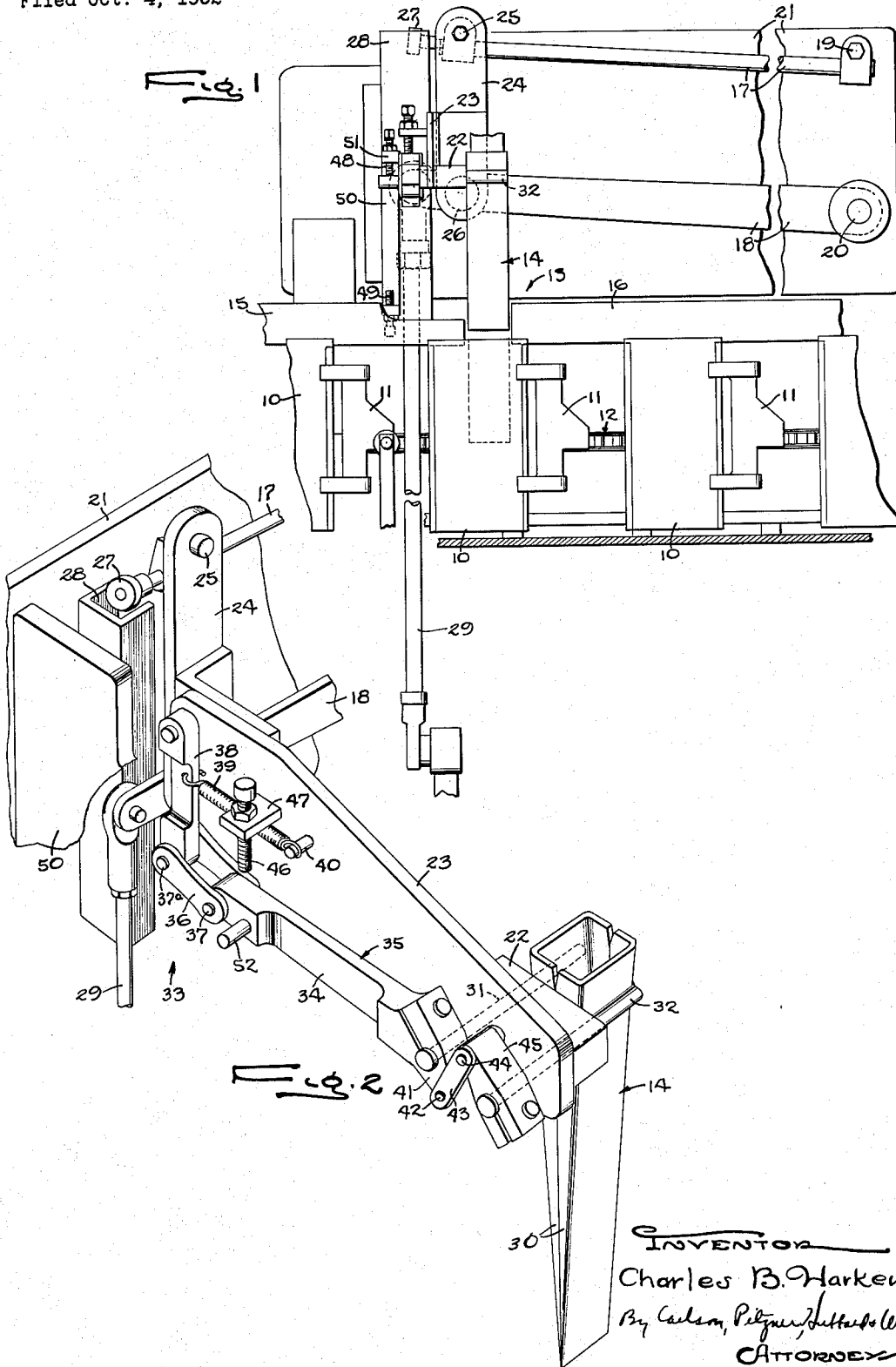
April 17, 1956

C. B. HARKER
DISPENSING DEVICE

2,742,215

Filed Oct. 4, 1952

3 Sheets-Sheet 1



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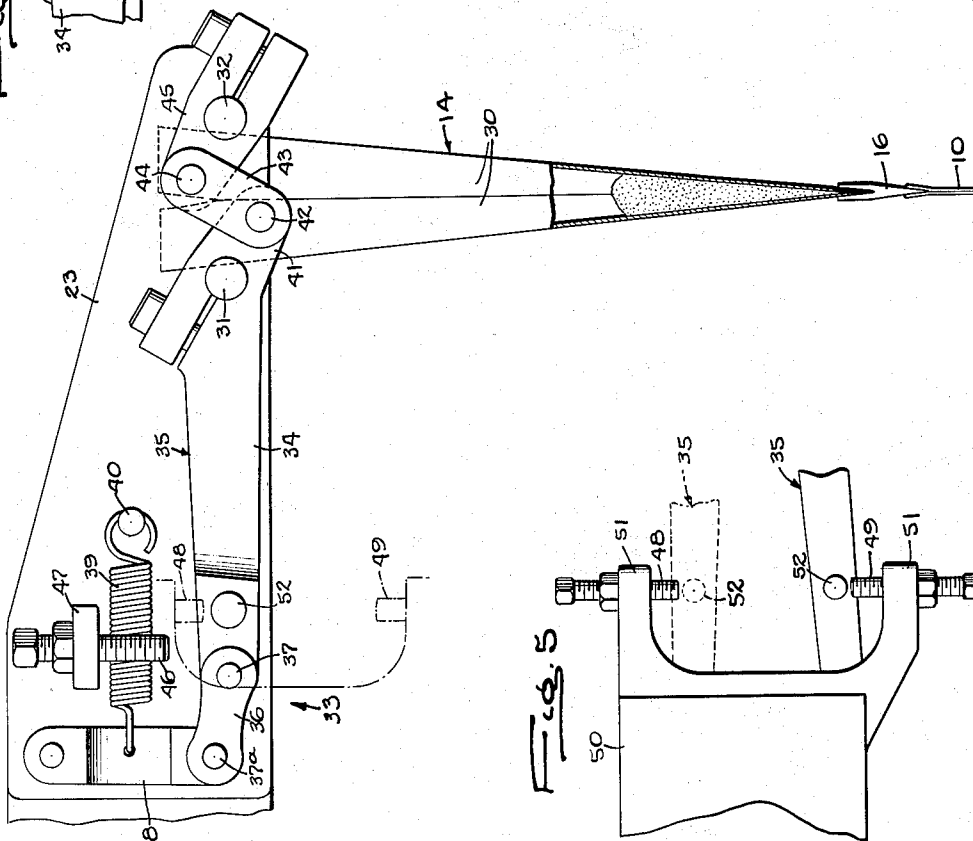
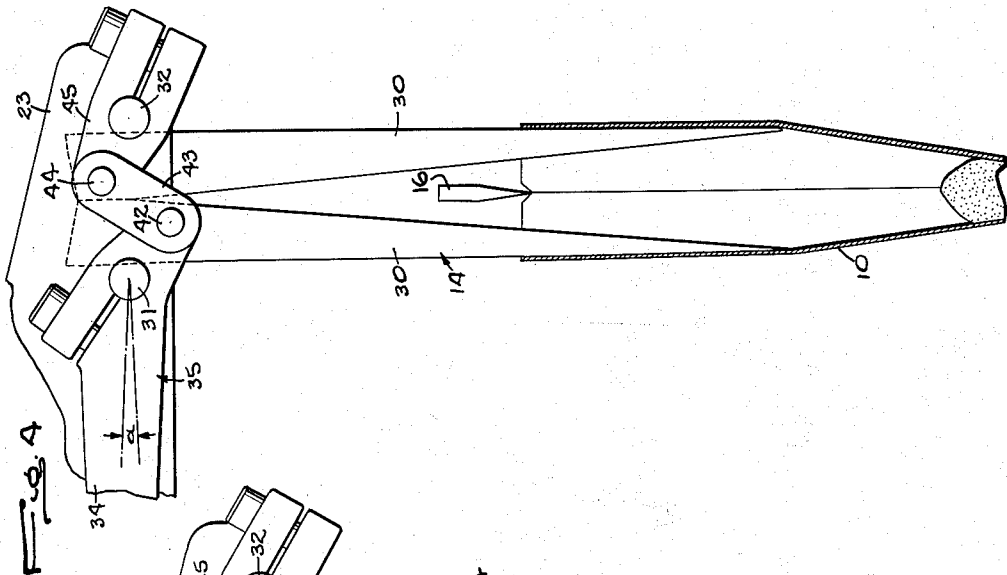


Fig. 3

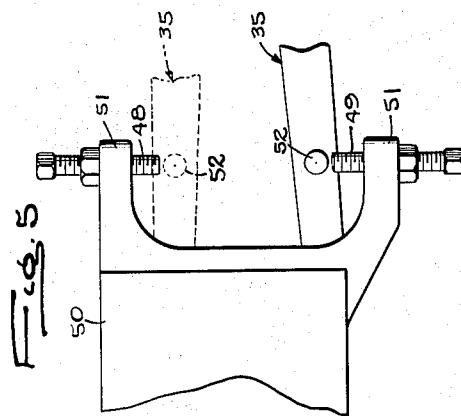


Fig. 5

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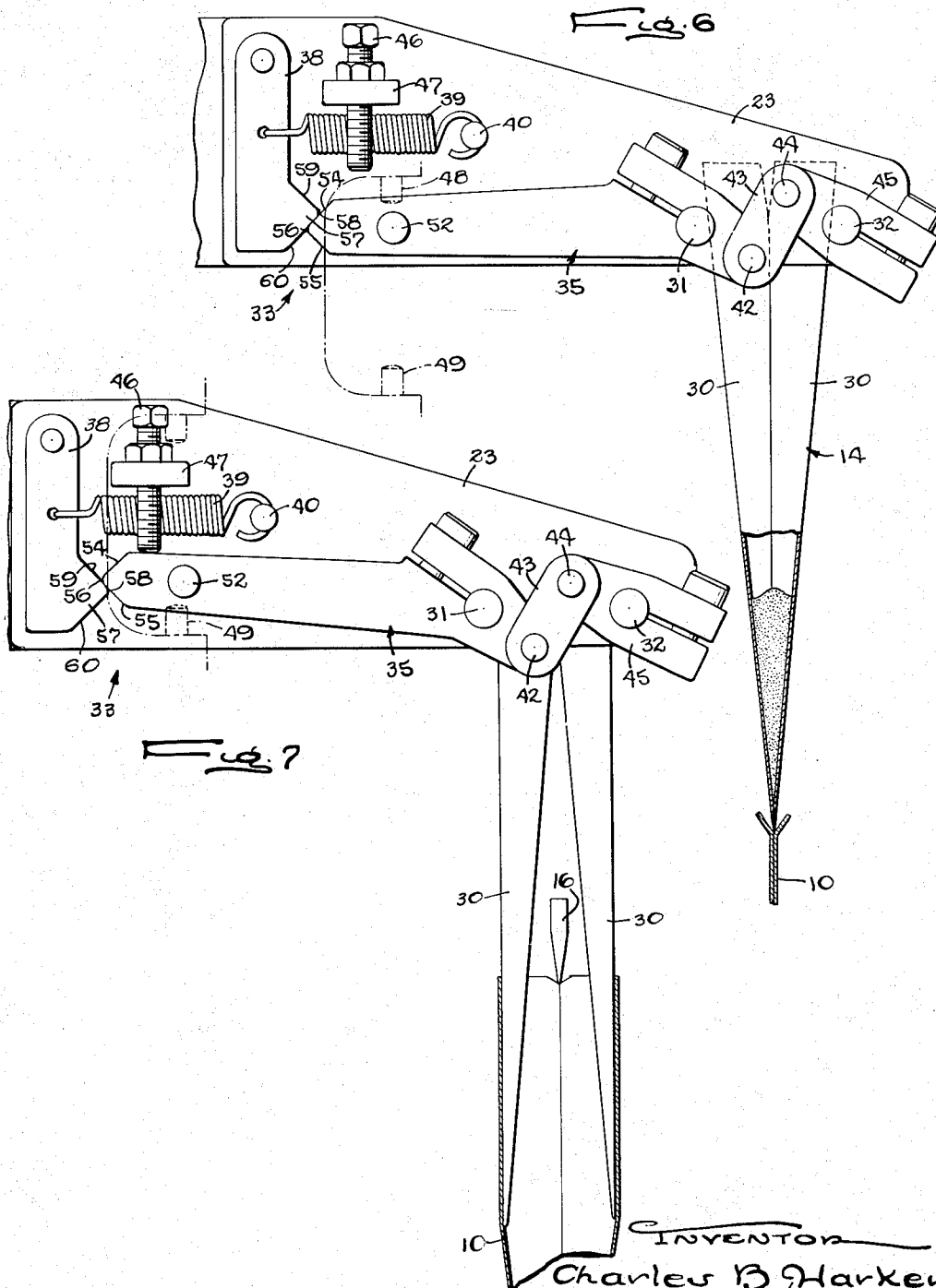
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3 Sheets-Sheet 3



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2,742,215

DISPENSING DEVICE

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11 Claims. (Cl. 226—59)

This invention relates to a dispensing device for use in a packaging machine of the type in which bags to be filled are advanced through a filling station where the spout of the dispensing device is lowered into the bag, opened to discharge a quantity of material to be packaged and then raised out of the bag. The invention has more particular reference to a dispensing device in which the spout is formed by two pivoted buckets that swing together and apart to close and open the spout.

One object of the invention is to open and close the spout by a novel mechanism which is actuated in response to the up and down motions of the spout and which operates with an over-center action so that the spout is held either open or closed during its movement into and out of the bag.

A more detailed object is to swing the buckets by an over-center device which moves up and down with the spout and is moved across center in one direction as the spout approaches its lower position and in the opposite direction as the spout nears its upper position.

Other objects and advantages of the invention will become apparent from the following detailed description taken in connection with the accompanying drawings, in which

Figure 1 is a fragmentary side view of a packaging machine employing the novel dispensing device of the present invention.

Fig. 2 is a fragmentary perspective view of the dispensing device.

Fig. 3 is a fragmentary side view.

Fig. 4 is a view similar to Fig. 3 but showing the parts in a different position.

Fig. 5 is a fragmentary side view of the stops for actuating the toggle mechanism.

Figs. 6 and 7 are views similar to Figs. 4 and 5 and illustrate a modified form of the invention.

For the purposes of illustration, the invention is shown in the drawings embodied in a packaging machine in which a row of bags 10 are gripped open end up by clamps 11 on a conveyor 12 and are advanced edgewise step by step through a filling station 13. At the filling station, a spout 14 which receives a charge of material to be packaged from a suitable hopper (not shown) is lowered into the bag and opened to discharge the material into the bag. The mouth of the bag at the filling station is held open preparatory to the entry of the spout by splitter blades 15 and 16 disposed on opposite sides of the spout and between the upper ends of the bag walls. Before the next advance of the bags, the spout is raised out of the bag and closed to receive another charge of material from the hopper.

To effect the up and down movement of the spout 14, the latter is carried on the free ends of elongated parallel arms 17 and 18 which extend longitudinally of the machine along the path of the bags 10 and are fulcrumed beyond the filling station 13 at 19 and 20 on an upright frame plate 21. In the present instance, the

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spout is mounted on a block 22 (Fig. 2) fast on the outer end of an arm 23 which projects forwardly from a link 24 whose upper and lower ends are joined through pivots 25 and 26 to the arms 17 and 18. With this arrangement, the spout 14 is lowered into and raised out of a bag dwelling at the station 13 by swinging the arms 17 and 18 down and up. A roller 27 on the end of the arm 17 rides in a channel 28 on the plate 21 to guide the arms and maintain the spout in the plane of the bag at the filling station.

The arms 17 and 18 are turned about their fulcrums by a vertical link 29 which is pivotally connected at its upper end to the arm 18 and is moved up and down by a suitable mechanism (not shown). In the upper position of the arms, the lower end of the spout 14 is disposed as shown in full slightly above the upper end of the bag dwelling at the station 13. As the spout is lowered, it enters the mouth of the bag separating the bag walls and coming to rest in the position shown in broken lines in Fig. 1.

Preferably, the spout 14 is of the so-called clam-shell type and comprises two fingers or buckets 30 of channel cross section. The buckets taper downwardly gradually to a sharpened end and open toward each other to form a closed receptacle when the flanges abut against each other as shown in Fig. 3. Near their upper ends, the buckets are welded or otherwise secured to parallel rockshafts 31 and 32 projecting through and journaled in the block 22 so that the spout may be opened and closed by turning the rockshafts to swing the buckets.

In accordance with the present invention, the spout 14 is opened and closed by an over-center device 33 which is actuated in response to the up and down motions of the spout and which operates with a snap action as the spout approaches its upper and lower positions so that the latter is held either open or closed during movement out of and into the bag 10. The over-center device is mounted on the bucket support 23 for movement up and down with the spout and is coupled to the buckets 30 to open and close the spout as it is moved back and forth across center. As the spout approaches its lower position an abutment 49 on the frame of the machine engages a part of the device 33 and moves across center in one direction to open the spout. Similarly, as the spout nears the upper position, the device encounters a second abutment 48 and is moved over center in the opposite direction to swing the buckets 30 together and close the spout.

While the over-center action may be achieved in various ways, such as magnetically, frictionally or by a spring, the over-center device 33 is shown in Figs. 1 through 5 as a toggle mounted on the spout support 23 and coupled through the rockshafts 31 and 32 to the buckets 30 to swing the latter apart when the toggle is flexed in one direction and together upon flexing of the toggle in the opposite direction. In the present instance, one link of the toggle 33 is formed by the inner and longer arm 34 of an elongated lever 35 lying alongside the spout support 23 and secured near its outer end to the rockshaft 31 which forms the fulcrum of the lever. The second link 36 of the toggle is pivotally connected at 37 to the link 34 and its other end is pivoted at 37^a to the end of an arm 38 which is pivotally suspended from the support 23 and forms a shifting pivotal connection between the link 36 and the support. A contractile spring 39 acting between a pin 40 on the spout support and the arm 38 snaps the toggle into the fully flexed position as soon as the toggle pivot 37 is moved in one direction or the other across dead center. In effect, therefore, the spring acts on the link 36 to urge the outer pivots 37^a and 31 together and

hold the toggle flexed with the spout either open or closed.

While only one of the buckets 30 need be swung by the toggle 33 to open the spout 14, it is preferred to connect the rockshafts 31 and 32 together to turn in opposite directions so that both buckets swing. To this end, the outer short end 41 of the lever 35 is pivotally connected at 42 to one end of a link 43 inclined upwardly and across the dividing line between the buckets 30 and pivoted at 44 to the free end of a crank 45 fast on the other rockshaft 32 and of a length equal to that of the arm 41. When the lever 35 is rocked vertically through the small angle a (Fig. 4) by flexing the toggle in one direction or the other, the rockshafts 31 and 32 and the buckets 30 are swung between the open and closed positions shown in Figs. 3 and 4. The spout closing movement is limited by engagement of the bucket edges while a vertical screw 46 threaded through a lug 47 on the support 23 above the toggle 33 engages the lever 35 and serves as a stop to determine the extent of the opening movement.

To open and close the spout 14 in response to the up and down motions of the spout support 23, the abutments 48 and 49 are opposed stationary stops (Figs. 3 and 5) mounted on the frame of the machine to engage and flex the toggle 33 in one direction or the other as the support approaches its upper and lower positions. In the form shown, these stops are mounted in vertically spaced relation and on opposite sides of the toggle on a projection 50 extending forwardly from the plate 21 and may be screws threaded for adjustment through lugs 51 on the forward end of the projection.

Near the upper limit of the retracting movement of the spout 14, a part of the toggle 33, herein a pin 52 projecting laterally from the lever 35, encounters the stop 48 as shown in phantom in Fig. 5 thus causing the lever to be swung downwardly relative to the support 23 and past the dead center position in the final retracting movement of the spout. As soon as the toggle pivot 37 crosses over center, the spring 39 tends to flex the toggle further causing the lever to swing downwardly until the buckets come into full engagement at their adjacent edges as shown in Fig. 3. In a similar way, the stop 49 blocks the movement of the pin 52 as the arms 17 and 18 are swinging downwardly to lower the spout 14 into the bag, the toggle links 34 and 36 being flexed upwardly and then moved over-center at which time the spring 39 flexes the toggle further until the lever 35 abuts against the stop 46. The buckets 30 thus are swung apart spreading the bag walls and opening the spout to allow the charge of material carried thereby to fall by gravity into the bag as shown in Fig. 4.

Instead of the toggle, the over-center device 33 may be of the detent type as shown in Figs. 6 and 7. In this case, the inner end of the lever 35 is sharpened to form two inclined cam surfaces 54 and 55, one sloping up from the point 56 and the other down, and a lateral projection 57 on the lower end of the arm 38 is pointed at 58 and has two similarly inclined cam surfaces 59 and 60 on opposite sides of the point. With this arrangement the arm 38 serves as a detent which urges the lever 35 into either the upper or the lower limit position and holds the lever in that position but which is movable outwardly against the action of the spring 39 to permit the lever to turn from one limit position to the other. Thus, when the point 56 on the lever 35 is below the point 58 on the projection 57, the spring 39 pulls the arm 38 to the right as viewed in Fig. 6 and the lower cam surface 60 on the projection engages the upper cam surface 54 on the lever and turns the latter counterclockwise until the buckets 30 are in the closed position. Similarly, when the point 56 is disposed above the point 58, the upper cam surface 59 on the projection 57 engages the lower cam surface 55 on the lever 35 as shown in Fig. 7 and, due to the swinging of the arm 38 under the action of the spring 39, the

lever is turned clockwise until it abuts against the stop 46 and the spout 14 is open.

In operation, assuming the parts to be in the position shown in Fig. 6, the supporting arm 23 is lowered to lower the spout 14 into the bag 10. As the spout nears its lower limit, the pin 52 on the lever encounters the stop 49 which, in the final downward movement of the spout, swings the lever up causing the point 56 on the lever to move up over the point 58 on the projection 57, that is, across the center position of the over-center device 33. During this movement of the lever, the arm 38 is swung out away from the lever against the action of the spring 39, but, as soon as the lever has crossed the center position, the spring swings the arm back camming the lever up against the stop 46 at which time the spout is open as shown in Fig. 7. Thus, as in the case of the toggle, the spout remains closed as it enters the bag and is opened as it reaches its lower limit position.

During the retracting movement of the spout 14, the buckets 30 remain in the open position until, near the upper limit of the spout, the pin 52 engages the stop 48 which, in the final upward movement of the spout, swings the lever 35 down across center. When the point 56 on the lever has passed below the point 58 on the arm projection 57, the arm 38 is swung in by the spring 39 and cams the lever down until the flanges of the buckets abut against each other and the spout is closed to receive another charge of material.

It will be observed from the foregoing that the dispensing device is comparatively simple in construction since it utilizes the up and down motions of the spout 14 to swing the buckets 30 and thus does not require an independent actuator. Further the spout is opened and closed by the positive over-center action of the over-center device 33. Due to the snap action of the latter, the spout is lowered almost to its lower limit before being opened permitting the clam-shell buckets to be lowered a substantial distance into the bag 10. Thus, the buckets, when opened, not only discharge the material to be packaged into the bottom of the bag, but also spread the bag walls so that the bag may receive the material. In addition, since the spout is almost fully retracted before being closed, a complete discharge of the material is insured. In this way, measured quantities of material may be packaged accurately in the bags.

I claim as my invention:

1. A dispensing device having, in combination, a support, a spout mounted on said support and including parts relatively movable to open and close the spout, a frame, means mounting said support on said frame for movement back and forth within a predetermined range, an over-center device carried by said support for bodily movement therewith and coupled to said parts to open the spout when moved across center in one direction and close the spout when moved across center in the opposite direction, means limiting the over-center movement of said device in each direction, a first abutment mounted on said frame to engage a part of said device as said support approaches one end of said range and move the device across center toward one limit position, a second abutment mounted on said frame to engage said device as said support approaches the other end of said range and move the device across center toward the other limit position, and yieldable means acting on said device and operable when the device is moved across center in either direction to urge the same into the corresponding limit position.

2. The combination of, a support, a pair of fingers pivoted on said support to swing toward and away from each other, a frame, means mounting said support on said frame for movement between first and second positions, an over-center device carried by said support for bodily movement therewith, two spaced stops mounted on said frame and disposed on opposite sides of said device, one engaging a part of said device and moving the same across center in one direction as said support

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approaches said first position and the other similarly engaging and moving said device across center in the opposite direction as the support approaches said second position, and a connection between said device and said fingers operable to swing the fingers apart when the device is moved in one direction and together upon movement of the device in the opposite direction.

3. A dispensing device comprising a frame, a support mounted on said frame to move back and forth between a first and a second position, a filling spout carried by said support and having parts movable relative to each other to open and close the spout, a member connected to said parts and movable back and forth to open and close the spout, an over-center device mounted on said support for bodily movement therewith and operatively coupled to said member to move the same back and forth when moved across center in one direction or the other, a first abutment mounted on said frame to engage a part of said device as said support approaches said first position and move the device across center in the direction to open the spout in the continued movement of the support, and a second abutment mounted on said frame to engage a part of said device as said support approaches said second position and move the device in the opposite direction in the continued movement of the support thereby to close said spout.

4. In a dispensing device, the combination of, a support, a pair of buckets mounted on said support and cooperating to form a filling spout, a frame, means mounting said support on said frame for movement between first and second positions, a toggle carried by said support for bodily movement therewith and comprising two links pivoted together, two spaced stops mounted on said frame and disposed on opposite sides of said toggle, one engaging a part of and flexing said toggle in one direction as said support approaches said first position and the other similarly engaging and flexing the toggle in the opposite direction as the support approaches said second position, means limiting flexing of said toggle in each direction, a member connected to one of said buckets and movable back and forth to move said one bucket toward and away from the other bucket, a pivotal connection between one of said links and said member, a second pivotal connection between the other of said links and said support, one of said connections being shiftable relative to said support, and a spring acting on at least one of said links to urge said connections toward each other and flex said toggle fully when flexed initially by either of said stops.

5. A dispensing device comprising a frame, a support mounted on said frame to move back and forth between a first and a second position, a filling spout carried by said support and including parts relatively movable to open and close the spout, a member connected to said parts and movable back and forth to open and close the spout, a toggle mechanism mounted on said support and operatively coupled to said member to move the same back and forth when flexed in one direction or the other, a first abutment mounted on said frame to engage a part of said toggle mechanism as said support approaches said first position and flex the toggle in the continued movement of the support, a second abutment mounted on said frame to engage a part of said toggle mechanism as said support approaches said second position and flex the toggle in the opposite direction in the continued movement of the support, means limiting the flexing of said toggle in each direction, and yieldable means acting on said toggle to urge the toggle when flexed toward and hold the same in the fully flexed position with said spout either open or closed.

6. A dispensing device comprising a frame, a support mounted on said frame to move up and down between upper and lower positions, two parallel rockshafts journaled on said support and spaced apart horizontally, two buckets, one fast on each of said rockshafts, cooperating with each other to form a spout, an elongated lever rigid-

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ly connected intermediate its ends to one of said rockshafts whereby the latter constitutes the fulcrum of the lever, mechanism connecting one arm of said lever to the other of said rockshafts to turn the rockshafts together but in opposite directions, a link pivotally connected at one end to the other arm of said lever and coupled at the other end to said support for turning and shifting relative to the same, said link and said other arm constituting a toggle, two spaced stops mounted on said frame and disposed on opposite sides of said toggle, one engaging a part of and flexing said toggle in one direction as said support approaches said upper position and the other similarly engaging and flexing the toggle in the opposite direction as the support nears said lower position, and means yieldably connected to said toggle and tending to flex the toggle further when the latter is engaged by said stops.

7. In a dispensing device, the combination of, a frame, a support mounted on said frame for movement back and forth between first and second positions, a pair of buckets mounted on said support and cooperating to form a filling spout, a member connected to one of said buckets and movable back and forth to move said one bucket toward and away from the other bucket, an over-center toggle comprising two links pivoted together, one of said links being coupled to said member and the other pivotally connected to said support, a first stop mounted on said frame to engage one of said links as said support approaches said first position and shift said toggle across center in one direction in the continued movement of the support thereby to move said member and open said spout, a second stop similarly mounted on said frame to engage one of said links as said support approaches said second position and shift said toggle across center in the opposite direction thereby to close said support, and means yieldably connected to said toggle and operable to flex the toggle when the latter is shifted across center by said stops.

8. A dispensing device comprising a frame, a support mounted on said frame to move back and forth between a first and a second position, a filling spout carried by said support and having parts movable relative to each other to open and close the spout, a member connected to said parts and movable back and forth to open and close the spout, a toggle mechanism mounted on said support and operatively coupled to said member to move the same back and forth when flexed in one direction or the other, a first abutment mounted on said frame to engage a part of said toggle mechanism as said support approaches said first position and flex the toggle in the continued movement of the support, and a second abutment mounted on said frame to engage a part of said toggle mechanism as said support approaches said second position and flex the toggle in the opposite direction in the continued movement of the support.

9. A dispensing device comprising a frame, a support mounted on said frame for movement back and forth between first and second positions, a filling spout mounted on said support and comprising parts movable relative to each other to open and close the spout, an arm pivoted on said support, a member coupled to said parts and movable back and forth across a center position with respect to said arm and between first and second limit positions in which said spout is open and closed respectively, a first pair of cam surfaces on said arm and said member respectively and engageable when said member is on one side of said center position, a second and similar pair of cam surfaces engageable when said member is on the other side of said center position, means yieldably urging said arm and said member together to cause said first surfaces when in engagement to move the member toward said first limit position and said second surfaces when in engagement to move the member toward said second limit position, a first abutment on said frame engageable with said member as said support approaches said first position and operable to move the member across center in said one direction, and a second abutment on said frame en-

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gageable with said member and operable to move the member across center in said other direction.

10. A dispensing device having, in combination, a frame, a support mounted on said frame to move up and down between upper and lower positions, two horizontal parallel rockshafts laterally spaced apart and journaled on said support, two buckets, one fast on each of said rockshafts, cooperating to form a spout, an elongated lever rigidly connected to one of said rockshafts to turn up and down about the latter between first and second limit positions, mechanism connecting said lever and the other of said rockshafts to turn the rockshafts together but in opposite directions, a detent engageable with said lever to hold the same in each of said limit positions, means yieldably urging said detent into engagement with said lever and permitting the member to be moved from one limit position to the other, and two spaced stops mounted on said frame above and below said lever, one stop engaging said lever and turning the same up to open said spout as said support approaches said lower position and the other engaging and turning the lever down as the support approaches said upper position to close the spout.

11. A dispensing device comprising a frame, a support mounted on said frame for movement between first and second positions, a spout carried by said support and having parts relatively movable to open and close the

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spout, a member mounted on said support for bodily movement therewith and movable back and forth relative to the support between first and second limit positions, means connecting said member and said parts to open and close the spout as said member moves to said first and second limit positions respectively, a detent engageable with said member to hold the same in each of said limit positions, means yieldably urging said detent into engagement with said member and permitting the member to be moved from one limit position to the other, a first abutment on said frame engageable with said member as said support approaches said first position and operable to move the member to said first limit position, and a second abutment on said frame engageable with said member as said support approaches said second position and operable to move the member to said second limit position.

References Cited in the file of this patent

UNITED STATES PATENTS

574,137	Cummings -----	Dec. 29, 1896
896,952	Sturgeon et al. -----	Aug. 25, 1908
997,145	Lines -----	July 4, 1911
2,051,483	Jones -----	Aug. 18, 1936
2,307,990	Briggs -----	Jan. 12, 1943