

[54] **DISPENSING DEVICE**
 [75] Inventors: **Frank Victor Pliml, Jr.**, Arlington Heights; **Ernest William Reinwall, Jr.**, McHenry, both of Ill.
 [73] Assignee: **Illinois Tool Works Inc.**, Chicago, Ill.
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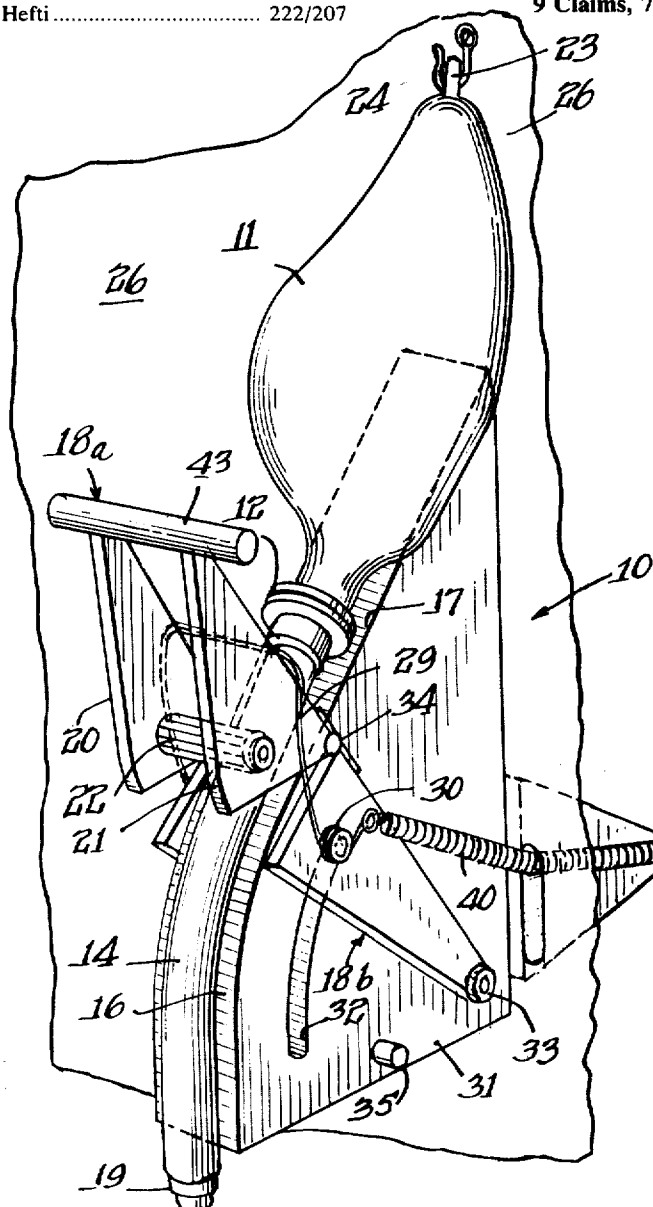
Primary Examiner—Robert R. Reeves
Assistant Examiner—Joseph J. Rolla
Attorney, Agent, or Firm—Olson, Trexler, Wolters, Bushnell & Fosse, Ltd.

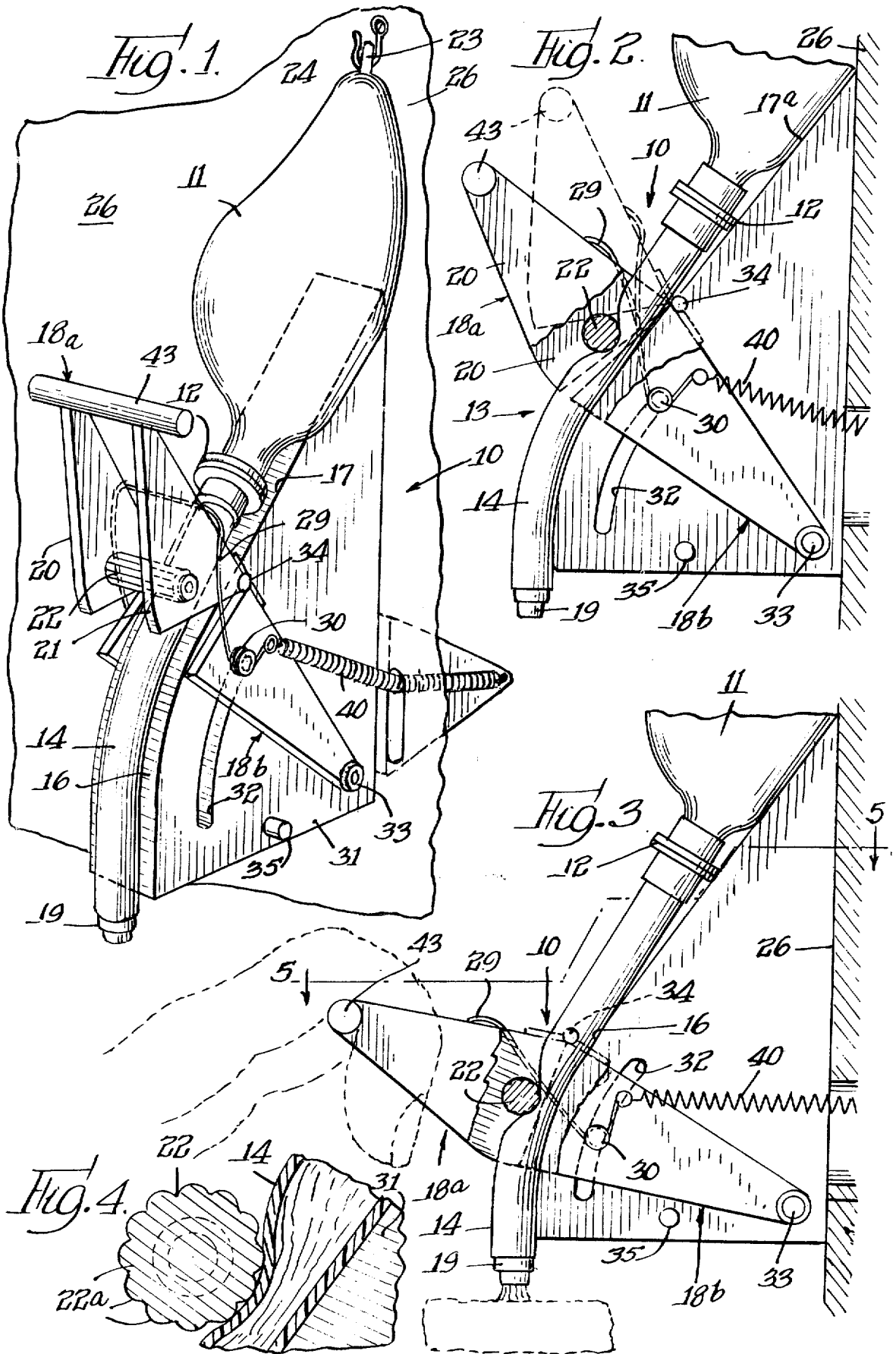
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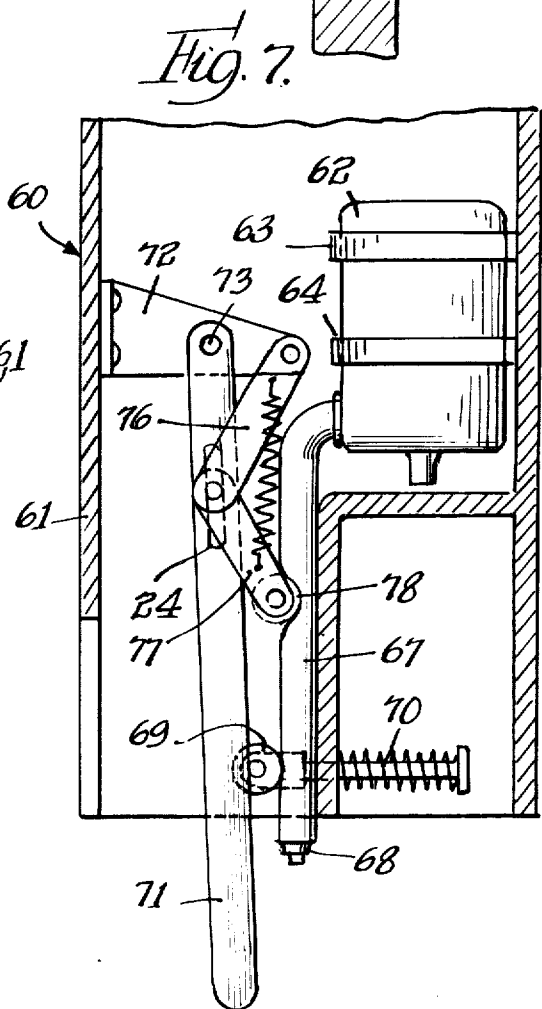
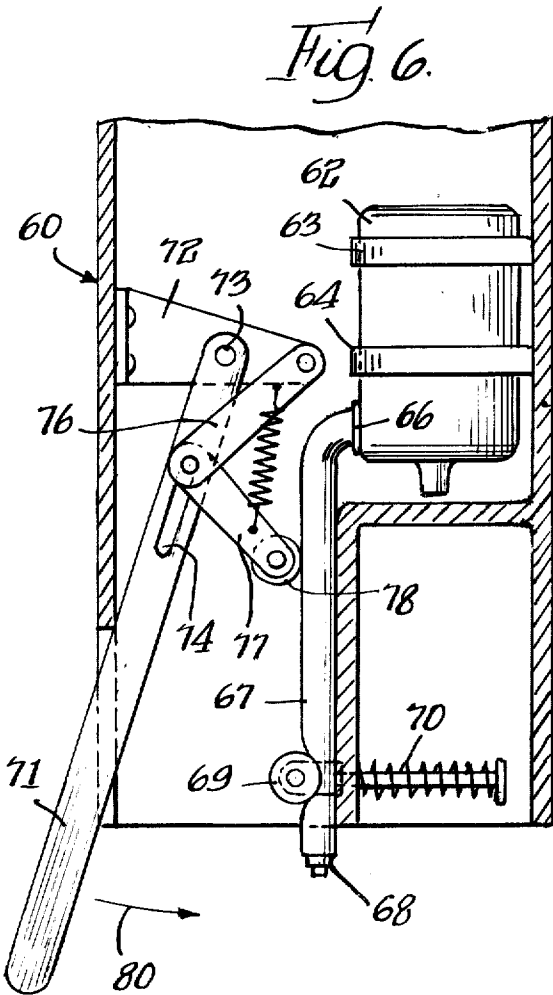
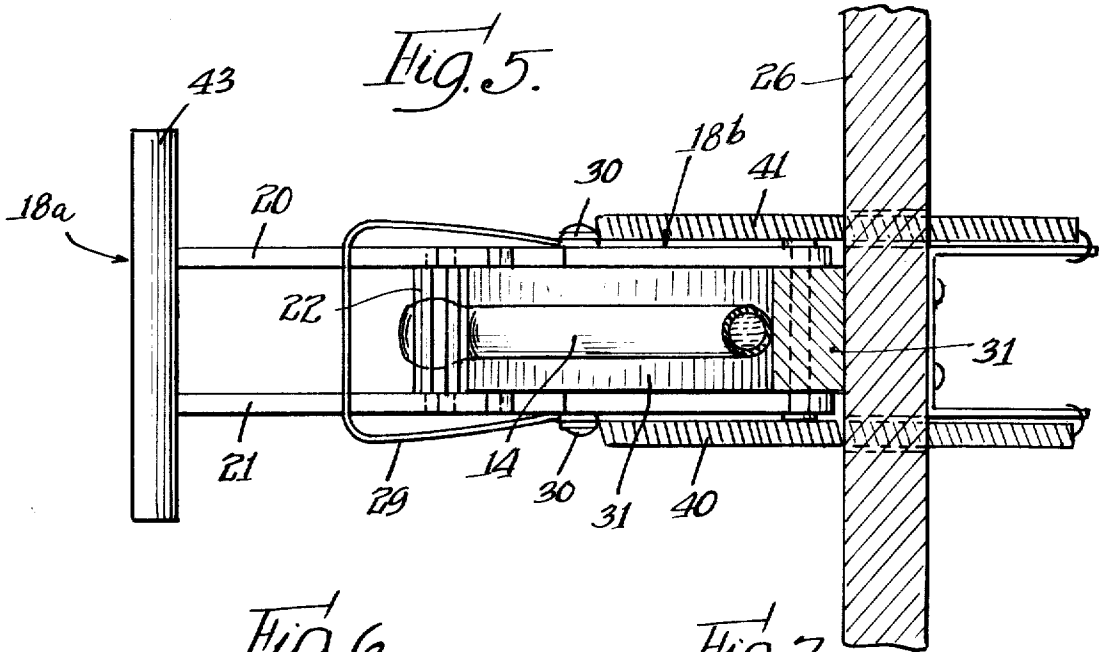
[57] **ABSTRACT**
 The embodiment of the invention disclosed herein is directed to a dispensing device for selectively discharging a quantity of flowable material such as condiments, i.e., tartar sauce, catsup, mustard, etc., and more particularly to a dispensing device which allows for discharging a desired quantity of such flowable material without obtaining excessive amounts thereof.

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9 Claims, 7 Drawing Figures







DISPENSING DEVICE

DESCRIPTION OF THE PRIOR ART

Heretofore, dispensing devices of the type utilizing a flexible tube or hose which is to be squeezed by a slide at the down position, the handle pivots upward to release the tube; however, the roller does not completely disengage the tube thus affording a somewhat dampening action as the arm returns to the upright position. In the embodiment disclosed herein, the volume the product dispenses is in the order of about three-fourths of an ounce more or less and intermediate stops of travel of the handle will produce lesser amounts.

Also, some of the prior art devices incorporate means for squeezing the collapsible tubing progressively toward the nozzle so that the tubing is forced closed. However, the complete closure of the tubing curves at the end of travel so that further ejection of material is prevented.

SUMMARY OF THE INVENTION

Accordingly, it is an object of this invention to provide a new and improved dispensing device for ejecting flowable material from a nozzle in a uniform manner and which device overcomes the problems of the prior art. Briefly, the dispensing device of this invention is most advantageously used in conjunction with apparatus to meter out fixed amounts of food product, such as mayonnaise, mustard, catsup, tartar sauce, cheese sauce, etc., from a disposable polyethylene bag. The polyethylene bag is provided with a plastic fitment to be heat sealed mechanically attached, pressure sealed, etc. to the bag when the bag is filled with the material to be dispensed. The dispensing device further includes an injection molded tube to be attached to the bag fitment for dispensing of the material therein. This tube may also be disposable. The tube end preferably is provided with a piercing device to penetrate the fitment and gain access to the material within the bag. Another means of opening the bag rather than employing a piercing device on the fitment tube is to provide the bag fitment with a tear away tab opening thus removing the fitment seal and then mechanically attaching the dispensing tube. The opposite end of the tube is provided with a duck-bill type cut-off configuration which maintains the tube in a closed condition. Both the tube fitment and bag may be disposable items, if necessary, thereby eliminating the need of cleaning equipment, or the like.

The dispensing mechanism includes a roller which is progressively urged into contact with the flexible tube so that the contents within the tube are ultimately squeezed forward at all times rather than partially forward and partially back into the container. By pulling down the handle, initial action will be a pivoting of the handle at a hinge point and subsequently a collapsing of the tube as the handle moves further along to cause firm engagement of the roller with the collapsible tube. The tube is made of a material so as to have a memory that will cause it to again flex to a substantially cylindrical configuration. The tube fills almost instantly behind the roller and the second shot of product can be pumped out immediately. This arrangement of providing a relatively long length of tube which is continu-

ously collapsed during the squeezing operation, provides an accurate and consistent quantity which will vary only in an amount in the order of about plus or minus 5 percent by weight. When releasing the handle at the down position, the handle pivots upward to release the tube; however, the roller does not completely disengage the tube thus affording a somewhat dampening action as the arm returns to the upright position. In the embodiment disclosed herein, the volume the product dispenses is in the order of about three-fourths of an ounce more or less and intermediate stops of travel of the handle will produce lesser amounts.

By providing a dispensing device of the character disclosed herein, flowable materials such as tartar sauce can be dispensed reliably despite the fact that it has particles such as pickle chips and the like therein. With the prior art, dispensing devices such as the plunger type, it was very difficult to dispense products such as tartar sauce and the like.

Many other objects, features and advantages of this invention will be more fully realized and understood from the following detailed description when taken in conjunction with the accompanying drawings wherein like reference numerals throughout the various views of the drawings are intended to designate similar elements or components.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary perspective view illustrating a dispensing device constructed in accordance with the principles of this invention;

FIG. 2 is a side elevational view of the dispensing device of this invention showing the dispensing handle in an initial position, in phantom, and as moved to an intermediate position in solid lines;

FIG. 3 illustrates the dispensing device of this invention with the dispensing handle illustrated and a further advanced position than that shown in FIG. 2;

FIG. 4 illustrates the roller configuration that causes collapse of the dispensing nozzle of this invention;

FIG. 5 is a top view taken along line 5-5 of FIG. 3;

FIG. 6 is an alternate embodiment of a dispensing device that can be constructed in accordance with the principles of this invention; and

FIG. 7 illustrates the device of FIG. 6 in operable condition.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

Referring now to the drawings, FIGS. 1, 2, 3, 4 and 5 illustrate one form of dispensing device which is constructed in accordance with the principles of this invention and designated generally by reference numeral 10. The dispensing device 10 includes a container 11, preferably formed of a collapsible plastic bag which can have a quantity of flowable material disposed therein by means of a conventional packaging process which, in turn, will also provide a fitment 12 to be located at the lower portion of the bag when positioned in the dispensing device, as best seen in FIG. 1. The fitment 12 is arranged to receive a discharge nozzle arrangement 13 which includes a flexible, collapsible conduit member 14 positioned over an arcuately-shaped support surface 16. The arcuatelyshaped support surface, preferably leads from an inclined surface 17 and is cooperable therewith to provide a flow control area so that when a dispensing handle structure 18 is actuated,

flowable material from the bag 11 moves through the flexible collapsible conduit 14 in a uniform manner toward a discharge or dispensing end 19 with little or no reverse flow of the material back into the container 11. During the release of the actuating arm mechanism 18, the flexible conduit 14 will expand, thereby drawing additional flowable material into the conduit from the bag 11.

The dispensing arm member 18 has a pair of spaced apart flange portions 20 and 21 positioned on opposite sides of the flexible collapsible conduit or tube 14 and arranged to carry a roller member 22 which is urged against the outer surface of the tube 14 during actuation of the arm member and continuously, progressively causes collapse of the conduit in a gradual uniform manner as the roller member traverses the flow control area located between the arcuatelyshaped surface 16 and the inclined surface 17. By so controlling the gradual collapse of the conduit, flowable material therein will move more uniformly toward the dispensing end 19 rather than having part of the flowable material move toward the dispensing nozzle and the other part move upwardly back into the container 11.

Most advantageously, the roller 22 is provided with a plurality of arcuately spaced apart longitudinally directed rib members 22a which provide for a gripping engagement with the conduit member 14.

In the illustrated embodiment, the container of bag 11 is provided with a support tab 23 which has an opening or aperture formed therein to be engaged with a support hook 24 located on a bulkhead or wall panel 26 which forms part of the structure of the dispensing apparatus. As best seen in FIGS. 1 and 2, the lower portion of the bag is somewhat supported in a downwardly, outwardly directed inclined position as a result of the top portion of the inclined surface 17, as the bag engages the portion 17a thereof.

The actuating handle mechanism 18 includes a spring member 29 which engages a guide pin 30 on both sides of the spaced apart flange portions 20 and 21. The spring 29 prevents the upper portion 18a of the handle 18 from being inadvertently urged smartly upwardly as a result of quick release and expansion of the flexible tube 18. Therefore, the spring 29 maintains a slight pressure of the roller 22 on the top surface of the conduit 14. The dispensing arm member 18 has the lower portion 18b thereof secured to a block member 31 which, in the illustrated embodiment, has the outer surface thereof configured to form the convex arcuatelyshaped surface 16 and the inclined surface 17. The slot 32 is formed in the block 31 and provides a guide for the pin structure 30. The lower portion of the handle 18 is pivoted by a pivot connection 33 which causes the entire dispensing handle to rotate and relative movement between the upper and lower portions 18a and 18b, respectively, is obtained by a pivot point 34. In the illustrated embodiment, the flow control area between the arcuately shaped surface 16 and the inclining surface 17 is intended to be at a point where the roller 22 gradually engages the flexible, collapsible conduit 14 during the initial pivot action about the pivot point 34. Further downward movement of the handle 18 will cause the entire handle assembly to pivot about the pivot point 34 to urge flowable material within the conduit outwardly of the dispensing end 19. An outwardly extending pin 35 is provided on at least one side of block 31 to serve as a limit stop for the downward

movement of arm 18b. Pin 35 can be made adjustable so as to predetermine the amount of material dispensed.

A pair of return springs 40 and 41 are provided for engagement with the lower portion of the handle 18 to retract the handle assembly to the position as shown in FIGS. 1 and 2. When a crossbar member 43, located at the uppermost end of the handle assembly 18 is released, the entire assembly will retract arcuately upwardly in readiness for another dispensing operation. The rapid expansion of the conduit member 14 sucks flowable material from the bag 11 to provide substantially immediately a quantity of flowable material in the conduit for a rapid subsequent discharge thereof.

Referring now to FIGS. 6 and 7, there is seen an alternate embodiment of the present invention and includes a dispensing housing structure 60 formed by enclosure walls 61 and wherein is positioned a container 62 held by a pair of spaced apart brackets 63 and 64. At the lower end of the container 62 is a fitment 66 to which is connected a flexible collapsible conduit or tube member 67.

In this embodiment, the lower end, i.e., the dispensing end 68 may be of the duck-bill type or may be continuously opened and the quantity of flowable material restricted by a pinch-off roller 69 which closes the path for the material. The pinch-off roller 69 is provided with a spring member 70 of sufficient strength to cause collapse of the conduit 67 when no added pressure is applied thereto as a result of a dispensing roller, in a manner to be described.

In this embodiment, an actuating lever 71 has the upper end thereof pivotally connected to a support arm 72 by pivot point 73. A slot 74 is formed in the arm 71 and engages with a first lever arm 76 extending outwardly and upwardly therefrom to be connected to the support arm 72 at the inmost portion thereof. Also secured within the slot 74 is a downwardly, outwardly directed arm 77 which, in turn, has a roller 78 formed at the lower end thereof. The roller 78 progressively engages the flexible, collapsible conduit 67 as the lever arm 71 is moved in the direction of the arrowed line 80. The roller 78 does not abruptly squeeze off the collapsible conduit 67, but as a result of the interaction between the lever arms 76, 77 and the slot 74, a gradual downward squeezing off of the conduit 67 is obtained. This, therefore, reduces the amount of backflow of flowable material into the container as it is dispensed through the flexible, collapsible conduit. As a result of the closing off of the conduit 67 and the downward motion of the roller 78, pressure within the conduit increases sufficient to urge the pinch-off roller 69 outwardly and open the passage through the conduit. This then allows the flowable material therein to be discharged.

While several embodiments of the present invention have been illustrated herein in particular detail, it will be understood that variations and modifications may be effected without departing from the spirit and scope of the novel concepts of this invention.

The invention is claimed as follows:

1. A dispensing device for selectively discharging a quantity of flowable material from a container having a fitment to receive a discharge nozzle, including a block member having an arcuately-shaped convex surface positioned beneath said container and extending outwardly therefrom, said arcuately shaped convex sur-

face leading into a support surface which is positioned beneath said container, and the juncture between said support surface and said arcuately shaped convex surface provides a fluid flow control area for directing a quantity of the flowable material within said nozzle toward a dispensing end thereof while substantially preventing the flowable material from being urged upwardly back into said container, said nozzle being formed of a flexible tube communicating with and extending from said container and in contact with said arcuately shaped convex surface to conform substantially to the contour thereof, said flexible tube being resilient to permit collapse thereof and squeeze a quantity of flowable material therefrom, an arm member positioned above said flexible tube and providing spaced-apart flange portions positioned on opposite sides of said flexible tube, said arm member being mounted for in a direction beginning at and along said support surface for progressively squeezing said flexible tube arcuately and downwardly to urge the quantity of flowable material therein through the dispensing end of said nozzle, wherein said block member includes an arcuately shaped slot formed therein, said arcuately-shaped slot being projected from a pivot point which also corresponds to the center of the radius of curvature of said arcuately-shaped surface and wherein said arm member includes a guide extending into said arcuately-shaped slot for travel within said slot through a predetermined distance, and further including means extending from said block member to provide an adjustable stop against which said arm member engages at the end of travel thereof of the flowable material to control volume dispensed.

2. The dispensing device as set forth in claim 1, wherein said container is formed of a collapsible, disposable plastic bag.

3. The dispensing device as set forth in claim 2, wherein said flexible tube is readily detachable from said dispensing device and disposed of and replaced when replacing said collapsible, disposable plastic bag.

4. The dispensing device as set forth in claim 1, wherein said dispensing end of said nozzle is provided with a duck-bill closure to restrain flow of the material therethrough until such time said flexible tube is collapsed.

5. The dispensing device as set forth in claim 1, wherein said arcuately-shaped convex surface and said support surface are inclined, said surfaces being formed as the upper surface of a block member, said inclined surface providing a partial support beneath said container, and said block member providing means for pivotally connecting said arm member for cooperation therewith to effect a dispensing action of the flowable material through said flexible tube.

6. A dispensing device for selectively dispensing a quantity of flowable material, comprising in combination: a housing, a container of flowable material to be dispensed secured within said housing, a collapsible, flexible tube extending from said container and downwardly within said housing, a support surface immediately adjacent said flexible, collapsible tube, pinch-off means associated with said collapsible, flexible tube to prevent flow of material therethrough, an actuating lever, a support arm secured within said housing and pivotally receiving said actuating lever, a first intermediate lever secured to said support arm and engaging a slot formed in said actuating lever, and a second intermedi-

ate lever secured to said first intermediate lever and engageable with said slot, said second intermediate lever having a squeeze roller secured to the free end thereof for engagement with said flexible, collapsible tube for urging flowable material therethrough as a result of pivotal actuation of said lever.

7. A dispensing device as claimed in claim 6 wherein said device comprises a support means for said roller, and said pinch-off means is a roller disposed on one side of said feed tube, said dispensing device comprises a frame having a wall member that is disposed adjacent the opposite side of said feed tube, said support means comprises an elongated rod which is secured to said frame on said opposite side of said feed tube and said resilient means is a coiled spring which is disposed around said rod intermediate said frame and said wall member to bias said roller toward said first position.

8. A dispensing device for selectively discharging a quantity of viscous material from a container having a fitment to receive a discharge nozzle, said device including an arcuately-shaped convex support surface positioned beneath said container and extending outwardly therefrom, said arcuately-shaped support surface leading into a support surface which is positioned beneath said container with said arcuatelyshaped surface providing a fluid control area for directing a quantity of the viscous flowable material within said nozzle toward a dispensing end thereof, said nozzle being formed of a flexible tube communicating with and extending from said container and in contact with said arcuately-shaped surface to conform substantially to the contour thereof, said flexible tube being resilient to permit collapse thereof and squeezing a quantity of flowable material therefrom, an arm member having a pair of spaced apart flange portions positioned on opposite sides of said flexible tube and a transverse pressure means carried by said flange portions positioned transverse to and above said flexible tube, said flange portions each including two separate sections pivotally joined adjacent to common ends thereof to permit limited arcuate movement relative to each other, the first lower section pivotally secured to a block member forming said arcuate-shaped surface and said support surface, said block member including arcuately disposed guide means, said guide means being projected from said pivot point which also corresponds to the center of the radius of curvature of said arcuately shaped surface, said arm member having a guide cooperating with said guide means for travel through a predetermined distance, said second section capable of actuating said first section after the limited arcuate movement about their edge pivot point has been accomplished, whereby said arm member with its transverse pressure means is adapted to be moved under application of a force thereon in a direction along said arcuately shaped support surface for progressively squeezing said flexible tube arcuately and downwardly to urge the quantity of viscous flowable material therein through the dispensing end of the nozzle, the release of the force on said second section causing it to break away from its cooperating position relative to said first section whereby pressure by the transverse roller against the flexible tube is relieved, and means for returning the arm member to its initial position remote from the discharge end of said nozzle.

9. A dispensing device for selectively discharging a quantity of flowable material from a container having

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a fitment to receive a discharge nozzle, including an arcuately shaped convex surface positioned beneath said container and extending outwardly therefrom, said arcuatelyshaped convex surface leading into a support surface which is positioned beneath said container, and the juncture between said support surface and said arcuately shaped convex surface provides a fluid flow control area for directing a quantity of the flowable material within said nozzle toward a dispensing end thereof while substantially preventing the flowable material from being urged upwardly back into said container, said nozzle being formed of a flexible tube communicating with and extending from said container and in contact with said arcuately shaped convex surface to conform substantially to the contour thereof, said flexible tube being resilient to permit collapse thereof and

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squeeze a quantity of flowable material therefrom, an arm member positioned above said flexible tube and providing spaced apart flange portions positioned on opposite sides of said flexible tube, said arm member being mounted for movement in a direction beginning at and along said support surface for progressively squeezing said flexible tube arcuately and downwardly to urge the quantity of flowable material therein through the dispensing end of said nozzle, wherein said arm member is formed of two sections, a first lower section pivotally secured to said block member and a second section pivotally connected to said first section for limited arcuate movement relative thereto and for effecting movement of said first section after said limited arcuate movement has been accomplished.

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