Sept. 12, 1967 D. J. MOYNIHAN 3,341,088

DEVICE FOR DISPENSING POWDERED MATERIAL

Filed April 25, 1966 2 Sheets-Sheet 1

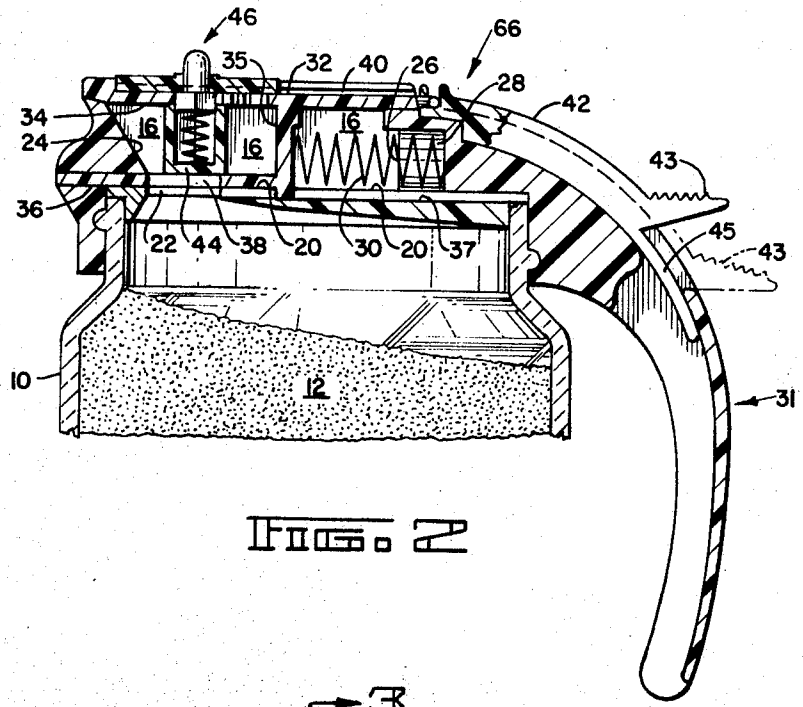


FIG. 2

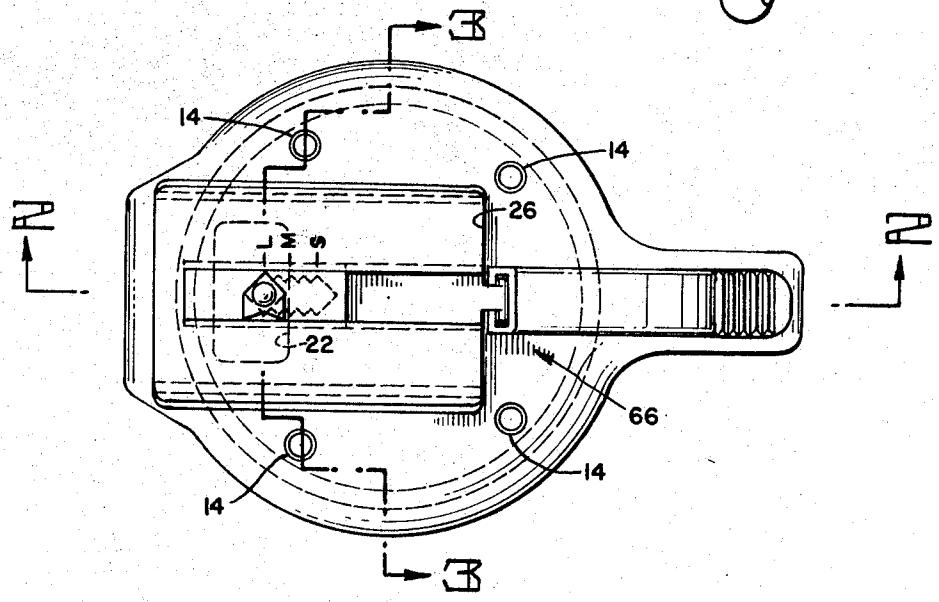


FIG. 1

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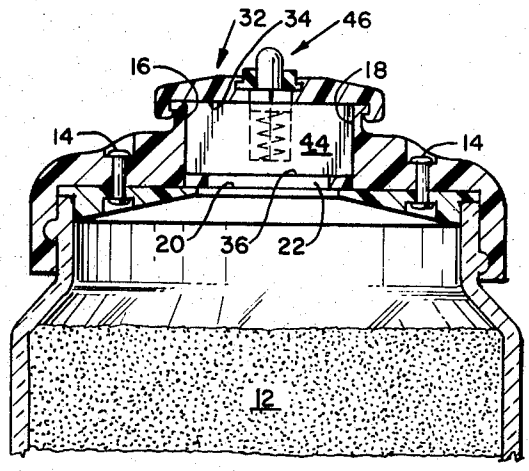


FIG. 3

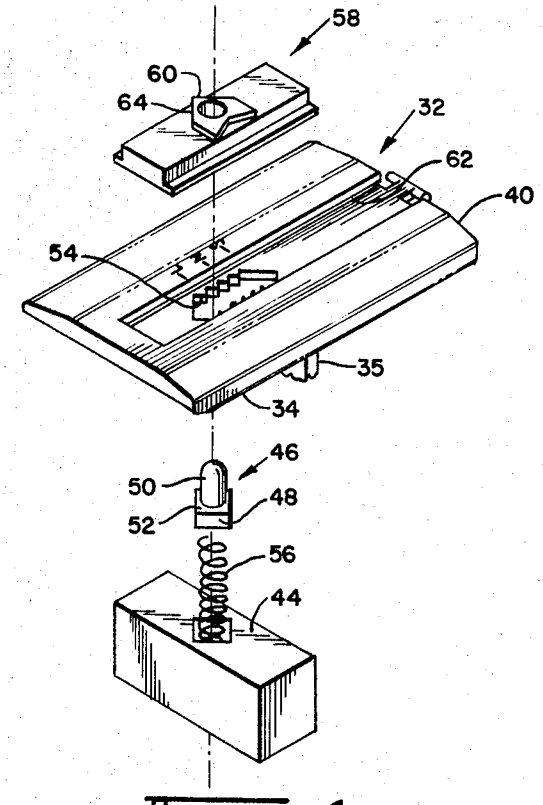


FIG. 4

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United States Patent Office 3,341,088
Patented Sept. 12, 1967

3,341,088

DEVICE FOR DISPENSING POWDERED MATERIAL

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Filed Apr. 25, 1966, Ser. No. 544,784
6 Claims. (Cl. 222—440)

This invention relates to devices for dispensing powdered material, and deals more particularly with a novel closure for a container in which the material to be dispensed is stored.

A general object of the present invention is to provide a closure for dispensing powdered material from a container, which closure can be readily attached to said container.

Another object of the present invention is to provide a closure for dispensing powdered material from a container, which closure is so designed that the user can manipulate the dispensing mechanism with the same hand used to pick up the container itself.

Still another object of the present invention is to provide a closure for dispensing powdered material from a container, which closure includes a dispensing mechanism with a chamber of variable capacity to permit predetermined quantities of such material to be dispensed.

A more specific object of the present invention is to provide a threaded closure of the foregoing character adapted for use with a screw top jar of the type commonly used for instant coffee or the like, which closure can be used in place of the cap normally supplied on such a jar.

Another specific object of the present invention is to provide a closure for dispensing powdered material from a container, which closure includes a handle for supporting the container and closure in an inverted or upright position, and a thumb engageable trigger so arranged on the handle as to permit the dispensing mechanism to be operated by the thumb of the hand used to grasp the handle.

A still further specific object of the present invention is to provide a dispensing mechanism for a closure of the foregoing character wherein the aforementioned trigger need only be actuated once for each predetermined quantity of material to be dispensed, and wherein the container can be held in said inverted position during several successive trigger actuations. The drawings show a preferred embodiment of the invention and such embodiment will be described, but it will be understood that various changes may be made from the construction disclosed, and that the drawings and description are not to be construed as defining or limiting the scope of the invention, the claims forming a part of this specification being relied upon for that purpose.

Of the drawings:

FIG. 1 is a plan view of a closure constructed in accordance with the present invention;

FIG. 2 is a vertical sectional view of the closure of FIG. 1 and is taken along the line 2—2 of that figure;

FIG. 3 is a vertical sectional view taken along the line 3—3 of FIG. 1;

FIG. 4 is an exploded view of a portion of the dispensing mechanism shown in the closure of FIG. 1.

Turning to the drawings in greater detail, FIG. 2 shows a container in the form of a screw top glass jar **10** of the type commonly used for storing instant coffee or the like indicated generally at **12**. Such a jar would normally be provided by the manufacturer of the coffee or other powdered material to be dispensed, and would have a conventional screw top metal cap (not shown) normally supplied therewith. In accordance with the present invention a closure is provided for use in lieu of such a conventional screw top cap and the drawings show a preferred embodiment of such a closure having a suitable dispensing mechanism integrally provided therein.

The closure defines a downwardly open receptacle for receiving the open top of the jar **10** and may be made in two parts which are connected by four rivets or the like indicated generally at **14** in FIGS. 1 and 3. The two-part construction shown is intended to be illustrative only and it is conceivable that the closure of the present invention might be made in one part if intended for use with a container adapted for permanent attachment thereto.

As best shown in FIGS. 2 and 3, the upper portion of the closure defines an elongated cavity having spaced side walls **16** and **18** and a lower wall **20**. An opening **22** is provided in the lower wall **20** adjacent one end of the cavity for a purpose to be described, and the front wall **24** of said cavity is inclined as shown, while the rear wall **26** preferably comprises a socket **28** in which a compression spring **30** is received for a purpose to be discussed in greater detail hereinbelow. Still with reference to the closure, FIG. 2 shows a handle portion **31** which may comprise an integral part of said closure and extends rearwardly and downwardly in spaced relation to the side of the container as shown in FIG. 2 so that the container, together with the closure, can be conveniently lifted and moved to an inverted position.

A valve **32** is slidably received in the elongated closure cavity, and as best shown in FIG. 2 has a forward portion which is generally U-shaped with upper and lower wall portions, **34** and **36** respectively, which extend across the closure cavity as best shown in FIG. 3. The wall portions **34** and **36** of the valve cooperate with the cavity side walls **16** and **18** of the closure itself to define a dispensing chamber therebetween. The lower wall portion **36** of the valve defines an opening **38** which in FIG. 2 is registered with the closure opening **22** when the valve **32** is in a first position. A rear portion **40** of the valve **32** is connected to a trigger **42** slidably carried by the handle **31**, and as so arranged rearward and downward movement on the trigger **42** causes the valve to move from the first position shown to a second position wherein a pour spout is defined between the forward edge of the upped wall **34** of the valve, and the inclined forward wall **24** of the closure.

Still with reference to the valve **32**, it will be apparent from FIG. 2 that the upper and lower wall portions **34** and **36** are connected by an intermediate strut portion **35** which extends downwardly somewhat below the lower wall portion **36**. The lower end of the strut portion **35** is received in a slot **37** provided for this purpose in the lower portion of the closure. A spring **30** will be seen to act between the closure and the intermediate strut portion **35** of the valve **32** to urge the valve forwardly closing off the pour spout just described. The above-mentioned socket **28** receives the spring **30** as shown. From FIG. 2 it will also be apparent that the forward edge of the upper wall portion **34** of the valve **32** is inclined slightly so as to engage a similarly shaped inclined surface on the closure. These surfaces provide a stop for the valve **32**.

In further accordance with the present invention, means is provided for varying the capacity of the dispensing chamber defined in the valve **32**, and as shown said means comprises a generally rectangularly shaped plug **44** which extends horizontally across the generally rectangularly shaped chamber, and also extends vertically from the upper wall portion **34** to the lower wall portion **36** of the valve **32**. The plug **44** is slidably received between these surfaces and suitable means is provided for releasably

retaining the plug in any one of a plurality of positions relative to the valve **32**.

The means for retaining the plug preferably comprises a plunger **46** having a lower end portion which is diamond-shaped in cross section to fit in a cooperatively shaped bore in the plug **44**, and an upper end portion **50** which may be circular in cross section and is preferably of somewhat smaller cross-sectional size than the lower end portion to provide an upwardly facing abutment surface, or flange **52**, best shown in FIG. 4. Still with reference to FIG. 4, the upper wall portion **34** of the valve **32** will be seen to have an elongated slot or opening, indicated generally at **54**, to slidably receive the upper end portion **50** of the plunger **46**. The slot **54** is preferably so defined that triangular notches are provided for receiving the corners of the diamond-shaped lower end portion **48** of the plunger **46**, which corners when received in said notches will be seen to restrict longitudinal movement of the plunger, and hence of the plug **44**, with respect to the valve **32**. Finally, a compression spring **56** is provided in the diamond-shaped bore which receives the lower end **48** of the plunger **46** and said spring **56** serves to urge the plunger upwardly so that said corners of the diamond-shaped end portion are in locking engagement with said notches. It will thus be apparent that by depressing the plunger manually the plug can be moved longitudinally and with respect to the valve **32** in order to vary the capacity of the dispensing chamber described hereinabove.

Since the upper wall portion **34** of the valve **32** serves to define at least in part the dispensing chamber, which may be filled with powdered material to be dispensed, the elongated opening **54** therein is preferably fitted with a cover **58** having a centrally arranged opening **60** through which the plunger upper end portion **50** is adapted to extend when the various parts are assembled. The cover **58** is adapted to slide relative to the valve **32** in the slot **62** provided for this purpose in the valve **32**. The underside of the cover **58** also serves to engage the aforementioned upwardly facing flange **52** on the plunger and the valve defined slot **62** is so shaped as to restrain the cover **58** against upward movement with respect to the valve **32** without interfering with the fore and aft plug movement just described. Finally, and still with reference to the cover **58**, a marker **64** is provided thereon so as to provide an indication of the relative position of the plug **44** in the dispensing chamber. More particularly, and still with reference to FIG. 4, markings are provided on the upper surface of the valve **32** as indicated at L, M and S, which markings are so located as to be registrable with the pointed tip of the marker **64** when the size of the dispensing chamber corresponds to a particular quantity of powdered material. Since the embodiment shown is intended for use with an instant coffee jar, the mark L would correspond to a relatively light cup of instant coffee, the mark M a medium strength cup, and the mark S a strong cup. Similarly, marks such as L, R, H might be employed to denote respectively level, round, and heaping teaspoons of coffee. Although only three indicia are provided on the valve **32** it will be noted that five notches are provided in the elongated slot, or opening **54**, so that intermediate adjustments are provided. It will of course be apparent that the actual number of adjustments is arbitrary and will depend on the type of material to be dispensed and other relevant factors. Thus, the five adjustments shown are chosen for purposes of illustration only.

The closure and its various components are preferably made from a suitable thermoplastic material and are so designed as to be well adapted to high quantity production to provide an inexpensive closure for dispensing predetermined quantities of powdered material.

The trigger **42** travels in an arcuate path along a handle defined track, indicated generally at **45** in FIG. 2. The path of movement of the trigger **42** is indicated by the solid and broken line positions of a tab **43** on the trigger. Since the valve **32** follows a straight line motion in response to the nonlinear movement of the trigger **42** suitable means must be provided for connecting these parts. In keeping with the economic construction desired in a closure of the present invention these parts, namely the trigger **42** and the valve **32**, are connected by a suitable pin and socket arrangement indicated generally at **66** in FIGS. 1 and 2. As shown a cylindrically shaped pin **68** is defined at the rear end of the valve **32** and a rectangularly shaped socket is defined in forward end of the trigger **42**. It will of course be apparent that the pin and socket defining portions of the valve and trigger might be reversed without departing from the scope of the present invention.

Turning now to the operation of the closure described above, FIG. 2 shows the closure mounted in place on a glass jar **10** having a quantity of powdered material **12** stored therein. FIG. 1 shows the plunger **42** arranged in a position for dispensing a minimum amount of such powdered material. It will, of course, be apparent that the plunger **46** might be moved from the position shown to any one of some five predetermined positions with the result that predetermined quantities of such material might be dispensed in the following manner. The handle **31** is grasped by the user and the entire assembly is tilted toward an inverted position (not shown) wherein the material **12** runs through the registered openings **22** and **38** into the dispensing chamber defined between the forward wall **24** of the closure, the upper wall portion **34** of the valve, and the plug **44**. Once the closure and container have been so inverted, the user need only retract the trigger **42** by exerting thumb pressure on the protruding tab **43** causing the valve **32** to move rearwardly and the abovedescribed pour spout to open. The material contained in the dispensing chamber will thus pour downwardly out of said pour spout. It will be noted that in the position shown in the drawings, the plug **44** blocks at least in part the opening provided for the flow of powdered material into the chamber. The degree of blocking achieved by the plug **44** will be seen to depend upon the position of the plunger **46**, that is, as the plunger **46** is moved rearwardly to dispense greater quantities of powdered material the opening provided between the dispensing chamber and the interior of the jar **10** will be correspondingly increased.

The invention claimed is:

1. A dispensing closure for use with an inwardly open container having a powered material stored therein, said closure comprising a lower portion which defines a downwardly open receptacle for receiving the open end of said container, an upper portion which defines an elongated cavity having spaced side walls and a lower wall with an opening adjacent one end, a valve slidably received in said cavity, said valve being generally U-shaped in cross section having a lower wall with an opening registrable with said closure opening when said valve is in a first position, said valve further including an upper wall spaced from said lower wall and defining a dispensing chamber with said lower valve wall, said upper valve wall having an end which abuts a cooperatively shaped surface on said closure when said valve is in said first position and which defines a pour spout therewith when said valve is moved from said first position, a handle extending rearwardly and downwardly from said closure in spaced relation to the sides of a subadjacent container, said handle being located generally opposite to said pour spout, a trigger connected to said valve and slidably received in a track defined in said handle for movement between first and second positions corresponding to first and second valve positions respectively, biasing means for urging said valve and trigger toward said first position, a plug slidably received between said upper and lower valve walls for varying the size of said valve defined dispensing chamber, and means connected to said plug and extending upwardly through a slot defined in said valve upper wall for manually moving said plug.

2. A closure as set forth in claim **1** and further characterized by detent means for releasably retaining said

plug in any one of a plurality of positions relative to said valve.

3. A dispensing closure for use with an upwardly open container having a powdered material stored therein, said closure comprising a lower portion which defines a downwardly open receptacle for receiving the open end of said container, an upper portion which defines an elongated cavity having spaced side walls and a lower wall with an opening adjacent one end, a valve slidably received in said cavity and defining a dispensing chamber therewithin, said valve having an opening in a lower wall portion which registers with said closure opening when said valve is in a first position, a trigger movably mounted on said closure and connected to said valve for moving the latter away from said first position and toward a second position wherein said chamber is isolated from the hollow interior of the container, said valve cooperating with said closure upper portion to define a pour spout when said valve is in said second position, a handle which extends rearwardly and downwardly from the closure in spaced relation to the sides of a subadjacent container, which handle is located generally opposite to the spout defining portiton of said closure, said trigger slidably received in a track defined in said handle for movement between a first position corresponding to said first valve position and a second position corresponding to second valve position, spring biasing means for urging said valve toward said first valve position and for returning said trigger to said first trigger position, said valve having a U-shaped cross section with an upper wall spaced from said lower wall, said upper wall having an end which abuts a similarly shaped surface on said closure to close off the pour spout when said valve is in said first position, a plug slidably received between said upper and said lower valve walls for varying the size of said valve defined dispensing chamber, and a plunger having a lower end portion slidably received in a cooperatively shaped bore in said plug, said plunger further including an upper end portion which extends upwardly through an elongated slot in said valve upper side wall so that said plunger can

be manually moved along said plunger opening to vary the position of said plug relative to said valve.

4. A closure as set forth in claim 3 and further characterized by a cover for said elongated plunger opening, which cover has an opening shaped so as to receive said plunger upper end portion, said cover being slidably mounted in said valve upper side wall for limited longitudinally movement corresponding to movement of said plug.

5. A closure as set forth in claim 4 wherein said plunger lower end portion is of diamond-shaped cross section somewhat larger in size than said upper end portion to define an upwardly facing flange therebetween for engaging said cover, said elongated plunger opening having a plurality of notches along either side edge for restraining said plunger against movement with respect to said valve, and a spring in said plug bore acting between said plug and said plunger to urge said plunger upwardly, whereby downward pressure on said plunger disengages said diamond-shaped lower end portion of said plunger from said notches to permit the plunger and plug to be moved with respect to said valve.

6. A closure as set forth in claim 5 wherein said plug and said valve opening are so related that said plug serves to minimize the opening provided by said valve enclosure openings when said plunger is in its extreme forward position.

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