May 25, 1965 D. F. ARMOUR 3,184,782

DISPENSING DEVICE

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FIG. 1

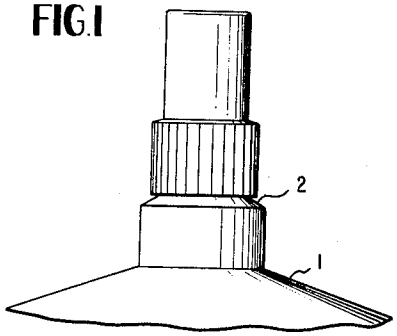



FIG. 3

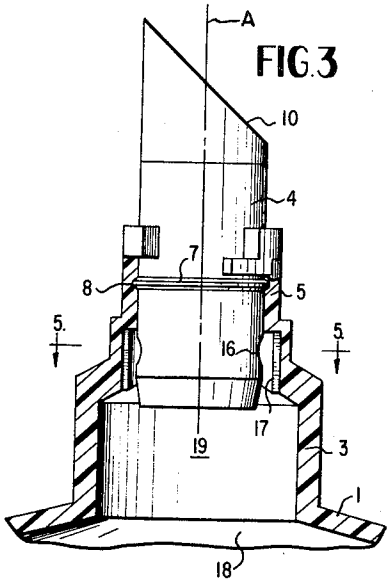



FIG. 4

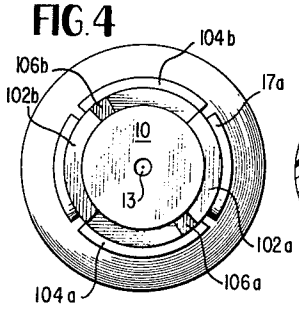



FIG. 5

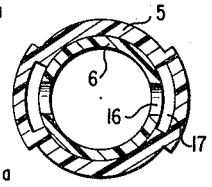
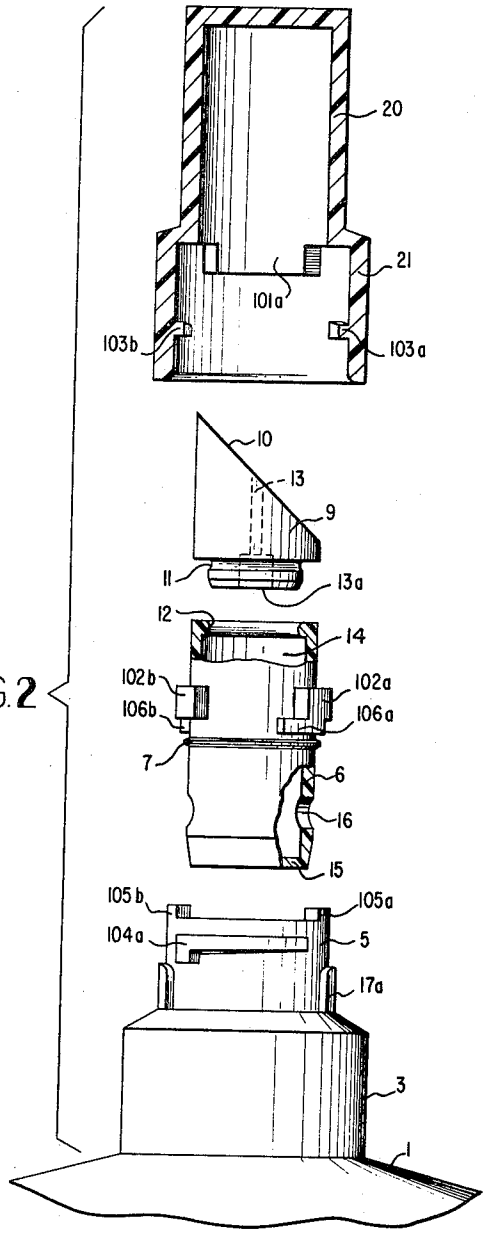



FIG. 2




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DISPENSING DEVICE

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FIG. 12

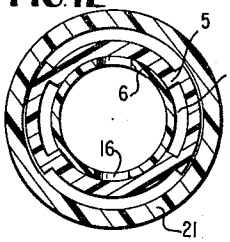



FIG. 9

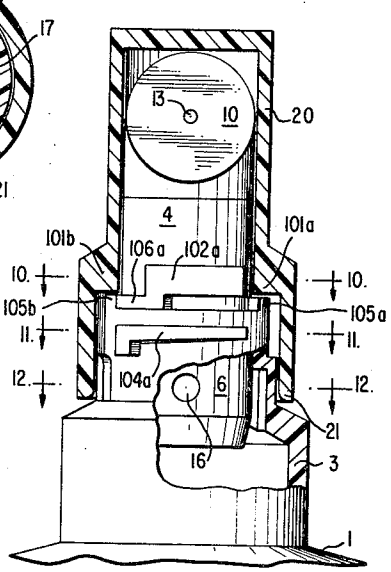
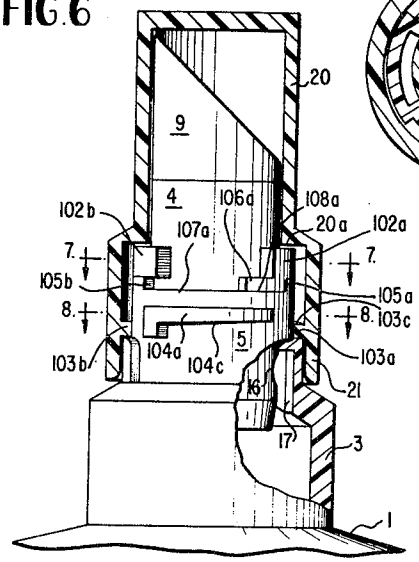



FIG. 6



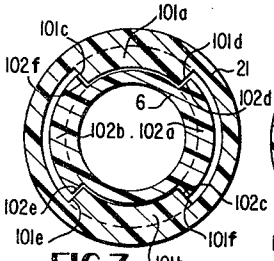




FIG. 7

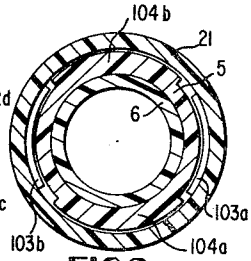



FIG. 8

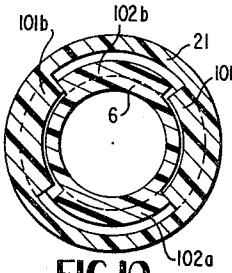



FIG. 10

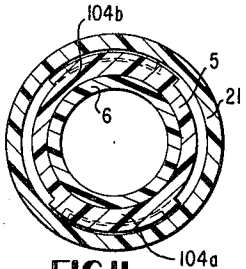



FIG. 11

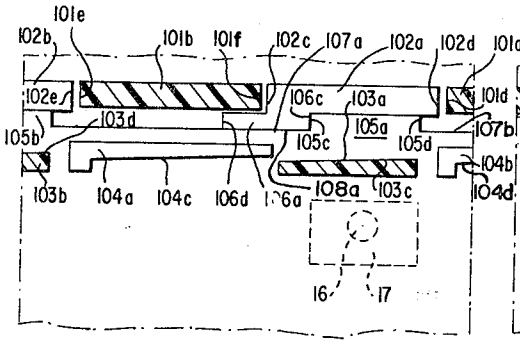



FIG. 13

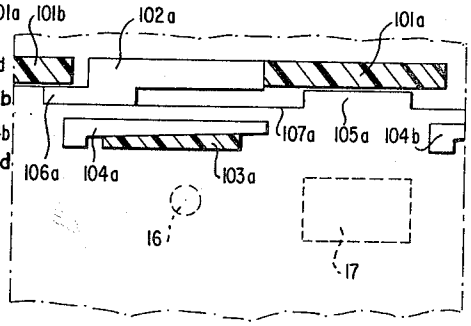



FIG. 14

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3,184,782

# DISPENSING DEVICE

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Filed July 30, 1963, Ser. No. 298,620
11 Claims. (Cl. 15—594)

This invention pertains to improved dispensing devices. In particular, it relates to containers for dispensing materials such as liquids or semifluid solids, which containers are provided with a unique valve mechanism.

The concept of employing a valve mechanism in the outlet of a material reservoir or container is well-known. However, heretofore such valve mechanisms have required a manipulation of components positioned adjacent an exposed material outlet. Thus, where material residue was present on an outlet or on a material applicator positioned on the outlet, a person attempting to manipulate the valve mechanism often inadvertently and undesirably contacted such material.

Container valve mechanisms of the type previously employed have often proven to be nettlesome with respect to the intricacy of their manipulations. In many instances it was difficult for a user to determine whether or not a valve had been properly positioned and the manipulation of the valve mechanism often proved tedious, frustrating and time consuming in nature.

In recognition of the problems associated with dispenser valve mechanisms of the type previously known, it is an object of this invention to provide an improved dispensing device including a valve mechanism which substantially obviates difficulties of the type heretofore described.

It is a particular object of the invention to provide such an improved dispensing device including a valve mechanism which is automatically operable in response to the securing and releasing of a container outlet closure.

A still further principal object of the invention is to provide an improved dispensing device including functionally interrelated, material outlet, valve, and outlet closure components which cooperate to allow a user to effect the simultaneous securing of the closure and closing of the dispenser valve, as well as the simultaneous releasing of the closure for removal from the outlet and the opening of the valve.

It is an additional object of the invention to provide such interrelated outlet, closure, and valve components which cooperate to insure accurate and positive positioning of a dispenser outlet valve in both open and closed valve positions, responsive only to the securing or freeing of the closure on the dispenser material outlet.

A still further object of the invention is to provide a structural assembly of a container closure, container outlet and outlet valve which is characterized by cylindrically configured components which are coaxially and mutually telescopingly arranged and operably interconnected by appropriate abutment means so as to provide a structure of maximum simplicity, foolproof mode of assembly, and functional reliability.

In order to accomplish the foregoing objects, there is envisioned a dispensing device including a material reservoir which is improved by the addition of a unique combination of material outlet means, valve means, closure means, and valve actuating means. The valve means is associated with the outlet means and adapted to control the exit of material therefrom. The closure means is adapted to be positioned over the outlet means. The valve actuating means is operable between the closure means and the valve means for causing the valve means to open in response to one relative movement between the closure means and outlet means, and for causing the valve means to close in response to another relative movement between the closure means and outlet means.



In the preferred embodiment, the valve means comprises a rotary valve journaled within a generally cylindrical sleeve extending from the material reservoir which defines the material outlet. The valve actuating means comprises cap-carried abutment means, sleeve-carried abutment means, and rotary valve-carried abutment means. A portion of the cap-carried abutment means is adapted to cooperate with the sleeve-carried abutment means, while another portion of the cap-carried abutment means is adapted to simultaneously cooperate with valve-carried abutment means to cause the simultaneous closing of the valve and securing of the cap on the sleeve when the cap is rotated in one direction. Rotating the cap in the opposite direction is effective to simultaneously open the valve means and free the cap from the sleeve to allow its axial removal therefrom.

In describing the invention, reference will be made to a preferred embodiment illustrated in the accompanying drawings. In these drawings:

FIGURE 1 is a fragmentary, elevational view of a container in which the improved dispensing outlet of the invention is incorporated;

FIGURE 2 is a fragmentary, partially sectioned and enlarged view of components of the improved dispensing outlet of the invention shown in axially separated relationship;

FIGURE 3 is an enlarged, fragmentary, and partially sectioned elevational view of the improved dispenser outlet shown in FIGURE 1 illustrating a relationship between the valve and material outlet components of the dispenser;

FIGURE 4 is a top plan view of the dispenser outlet components shown in FIGURE 3;

FIGURE 5 is a transverse sectional view illustrating the open valve relationship between valve and outlet components of the FIGURE 1 device as viewed along section line 5—5 of FIGURE 3;

FIGURE 6 is an enlarged, fragmentary and partially sectioned, elevational view of the FIGURE 1 device illustrating a relationship between the assembled closure, valve, and outlet components, with the valve being in an open or material dispensing position;

FIGURE 7 is a transverse sectional view which illustrates a relationship between the valve and closure components of the FIGURE 1 device, as viewed along the section line 7—7 of FIGURE 6;

FIGURE 8 is a transverse sectional view illustrating a relationship between the closure, outlet, and valve components of the FIGURE 1 device as viewed along the section line 8—8 of FIGURE 6;

FIGURE 9 is an enlarged, fragmentary, and partially sectioned, elevational view of the FIGURE 1 device illustrating a relationship between closure, valve, and outlet components, with the valve being in a closed position;

FIGURE 10 is a transverse sectional view illustrating a relationship between closure and valve components of the FIGURE 1 device as viewed along section line 10—10 of FIGURE 9;

FIGURE 11 is a transverse sectional view illustrating a relationship between closure, outlet, and valve components of the FIGURE 1 device as viewed along the section line 11—11 of FIGURE 9;

FIGURE 12 is a transverse sectional view illustrating a closed valve relationship between the valve and outlet components of the FIGURE 1 device as viewed along the section line 12—12 of FIGURE 9;

FIGURE 13 is a schematic and fragmentary illustration of valve actuating and closure securing abutment components of the FIGURE 1 device illustrating these components in an open valve position; and

FIGURE 14 is a schematic and fragmentary illustration of valve actuating and closure securing, abutment com-

ponents of the FIGURE 1 device illustrating these components in a closed valve position.

As shown in FIGURE 1, a material reservoir 1, an upper portion only of which is shown and which may comprise a flexible walled bottle fabricated of plastic material, is provided with a material outlet assembly 2. As shown in FIGURES 1, 2 and 3, outlet assembly 2 includes material outlet defining sleeve means 3 which has a generally cylindrical configuration. Valve means comprising a rotary valve 4 is journaled, i.e., rotatably mounted, within a cylindrical portion 5 of sleeve 3 in the manner generally shown in FIGURE 3.

Rotary valve 4 has a cylindrical portion 6 having an outer diameter corresponding closely to the inner diameter of the cylindrical portion 5 of the sleeve 3. As shown, valve 4 is coaxially and telescopingly arranged within sleeve portion 5 so as to project partially therefrom. Thus sleeve means 3 and roary valve 4 have a common cylindrical axis (A) as shown in FIGURE 3. The effective securing of the valve 4 within the sleeve portion 5 may be facilitated by an annular bead 7 which projects radially outwardly from the cylindrical, outer periphery of rotary valve 4. Bead 7 is received within an annular groove 8 formed within the inner cylindrical periphery of the sleeve portion 5.

By fabricating the sleeve means 3 of a slightly yieldable plastic material such as polyethylene or polypropylene, the valve bead 7 may be moved into engagement with the sleeve groove 8 by merely forcing the rotary valve 4 axially into the cylindrical sleeve portion 5 until the bead enters the groove 8 to lock the valve and sleeve in their journaled relationship. In this relationship, the bead 7 may engage the groove 8 to such an extent as to provide a locking and nominal sealing action but not prevent the relatively free rotation of the valve 4 within the sleeve portion 5. As will be appreciated, this mode of assembly may be accomplished with a relatively rigid valve 4 but would be facilitated by fabricating the valve 4 of slightly yieldable material.

Where a material is to be dispensed, such as glue, shoe polish or other material to be spread on an appropriate surface, it may be desirable to provide a material applicator 9 in association with the valve 4. As shown in FIGURES 2 and 3, such an applicator 9 may comprise a cylindrical segment having a sloping applicator face 10, or other shapes, depending on the product to be dispensed. Applicator 9 may be fabricated of relatively soft, resilient material such as soft solid rubber, sponge rubber, soft solid plastic, soft cellular plastic, or felt.

Applicator 9 may be fabricated so as to be detachable from the valve 4. As illustrated, applicator 9 may be attached to the valve 4 by an annularly grooved neck portion 11 adapted to be peripherally engaged and secured by an annular rim 12 of the valve body 4. Owing to the resilient character of the applicator 9, assembly between the applicator 9 and the valve body 4 may be accomplished in a well-understood fashion by merely pushing the applicator 9 axially into the valve body 4 so as to cause the rim 12 to lockingly engage the annularly grooved portion 11 of the applicator 9.

A flow of material from within the material reservoir 1 through the material applicator 9 involves the passage of this material through a longitudinally or axially extending passage 13 formed in the applicator 9. Through means of an enlarged passage portion 13*a*, passage 13 communicates with a relatively enlarged and axially or longitudinally extending material passage 14 formed in the valve body 4. The side wall or cylindrical portion 6 of the valve body 4 is provided with at least one laterally extending port 16 which provides communication between the valve passage 14 and the exterior of the valve body. The lower end of the valve body 4 is closed by a transverse wall 15.

As shown in FIGURES 3 and 5, the sleeve means 3 may be provided with one or more generally longitudinally extending passages 17 which communicate with the interior 18 of the material reservoir 1 by way of open interior portion 19 on the lower end of the sleeve means 3.

In the illustrated embodiment, a pair of longitudinal sleeve passages 17 are provided which are located on opposite sides of the sleeve portion 5. In the manner shown in FIGURES 2 and 3, each such passage 17 may be formed in an outwardly projecting wall portion 17*a* of the sleeve 3. As shown in FIGURES 2, 3 and 5, the rotary valve 4 may include a pair of lateral ports 16, which are disposed on opposite sides of the cylindrical valve wall 6 and adapted to be simultaneously aligned with the longitudinal passages 17. As will be apparent, when one port 16 is aligned with one passage 17, the other valve port will be aligned with the other longitudinal sleeve passage. This inclusion of the two ports 16 also permits assembly of the valve 4 without indexing of the valve.

When the rotary valve body 4 is rotated to the position shown in FIGURES 3 and 5, so as to align at least the ports 16 with sleeve passages 17, a material passageway is provided from the interior 18 of the material reservoir 1 to the exterior of the material applicator 9. This passageway includes the sleeve interior portion 19, the longitudinal sleeve passageways 17, the valve ports 16, the valve body passage 14, and the material applicator passage 13, which opens on the applicator, or material spreading surface 10.

As will be appreciated, owing to the closely fitting relationship between the outer cylindrical surface of the valve body 4 and the inner cylindrical surface of the sleeve portion 5, the valve body 4 may be rotated so as to displace the ports 16 from the passages 17 and thus close the material passageway by causing portions of the inner surface of the sleeve portion 5 to extend across and seal the ports 16.

The dispensing device shown in FIGURE 1 includes a closure or cap 20. As illustrated, cap 20 is generally cylindrical in configuration and includes a cylindrical portion 21 adapted to telescopingly pass or move over the applicator, valve body 4, and sleeve portion 5 to assume the position shown in FIGURE 6 so as to effectively cover and protect the valve and material applicator assembly. Cap 20 may be fabricated of rigid or semirigid material such as metal or plastic. As will be apparent by reference to FIGURES 1, 2 and 6, for example, cap 20 will have a cylindrical axis coinciding with the sleeve means and valve axis (A) when the cap is in its assembled position.

The simultaneous valve actuating and cap securing and releasing action achieved through the present invention is accomplished through the interaction of a series of abutment means carried by the cap 20, the rotary valve 4, and material outlet defining sleeve 3.

Rotary movement of the valve, responsive to cap movement, is effected by the interaction of first abutment means carried by the cap 20 and second abutment means carried by the rotary valve 4.

As shown in FIGURES 6 and 7, each cap-carried first abutment means comprises a pair of generally rectangular abutments 101*a* and 101*b* disposed, respectively, on opposite sides of the interior of the cap 20. Each abutment 101*a* and 101*b* projects laterally and generally radially inwardly from the inner cylindrical surface of the cap portion 21. The first abutment means includes first surface means extending generally longitudinally and radially of the cylindrical axis of the cap 20 such as the surfaces 101*c* and 101*d* of the abutment 101*a* and the surfaces 101*e* and 101*f* of the abutment 101*b*.

The second abutment means comprises a pair of generally rectangular abutment portions 102*a* and 102*b*. Each such rectangular abutment portion projects laterally outwardly and generally radially from the outer surface of the cylindrical wall 6 of the rotary valve 4. Each such rectangular abutment portion includes second sur-

face means extending generally radially and longitudinally of the cylindrical axis of the rotary valve 4. Included in this second surface means are the surfaces 102*c* and 102*d* carried by the abutment portion 102*a* and the surfaces 102*e* and 102*f* carried by the abutment portion 102*b*.

As shown in FIGURE 7, when the cap 20 is positioned over the sleeve 3, with the valve 4 journaled within the sleeve portion 5 and projecting partially thereabove, the abutment portions 101*a* and 101*b* are disposed so as to lie in axial alignment with and between the second abutments 102*a* and 102*b*.

As shown in FIGURE 7, the circumferential extent of the abutment portions 101*a* and 101*b* is sufficiently limited to allow the abutment portions 102*a* and 102*b* to pass at least partially axially thereby so as to position the abutment surfaces of these abutments in at least partially axially overlapping relationship. With this relationship, the surface 102*d* will lie opposite the surface 101*d*, the surface 101*c* will lie opposite the surface 102*f*, the surface 101*e* will lie opposite the surface 102*e* while the surface 101*f* will lie opposite the surface 102*c*.

The securing of the cap 20 on the sleeve 3 so as to prevent its axial movement therefrom is obtained by the cooperation of third and fourth abutment means.

The third abutment means carried by the cap 20 may comprise a pair of abutments 103*a* and 103*b* carried by the cylindrical portion 21 of the cap 20. Each abutment 103*a* and 103*b* extends generally radially inwardly of the inner surface of the cylindrical portion 21 of the cap 20.

The third abutment means includes third surface means which project laterally inwardly of the inner surface of the cylindrical cap portion 21 and extend transversely of the cylindrical cap axis. Such third surface means include the surfaces 103*c* and 103*d* of the abutments 103*a* and 103*b*, respectively. As illustrated, these surfaces are disposed so as to face away from the material reservoir 1.

The fourth abutment means, carried by the sleeve means 3, may comprise a pair of abutments 104*a* and 104*b* each of which extends generally radially outwardly of the outer surface of the cylindrical sleeve portion 5. The fourth abutment means includes fourth surface means disposed so as to face the material reservoir, which fourth surface means includes the surface 104*c* of the abutment 104*a* and the surface 104*d* of the abutment 104*b*.

The extent to which the sleeve abutments 104*a* and 104*b* extend circumferentially about the periphery of the sleeve portion 5 is sufficiently limited so as to allow for the longitudinal passage of the abutments 103*a* and 103*b* at least partially thereby when the cap 20 is inserted on the sleeve portion 5. With this relationship, the abutments 103*a* and 103*b* may pass between the abutments 104*a* and 104*b* as the cap 20 is moved axially over the sleeve portion 5 toward the material reservoir 1 so as to dispose at least a portion of the surface 103*c* which lies adjacent the surface 104*c* at a point intermediate the adjacent portion of this surface 104*c* and the material reservoir 1. Similarly, at least a portion of the surface 103*d* which lies adjacent the surface 104*d* will be disposed intermediate at least the adjacent portion of the surface 104*d* and the material reservoir 1. With this arrangement, the cap 20 may be rotated on and relative to the sleeve portion 5 so as to cause the surfaces 103*c* and 103*d* to move respectively under the surfaces 104*c* and 104*d* so as to secure and prevent axial removal of the cap 20 from the sleeve means 3.

The circumferential overlapping of the surfaces 103*c* and 104*c* and the surfaces 104*d* and 103*d* in and of itself provides an effective cap securing action. However, if desired, and as shown in FIGURES 13 and 14, the surface 103*c* and the surface 104*c* may be provided with surfaces which slope in complementary relationship and the surfaces 104*d* and 103*d* may be provided with a similar complementary sloping relationship so as to allow the cap 20, when rotated on the sleeve portion 5 to become wedgingly secured to this sleeve portion. As will be appreciated, this wedging action requires that the cap be secured against axial movement toward the material reservoir 1 prior to the rotation of the cap. This limitation on axial cap movement may be provided by annular ledge portions or stops 20*a* and 20*b* which are adapted to respectively engage the upper surfaces of the abutments 102*a* and 102*b* as illustrated in FIGURE 6.

Limitations on the extent of rotary movement of the valve 4, which will ensure that at one extremity it is in an accurately defined open valve position with the ports 16 and the sleeve passages 17 aligned and that at another extremity it is in a closed valve position with the ports 16 and the sleeve passages 17 out of alignment, is obtained by fifth and sixth abutment means.

The fifth abutment means, carried by the sleeve portion 5, comprises a pair of abutments 105*a* and 105*b*, each of which projects longitudinally upwardly from the upper end of the sleeve portion 5. The fifth abutment means includes fifth surface means which extend generally radially and longitudinally of the cylindrical axis of the sleeve 3. Such fifth surface means include the surfaces 105*c* and 105*d* carried by the abutment 105*a* and similar surfaces carried by the abutment 105*b*.

The sixth abutment means, carried by the rotary valve 4, includes a pair of rectangular abutment portions 106*a* and 106*b* which partially overlap and define integral but offset extensions of the rotary abutment portions 102*a* and 102*b*, respectively.

The sixth abutment means includes sixth surface means such as the surfaces 106*c* and 106*d* of the abutment 106*a* which extend radially and longitudinally of the cylindrical axis of the rotary valve 4 and similar surfaces of the abutment 106*b*.

With the valve 4 journaled within the sleeve portion 5, the sixth surface means will at least partially overlap the fifth surface means so as to provide rotary stops for limiting the extent of rotary movement of the valve 4. For example, engagement between surfaces 105*c* and 106*c* will properly align the valve ports 16 with the sleeve passages 17 as shown in FIGURE 13, while engagement between the surface 106*d* and the abutment 105*b* will define the extent to which the rotary valve 4 may be moved to a closed valve position as shown in FIGURE 14.

Seventh and eighth surface means may be included in the device so as to afford positive stop means for limiting the extent of axial movement of the valve 4 into the sleeve 5 so as to prevent the inadvertent movement of the valve 4 into the material reservoir 18 during valve installation.

The seventh surface means may comprise sleeve carried surfaces 107*a* and 107*b* each of which extends generally transversely and radially of and partially circumferentially around the cylindrical portion 5 of the sleeve 3.

The eighth surface means extends radially outwardly of the outer surface of the cylindrical portion 5 and partially circumferentially thereabout. The eighth surface means may include a pair of surfaces formed on the lower sides of abutments 106*a* and 106*b*. One such surface 108*a* formed on abutment 106*a* as illustrated in FIGURE 13, faces downwardly, i.e. toward the material reservoir 1, and is adapted to engage the upwardly facing surface 107*a*. As will be appreciated, when the eighth surface means engages the seventh surface means, axial movement of the valve 4 inwardly of the sleeve 5 is positively interrupted or stopped.

As illustrated, the second, sixth and eighth surface means may each include a surface formed on an integral and generally radially outwardly extending projection of the cylindrical portion 6 of the rotary valve 4. Each such projection, of which there are two in the illustrated embodiment, is an integral composite of a second and sixth abutment. For example, the abutment 102*a* and abutment 106*a* comprise an integral projection including surfaces 102*c* and 102*d* of the second surface means, surfaces 106*c* and 106*d* of the sixth surface means, and surface 108*a* of the eighth surface means. As shown in

FIGURE 13, the surface **108***a* of the eighth surface means is in mutually intersecting relationship with the surfaces **106***c* and **106***d* of the sixth surface means.

As illustrated, at least one surface of the fifth surface means intersects at least one surface of the seventh surface means on the upper end of sleeve portion **5**. For example, the surface **107***a* of the seventh surface means is in mutually intersecting relationship with the surface **105***c*.

The cap carried first and third abutment means **101***a*, **101***b*, **103***a* and **103***b*, cooperate with the valve carried abutment means **102***a* and **102***b* and with the sleeve carried abutment means **104***a* and **104***b* to effect a simultaneous valve and cap operating action.

The first and second abutment means **101***a*, **101***b*, **102***a* and **102***b* are disposed in relation to the third and fourth abutment means **103***a*, **103***b*, **104***a* and **104***b* so that when the cap **20** is moved axially over the sleeve portion **5** to bring the first surface means opposite or adjacent to the second surface means, the third abutments **103***a* and **103***b* are caused to assume the position illustrated in FIGURES 6, 8, and 13. In the FIGURE 13 position, the abutments **103***a* and **103***b* have moved at least partially past the fourth abutments **104***a* and **104***b*. In this position, the valve **4** and sleeve **5** are in the relative positions shown in FIGURES 5, 6 and 13 with the valve in the open or material dispensing position. The abutments **101***a* and **101***b* are positioned between and aligned with the abutments **102***a* and **102***b* as shown in FIGURE 7. As shown in FIGURE 8 and FIGURE 13, the abutments **103***a* and **103***b* lie between the abutments **104***a* and **104***b* but are axially displaced therefrom. With the apparatus components thus positioned, the cap **20** may be rotated clockwise, when viewing the device as shown in FIGURES 7 and 8, so as to cause simultaneous valve closing and securing of the cap **20**. This simultaneous action is achieved by engagement between the surfaces **101***d* and **102***d* and the surfaces **101***e* and **102***e* which causes rotation of the valve **4** to a closed valve position as shown in FIGURES 9, 10, and 14, and by the movement of the surfaces **103***c* and **103***d*, respectively, beneath the surfaces **104***c* and **104***d* as shown in FIGURES 9, 11, and 14.

When the apparatus components have assumed the closed valve position illustrated in FIGURES 9, 10, 11, 12 and 14, counterclockwise rotation of the cap **20** will effect simultaneous reopening of the valve and release of the cap for axial removal from the sleeve **3**. As will be appreciated, such counterclockwise rotation of the cap **20** will cause the surfaces **101***c* and **101***f* to respectively engage the valve surfaces **102***f* and **102***c* so as to cause counterclockwise valve rotation and cause the surfaces **103***c* and **103***d* to move counterclockwise to a position displaced from the surfaces **104***c* and **104***d*.

With the alignment of abutments shown, if the valve **4** should be rotated to a closed valve position with the cap off, it would not be possible to replace the cap on the closure in an improper fashion and attempt to secure the cap and rotate the valve. With the valve rotated to the closed position shown in FIGURE 9, the abutments **104***a* and **104***b* will engage the abutments **103***a* and **103***b* so as to prevent movement of the cap abutments **101***a* and **101***b* into the spaces between the abutment portions **102***a* and **102***b*. This safety feature which insures a foolproof mode of assembly of components results from the relative positioning of component abutments. When the valve **4** has been rotated to the closed valve position, the abutments **102***a* and **102***b* are generally aligned with the abutments **104***a* and **104***b*, respectively, as shown in FIGURES 9, 10, 11, and 14. As shown in FIGURES 9, 10, and 11, the cap carried abutments **103***a* and **103***b* are circumferentially offset from the cap carried abutments **101***a* and **101***b* and are disposed between the abutments **101***a* and **101***b* and the material reservoir **1**. With this arrangement of cap abutments, and when the valve is in the closed position shown in FIGURE 14, the abutments **103***a* and **103***b* will of necessity engage the abutments **104***a* and **104***b* so as to prevent the abutments **101***a* and **101***b* from moving into operative engagement with the valve carried abutments **102***a* and **102***b*.

In describing the structure and operation of the improved valve mechanism of the invention, the several advantages of the invention have been made apparent.

A valve mechanism has been provided by means of which simultaneous valve actuation and closure securing and releasing may be achieved responsive to cap manipulation. There is no necessity for a user to engage valve components adjacent exposed material outlets where there would be a danger of touching material residue.

A valve mechanism has been provided wherein both open and closed valve positions are positively determined merely through the action of releasing or securing a container closure. No tedious manipulations of valve actuating members is thus necessary.

The coaxial arrangement of sleeve, valve and closure components and the unique utilization of abutments integral with these components enables the production of a functionally effective but structurally simple device. This device includes only three components, each of which may be conveniently fabricated by conventional molding techniques. The arrangement of abutments on the components is such as to positively prevent improper assembly of the cap, valve and sleeve components.

While the invention has been described with reference to a preferred embodiment, it will be readily apparent that its scope is such as to encompass additions, modifications, deletions, substitutions, and other changes in relation to the illustrated form of the invention.

What is claimed is:

1. In a dispensing device, including a material reservoir, the improvement comprising:
   - sleeve means having generally cylindrical, inner and outer portions and extending from said material reservoir and defining a material outlet;
   - rotary valve means having a generally cylindrical outer portion journaled within said generally cylindrical inner portions of said sleeve means;
   - cap means having a generally cylindrical inner portion adapted to telescopingly pass over said outer cylindrical portion of said sleeve means and be rotated to a secured cap position;
   - cap means carried abutment means projecting generally laterally inwardly from the generally cylindrical inner portion of said cap means;
   - sleeve means carried abutment means projecting generally laterally outwardly from the generally cylindrical outer portion of said sleeve means; and
   - valve means carried abutment means projecting generally laterally outwardly from the generally cylindrical outer portion of said valve means;
   - said cap means carried abutment means being adapted to cooperate with said sleeve means carried abutment means and said valve means carried abutment means to cause the simultaneous rotation and closing of said valve means and securing of said cap means on said sleeve means when said cap means is rotated in one direction and for causing simultaneous rotation and opening of said valve means and freeing of said cap means in relation to said sleeve means to allow its axial removal therefrom when said cap means is rotated in an opposite direction.

2. In a dispensing device, including a material reservoir, the improvement comprising:
   - sleeve means having generally cylindrical inner and outer portions and extending from said material reservoir and defining a material outlet;
   - rotary valve means having a generally cylindrical outer portion journaled within said generally cylindrical inner portion of said sleeve means;
   - cap means having a generally cylindrical inner portion adapted to telescopingly pass over said outer cy-

lindrical portion of said sleeve means and be rotated to a secured cap position;

first abutment means carried by said cap means and projecting generally laterally inwardly from the generally cylindrical inner portion of said cap means;

second abutment means carried by said rotary valve means, projecting generally laterally outwardly from the generally cylindrical outer portion of said rotary valve means, and adapted to be engaged by said first abutment means to cause rotation of said valve means in response to rotation of said cap means;

third abutment means carried on said sleeve means and projecting generally laterally outwardly from the generally cylindrical outer portion of said sleeve means; and

fourth abutment means carried on said cap means, projecting generally laterally inwardly from the cylindrical inner portion of said cap means, and adapted to engage said third abutment means to secure said cap means on said sleeve means and prevent its axial removal therefrom.

3. In a dispensing device as described in claim 2:

said rotary valve means including at least one longitudinally extending material passage and at least one laterally extending port communicating with said passage; and

said sleeve means including at least one longitudinally extending passageway adapted to provide communication between said material reservoir and said port of said rotary valve means when said rotary valve means is rotated so as to align said port therewith.

4. In a dispensing device as described in claim 2:

material applicator means mounted on said valve means,

said material applicator means being adapted to be received within said closure means when said closure means is positioned over said outlet means.

5. In a dispensing device as described in claim 2:

said first abutment means and said second abutment means being disposed in relation to said third and fourth abutment means so that when said cap means is moved axially over said sleeve means to position said first abutment means in rotatably engageable relationship relative to said second abutment means, said third abutment means is caused to move at least partially past said fourth abutment means so that, when said cap means is rotated, said third abutment means is caused to circumferentially overlap fourth abutment means.

6. In a dispensing device as described in claim 5:

stop means for limiting axial movement of said cap means over said sleeve means toward said material reservoir; and

said third abutment means and said fourth abutment means having surface portions sloping in complementary relationship so that, when said cap means has been moved axially over said sleeve means so as to cause said third abutment means to move at least partially past said fourth abutment means, said cap means may be rotated relative to said sleeve means to cause the sloping surface portion of said third abutment means to engage the sloping portion of said fourth abutment means and, in cooperation with said stop means, wedge said cap means on said sleeve means.

7. In a dispensing device as described in claim 2:

said first abutment means including first surface means extending generally longitudinally and radially of a cylindrical axis of said cap means;

said second abutment means including second surface means extending generally radially and longitudinally of a cylindrical axis of said rotary valve means;

said first abutment means and said second abutment means circumferentially extending respectively about the inner periphery of said cap means and the outer periphery of said rotary valve means to such a limited extent as to allow said first abutment means to pass partially by said second abutment means when said cap means is axially moved over said sleeve means, and position at least a portion of said first surface means adjacent and axially overlapping at least a portion of said second surface means;

said third abutment means including third surface means projecting laterally inwardly of said inner cylindrical portion of said cap means and extending transversely of a cylindrical axis thereof, said third surface means being adapted to face away from said material reservoir when said cap means is positioned over said sleeve means, said third abutment means extending generally radially inwardly of said inner cylindrical wall portion of said cap means;

said fourth abutment means extending generally radially outwardly of said outer cylindrical portion of said sleeve means and including fourth surface means projecting transversely outwardly of a cylindrical axis of said sleeve means, said fourth surface means facing said material reservoir; and

said third abutment means and said fourth abutment means circumferentially extending, respectively, about the inner periphery of said cap means and the outer periphery of said sleeve means to such a limited extent as to allow said third abutment means to pass at least partially by said fourth abutment means when said cap means is axially moved over said sleeve means and position at least a portion of said third surface means, in relation to the axis of said sleeve means, intermediate at least a portion of said fourth surface means and said material reservoir.

8. In a dispensing device as described in claim 7:

fifth abutment means projecting longitudinally upwardly from an upper end of said sleeve means, said fifth abutment means including fifth surface means extending generally radially and longitudinally of the cylindrical axis of said sleeve means; and

sixth abutment means projecting generally radially outwardly from said outer cylindrical portion of said rotary valve means, said sixth abutment means including sixth surface means extending generally radially and longitudinally of the cylindrical axis of said rotary valve means;

said sixth abutment means being adapted to be disposed in relation to said fifth abutment means so that said fifth and sixth surface means will at least partially axially overlap so as to limit the extent of rotation of said rotary valve means.

9. In a dispensing device as described in claim 8:

seventh surface means extending generally radially of and partially circumferentially around a cylindrical portion of said sleeve means, said seventh surface means facing away from said material reservoir; and

eighth surface means extending radially outwardly of the outer cylindrical surface of said rotary valve means and partially circumferentially thereabout, said eighth surface means facing generally toward said material reservoir and adapted to engage said seventh surface means to limit axial movement of said rotary valve means toward said material reservoir.

10. In a dispensing device as described in claim 9:

said second, sixth and eighth surface means each including at least one surface formed on an integral and radially, outwardly extending projection of the cylindrical surface of said rotary valve means, with said one surface of said sixth and eighth surface means being in mutually intersecting relationship; and

said fifth and seventh surface means each including at least one surface formed on an upper end of said sleeve means, with said one surface of said fifth and seventh surface means being in mutually intersecting relationship.

11. In a dispensing device as described in claim 2:

said third abutment means carried by said cap means being circumferentially offset from said first abutment means carried by said cap means and adapted to be disposed between the axial location of said first abutment means and said material reservoir; and

said second abutment means carried by said rotary valve means being adapted to be circumferentially aligned with said fourth abutment means carried by said sleeve means when said rotary valve means is



in a closed valve position whereby said third abutment means of said cap means will engage said fourth abutment means and prevent said first abutment means from moving into operative engagement with said second abutment means carried by said rotary valve means.

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