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2,744,666

DISPENSER WITH FRICTIONALLY INTERFITTING PARTS IN WHICH
A CLOSURE MEMBER IS ROTATABLE ABOUT AN AXIS

Filed May 28, 1952

3 Sheets-Sheet 1

FIG. 2.

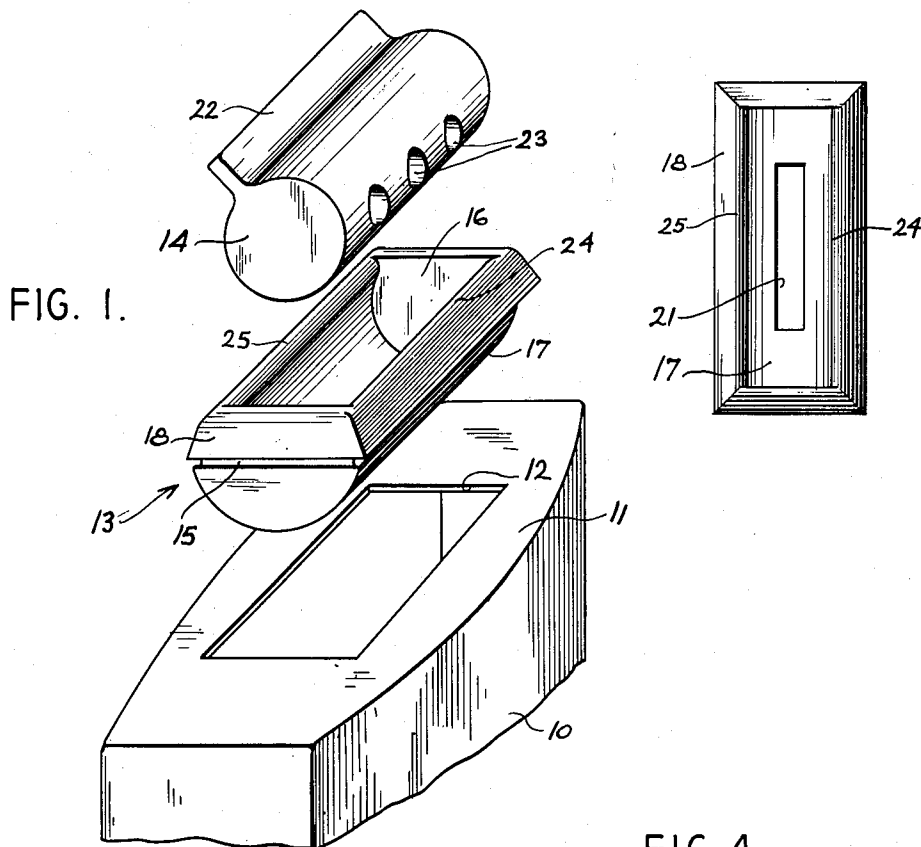
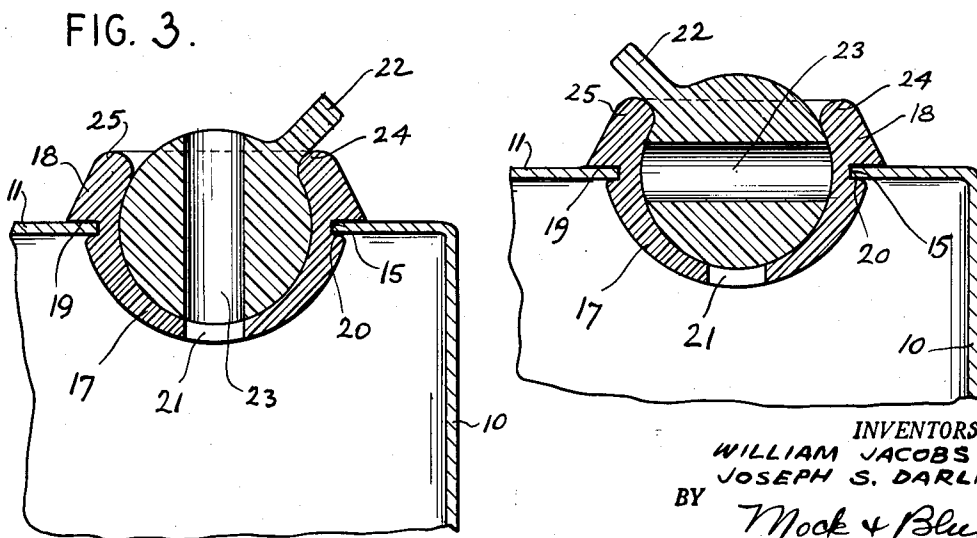


FIG. 4.



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FIG. 5.

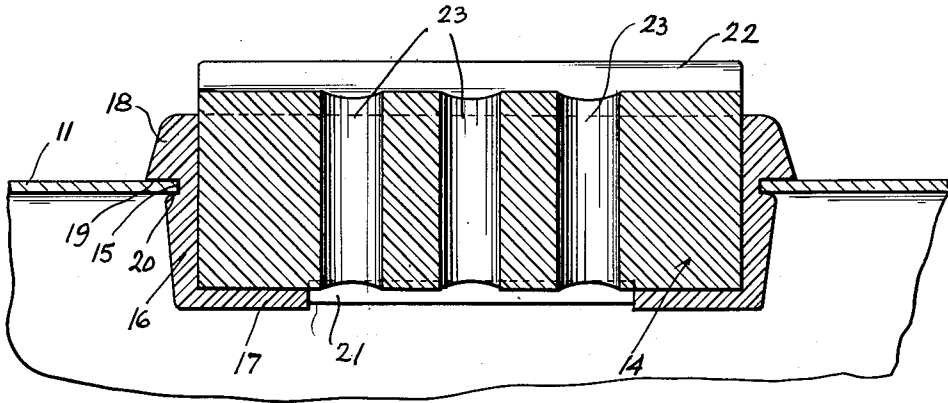


FIG. 6.

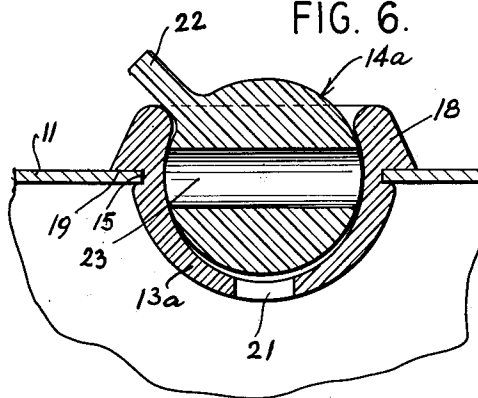


FIG. 7.

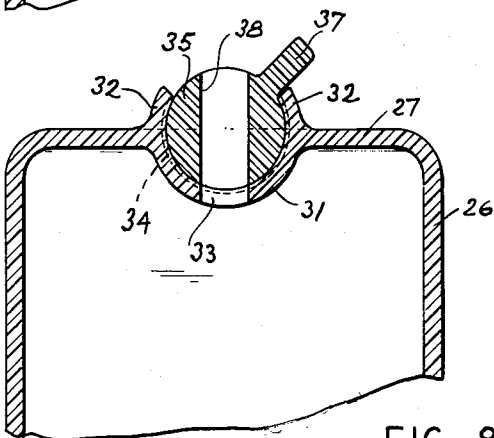
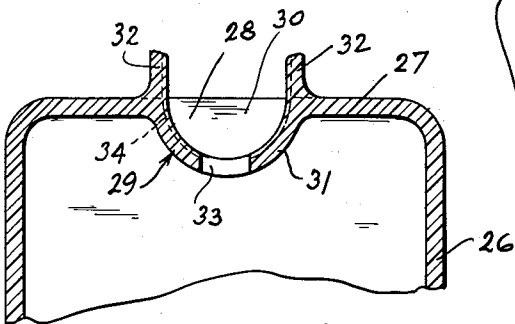
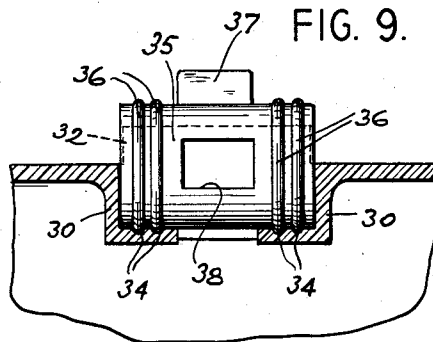


FIG. 8.

FIG. 9.



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3 Sheets-Sheet 3

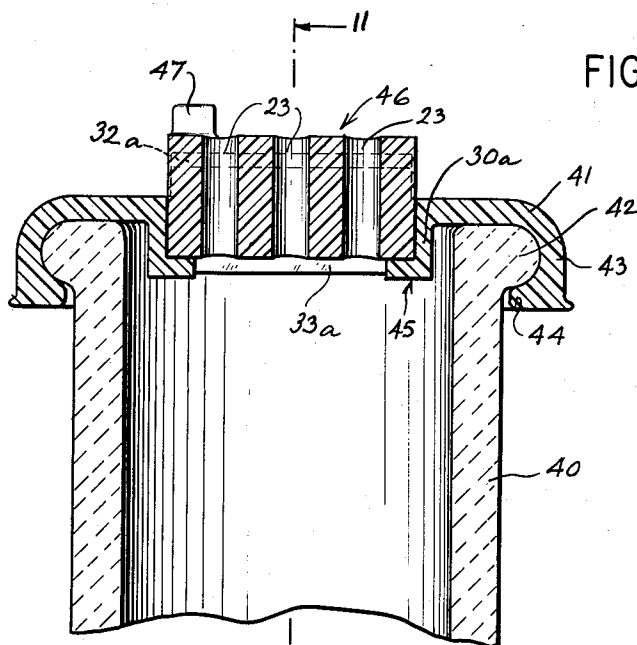


FIG. 10.

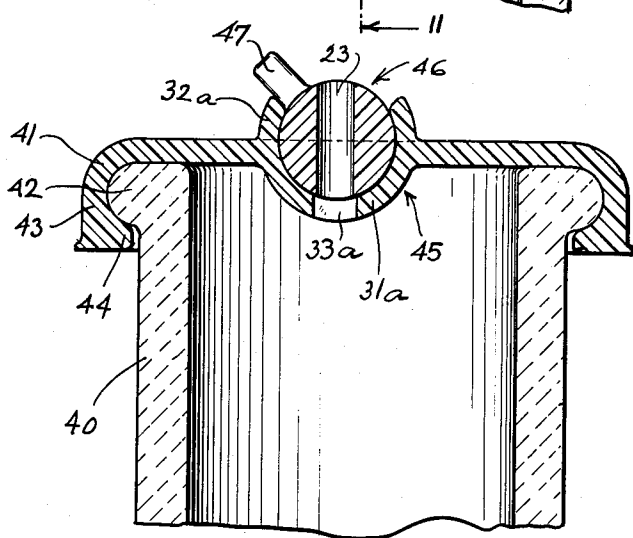


FIG. 11.

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DISPENSER WITH FRICTIONALLY INTERFITTING PARTS IN WHICH A CLOSURE MEMBER IS ROTATABLE ABOUT AN AXIS

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Application May 28, 1952, Serial No. 290,488

7 Claims. (Cl. 222—545)

This invention relates to an improved combined container and dispenser, in which the closure member is adapted to be rotated about an axis which is transverse to the axis of the container, in order to dispense the contents thereof.

In one embodiment, the dispenser comprises a container portion whose upper face has a rectangular opening. An intermediate top piece is provided, said top piece being adapted to be force-fitted into the opening of the container portion. This top piece is in the form of a hollow cylinder whose axis extends laterally with respect to the axis of the container, said top piece being cut away at its upper portion and having an opening in its bottom portion which communicates with the container portion. There is also provided a closure member which is substantially in the form of a solid cylinder and which is adapted to be force-fitted into the interior of the top piece. This closure piece is turnable about the axis of the top piece and is provided with a radially extending finger piece for such turning. The closure piece has one or more through-and-through diametrical openings which communicate with the container portion in one turned position of the closure piece, and which are out of communication with the container portion in another turned position of the closure piece.

The above construction is economical to manufacture, since it requires only three parts which may be force-fitted together, or else fitted together by other simple operation, without the use of connecting members.

In another embodiment of the invention, the top piece is integral with the container portion. This construction may be of particular value if the container portion is a collapsible tube or is made of a flexible plastic such as polyethylene.

It will be apparent that this improved dispenser is suitable for use in dispensing powder, pastes and liquids. The use of a screw cap is eliminated, and the closure piece may be easily manipulated by the fingers of the user. Furthermore, the closure piece has clearly defined opening and closing positions, which eliminate the need for visual inspection to determine whether the dispenser is completely closed.

Other objects and advantages of this invention will become apparent from the following description, in conjunction with the annexed drawing in which preferred embodiments are disclosed.

In the drawing,

Fig. 1 is an exploded perspective view of the parts of my improved container and dispenser, said parts comprising a container portion (partly broken away), a top piece and a closure piece.

Fig. 2 is a top plan view of the top piece.

Fig. 3 is a vertical cross-section of the assembled dispenser, with the closure piece in dispensing position.

Fig. 4 is a view similar to Fig. 3, with the closure piece in closing position.

Fig. 5 is a vertical longitudinal section of the assembled dispenser..

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Fig. 6 is a view similar to Fig. 4, showing modified shapes of the closure piece and the top piece.

Fig. 7 is a vertical cross-section, partly broken away, of the container portion of a second embodiment of my dispenser, prior to bending over the lips of said container portion.

Fig. 8 is a vertical cross-section of the assembled dispenser according to my second embodiment and Fig. 9 is a vertical longitudinal section, partly in elevation thereof.

Fig. 10 is a vertical longitudinal section of a third embodiment of the invention, and Fig. 11 is a section on line 11—11 of Fig. 10.

Upon reference to the drawing in detail, it will be seen that Fig. 1 shows a first embodiment of the invention. In this embodiment, container 10 is preferably made of a rigid material, such as metal. The sides and bottom of container 10 are conventional, and are therefore broken away. The top 11 of container 10 is substantially planar and has a rectangular opening 12 therein.

Top piece 13 is adapted to be interfitted with top wall 11. Top piece 13 may be molded in one piece from any suitable material. Optionally and preferably, the material used is polyethylene plastic, which is sufficiently resilient to be force-fitted with container 10 and with closure piece 14. Said top piece 13 is in the general shape of a hollow part-cylinder, of a greater size than a semi-cylinder.

As is clearly shown in the drawing, piece 13 has a groove 15 which extends around the outside of the entire piece. This groove 15 extends across an end face 16 of piece 13, then along one side of the peripheral wall 17 of piece 13, then along the other end face 16, and then back to its starting point along the other side of peripheral wall 17.

Piece 13 is provided with a continuous external flange 18 above said groove 15, said flange 18 having a laterally extending lower face 19 which is co-extensive with the upper face of groove 15. The lower face 20 of groove 15 serves as a shoulder.

As is shown in Figs. 3, 4 and 5, top piece 13 may be interfitted with container 10, with the bottom portion of piece 13 extending through the opening 12 of top wall 11, and with the peripheral edge of said opening 12 positioned within groove 15. Flange face 19 abuts the upper face of top wall 11, and shoulder 20 abuts the lower face of top wall 11. Since piece 13 is made of a somewhat resilient piece, and since the peripheral wall 17 is convex, piece 13 may be simply forced downwardly into container 10 until top wall 11 is snapped between flange face 19 and shoulder 20.

The interior space of top piece 13 is substantially in the form of a part-cylinder, with its axis extending laterally with respect to the axis of container 10. The upper part of piece 13 is cut away so that in vertical cross-section its interior wall is substantially the major arc of a circle.

Said top piece 13 has a hole 21 in its base, said hole 21 being in registration with hole 12 and extending in the direction of the axis of piece 13.

Closure piece 14 is substantially in the shape of a cylinder. Said piece 14 is preferably made of a resilient plastic material, such as polyethylene, to insure a close force-fit with piece 13. Piece 14 has a finger piece 22 which preferably extends along its entire length and also radially outwardly. Finger piece 22 is preferably integral with closure piece 14.

Closure piece 14 is preferably solid, except that it preferably has a plurality of axially-spaced, diametrically extending, through-and-through openings 23. The axis of hole 23 is preferably inclined at an angle other than a right angle to the radial direction of finger piece 22.

As is clearly shown in the drawing, closure piece 14

may be force-fitted within the interior space of top piece 13, with the axes of said pieces in alignment. Piece 14 substantially fills the interior volume of piece 13, and finger piece 22 extends above the upper opening of piece 13.

Fig. 3 shows piece 14 in dispensing position. In this position, finger piece 22 abuts one side edge 24 of top piece 13, and the openings 23 extend substantially in the direction of the axis of container 10, with their lower ends in registration with opening 21. In order to close the dispenser, as shown in Fig. 4, it is merely necessary to turn top piece 14 in a counter-clockwise direction, by manipulation of finger piece 22, until said holes 23 are out of registration with opening 21. Preferably, top piece 14 is turned until finger piece 22 abuts the other side edge 25 of top piece 13, in which position said openings 23 extend substantially horizontally. It is therefore preferable that the inner side wall of top piece 13 corresponds in vertical cross-section to three fourths of the arc of a circle.

Fig. 6 shows a modified construction to ensure a better frictional fit of the top piece and the closure piece, in case the frictional fit provided by the molded polyethylene or similar plastic is not sufficient. In this modification, top piece 13a and closure piece 14b respectively correspond to top piece 13 and closure piece 14 of Fig. 1, except in their vertical cross-sectional shapes.

In vertical cross-section, the inner wall of top piece 13a corresponds to the major arc of an ellipse whose major axis extends in the longitudinal direction of the axis of container 10. In said vertical cross-section, the outer wall of closure piece 14a is in the shape of an ellipse whose major axis extends laterally in the closing position of Fig. 6. The axes of each piece differ only slightly in length. As will be apparent from Fig. 6, the minor axis of piece 14a is slightly shorter than the major axis of piece 13a, the difference in length being exaggerated in the drawing for the sake of clarity. On the other hand, the major axis of piece 14a is normally slightly longer than the minor axis of piece 13a, so that the parts are frictionally held in the position of Fig. 6. The parts are made of material, such as molded polyethylene, which is sufficiently resilient so that the parts may be forced into the position of Fig. 6.

It will be apparent that when closure piece 14a is turned ninety degrees to its opening position, its major axis will be aligned with the major axis of top piece 13a, and that closure piece 14a turns relatively freely in the vicinity of its opening position.

Another embodiment of the invention is shown in Figs. 7-9. This embodiment is particularly suitable for a container made out of an elastic or collapsible material. In this embodiment, the container and the holder for the closure member are preferably integral.

Fig. 7 shows a container 26 in an intermediate stage of construction. The top container wall 27 has a rectangular aperture 28. The holder 29 for the closure member has substantially semi-circular end walls 30 which depend from top wall 27 and which are respectively integral with the respective end edges of aperture 28. Holder 29 also has a semi-cylindrical peripheral wall 31 which depends from top wall 27 and whose upper edges are respectively integral with the respective side edges of aperture 28. The end edges of wall 31 are respectively integral with the respective peripheral edges of end walls 30. Fig. 7 also shows that top wall 27 has a pair of upstanding flanges 32 which are respectively integral with the respective side edges of aperture 28 and which serve as extensions of wall 31.

Said wall 31 has a rectangular opening 33 in its base, so that the interior spaces of holder 29 and container 26 are in communication with each other. The inner face of wall 31 has pairs of spaced grooves 34 therein, which are respectively located forwardly and rearwardly of opening 33. Each groove 34 is located in a plane which is

transverse to the axis of holder 29. Groove 34 extends between the respective upper edges of flanges 32.

Closure member 35 is substantially cylindrical in shape and has pairs of circumferential annular ribs 36 which correspond in position and shape to the respective pairs of grooves 34. Closure member 35 has a radially outwardly extending finger piece 37 positioned between the pairs of ribs 36. Closure member 35 also has a through-and-through diametrical opening 38 whose axis is inclined at an acute angle to the radial direction of finger piece 37. Opening 38 is located between the respective pairs of ribs 36.

In assembly, closure member 35 is first placed within the interior space of holder 29 with their axes in alignment, with their respective end faces abutting each other frictionally and with the ribs 36 respectively slidably positioned in respective grooves 34. In the next step, flanges 32 are swedged toward each other (Fig. 8) so that they frictionally abut the peripheral wall of finger piece 37. In the completed assembly, the inner faces of flanges 32 conform in curvature to the inner face of wall 31 so that in vertical cross-section, the inner face of holder 29 is in the form of a three-quarter arc of a circle.

Closure member 35 is frictionally and turnably held within holder 29, closure member 35 being turnable between the respective positions in which finger piece 37 abuts the respective flanges 32. In one of these positions, as shown in Fig. 8, hole 38 is aligned with hole 33, so that the contents of container 26 may be dispensed. When closure member 35 is turned a quarter turn in a counter-clockwise direction, finger piece 37 abuts flange 32, and hole 38 is out of registration with hole 33, thereby closing the dispenser. In this closed position, the interfitting ribs 36 and grooves 34 tend to prevent leakage of the contents of the dispenser.

Another embodiment of the invention is shown in Figs. 10 and 11. In this embodiment, a preferably glass container 40 with a snap-on cover 41 is employed. Container 40 has a cylindrical side wall with an outwardly extending peripheral flange 42 at its upper end. Cover 41 is disk-shaped and has a depending peripheral flange 43 which is turned inwardly at its lower portion 44.

Cover 41 may be made of a molded, resilient plastic and may be snapped onto container 40 with flange 42 positioned between cover 41 and flange portion 44. This is clearly shown in Figs. 10 and 11.

Cover 41 has a rectangular aperture. The holder 45 for the closure member is integral with cover 41. Holder 45 has end walls 30a corresponding to end walls 30 of Fig. 7 and a peripheral wall 31a, 32a corresponding to and formed in the same manner as peripheral wall 31, 32 of Fig. 8, except for the omission of any grooves. Slot 33a corresponds to slot 33.

Closure member 46 is substantially the same as closure member 14 of the first embodiment, except that finger piece 47 extends along only a portion of the length of said closure member 46.

It will be apparent that a number of the features of the three embodiments and of the modification of Fig. 6 may be interchanged. Thus it is preferable to have a plurality of holes 23 in closure member 14 when powder is to be dispensed. However, holes 23 may be replaced by a single hole such as 38 when liquid is to be dispensed.

Optionally, also, ribs and grooves such as ribs 36 and grooves 34 may be utilized in the embodiment of Fig. 1. The ribs and grooves may be omitted in the embodiment of Fig. 7. Optionally, this embodiment may be constructed in accordance with the modification of Fig. 6.

The third embodiment essentially incorporates the holder of the second embodiment and the closure member of the first embodiment on a snap-on cover. Optionally, also, this embodiment may be modified by interchanging other features of the preceding embodiments.

In any embodiment or modification, the construction

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of the top piece and of the closure member is intended to be such as to minimize leakage of the contents of the dispenser. It is believed that when these parts are made of material such as previously described, and when construction features such as the interfitting shapes of Figs. 1 and 6 or the ribs and grooves of Fig. 9 are employed, it is unnecessary to use washers or other additional means to prevent leakage. However, the invention permits the use of washers or the like if desired.

It will be apparent that this invention makes it possible to manufacture an effective dispenser entirely out of plastic. Thus if container 10 is molded in one piece, it is difficult to apply a conventional dispensing cap thereto. However, the resilient plastic top piece 13 and closure member 14 may be readily interfitted with container 10. The embodiment of Fig. 7 is particularly useful if container 26 is collapsible and contains a paste. Then when closure member 35 is assembled with the dispenser, the rings 36 serve as gaskets to prevent the extrusion of the paste, except through hole 38. The embodiment of Fig. 10 is particularly useful when it is desired to dispense powder from a glass container. Thus, this embodiment enables the use of a glass salt or pepper shaker without the use of a metal top.

Preferred embodiments of the invention, together with various changes, omissions and additions therein, have been disclosed. It will be apparent that various other changes, omissions and additions may be made without departing from the scope and spirit of the invention.

What is claimed is:

1. A dispenser comprising a hollow container which has a top, said top including a unitary block-like portion which is somewhat compressible and bendable and which is resilient, said block-like portion having a cavity which has a concave longitudinal wall and transverse, planar end walls and which is open at its top, said concave wall having an opening in its bottom portion which communicates with the interior space of said container, and a unitary dispensing member, said dispensing member being somewhat compressible and being resilient and having a radially outwardly extending finger piece, said dispensing member being positioned within and in axial alignment with said cavity with said finger piece extending through the top opening of said cavity, with said end faces respectively frictionally and turnably abutting the respective end walls and with said peripheral face frictionally and turnably abutting said concave wall, said dispensing member having a through-and-through diametrical opening, said dispensing member opening extending between and communicating with the bottom opening in said concave wall and the top opening therein when said finger piece abuts a first side of said top opening therein, said dispensing member opening being out of communication with said bottom opening of said concave wall when said finger piece abuts the second side of said top opening therein, said cavity in transverse cross-section being generally in the shape of a major arc of an oval whose major axis extends between said bottom opening of said concave wall and said top opening therein, said dispensing member being in transverse cross-section generally in the shape of an oval whose major axis is substantially aligned with the minor axis of said cavity when said finger piece is in its second-mentioned position, said major axis of said dispensing member being slightly longer than said minor axis of said cavity, whereby said dispensing member is frictionally and compressibly and resiliently and releasably held in its position in which said finger piece is in the second-mentioned position thereof, the major and minor axes of said dispensing member being at least as small respectively as the major and minor axes of the cavity, so as to permit said dispensing member to be moved freely to its position in which said finger piece is in its first-mentioned position.

2. A dispenser comprising a hollow container which has a top, said top including a unitary block-like portion

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which is somewhat compressible and bendable and which is resilient, said block-like portion having a cavity which has a concave longitudinal wall and transverse, planar end walls and which is open at its top, said concave wall having an opening in its bottom portion which communicates with the interior space of said container, and a unitary dispensing member, said dispensing member being somewhat compressible and being resilient and having a radially outwardly extending finger piece, said dispensing member being positioned within and in axial alignment with said cavity with said finger piece extending through the top opening of said cavity, with said end faces respectively frictionally and turnably abutting the respective end walls and with said peripheral face frictionally and turnably abutting said concave wall, said dispensing member having a through-and-through diametrical opening, said dispensing member opening extending between and communicating with the bottom opening in said concave wall and the top opening therein when said finger piece abuts a first side of said top opening therein, said dispensing member opening being out of communication with said bottom opening of said concave wall when said finger piece abuts the second side of said top opening therein, said cavity in transverse cross-section being substantially in the shape of a major arc of an ellipse whose major axis extends between said opening in the base of said concave wall and said top opening therein, said dispensing member being in transverse cross-section substantially in the shape of an ellipse whose major axis is substantially aligned with the minor axis of said cavity when said finger piece abuts said other side of said top opening in said concave wall, said major axis of said dispensing member being slightly longer than said minor axis of said cavity, whereby said dispensing member is frictionally and compressibly and resiliently and releasably held in its position in which said finger piece abuts said other side of said top opening in said concave wall.

3. A dispenser in accordance with claim 1, in which the top of said container is substantially planar and has a longitudinal opening within which said block-like portion is adapted to be frictionally interfitted, said block-like portion having a circumferential groove in which the edge zone of said upper wall around said opening therein is adapted to be located by snapping said edge zone into said groove.

4. A dispenser in accordance with claim 1, in which said cavity has transverse grooves in the concave wall thereof which are respectively spaced forwardly and rearwardly of the openings in the closure member and in the base of said concave wall, said dispensing member having annular ribs on the peripheral wall thereof which respectively ride turnably and frictionally in the respective grooves.

5. A dispenser in accordance with claim 2, in which the top of said container is substantially planar and has a longitudinal opening within which said block-like portion is adapted to be frictionally interfitted, said block-like portion having a circumferential groove in which the edge zone of said upper wall around said opening therein is adapted to be located by snapping said edge zone into said groove.

6. A dispenser in accordance with claim 2, in which said cavity has transverse grooves in the concave wall thereof which are respectively spaced forwardly and rearwardly of the openings in the closure member and in the base of said concave wall, said dispensing member having annular ribs on the peripheral wall thereof which respectively ride turnably and frictionally in the respective grooves.

7. A dispenser comprising a hollow container which has a top, said top including a unitary block-like portion which is somewhat compressible and bendable and which is resilient, said block-like portion having a cavity which has a concave longitudinal wall and transverse, planar end

walls and which is open at its top, said concave wall having an opening in its bottom portion which communicates with the interior space of said container, and a unitary dispensing member, said dispensing member being somewhat compressible and being resilient and having a radially outwardly extending finger piece, said dispensing member being positioned within and in axial alinement with said cavity with said finger piece extending through the top opening of said cavity, with said end faces respectively frictionally and turnably abutting the respective end walls and with said peripheral face frictionally and turnably abutting said concave wall, said dispensing member having a through-and-through diametrical opening, said dispensing member opening extending between and communicating with the bottom opening in said concave wall and the top opening therein when said finger piece abuts a first side of said top opening therein, said dispensing member opening being out of communication with said bottom opening of said concave wall when said finger piece abuts the second side of said top opening

therein, said cavity having transverse grooves in the concave wall thereof which are respectively spaced forwardly and rearwardly of the openings in the closure member and in the base of said concave wall, said dispensing member having annular ribs on the peripheral wall thereof which respectively ride turnably and frictionally in the respective grooves.

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