Nov. 17, 1964 R. BERNHARDT 3,157,322

DISPENSING UNIT AND METHOD OF PRODUCING THE SAME

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FIG.1

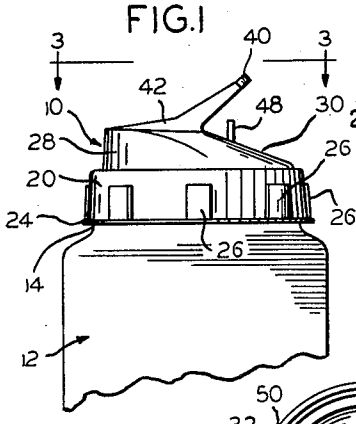
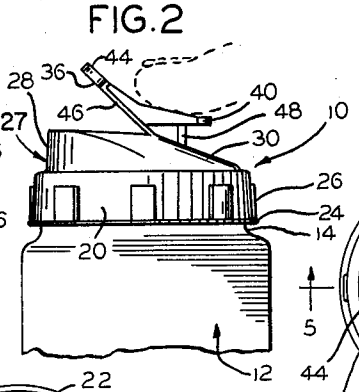


FIG.2



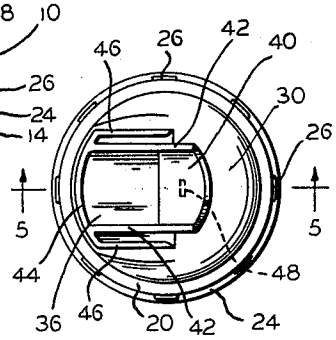


FIG.3

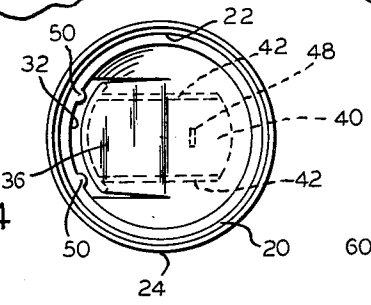
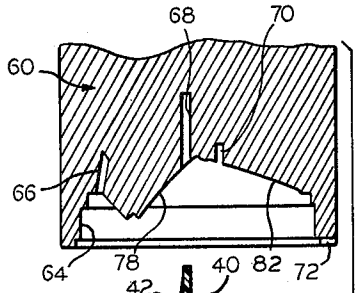


FIG.4



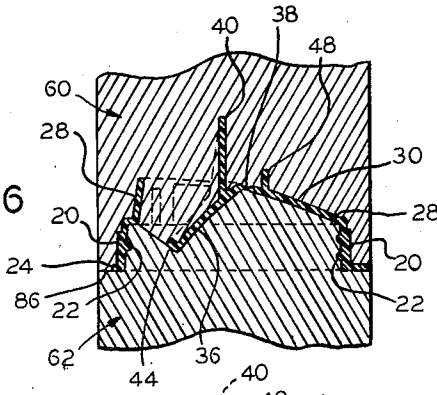


FIG.6

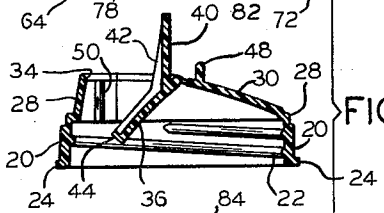
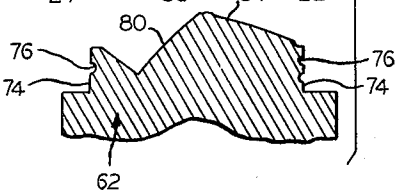


FIG.7



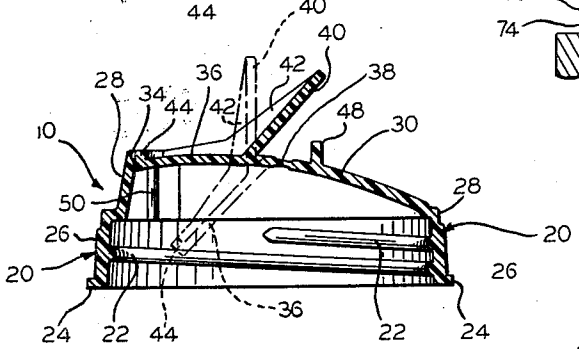


FIG.5

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FIG. 8

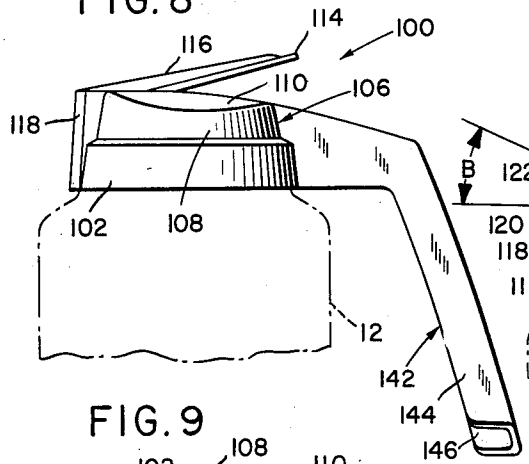

FIG. 10

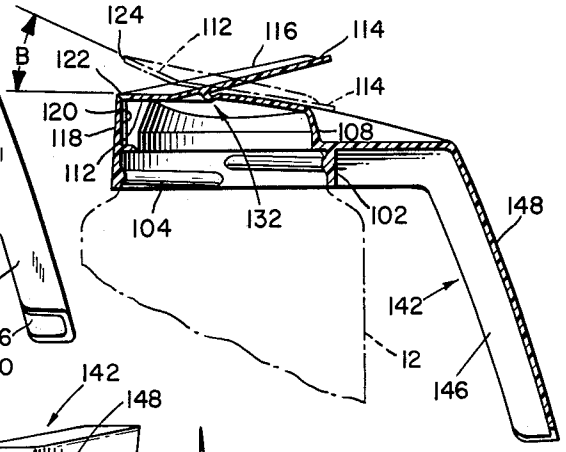

FIG. 9

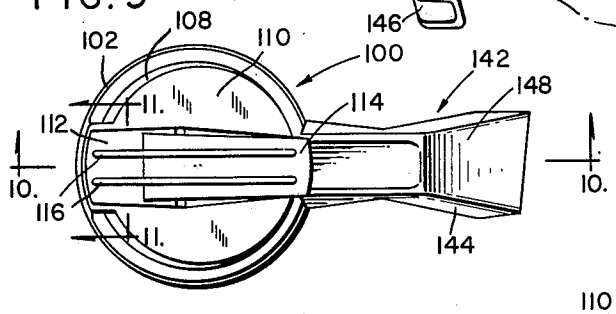

FIG. 11

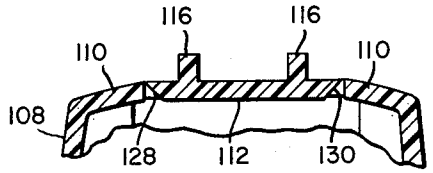

FIG. 12

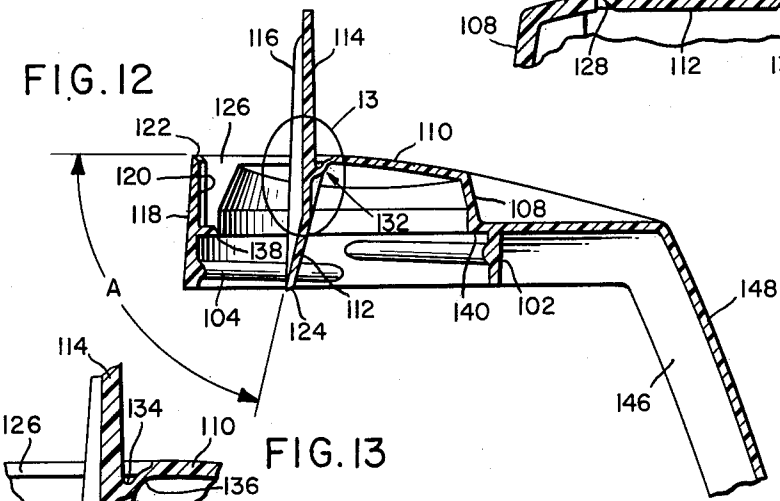

FIG. 13

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3,157,322

DISPENSING UNIT AND METHOD OF PRODUCING THE SAME

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Filed Sept. 14, 1961, Ser. No. 138,072
12 Claims. (Cl. 222—517)

This invention relates to dispensing units such as those for placement on containers from which fluent materials including liquid and liquid suspensions and granular materials are to be poured and, more particularly, to integral one-piece self-closing dispensing units of resilient plastic material and to an improved method of producing such dispensing units.

It is the custom today in many restaurants and in certain homes to place sugar, cream, syrup and the like on the dining table so that each person can season and apply these materials to the food as he eats it at the table. For the sake of convenience and to minimize contamination and spoilage, these materials are conveniently placed in containers equipped with dispensing tops of the self-closing type having closures which are normally biased closed but which can be manually operated to provide a dispensing opening through which the contents of the container can be applied to food by the user. Self-closing dispensing tops available heretofore have in general been relatively complicated in that they comprise a plurality of parts and further have a structure and configuration such that there are areas which can be cleaned only with difficulty, thus rendering them less than satisfactory for sanitary reasons. Furthermore, the self-closing dispensing tops provided heretofore have been relatively expensive and have been produced and assembled by methods which also are relatively expensive.

Accordingly, it is an important object of the present invention to provide an improved dispensing unit of the self-closing type that is of integral and one-piece construction.

Another object of the invention is to provide an improved integral one-piece self-closing dispensing unit that is formed of a resilient plastic material.

Yet another object of the invention is to provide a dispensing unit of the type set forth which can be easily cleaned after use and which is substantially free of entrapping pockets or cracks in which decaying food and bacteria can be trapped.

Still another object of the invention is to provide an improved dispensing unit of the type set forth which can be easily produced from resilient plastic materials using inexpensive methods of production.

A further object of the invention is to provide an improved method of making an integral one-piece self-closing or self-restoring dispensing unit of resilient plastic material.

Further features of the invention pertain to the particular arrangement of the elements of the dispensing unit and to the particular sequence of the method steps, whereby the above-outlined and additional objects and operating features thereof are attained.

The invention, both as to its organization and method of operation together with further objects and advantages thereof, will best be understood by reference to the following specification taken in connection with the accompanying drawing, wherein like reference numerals have been used to designate like parts throughout, and in which:

FIGURE 1 is a side elevational view of a dispensing unit made in accordance with and embodying the principles of the present invention, the dispensing unit being shown mounted on an associated container for fluent material and the closure flap being illustrated in the closed position thereof;

FIG. 2 is a side elevational view similar to FIG. 1 and showing the thumb of a user on a handle of the closure flap, the closure flap having been moved to the open or dispensing position thereof;

FIG. 3 is a top plan view of the dispensing unit illustrated in FIG. 1, the dispensing unit having been removed from the associated container;

FIG. 4 is a bottom plan view of the dispensing unit of FIG. 3 with the closure flap moved to the position of FIG. 2;

FIG. 5 is an enlarged view in vertical section, as seen in the direction of the arrows along the line 5—5 of FIG. 3, the closure flap being shown in the closed position in solid lines and being shown in the position as molded in dashed or broken lines;

FIG. 6 is a view in vertical section of a molding die useful in producing the dispensing unit of the present invention, the molding die being shown in the closed position and having a freshly molded dispensing unit enclosed therein;

FIG. 7 is an exploded view of the parts illustrated in FIG. 6 and showing the dispensing unit removed from the molding die;

FIG. 8 is a side elevational view of another embodiment of the dispensing unit of the invention;

FIG. 9 is a top plan view thereof;

FIG. 10 is a vertical longitudinal sectional view thereof, as seen in the direction of the arrows along the line 10—10 of FIG. 9, the closure flap being shown in the closed position in solid lines and in the open position in dashed lines;

FIG. 11 is an enlarged fragmentary vertical cross-sectional view thereof, as seen in the direction of the arrows along the line 11—11 of FIG. 9;

FIG. 12 is an enlarged vertical longitudinal sectional view similar to FIG. 10, with the closure flap shown in its position as molded; and

FIG. 13 is a further enlarged fragmentary sectional view of the closure flap and associated structure as indicated by the number 13 in FIG. 12, illustrating the hinged connection of the parts.

Referring to FIG. 1 of the drawings, there is shown one embodiment of a dispensing unit generally designated by the numeral 10, in operative position on a container 12 for fluent materials such as sugar, cream, syrup and the like, the dispensing unit 10 being made in accordance with and embodying the principles of the present invention. The container 12 is typically formed of glass or plastic and is provided at the upper end thereof with an upstanding neck 14 that is cylindrical in form and is provided with external threads (not shown) for the attachment of the dispensing unit 10 thereto.

The dispensing unit 10 is formed of a resilient synthetic organic plastic material, such for example, as polyethylene or polypropylene resin, and is formed as an integral one-piece unit. From FIGS. 3, 4 and 5 of the drawing, it will be seen that the dispensing unit 10 comprises generally a circular collar 20 which has an internal diameter such that it can receive the neck 14 of the associated container therein and further is provided with integral internal threads 22 that receive and co-operate with the threads on the container neck 14, whereby firmly to mount the dispensing unit 10 on the container 12. An outwardly extending reinforcing flange 24 is formed around the bottom of the collar 20 as viewed in FIG. 5 and there also are provided on the collar 20 outwardly extending embossments 26 which facilitate gripping by the user when applying the dispensing unit 10 to the container 12 and when removing it therefrom.

Extending upwardly from the collar 20 and completely therearound is a closure wall 27 which includes an in-

wardly inclined upstanding circumferential side wall **28** having a small vertical extent on the rear side of the dispensing unit **10**, i.e., to the right as viewed in FIGS. 1, 2, and 5 of the drawing and has a substantial vertical extent on the front of the dispensing unit **10**, i.e., to the left as viewed in FIGS. 1, 2 and 5 of the drawing. Substantially covering the area enclosed by the upper edge of the side wall **28** is a top wall **30** which is curved in cross section and is provided with a dispensing opening in the front or left portion thereof as seen in FIG. 5 of the drawing, the dispensing opening being generally designated by the numeral **32** (see FIG. 4). That portion of the upstanding wall **28** which forms a portion of the boundary of the dispensing opening **32** has the inner surface thereof beveled as at **34** (see FIG. 5) to form a pouring lip for the dispensing unit **10** and also to guide the movement of the closure flap into the operative closed position as will be explained more fully hereinafter.

There is attached to the curved top wall **30** a closure flap **36** which is shaped generally complementary to the outline of the dispensing opening **32**. The top wall **30** and the closure flap **36** are connected by a a hinge **38** having a thickness substantially less than that of either the top wall **30** or the closure flap **36**, so that the closure flap **36** can be moved relative to the top wall by bending at the hinge **38**. Although the thickness of the material forming the hinge is less than the thickness of the material at other points in the dispensing unit **10**, the thickness of the material at the hinge is sufficient to possess substantial resiliency, thereby to urge the closure flap **36** toward a closed position as will be explained more fully hereinafter.

There is provided upon the closure flap **36** a depressible thumb piece or lever arm **40** which is formed integral therewith and extends upwardly therefrom at an acute angle and to the right as viewed in FIG. 5, the thumb piece **40** being relatively stiff thereby to move the closure flap **36** by bending of the hinge **38**. Formed along each of the side edges of the thumb piece **40** is a reinforcing flange **42** which extends the length thereof and down onto the closure flap **36** and to an upstanding reinforcing flange **44** which extends around the curved front side of the closure flap **36** and joins with two parallel and substantially straight reinforcing flanges **46** extending along the straight sides of the closure flap **36**.

There is formed on the top wall **30** adjacent to the hinge **38** and opposite the thumb piece **40** an upstanding abutment **48** which is adapted to contact the underside of the thumb piece when it and the associated closure flap **36** are moved to the pouring position as illustrated in FIG. 2 of the drawing, to limit the movement thereof. There is also provided a pair of spaced apart semicircular stop members **50** integral with the upstanding wall **28** and disposed adjacent to the sides of the dispensing opening **32**, as may be best seen in FIG. 4 of the drawing. The stop members **50** contact the underside of the front end of the closure flap **36** when it is moved to the closed position as illustrated in FIGS. 1 and 5 of the drawing, to normally limit the downward movement of the closure flap **36** in the closing direction.

The dispensing unit **10** is formed integral and in one piece by molding from a synthetic organic plastic resin such as polypropylene or polyethylene, it being understood that other like plastic resins can be utilized provided that they possess equivalent molding and resilient characteristics to those possessed by polyethylene. The molding is preferably carried out by injection utilizing a die set illustrated in FIGS. 6 and 7 of the drawing and including an upper female die member **60** and a lower male die member **62** which when closed co-operate to form a cavity having the required shape to produce a dispensing unit **10** when a suitable amount of plastic resin is injected thereinto. More specifically, the female die member **60** has a generally cylindrical opening **64** therein and against the wall of which is molded the circular collar **20** having the embossment **26** thereon. Communicating with the opening **64** is an upstanding opening or passage **66** in which is formed the circumferential side wall **28**. Also communicating with the opening **64** is an opening **68** shaped to mold the thumb piece **40** and the reinforcements **42** thereon. Likewise, there is provided an opening **70** for molding the abutment **48**, together with the usual gate opening **72** to the lower right as seen in FIG. 7. The male die member **62** has an upstanding wall **74** with grooves **76** therein to mold the inner surface of the collar **20** and the threads **22** thereon, respectively. The closure flap **36** is molded against complementary-shaped surfaces **78** and **80** on the die members **60** and **62** and the top wall **30** is likewise molded between a pair of spaced apart complementary-shaped surfaces **82** and **84** on the die members **60** and **62**, respectively.

In the molding of a dispensing unit **10**, the die members **60** and **62** are assembled in the position as illustrated in FIG. 6 of the drawing and thereafter a suitable quantity of the synthetic organic plastic resin, such as polypropylene as polyethylene, is heated to molding temperature thereof and injected through the gate **72** into the molding cavity provided by the facing surfaces of the die members **60** and **62**, care being taken completely to fill the molding cavity while pressing the die members **60** and **62** firmly against one another along the part line **86**. After the plastic resin has been cooled sufficiently to permit handling thereof, the die members **60** and **62** are separated, the molded dispensing unit **10** being retained upon the die member **62** because of the presence of the threads **22** on the dispensing unit **10** engaging in the grooves **76** of the die member **62**. Thereafter the dispensing unit **10** is stripped from the die member **62** and the plastic material in the gate **72** removed therefrom.

It will be noted that at this state in the manufacture of the dispensing unit **10**, the closure flap **36** is in the position illustrated in FIG. 7 of the drawing and in the position illustrated by dashed lines in FIG. 5 of the drawing. The closure flap **36** in order to be operative as a self-closing element in a dispensing unit must be moved from the first or molded position thereof illustrated in FIG. 7 to a second position as illustrated by solid lines in FIG. 5 wherein the closure flap **36** closes the dispensing opening **32** in the closure wall **27**. The movement of the closure flap **36** from the first position illustrated by dashed lines in FIG. 5 to the second position illustrated by solid lines in FIG. 5 past the stop members **50** is readily accomplished since the closure flap **36** and the associated parts are all flexible whereby the closure flap **36** can be sufficiently deformed to permit movement thereof past the stop members **50** and the closure flap **36** is further sufficiently resilient to resume the molded shape thereof after being placed in the second position illustrated by solid lines in FIG. 5. It will be noted, however, that the closure flap **36** can be moved to the first or dashed line position of FIG. 5 from the second position or solid line position of FIG. 5 past the stop members **50** only with difficulty, although such movement is possible by deforming the closure flap **36**.

In moving the closure flap **36** from the first or dashed line position of FIG. 5 to the second or solid line position thereof, stresses are produced in the hinge **38** and because of the resilient character of the plastic forming the unit **10**, the stresses are substantially permanent and continually urge the closure flap **36** toward the first or dashed line position thereof and therefore against the upper surfaces of the stop members **50** as viewed in FIG. 5. The stresses created in the hinge **38** are not sufficient, however, to deform the closure flap **36** and to force it past the stop members **50**.

With the closure flap **36** and the associated parts in the second or full line position illustrated in FIGS. 1, 3 and 5 of the drawing, manufacture of the dispensing unit **10** is complete and it can now be placed upon an associated container such as the container **12** by engaging the threads **22** of the collar **20** with the mating threads on

the neck **14** of the container **12**. In order to dispense materials from the container **12** through the dispensing unit **10**, the user grasps the container **12** and places his thumb or a finger upon the thumb piece **40** and moves it and the attached closure flap **36** from the second or full line position illustrated in FIGS. 1 and 5 of the drawing to a third or open position illustrated in FIGS. 2 and 4 of the drawing wherein the closure flap **36** is raised from the stop members **50** and is removed from covering relationship with respect to the dispensing opening **32**. By tilting the container **12**, the contents thereof can now be poured or dispensed therefrom through the dispensing opening **32** and across the pouring lip **34**. When the desired amount of contents from the container **12** have been dispensed, the user removes his thumb or finger from the thumb piece **40**. Movement of the closure flap **36** from the second or full line position of FIG. 5 to the third or dispensing position of FIG. 2 has created yet further stresses in the hinge **38** which tend to urge the closure flap **36** toward the stop members **50** and, upon the removal of the thumb or finger of the user from the piece **40** at the end of a dispensing operation, the stresses in the hinge **38** move the closure flap **36** and the associated parts to the second or closed position illustrated in FIGS. 1 and 3 and by full lines in FIG. 5 of the drawing. The bevel pouring lip **34** aids in guiding the closure flap **36** to the closed position thereof against the upper ends of the stop members **50**. As has been explained above the abutment **48** contacts the underside of the piece **40** when the closure flap **36** is in the fully open position thereof and thus determines the fully open or third position of the closure flap **36** as is illustrated in FIG. 2 of the drawing.

From FIGS. 4, 5 and 7 of the drawing, it will be seen that the unit is substantially free of cracks, crevices or other material trapping areas that will collect material to permit spoilage thereof. This smooth inner construction of the dispensing unit **10** also facilitates removal of any materials therefrom which may tend to adhere thereto despite the smooth non-catching construction thereof. It is further noted that the method of molding the dispensing unit **10** can be carried out using standard equipment and standard molding procedures that are economical to construct and to operate.

A second embodiment of the invention is illustrated in FIGS. 8–13 of the drawings. A dispensing unit generally indicated by the number **100** includes, similarly to the embodiment of FIGS. 1–7, a collar **102** internally threaded at **104**, a closure wall **106** which includes a side wall **108** and a top wall **110**, a closure flap **112**, a thumb piece **114** of increased thickness integral therewith, and two spaced parallel longitudinal upstanding reinforcing ribs **116** integral with the flap and the thumb piece. In addition, a pour spout **118** is integrally formed on the front of the closure wall **106**, and it projects therefrom and defines an internal flow channel or recess **120** (FIGS. 10 and 12). An inner bevel edge **122** defines the lip of the pour spout, and it mates with an inner bevel edge **124** on the free end of the closure flap **112**, as illustrated particularly in FIGS. 10 and 12. The closure flap is supported on the pour spout bevel edge **122** in the second position of the flap, in which it closes the dispensing opening **126**. Respective side bevel edges **128** and **130** (FIG. 11) are provided on the flap **112**, and they facilitate movement of the flap into its position closing the dispensing opening **126**, in general alignment with the top wall **110**.

A preferred feature of the invention resides in the mounting of the closure flap **112** as illustrated in FIGS. 8–13, and particularly as shown in FIGS. 12 and 13. The flap is molded in a first position which is at a preferred angle A to its second or unit closing position, as illustrated in FIG. 12, on the order of 80°. The flap **112** is mounted on an integral S-shaped hinge **132** which is also integral with the top wall **110**, and the hinge has a reduced thickness relative to the flap and the wall. As

an example of the thicknesses, the flap and wall thicknesses may be about .05 inch and the hinge thickness at the center thereof may be about .016 inch, or about one-third of the former thicknesses. The hinge **132** includes a bend **134** integral with the underside of the flap **112** and curved rearwardly in the direction of the thumb piece **114**, and a reverse bend **136** integral with the top wall **110** and curving inwardly thereof.

The foregoing construction provides a strong resilient snap action of the closure flap **112** in closing the dispensing opening **126**. Movement of the flap through the described angle A from its molded position and the resulting compression of the rearwardly directed bend **134** and opening of the reverse bend **136** cause the hinge **132** to function also as an effective flap closing spring.

The unit **100** is molded in like manner to the preceding embodiment, with the flap **112** at the angle A and as illustrated in FIG. 12. In moving the flap angularly from this first position to its second position illustrated in full lines in FIG. 10, the flap is moved past a ledge **138** at the base of the pour channel **120**, which ledge is a continuation of an inner peripheral rim **140** serving to engage the rim of a container **12**. The flap flexes slightly to clear the ledge **138** and as the flap is moved in the channel **120** of the pour spout **118** outwardly to a position seated on the bevel edge **122**.

The outer surface of the top wall **110** provides abutment means for the thumb piece **114**, shown in its abutting position in phantom in FIG. 10. The abutment means restricts the angle B between the second or full line position and the third or phantom position of the flap **112** to an angle which together with the angle A illustrated in FIG. 12 is within the limits of the "memory" of the material of construction, or within its ability to return the flap **112** to its second position. In the illustrative embodiment employing resilient molded polypropylene or polyethylene, the angle between the first and third positions of the flap is maintained within about 100°. With a preferred angle A on the order of 80°, the angle B may be, correspondingly, on the order of 20°. This construction provides excellent flap closing action and ample room for pouring with the flap open, and the flap continues to provide an effective closure over extended use.

A channeled handle **142** for supporting the unit **100** is formed integrally in the unit. It includes spaced parallel angular sides **144** and **146** which are integral with the collar **102** and the side wall **108** on the rear side of the unit. The handle sides are joined by a cross member **148** integral therewith and with the collar **102** at its junction with the side wall **108**. When the unit is assembled on a container **12**, the assembly is grasped by the handle **142**, and the thumb piece **114** is engaged by the thumb or a finger of the hand. The container is tilted with the thumb piece depressed to pour its contents from the pour spout **118**. When the thumb piece is released, the flap **112** returns to its position on the bevel edge **122** of the spout and effectively close the dispensing opening **126**. The dispensing unit **100**, like the preceding embodiment **10** of the unit, is well adapted to be maintained clean and sanitary.

It will be seen that there has been provided an improved dispensing unit of the self-closing type and a method of producing such a dispensing unit which fulfill all of the objects and advantages of the invention set forth above. While there has been described what are at present considered to be preferred embodiments of the invention, it will be understood that various modifications can be made therein and its is intended to cover in the appended claims all such modifications as fall within the true spirit and scope of the invention.

I claim:

1. An integral one-piece self-closing dispensing unit of resilient plastic material comprising, a closure wall having an inner surface and an outer surface and a dispensing opening therein, and a closure flap joined integrally with

said closure wall along one edge of said dispensing opening for closing said opening, said closure flap being adapted to occupy a first unstressed position extending inwardly through said dispensing opening and beyond said inner surface, said closure flap also being capable of being flexed and angularly movable from said first position through said dispensing opening and to a second position wherein said closure flap closes said dispensing opening, said closure flap being thereafter angularly movable to a third position extending outwardly from said outer surface to open said dispensing opening, the movement of said closure flap from said first position to said second position creating stresses in said resilient plastic material urging said closure flap toward said second position closing said dispensing opening.

2. A dispensing unit as defined in claim 1 wherein the angle between said first and third positions is within about 100 degrees.

3. A dispensing unit as defined in claim 1 including an integral curved hinge joining said closure wall and said closure flap.

4. A dispensing unit as defined in claim 1 including a thumb piece integral with said closure flap.

5. A dispensing unit as defined in claim 1 including a stop member integral with said closure wall and extending inwardly into said dispensing opening, said closure flap being capable of being flexed past said stop member in moving from said first position to said second position and thereafter being disposed on said stop member in said second position.

6. An integral one-piece self-closing dispensing unit of resilient plastic material comprising, a closure wall having an inner surface and an outer surface and a dispensing opening therein, a closure flap having an outline complementary to said dispensing opening substantially to close said opening when disposed therein in general alignment with said closure wall, a hinge of reduced thickness between said closure wall and said closure flap, said hinge being integral with said closure flap and integral with said closure wall along one edge of said dispensing opening, and a thumb piece integral with said closure flap, said closure flap being adapted to occupy a first position wherein said hinge is unstressed with said closure flap extending inwardly through said dispensing opening and beyond said inner surface, said closure flap also being capable of being flexed and angularly movable about said hinge from said first position through said dispensing opening and to a second position wherein said closure flap closes said dispensing opening, said closure flap being thereafter angularly movable about said hinge to a third position extending outwardly from said outer surface upon engagement of said thumb piece to remove said closure flap from said dispensing opening, the movement of said closure flap from said first position to said second position creating stresses in said hinge urging said closure flap toward said second position closing said dispensing opening.

7. An integral one-piece self-closing dispensing unit of resilient plastic material comprising, a collar having threads on the inner surface thereof to engage threads on an associated container, a closure wall closing one end of said collar and having an inner surface and an outer surface and a dispensing opening therein, a closure flap joined integrally with said closure wall along one edge of said dispensing opening and having an outline complementary to said opening substantially to close said opening when disposed therein in general alignment with said closure wall, the juncture between said closure wall and said closure flap being of reduced thickness to provide a hinge therebetween, a thumb piece integral with said closure flap and extending therefrom away from said outer surface, said closure flap being adapted to occupy a first unstressed position extending inwardly through said dispensing opening and beyond said inner surface, said closure flap also being capable of being flexed and angularly movable about said hinge from said first position through said dispensing opening and to a second position wherein said closure flap closes said dispensing opening, said closure flap being thereafter angularly movable about said hinge to a third position extending outwardly from said outer surface upon engagement of said thumb piece to remove said closure flap from said dispensing opening, and means abutting said thumb piece to limit the movement of said closure flap from said second position to said third position thereof, the movement of said closure flap from said first position to said second position creating stresses in said hinge urging said closure flap toward said second position closing said dispening opening.

8. An integral one-piece self-closing dispensing unit of resilient plastic material comprising, a closure wall having an inner surface and an outer surface and a dispensing opening therein, a closure flap joined integrally with said closure wall along one edge of said dispensing opening and having an outline complementary to said opening substantially to close said opening when disposed therein in general alignment with said closure wall, an integral curved hinge of reduced thickness joining said closure wall and said closure flap, an inner bevel edge on said closure wall opposite to said one edge of said dispensing opening, a mating inner bevel edge on said closure flap, a thumb piece integral with said closure flap for moving the flap angularly about said hinge, said closure flap being capable of being flexed and angularly movable from a first position extending inwardly through said dispensing opening and to a second position wherein said closure flap is disposed with said bevel edge thereof upon said closure wall bevel edge and closes said dispensing opening, said closure flap being thereafter angularly movable to a third position extending outwardly from said outer surface upon engagement of said thumb piece to remove said closure flap from said dispensing opening, means abutting said thumb piece to limit the movement of said closure flap from said second position to said third position thereof, the movement of said closure flap from said first position to said second position creating stresses in said hinge urging said closure flap toward said second position closing said dispensing opening, and a handle for supporting the unit integral with said closure wall.

9. The method of producing from a resilient plastic material an integral one-piece self-closing dispensing unit, having a closure wall with a dispensing opening therein and a closure flap integral therewith and biased toward a position closing said dispensing opening, comprising the steps of molding said dispensing unit with said closure wall and said closure flap joined integrally and with the closure flap in a first position protruding inwardly through said dispensing opening into the interior of said dispensing unit, and then forcefully flexing and angularly moving said closure flap outwardly through said dispensing opening, thereby to stress said resilient plastic material at the juncture of said closure wall and said closure flap to produce stresses therein biasing said closure flap to a second position closing said dispensing opening.

10. The method of producing from a resilient plastic material an integral one-piece self-closing dispensing unit, having a closure wall with a dispensing opening therein and a closure flap integral therewith and biased toward a position closing said dispensing opening, comprising the steps of molding said dispensing unit with said closure wall and said closure flap joined integrally by a hinge of reduced thickness, and with the closure flap in a first position protruding inwardly through said dispensing opening into the interior of said dispensing unit, and then forcefully flexing and angularly moving said closure flap about said hinge outwardly through said dispensing opening, thereby to stress said resilient plastic material at said hinge to produce stresses therein biasing said closure flap to a second position closing said dispensing opening.

11. The method of producing from a moldable resilient plastic material an integral single-piece article having a body with an opening therein and a self-closing closure element for said opening, comprising the steps of molding said article with said body and said closure element integrally joined and with said closure element extending angularly in one direction from said body, then forcefully flexing and angularly moving said closure element generally in the opposite direction and bodily through said opening, thereby to stress said resilient plastic material adjacent the juncture of said closure element and said body to produce stresses therein constantly biasing said closure element toward a closing position with respect to said opening.

12. A self-closing dispensing device formed entirely of resilient plastic material, comprising a wall of said resilient plastic material having an opening therein, a substantially rigid closure flap of said material for closing said opening, means including a flexible junction section of said resilient plastic material integral with said closure flap and adjacent an edge of said opening for

connecting said flap to said wall, said junction section having a thickness less than that of said closure flap and said wall, said junction section being permanently stressed constantly to urge said closure flap in a direction toward said opening and toward a closing position with respect thereto, and a substantially rigid projection on said closure flap extending to a position spaced from said wall and adapted to be finger-pressed temporarily to overcome said stresses and to pivot said closure flap about said junction section toward an open position with respect to said opening.

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