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(54) **Child-resistant dispensing closure.**

(57) A child-resistant dispensing closure fabricated from resilient material has an inverted cup-shaped body and an axially protruding nozzle (31). A saucer-shaped lid (23) for closing the nozzle is connected to the body by a flexible hinge which is unitary with the body and the lid and which is located at one edge of the body. Cooperating means (42) for retaining the lid in closed position overlying the body and the nozzle comprise catch means being located diametrically opposite the hinge. The lid has a maximum diameter no greater than the diameter of the top of the body. The catch means may be at least partially disengaged by moving the lid laterally relative to the body so that a portion of the lid protrudes radially beyond the top of the body. By grasping the protruding portion of the lid, the lid then may be swung angularly away from closing position.

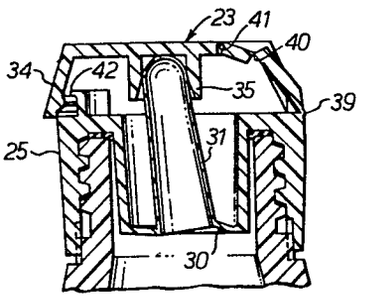

FIG.6

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CHILD-RESISTANT DISPENSING CLOSURE

Because of the fact that many substances found in an average home are extremely dangerous and often life threatening, particularly if consumed by a child of tender years, much emphasis has been placed on packaging many such substances in containers provided with child-resistant caps. For examples, many drugs, both prescription and over-the-counter, are so packaged, as are some dangerous liquid and particulate substances such as anti-freeze for automobiles, drain cleaners, furniture polishes, etc.

Most of the child-resistant caps which so far have been developed fall into either of two general classes. Some of the caps consist of two separate parts which must be assembled to each other before being placed upon the containers which they are to fit. Others have been so designed as to consist of only one integral or unitary piece, thus reducing the cost of manufacture by eliminating the necessity for a second mold and for an assembly task.

The most successful of the child-resistant closures usually have had two features in common. First, in order to remove or open the closure, it has been necessary that two separate and dissimilar

movements or actions take place. It has been found that a child of tender years, say six or less, usually does not readily comprehend how these two dissimilar actions must be performed, although an older child or an adult can do so by reading the instructions which usually are printed or molded on the closures. Secondly, some of the most successful child-resistant closures have also had the property of clearly indicating to an observing adult whether or not the closure is in child-resistant status or merely has been returned to its container without being restored to protective condition.

Unfortunately, many other substances which commonly are found in domestic situations have not yet been provided with satisfactory child-resistant closures. For examples, toilet bowl cleaning liquids, dishwashing liquids, and others, which usually are packaged in containers having dispensing openings, still appear in the market place with closures which an average small child can readily open.

Some closures for such substances have been provided with what might be called "snap-caps" i.e., caps which require that they be removed by the exercise of a fairly substantial amount of force, as, for example, to lift one edge so that the closure can be opened.

A typical closure of this kind is disclosed

in Babiol U.S. Patent No. 4,010,875. This comprises a child-resistant dispensing closure for a container, said closure having means adapted to co-operate with means on said container for retaining said closure on said container, said closure comprising

(a) a cup-shaped body having an annular skirt and a top,

(b) means providing a central dispensing opening in said top,

(c) a lid having means on its underside that is adapted to close said dispensing opening when said lid is in a closing position overlying said top,

(d) a flexible hinge web connecting said lid to said body at adjacent edges thereof, and

(e) co-operating catch means on said lid and said body.

There is a lip on the lip which protrudes beyond the edge of the body as so to be readily engageable with a thumb to lift the edge of the lid. The cap disclosed in Babiol would possess some child-resistant features simply by reason of the fact that a small amount of force is required to disengage the closing lid from the cap body so that it can be swung into open position and the content material dispensed from the container. However, the protruding lip provides an obvious clue as to the manner of opening and it has been found that where but a single movement is required, as in the Babiol closure, even a very small child readily can open the closure. It is possible also for the child to hold the container in one hand and bite into the cap to open the closure.

Many prior art child-resistant caps can be replaced upon their containers in what seems to be closed position without actually being re-established in child-resistant status. As a result, if the user is inattentive or a little bit careless, it may seem that the closure is safe although it really is not.

The invention is aimed at preventing these disadvantages, and provides a child-resistant dispensing closure particularly designed to be utilised on containers of liquid materials which are dispensed in small

quantities. The closure positively indicates whether or not it is in protective status and automatically returns to child-resistant status every time it is closed. It requires that two completely dissimilar actions be simultaneously performed in order to open the closure.

The closure can be manufactured as a single, unitary piece of resilient, resinous material such as polypropylene, thus enabling high-speed production in multi-cavity molds in order to minimise cost.

In the preferred case, the parts have exteriors so designed that the closures may be placed upon containers by the use of conventional automatic capping machines.

According to the invention there is provided a child-resistant dispensing closure for a container, said closure having means adapted to co-operate with means on said container for retaining said closure on said container, said closure comprising

(a) a cup-shaped body having an annular skirt and a top,

(b) means providing a central dispensing opening in said top,

(c) a lid having means on its underside that is adapted to close said dispensing opening when said lid is in a closing position overlying said top,

(d) a flexible hinge web connecting said lid to said body at adjacent edges thereof, and

(e) co-operating catch means on said lid and said body characterised in that:

said lid is of such size and shape that no part there over-hangs said top in said closing position,

said web having a length sufficient to provide for (1) angular movement of said lid relative to said body from such closing position and (2) lateral translatory movement relative to said body from said closing position a distance sufficient that a lower edge portion of said lid over-hangs the edge of said top,

said catch means including horizontal lips on said body and on said lid which lips are engaged when said lid is in said closing position and which are disengageable by engaging the over-hanging edge portion of said lid after moving said lid from said closing position laterally relative to said body.

In one embodiment said lips are disengageable following a said lateral translatory movement which is along a diameter of said top through said hinge.

In another embodiment said lips are disengageable following a said lateral translatory movement which is transverse to a diameter of said top through said hinge.

Embodiments of the invention are hereafter described with reference to the accompanying drawings, in which:-

Fig. 1 is a fragmentary view in perspective, showing a child-resistant dispensing closure embodying the invention on the neck of a container, the closure being shown in closed position;

Fig. 2 is a view similar to Fig. 1, but illustrating a first movement which is necessary to open a closure embodying the invention;

Fig. 3 is a view similar to Figs. 1 and 2, with the closure rotated some 90°, more or less, and being illustrated in open position;

Fig. 4 is a diametric, vertical sectional view, taken generally along the line 4-4 of Fig. 3 and shown on a greatly enlarged scale;

Fig. 5 is a view similar to Fig. 4, but showing the closure in closed position;

Fig. 6 is a view similar to Figs. 4 and 5, and showing the closure in the same position as that illustrated in Fig. 2;

Fig. 7 is a view similar to Figs, 4, 5 and 6, and showing the closure in an intermediate position between the open position of Fig. 4 and the closed position of Fig. 5;

Fig. 8 is a fragmentary, top plan view taken from the position indicated by the line 8-8 of Fig. 4 and shown on a further enlarged scale;

Fig. 9 is a fragmentary, horizontal, sectional view taken along the line 9-9 of Fig. 4 and shown on an enlarged scale;

Figs. 10, 11 and 12 are views similar to Fig. 5 of different respective embodiments;

Fig. 13 is a fragmentary view in perspective of a closure embodying the invention shown in closed position;

Fig. 14 is a view similar to Fig. 13 but showing the lid for the closure moved laterally relative to the closure body in the first step which is necessary to move the closure lid from closed to open position;

Fig. 15 is a view in perspective similar to Figs. 13 and 14 but shown on a slightly enlarged scale with the closure lid in open position;

Fig. 16 is a fragmentary vertical sectional view along a transverse diameter as generally indicated by the reference line 16-16 of Fig. 13 and showing the closure in closed position;

Fig. 17 is a view similar to Fig. 16 but taken along line 17-17 of Fig. 14;

Fig. 18 is a fragmentary view in perspective of yet another embodiment of the invention in closed position, the closure being shown on the upper end of the neck of a container which is fragmentarily indicated;

Fig. 19 is a view similar to Fig. 18 but showing the lid for the closure moved to a first position in which an older child or an adult can grasp a portion of the lid to swing it to open position;

Fig. 20 is a view in perspective of the closure embodying this modification of the invention in fully open position;

Fig. 21 is a fragmentary view taken from the position indicated by the line 21-21 of Fig. 19 and shown on an enlarged scale;

Fig. 22 is a fragmentary, diametric vertical sectional view taken generally along the line 22-22 of Fig. 18;

Fig. 23 is a view similar to Fig. 22 but taken generally along the line 23-23 of Fig. 19 and showing the closure in a position rotated 90^{o} relative to the position illustrated in Fig. 22 to illustrate how the lid is first moved laterally relative to the closure body to protrude a portion of the lid beyond the edge of the closure body thus to enable it to be grasped and swung open;

Fig. 24 is a vertical sectional view taken along the line 24-24 of Fig. 20 and shown on an enlarged scale;

Fig. 25 is a vertical sectional view taken along the line 25-25 of Fig. 18;

Fig. 26 is a fragmentary, horizontal, sectional view taken along the line 26-26 of Fig. 22 and shown on an enlarged scale; and

Fig. 27 is a view similar to Fig. 26 but showing the illustrated parts in the position to which they are moved when the lid of the closure is moved from the position shown in Figs. 18 and 22 to the position shown in Figs. 19 and 23.

A first embodiment of a child-resistant dispensing closure according to the invention is illustrated in Figs. 1-9, inclusive. The closure, generally indicated by the reference number 20, is a unitary structure and is shown in Figs. 1-7, inclusive, as being held in position on a container 21 which has a threaded neck 27, by means of threads 26.

The closure 20 comprises an inverted, cup-shaped cap 22 and a lid 23 which are hingedly connected to each other by a double-acting hinge, generally indicated by the reference number 24.

The cap 22 also has an inner, co-axial skirt 28 which is connected at its upper end to the upper end of the outer skirt 25 by an annular web 29. A lower, inwardly-directed web 30 is integral with the lower edge of the inner skirt 28, and its inner, circular edge defines an opening into the lower end of an axially extending nozzle 31, which is integral therewith. The nozzle 31 protrudes upwardly beyond the top web 29 and has a dispensing orifice 32 at its upper end.

The lid 23 has a disc-like top 33 and, in the illustrated embodiment, is generally saucer-shaped, having a conical rim 34. A nozzle closing element 35 is formed on the inner surface of the lid 33, as best can be seen in Fig. 5.

The lid 23 is integrally connected to the cap 22 by the double-acting hinge 24, which has two leaves 36 and 37. The hinge 24 is located in an inwardly-extending recess 38, formed partly in the top 33 of the lid 23 and in the rim 34 thereof. The hinge leaf 36 is connected to the edge of the cap 22 by a narrow, flexible web 39. The leaf 36 is connected to the leaf 37 and, in turn, the leaf 37 connected at its opposite side to the lid top 33 by thin, flexible portions 40 and 41.

Angular movement of the lid 23 from the fully open position illustrated in Figs. 3 and 4 is accomplished by swinging the lid 23 over to a position above the cap 22, the web 39 providing for this movement.

When the lid 23 approaches the closed position of Figs. 1 and 5, engagement takes place between lid catch means on the lid 23 and the cap 22. These catch means consist of an arcuate, over-hanging lip 42, erected above the top web 29 at the side opposite the hinge web 39, and an undercut, complementary rib on the inner side of the lid rim 34, which also is located opposite the web 39.

As can best be seen by reference to Fig. 7, when the lid 23 is moved toward closed position illustrated in Figs. 1 and 5, engagement between the lip 42 and rib 43 pulls the lid 23 over (to the left in Fig. 7), flexing the hinge 24 at the web 39 and the flexible portion 40. Because the closing element 35 already has telescoped over the upper end of the nozzle 31, as shown in Fig. 7, the lateral movement of the lid 23 at this point also pulls over the upper end of the nozzle 33, flexing either the nozzle 33 or the lower web 30, or both.

Immediately thereafter the lid 23 is moved downwardly its last increment of arcuate movement to

the closed position of Figs. 1 and 5, the resiliency of the nozzle 31, web 30, and hinge 24 pulling the lid 23 back (to the right in Fig. 7) snapping the rib 43 beneath the lip 42, to the position illustrated in Fig. 5.

It will be appreciated, of course, that in order for the just described actions to occur when the lid 23 is moved from its fully open position of Figs. 3 and 4 to its fully closed position of Figs. 1 and 5, the material from which the closure is fabricated must be a resilient material, for example, polyethylene or the like.

The rib 43 and lip 42 function as a child-resistant catch means to retain the lid 23 in the closed position of Figs. 1 and 5, and, as can be seen in those figures, the outside circumference of the lower margin of the lid rim 34 and the hinge web 36 are such that they are no larger than, and preferably the same size as, the diameter and circumference of the outer edge of the cap top web 29. The coincidence of the edges of the lid 23 and the cap 24 thus disguises the functioning described above and also practically eliminates the possibility that one can open a closure embodying the invention merely by swinging the lid 23 from the closed position to the open, or

dispensing, position.

Because of the telescoping engagement of the upper end of the nozzle 31 and the closing element 35 and the resiliency of the material from which these parts are fabricated, the lid 23 is snugly retained in its closed position by the engagement of the catch means 42 and 43, as described.

In addition, because there are no parts of the cap 22 or the lid 23 which protrude radially beyond the common periphery of the edges thereof, the closure readily can be handled by conventional automatic capping machinery.

When an older child or an adult desires to dispense material from the container, it is necessary that two simultaneous dissimilar actions be performed. First, the person must push the lid 23 from the position illustrated in Figs. 1 and 5 to the position illustrated in Figs. 2 and 6. This is made possible by the flexing of the double-acting hinge 24 on the web 39 and flexible portions 40 and 41 as illustrated in Fig. 6 and is resisted by the resiliency of those hinge elements as well as the resiliency of the nozzle 31 and/or the lower web 30. This action is necessary in order to move the rib 43 on the lid 23 outwardly relative to the lip 42. As can be seen in Fig. 6, this causes the edge of the

lid rim 34 to protrude laterally beyond the upper edge of the outer cap skirt 25 so that it can be engaged by the finger of the user. The user may then swing the lid upwardly and around the hinge web 39 to the open position of Figs. 3 and 4.

However, if the lateral pressure on the lid 23 against the resiliency of the several elements is released before the now-protruding edge of the cap rim 34 is engaged, the lid simply snaps back to the closed position illustrated in Figs. 1 and 5.

It is this requirement for simultaneous, dissimilar actions and the continuing necessity to hold the lid 23 in its laterally displaced position against the resiliency of the parts as described before it can be swung to the open position, which renders the cap strongly child-resistant. Indeed, the degree of resistance to the lateral movement of the lid 23 relative to the cap 22 and thus the degree of child-resistance may be modified as desired simply by stiffening the material from which the cap 22 and lid 23 are molded, either by selection of the particular compound or by different thicknesses of the various sections of the molded parts.

In addition, in this embodiment of the invention, means are provided to positively retain the entire closure 20 on the neck of the container 21.

These means consist of cooperating one-way ratchet teeth 44 on the neck of the container 21 and 45 on the outer skirt 25 of the cap 20, as shown in Fig. 9.

In the particular embodiment of the invention illustrated in Figs. 1-9, inclusive, it will be noted that the dispensing orifice 32 is not centered at the top of the nozzle 31, but is inclined at an angle of 45°, more or less, so that when the material is dispensed through a closure embodying the invention, it can be directed upwardly or laterally. This is particularly useful when materials, such as toilet bowl cleaner, are packaged in containers having closures embodying the invention. For other materials, the dispensing orifice may be located at the peak of the nozzle 31 and it may be of such size as desired for that particular material.

Fig. 10 shows a second embodiment of the invention in which a closure 50, like the earlier described embodiment, consists of a threaded cap 51 and a lid 52 which is integral therewith. In this embodiment, however, the cap 51 has a generally disc-like top 53 in which there is molded a central dispensing orifice 54. A double-acting hinge 55 connects the lid 52 to the cap 51 and the cap 51 and lid 52 are provided with catch means 56 and 57, respectively,

as in the earlier embodiment. In this structure, the lid 52 has a stopper 58 formed on the undersurface of the top of the lid 52, the base of the stopper 58 blending into a thinner portion 59 of the lid 52. As can be seen in Fig. 11, in closed position of this embodiment, the stopper 58 extends into the orifice 54.

The embodiment illustrated in Fig. 11 comprises a closure 70 consisting of a cap 71 and a lid 72. The cap 71 has a top 73 and an integral, protruding nozzle 74 which provides a discharge orifice. The cap 71 and lid 72 are connected by an integral hinge 75.

In this embodiment a closing element 76 is molded on the underside of the top of the lid 75 and fits circumjacent the end of the nozzle 74 in the same manner as the cup-shaped closing element 35 of Figs. 1-9.

The closure 70 is retained on a container neck 77 by inter-engaged rings 78 on the exterior of the container neck 77 and 79 on the inner surface of the cap 71.

Fig. 12 illustrates a closure 80 consisting of a cap 81 and a lid 82 similar to those previously described. As in earlier embodiments, the cap 81 has a top 83 and a protruding nozzle 84 which defines a

discharge opening. The cap 81 and lid 82 are integrally connected by a relatively thin web of material which forms a hinge 85. The hinge 85 of this embodiment differs from the hinges of earlier embodiments in that it does not have a number of parts with intervening thinner portions upon which it flexes, but, by reason of its thin section, provides for both the angular swinging motion and the lateral release movement which disengages the catch means. The lid 82 has an interior closing element 86 which enters the end of the nozzle 84 in closed position, and this engagement provides the resilient resistance to the lateral release movement.

The closure is retained on a container neck 87 by interengaging rings 88 and 89.

In Figs. 13 to 17 there is shown a closure generally indicated by the reference number 110 comprising a body 111 having a circular skirt 112 and a disc-like top 113. Threads 114 on the inner wall of the skirt 112 mate with complementary threads 115 on a container neck 116. Preferably the skirt 112 and container neck 116 also have one-way ratchet means, generally indicated by the reference number 117, so that when the closure 110 is threaded downwardly onto the container neck 116 it cannot be rotated in a retrograde direction, thus adding to its child-resistant quality.

In the embodiment illustrated in Figs. 13-17 the body 111 also has an integral, axially protruding nozzle 118 and the nozzle 118 has an angularly directed orifice 119.

The closure also comprises a generally saucer-shaped lid 120 which has a flat disc-like top 121 and a frusto-conical rim 122. The lid 120 is integrally connected to the closure 110, in this case to the body 111, by a flexible hinge 123. A cup-shaped nozzle cap 124 is formed on the underside of the lid top 121 and is of such size as to closely embrace the nozzle 118 when the lid 120 is in closing position as illustrated in Fig. 16.

Cooperating catch means consisting of an over-hanging rib 125 on the body top 113 and an inwardly extending lip 126 at the margin of the lid rim 122 are provided for retaining the lid in closing position as illustrated in Figs. 13 and 16. The rib 125 and lip 126 are aligned diametrically from the hinge 123.

As can best be seen in Figs. 16 and 17 the body top 113 and the lid top 121 both have relatively thin annular webs 127 and 128, respectively, which surround the bases of the nozzle 118 and the nozzle cap 124.

Because the entire closure is molded from a resilient resinous material, such as polyethylene, or

the like, an older child or an adult may move the lid transversely relative to the diametric line extending between the hinge 123 and the catch means 125-126 against the resiliency of the webs 127 and 128, as shown in Fig. 17. This transverse movement at least partially disengages the lip 126 from the rib 125 and, simultaneously, extends a tab 129 outwardly beyond the upper margin of the closure body 111 so that it may be grasped by the fingers of the person wishing to open the closure to enable that person to swing the lid from the position illustrated in Figs. 14 and 17 to the position illustrated in Fig. 15.

It will also be observed by reference to Fig. 13, that when the lid 120 is in closing position with the nozzle cap 124 closing the nozzle 118, the tab 129 lies closely adjacent the body top 113 and does not extend outwardly beyond the margin of the body 111 thereby making it difficult if not impossible to grasp lid 120 until it has first been moved to the position shown in Figs. 14 and 17.

The closure 110 is sealed to the container neck 116 by a flexible annular web 130 which extends around the underside of the body top 113 and is squeezed against the lip of the container neck as shown in Figs. 16 and 17.

The embodiment of the invention illustrated in Figs. 18-27 is a closure 160 comprising a body 161 having a skirt 162 which is threaded on its inner surface with threads 163. The closure threads 163 mate with threads 164 on a neck 165 of a container which is fragmentarily shown in a number of the figures.

In common with the earlier embodiments of the invention, the container neck 165 and the lower end of the cap skirt 162 have cooperating ratchet teeth 166 and 167 which prevent the closure 160 from being turned off of the container neck 165 once it has been threaded down tightly into the position illustrated in Figs. 18, 19, 22 and 23. The ratchet teeth 166 and 167 constitute part of the closure which contribute to making it child-resistant in that removal of the entire closure 160 from the container is virtually impossible once it has been threaded into the closed illustrated position.

The closure body 161 has a top annular rim 168 which extends inwardly and is integral with an inner circular wall 169 spaced inwardly from the inner surface of the skirt 162 only a distance such that when the closure is threaded onto the neck 165 of the container, the end of the threaded neck 165 is tightly squeezed between the skirt 161 and the inner wall 169 providing a leak-proof connection.

An inwardly directed, flexible, annular flange 170 at the bottom of the inner wall 169 integrally is connected to and supports an axially extending dispensing nozzle 171 which has a dispensing orifice 172 at its outer end.

The closure 160 also includes a saucer-shaped lid 173 which, of course, is highly similar to the lids of the earlier embodiments. The lid 173 is integrally connected to the body 161 by a flexible hinge web 174 which is connected at its outer side to an annular rim 175 of the lid 173 and its inner side to a thin web 176 (see also Fig. 21) formed at the outer side of an arcuate recess 177 in the body rim 168.

The lid 173 has a circular top 178 and a frusto-conical wall 179, the rim 175 being located at the bottom edge of the wall 179 and extending slightly radially outwardly therefrom. A nozzle cap 180 is formed on the underside of the lid top 178 and is centrally located so as to telescope over the end of the dispensing nozzle 172 when the lid 173 is swung into closing position as illustrated, particularly, in Figs. 18, 22 and 25. The lid top 178 has a thin annular section 181 surrounding the base of the nozzle cap 180 and, in this embodiment, the nozzle cap 180 is braced to the lid wall 179 by a pair of radially

extending webs 182 (see Fig. 13, particularly).

A generally tangentially extending catch 183 is erected on the body rim 168 diametrically opposite to the hinge web 174 and has an inwardly extending lip 184 spaced above the body rim 168 a distance such that the lid rim 175 will fit beneath the lip 184 when the lid 173 is on top of the body 161 either in the closing position illustrated in Figs. 118 and 122 or in the slightly laterally displaced position illustrated in Figs. 19 and 23.

The catch lip 184 overlies a slot 185 molded in the body rim 168, the slot 185 being of such size as to receive a lug 186 when the lid 173 is swung into the closing position illustrated in Fig. 18 and also when it is in the laterally displaced position illustrated in Fig. 19. The engagement of the lug 186 in the slot 185 is most clearly illustrated in Figs. 26 and 27 showing the position of the lug 186 in the slot 185 when the lid 173 is in the closing position (Fig. 26). Fig. 27 specifically shows the movement of the lug 186 as it is limited by the slot 185 when the lid 173 is moved laterally to the position illustrated in Figs. 19 and 23.

In common with the earlier described embodiments of the invention, it is the resiliency of the parts such

as the flange 170 at the base of the dispensing nozzle 171, the nozzle 171 itself, and the annular portion 181 of the lid top 178 which resist movement of the lid 173 from the closing position to the first position illustrated in Figs. 19 and 23. It will also be observed that even after the lid 173 has been moved laterally, twisting the hinge 174 and the flexible web 176 (as shown in Fig. 21) the rim 175 of the lid 173 remains engaged with the catch 183 even while the lid 173 is moved to the limit of its lateral movement, this being controlled by the engagement of the lug 186 in the slot 185 as illustrated in Fig. 27.

Also, in common with the earlier modifications of the invention, even after an older child or an adult has moved the lid 173 laterally, the catch means remain engaged so that if the lid is released at this point, the resiliency of the flexible parts will move it back to its central closing position as shown in Fig. 13.

The dispensing closure therefore remains child-resistant but readily may be opened by an older child or an adult by pushing the lid laterally, flexing the integral hinge and projecting a portion of the lid beyond the margin of the closure body so it can be grasped and swung upwardly and over to fully

open position to permit dispensing of the content material.

CLAIMS:-

1. A child-resistant dispensing closure (20) for a container, said closure having means (26) adapted to co-operate with means on said container for retaining said closure on said container, said closure comprising

(a) a cup-shaped body (22) having an annular skirt (28) and a top (29),

(b) means (31) providing a central dispensing opening in said top,

(c) a lid (23) having means (35) on its underside that is adapted to close said dispensing opening when said lid is in a closing position overlying said top,

(d) a flexible hinge web (24) connecting said lid to said body at adjacent edges thereof, and

(e) cooperating catch means (42,43) on said lid and said body characterised in that:

said lid is of such size and shape that no part there over-hangs said top in said closing position,

said web having a length sufficient to provide for (1) angular movement of said lid relative

to said body from such closing position and (2) lateral translatory movement relative to said body from said closing position a distance sufficient that a lower edge portion of said lid over-hangs the edge of said top,

said catch means including horizontal lips (42,43) on said body and on said lid which lips are engaged when said lid is in said closing position and which are disengageable by engaging the over-hanging edge portion of said lid (Fig. 6) after moving said lid from said closing position laterally relative to said body.

2. A closure according to claim 1 in which the means for retaining said closure on the container comprises threads (26) on said closure which mate with threads (27) on said container.

3. A closure according to claim 1 or claim 2 including means (45) on said closure for interengaging with corresponding means on said container to resist rotation of said closure relative to said container.

4. A closure according to any preceding claim in which the closing means (35) and the opening providing means (31) are telescopingly engaged when

the lid is in said closing position thereby providing a bias against lateral movement of said lid relative to the body.

5. A closure according to any preceding claim in which the means providing a central dispensing opening is a nozzle (31) having a dispensing orifice in its upper end and which constitutes an integral part of the top of the body and the closing means is an element on the underside of the lid which telescopes with the upper end of said nozzle.

6. A closure according to any preceding claim in which the lid (23) is generally of inverted saucer shape with a rim having a diameter no greater than the diameter of said top.

7. A closure according to any preceding claim in which the hinge web (24) has a first flex line (39) at the connection to the body and a second flex line (40) spaced from the first said flex line and at the connection of the lid.

8. A closure according to any preceding claim in which the catch means comprises:

(a) at least one over-hanging lip (42) on the top of the body, and

(b) a lip (43) on the margin of the lid that is adapted to engage beneath said over-hanging lip for retaining said lid in closing position.

9. A closure according to claim 8 in which a portion of the integral hinge is recessed into the rim of the lid.

10. A closure according to any preceding claim in which said lips are disengageable following a said lateral translatory movement (Fig. 1) which is along a diameter of said top through said hinge.

11. A closure according to any of claims 1 to 9 in which said lips are disengageable following a said lateral translatory movement (Fig. 13) which is transverse to a diameter of said top through said hinge.

12. A closure according to claim 11 in which the lid is generally of inverted saucer shape having a rim which engages the said top in the said closing position and in which the margin of said lid rim is cut back providing a peripheral lip (126) on the margin of said lid rim and there is an inwardly directed

overhanging lip on the edge of the body beneath which the lip on said lid rim is engaged in the said closing position.

13. A closure according to any preceding claim including cooperating means (85,86) on the lid and the body for limiting the lateral movement of said lid from closing position to a position with the margin of said lid extending beyond the edge of said body and with the lips on said lid and said body still partially engaged.

14. A container fitted with a closure according to any preceding claim so as to be child-resistant.

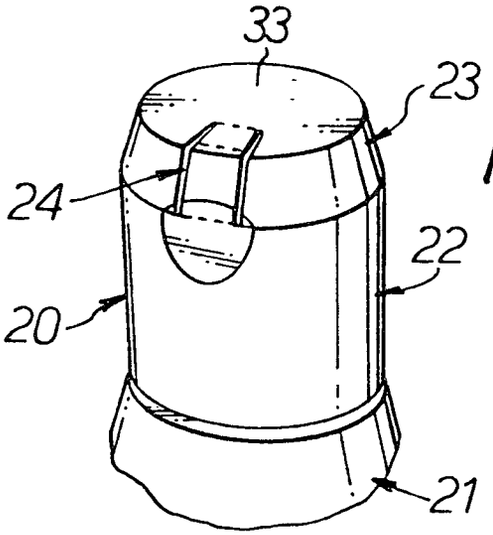


FIG.1

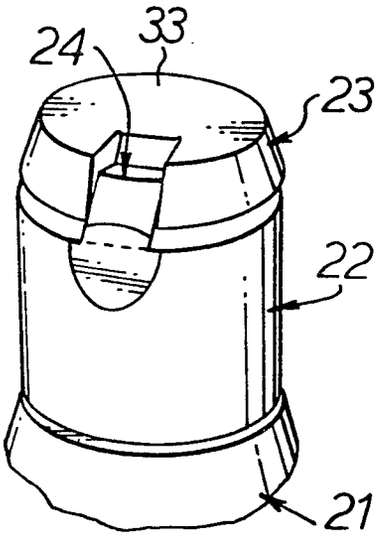


FIG.2

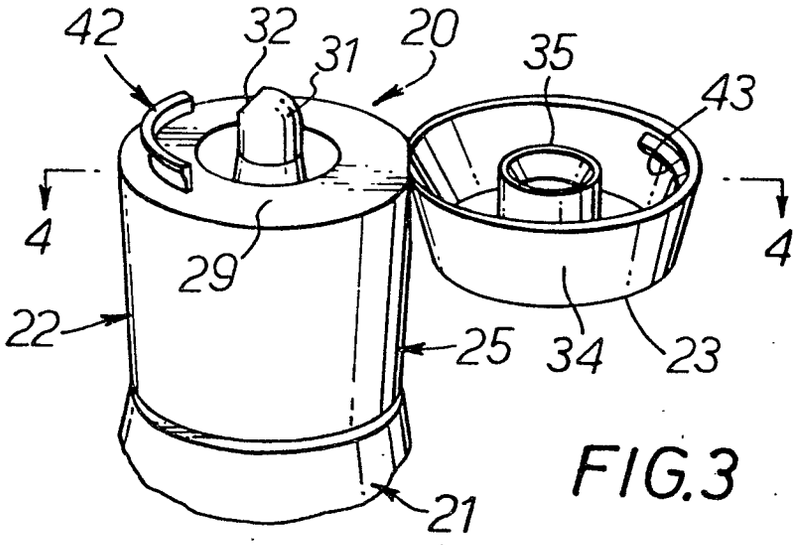
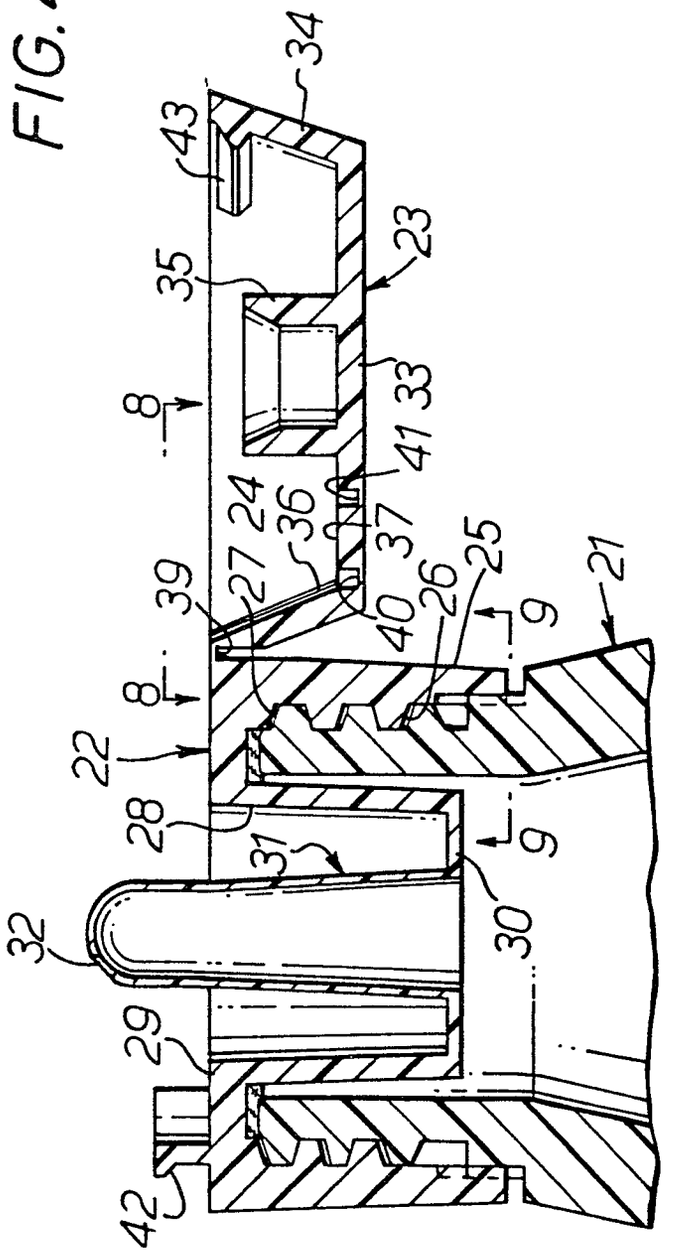


FIG.3

FIG. 4



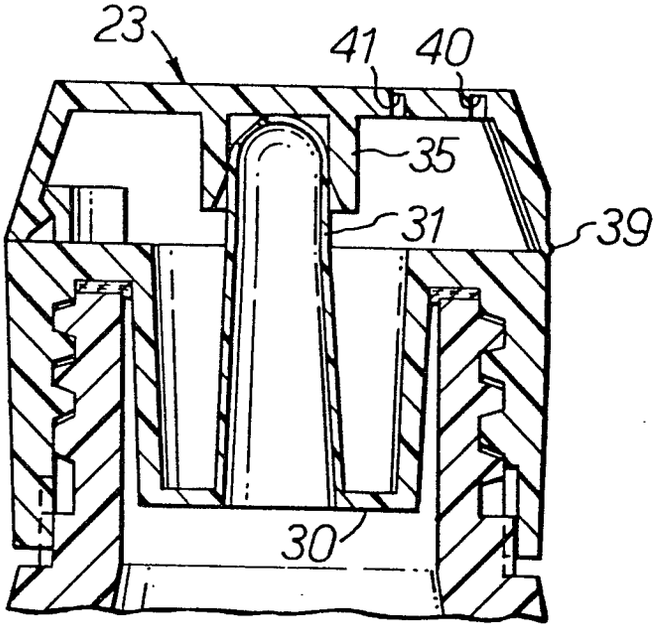


FIG.5

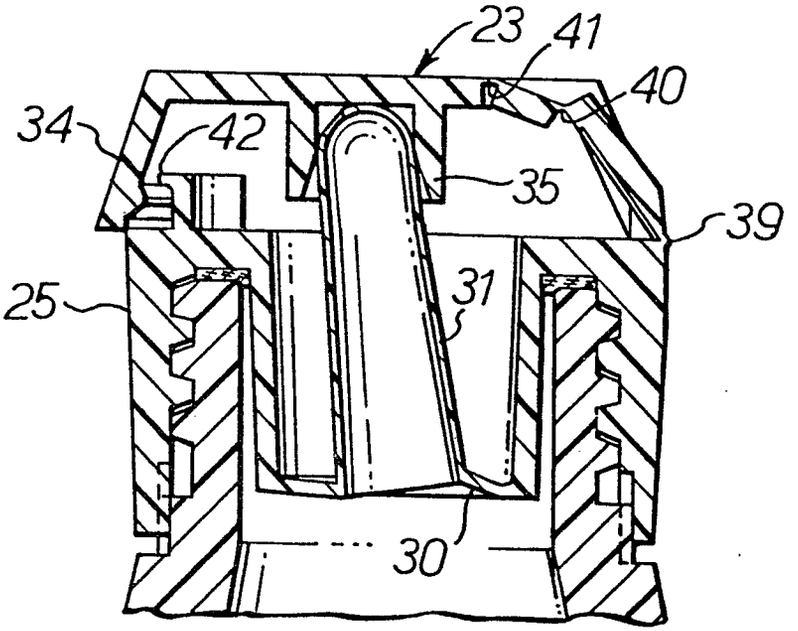


FIG.6

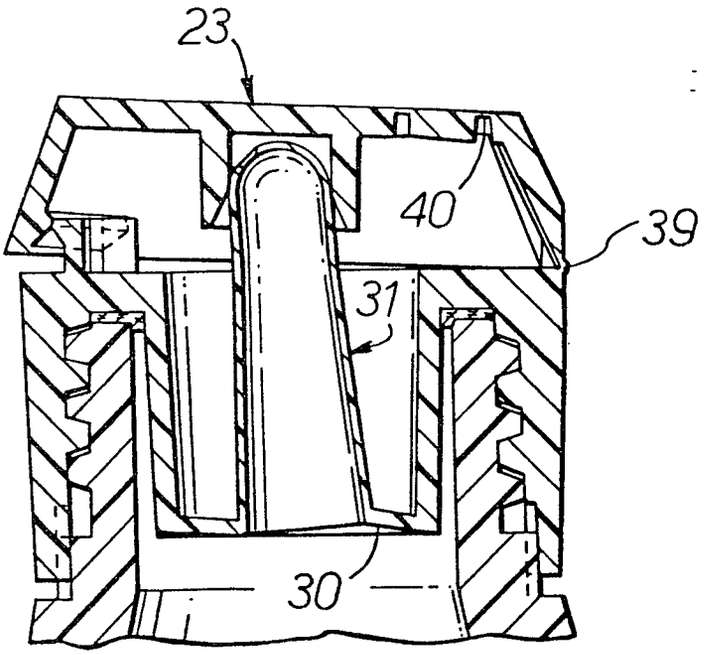


FIG.7

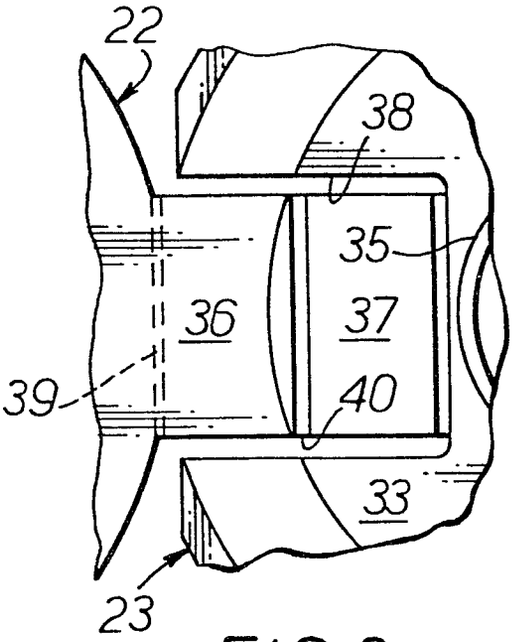


FIG.8

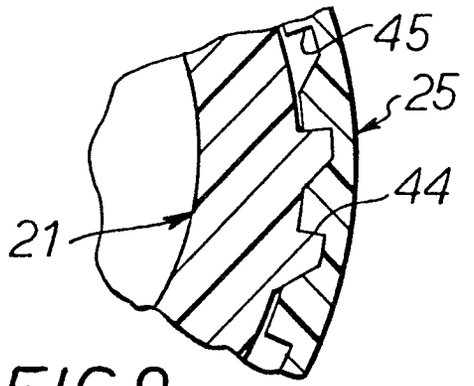


FIG.9

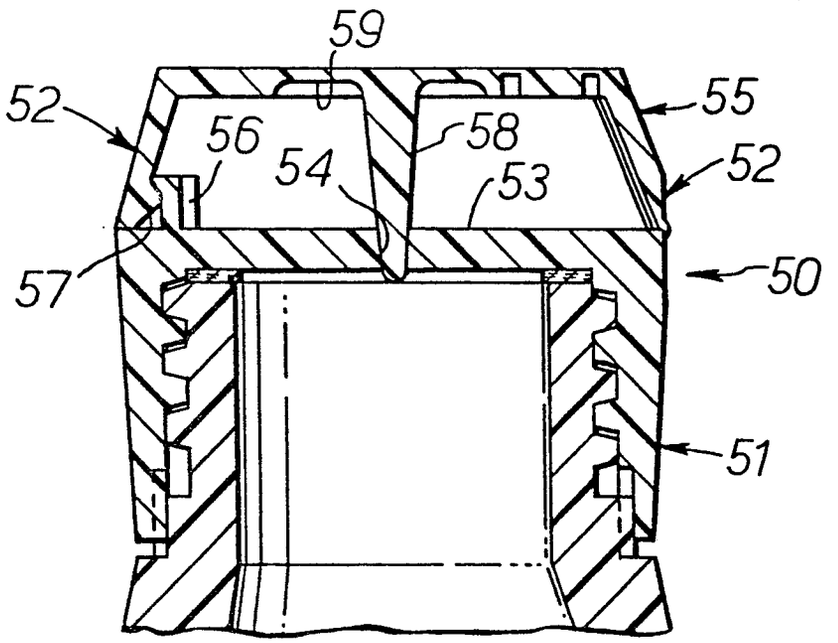


FIG.10

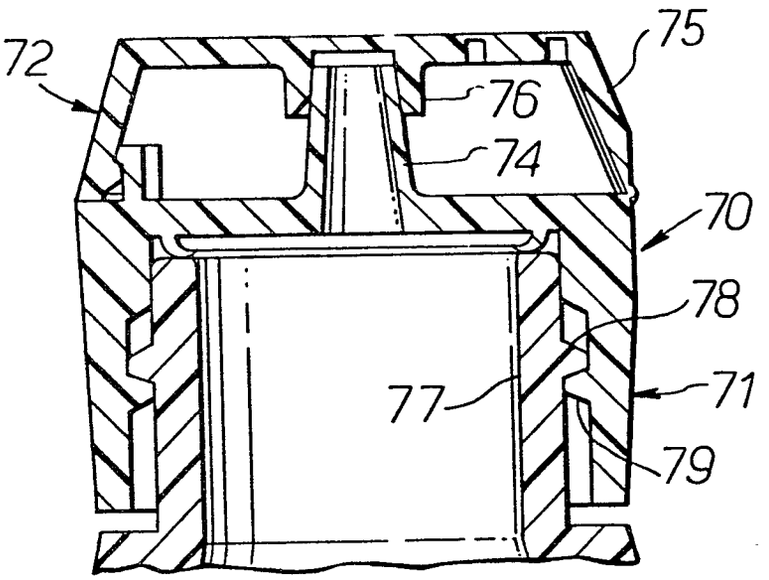


FIG. 11

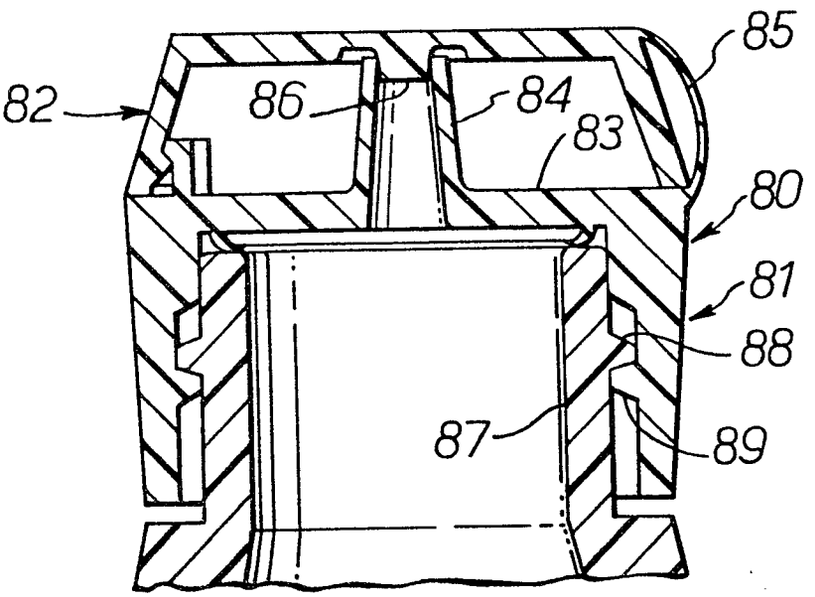


FIG. 12

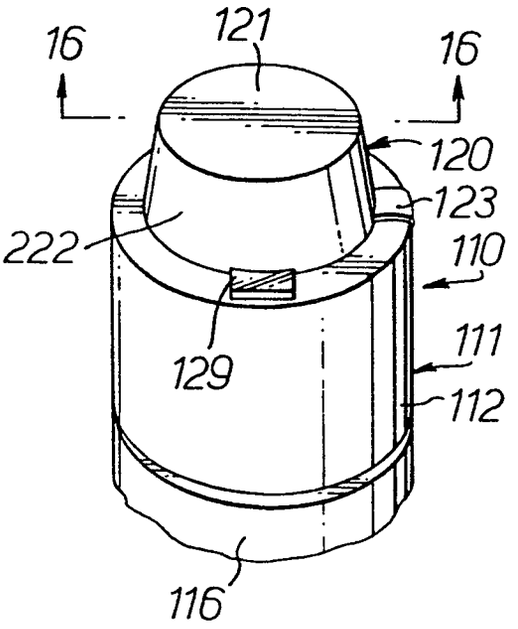


FIG. 13

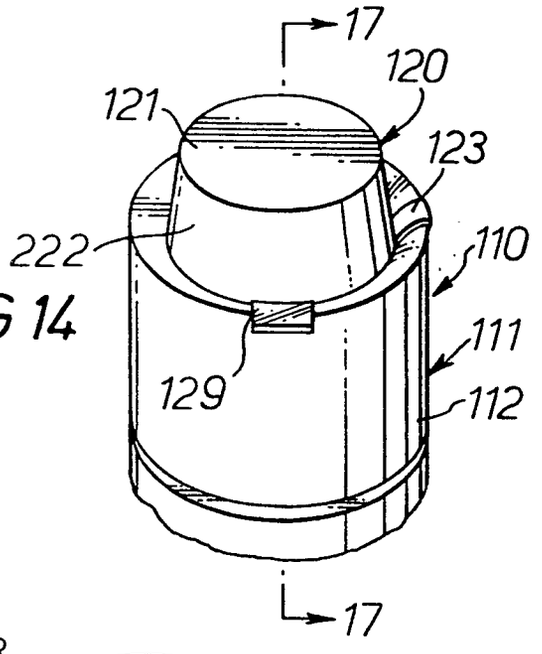


FIG 14

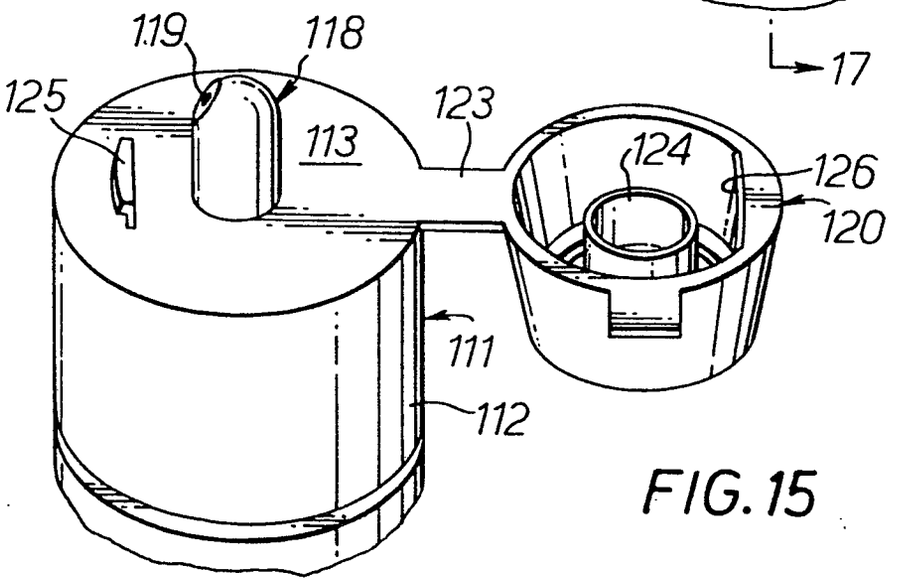


FIG. 15

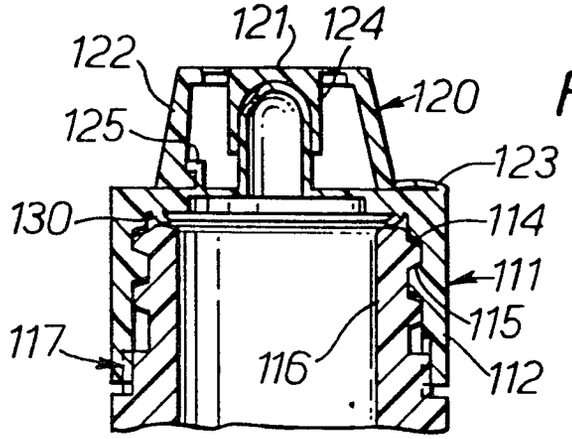


FIG.16

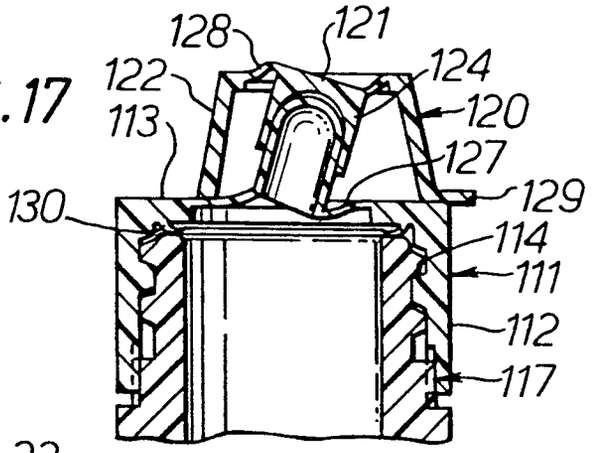


FIG.17

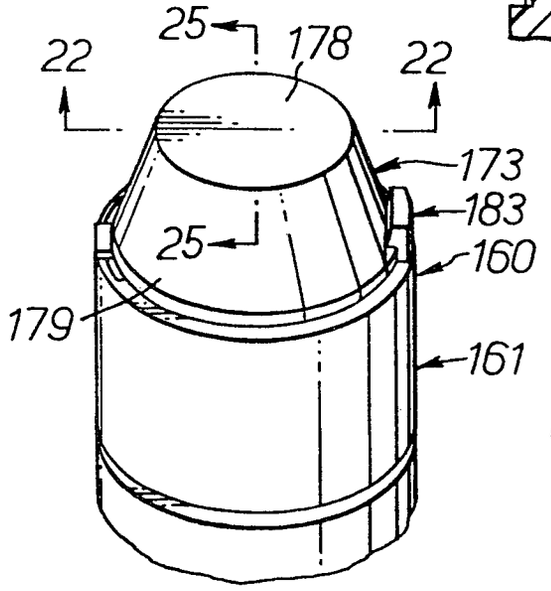


FIG.18

FIG.19

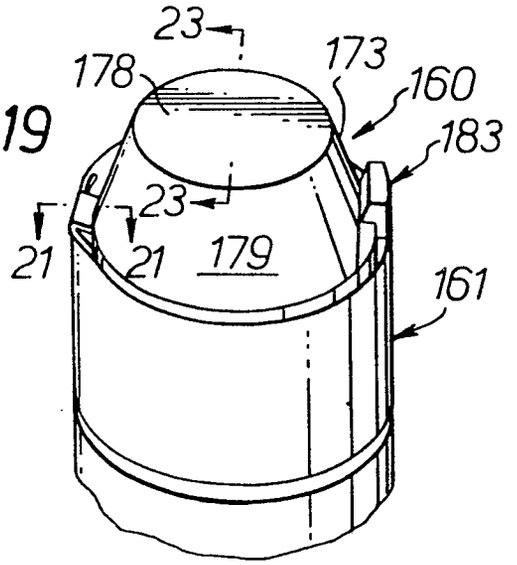
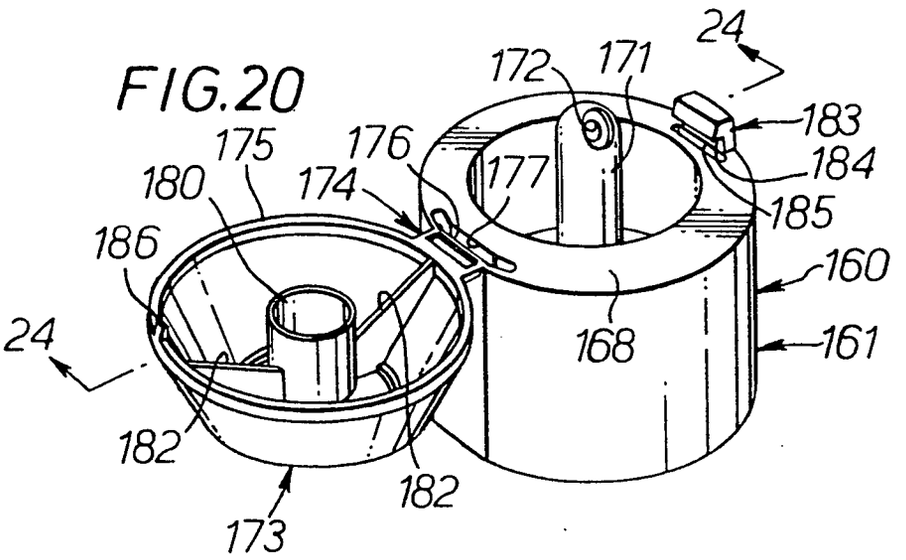


FIG.20



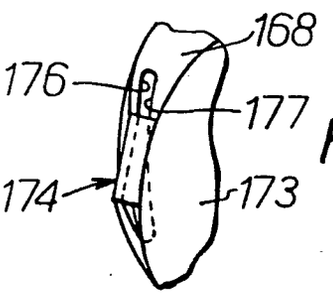


FIG.21

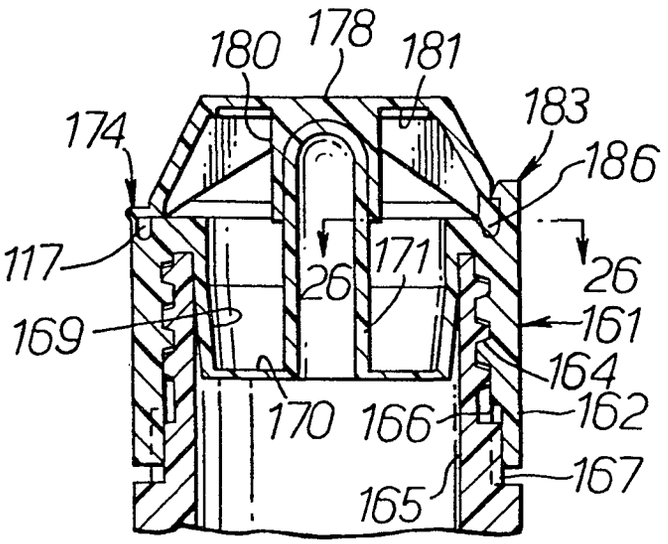

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FIG. 22

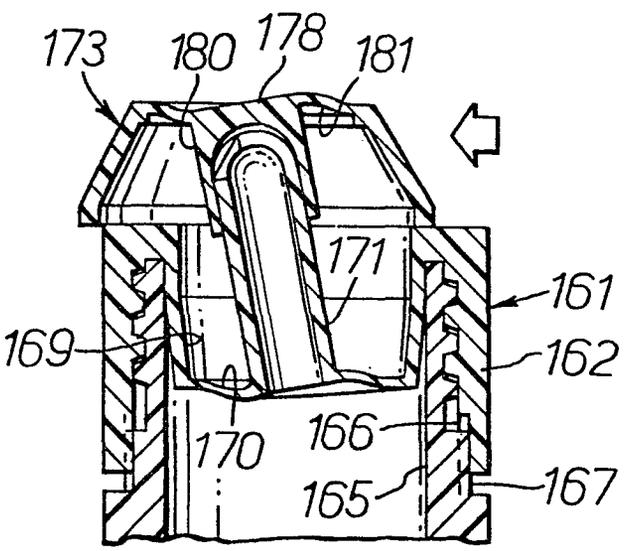
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FIG. 23

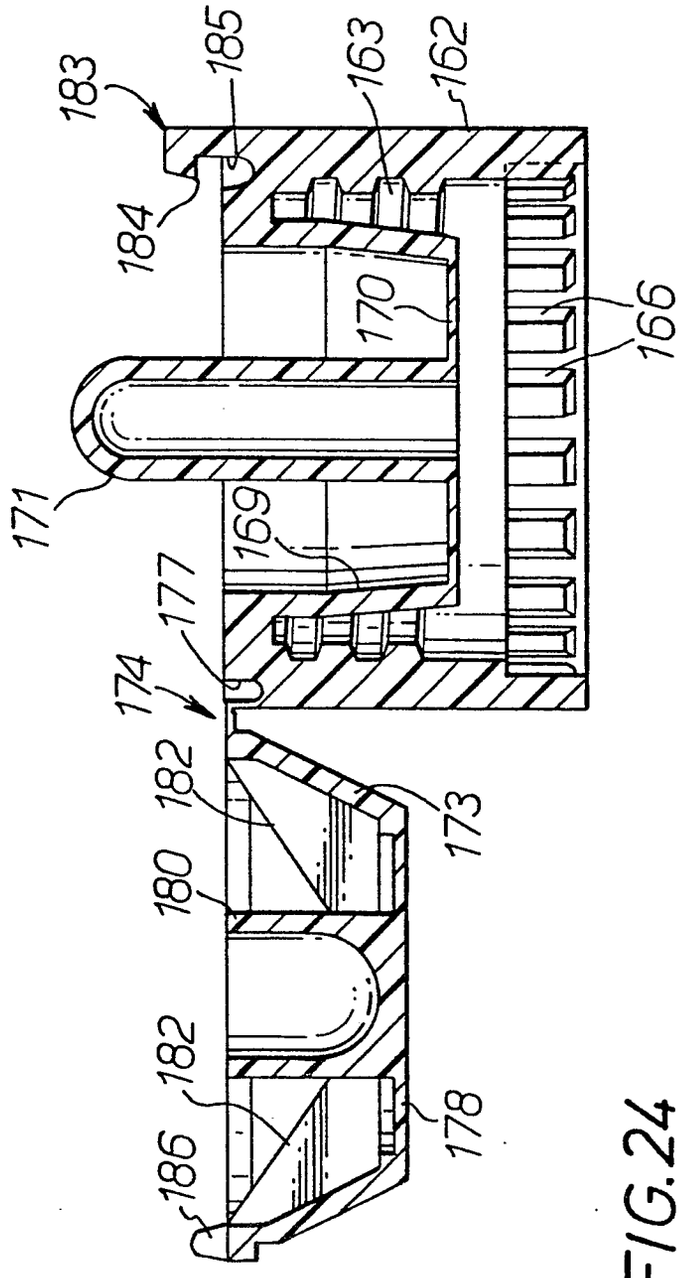
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FIG.24

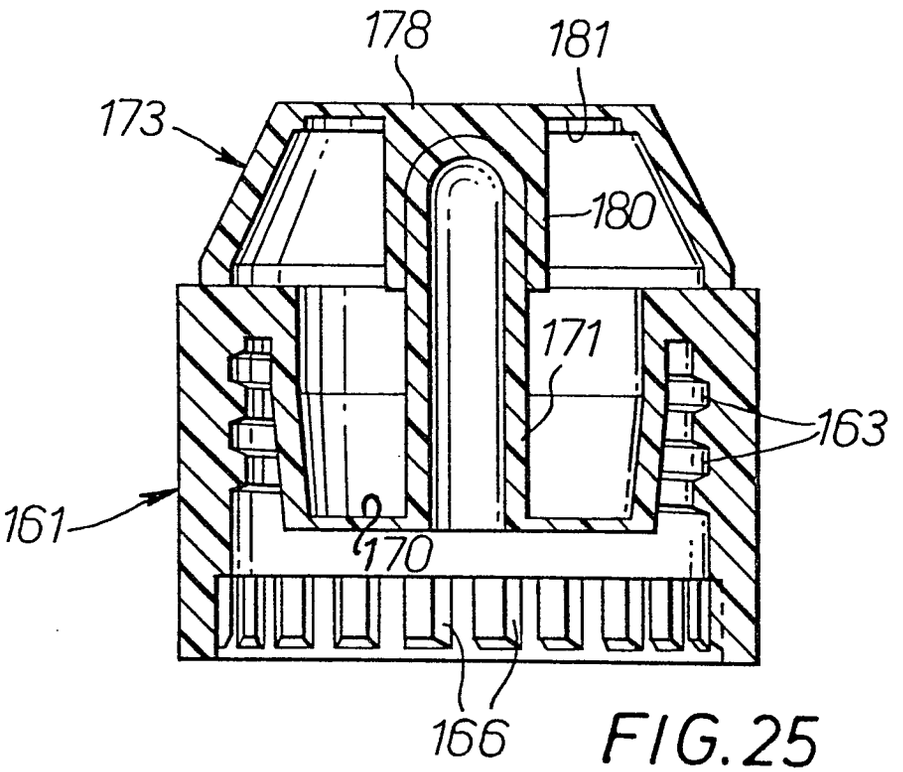

FIG. 25

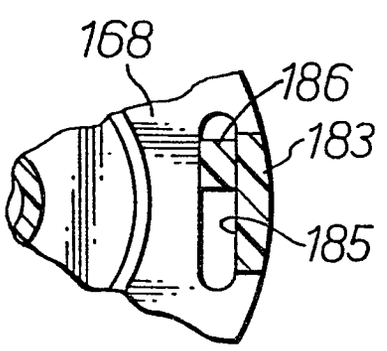

FIG. 26

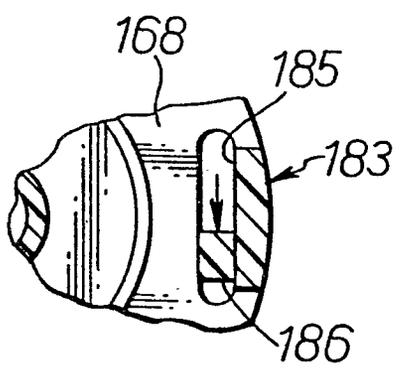

FIG. 27

0023396

European Patent Office

EUROPEAN SEARCH REPORT

Application number
EP 80302262.3

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim
	DE - A1 - 2 649 218 (POLYTOP) + Page 10, lines 13-21; page 12, lines 22-31; fig. + --	1,4-14
	US - A - 3 894 655 (ETHYL DEVELOPMENT) + Column 4, lines 39-54; fig. 4E, 5A, 6, 7 + --	1,4,8, 10,13, 14
	GB - A - 1 484 517 (NOVA) + Fig. 1,5 + --	1,4,5, 6,8,10, 11,14
	US - A - 4 010 875 (LE BOUCHAGE) + Fig. 2,3 + --	1,4-6, 8,10
	US - A - 3 927 805 (STULL) + Fig. 10 + --	1,4,6, 8,10
	DE - A1 - 2 749 946 (POLYTOP) + Page 13, lines 19-30; fig. 1-6 + --	2,3,5-7, 13
	US - A - 4 002 275 (VCA) + Fig. 9,10,10A + --	3,11
	AT - B - 230 757 (KRAUTKRÄMER) + Fig. 3 + --	3
A	US - A - 3 888 374 (SMITH) + Totality + ----	1

CLASSIFICATION OF THE APPLICATION (Int. Cl. 3)

B 65 D 47/00
B 65 D 47/08

TECHNICAL FIELDS SEARCHED (Int.Cl. 3)

B 65 D 45/00
B 65 D 47/00
B 65 D 55/00
B 65 D 43/00

CATEGORY OF CITED DOCUMENTS

X: particularly relevant
A: technological background
O: non-written disclosure
P: intermediate document
T: theory or principle underlying the invention
E: conflicting application
D: document cited in the application
L: citation for other reasons

&: member of the same patent family, corresponding document

X The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
VIENNA	06-10-1980	TROJAN