Nov. 7, 1972 R. N. CAROW ET AL 3,702,165

CHILD-PROOF DISPENSING CLOSURES

Filed July 28, 1971

FIG. 3

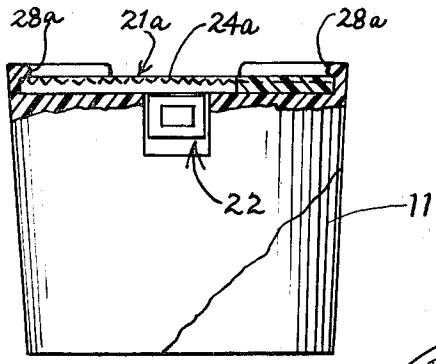


FIG. 1

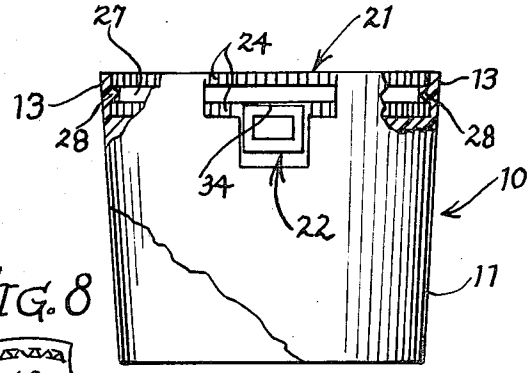


FIG. 8

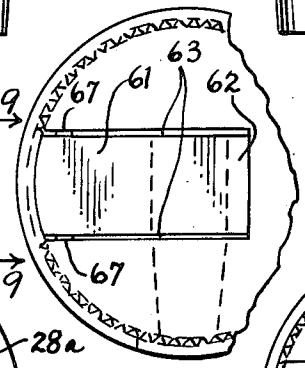


FIG. 4

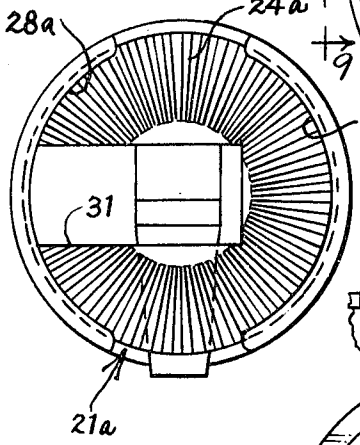


FIG. 2

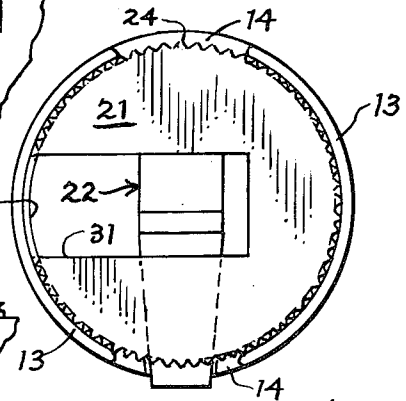


FIG. 9

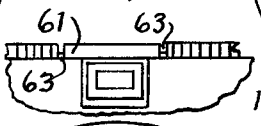


FIG. 7

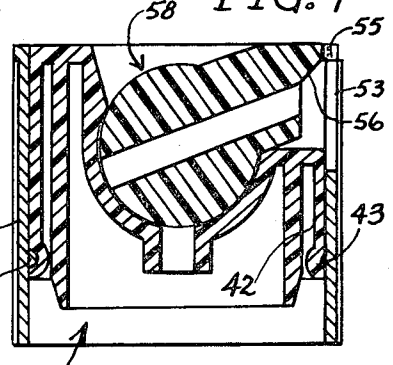


FIG. 5

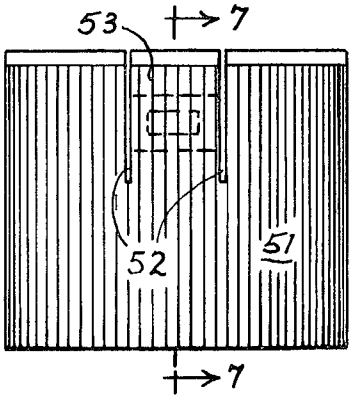
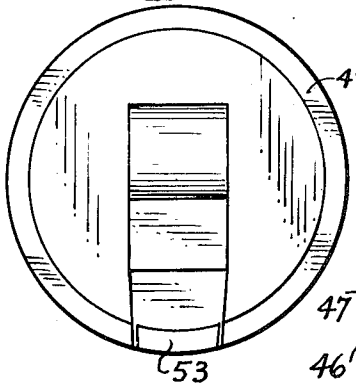


FIG. 6



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CHILD-PROOF DISPENSING CLOSURES

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Int. Cl. B65d 55/02
U.S. Cl. 222—153 17 Claims

ABSTRACT OF THE DISCLOSURE

Dispensing closures of the class which include a spout rotatably engaged in a base and movable between open and closed positions. To render the closure proof against being opened by a child of tender years, the closure, in one aspect, is provided with a disc surmounting the spout and adapted to be rotated to position a slot in the disc in or out of register with the spout. When the disc is rotated into register, the spout can be swivelled to dispensing position and vice versa. In another aspect, the disc has a notch into which the spout may be introduced to lock the disc against rotation. In yet another aspect, the spout is rendered inaccessible unless a spout-lifting finger on a rotatable sleeve is moved into alignment with the spout.

BACKGROUND OF THE INVENTION

In recent years, the packaging industry has been obliged, both by law and consumer reaction, to introduce every possible safeguard against access to a container by a child of tender years, in those cases where the contents are likely to result in injury or death by body contact or ingestion.

One important class of closures to be used with a container consists of those comprising a base and a swivel spout frictionally held in the base for movement between two positions permitting or interrupting flow of the contents. One important sub-class consists of those wherein the spout is adapted, when closed, to occupy a flush relation with an essentialy flat top of the base; another has a non-flush aspect wrere the spout is mounted on the base.

It is to be expected that colsures as just referred to are readily opened by a child, even inadvertently, as the spout can be engaged at its free end and swivelled in only one direction. To preclude such easy manipulation, the present invention, in the "locked" or "safe" condition, has means to prevent swivelling but, in the "unlocked" or "free" condition, the locking means is within the comprehension of an adult but not the average child of tender years.

SUMMARY OF THE INVENTION

The invention improvement is adapted to be incorporated with a well-known type of dispensing closure, which has a base to be attached to a container, the base having a bearing cavity with which a knuckle portion of a pouring spout is snap-fitted for rotation between open and closed positions. A typical configuration is disclosed in U.S. Pat. No. 3,111,245. In accordance with the invention, a rib is provided either entirely or interruptedly around the peirphery of the top of the base and the rib is so configured cross-sectionally as to receive a digitally-rotatable disc with a snap fit, the disc thus overlying the spout. A notch is formed in the disc and is of such form as to permit the spout to be manipulated when the disc has been rotated to bring the notch into register with the spout. Upon such registration, at least one interruption in the peripheral rib permits access to the spout. When the notch is shifted out of register, the spout cannot be rotated. Desirably the top surface or the edge of the disc is serrated for better engagement by the fingers.

In an alternative aspect, the under side of the disc may be recesesd essentially congruently with the spout. Thus, rotation of the disc to position the notch therein out of register with the spout, brings the recess into register, whereupon the spout may be lifted to be within the notch to lock the disc against rotation.

In still another aspect, a resilient sleeve is supported for rotation with respect to the base of the closure and extends sufficiently upwardly to block access to the outer end of the spout in any position to which it may be rotated. The sleeve is slit axially at two spaced apart points in its periphery to define a flap. Accordingly, when the sleeve is indexed to position the flap opposite the spout, such flap may be pressed in to cam the spout partly open. To this end, the spout has an inclined surface to be abutted by the flap. Once having been partially opened in this manner, the user's finger or thumb can swing the spout the rest of the way to full open position.

BRIEF DESCRIPTION OF THE DRAWING

FIG. 1 is a front elevation, with parts broken away, to illustrate a preferred embodiment of the invention;

FIG. 2 is a top plan view o fthe closure of FIG. 1;

FIG. 3 is a front elevation, with parts broken away, to show another embodiment;

FIG. 4 is a top plan view of the closure of FIG. 3;

FIG. 5 is a front elevation of still another embodiment;

FIG. 6 is a top plan view of the closure of FIG. 5;

FIG. 7 is a cross section taken on the line **7—7** of FIG. 5;

FIG. 8 is a partial top plan view of a modification of the invention shown in FIGS. 1 and 2; and

FIG. 9 is a partial view in the direction of the arrows **9—9** of FIG. 8.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The closure **10** shown in FIGS. 1 and 2 is fundamentally of a well-known type, for example, as disclosed in said Pat. No. 3,111,245, and comprises a fixed part to be attached to a container and a spout snap-fitted into the fixed part adapted to be swivelled between on and off positions. The arrangement is such that the top of the fixed part and the upper face of the spout are in essentially flush relation. Such characteristics warrant the commercial designation "flat top" closure.

In the present concept the lateral wall **11** of the closure is extended upwardly to form a flange **13** around the periphery which is interrupted, as at **14**, to provide access to the free end of the spout. Since dispensing closures of the type here considered are molded of a plastic composition which is resilient but generally shape-retaining, e.g. polyethylene, polyvinyl chloride or the like, the flange **13** may be momentarily deformed to admit the disc **21** now to be described with a snap fit. Such initial engagement may be facilitated by interrupting the flange at two places.

The disc **21** is thin and flat to conform to the flat top of the base **11**. However, in the case where the spout **22** is not flush, e.g. has a crowned or domed aspect, the disc would be shaped to comform. The disc has a series of serrations **24** around its edge for engagement by the user's thumb or finger to rotate the same. In order to retain the disc in operative position, the same has a groove **27** engaged by a rib **28** on the inside of each of the flanges **13—13**. It will be understood that the fit between the disc and flanges will be so selected as to enable reasonably free rotation of the former by positive action of the user, but shall not be a loose fit of a degree

enabling a child to be encouraged to "play" with the same.

The disc has a notch **31** of such extent as to permit the spout to be moved therethrough when the notch is in register therewith and the spout is swivelled from closed position to open position. Again, reference is made to said Pat. No. 3,111,245.

FIG. 2 shows the disc in spout-locking position, the notch **31** being displaced 90° from spout-freeing position. Any other angle of displacement is permissible, just so long as the notch and spout are out of register.

It will be apparent that a child of tender years is not expected to comprehend the manipulation which is required to align the notch with the spout. However, to add further to the child's bafflement, a recess **34** may be provided on the underside of the disc **21** (FIG. 1), this recess having a configuration such that the spout may be lifted slightly to fit therein. Since the spout has square corners (as shown) and the recess has straight sides, such interlocking fit will prevent rotation of the disc, and will preclude camming type disengagement upon rotation of the disc. It is understood that, since the disc and spout are interlocked, the child is obliged to effect two separate operations to gain access. The relative angular position of the notch **31** and recess **34** is variable. In the example the displacement is 90°.

It will be apparent that the slight rotation of the spout required to admit the same into the recess **34** is not sufficient to cause registry of the respective fluid passages through the spout and base. Hence, leakage is avoided.

If desired, a leaf or hairpin spring (not shown) may be introduced between the spout and base to constantly bias the spout into the recess **34**. Thus, in the locked position of the disc engagement is assured, while unlocking requires deliberately holding the spout down while the disc is rotated to align the notch therein with the spot. Again, an impediment is placed in the child's way.

An alternative embodiment is shown in FIGS. 3 and 4, which is quite similar to that described in connection with FIGS. 1 and 2, except that the disc **21***a* has radially disposed serrations **24***a* in its top surface. Otherwise, the construction and operation is as described in connection with FIGS. 1 and 2. In the alternative form, the disc is retained in rotatable relation by means of ribs **28***a*, carried over the top face of the disc. In the case of either the ribs **28** or **28***a*, initial assembly is a snap fit. FIG. 3 omits the recess, such as **34** of FIG. 1. As was mentioned, this feature is optional.

FIGS. 5 to 7 illustrate still another form of the invention. In this case, the fixed part or base **41** of the closure has the customary skirt **42** adapted to secure the closure to the neck of a container (not shown). This skirt has a peripheral groove **43** with which there is engaged, with a snap fit, a bead **46** on the interior of a sleeve **47** of resilient, but generally shape-retaining material which is adapted to rotate with respect to the closure. The fit is of a reasonably snug nature and, in order that digital rotation may be effected without too much effort, the exterior is knurled, as at **51**.

Turning to FIG. 5, the sleeve **47** has a pair of slots **52—52**, between them defining a resilient flap **53**. The flap is foreshortened, as indicated at **55** in order that its top edge may abut a cam surface **56** at the distal end of the spout **58**. The configuration of the flap and surface **56** is such that, when the sleeve **47** is rotated to bring the flap into register with the end of the spout, the flap may be pressed inwardly, whereupon the top **55** of the flap operates in camming relation with the surface **56** so that the spout is, so to speak, pried partially open. Thereafter, the finger or thumb may engage the spout to swivel the same the rest of the way to full-open position.

It is assumed that the child is not sufficiently developed to unlock the secret of the concealed end of the spout and, since the spout is inaccessible until pried upwardly, the child is thwarted in gaining access to the contents of the container. After use, the adult will actuate the spout to full-off position and then rotate the sleeve **47** to displace the flap **53** from registry with the spout. Should the adult neglect to rotate the sleeve, manipulation of the flap by the child will, more than likely, pose too much of a problem.

FIGS. 8 and 9 show a modification in which the opening **31** in the disc **21** is blocked pending initial opening by the consumer, sometimes referred to as rendering the device tamper-proof. Thus, there is provided a flap **61** hinged at **62** and free at its outer end. The flap **61** is defined by slits **63—63** through the disc **21**, but there are rupturable links **67—67** joining the flap to the body of the disc. When access to the contents of the container is desired for the first time, the user, after rotating the disc to register the flap **61** with the space **14**, will lift the flap, grasp the same, and rupture the links **67—67**. In this way, one may obtain access to the spout in the manner described. If desired the flap **61** may be torn or cut off and discarded. It will be apparent that the feature just described is equally applicable to the device of FIGS. 3 and 4 and that, in any case, the flap presents still another deterrent to the child.

We claim:

1. In a dispensing closure of the class which comprises a base having means to attach the closure to a container, the top of the base having a cavity to receive with a snap fit a spout adapted to be actuated from a closed to an open position for flow of contents from the container and vice versa, the spout, in its closed position, being substantially normal to the axis of the closure, the improvement which comprises: a disc on the top of the base, means to retain the disc in rotatable relation therewith, said disc having a notch extending inwardly from the periphery thereof; said notch being so dimensioned that, when the disc is rotated to register the notch with the spout, the spout may be moved to open position through said notch and, when the spout is closed and the disc rotated out of register, opening of the spout is precluded.

2. The combination in accordance with claim **1**, in which the disc-retaining means comprises an upwardly extending wall around the periphery of the disc, said wall being interrupted for access to the spout.

3. The combination in accordance with claim **1** further characterized by radial serrations on the top surface of the disc.

4. The combination in accordance with claim **1** further characterized by peripheral knurling on the disc and an opening in the disc-retaining means for access to the knurling.

5. The combination in accordance with claim **1** further characterized by the provision, in the lower face of the disc, of a recess so shaped and dimensioned to receive at least a portion of the spout to lock the disc against rotation when the spout is actuated in the recess.

6. In a dispensing closure of the class which comprises a base having a top surface and means to attach the closure to a container, the top of the base having a cavity to receive with a snap fit a spout adapted to be actuated from a closed to an open position for flow of contents from the container and vice-versa, the improvement which comprises: a disc adjacent the top, said disc having an opening therethrough, means on the top of the base to retain the disc in rotatable relation therewith, said opening being so dimensioned that, when the disc is rotated to register the opening with the spout, the spout may be moved through the opening to open position and, when the spout is closed and the disc rotated out of register, the spout is prevented from opening.

7. The combination in accordance with claim **6** wherein the disc has a peripheral groove and the disc-retaining means comprises a rib upstanding from said top at the periphery thereof, said rib having an inwardly-directed flange interfitting said groove with a sliding fit.

8. The combination in accordance with claim **6** wherein said disc-retaining means comprises a rib upstanding from

said top at the periphery thereof, said rib having an inwardly-disposed flange overlying the disc with a sliding fit.

9. The combination in accordance with claim **6** further characterized by male and female means on the disc and spout respectively, said means adapted to mutually engage when said opening is out of register with the spout.

10. The combination in accordance with claim **6** further characterized by means intermediate the spout and base to bias the spout toward the lower face of the disc.

11. A dispensing closure comprising a base part havin an essentially cylindrical configuration including means to attach the closure to a container, said base part having a substantially cylindrical cavity, the lateral wall whereof subtends an angle greater than 180°, a pouring spout having a substantially cylindrical knuckle frictionally and rotatably retained in said cavity for movement between on and off positions, said base part and spout having through passages to be brought into or out of register corresponding to open and closed conditions of the closure, a sleeve rotatably supported on the base part, concentric with said base part overlying said spout in the closed position thereof, a flap hinged on said sleeve for radial movement, the free end of said spout having a cam surface for impingement by the flap upon inward actuation thereof to displace the spout above the upper end of the sleeve for access by the user's finger.

12. A dispensing closure of the class which comprises a base part having a top and a cavity in the top into which a spout part is fitted for rotation of the spout between "on" and "off" positions, the base part and spout each having a passage adapted to register when the spout is in "on" position and vice versa, at least the free end of the spout in the "off" position, lying below the top, a sleeve carried on the base part, said spout having a camming surface at its free end and said sleeve having a digitally-displaceable portion, essentially coextensive with said free end, said sleeve normally concealing said end and adapted to be shifted to position said displaceable portion opposite said camming surface, said portion, when displaced inwardly of the closure, abutting said free end camming surface to partially shift said end for access by the user's finger.

13. The combination in accordance with claim **6** further characterized in that there is a member bridging said opening to preclude said spout movement through said opening, said member being joined to said disc by rupturable elements whereby said member may be displaced or removed to allow said spout movement upon rupture of said elements.

14. The combination in accordance with claim **13** in which at least the disc and member comprise a resilient but generally shape-retaining material.

15. The combination in accordance with claim **13** wherein at least one of the elements is constituted as a hinge for said member.

16. In a dispensing closure of the class which comprises a base having means to attach the closure to the opening of a container, a spout having a knuckle rotatably held in a cavity in the base, the spout being adapted to be actuated from a closed to an open position for flow of contents from the container and vice versa to interrupt flow, the base having an axis substantially aligned with the axis of the container opening, the spout, in its closed position, being substantially normal to said axis, the improvement which comprises: an annular member carried on the top of the base, means to retain said member in rotatable relation with the base, said member having a recess on the inside thereof, said recess being so configured and positioned with respect to the free end of the spout that, when the member is rotated to bring the recess and end of the spout into register, the spout may be rotated to its open position through said recess and, when the spout is closed and the member has been rotated out of register, movement of the spout to the open position is prevented.

17. The combination in accordance with claim **16** further characterized by the provision of protuberances on the member to facilitate rotation thereof.

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U.S. Cl. X.R.

222—505, 536, 541

Notice of Adverse Decision in Interference

In Interference No. 98,531, involving Patent No. 3,702,165, R. N. Carow and S. M. Libit, CHILD-PROOF DISPENSING CLOSURES, final judgment adverse to the patentees was rendered May 7, 1976, as to claims 16 and 17.

[*Official Gazette November 30, 1976.*]