DISPENSER WITH TURN CAP

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ABSTRACT

A small dispenser of the type intended to be held in the hand, for discharging various substances such as powdered tale or other fine particulate material, granulated substances and the like, as well as certain viscous substances. The dispenser comprises a plastic container or small jar having a transverse top wall provided with a large central opening and with a plurality of discharge openings (or a single opening) disposed radially outward of the central opening. Turnably mounted on and engaged with the transverse top wall is a captive cap having similar dispensing openings (or single opening) adapted to be registered with the corresponding openings or opening of the transverse container wall when the cap is properly rotatably positioned. The cap has a centralized depending bearing and retainer skirt which is adapted to fit into the large central opening of the transverse wall of the container, said skirt having a detent bead or shoulder means around its bottom rim. One of the parts, preferably the cap, is of resilient or yieldable plastic substance, whereas the other is preferably of a more rigid plastic composition, the arrangement being such that the cap can be press or snap fitted to the container by forcing the depending skirt thereof with its detent bead into and through the large central opening of the transverse container wall at the top. To facilitate such snap type assemblage, the central opening of the transverse wall is made tapered or with sloping edges which tend to cam inwardly the detent bead of the depending skirt of the cap as the latter is forced downward onto the container, whereby the detent bead is radially compressed or reduced in size and forced completely past the bottom edge of the large wall opening. Upon this occurring, the detent bead radially expands to its original shape, whereby it effectively locks the cap to the container top while permitting the cap to be turned with respect thereto. At the underside of the cap there is a stop lug which is received in a movement-limiting slot of the transverse wall, the slot being so arranged that for one stopped or limited position of the cap the discharge openings thereof are out of registration with those of the top wall of the container. For the other limiting position, the discharge openings of both parts are in registration, enabling dispensing of the contents of the container to be effected. The assemblage of the cap to the container is very quickly and economically effected, without requiring separate fastenings of any kind, or additional operations to be performed on either the container or the cap.

3 Claims, 9 Drawing Figures
DISPENSER WITH TURN CAP

BACKGROUND

This invention relates to small hand-held dispenser-type containers of the kind intended to hold and dispense powdered or granulated material, and in some instances viscous material.

In the past a great variety of dispensers with captive caps or closures have been proposed and produced. Generally the closures are so arranged that for one rotative position thereof the discharge openings which are provided will be registered with those of a container wall so as to permit dispensing of the contents, whereas for another rotative position the discharge openings will be out of registration, thereby closing the container (so to speak). In these prior devices different means have been utilized to secure the turn cap to the top container wall. In some cases small tabs were laid over the cover piece, or else rivets or eyelets were utilized, whereas in other cases where the parts were molded of plastic, a heated tool was used to mushroom a center pivot stud of the cap, thereby providing an enlargement thereon for the purpose of preventing the cap from being removed from the container. Still other arrangements involved a molded plastic overlay carried by the container, which extended around or over the turnable cap to hold the latter captive.

While these prior devices operated satisfactorily, they involved in some instances extra parts and additional assembly operations, and in other cases there were needed specialized, heated tools. The type of assembly of the cap to the container in some cases necessitated a filling of the container from the bottom, and the subsequent applying of a bottom closure. The above methods and structures for holding a dispenser cap captive are considered to be time-consuming and costly after it is realized that the container is a throwaway item whereby the entire, overall cost must be held to a very low figure. In virtually all instances the package is discarded after the contents thereof have been completely consumed.

SUMMARY

The above drawbacks and disadvantages of prior small handheld dispensers are obviated by the present invention, which has for one object the provision of a novel and improved dispenser of molded plastic substance, wherein a captive, turnable dispensing cap having discharge openings can be easily and quickly assembled to the container by a very simple force or snap-fit operation which does not require special heated tools or reworking of the material, or additional parts or folding or forming operations and the like. A supplemental object of the invention is to provide an improved snap-assembled turnable dispenser cap and container combination, wherein a simple and positive detent or stop means is had for limiting the turning movement of the cap without interfering with the quick and convenient snap assembly.

The above objects are accomplished by the provision of a container or jar which is preferably formulated of relatively rigid plastic, having a transverse top wall provided with a large central opening, preferably made with sloping or bevelled edges. There is additionally provided a turnable dispensing cap which is preferably of yieldable or resilient plastic substance, having a cylindrical depending retainer skirt that is so molded as to form at its bottom rim a detent bead. The skirt and bead are arranged so that they can be forced into and through the large central opening of the top wall of the container, being radially compressed or reduced during such operation. As the detent bead reaches and passes the bottom portion of the edge of the large central opening, it snaps back to its original, larger diameter and constitutes an effective detent means that holds the turn cap captive, against removal. At the same time, the central skirt constitutes a bearing post to enable the cap to have a turning movement. At the underside of the cap there is a stop lug, which is accommodated in a movement-limiting slot in the container wall whereby the turning of the cap is restricted to a small arc. At one limit of the arc, the discharge openings of the cap and container wall are in registration to permit discharge of the container contents. At the other limit of movement, the discharge openings are out of registration, and the container is, in effect, closed.

Other features and advantages of the invention reside in the provision of an improved container and turnable cap as above set forth, which is especially simple and easy to mold or fabricate, easy to assemble and operate, and foolproof in its functioning.

Still other features and advantages will hereinafter appear.

In the drawings, showing several embodiments of the invention:

FIG. 1 is a view partially in side elevation and partially in axial section, of a container and improved captive dispenser cap as provided by the invention.

FIG. 2 is a top plan view of the dispenser cap.

FIG. 3 is a bottom plan view of the dispenser container.

FIG. 4 is a fragmentary side elevational view of a portion of the rim of the turn cap, revealing the knurling thereof.

FIG. 5 is a bottom plan view of the turnable cap.

FIG. 6 is a top plan view of the container and top wall thereof.

FIG. 7 is an enlarged detail in section, revealing the detent action between the turn cap and the container by which the cap is held captive on the container.

FIG. 8 is a bottom plan view of a dispenser cap illustrating another embodiment of the invention.

FIG. 9 is a top plan view of a container and top wall, of the type for use with the cap of FIG. 8.

Referring first to FIGS. 1-7, there is illustrated a container part or jar 10 which is preferably constituted of a relatively rigid plastic such as polystyrene. The jar 10 has an inserted bottom closure 12, which is ultrasonically welded in place to form a tight seal. At its top, the jar 10 has a stepped neck portion indicated generally by the numeral 14, said neck portion comprising a larger-diameter, cylindrical wall 16 and a smaller-diameter, cylindrical wall 18 joined to each other by an annular shoulder 20. The larger-diameter neck portion 16 is joined to the cylindrical side wall of the container 10 by an annular shoulder 22.

Carried by the neck portion 18 is a transverse top wall 24 having a large central bearing aperture 26 which is surrounded by a plurality of small discharge or dispensing openings 28.
Cooperable with the top wall 24 of the container 10 is a turnable dispensing-type cap part 30 which is preferably molded of yieldable or resilient plastic substance such as polyethylene. The cap 30 has a depending outer rim portion 32 provided with knurling or ribs 34 as seen in FIG. 4. The bottom edge 36 of the rim 32 is closely adjacent the annular shoulder 20 of the container 10 and preferably can engage such shoulder so that only a tightly-closed crack is visible.

The cap 30 has a top wall transverse 38 which is provided with discharge openings 40 adapted to register with the openings 28 of the container wall 24 when the cap 30 is properly oriented on the container by being turned thereon to a dispensing position. By shifting or turning the cap from the dispensing position wherein the sets of discharge openings become registered, they can be closed. One set (that on the cap, numbered 40) will be closed by the smooth top surface of the wall 24, and the other set 28 (in the wall 24) will be closed by the smooth undersurface of the wall 38 of the cap. The top surface of the transverse wall 24 intimately engages the under surface of the wall 38.

To limit the turning movement of the cap 30 on the container top, a movement limiting slot 44 is provided in the top wall 24 of the container, said slot receiving a stop lug 46 which is molded in the underside of the cap 30.

In accordance with the present invention, the cap 30 and the top portion of the container 10 are so constituted and arranged that the cap may be assembled to the top wall by a simple and quick snap fit connection. To effect this, the cap 30 is provided with a depending circular bearing portion in the form of a hollow boss or annular skirt 48 which has at its bottom edge or rim a detent shoulder means in the form of a bead 40. Also, preferably the edge 52 of the large central opening 26 of the container is made tapering or beveled to provide a wider mouth portion at the top surface of the wall 24.

The bead 50 is larger in diameter than the small-diameter portion of the large central opening 26 so that there is an interference fit, and is rounded at the bottom, as indicated at 54, whereby it acts as a cam and can be readily started in the opening 26 by merely placing the cap 30 over the top wall 24 of the container. Due to the resilience or yieldability of the cap material, the cap can now be forced downward onto the container, whereverupon the depending skirt 48 and the detent bead 50 thereof will be temporarily radially compressed or reduced in size and the bead forced into and past the central opening 26, causing it to engage the underside of the opening edge. This is clearly indicated in FIG. 7.

Upon this occurring, the cap 30 will be held captive on the container 10, and will be turnable through a small arc as permitted by the travel of the stop lug 46 in the movement-limiting slot 44. When the lug 46 is at one end of the slot (the upper end as viewed in FIG. 6) the openings 40 of the cap will be in registration respectively with the corresponding openings 28 of the top wall of the container, and the contents of the container may thus be dispensed through the registered openings. When the cap 30 is turned clockwise as viewed in FIG. 2 to bring the lug 46 at the bottom end of the limit slot 44 (as viewed in FIG. 6), the openings 40 of the cap will be out of registration with the openings 28 of the top wall, and the container will then in effect be closed.

It will be understood that at the time of assembly of the cap to the container, the stop lug 46 is roughly located in registration with the movement-limiting slot 44, preferably so as to safely enter the slot between the ends thereof.

The diameter of the skirt 48 is relatively large, approximately one-half of the overall diameter of the cap part 30, thereby imparting structural stability to the cap and preventing distortion of the same and possible leakage of the contents of the container. Regarding this latter, it should be noted that the closeness of the walls of the skirt 48 to the discharge openings 40 insures a tight closure or seal, and prevents leakage since restraint is exercised by the bead 50, securely holding the walls 24 and 38 intimately engaged.

Another embodiment of the invention is illustrated in FIGS. 8 and 9. In these figures a cap 30a is provided with an arcuate, relatively large discharge opening 40a, and the container 10a has a corresponding relatively large arcuate discharge opening 28a. The lug 46a of the cap 30a can occupy and move along a relatively large, arcuate movement-limiting slot 44a in the top wall 24a of the container 10a. The cap 30a has a depending circular skirt 48a provided with a detent bead 50a at its bottom rim, whereby it can be inserted into the central opening 26a of the container 10a and assembled thereto by a snap fit, in a manner described above in connection with FIGS. 1–7. The larger size of the discharge openings 28a, 40a require the movement-limiting slot 44a to be of greater arcuate length in order to enable the cap to be turned a sufficient extent to bring the opening 40a thereof out of registration with the opening 28a of the container, thereby to close the container.

Instead of the caps being resilient and the containers rigid, the containers can also be resilient, if desired. The resilient nature of the cap material enables the cap to be pulled from a one-piece mold without destroying the detent bead on the retainer-bearing skirt. If the retainer bead is made discontinuous, as in the form of many small ribs, the cap could be molded of an essentially rigid plastic and still permit it to be withdrawn from the mold while hot, without destroying the ribs. Or, the detent bead could be of lesser height to permit withdrawal if a relatively rigid plastic is used. In such case, the container would want to be resilient.

It will now be seen from the foregoing that I have provided a novel and improved, especially simple, molded plastic container and turnable dispenser cap, wherein the assemblage of the cap to the container can be effected in the simplest possible manner, without the necessity for additional parts or added operations. Instead, the assemblage of the cap to the container requires merely pressing of the cap against the top of the container and forcing the detent bead of the cap through the large central bearing opening in the top wall of the container. The resultant article is seen to be especially simple, economical to fabricate, mold and assemble, and is reliable and foolproof in operation. When the cap is turned to close the container, no leakage of the container contents will occur. The cap is easily actuated to open and close the discharge openings, and is sturdy and foolproof in its operation.

Variations and modifications are possible without departing from the spirit of the invention.

I claim:
1. A hand-held dispenser comprising, in combination:
   a. a molded plastic container part having a neck portion, and having a transverse top wall extending across the neck portion,
   b. said top wall having a central bearing aperture and having at least one discharge opening disposed radially outward of said bearing aperture,
   c. a molded plastic cap part having a flat annular wall adapted to fit over the transverse wall of the container part, said cap part and container part walls having intimate engagement with each other,
   d. the flat annular wall of the cap part having at least one discharge opening which is offset from its center and is adapted to be moved into and out of registration with the discharge opening of the container part when the cap part is turned thereon,
   e. said cap part having a depending circular bearing portion extending through the bearing aperture of said top wall,
   f. said bearing portion having detent shoulder means constituting an interference fit into said bearing aperture, said shoulder means being engageable with the underside of the container top wall to hold the cap part captive on the container part,
   g. one of said parts being constituted of resilient plastic whereby it is temporarily yieldable to enable the cap bearing portion and shoulder means thereof to be forced into the bearing aperture of the body part in order to assemble the cap part on the top wall of the container part,
   h. said part being constituted of resilient plastic substance, the bearing portion of the cap part comprising an annular depending skirt which is open at its bottom,
   i. said cap part having a depending annular rim portion with a bottom edge at its outer periphery,
   j. said container part having an annular shoulder on the neck portion, engaging with the bottom edge of said rim portion to effect a further steadying of the cap part and to give a closed appearance,
   k. the periphery of the top transverse wall of the container part having a loose fit in the cap rim portion, providing for clearance space inside said rim portion,
   l. said detent shoulder means of the cap part bearing portion comprising an annular rounded bead extending along the edge of the depending skirt.

2. A dispenser cap as in claim 1, and further including:
   a. cooperable stop means on the cap part and container part, comprising a lug within and integral with the cap part and a slot in the periphery of the transverse top wall of the container part, in which the lug is movable.

3. A dispenser as in claim 2, wherein:
   a. the bearing aperture of the top wall has outwardly sloped edges having the largest diameter at the top of the wall so as to facilitate the entrance of the bearing portion therein.