

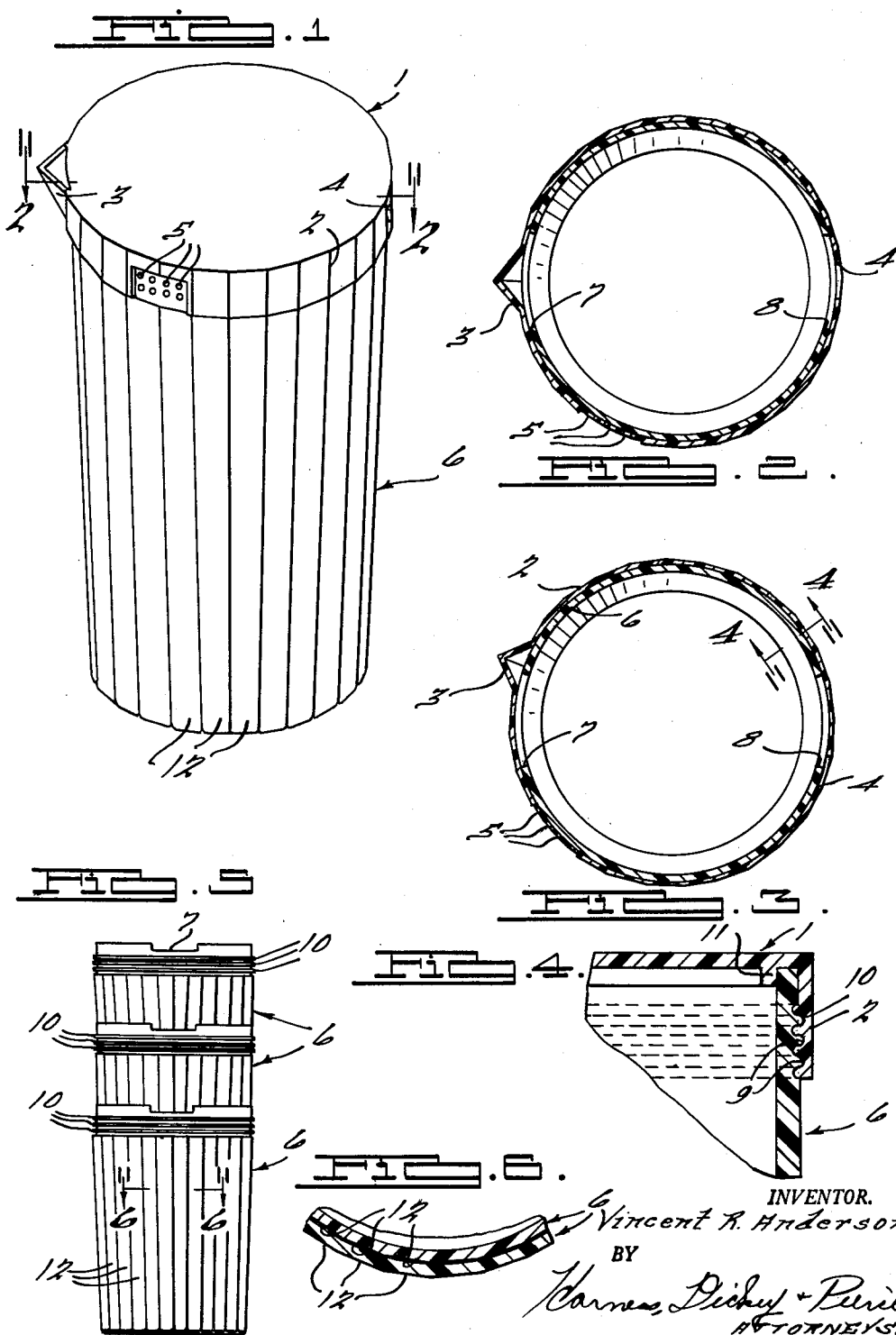
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PLASTIC DISPENSING CONTAINER

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PLASTIC DISPENSING CONTAINER

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2 Claims. (Cl. 222-480)

This invention relates to improvements in containers used for dispensing liquids and powdered and granulated solids, and more particularly to containers for dispensing beverages, liquid foods, condiments and the like.

One object of this invention is to provide an inexpensive container of simple design and manufacture, suitable for dispensing a variety of liquids and powdered and granulated solids.

Another object is to provide an improved dispensing container having a snap-on cap or closure which can be removed easily, thereby facilitating cleaning the interior and refilling the container.

A further object is to provide an improved dispensing container having a snap-on cap which may be selectively rotated to a closed position, a pouring position, or a sifting or shaker position whereby the contents can be poured from an outwardly extending spout from the side wall of the cap or ejected from the container through perforations in the side wall of the cap.

Still another object is to provide improved dispensing containers of such construction that when the containers are empty and the snap-on caps or closures are removed, the containers may be stacked in a nested relation whereby they occupy comparatively small space and from which relationship the nested containers may be easily separated and removed from the stack.

Other objects and advantages of this invention will become apparent from a reading of the following specification in connection with the accompanying drawing, in which:

FIGURE 1 is a perspective view of an assembled dispensing container embodying the present invention;

FIG. 2 is a sectional view of the container of FIGURE 1 taken along line 2-2 thereof;

FIG. 3 is a sectional view similar to that shown in FIG. 2 but illustrating the relationship of parts after rotating the cap to a different position than that shown in FIG. 2;

FIG. 4 is an enlarged fragmentary sectional view through the cap and container taken along line 4-4 of FIG. 3;

FIG. 5 is an elevation view illustrating the stacking or nesting characteristics of the containers; and

FIG. 6 is an enlarged fragmentary sectional view of the stacked containers taken along line 6-6 of FIG. 5.

Referring now in detail to the drawings and as best seen in FIG. 1, the dispensing container is comprised of a snap-on cap or closure 1 and a receptacle or container 6 so constructed that the snap-on cap 1 may be rotated relative to the container 6 enabling the contents therein to be dispensed through the appropriate apertures provided in the cap and container. The snap-on cap 1 has in its side wall 2 an outwardly extending spout 3, a vent hole 4 located diametrically opposite to said spout 3 and a series of spaced perforations 5 angularly disposed from the pouring spout 3 along the periphery of the cap side wall 2. The container 6 at its upper extremity has two elongated apertures 7 and 8, as shown in FIG. 2, equal in size and diametrically opposite to each other. By rotating the cap, the pouring spout 3 or small perforations 5 can be indexed to communicate with apertures 7 or 8, thereby enabling the contents of the container to be discharged by pouring or sifting, respectively.

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FIG. 2 illustrates the relationship between the cap and container wherein the pouring spout 3 and vent hole 4 have been indexed so as to fully communicate with the apertures 7 and 8, respectively, in the container providing maximum exposure of the pouring spout. FIG. 2 further illustrates the comparative width of the apertures 7 and 8 in relation to the width of the opening in the cap side wall 2 for the pouring spout 3, vent hole 4 and perforated area 5. To minimize the exactitude required by the user to align the pouring spout 3 or perforations 5 with the apertures 7 or 8 in the container, it is preferred that the width of the apertures 7 and 8 exceed the maximum width of the pouring spout 3 or perforated area 5 in the cap side wall and a width ratio of approximately 2:1 is satisfactory for this purpose.

FIG. 3 illustrates an alternate pouring position from that shown in FIG. 2 wherein the cap 1 has been rotated relative to the container 6, so that only a portion of the pouring spout 3 is in communication with aperture 7 in the container. It will be appreciated that a multitude of alternate pouring positions other than those shown in FIGS. 2 and 3 are obtainable, dependent on the relative positioning of the cap and container apertures, thereby providing a means for regulating the rate at which the contents may be poured from the container. It will be noted in both FIGS. 2 and 3 that the vent hole 4 continues to communicate with aperture 8 over the entire range of feasible pouring positions from the spout, thereby venting the interior of the container and preventing the creation of a partial vacuum within the container impeding its pouring characteristics. It will be appreciated that the vent hole 4 may sometimes be preferred as a pouring nozzle, in which event the pouring spout 3 will provide the necessary venting action.

In a similar manner by rotating the cap 1 relative to the container 6, the small perforations 5 may be indexed to communicate partially or fully with the aperture 7 or 8 in the container, thereby enabling powdered or granulated solids to be discharged by sifting or screening through the small holes 5 in the cap side wall 2. The perforated area 5 as embodied in the dispensing container shown in FIGURE 1, is comprised of eight holes arranged in two horizontal rows of four holes each; the holes in the upper row all of equal diameter and somewhat larger than those in the row below. This arrangement provides four shaking positions by selectively exposing two, four, six or all eight holes. The diameter of the perforations 5 is such that granulated materials such as sugar, salt and the like can be freely dispensed through the perforations. Inasmuch as the perforations are primarily employed for dispensing powdered and granulated solids, venting the container under these circumstances is not necessary as in the case when pouring liquids from the spout. Accordingly, the vent hole 4 is closed when all or a portion of the perforations are in communication with the aperture 7 in the container, thereby preventing unintentional discharge of the contents through the vent hole 4 while shaking and dispensing the contents through the perforations 5. It will also be noted in FIGS. 2 and 3 that the angular disposition of the perforated area 5 relative to the pouring spout 3 is such that it slightly exceeds the width of the aperture 7 in the container, thereby minimizing the extent to which the snap-on cap must be rotated to alternately select a pouring or sifting position from a closed position intermediate between the two, but concurrently preventing the simultaneous pouring and sifting of the contents of the container 2.

It will be appreciated by those skilled in the art that although the aforementioned arrangement of dispensing apertures around the closure side wall 2 is a preferred embodiment of this invention, numerous modifications are

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feasible. For example, the vent hole 4 may be omitted and the perforated area located substantially opposite to the pouring spout 3 such that venting action is provided by perforations 5 during the pouring of contents from the container through the spout 3.

The unique method by which the snap-on cap 1 is secured to the container 6 sealing the contents therein and enabling the cap to be selectively rotated to the desired dispensing position is illustrated in FIG. 4. Three annular parallel grooves 9 around the inner surface of the cap side wall 2 coincide and engage with three annular beads 10 around the upper outside periphery of the container 6 providing the dual function of sealing the contents with the container and acting as a track to guide the cap 1 during its rotation. The annular grooves 9 have been positioned around the lower portion of the inner cap side wall 2 so as to facilitate disengagement of the snap-on cap from the container. Additional sealing and rigidity are imparted to the cap and container by the annular flange 11 being concentric with the cap side wall 2 and disposed therefrom a distance approximately equal to the wall thickness of the upper container body. Dimensional tolerances between the annular grooves 9 and the annular beads 10 and between the annular flange 11 and upper container body required to achieve a satisfactory seal of the contents is somewhat dependent upon the characteristics and properties of the materials employed in fabricating the container and snap-on cap. It is desirable to use a material for the cap which is soft, flexible and elastic in order that the snap-on cap will deform, bend and stretch so as to conform with the contour of the comparatively harder, less flexible mating surface of the upper container body. Snap-on caps made of plastic materials such as polyethylene and polypropylene used in conjunction with containers made of a relatively harder plastic, such as high impact polystyrene, have evidenced excellent operating and sealing characteristics over a period of long usage. Because of the enveloping characteristics imparted to a cap composed of polyethylene or polypropylene, dimensional tolerances between mating surfaces are not as critical as in cases where a less pliable plastic material is used. Molded polyethylene snap-on caps having an inner side wall diameter of approximately 0.004 inch less than the diameter of the outer periphery of the upper container body and tolerances in the order of 0.002 inch between mating grooves, beads and flanges have exhibited excellent operating and sealing characteristics.

The container body 6 is comprised of a substantially frusto-conical vessel with the walls tapered slightly, e.g. about 5°, to the axis having a flat bottom and a round smooth inner surface. The outer surface of the container is comprised of longitudinal tangential flat segments 12, as illustrated in FIGS. 1, 5 and 6, extending up the sides of the container to a point below that at which the cap side wall 2 overlaps the upper container body but extending upwardly from the bottom a distance sufficient to avoid a stacking problem. These flat outer segments 12 impart additional rigidity to the container and facilitate holding the container while rotating the cap in relation thereto. It will be noted that corresponding flat segments are located on the outer periphery of the cap side wall 2 providing symmetry of design and enhancing the gripping characteristics of the snap-on cap for rotation relative to the container. Another and equally important function of the flat segments 12 on the outer container wall is to facilitate disengagement of stacked or nested containers, as illustrated in FIG. 5, by minimizing the surface contact between adjacent layers and avoiding a partial vacuum from forming during the extraction of one container from within the other. This advantage is graphically illustrated in FIG. 6 wherein the contact between adjacent walls of stacked containers has been magnified to reveal the presence of air passages between the smooth round inner surface of the outer container and the flat

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segmented outer surface of the inner container, thereby minimizing and limiting contact between nested containers to the edges created by adjacent flat segments. It is critical that the number of flat segments 12 around the periphery of the container be restricted to a range between twenty and thirty-two in order to assure a satisfactory molded product. A number of flats less than twenty causes substantial variations in the wall thickness of the container, increasing the susceptibility of shrink marks in the molded plastic container body occasioned by the high stresses induced by the dissimilar cooling rates and molding pressures within thick and thin wall sections. With materials sufficiently flexible to function satisfactorily with a snap-on cap, the provision of more than thirty-two flat segments 12 on the periphery of the container gives too little separation between adjacent surfaces to prevent vacuum sealing upon stacking, thereby making the separation of nested containers difficult. Furthermore, increasing the number of flat segments 12 above thirty-two reduces the gripping qualities of the container surface. The structure and composition of the container body should be sufficiently rigid so that it will not deform under hand pressures ordinarily exerted while holding the container and sufficiently flexible in order that the upper container body may be temporarily deformed so as to release the snap-on cap 1 from the engaging annular beads 10 around the upper container body 6. Containers fabricated from molded high-impact polystyrene have the desired rigidity and flexibility and have proven uniquely compatible when used in conjunction with polyethylene snap-on caps. It is recognized that containers fabricated from other materials having structural properties similar to those of high impact polystyrene will also be satisfactory.

As above suggested the combination moving seal and snap-on characteristic of the cap and container are partially dependent on relative flexibility of those members. In general, the cap member should be fabricated from a material which is more flexible than the container and yet this flexibility should be sufficiently low such that continued use does not result in a permanent stretching or distortion of the cap to an extent which materially reduces the efficiency of the seal. In a similar manner the container should be sufficiently inflexible to become permanently distorted with use resulting from the peripheral compression of the cap. Good results have been obtained from the use of a variety of materials as the cap and the container when the above considerations are observed, for example, a container of cardboard of conventional type and a cap of one of high impact styrene, high density polyethylene or polypropylene, a container of high density polypropylene and a cap of high density polyethylene, a container of high density polyethylene and a cap of lower density polyethylene, etc. are all satisfactory. It will be appreciated that many other combinations of plastic materials or combinations of inorganic and plastic materials could be used.

The use of a molded polyethylene plastic snap-on cap in conjunction with a molded polystyrene plastic container body provides a dispensing container which is versatile, efficient, durable and resistant to chemical attack from the varied contents which may be contained in and dispensed therefrom. An additional advantage of these plastic materials is their susceptibility to be impregnated with suitable pigments and dyes imparting colors of a permanent and durable nature which add to the attractiveness of the dispensing container.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the shape, size and details may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

What is claimed is:

1. A dispensing container comprising a receptacle and

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a snap-on closure, said receptacle having a bottom portion and a substantially frusto-conical wall integral with said bottom portion and flaring upwardly therefrom, said wall having a smooth inner surface and an outer surface comprised of between twenty and thirty-two tangential longitudinally disposed flat segments extending upwards from the said bottom portion of said receptacle to a point below that at which the said closure overlies the upper extremity of said receptacle, a plurality of annular parallel beads encircling the periphery of said receptacle adjacent to the upper end surface thereof, two elongated apertures in the wall of said receptacle located substantially opposite to each other and disposed immediately above said annular beads, said snap-on closure being a cap having a top portion and an annular side wall depending therefrom and integral therewith and adapted to overlie the upper extremity of said receptacle, said closure side wall having along its outer periphery dispensing apertures including a pouring spout extending upwardly and outwardly from said side wall, a venting aperture located substantially opposite said spout, and a sifting means comprising a plurality of closely spaced perforations angularly disposed from said spout and said venting aperture, said closure also including a sealing flange extending down from the inner surface of said top portion and in-

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tegral therewith, said flange concentric with said side wall and disposed therefrom a distance approximately equal to the thickness of the upper wall of said receptacle, a plurality of annular grooves disposed on the inner surface of the said side wall adapted to engage the said annular beads on said receptacle to form a rotatable seal therewith, said dispensing apertures adapted for selective alignment with said apertures in said receptacle upon rotation of said closure relative to said receptacle.

2. A dispensing container as provided for in claim 1 wherein the snap-on closure is molded polyethylene plastic, and the receptacle is molded high-impact polystyrene.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

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November 13, 1962

Vincent R. Anderson

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 3, line 13, for "with" read -- within --; line 17, for "faciliate" read -- facilitate --; line 21, for "he" read -- the --; line 34, for "polyphylyene" read -- polyethylene --; column 4, line 10, for "plasic" read -- plastic --.

Signed and sealed this 16th day of July 1963.

(SEAL)

Attest:

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