May 10, 1955 G. DE W. MILES 2,707,930

DISPENSING CONTAINER

Filed Nov. 22, 1952

Fig. 1.

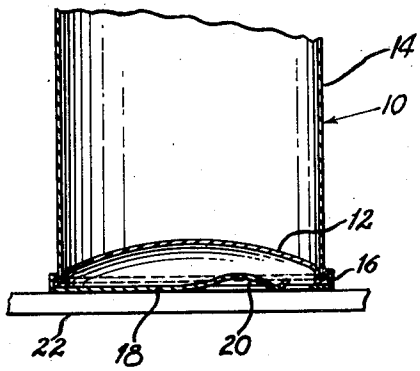


Fig. 2.

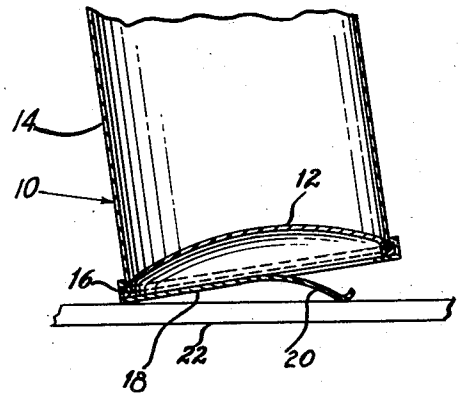


Fig. 3.

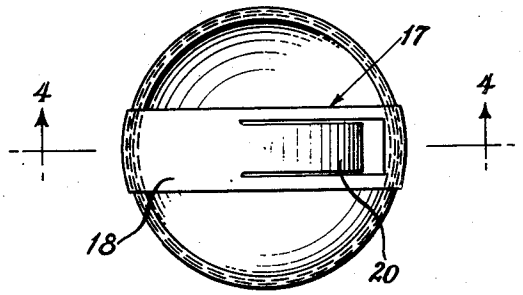


Fig. 4.

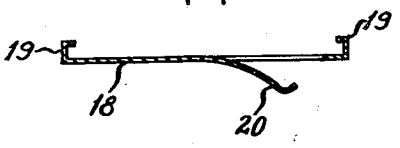


Fig. 5.

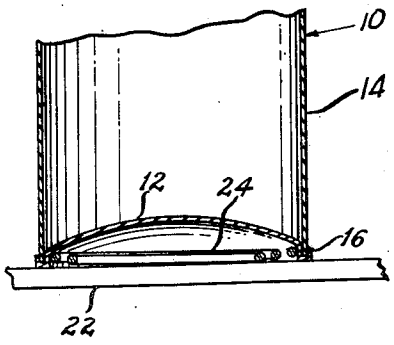
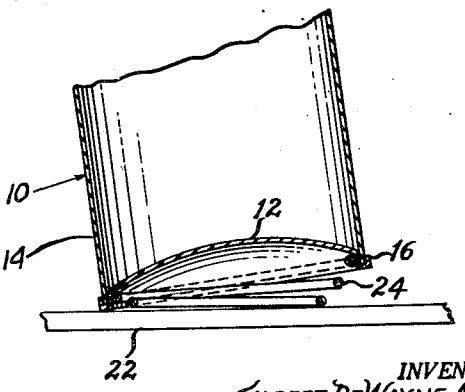


Fig. 6.



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DISPENSING CONTAINER

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6 Claims. (Cl. 116—114)

The present invention relates to containers. The invention relates more particularly to dispensing containers provided with means adapted to tilt said container when the gross weight of the container and its contents falls below a predetermined weight value.

While the invention, in the broadest aspects thereof, contemplates dispensing containers of practically any size or shape adapted for almost any use, it will be described, for purposes of convenience only, with particular reference to dispensing containers of the aerosol type.

All of the aerosol containers presently available have walls constructed from opaque materials, e. g., metals. Because of this fact the user cannot, by merely looking at the container, determine the quantity of material present therein. Furthermore, since the cap and dispensing valve assembly are sealed irremovably to the container by crimping, soldering or the like to insure gas-tight construction, the user cannot open the container and look inside to determine the quantity of material present therein.

The foregoing methods and materials of construction of aerosol and like dispensing containers render it difficult to determine, with any degree of certainty, when such containers are nearly exhausted. Knowledge that the contents of an aerosol container is nearly exhausted is very important to the user, for example, of an aerosol shaving cream composition because the user may find that he has exhausted the cream in the middle of a shave.

The present invention provides a storage-dispensing container or package of aerosol or like character having means capable of tilting the container when its contents are nearly exhausted. Broadly, the invention comprises a container adapted to hold a mass of material which container has means adapted to tip said container when the gross weight of the container and said material falls below a predetermined weight value.

To indicate more fully the advantages and capabilities of the present invention, reference is made to the following description taken in conjunction with the accompanying drawing, which by way of illustration shows two preferred embodiments of the invention.

Other embodiments of the invention employing the same or equivalent principles may be used and structural changes may be made as desired without departing from the present invention and the purview of the appended claims. In the drawing similar reference characters are used to designate corresponding parts in each of the several figures.

In the drawing:

Fig. 1 is a fragmentary sectional side view of a container and tilting means in accordance with a preferred embodiment of the invention. The container is shown in the position it assumes on a flat surface when the container is full;

Fig. 2 is a view similar to Fig. 1 showing the position the container assumes when the gross weight of the container and its contents falls below a predetermined weight value;

Fig. 3 is a bottom view of the container shown in Figs. 1 and 2;

Fig. 4 is a sectional view of the tilting means shown in Fig. 3 taken along line 4—4 looking in the direction of the arrows; and

Figs. 5 and 6 are views similar to Figs. 1 and 2 showing a container and tilting means in accordance with another preferred embodiment of the invention.

Referring to the drawing the invention as therein illustrated is embodied in a conventional aerosol dispensing container referred to generally by reference figure **10**. Looking first at Fig. 1, the container is shown in the form of a generally cylindrical metal can having a domed or externally concave bottom wall **12** (adapted to withstand internal pressure) and a generally cylindrical side wall **14**. A cap and dispensing valve assembly, not shown on the drawing but which may be of any conventional type or design, is attached irremovably to the container by crimping and soldering. The peripheral edge of bottom wall **12** is rolled about the end of side wall **14** affording an annular bead **16**. Bottom wall **12** is secured irremovably to container **10** in any convenient manner, e. g., as by crimping or soldering bead **16** to side wall **14**.

As shown more clearly in Figs. 3 and 4 a tilting element, referred to generally by reference character **17**, is attached to the bottom of container **10**. Element **17** has a body portion **18** and a spring finger **20**. Body portion **18** may be of any suitable shape and may be secured to container **10** in any suitable manner. In the preferred embodiment shown in Figs. 1–4 body portion **18** is of a generally rectangular shape. It is attached to container **10** by crimping the rolled ends **19** thereof about bead **16** of bottom wall **12** to insure an irremovable attachment.

Spring finger **20** preferably is cut from body portion **18** and is bent downwardly therefrom and formed into a shape substantially as indicated on the drawing. Fig. 4 illustrates the position of spring finger **20** with relation to body portion **18** when the spring finger is not under tension and is in the normal or relaxed position.

Tilting element **17** is constructed such that when attached to container **10** spring member **20** has a strength sufficient to assume its relaxed position and tilt the container only when the gross weight of the container and its contents has fallen below a predetermined weight value.

Thus, when in use container **10** remains in an upright position (Fig. 1) when placed on a flat surface, e. g., table **22**, until the gross weight of the container and its contents on spring finger **20** falls below a predetermined weight value. When the gross weight on finger **20** falls below said predetermined value, said spring finger **20** relaxes (assuming the position with reference to body portion **18** shown in Fig. 4) and tilts the container to the position illustrated in Fig. 2, thus indicating to the user that the container is nearly exhausted.

As indicated hereinbefore body portion **18** may be of any suitable shape and may be secured to container **10** in any suitable manner. If desired body portion **18** instead of being rectangular, may be circular in shape in which instance the same may be attached to container **10** by rolling the entire peripheral edge thereof about bead **16** of bottom wall **12**. Body portion **18** also may be cruciform in shape in which form the ends of its cross arms may be secured to bead **16** of the bottom wall of container **10**.

It is preferred that body portion **18** be secured irremovably to container **10** as by crimping or soldering to avoid the possibility of tilting element **17** becoming separated from container **10** and being misplaced. However, if it is desired to detachably secure the tilting element

to the container, body portion 18 need only be snapped or clipped about bead 16.

Tilting element 17 may be constructed from any one of many materials having resilient or spring like properties, e. g., metals such as spring steel, beryllium copper, bronze, brass, etc.; plastics such as polystyrene, cellulose acetate, etc.

While it is preferred that body portion 18 and spring finger 20 be integral with one another, the invention in the broadest aspects thereof contemplates that finger 20 may be cut and formed separately and thereafter attached to body portion 18. When spring finger 20 is cut and formed separately from body portion 18, it is necessary that only finger 20 be constructed of spring like or resilient material.

Fig. 5 and 6 illustrate a container in accordance with another preferred embodiment of this invention. In Figs. 5 and 6 a coiled spring 24 is secured to domed bottom wall 12 interiorly to bead 16. Spring 24 preferably is secured in position by soldering, crimping, or the like to avoid the possibility of said spring becoming separated from container 10 and being misplaced. However, if desired, spring 24 may be secured detachably to container 10 in any convenient manner.

The container illustrated in Figs. 5 and 6, like the container illustrated in Figs. 1 and 2, remains in an upright position when placed on a flat surface so long as the gross weight of the container and its contents are sufficient to prevent coiled spring 24 from assuming its relaxed position. However, when the gross weight on spring 24 falls below a predetermined weight value said spring assumes its relaxed position and tilts the container to the position shown in Fig. 6.

Aerosol containers of the type hereinbefore illustrated comprise containers wherein a product is packaged under pressure and the discharging or dispensing of said product is governed by a manually releasable valve.

Such dispensing containers have been used widely in the packaging and commercial distribution of shave creams, shampoos, glues, foodstuffs and the like. Furthermore, it has been found that the use of such containers facilitates the convenient handling of liquids such as insecticides, perfumes, deodorants, oils, waxes, paints, and similar materials.

In general, such products either are packaged under pressure or are placed in containers having means for creating a gaseous pressure within the walls thereof whereby, upon release of a suitable valve positioned in a passage through an outer wall of said container, the contained product and gas may be dispensed through said passage and ejected from the container.

It is difficult to determine the amount of product contained within the aerosol dispensing containers heretofore known since such containers are of sealed construction and have walls of opaque materials. This difficulty is overcome or substantially minimized by the dispensing containers of the present invention. These novel containers are simple in character and are adapted for rapid and economical production and assembly by machines and methods that are commercially available and highly efficient in operation.

While there has been described and illustrated what are at present considered to be the preferred embodiments of the invention, it will be understood that many modifications, changes, substitutions, etc. may be made therein without departing from the true scope of the invention as defined in the appended claims.

What is claimed is:

1. A package comprising a container adapted to hold a mass of material and means including a resilient member for tilting the container when the gross weight of the container and said material falls below a predetermined weight value, said container having a bottom wall, said means for tilting the container being located on said bottom wall exteriorly of the container, and the resilient member of said means being spaced inwardly from the peripheral edge of said bottom wall.

2. A package as set forth in claim 1 in which said means comprises a tilting element having a body portion and a spring finger, said body portion being attached to the exterior surface of the bottom wall of said container and said spring finger being attached to said body portion and inwardly spaced from the periphery of the bottom wall.

3. A package as set forth in claim 1 in which said means comprises a coiled spring attached to the exterior surface of the bottom wall of said container and inwardly spaced from the peripheral edge of said bottom wall.

4. A storage and dispensing receptacle comprising a sealed aerosol container having opaque side, top, and bottom walls which is adapted to contain a mass of material, and a spring secured to the bottom of said container, said spring being located inwardly from the peripheral edge of the bottom wall of the container and adapted to engage a support upon which the container rests at a position between the periphery and the center of the bottom of the container and thereby impart a tilting force thereto, said force being sufficient to tilt said container only when the gross weight of the container and said material falls below a predetermined weight value.

5. A package comprising a container adapted to hold a mass of material, said container having a bottom wall, means for tilting the container located on said bottom wall exteriorly of the container and including a resilient tilting member spaced inwardly from the peripheral edge of said bottom wall, which resilient tilting member is adapted to engage a substantially horizontal support surface upon which the container may be placed, and which member will tilt the container to a predetermined position so that the base of said container is noticeably at an angle to the plane of the support surface when the gross weight of the container plus contents falls below a predetermined value, while allowing the base of said container to maintain a position parallel to the support surface when the said gross weight is above said predetermined value.

6. A storage and dispensing receptacle comprising a sealed aerosol container having opaque side, top and bottom walls, which is adapted to contain a mass of material, and a spring secured to the bottom of said container, said bottom being concave, said spring being located inwardly from the peripheral edge of the bottom wall of the container and adapted to engage a substantially horizontal support surface upon which the container rests at a position between the periphery and the center of the bottom of the container, said spring being situated at least partially within the container bottom concavity when the container is parallel to and in contact with said support surface and being capable of moving the container to a position in which its base is at a noticeable angle to the support surface when the gross weight of the container and contents thereof is less than a predetermined amount, while being incapable of moving the base from a position parallel to the support surface when said gross weight is more than said predetermined amount.

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