United States Patent [19]

Lebel et al.

[11] **3,885,698**

[45] **May 27, 1975**

[54] **CONTAINERS FOR AEROSOLS, GASES AND THE LIKE**

[76] Inventors: **Constantin Erwin Lebel,** 107, Avenue de Saint-Quen, 75017 Paris; **Pierre Ilie Isidore Karmitz,** 95, Avenue Henri Martin, Paris 75016, both of France

[22] Filed: **Dec. 20, 1973**

[21] Appl. No.: **426,653**

Related U.S. Application Data

[62] Division of Ser. No. 295,524, Oct. 6, 1972, Pat. No. 3,805,995.

[52] **U.S. Cl.** ..... **220/69;** 116/114 R; 248/133; 248/364

[51] **Int. Cl.** **B65d 7/42;** G01d 13/00

[58] **Field of Search** ..... 220/69, 70; 215/1 R; 248/133, 137, 346, 364; 116/114 R, 118

[56] **References Cited**

UNITED STATES PATENTS

453,079	5/1891	Duncan	248/133 X
480,095	8/1892	Holme	248/133 X
1,269,051	6/1918	Cheney	248/364 X
2,784,577	3/1957	Beaham	248/364
2,793,788	5/1957	Lysne	220/69
3,054,535	9/1962	Clarey	215/1 R
3,100,054	8/1963	Rudens	215/1 R

Primary Examiner—John Petrakes
Attorney, Agent, or Firm—Buell, Blenko & Ziesenheim

[57] **ABSTRACT**

An apparatus is provided for holding fluid material distinguished by being balanced in such a way that when placed on a horizontal surface its position will change depending upon whether the fluid contents exceed or fall below a pre-selected minimum.

2 Claims, 12 Drawing Figures

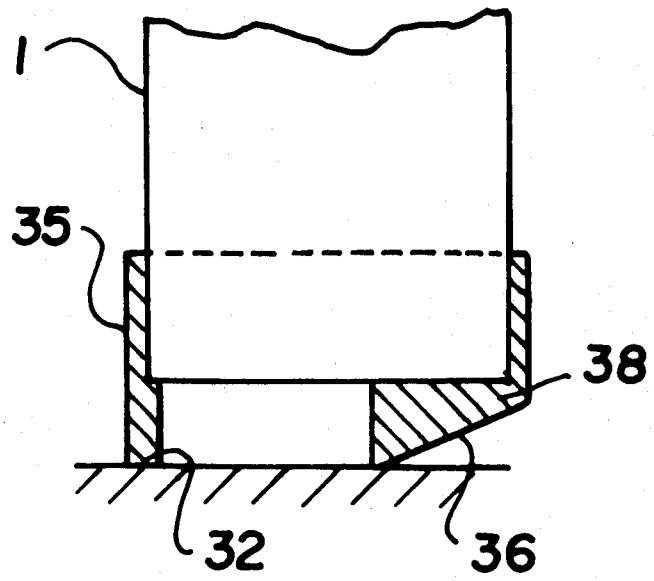


Fig.1.

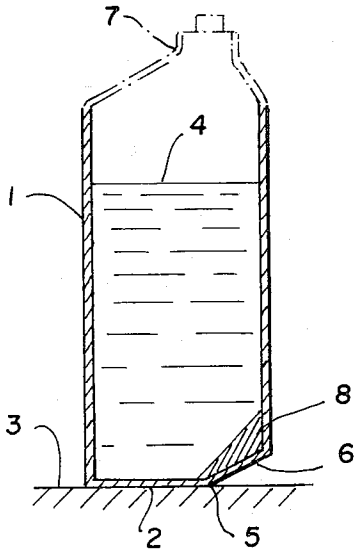


Fig.2.

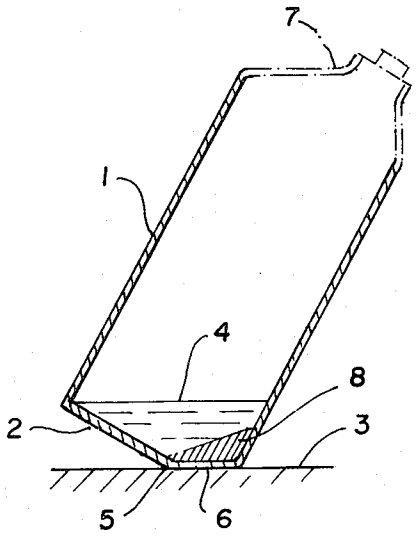


Fig.3.

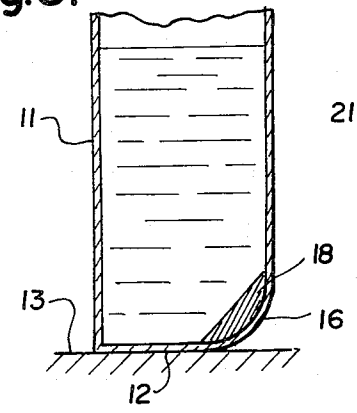


Fig.4.

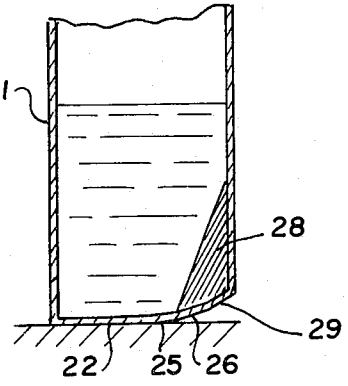


Fig.5.

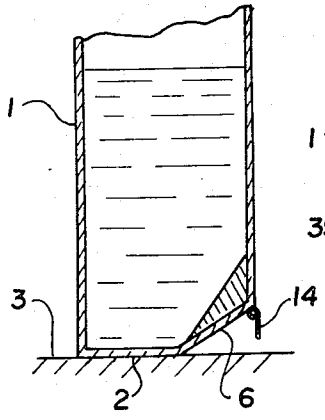


Fig.6.

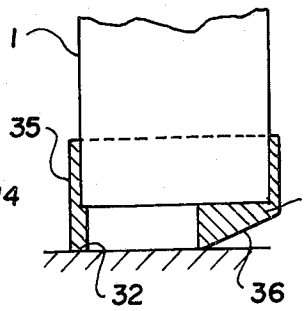


Fig.7.

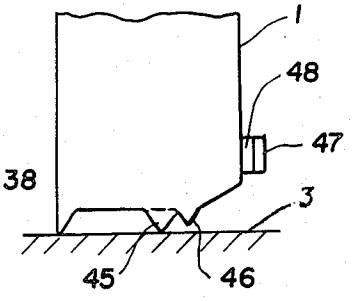


Fig.8.

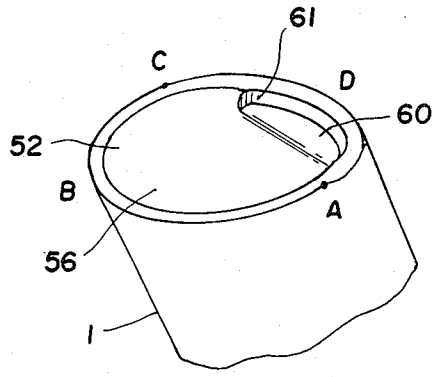


Fig.9.

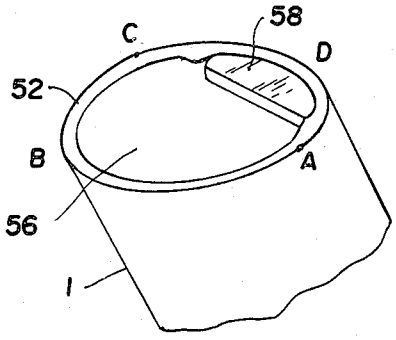


Fig.10.

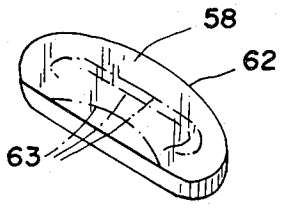


Fig.11.

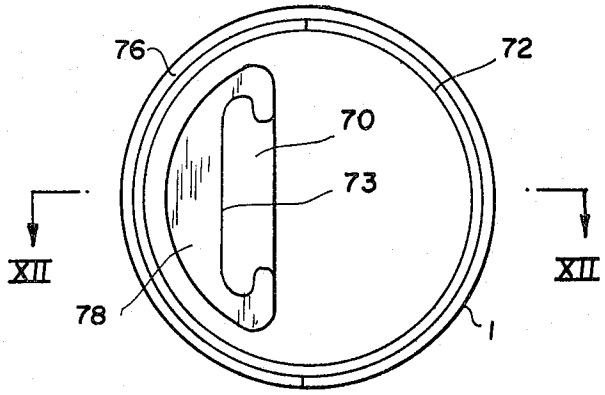
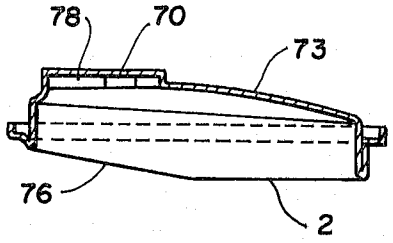


Fig.12.



CONTAINERS FOR AEROSOLS, GASES AND THE LIKE

This invention relates to containers for aerosols, gases and the like and particularly to a container for automatically indicating the approach of exhaustion of the contents of the container.

Containers have in the past been provided for indicating the approximate contents. However, these devices have depended upon some extraneous attachment for creating the indication of contents. Typical of these past devices are those of U.S. Pat. No. 2,575,110 and French Pat Nos. 969,692 and 747,707.

There is an ever increasing use of containers such as bottles for gases, aerosols and other products (shaving foams, polishes, hair spray, scouring solutions, etc.). These containers, however, do not provide any facility for checking the quantity of the product which they still contain when some of it has been used. This often leads to the nuisance that the user will find the container empty when the product is most needed.

The aim of the present invention is to remedy this state of things by providing the user with some simple, sturdy, reliable and inexpensive means to be warned in time that there is only a small quantity of the product left in his container and time has come to refill his bottle or to have a new one.

For this purpose, according to the invention, the balance of the container is arranged in such a manner that, if put on a fairly horizontal stand, its standing position will be different according to whether it does contain more than a given minimum quantity of the product or not. The container is preferably provided with a bearing surface on which it can rest upright in stable equilibrium only so far as its content remains above a preselected minimum. This minimum can be adjusted for, particularly by means of a counterpoise.

In one practical execution, the bottom of the container is provided with an exterior cavity in which a counterweight is lodged. The latter can be fastened in the said cavity by friction (jamming) or any other means, e.g., gluing.

A preferred shape for the cavity is one following basically the shape of a segment of a circle with rounded angles, providing the space where to lodge counterweights of matching shape, the weight of which can be adjusted by warying their thickness or by contriving holes or notches of adequate size in them.

In the foregoing specification we have set out certain objects, purposes and advantages of this invention. Other objects, purposes and advantages of this invention will be apparent from a consideration of the following description and the following drawings in which:

FIG. 1 is a schematic section of a substantially filled container according to the invention;

FIG. 2 is a schematic section as in FIG. 1 in which the container is shown nearly empty;

FIG. 3 is a second embodiment of the container according to the invention;

FIG. 4 is a third embodiment of the container according to the invention;

FIG. 5 is a fourth embodiment of the container according to the invention;

FIG. 6 shows, in partial section the use of a base plate in conformity with the invention together with a container of the usual type;

FIG. 7 is a partial schematic view of a container with adjustable tipping points;

FIG. 8 is the perspective view of the bottom of still another alternative implementing of a container in conformity with the present invention devoid of counterweights;

FIG. 9 is a view analogous to FIG. 8, but showing a counterweight in position;

FIG. 10 is also a schematic view, in larger scale, also in perspective, showing various implementations of counterweights;

FIG. 11 is a plane view of a bottom, conforming to the invention, for a container with appended bottom; and

FIG. 12 is a section along XII—XII of FIG. 11.

In the embodiment illustrated by FIGS. 1 and 2, the lower part of a container 1 has the shape of a wide open dihedron, e.g., abt. 150°–170°.

The container is balanced in such a way that, as long as it contains a quantity of product greater than a given minimum value, it will rest in stable equilibrium on surface 2 of the dihedron upon some, generally horizontal, platform, such as a table, a shelf, the floor, etc. . . as shown on FIG. 1. The surface 2 takes the major part of the base of the container and can be at right angles to its main vertical axis, as is the bottom of any ordinary container.

The word "surface" must be taken here in its broadest sense, so to mean any configuration of base (surfaces, lines or points) making it possible to place the container on some stand.

As soon as the quantity of the product in the container reaches the chosen minimum value or drops below it, the container will tumble over round the edge 5 of the dihedron, if placed on the stand 3, and will come to rest in stable equilibrium upon the other face 6 of the dihedron, as shown on FIG. 2.

The balancing of the container can be effected by various means. One can e.g., offset some accessories or details, such as a distributing head 7, weldings or bendings in either direction. One also can provide a counterweight 8 thoughtfully positioned e.g., in the lower part of the container, or even combine these two methods. In this way, one transforms the base of the container into a pair of scales, the point (or the points) of support of which are offset as compared to the container, with a counterweight such as will cause the container to tip over as soon as the weight of the content resting upon the surface 2 becomes smaller than the total sum of the weight resting upon face 6 plus the weight of the counterweight.

The counterweight 6 can be fastened inside the container, below the container or outside of it. It can be removable and can consist e.g., in one or several magnets.

The balance of the container can be established in such a way that the presence or absence of some accessory part, such as a cover or a cap will alter the minimum value of the content effecting the change in the position of the container.

Also, instead of providing a position of stable balance on surface 6, one can arrange that the container falls over when the quantity of the contained product drops below the minimum value.

Such is the case with the container shown, on FIG. 3, the face 16 of which has the shape of a portion of a cylinder with horizontal axis; when the quantity of the

product becomes sufficiently low, the container will fall, rolling on face **16.**

In the version of FIG. **4,** the face of stable bearing surface **22** joins to two other bearing-faces, i.e., an intermediate face **26** forming a certain angle with it, e.g., 160°–170°and another face **29,** which can be plane or curved and forms a wider angle to face **22.**

The balancing can be effected in such a way that it enables to choose between two minimum values of the contained quantity of the product in the container: one which will provide a position of stable balance upon the face **6** and the other, smaller than the first one, which effects either a resting on face **9,** or the overturn.

In the version of FIG. **5,** a container of the type shown on FIGS. **1** and **2** is fitted at the upper end of face **6** with a small hinged paddle **14** possibly of some garish color. As long as the container remains sufficiently filled, the paddle stands vertical, but once the container tends to rest on face **6,** it will be pushed aside to the right and becomes conspicuous to the user.

The invention can be applied to any sorts of containers, especially to non transparent ones, where it is difficult or impossible to assess the amount of the content, e.g., of bottles for compressed or liquefied gases, of aerosol bottles, of cans, drums, etc.

It can be applied to already existing containers to which one only has to adapt, either permanently — e.g., by welding, gluing, crimping, flanging, etc. — or temporarily — e.g., by encasing, attaching by magnetic devices, etc. — a conveniently shaped base-plate, such as base-plate **35** of FIG. **6,** having plan supporting faces **32** and **36** and being fitted with a ballast **38** which could consist in a magnet. Here the container **1** is simply encased into the base-plate.

On FIG. **7** the position of the tipping edge of the container is adjustable. For this purpose the container bears laterally teeth **45** and **46,** the teeth **45,** the ones nearer to the center of the basis being longer than the teeth **46.** Once the container has been sufficiently emptied to be tipped around the teeth **45,** one can break off these teeth, so to make the container rest upon the teeth **46.**

In this case the container will tip over once the quantity of the product-content has dropped below a second minimum value, lower than the value which effected resting on the teeth **45.**

The counterweight **48** can be outside the container. One or several counterweights **47** can be provided e.g., in form of magnets, enabling to adjust the minimum value by this further possibility.

Instead of the teeth **45** and **46** one could provide bearing points implemented in form of travellers, enabling to adjust the tipping edge of the container.

In the example of execution shown on FIGS. **8** and **9,** the container **1** comprises a bottom having two bases or bearing faces, one normal **52,** consisting in an arc ABC placed in a plane perpendicular to the axis of the container and extending over more than 180°, and the other **56,** consisting in an arc ADC placed in a sloping plane e.g., of 10°compared to the plane of the base **52.** The bottom of the container is hollow and convex toward the inside, which enables to satisfy the provisions for safety.

In order to allow for the fitting of a counterweight **58** to the container, the portion of the bottom corresponding to the base **56** comprises a cavity **60** in shape of a segment of a circle with rounded angles. This cavity is fairly concentric to the bottom of the container. The lateral face **61** of the said cavity is sensibly perpendicular to its bottom which permits the counterweight **58** to be jammed in by simple elastic wedging (FIG. **9**) provided that the dimensions of the counterweight have been conveniently determined. One could, of course, wedge the counterweight by means of one or several blocks, or fasten it by any other means, such as e.g., gluing, welding, etc.

The counterweight shows a lateral surface the shape of which matches the one of the face **61** of the cavity. It can, on the other hand, be of dimensions and of a configuration varying according to the bulk which one has determined.

As shown by FIG. **10,** in order to alleviate the counterweight, one can, at the opposite of the portion **62** of its lateral surface encasing into the face **61** of the cavity, cut a more or less pronounced notch **63,** which then will confer to it a shape of a bean or a shape of letter C.

On the FIGS. **11** and **12,** the bottom **73** of the container is meant to be appended by crimping to the body (not shown) of the said container. This bottom comprises the two above mentioned bases of support **72** and **76** as well as cavity **70** in which one lodges the counterweight **78.** This latter is hollowed by a large central notch **73** which confers to it a shape of C.

It is obvious, that alterations can be made in the methods of execution described above, especially by substitution of equivalent technical means without transgressing the frame of the present invention by doing so. Thus, while we have described several presently preferred embodiments of this invention in the foregoing specification, it will be understood that this invention may be otherwise embodied within the scope of the following claims.

We claim:

1. A removable bottom member for fluid holding containers comprising a base member having a cavity for receiving and frictionally engaging the base of a fluid holding container and opposite to said cavity a bottom defined by a first portion in the form of one flat horizontal plane and by a second portion diverging from said plane generally along a line offset from the vertical axis of the container including a counterweight positioned thereon, said line forming a balancing pivot line around which the container pivots by gravity when the level of fluid material in the countainer drops below a preselected minimum amount, whereby the container and bottom member rests on said flat horizontal plane when the fluid therein exceeds said preselected minimum amount and rotates by gravity about said pivot line offset from the vertical axis of the container when the fluid therein falls below said preselected minimum amount.

2. A removable bottom member as claimed in claim **1** wherein the counterweight is a movable counterweight fixed thereto.

* * * * *