

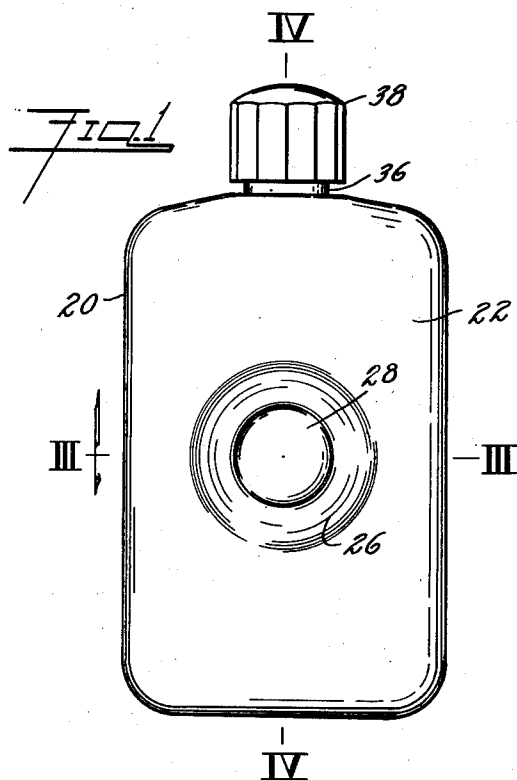
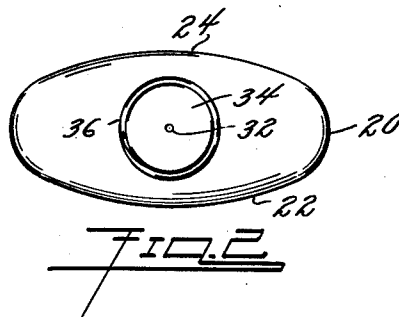
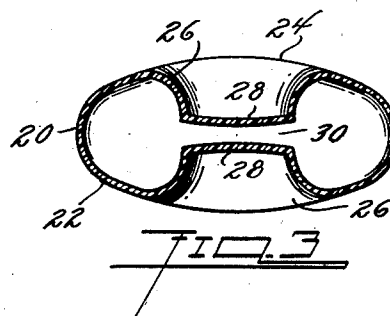
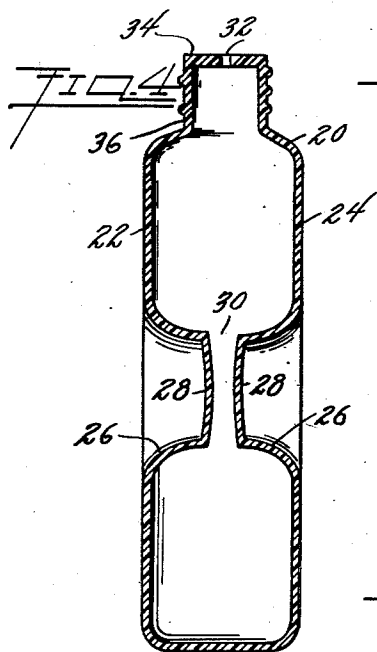
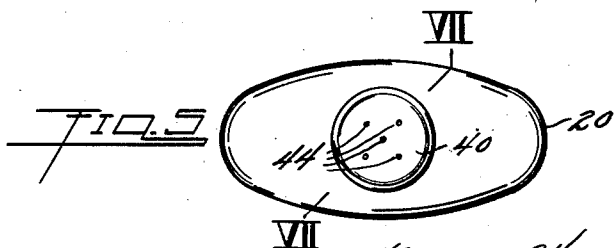
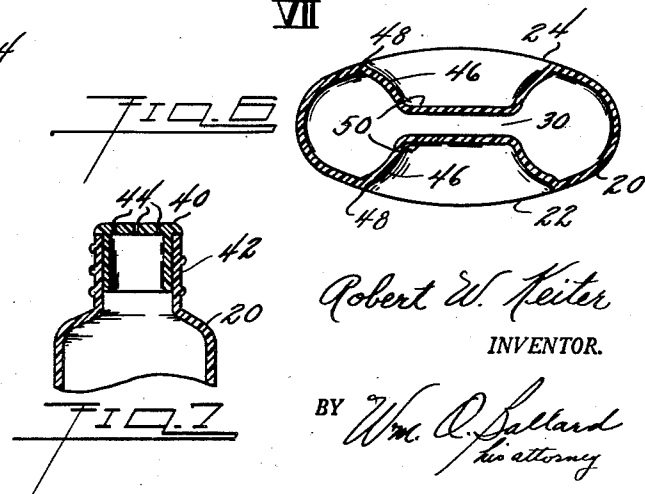
Sept. 7, 1954

R. W. KEITER
FLEXIBLE CONTAINER FOR DISPENSING PREDETERMINED
QUANTITIES OF MATERIALS

2,688,424

Filed Dec. 11, 1950

2 Sheets-Sheet 1



Robert W. Keiter
INVENTOR.

BY *Wm. A. Ballard*
his attorney

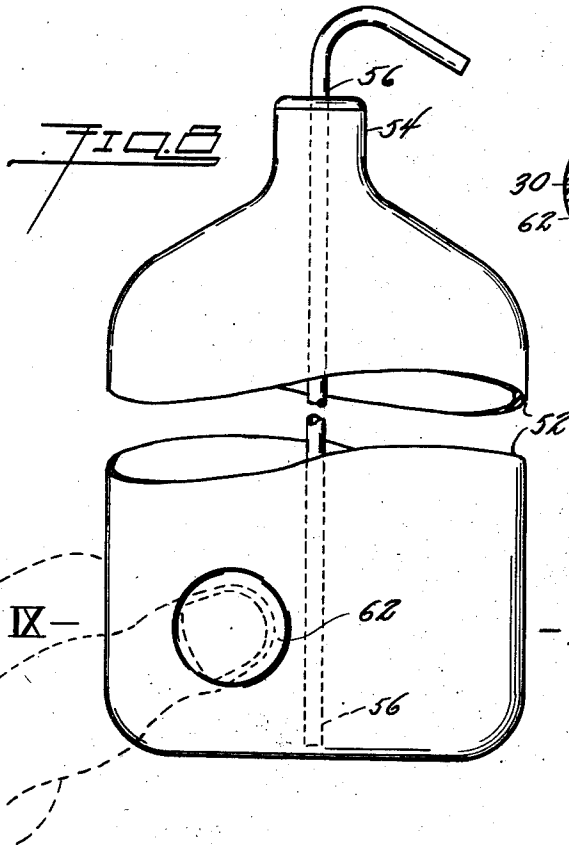
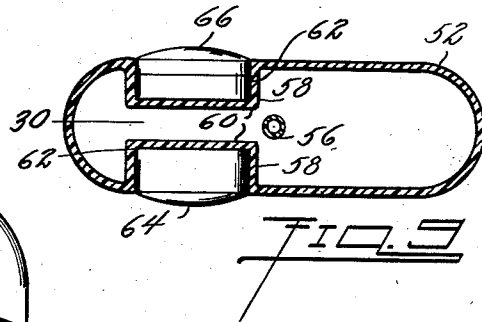
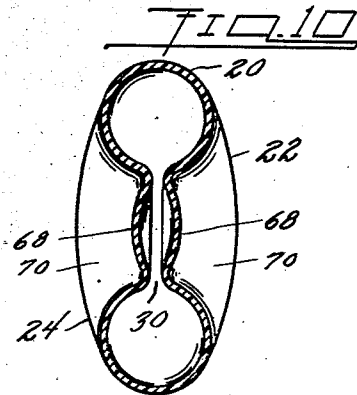
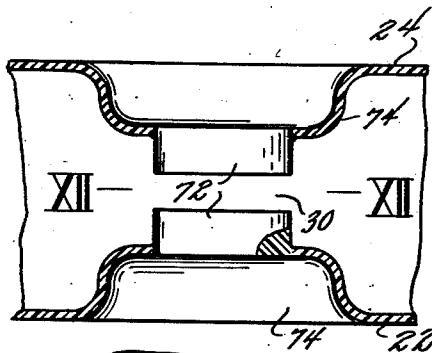
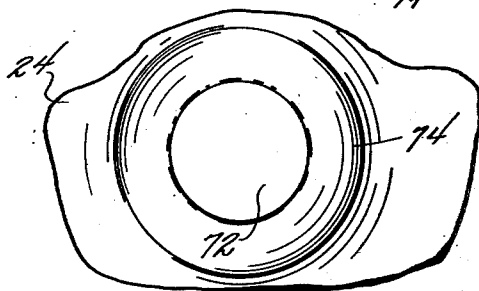
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INVENTOR.
Robert W. Keiter
BY
Wm. O. Ballard
his attorney

UNITED STATES PATENT OFFICE

2,688,424

FLEXIBLE CONTAINER FOR DISPENSING
PREDETERMINED QUANTITIES OF MA-
TERIALS

Robert W. Keiter, Toledo, Ohio

Application December 11, 1950, Serial No. 200,260

7 Claims. (Cl. 222-215)

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This invention relates to flexible plastic containers.

An object of this invention is to provide a flexible plastic container, more particularly of bottle form, from which a predetermined portion of its contents may be discharged at will.

Another object of this invention is to provide a container of the type described having one or more discharge ports of a diameter restricting free flow therethrough of the contents of the container, yet which will allow flow therethrough, when squeeze pressure is exerted against the body of the container.

Another object of this invention is to provide designated portions of the body of the container which, when squeezed together, will cause a predetermined portion of the container contents to be discharged therefrom.

Another object of this invention is to provide containers of the type described which have discharge ports and squeeze areas of sizes and movements calculated to co-ordinate the contents of the containers therewith in determining a predetermined volume discharge of the contents from the container with each completed squeeze operation, such discharge to be within a prescribed time limit.

And another object of this invention is to incorporate the functional advantages advanced by the squeeze areas with attractive design and utilizing such visual attractions to increase the utility and operation of the devices.

Other objects and advantages of this invention relating to the arrangement, operation and function of the related elements of the structure, to various details of construction, to combinations of parts and to economies of manufacture, will be apparent to those skilled in the art upon consideration of the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

Referring to the drawings:

Fig. 1 is a side elevation of a flexible plastic bottle type container having a form of the invention incorporated therein;

Fig. 2 is a plan view of the bottle of Fig. 1, the closure cap being removed to expose the top which is provided with a single discharge port;

Fig. 3 is a view on the line III—III, Fig. 1;

Fig. 4 is a view on the line IV—IV, Fig. 1;

Fig. 5 is a view similar to Fig. 2, the top shown being provided with a plurality of discharge ports;

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Fig. 6 is a view similar to Fig. 3, showing a modified cross-sectional fabrication;

Fig. 7 is a view on the line VII—VII, Fig. 5;

Fig. 8 is a side elevation of a modified type of container, parts being broken away, having a spout discharge, an off-the-center disposition of the squeeze areas and other features;

Fig. 9 is a view on the line IX—IX, Fig. 8;

Fig. 10 is a view similar to Fig. 3, showing an additional modification of the squeeze areas;

Fig. 11 is a partial section through a container, illustrating another modification of the squeeze areas; and

Fig. 12 is a view on the line XII—XII, Fig. 11.

The containers shown herein are primarily of bottle form fabricated from a flexible plastic such as polyethylene which may be commercially produced in desired forms by injection and compression molding and retain their forms and utility over a wide range of temperatures. The containers may package a wide range of liquids, semi-liquids, pastes and the like, due to its low moisture absorption as well as its low moisture permeability and chemical inertness.

The various dimensions entering into the final form of a container embodying the invention herein will be calculated by reference to the nature and volume of the contents to be packaged therein, the volume of a single discharge therefrom and the time within which said discharge is to be made.

As shown in Fig. 1, the container is of bottle form having a body 20 including a pair of opposing wall surface regions 22, 24. Each of these regions has a depression or inwardly dished portion 26 extending to a central plate-like face 28. The faces 28 are axially aligned in opposition to each other spaced a distance 30 calculated in relationship to the area of such faces 28, so that when said regions or squeeze areas are pressed together, a predetermined fraction of the container contents will be expressed or ejected through port 32 in the top 34 of neck portion 36. The diameter, fixing the capacity of the port 32 is such that the contents would not ordinarily flow therethrough, but pressure on the squeeze areas will force such flow and it will be limited to a predetermined amount with each squeeze operation.

When not in use the port 32 may be covered by a closure cap 38.

The inwardly dished portions 26 have a contour which directs and guides an operator's fingers onto the squeeze areas in proper position so that an ensuing squeeze will cause the discharge for which the particular container is adapted.

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For example, one type of commercial liquid detergent requires a certain volume thereof for an ordinary home dish-washing operation. The squeeze areas and distance therebetween are determined so that when the squeeze areas are pressed together, the desired amount of the detergent is delivered from the container and within a time which is not too long to discourage the operator's waiting for the full discharge.

The container of Fig. 1 has a comparatively large diameter discharge port 32, so that the top may be commercially formed as an integral part of the device as illustrated in Fig. 4. In instances wherein such a port would be too large to prevent free flow therethrough, as is the situation wherein certain liquids are packaged, a plug 40 may be inserted within an open end neck 42, which plug may be perforated by a plurality of smaller diameter ports 44.

The combination of the slightly concaved opposing faces 28 with the substantial extent of the finger guiding dished portions 26, absorb practically the entire wall movement during a squeeze operation so that little or no distortion is imparted to the remainder of the container body. This allows for an accuracy in determining the face areas 28, and space 30, which is ample for dispensing the types of merchandise for which the containers herein are particularly adapted.

The squeeze distortion may be localized to even a greater degree as illustrated in Fig. 6, wherein the dished portions 46 may extend inwardly in an ogee manner from a distinct edge 48 to planar or flat faces 50. The edge 48 provides a comparatively rigid ring about the finger receiving cups, with substantially all collapse or squeeze absorbed within the portions 46.

In the type of bottles so far described, it is but necessary to invert the container and squeeze the indicated or identified areas together, and a predetermined discharge volume from the contents, will be delivered through the discharge ports.

Selecting a typical example of operation; a 4 oz. oval bottle was used; the diameter of the faces 28 was $1\frac{1}{8}$ "; the cup portions outer diameters $1\frac{1}{2}$ "; the spacing $30\frac{1}{8}$ ". This bottle was equipped with a multiple discharge port plug including five apertures of .032" diameter each. Per squeeze, the average discharge therethrough was 5.25 cc. at normal room temperatures (70°-75°). There was negligible variations between successive discharges.

This represents a recommended quantity of a commercial liquid detergent for a normal home dish-washing operation. The multiple ports prevented any free flow of the detergent from the inverted bottle, before or after the squeeze.

These features may also be incorporated in containers equipped for spout delivery as shown in Fig. 8. Herein, a bottle-like container 52 is provided with neck 54 mounting tubular spout discharge device 56. Inwardly dished portions 53 are disposed in an off-the-center position and provide opposing faces 60. The cup-like portions 58 may mount filler plugs 62 to indicate the squeeze areas. In the more elaborate package technique, such as is commonly used in the cosmetic arts, the plugs 62 may be decorative items or even useful articles such as medallions 64, packets 66 for other cosmetics or premiums or the like.

Referring to Fig. 10, the cross-sectional contour presents a pair of opposing concaved squeeze faces 68 with comparatively large cups 70. Any body distortion, during the discharge operation,

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is restricted even to a greater extent than in the types heretofore described, and a sharper or more spurt type ejection may be had. This action can be determined by the radius of the faces 68.

Solid plugs 72 can be used to provide the squeeze areas and can be incorporated into containers by injection molding operations. Their areas and opposing face contours can be most accurately controlled. Their mounting cups 74 are given a compatible contour.

It is to be understood that the above detailed description of the present invention is intended to disclose an embodiment thereof to those skilled in the art, but that the invention is not to be construed as limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of being practiced and carried out in various ways without departing from the spirit of the invention. The language used in the specification relating to the operation and function of the elements of the invention is employed for purposes of description and not of limitation, and it is not intended to limit the scope of the following claims beyond the requirements of the prior art.

What is claimed and is desired to secure by United States Letters Patent:

1. A flexible plastic flask having a body provided with a port, a pair of cup-shaped regions inwardly extending from the outer surface of said flask to provide an opposing pair of closely spaced predetermined planar surface areas, which areas when squeezed together cause a predetermined volume of the container contents to be discharged through said port.

2. A flexible plastic flask having a body provided with a port, a cup-shaped region inwardly extending from the outer surface of said flask body to provide a predetermined area inner surface closely spaced from an opposing portion of said body, which surface when squeezed to contact said opposing surface will have ejected through said port a predetermined fraction of the body contained contents.

3. The structure set forth in claim 2 wherein the inner surface provides a concaved face directed toward the opposing flask portion.

4. The structure set forth in claim 2 wherein the inner surface presents a convex face to the opposing flask portion.

5. A flexible plastic bottle flask-form having a body provided with a discharge port, said discharge port being of less capacity than necessary to permit free flow of the contents from said body, a cup-shaped depression inwardly from the surface of the bottle body providing a predetermined area face closely opposing another body portion, which face when squeezed to contact said opposing body portion will create an internal pressure within said body to cause a predetermined limited portion of said contents to be ejected through said port.

6. A flexible plastic flask having a body including a pair of substantially flat opposing sides and a discharge port from the interior of said body, a pair of opposing depressions inwardly from the sides of said body, said depressions providing a pair of spaced faces, said faces and the space therebetween being of precalculated dimensions so that when said faces are brought into contact by pressure exerted thereagainst, a predetermined limited volume from the contents

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of said body will be ejected through said port within a given length of time.

7. A molded plastic flask embodying a unitary body and spout, means closing the major discharge area of said spout and providing a minor aperture therethrough, said body providing a pair of major opposing side areas, a cup-shaped portion molded therein as an integral portion of the flask and extended inwardly from one of said major side areas providing an inner predetermined area face closely positioned from said opposing major side and spaced therefrom a predetermined distance, said inner area shiftable to abut said opposing major side and thereby eject a predetermined portion of the contents of said 15 flask through said aperture.

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