July 24, 1956 A. E. NAVE ET AL 2,755,972

FLEXIBLE WATER DISPENSING BOTTLE

Filed Dec. 9, 1953 3 Sheets-Sheet 1

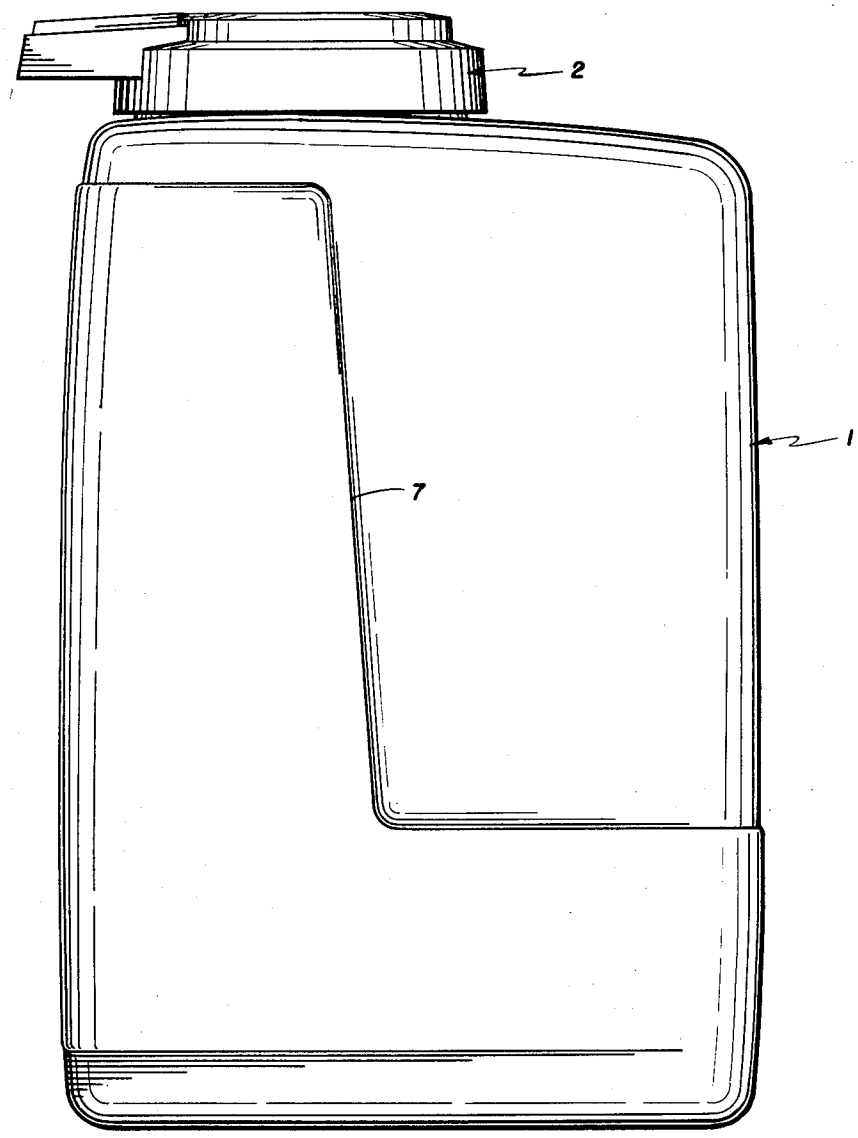


Fig 1

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Filed Dec. 9, 1953 3 Sheets-Sheet 2

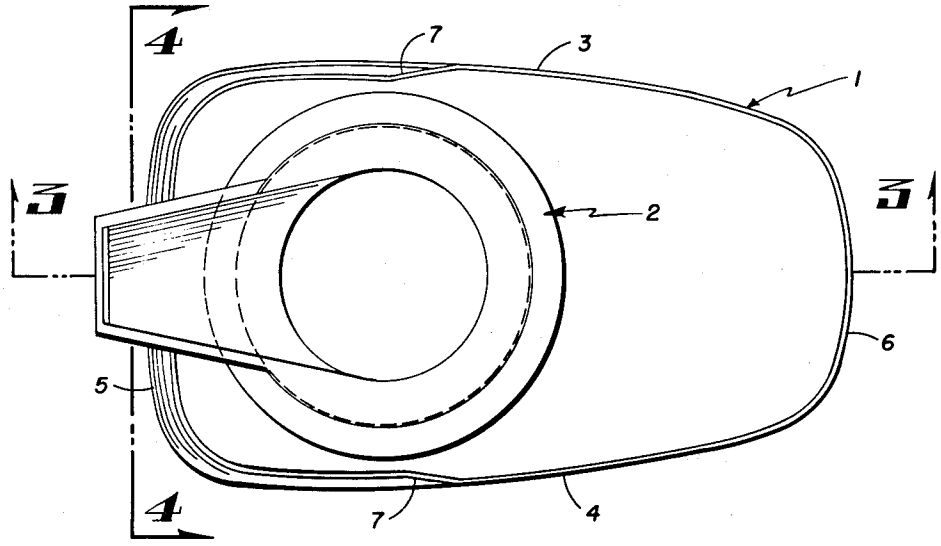


Fig 2

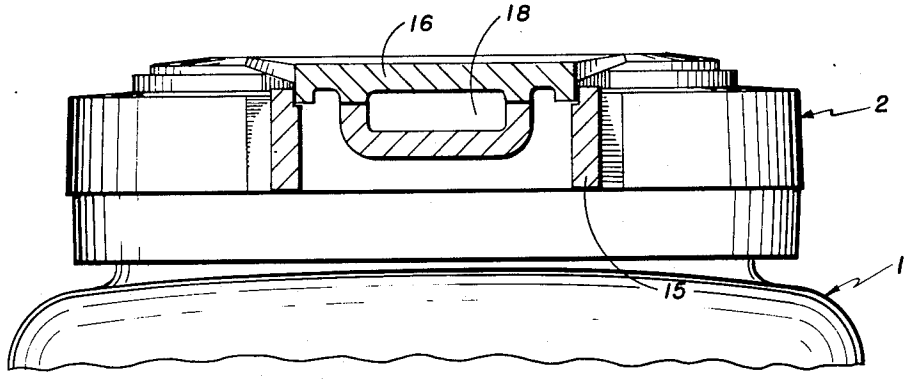


Fig 4

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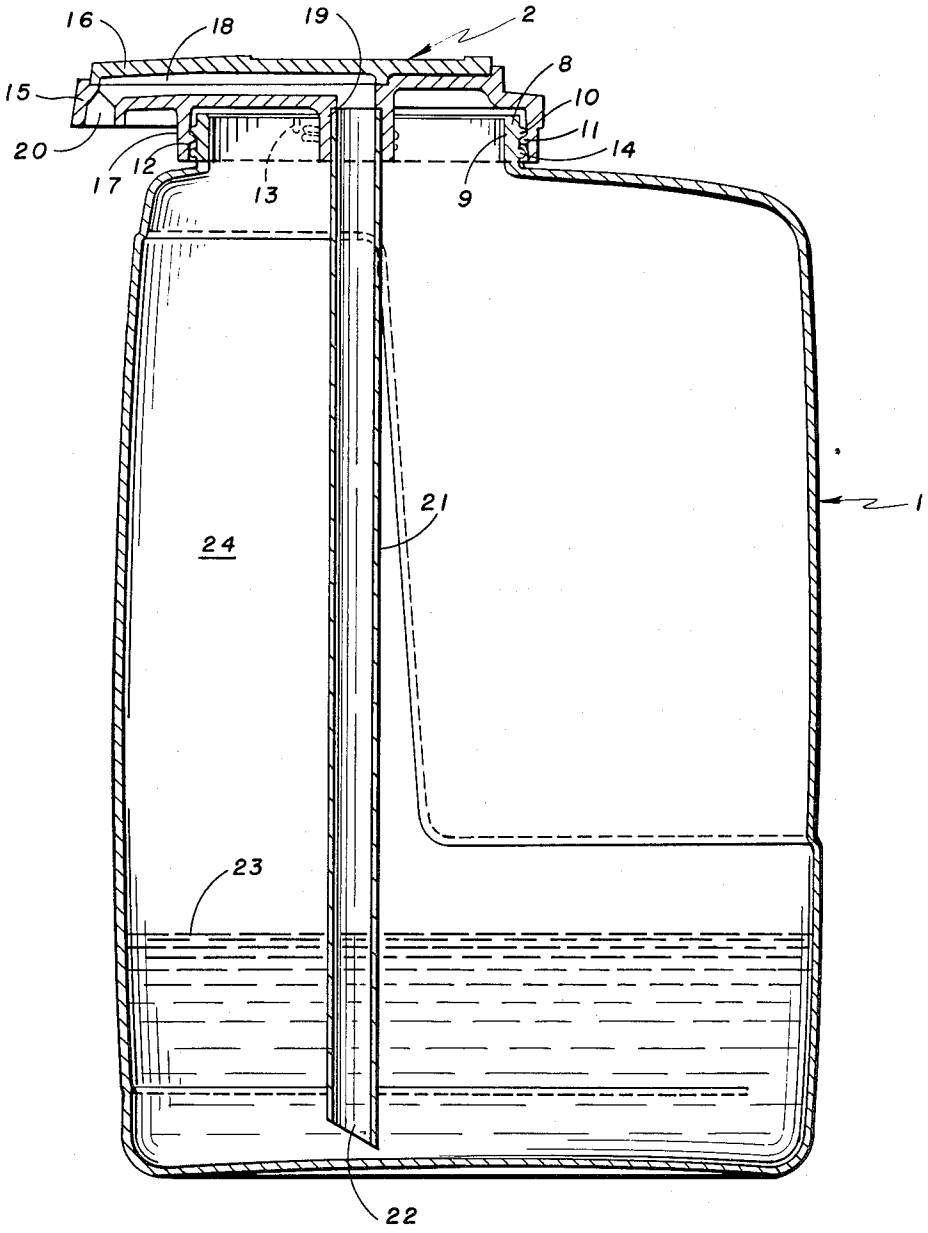


Fig 3

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FLEXIBLE WATER DISPENSING BOTTLE

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3 Claims. (Cl. 222—211)

The present invention concerns a container and, more specifically, a flexible container designed to hold and eject water or other liquids when its side walls are squeezed or compressed. The preferred embodiment of the invention is particularly adapted for storage in a refrigerator so that the user can readily obtain cool drinking water.

Briefly stated, the present invention comprises a water bottle made from pliable plastic having a threaded hard plastic cap to which a feed tube, extending from the interior of the bottle, is securely attached in communication with a discharge channel and nozzle formed in the cap through which water from the bottle can be ejected when the side walls of the bottle are compressed. As will be apparent to those skilled in the art, squeezing the side walls of the bottle compresses its contents and ejects water from the nozzle. The quantity of water ejected can be readily controlled by the amount of compression to which the side walls of the bottle are subjected. When the pressure is released, air is drawn into the interior of the bottle, replacing the quantity of liquid that has been ejected. The process for ejecting the water may be repeated at will until the liquid is reduced to a level below the end of the feed tube at which time the bottle will be substantially empty.

Threads are provided adjacent the finish portion of the bottle for securing the cap in position. Below the threads there is provided a peripheral projection engaging the cap and forming an airtight seal whereby leakage from the bottle is precluded. The threads are arranged in such a fashion as to cooperate with stop members integrally molded with the cap so that the cap can be assembled with the bottle in any one of a plurality of predetermined positions.

For convenience, the present invention is described with reference to a bottle for storing and ejecting water although it should be understood that other liquids, such as orange juice, grape juice, and tomato juice can be stored and ejected from the bottle.

In view of the foregoing, it will be apparent that an important object of the present invention is the provision of an improved liquid storing and dispensing container.

More specifically stated, it is an object of the present invention to provide a flexible bottle with a sealed filler cap whereby liquids stored within the bottle may be ejected when the side walls of the bottle are compressed.

A still more specific object of the invention is the provision of a flexible bottle having threads for engaging a filler cap, the threads being arranged to position the cap in any one of a plurality of predetermined positions.

A further object of the invention is the provision of a filler cap including a feed tube, discharge channel, and nozzle whereby the cap may be assembled on a flexible bottle to facilitate ejection of a quantity of liquid from the bottle.

A broad object of the invention is the provision of an attractive and simple bottle for storing liquids within

a refrigerator and for facilitating the dispensing of such liquids merely through compression of the side walls of the bottle.

The novel features that are considered characteristic of the invention are set forth in the appended claims; the invention itself, however, both as to its organization and method of operation, together with additional objects and advantages thereof, will best be understood from the following description of the preferred embodiment when read in conjunction with the accompanying drawings, in which:

Figure 1 is a side elevational view of the bottle and cap assembly;

Figure 2 is a top plan view of the assembly shown in Figure 1;

Figure 3 is a cross sectional view taken on plane 3—3 of Figure 2 showing the structural details of the bottle and cap; and

Figure 4 is a cross sectional view taken on plane 4—4 of Figure 2 showing the details of a discharge channel formed within the cap.

With reference to Figure 1, there is shown a bottle, generally designated **1**, which may be made from a pliable, flexible plastic such as polyethylene or similar material. Assembled to the top of the bottle is a filler cap, generally designated **2**, which may be made from polystyrene or other relatively rigid hard plastics. As indicated in Figure 2, the bottle has a relatively rectangular horizontal cross section including side walls **3** and **4** and end walls **5** and **6**. To improve the appearance of the bottle and increase its flexibility, an integral step **7** may be molded in the side walls **3** and **4**.

Attention should now be directed to Figure 3 which shows the bottle in cross section. From Figure 3 it will be noted that the bottle includes a cylindrical finish portion **8** defining a throat **9** through which liquids may be poured into the bottle. On the exterior of the finish portion there is integrally molded four short thread portions **10** designed for engagement by complementary threads **11** formed on the interior surface **12** of the filler cap **2**. The thread portions **10** and **11** are relatively short in circumferential extent so that it is possible to assemble cap **2** to bottle **1** in any one of a plurality of different positions. Stop members **13** are integrally molded on surface **12** of cap **2** for engagement with the ends of any one of the threads **10** whereby the cap, when secured to the bottle, may be accurately brought into any one of a number of predetermined positions. A circumferential ridge, or projection, **14** is also molded beneath threads **10** for engagement with surface **12** whereby an airtight seal is formed between the bottle and cap.

Optionally, projection **14** may be proportioned to provide about .012 square inches of clearance space between the projection and surface **12**. This small clearance permits gradual expansion of the contents of the bottle as it warms up after being removed from the refrigerator without generating pressure within the bottle which would displace its contents. The clearance is so small, however, that the projection acts substantially as an airtight seal during the time that the bottle is compressed.

The details of the cap may now be considered. With further reference to Figure 3, it will be noted that the cap is formed of two parts **15** and **16** which are cemented together to form a unitary assembly. Part **15** includes a cylindrical downwardly extending portion **17**, the interior surface of which, **12**, includes threads **11**. A discharge channel **18** is molded partially in each of the parts **15** and **16** (see Figures 3 and 4) so that when the parts are assembled a flow channel is formed extending from a central cylindrical opening **19** in the cap to a discharge nozzle **20**.

Force-fitted in the cylindrical opening **19** is a feed tube

21 which depends from the cap and extends into the interior of the bottle, the lower end of the feed tube 22 almost touching the bottom of the bottle. The feed tube may be made from polyethylene or any other suitable material and, for simplicity, may be force-fitted into the cap.

For convenience of illustration, the bottle has been shown filled with liquid to a level indicated at 23. It should be noted that the liquid covers the lower end 22 of feed tube 21. Since the bottle is made from flexible material, force applied to its side walls will reduce its internal volume and compress air within space 24 above the liquid in the bottle, pressure thereby being applied to the surface of the liquid which is forced up through the feed tube 21 and through the discharge channel 18, the liquid eventually being discharged through nozzle 20. When the side walls of the bottle are released, a slight evacuation is produced in the bottle which induces a flow of air through the nozzle, discharge channel, and feed tube into the interior of the bottle. Thereafter, the walls of the bottle may again be compressed to eject more of the liquid stored within the bottle. Naturally, the amount of liquid ejected is a direct function of the amount of pressure exerted on the side walls of the bottle and the length of time that the pressure is applied.

As illustrated in Figures 2 and 3, the cap has been shown assembled to the bottle in such position that nozzle 20 overhangs end wall 5. In this position a drinking glass or other receptacle may be held closely adjacent end wall 5 to receive liquid ejected through nozzle 20. By virtue of threads 10 and 11 and the provision of stop member 13, the cap may also be assembled with the nozzle overhanging side walls 3 or 4 to suit the fancy and convenience of the user. By virtue of the provision of projection 14, an airtight seal may be formed between the cap and the bottle regardless of the assembled position of the cap.

The cross sectional shape of the bottle makes it particularly convenient for a person to grasp it and squeeze it with one hand while holding a glass to receive liquid from the bottle in the other hand. The shape of the bottle also facilitates its storage within a refrigerator, for instance in a shelf attached to the door of a refrigerator where the bottle will be most accessible.

The bottle and cap may be easily disassembled for cleaning purposes merely by unscrewing cap 2 from bottle 1. Since feed tube 21 is force-fitted in the cap, it may also be readily removed to facilitate cleaning. As will be understood, in view of the foregoing description, liquid can be easily poured into the bottle through throat 9 when the cap is removed.

Because of the flexibility of the bottle, liquid can be ejected from it regardless of the extent to which it is filled. Should the bottle be completely filled, pressure applied to its side walls will be directly transferred to the liquid which will be forced under pressure through the feed tube and out the nozzle, as has been explained.

Those skilled in the art will appreciate that the preferred embodiment of the invention provides a simple foolproof liquid container excellently adapted for storing liquids within a refrigerator and for dispensing any desired quantity. The simplicity of the design facilitates its use and makes it possible to easily fill the bottle and clean the assembly, as required.

Having described a preferred embodiment of our invention, we claim:

1. In combination, an upright flexible plastic water bottle, a threaded finish portion formed integrally with the top of said bottle, a hard plastic cap having an interior surface threadedly engaged with the threads of said finish portion, a continuous peripheral projection on said finish portion in substantial sealing engagement with the interior surface of said cap, and a feed tube secured to said cap and extending into said bottle, said cap defining a horizontal discharge channel in communication with said feed tube, and a downwardly directed nozzle in communication with the discharge channel whereby upon application of pressure to said bottle its contents will be ejected through said feed tube, discharge channel, and downwardly from said nozzle.

2. In combination in a liquid dispenser, a flexible bottle, a finish portion formed integrally with and projecting from the top of said bottle, a plurality of equally spaced interrupted thread portions projecting from the exterior of said finish portion, a relatively rigid cap, said cap defining a substantially cylindrical interior surface for surrounding said finish portion, a plurality of interrupted thread sections projecting inwardly from the cylindrical surface of said cap, said thread sections of said cap being engageable with said thread portions of said finish portion in any one of a predetermined number of positions determined by the orientation of said thread portions, a stop member formed integrally on and projecting inwardly from the cylindrical surface of said cap for engagement with any one of said thread portions to determine the relative position of said cap when threadedly secured to said bottle, a continuous peripheral ridge formed integrally with said finish portion and extending into substantial sealing engagement with the cylindrical surface of said cap below said thread sections, and a feed tube secured to said cap and extending into said bottle, said cap being formed to define a substantially horizontal discharge channel in communication with said feed tube and a downwardly directed discharge nozzle in communication with the discharge channel.

3. In combination in a liquid dispenser, a flexible multisided bottle, a finish portion formed integrally with and projecting from said bottle, a plurality of equally spaced interrupted threads projecting from the exterior of said finish portion in a preferred orientation relative to the sides of said bottle, a relatively rigid cap defining a substantially cylindrical interior surface for surrounding said finish portion, a plurality of interrupted threads projecting inwardly from the interior surface of said cap, said threads of said finish portion and said cap being engageable in any of a plurality of predetermined positions determined by the orientation of said threads on said finish portion, a feed tube secured to said cap and extending into said bottle, said cap being formed to define a discharge channel in communication with said feed tube and at its outer portion a downwardly directed nozzle in communication with the discharge channel, the nozzle having a preferred orientation to the threads of said cap and a rigid thread engaging stop member extending between said cap and said finish portion for determining the position of said cap when fully assembled on said bottle and positioning the nozzle immediately adjacent any one of the sides of said bottle.

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