June 13, 1967 K. HINZ 3,324,903

SYPHONS ADAPTED TO CONTAIN AND DISPENSE SODA WATER

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FIG. 1.

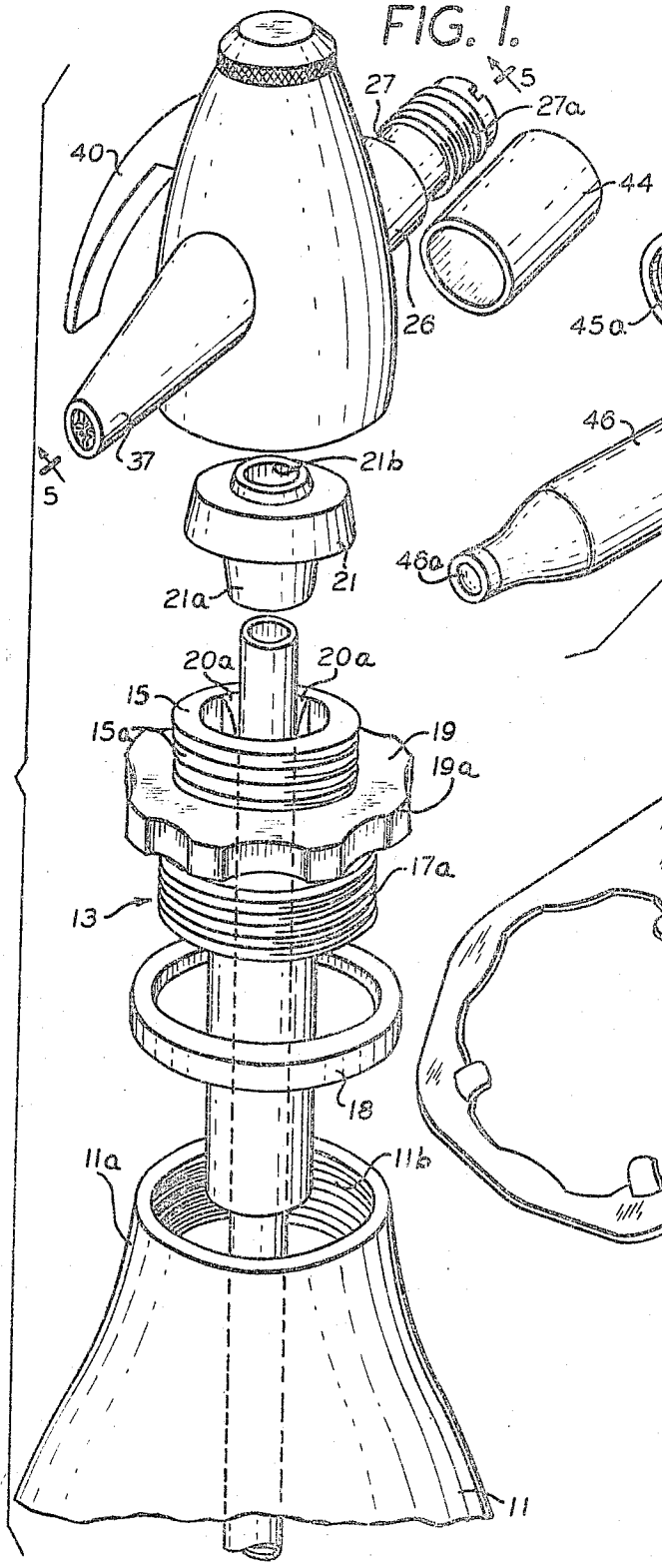


FIG. 2.

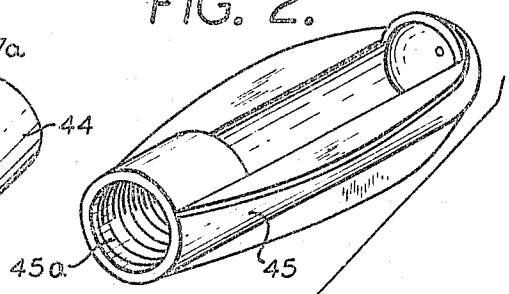


FIG. 6.

FIG. 7.

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FIG. 3.

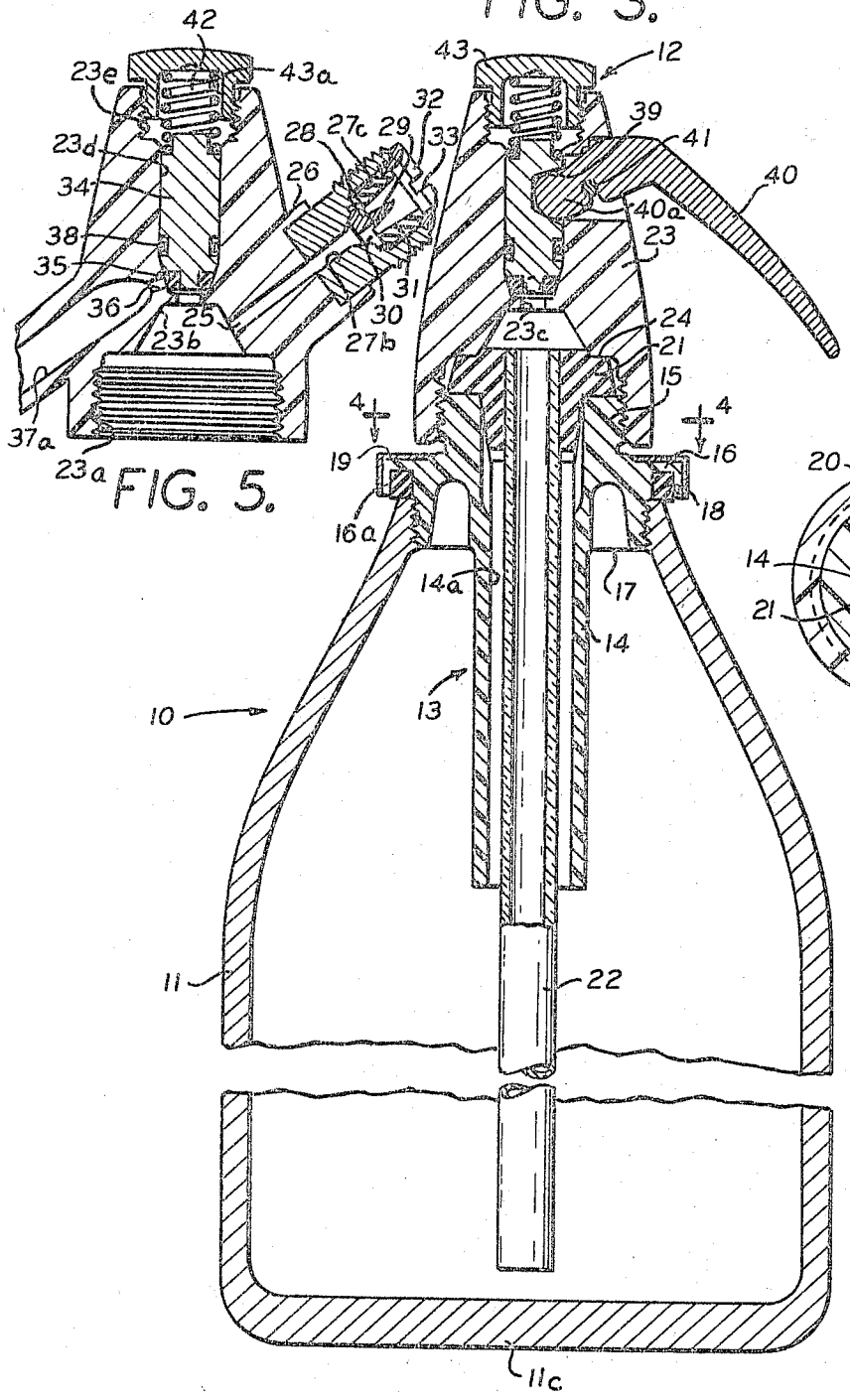
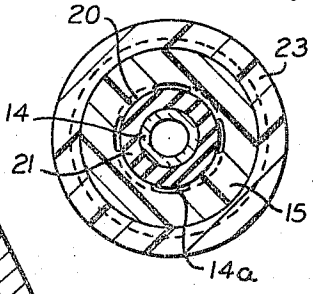


FIG. 5.

FIG. 4.



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3,324,903

SYPHONS ADAPTED TO CONTAIN AND DISPENSE SODA WATER

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6 Claims. (Cl. 141—17)

This invention relates to bottles or syphons adapted to contain and dispense soda water and like carbonated beverages under pressure.

It is an important object of the present invention to provide a novel and improved syphon construction for dispensing carbonated or soda water under pressure.

It is also an object of the present invention to provide a syphon of this type which is designed to be repeatedly charged in the home by the user with ordinary tap water, thereby to eliminate the need for and inconvenience of returning empty bottles to the bottler, periodic deliveries of filled bottles, and providing storage space for both filled and empty bottles between deliveries.

Another object of the present invention is the provision of such a syphon which is of highly simplified construction, is easy to take apart for cleaning and refilling and yet absolutely safe if properly assembled, and can be manufactured at relatively low cost so as to place it well within the means of the average consumer.

The foregoing and other objects of the present invention, as well as the characteristics and advantages thereof, will be more clearly understood from the following detailed description when read in conjunction with the accompanying drawings, in which:

FIG. 1 is a fragmentary, exploded, isometric view of a syphon constructed in accordance with the principles of the present invention;

FIG. 2 is a similar view of a gas-containing capsule and mounting attachment therefor designed for use with the syphon shown in FIG. 1;

FIG. 3 is a fragmentary, vertical sectional view of the syphon shown in FIG. 1, the view being taken in the plane of the valve control arm thereof;

FIG. 4 is a sectional view taken along the line 4—4 in FIG. 3;

FIG. 5 is a fragmentary sectional view taken along the line 5—5 in FIG. 1; and

FIGS. 6 and 7 are isometric plan views of two tools designed for use with the syphon shown in FIG. 1.

Referring now to FIGS. 1 and 3 to 5 in greater detail, it will be seen that the bottle or syphon **10** according to the present invention comprises a liquid-receiving vessel **11**, a valve and dispensing cap or syphon head **12**, and an intermediate member **13** which is removably secured to the vessel **11** and to which the head **12** is in turn removably secured. The intermediate member and the syphon head are preferably made of suitable rigid synthetic plastic materials, except for certain component parts thereof to be mentioned presently. The vessel **11** is preferably made of metal, e.g. steel, aluminum or the like, although it may also be made of suitably strong resinous materials capable of withstanding the internal pressures to which the bottle will be subjected during use. The vessel **11** is narrowed adjacent its uppermost end to define a neck **11***a* in which are provided internal threads **11***b*.

As clearly shown in FIGS. 1 and 3, the intermediate member **13** comprises a main tubular body **14** which is provided adjacent its upper end with an enlarged diameter portion **15** having external threads **15***a*, and with a radially outwardly extending rim **16** terminating in an outer downward flange **16***a*. An annular skirt **17** having external threads **17***a* extends downwardly from the lower surface of the rim **16** radially inwardly of the flange **16***a*, and the outer diameter of the threaded portion of this skirt is such that it can be screwed into the neck of the vessel **11**. A rubber or like sealing ring **18** is securely fitted into the groove defined between the flange **16***a* and the skirt **17**.

Inasmuch as the entire member **13** is preferably molded as a one-piece unit of a suitable synthetic plastic resinous material, a metal cap **19**, preferably of stainless steel, is tightly fitted over the rim **16** and flange **16***a*. In the illustrated embodiment of the invention, the cap **19** is essentially octagonal in outline with slightly inwardly curved sides **19***a*, the general outer dimensions and contours of the cap matching the inner contours of an opening provided in the head of a wrench-like tool W (see FIG. 6).

Within the confines of the enlarged portion **15**, approximately, the interior bore **14***a* of the tubular body **14** is slightly enlarged and provided with equidistantly peripherally spaced ribs **20** (see FIG. 4) the uppermost end regions of which diverge outwardly of the bore, as shown at **20***a* (see FIG. 1). These ridges define the seat for the correspondingly tapered portion **21***a* of a stopper or plug **21** of sealing material having a central bore **21***b* into which is tightly fitted an elongated glass tube **22** which is of sufficient length (see FIG. 3) to extend to a location substantially adjacent the bottom **11***c* of the vessel **11**.

The syphon head **12** comprises an essentially frustoconical member **23** which is axially bore throughout its length. The lowermost portion **23***a* of this bore is internally threaded (see FIG. 5) and of such a diameter as to permit the member **23** to be screwed onto the section **15** of the member **13**. The portion **23***b* of the bore in the member **23** is narrowed and defines a downwardly facing shoulder **24** adapted to engage the upper peripheral edge of the stopper or plug **21** so as to press the same down into tight sealing relationship with the uppermost end of the portion **15** of the member **13**. The portion **23***b* of the bore immediately above the shoulder **24** communicates at one side with a passageway **25** extending at an upward slant through the wall of the member **23** and into a lateral projection **26** within which is fixedly retained a metal block **27** provided adjacent its outermost end with external threads **27***a*. The block has an axial bore **27***b* which communicates at one end with the bore **25** and at its other end with an enlarged recess **27***c* essentially coextensive with the threaded portion **27***a* thereof. The outermost end region of the recess **27***c* is provided with internal threads.

Seated in the bottom of this recess is a metal disc **28** having a sharp pointed projection **29** extending axially upwardly therefrom. A groove or recess **30** is formed in the disc **28** and projection **29** at one side thereof, establishing communication between the area at the upper face of the disc and the bore **27***b*. The upper face of the disc **28** is peripherally engaged by one end of a sleeve-shaped sealing ring or gasket **31** which is retained in place by an annular metal ring or sleeve **32** screwed into the outermost end region of the recess **27***c* and bearing against the other end of the sealing ring. The sleeve **32** is provided with a pair of diametrically opposed slots **33** at its outermost edge for insertion of a key or screwdriver-like tool K (see FIG. 7).

The bore portion **23***b* of the member **23** further communicates through an axially narrowed bore portion **23***c* with an enlarged bore portion **23***d* within which is slidably disposed a valve body **34** the lowermost end of which is adapted to seat against the annular shoulder bounding the narrowed bore portion **23***c*. Adjacent this end the valve body **34** carries an annular gasket or sealing ring **35** which, when the body is in its lowermost position,

seats against the surrounding wall of the bore portion **23***d* and seals off the inlet end of a lateral bore **36**. The latter extends at a downward slant from the bore portion **23***d* and communicates at its other end with an enlarged bore **37***a* of a nozzle **37** extending downwardly from the side of the member **23** opposite the location of the projection **26**.

The valve body **34**, which also carries in an annular recess an auxiliary sealing ring **38** slidably engaging the wall of the bore portion **23***d*, is provided at one side intermediate the plane of the axes of the projection **26** and nozzle **37** with a recess **39** into which extends the nose **40***a* of an operating arm **40** rockably mounted in the member **23** by means of a pin **41**. Bearing against the uppermost end of the valve body **34** is one end of a compression spring **42** the opposite end of which is received within an axial recess **43***a* of a cap member **43** screwed into the uppermost end of an enlarged internally threaded terminal portion **23***c* of the bore in the member **23** so as to cause the spring normally to bias the valve body to its lowermost position sealing the entrance to the nozzle **37**.

When it is desired to ready the syphon for use, the head **12** is first unscrewed from the intermediate member **13**, and the plug **21** and glass tube **22** are then removed from the member **13**. Care should be taken to ensure that the member **13** is securely and tightly screwed into the vessel **11**, with the sealing ring **18** in fluid-tight engagement with the top shoulder of the neck **11***a* of the vessel **11**, for which purpose the wrench-type tool W shown in FIG. 6 may be employed. The vessel **11** is then filled with ordinary cold tap water through the bore **14***a* of the tubular body **14** of the member **13** until the level of the water is approximately even with the bottom end of the skirt **17**, which can be judged from above by noting when the level of water in the tube **14** is essentially up to the lowermost end of the enlarged portion of the bore **14***a*. The glass tube and plug are now reinserted into the intermediate member **13** as shown, and the member **23** tightly screwed onto the enlarged portion **15** of the member **13**.

A small cap **44** which normally covers the outermost end of the block **27** is now removed and a metal adapter frame **45** (see FIG. 2) having nested therein a capsule **46** containing carbon dioxide gas under high pressure is screwed by means of an internally threaded bushing **45***a* onto the block **27** until the forwardmost end closure **46***a* of the capsule within the confines of the bushing **45***a* engages the pin or nail-like projection **29** of the disc **28**. Upon further screwing of the adapter frame onto the block **27**, the said pin penetrates the end closure **46***a* of the capsule and enables the carbon dioxide gas to escape therefrom and flow through the slot **30** and bore **27***b*–**25** into the interior of the vessel **11** where it mixes with the water to transform the same into the desired carbonated or soda water. Leakage of the gas past the capsule is prevented by the pressing of the outer surface of the closure and neck of the capsule against the surrounding annular sleeve-shaped sealing member **31**. As the carbon dioxide enters the syphon, the latter should preferably be vigorously shaken in order to insure a proper mixing of the water and carbon dioxide.

It will be readily understood that whenever thereafter the arm **40** is depressed (clockwise as shown in FIG. 3), the valve body **34** is raised against the force of the spring **42**, establishing communication between the axial bore in the member **23** and the nozzle bore **36**–**37***a*, thereby permitting the carbonated water to be forced in the form of a jet-like stream out of the bottle through the tube **22** and the nozzle **37**. During a dispensing operation, of course, leakage of gas and/or liquid past the valve body **34** is inhibited by the sealing ring **38**, while at other times escape of fluid from the bottle through the nozzle is inhibited by the sealing ring **35**.

By virtue of the provision of the intermediate member **13**, the syphon according to the present invention is possessed of a number of advantages not found in known devices of this type. Thus, using such a member makes it possible to form the vessel **11** with a relatively wide neck without correspondingly increasing the size of the syphon head, whereas in the known syphons limiting the size of the head necessarily entails making the neck of the liquid-receiving vessel correspondingly small. This makes cleaning of the inside of the known syphons difficult, a drawback which is effectively avoided by the present invention. Moreover, due to the large neck opening, standard size ice cubes can be introduced into the vessel **11** of the syphon, which has heretofore not been possible with the known syphons. Also, the manufacture of the syphon is greatly simplified and rendered more economical, since due to the wide mouth the vessel can now be molded of metal or other suitable material as a single, unitary structure without seams and without the expense of welding together separately formed sections.

Although there has been described herein a preferred embodiment of the syphon according to the present invention, it is to be understood that the foregoing disclosure is for purposes of illustration only and that the construction according to the present invention is susceptible to modification in a number of ways none of which entails a departure from the spirit and scope of the present invention as defined in the hereto appended claims.

What is claimed is:

1. In a syphon for dispensing carbonated water under pressure and having a liquid-receiving vessel and a syphon head defining the closure for said vessel, and wherein said syphon head is provided with a normally closed valve controlling communication between the interior of said vessel and the outside and arranged to be manually opened, and with releasable means for securing to said head a pressurized gas-containing capsule and to place the latter into communication with the interior of said head; the improvement comprising an intermediate member interposed between said vessel and said syphon head, said intermediate member comprising a tubular body provided adjacent one of its ends with a peripheral outwardly extending transverse rim and having the outer diameter of that section extending from said one end to said rim enlarged with respect to the outer diameter of the remainder of said body, said rim having a peripheral outer flange and radially inwardly therefrom an annular externally threaded skirt both facing toward the other end of said body, the outer diameter of said skirt being substantially equal to the inner diameter of the mouth of said vessel, said vessel in the region of said mouth being internally threaded, a sealing ring disposed in the space between said skirt and flange for contact with the top rim of said vessel upon screwing of said skirt into said mouth, and an elongated open-ended tube having an outer diameter which is smaller than the inner diameter of said body, said tube being mounted at said one end of said body in fluid-tight relation thereto and extending therethrough into close proximity with the bottom of said vessel, said section of said body being externally threaded, and said syphon head having an internally threaded bore section at its bottom end to permit it to be screwed onto said section of said body.

2. In a syphon for dispensing carbonated water under pressure and having a liquid-receiving vessel and a syphon head defining the closure for said vessel, and wherein said syphon head is provided with a normally closed valve controlling communication between the interior of said vessel and the outside and arranged to be manually opened, and with releasable means for securing to said head a pressurized gas-containing capsule and to place the latter into communication with the interior of said head; the improvement comprising an intermediate member interposed between said vessel and said syphon head, said intermediate member comprising a tubular body pro-

vided adjacent one of its ends with a peripheral outwardly extending transverse rim and having the outer diameter of that section extending from said one end to said rim enlarged with respect to the outer diameter of the remainder of said body, said rim having a peripheral outer flange and radially inwardly therefrom an annular externally threaded skirt both facing toward the other end of said body, the outer diameter of said skirt being substantially equal to the inner diameter of the mouth of said vessel, said vessel in the region of said mouth being internally threaded, a sealing ring disposed in the space between said skirt and flange for fluid-tight contact with the top rim of said vessel upon screwing of said skirt into said mouth, an elongated open-ended tube having an outer diameter which is smaller than the inner diameter of said body, and an annular stopper of sealing material surrounding said tube at one end thereof, said stopper being seated on said one end of said body, with said tube extending through and beyond said other end of said body into close proximity with the bottom of said vessel, said section of said body being externally threaded, and said syphon head having an internally threaded shouldered bore section at its bottom end to permit it to be screwed

onto said section of said body so as to press said stopper fluid-tightly against said one end of said body.

3. In a syphon according to claim 2; said rim, flange and skirt of said intermediate member being integral with said body.

4. In a syphon according to claim 3; said intermediate body being molded of synthetic resinous material.

5. In a syphon according to claim 2; said outer diameter of said section of said body being smaller than said outer diameter of said skirt.

6. In a syphon according to claim 2; the interior bore of said body being somewhat wider in the region of said section than in the remainder of said body, the juncture between the parts of said bore serving as an indication of the limit of filling of said vessel.

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