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"Dispensing of potable liquids"

This invention relates to improvements in or relating to the dispensing of potable liquids, such as mineral water, from large bottles made of a rigid material, such as glass or plastics material.

Mineral water is commonly supplied in large reusable glass bottles having a multi-litre capacity for communal use in buildings and other environments. Such large reusable glass bottles are environmentally more friendly than small disposable glass or plastics bottles.

Conventionally, controlled and hygienic dispensing of the mineral water from a large glass bottle is accomplished by supporting the bottle in a dispensing apparatus in an inverted position with its neck lowermost and dispensing the water under the effect of gravity through a valve arrangement which is attached to the neck of the bottle and enables ambient air to replace the dispensed water.

In some countries and environments, however, for economic and other reasons it has been the practice simply to store such large water bottles in an upright position and to pour the water from the bottles in the normal way as and when required. These large bottles, when full, are heavy and awkward to handle and this can lead to the water being spilled and wasted. Moreover, the bottle closure may intentionally or inadvertently not be replaced after use, thereby exposing the remaining water in the bottle to the possibility of airborne contamination, especially where the bottle is used in open air conditions.

It is an object of the invention to enable a potable liquid, such as water, to be readily and hygienically dispensed from such a large bottle whilst the bottle remains in the upright position.

Accordingly, the present invention provides a dispenser for dispensing potable liquid from a bottle disposed in the upright position, comprising a manually operable air pump for pumping air into the bottle through a one-way valve and a pressurising tube, in which dispenser the pump is mounted on a casing assembly for attachment to the neck of the bottle to support the pump above the neck of the bottle with the pressurising tube extending sealingly into the bottle through a bore in a stopper received in the neck of the bottle, and a liquid outlet tap is mounted on the casing assembly in communication with the interior of the bottle for controllably dispensing liquid from the bottle after pressurisation of the bottle by operation of the air pump.

In an embodiment of the invention the casing assembly comprises a casing body on which the pump and the liquid outlet tap are mounted, and an adapter for detachably mounting the casing body on the neck of the bottle.

Conveniently, the adapter of the casing assembly comprises a pair of jaw members for connection together around the neck of the bottle to clamp the neck therebetween and the casing body comprises releasable mounting means for mounting the casing body on the assembled adapter.

Preferably, the releasable mounting means on the casing body comprise downwardly depending latching members

for engaging complementary latching elements on the adapter.

Desirably, the liquid outlet tap is connected to the pressurising tube for dispensing liquid from the bottle through the said pressurising tube.

In order that the invention may be more readily understood, an embodiment thereof will now be described, by way of example, with reference to the accompanying drawings, in which:

Figure 1 is a perspective view of the upper part of a mineral water bottle fitted with a dispenser embodying the present invention;

Figure 2 is a cross-sectional view through a mineral water bottle fitted with the dispenser shown in Figure 1;

Figure 3 is a cross-sectional view through an upper part of the dispenser shown in Figures 1 and 2;

Figure 4 is a plan view of one jaw of an adapter of the dispenser;

Figure 5 is an underneath of the adapter jaw shown in Figure 4;

Figure 6 is a side view of the adapter jaw shown in Figures 4 and 5.

Figure 7 is a cross-sectional view on the line A-A of Figure 4; and

Figure 8 is a cross-sectional view on the line B-B of Figure 6.

Referring firstly to Figures 1 and 2, a dispensing apparatus 1 for dispensing mineral water from a large multi-litre glass bottle 2 standing in the upright position comprises a casing assembly having a moulded plastics casing body 3 which is attached by an adapter 4 to the neck 5 of the bottle 2.

An air pump 6, is mounted on the casing body 3 and is manually operable to pump air into the interior of the bottle 2 through a pressurizing tube 7 which sealingly extends through a bore 8 in a resilient bottle closure 9 inserted in the neck of the bottle 2. The closure 9 may be made of rubberised plastics material, such as "Santoprene". Within the casing body 3, the tube 7 is connected by a branch tube (not shown) to a liquid outlet tap 10 which can be opened and closed by an operating lever 11.

The air pump 6 of the dispenser 1 is shown in more detail in Figure 3.

As shown, in Figure 3 the pump 6 is mounted on a horizontal top wall 14 of an upwardly projecting hollow boss 15 formed on the upper surface of the casing body 3. The top wall 14 of the boss 15 is formed with a central upwardly open cylindrical socket 16 which projects downwardly from the wall 14 into the casing body 3. The bottom end of the socket 16 has an opening therein which communicates with the tube 7 which extends downwardly from the bottom end of the socket 16 and is formed integrally with the socket 16.

A one-way valve 17 is sealingly fitted in the cylindrical socket 16 from above and comprises a cylindrical valve body 18 provided at one end with an annular flange 19 which abuts the upper end of the socket 16 when the valve 17 is fully inserted in the socket 16. The valve body 18 defines a passage 19 extending through the socket 16, which passage houses a valve member 20 which is biased by a spring 21 into a closed position in which the valve member 20 seals the passage 19.

The pump 6 comprises a piston 22 having a head 23, an outer skirt 24 which is fixed at its lower end to the top wall 14 of the boss 15 so as to enclose the socket 16 and one-way valve 17, and an inner cylindrical skirt 25 which is concentric with the outer skirt 24 and has its lower end spaced above the top wall 14 of the boss 15. The interior of the inner skirt 25 communicates via a passage 26 in the piston head 23 with the interior of a movable cylinder 27 which is slidably received on the outer skirt 24 of the piston 22 and has an enlarged head 28 by which the cylinder 27 may be gripped and reciprocated on the piston 22. The head 23 of the piston 22 is formed with an annular recess 29 which defines a flexible diaphragm 30 and which accommodates a sealing ring 31 for forming a seal between the inside surface of the cylinder 27 and the outside surface of the piston 22.

The flexible diaphragm 30 allows air to enter the interior of the cylinder 27 when the cylinder is moved upwardly on the piston 22 but applies a sealing force to the sealing ring 31 to prevent air escaping past the sealing ring when the cylinder is moved downwardly, so that air compressed by the movement of the cylinder is forced through the passage 26 into the skirt 25, through the valve 17 and tube 7 into the bottle 2.

A circular air filter 32 is disposed between the bottom end of the inner skirt 25 of the piston 22 and the flange 19 of the one-way valve 17 and serves to filter the air pumped into the bottle 2 by the pump 6.

The casing body 3 is detachably mounted on the neck 5 of the bottle 2 by means of the adapter 4 which is shown in more detail in Figures 5 to 8.

The adapter 4 comprises a pair of co-operating identical jaws 35, which may be moulded from glass-filled nylon and one of which is illustrated in Figures 5 to 8. Each jaw 35 comprises an elongated body 36 formed with a central semi-circular aperture 37 dimensioned to receive and engage the neck 5 of the bottle 2 whereby, when the two jaws 35 are assembled together around the neck 5 of the bottle 2, the assembled adapter 4 grips the neck of the bottle.

At each longitudinal end of the jaw 35 the upper surface 38 of the jaw body 36 is formed with an upstanding lip 39 formed with an outwardly projecting protuberance 40 preventing a stop surface 41. The body 36 is also formed with a pair of fixing apertures 42 for receiving fastening elements (not shown) to connect the two jaws of the assembled adapter 4 together around the neck 5 of the bottle 2.

The casing body 3 has downwardly projecting latches 43, 44 formed with abutment surfaces for resiliently engaging behind the stop surfaces 41 of the protuberances 40, 42 to secure the casing body 3 to the assembled adapter 4 and thereby detachably mount the casing body on the neck of the bottle.

In operation of the dispensing apparatus, the cylinder 27 is manually reciprocated on the piston 22, thereby pumping air through the air filter 31, the one-way valve 17 and the tube 7 into the bottle 2 to build up air pressure in the bottle 2. With the water in the bottle thus under pressure, operation of the lever 11 of the outlet tap 10 enables water to be dispensed under pressure through the tube 7 and the outlet tap 10, the one-way valve 17 preventing the water from entering the pump 6 from the tube 7.

**CLAIMS:**

1. A dispenser for dispensing potable liquid from a bottle disposed in the upright position, comprising a manually operable air pump for pumping air into the bottle through a one-way valve and a pressurising tube, in which dispenser the pump is mounted on a casing assembly for attachment to the neck of the bottle to support the pump above the neck of the bottle with the pressurising tube extending sealingly into the bottle through a bore in a stopper received in the neck of the bottle, and a liquid outlet tap is mounted on the casing assembly in communication with the interior of the bottle for controllably dispensing liquid from the bottle after pressurisation of the bottle by operation of the air pump.
2. A dispenser according to claim 1, wherein the casing assembly comprises a casing body on which the pump and the liquid outlet tap are mounted, and an adapter for detachably mounting the casing body on the neck of the bottle.
3. A dispenser according to claim 2, wherein the adapter of the casing assembly comprises a pair of jaw members for connection together around the neck of the bottle to clamp the neck therebetween and the casing body comprises releasable mounting means for mounting the casing body on the assembled adapter.
4. A dispenser according to claim 3, wherein the releasable mounting means on the casing body comprise downwardly depending latching members for engaging complementary latching elements on the adapter.



5. A dispenser according to claim 4, wherein the latching elements on the adapter comprise protuberances on the jaw members defining stop surfaces and the latching members on the casing body comprise projections defining abutment surfaces engageable with the stop surfaces of the protuberances.
6. A dispenser according to any preceding claim, wherein the liquid outlet tap is connected to the pressurising tube for dispensing liquid from the bottle through the said pressuring tube.
7. A dispenser for dispensing potable liquid from a bottle disposed in the upright position substantially as hereinbefore described with reference to the accompanying drawings.
8. Any novel feature or combination of features described herein.