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[54] **PORTABLE FLUID CONTAINER**
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330

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ABSTRACT: A portable fluid container comprises a cylindrical housing with a gas induction means at the bottom thereof including a needle and a detachable cartridge holder which is capable of being threadably engaged on a valve socket of the gas induction means to cause the needle to pierce a cartridge carried by the holder and cause introduction into the housing of a pressure fluid contained within the cartridge. A cover is threadably mounted on the housing and carries a nozzle and a valve actuator by which the contents of the container can be dispensed.

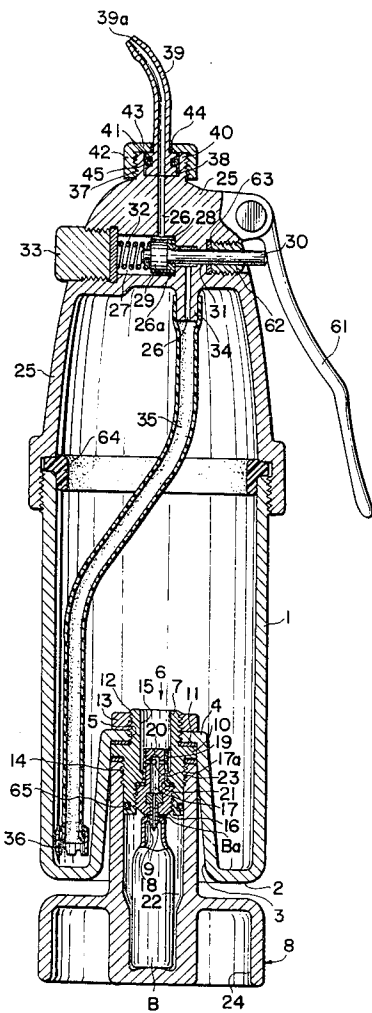


FIG. 1

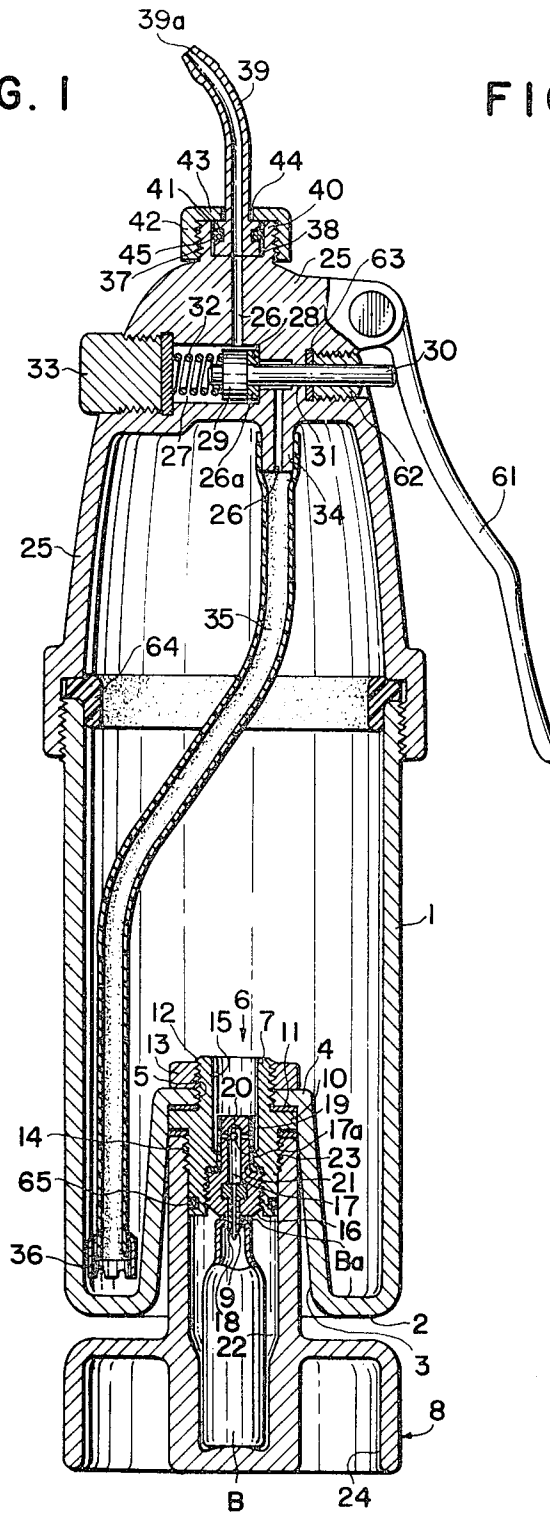
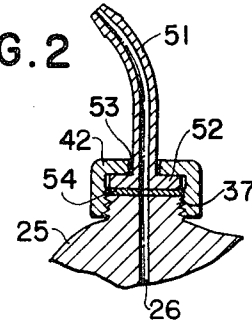


FIG. 2



PORTABLE FLUID CONTAINER

This invention relates to a portable fluid container. One of the objects of this invention is to provide a container intended to directly induct a pressure gas of a sterilizer, insecticide, aromatic agent or cleanser into a housing by attaching a pressure cartridge on the lower side thereof and, after buffering the gas stream in the housing, to eject said gas through a nozzle at any time by operating a valve. Another object of this invention is to provide a container adapted to check counterflow of ejecting gas from the cartridge to the housing by the provision of a simple check valve in the gas passage. Still another object of the invention is to provide a container which will forcibly deliver a liquid previously put in the housing, such as sterilizer, insecticide, aromatic agent or cleaner, by the pressure of a gas in the cartridge attached on the lower side of the housing. Another object of this invention is to provide a container in which liquid within the housing sufficiently absorbs effective constituents contained in the inducted gas by ejecting the same into the liquid within the housing. Another object of this invention is to make the fluid-ejecting direction freely changeable by placing the nozzle freely rotationally at a fixed position. Still another object is to provide a container which is portable and conveniently used.

A preferred embodiment of this invention is described below in detail with reference to the accompanying drawing, in which;

FIG. 1 is a longitudinal sectional view of a container in accordance with a preferred embodiment of this invention; and

FIG. 2 is a longitudinal sectional view showing another embodiment of the nozzle section thereof.

In FIG. 1, reference numeral 1 indicates a housing opened at its upper end, 2 a bottom wall thereof, 3 a recessed portion formed in said bottom wall 2, said recessed portion 3 having a ceiling 4 which is provided with a through-hole 5. Numeral 6 indicates a gas induction device which is provided on said ceiling 4. In the embodiment disclosed, the gas induction device consists of a valve socket 7, cartridge holder 8 and needle 9. The valve socket 7 includes an annular flange 10 adapted to be abutted against the lower side of the ceiling 4 through a packing member 11 placed therebetween, an upper externally threaded portion 12 extended upwardly through the hole 5 and engaged with a fixing nut 13 to secure said valve socket 7 on the ceiling 4, and also includes a lower externally threaded portion 14 on which the cartridge holder 8 is threadedly mounted. The valve socket 7 is also provided with an axial hole 15, at the bottom end of which the needle seat 16 is screwed in for holding the needle 9 to break the sealing plate Ba of the cartridge B. The needle seat 16 is also provided with a gas vent 17 communicating with a gas vent 18 in the needle 9. A gas passage 17a from the gas vent 17 of the needle seat 16 to the axial hole 15 is normally closed by a check valve 19. In the embodiment disclosed, the check valve 19 is shown formed of a resilient, T-shaped cylindrical member adapted to be fitted over the reduced-diameter portion 20 of the needle seat 16. This check valve 19 is also fitted in a reduced-diameter portion 21 being sealing within the axial hole 15 of the socket 7. The tee head of the check valve 19 is hermetically clamped between the bottom face of the reduced-diameter portion 21 and the shouldered portion of the needle seat 16. Alternatively, the gas vent 17 may be opened at the axially upper end at which the valve 19 may be disposed. The cartridge holder 8 comprises a cartridge-accommodating case 22 having at its upper opened end an internally threaded portion 23 for screwing in the threaded portion 14 of the socket 7, and a holding ring 24 integral with the case 22. Thus, upon rotation of the holding ring 24, the cartridge B may move upward with the result that the sealing plate thereof is broken by the needle 9 and then gas in the cartridge is ejected into the container.

Reference numeral 25 indicates a head screwed in freely removably fashions in the upper end portion of the housing 1 for closing the top opening thereof. This head 25 is provided with a fluid passage 26 to open the interior of the container to the atmosphere, a part 26a of which passage is used in com-

mon with the valve casing 27, and the such part 26a is provided with the valve seat 28 for freely movably inserting the valve 29 into the valve casing 27. A valve stem 30 is arranged to protrude outside the head 25 through a through-hole 31 communicating with the valve casing 27, and the valve 29 is given a tendency to seat normally on the valve seat 28 by means of a spring 32 provided between a screwplug 33, screwed in the left end of the valve casing 27, and the valve 29. Numeral 34 indicates the inwardly protruded part of the fluid passage 26, whereto a flexible tube 35 ready for using the container for liquid is closely fitted. The opening portion of the bottom end of said tube 35 is extended to the lower part inside the housing 1 by providing a weight 36 as occasion demands. Numeral 37 indicates the outwardly protruded part of the fluid passage 26, the outer periphery of which is threaded and enlarged to form a concave cavity 38 on this part. Numeral 39 indicates a nozzle, the tip 39a of which is curved with a certain angle with respect to its longitudinal line, the bottom part of which is provided with an connecting portion 40 having an enlarged outside diameter smaller than the inside diameter of the concave cavity 38, this connecting portion 40 being provided with an annular groove 41 on its outer periphery. Numeral 42 indicates a nut provided with an inwardly protruding flange 43 leaving the through-hole 44 of the inside diameter slightly larger than the outside diameter of the nozzle 39. This nut 42 is screwed on the threaded portion of the protruded part 37 of the fluid passage 26 in a freely detachable manner. After an O-ring 45 has been fitted into the annular groove 41 on the outer periphery of the connecting portion 40 of the nozzle 39, and the connecting portion 40 has been loosely fitted into the concave cavity 38, the nozzle 39 is attached to the head 25 at the predetermined position by screwing the nut 42 on the protruded part 37, so as to freely rotate through 360° around the vertical axis.

Fig. 2 shows a modification of the gas induction device 6. A nozzle 51 has a flange 52 at its base, and the fluid passage 26 thereof is opened directly to the top face of the outwardly protruding part 37 of the head 25. The part 37 is threaded on its outer periphery, so that the nozzle 51 is securely fixed to the head 25 by passing the nozzle 51 through a through-hole 53 of the flanged nut 42, placing the flange 52 of the nozzle 51 on the top face of the outwardly protruding part 37 through a packing 54, and then threadedly tightening the nut 42. In such a position, the nozzle 51 is locked against rotation, but there is no trouble of leaking fluid from the outwardly protruding part 37.

Numeral 61 indicates a lever pivotally attached to the head 25, and the lever 61 is in engagement with an outer end of valve stem 30 and operated to open and close the valve 29. As a matter of course the valve stem 30 may well be directly operated by hand. Numeral 62 indicates a screwplug threadedly inserted in the through-hole 31 through a packing 63, 45 gasket, and 46 O-ring.

The container shown in the drawing is operated according to the following procedure:

The holder 8 is detached from the socket 7, and attached again after putting a fresh gas cartridge B into the accommodating case 22 with the sealing plate Ba up. In the case of using the container for ejecting a liquid, the head 25 is detached from the housing 1, and attached against by screwing the head 25 on the housing 1 after filling thereof with the liquid. During the screwing operation of the head 25 the tip of the needle 9 strikes against the sealing plate Ba, and breaks the same plate. Then, gas within the cartridge B escapes to the gas vent 17 through the gas vent 16 of the needle 9, and the valve 19 is opened under the pressure of the escaping gas, which is directly ejected within the housing 1, causing the pressure within the housing to rise. In the case of the existence of liquid within the housing 1, the gas is ejected directly into the liquid and gradually concentrates in the upper part within the head 25 thereby depressing the liquid level in the housing 1, so that the effective constituents contained in the gas are well absorbed by the liquid. With the valve stem 30 being

pushed in forcibly in opposition to the spring 32 by operating the lever 61, the valve 29 separates from the valve seat 28 to open the fluid passage 26 whereby the pressure gas passes through it and eventually is ejected out through the nozzle 39 or 51. When using a liquid, the liquid flows upwardly through the flexible tube 35 under the gas pressure, passes through the passage 26 and eventually is ejected out through the nozzle 39. Accordingly after the cartridge B is installed, the pressure fluid can be delivered out at any time. In such case, the direction of the liquid to be ejected can be freely changed through 360°. When the delivering operation of the liquid is finished, the cartridge B should be replaced with new one for use in the same operation as before.

It will be understood that this invention includes various changes or modifications of such containers without departing from the spirit and scope of this invention as defined in the appended claims.

What is claimed is:

1. A portable fluid container a cylindrical housing having an upper open end, a gas induction means on the bottom of the housing including a recessed portion with an aperture, a valve socket threaded in said aperture and protruding thereabove, said valve socket being open into said housing, locking means releasably engaging the protruding portion of the valve socket above said aperture, a needle seat threaded in said socket and having an opening therein leading to said valve socket, check valve means supported by said needle seat for permitting fluid flow only in the direction from said seat into the socket and

housing, a hollow needle in said seat, a cartridge holder threadable on said valve socket and carrying a cartridge of pressurized gas facing said needle such that by rotation of said holder said needle will pierce the cartridge, said holder including an external ring of substantially greater diameter than said valve socket, a cover mounted on said housing and having a passageway leading from the interior of the housing to the atmosphere, and valve means on said cover controlling the opening and closing of said passageway.

2. A container as claimed in claim 1 wherein said check valve comprises a resilient, cylindrical member fitted on said socket and covering the opening in said needle seat.

3. A container as claimed in claim 2 comprising a nozzle on said cover in communication with said passageway.

4. A container as claimed in claim 3 wherein said nozzle includes an integral portion of enlarged diameter, said cover being provided with a recess in which said portion of enlarged diameter is insertable, an annular sealing member between said cover and enlarged portion to permit 360° rotation of said nozzle in said recess while providing a seal, and a locking nut on said enlarged portion threadably engaged with said cover.

5. A container as claimed in claim 3 wherein said nozzle includes an integral enlarged portion for abutment with said cover, a seal between said cover and enlarged portion, and a locking nut on said enlarged portion threadably engaged with said cover.

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