

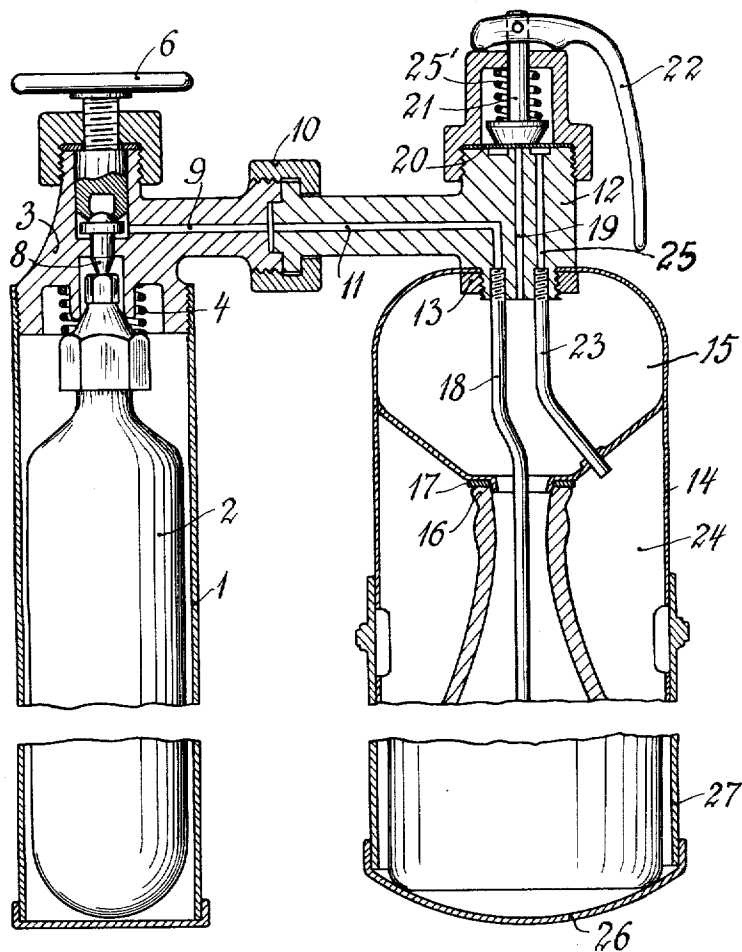
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H. ANDVIG

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SIPHON APPARATUS FOR IMPREGNATING LIQUIDS WITH CARBONIC ACID

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Inventor:
Hans Andvig
By E. F. Kenderoth
Att'y

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SIPHON APPARATUS FOR IMPREGNATING
LIQUIDS WITH CARBONIC ACID

Hans Andvig, Oslo, Norway

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1 Claim. (Cl. 226—69)

This invention relates to apparatus for use in the private home for aerating liquids at small costs and without material trouble.

It is already known to place a valve device 5 in the head of the container adapted to receive a carbonic acid bottle, for controlling the transfer of high pressure carbonic acid gas to a second container adapted to receive a bottle containing the liquid to be impregnated. It is also old to 10 connect the two containers together by means of a coupling. In this prior art arrangement it is customary to introduce the carbonic acid bottle into the first container from the bottom of the latter, and the carbonic acid gas is then passed to 15 the liquid-containing bottle by means of a pipe leading to a point just short of the bottom of the latter.

This construction possesses the disadvantage that the fluid motion in the impregnating or 20 liquid-containing bottle is not free, and consequently is not as turbulent as is desired in order to obtain effective impregnation. The further disadvantage exists that no provision is made for a safety mechanism against too high pressures. A still further disadvantage resident in 25 these prior art constructions resides in the fact that should the container for the carbonic acid bottle burst, as occurs from time to time, the comparatively expensive valve mechanism will also be damaged.

The present invention is directed to a construction in which the aforementioned disadvantages are avoided.

My new construction houses the mixing chamber in, and in direct connection with the impregnating or liquid-containing bottle. A safety 30 valve is connected to the mixing chamber, and the valve head of the bottle containing the carbonic acid gas is made as an independent part, in such manner that it may be readily placed 40 on a new container for the said bottle, should the original container burst for any reason whatsoever.

A preferred form of my new invention is illustrated by way of example in the attached drawing, wherein is depicted a sectional view of a container for a carbonic acid bottle and a 45 container for a liquid-containing bottle, the two containers being interconnected and in readiness for use.

Referring more particularly to the drawing, a first container 1 is adapted to receive a bottle 2 containing the carbonic acid gas, a valve head 3 being threaded or otherwise secured to the 55 container 1. A spring 4 disposed between the

neck 5 of the bottle 2 and the valve head 3 serves to position the bottle 2 resiliently in place with respect to the container 1. The bottle 2 is of course fully sealed by the manufacturer thereof in the usual manner, as for example by means 5 of the conventional metal disc secured tightly to the mouth of the bottle.

A needle 8 serves to puncture the cap on the bottle 2, and this needle is shown as fast to the spindle of a hand wheel 6, which spindle is 10 threaded or otherwise passed through a cap 7 on the valve head 3. By turning down the hand wheel 6 the cap on the bottle 2 is punctured by the needle 8, following which puncturing operation the contents of the bottle may be prevented 15 from escaping by means of the said needle 8 which now serves as a valve controlled by the hand wheel 6.

By slightly backing off the hand wheel 6 the needle 8 may be removed sufficiently from the 20 cap of the bottle 2, to permit the carbonic acid gas to pass through the bore 9 to a coupling piece 10, the gas then passing through the bore 11 of a head 12 of a second container 14, adapted to be impregnated. The passage of the gas is occasioned by the difference in pressure of the bottle 2 and that of the bottle containing the liquid to be aerated.

This container 14 is shown as provided with a mixing chamber 15, the lower part of which connects directly with the neck 16 of a bottle, an intermediate packing 17, preferably of rubber, being provided. The aforementioned bore 11 is shown as communicating with a removable pipe 18 communicating with the liquid in the bottle, 35 and terminating at one end in the head 12. This pipe 18 is shown as having a central bore communicating with the bottle 16 only at the bottom thereof, although of course the pipe 18 may if desired have perforations along its whole 40 length or a desired fraction thereof. As stated, this pipe 18 preferably extends to a point just short of the bottom of the bottle 16. The pipe 18 may also be provided with an interchangeable head. The head 12 is shown as having a bore 19, 45 closed at its upper end by means such as a diaphragm 20 and a cooperating piston 21, shown as biased by means such as a spring 25'. The piston 21 may be operated by a suitable lever 22, shown as pivoted on a nose contacting with the 50 top of the valve casing, for uncovering the bore 19.

The head 12 is also shown as provided with a bore 25, communicating through a pipe 23 with a chamber 24 disposed within the container 14 55

but outside of both the mixing chamber 15 and the bottle 16.

When using the device, the bottle 16, filled with water or other fluid, is placed in the container 14, at which time the neck of the bottle is forced tightly against the washer 17. The hand wheel 6 is then backed off (the cap of the bottle 2 having already been punctured by the needle 8) so that the needle 8 permits the passage of high pressure carbonic acid gas through the bores 9 and 11 and pipe 18 to the bottom of the bottle 16. The carbonic acid gas, passing upwardly through the bottle 16, forces the liquid into the mixing chamber 15. During this process any danger of the bottle bursting is avoided by the safety valve 21 which serves in part to reduce the pressure in the bottle and at the same time in part to increase the pressure in the chamber 24 outside of the bottle. The desired aeration is obtained partly by the mechanical mixing together of the liquid and gas in the mixing chamber 15 and in part by the absorption of the gas by the liquid while the latter is rising upwardly through the bottle into the mixing chamber. The result follows from this double action that the liquid is aerated better and in a shorter space of time than is possible with the prior art constructions, and in a small fraction of a minute the aeration is completed and the hand wheel 6 may be rotated to close the needle valve 8. Upon closure of the needle valve 8, the liquid contents of the mixing chamber 15 immediately return to the bottle 16, the carbonic acid gas which passes through the safety valve 21 being lost.

The next step in the impregnation of the liquid contents of the bottle 16 consists in opening the valve 21 by means of the handle 22, as a result of which the bottle 16 is connected with the chamber 24, so that the pressures are equalized and the pressure of the bottle 16 is quickly reduced to approximately atmospheric pressure due to leakage in the connection between the container 14 and its bottom part 27. This connection may then be loosened and the bottom 16 (into which the impregnated mixture in the chamber 15 has now moved back) may be removed from the container 14 so that the liquid may be used at once or the bottle may be provided with a closure cap. Due to the mechanical mixture of the water and the carbonic acid gas, and to the tendency of the latter to pass to the neck of the bottle, the interior pressure of the bottle would increase materially after the bottle has been sealed, so that the aerated liquid

content will be more active than is the case with most of the bottles of aerated liquid usually purchased on the market.

Should by any chance the containers 1 or 14 be destroyed for any reason, the solid and rather expensive top or valve part will very likely not be affected, even upon the occurrence of a severe shock as would be the case should the apparatus fall, for example, to a stone floor. As a consequence it ordinarily is unnecessary to replace the entire apparatus, it usually being sufficient to substitute only the containers 1, 2, and 14.

As shown, the chamber 15 is disposed as an integral part of the impregnating container 14. However, it is to be understood that if desired, this chamber 15 may be designed as a separate unit adapted to be received in an interchangeable mixing chamber.

To facilitate the positioning of the bottle 16, the bottom 26 of the container 14 is shown as connected to the lower wall 27 of the latter by suitable means such as a bayonet-joint.

The device disclosed may be used as a siphon by providing the mixing chamber 15 with an outlet pipe and a control valve therefor, this outlet pipe and valve preferably being displaceable in nature, so that it may be removed when the apparatus is used for impregnating liquids in bottles.

It is of course readily apparent that once the broad aspects of my invention are disclosed, numerous modifications and adaptations will at once occur to those skilled in the art. Accordingly, I intend that my invention be limited only by the scope of the appended claim.

I claim:

In an apparatus for impregnating liquids with carbonic acid, a container for receiving a carbonic acid bottle, a removable head for said container, a combined piercing device and closing valve in said head for puncturing the head of the carbonic acid bottle and for sealing the same, a second or impregnating container divided into two chambers, one for housing the fluid to be impregnated, and the second for mixing said fluid with carbonic acid, a removable head connected with said second container, means for connecting the heads of the containers, a pipe connecting through said heads with the carbonic acid bottle, for leading the carbonic acid supply to the interior of said second container, and means for releasing the gas from the first or mixing chamber.

HANS ANDVIG.