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(54) Beverage dispensing method and device.

(57) A method and device for the dispensing of drinks, particularly carbonated soft drink beverages. One or more filled containers (20,74), having an outlet opening (20a,74a) and a deformable wall, are enclosed within a pressure vessel (18,70,90) with a dispensing valve (26,108,110,112) communicating with the containers. Pressurized fluid is introduced into the pressure vessel (18,70,90) so that when the discharge valve (26,108,110,112) is opened, the wall of the container (20,74) is squeezed, thereby expelling its contents. The containers are normally family size, soft drink plastic bottles. The device is suitable for use in private homes, offices and commercial places.

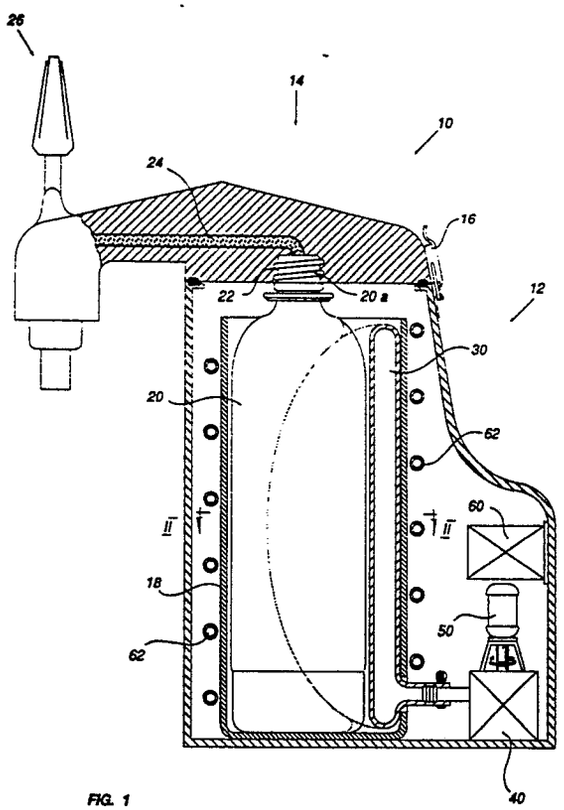

FIG. 1

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BEVERAGES DISPENSING METHOD AND DEVICE

BACKGROUND OF THE INVENTION

The present invention relates to liquid dispensers, mainly applicable for the dispensing of carbonated soft drinks, e.g. for homes, offices, restaurants, bars and the like.

The major problem encountered in dispensing carbonated beverages, such as Coca Cola (TM) or beer, is the reduction of the CO2 or other gas mixture concentration dissolved therein, which adversely effects its effervescent quality, and therefore the taste of the beverage.

The same problem exists, with the consumption of the contents of a family size bottle in the home, in that if the contents are not consumed in one go, i.e. the bottle is opened and closed several times, the beverage becomes flat and unappetising.

Commercially available carbonated beverages dispensers necessarily require the use of a CO2 pressurized reservoir, in the form of a pressurized vessel, which is used either to originally prepare the beverage by admixing syrups, water and the gas -- or, in other installations, to keep the dissolved gas concentration up to the desired level.

Such installations involve considerable logistic problems as well as complexity of construction; furthermore, the use of pressurized gas vessels and the need to introduce additional quantities of gas into the liquid, often cause serious problems of foaming during the dispensing of the beverage into cups; the problem of the contents of a single bottle losing its effervescent characteristic by piecemeal consumption remains as yet unsolved.

It is thus the major object of the invention to provide a method of dispensing carbonated liquids, mainly beverages, such as soda water, Coca Cola (TM) or beer, while avoiding the drawbacks of the conventional installations.

It is a further object of the invention to dispense the carbonated liquids without the occurrence of foaming of the beverage as encountered in the conventional installations.

It is a still further object of the invention to provide refrigerating means, integrally incorporated in the dispensing installation, for dispensing the beverage at an appropriate low temperature.

It is a still further object of the invention to provide a dispensing device readily adapted to supply more than one sort or brand of carbonated drink.

SUMMARY OF THE INVENTION

According to one aspect of the present invention there is provided a method for the dispensing of liquids, particularly carbonated beverages, comprising the steps of filling the liquid into one or more containers each having an outlet opening and a deformable wall; enclosing the container within a pressure vessel, with the opening communicating with a dispensing valve; introducing pressurized fluid into the vessel for squeezing the wall of the container and thereby expelling the liquid when the discharge valve is opened.

The said fluid is preferably liquid which is cooled by an appropriate cooling system.

The dispensing of the liquid from the said container(s) is effected either intermediate an inflatable cushion provided within the pressure vessel, or directly by pneumatic or hydrostatic pressure of air or liquid, respectively, maintained within said pressure vessel.

According to another aspect of the invention, a liquid dispensing device is provided comprising a pressure vessel with a removable cover, one or more containers of the liquid being accommodated-ed within the vessel, the containers having a deformable wall and an opening in communication with a dispensing valve, and means for introducing pressurized fluid into the vessel, so that when the valve is opened the liquid is expelled by squeezing the wall of the container and discharged through the valve.

The pressure vessel can accommodate containers storing different makes or brands of liquid, each selectively dispensed by its respective discharging valve.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more readily understood in the light of the ensuing description of a few preferred embodiments of the invention, given by way of example only, with reference to the accompanying drawings, wherein -

Fig. 1 is a schematic, longitudinal cross-sectional view of a device featuring the principles of the present invention according to one embodiment thereof employing an inflatable air cushion;

Fig. 2 is a section taken along line II-II of Fig. 1;

Fig. 3 is a diagram of the pressure system of the device of Fig. 1;

Fig. 4 is a diagram of the electrical system of the device of Fig. 1;

Fig. 5 is a diagram of the refrigerating sys-

tem of the device of Fig. 1;

Fig. 6 illustrates direct use of pneumatic/hydraulic pressure for squeezing a container within a pressure vessel according to a second embodiment of the invention;

Fig. 7 is a schematic, cross-sectional view of a pressure vessel containing a plurality of family-size, soft-drink bottles;

Fig. 8 is a section taken along line VIII-VIII of Fig. 7;

Fig. 9 is a section taken along line IX-IX of Fig. 7; and

Fig. 10 illustrates a produceable, self-contained dispenser device accommodating bottles of three different tastes.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The dispensing device, generally denoted 10 in Fig. 1 comprises a base housing portion denoted 12 and a removable head or top housing portion 14, mounted onto and sealed against the base portion 12, e.g. by clasps 16 (only one being shown).

A cylindrical, open top jacket 18 is provided within the base 12 sized to accommodate an ordinary, family size plastic bottle 20 with its screw threaded neck portion 20a received within a female screw threaded depression 22 formed in the otherwise solid structure of the head 14.

Further comprised in the head 14 is a passage 24 leading from the depression 22 (i.e. communicating with the interior of the bottle 20) to a manipulatable dispensing valve or tap denoted 26, of any suitable type.

Within the cylindrical jacket 18, a crescent-shaped, elastic, inflatable air cushion or balloon 30 is enclosed. The cushion 30, preferably of rubber, is generally elongated and of a height substantially equal to the height of the cylindrical body portion of the bottle 20.

As further schematically shown in Fig. 1, the air cushion 30 is connected to a compressor unit 40, driven by an electric motor 50; and there is further provided a refrigeration system generally denoted 60, incorporating a cooler spiral pipe 62 surrounding the jacket 18. Preferred design details of the pneumatic, electrical and cooling systems will be given below with reference to Figs. 3, 4 and 5, respectively.

The major characteristic feature of the invention will now be readily understood, namely, that after loading the device 10 with the bottle 20, and upon inflating the cushion 30 by air pressure charged thereinto by the compressor 40, and opening the valve 26, the bottle 20 will become crimped due to its readily deformable thin plastic wall, as shown in broken lines in Figs. 1 and 2. The deformation pressure, controlled by pressostat 51 (see Fig. 4), is necessarily higher than the CO_2 vapour pressure prevailing within the bottle 20.

It is thus made clear that dispensing the contents of the bottle 20, via the passage 24 by opening the valve 26, does not involve a change of the pressure within the bottle 20 or along the passage 24; this feature is most important, particularly in the case of easily foamable beverages such as Diet Coca Cola (TM) and beer, to prevent the frothing up of the beverage, as described in the preamble hereto.

As can be readily understood, the beverage can thus be intermittently consumed, without any deterioration of its quality as far as its dissolved CO_2 concentration is concerned, and is supplied cool by the operation of the refrigeration system 60.

Once exhausted, exchanging of the bottle is easily performed by removing the head 14 (after deflating the air cushion 30, and releasing the clasps 16), unthreading the collapsed, flattened bottle, opening a new bottle and threading its head into the depression 22, and reassembling the unit.

In Fig. 3, a preferred embodiment of the pneumatic system is diagramatically represented. Thus, the rubber air cushion 30 is connected to the compressor 40 intermediate line 41. A selector valve 42 is provided, operable from outside the housing 12, for selectively admitting/relieving the pressure into/from the cushion 30 via passage ways 42a, 42b, respectively. Further provided are manometer 43, pressure accumulator 44, safety relief valve 45, and pressure regulating switch 51 - all according to well known design considerations and practice in equivalent systems and therefore need not be described in more detail.

Fig. 4 diagramatically illustrates the electrical system of the device of Fig. 1, comprising the compressor motor 50, the pressostat 51, and the refrigerator 60, connected by plug 53 to a power supply. Optionally, if the dispensing device 10 is designed to be self-contained and portable, for outdoor use at picnics or in the automobile, a chargeable battery 52 may be added.

Fig. 5 diagramatically shows the components of the refrigerating system 60, which comprises besides the compressor 63 and the cooling spiral 62, condenser 64, expansion valve 65 and refrigerant gas reservoir 66.

It should be noted that rather than pneumatically compacting the container 20, i.e. by inflating the air cushion 30, the device may be hydraulically operated in an analagous manner by filling the housing base portion 12 with water and applying air pressure above the water level. This concept is

further developed in the embodiments of Figs. 6 and 7-9.

In the embodiment of Fig. 6 there is shown a housing 70 in any suitable form, say cylindrical or prismatic, to which there is releasably mounted a head 72. Within the housing 70 there is accommodated a container 74 made of plastic or other yieldable sheet material, with nipple 74a suitably insertable in a self-sealing fashion through opening 72a, as shown. A slidable valve spool 76 is provided, having a first passage 76a and a second passage 76b, adapted to be manipulated into one or other extreme positions such that the passages are either in communication with pressure fluid inlet port 78 and discharge or dispensing passage 80 -- or disconnected therefrom. The pressure inlet port 78 is connected to a hydraulic or pneumatic pressurized fluid source (not shown), constituted by a water pump (or even the municipal water mains), or an air compressor.

When the spool 76 is switched over to its communicating state (in the righthand direction), pressure is introduced, via passage 76b, into the housing 70, for compacting the beverage container 74, whilst passage 76a becomes open for the discharge of the liquid contents under the applied hydrostatic pressure.

In Figs. 7 - 9 a further developed embodiment of the device is illustrated, designed for use with ordinary plastic bottled, soft drinks. There is provided a pressure vessel 90 with an openable lid 92, which may be sealed against the inner side of the top opening of the vessel 90 by screw tightened closing devices designated 94, of a known design. The vessel 90 contains three pairs of family size soft drinks bottles, denoted A1 and A2, B1 and B2, C1 and C2, connected to each other by brackets 96, 98, 100. The brackets are provided with female screw threaded recesses configured to receive the mouths of the bottles, thereby establishing communication therebetween, as clearly shown with respect to the bottles A1 and A2 and the bracket 96. The brackets are connected to their respective dispensing taps, namely bracket 96, via quick coupling 97 and line 102 to tap 108, and so forth.

The vessel 90 is filled with water, and charged with pressurized air by a compressor unit 114, as schematically shown. Under the constantly maintained hydrostatic pressure of the water, each one of the bottles tends to become squeezed, such that its contents can be discharged through its respective valves 108 - 112 when opened. In this manner, a plurality of soft drinks of different tastes can be dispensed by one and the same device, a readily achieved overall appearance and structure of which being exemplified in Fig. 10.

Again, the main advantages of the invention as hereinbefore detailed are plainly achieved. No external CO_2 source is required to maintain the carbonated beverage under pressure; complete exhaustion of the bottles is ensured; and cooling of the drinks can be readily included in the manner analagous to that exemplified in the embodiment of Fig. 1.

Exchanging of bottles once emptied involves the relief of the pressure from the vessel 90, disconnecting the coupling, and retrieving the used, compacted bottles with their common bracket for replacement by a pair of fresh, full bottles.

Thus achieved are effective, simple and low-cost method and device particularly for dispensing carbonated soft drinks, in the form of a neat unit that can be stored for use in private houses, offices and commercial places, rendering redundant the heretofore regarded indispensible use of pressurized CO_2 vessels and entailed complicated installation and logistics.

Furthermore, the introduction of these devices into the market will boost the sale of the family size bottles, a goal long strived for by the soft drinks producers.

Those skilled in the art will readily appreciate that many variations, modifications and changes may be applied to the invention as herein exemplified without departing from its scope as defined in and by the appended claims.

Claims

1. A method for the dispensing of liquids, particularly carbonated beverages, comprising the steps of:

(a) filling the liquid into one or more containers (20,74) each having an outlet opening (20a,74a) and a deformable wall;

(b) enclosing the container (20,74) within a pressure vessel (18,70,90), with the opening (20a,74a) communicating with a dispensing valve (26,108,110,112);

(c) introducing pressurized fluid into the vessel (18,70, 90) for squeezing the wall of the container (20,74) and thereby expelling the liquid when the discharge valve (18,108,110,112) is opened.

2. A method as claimed in Claim 1 wherein the said fluid is air.

3. A method as claimed in Claim 1 wherein the said fluid is a liquid.

4. A method as claimed in Claim 3 comprising the further step of cooling the liquid.

5. A method as claimed in Claim 4 wherein the liquid is cooled by heat exchanging conduits (62) of a refrigeration system (60).

6. A method as claimed in Claim 1 wherein the pressurized fluid is introduced into an elastic, inflatable cushion (30) provided within the pressure ves-

sel (18), so that the container (20) becomes squeezed by the cushion wall when inflated.

7. A method as claimed in Claim 1 wherein the container (20) is a regular, family size carbonated soft drink plastic bottle.

8. A method as claimed in Claim 7 wherein two or more bottles (20) are provided, each containing a different kind of soft drink, and connected to respective dispensing valves (108,110,112).

9. A method as claimed in Claim 7 wherein two or more bottles (20) are provided within the vessel with their mouths connected in parallel to the same respective valve (108,110,112).

10. A liquid dispensing device, particularly for carbonated beverages, comprising a pressure vessel (18,70,90) with a removable cover (14,72,92), one or more containers (20) of the liquid being accommodated within the vessel, the containers (20,74) having a deformable wall and an opening (20a,74a), a dispensing valve (26,108,110,112) in communication with the opening, and means for introducing pressurized fluid into the vessel (18,70,90), so that when the valve (26,108,110,112) is opened the liquid is expelled by squeezing the wall of the container (20,74), and discharged through the valve (26,108,110,112).

11. A device as claimed in Claim 10 further comprising a refrigerating system (60) for cooling the liquid.

12. A device (14) as claimed in Claim 11 wherein the refrigerating system (60) comprises a cooler pipe (62) spiraling around the container(s).

13. A device as claimed in Claim 10 wherein the pressurized fluid is introduced into an elastic, inflatable cushion (30).

14. A device as claimed in Claim 10 wherein the container (20) is regular, family size, carbonated soft drink plastic bottle.

15. A device as claimed in Claim 14, two or more bottles (20) being provided, each containing a different tasting soft drink and connected to a respective dispensing valve (108,110,112).

16. A device as claimed in Claim 14 wherein two or more bottles (20) are provided within the vessel with their mouths connected in parallel to the same valve (108,110,112).

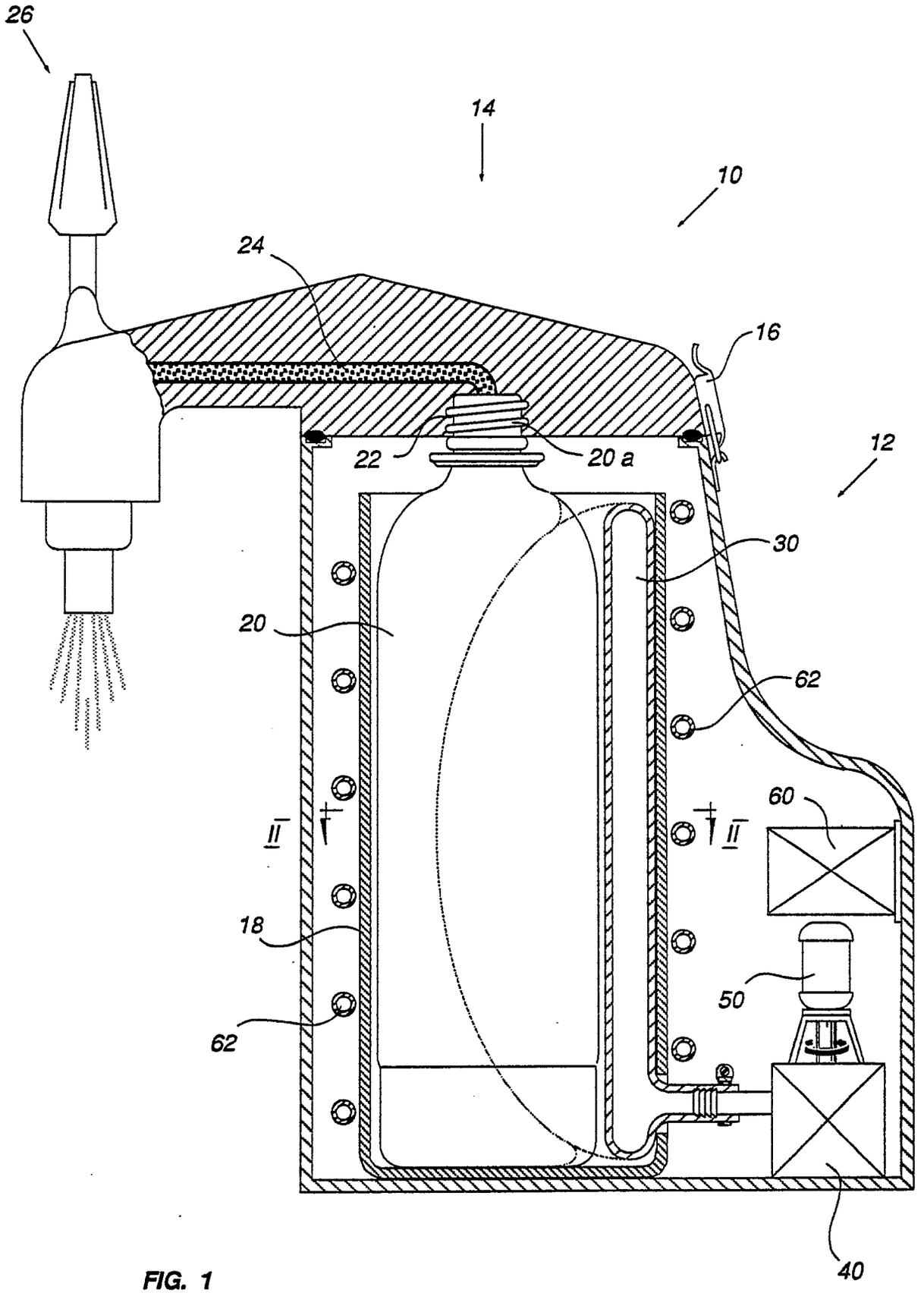

FIG. 1

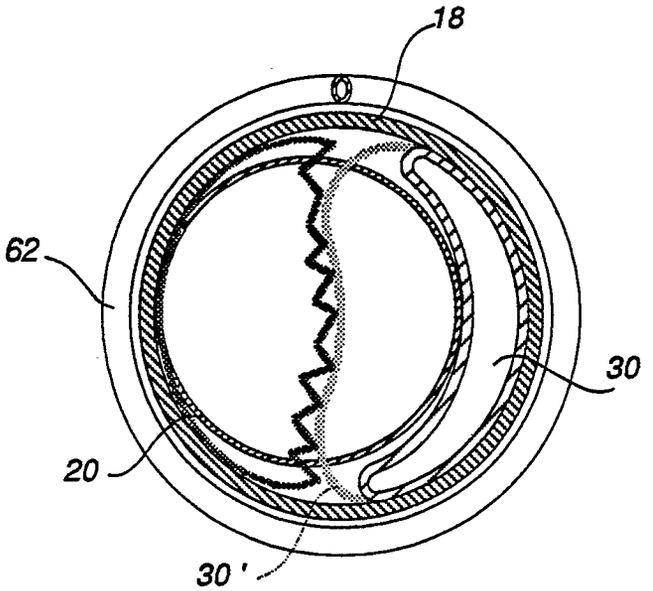

FIG. 2

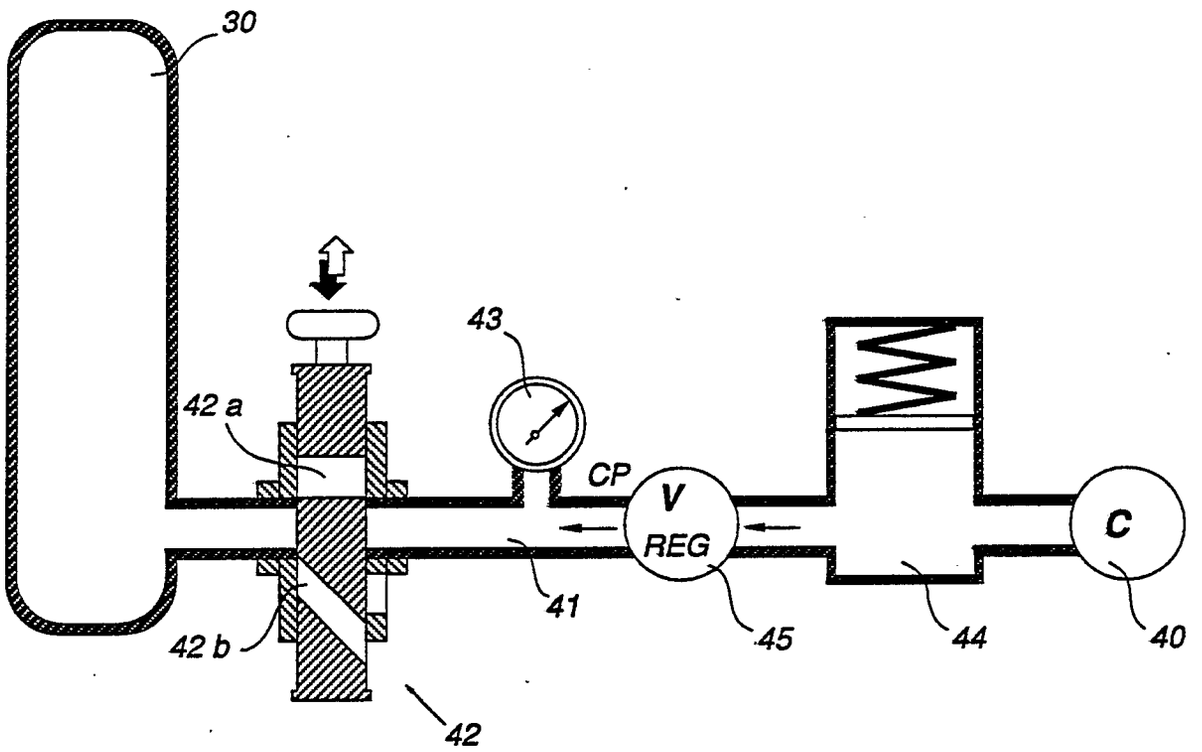

FIG. 3

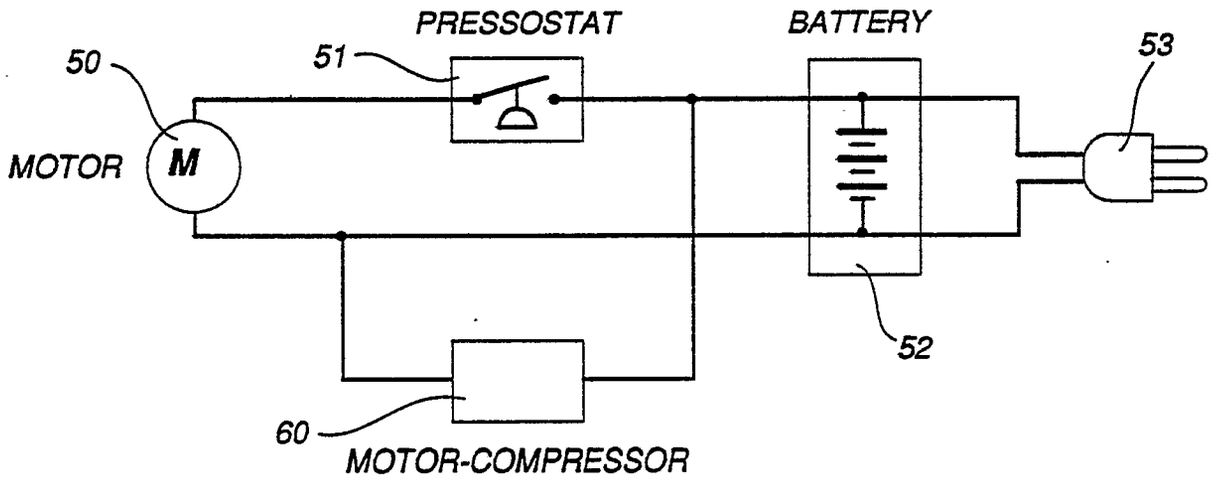
PRESSOSTAT
BATTERY
50
51
53
MOTOR
M
52
60
MOTOR-COMPRESSOR

FIG. 4

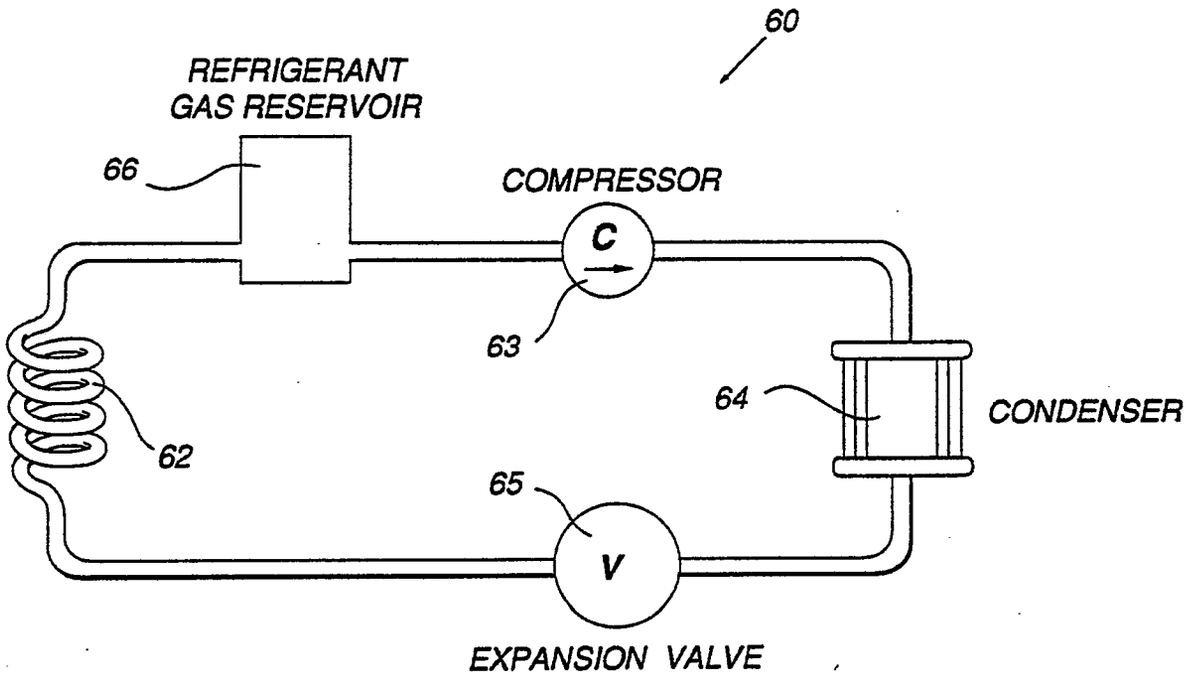
60
REFRIGERANT
GAS RESERVOIR
66
COMPRESSOR
C
63
64
CONDENSER
62
65
V
EXPANSION VALVE

FIG. 5

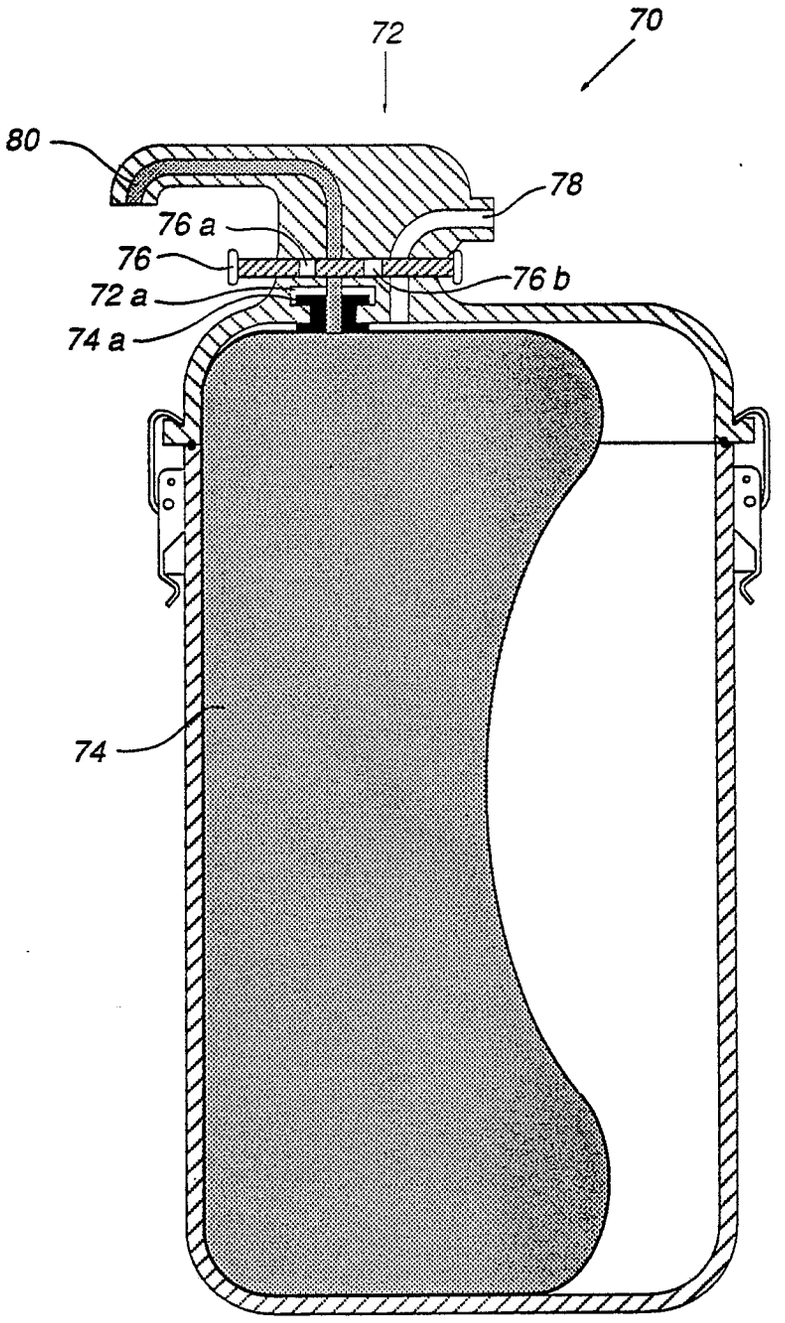

FIG. 6

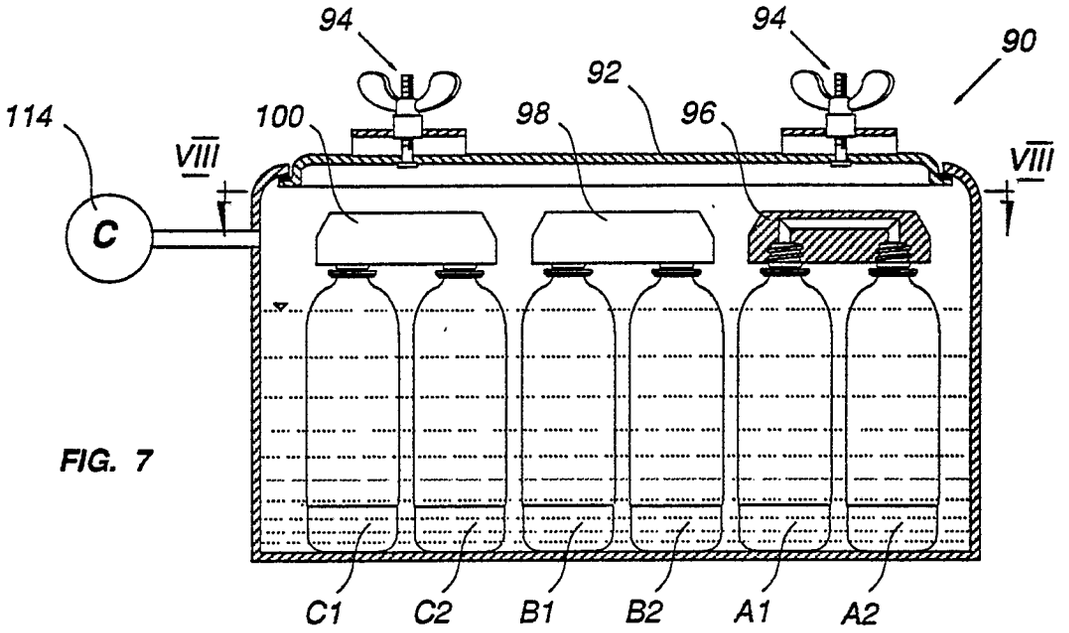

FIG. 7

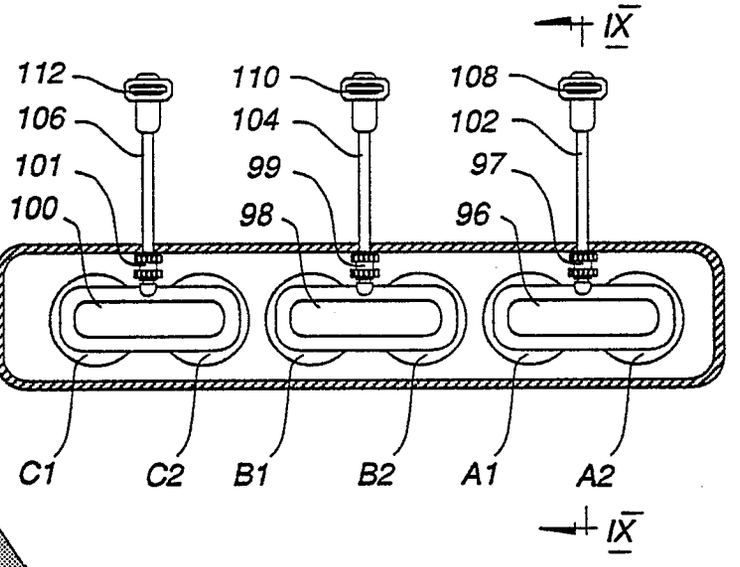

FIG. 8

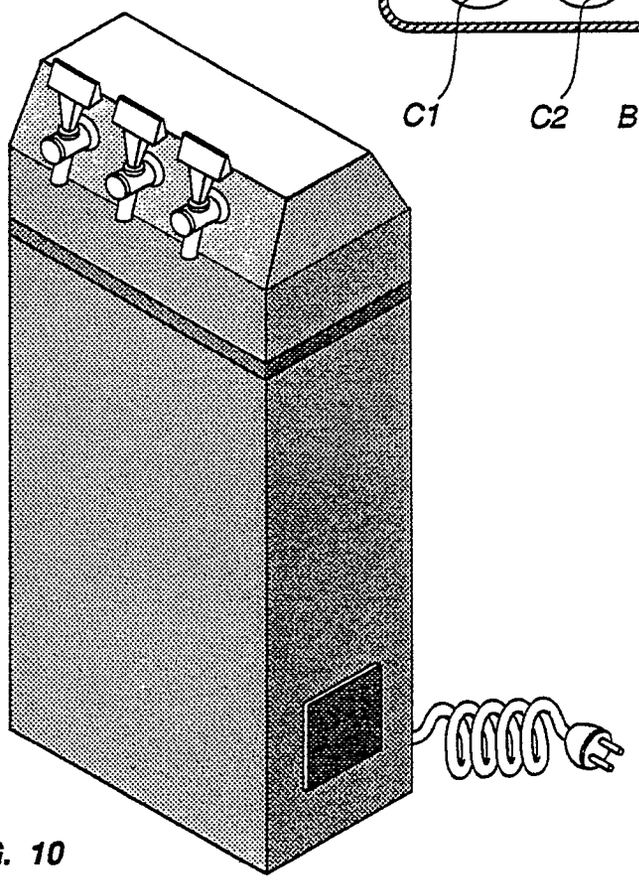

FIG. 10

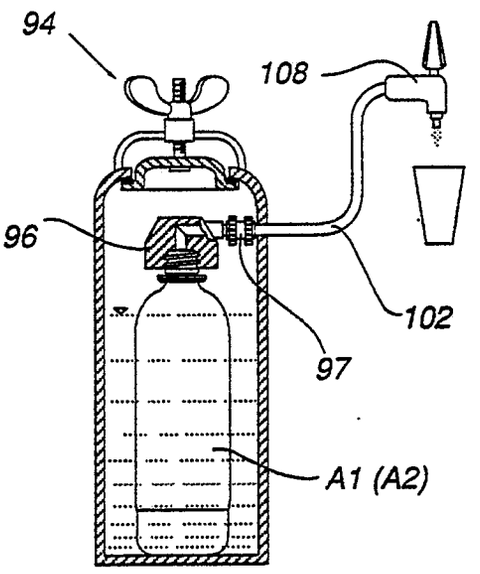

FIG. 9

European Patent Office

EUROPEAN SEARCH REPORT

Application Number

EP 89 12 3904

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl.5)
X	GB-A-2 146 705 (A. GUINNESS SON & CO.) * Figure 1; page 3, line 101 - page 4, line 54 *	1,2,10-12	B 67 D 1/04
Y		4,5,7-9,14-16	
X	GB-A-2 159 583 (DAWES) * Claims 1,4; figure 2 *	1,3,6,10,13	
Y		4,5	
Y	FR-A-2 607 109 (CASTANET) * Figure 1; claim 1 *	7-9,14-16	
X	CH-A- 365 964 (FIRMA W. ERNY) * Whole document *	1-3,6,10,13	
A	FR-A-2 411 318 (TOBELEM) * Figure 1; claims *	8,15	

TECHNICAL FIELDS SEARCHED (Int. Cl.5)

B 67 D
B 65 D

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	27-02-1990	DEUTSCH J.P.M.

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
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D : document cited in the application
L : document cited for other reasons

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