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Dispensing of beverages.

The invention proposes, in the dispensing of carbonated beverage from a closed container (12) through a tap (16), the progressive introduction of CO₂ into the free space above the surface of the beverage from a capsule (14) thereof, as dispensing proceeds, the added CO₂ maintaining carbonation of the beverage at a requisite level and facilitating dispensing of the beverage.

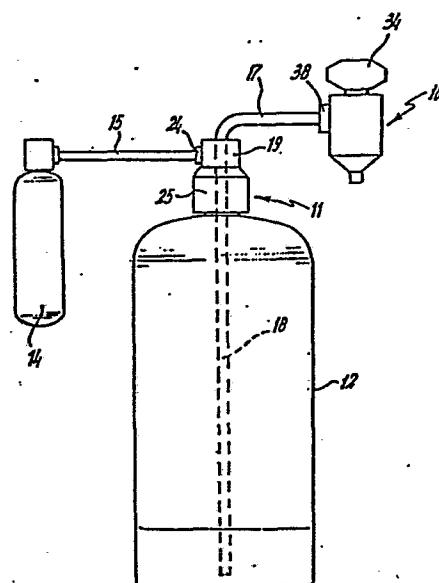


FIG. 1

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DISPENSING OF BEVERAGES

The invention concerns the dispensing of beverages,
and has particular, though not exclusive, reference to
the dispensing of carbonated beverages in the home.

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Over the past several years attempts have been made to
develop the retail sale of beer and wine in larger units
than hitherto, the most widely used package being one
comprising a bag of a synthetic plastics material supported
10 within a cardboard box of rectangular form, delivery
from the bag being through a manually actuatable tap. The
arrangement aforesaid is used in the context of wine and
of beer.

- 15 A more recent development has involved the provision of a
slider above a plastics bag supported in a cylindrical
container, the wall of the container being of cardboard
and the slider being movable axially of the container and
serving to place the contents of the bag under pressure.
20 Such a structure is used for beer.

Both of the structures aforesaid have met with wide acceptance, but they do suffer from the shortcoming that they cannot be used with highly gaseous beverages such as sparkling wines, gaseous beers and lager.

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A further recent development is the use of larger bottles, say of three or five litre capacity, in the retail sale of such gaseous beverages as lemonade, but difficulty is experienced in relation to such bottles in that the degree of carbonation of the contents of the bottle progressively reduces once the same is opened and the contents are utilised. In the event, unless the contents are used within a matter of days of the bottle first being opened, there is every likelihood that any remaining contents will go "flat".

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Furthermore, the very bulk of the larger capacity bottles makes difficult the pouring of the contents thereof in a controlled manner.

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The object of the present invention is to provide a means which makes more practical the use of large capacity containers, without the limitations of and difficulties inherent in conventional such containers.

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In one of its aspects the present invention proposes a method of dispensing beverage existing under pressure in a closed container through a dispense tap in fluid flow convection with the lower region of the said container via a small-bore tube, characterised by the progressive introduction of a pressurising/carbonating medium into the container to occupy the space above the free surface of the beverage as dispensing proceeds, the medium being supplied in an amount sufficient to maintain satisfactory dispensing.

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According to another aspect of the present invention there is proposed a beverage dispense system for use in practising the method aforesaid, said system comprising a container for the beverage, inlet means for the supply of
5 a pressurising/carbonating medium to the interior of the container and connectable with a supply of such medium, a dispense tap and a small bore tube connecting such tap with the lower region of the container.

10 According to a preferred feature, the container comprises a plastics bottle fabricated from polyethylene terephthalate (PET).

According to a further preferred feature, means are provided
15 for delivering pressurising/carbonating medium to a position intermediate the upper and lower ends of the interior of the container.

The invention will now be described further, by way of
20 example only, with reference to the accompanying drawings in which:-

Fig. 1 is a diagrammatic view of a beverage dispense system in accordance with the invention;

25 Fig. 2 is a cross-section through the bottle fitting as shown in Fig. 1; and

Fig. 3 is a cross-section through the tap embodied in the system shown in Fig. 1.

30 Referring now to the drawings, a dispense system for carbonated beverages, and particularly, though not exclusively, beverages having a high degree of carbonation, comprises a bottle fitting 11 applied to the neck of a large capacity polyethylene terephthalate bottle 12 containing the beverage,
35 the fitting having an inlet 13 in fluid flow connection with

a supply of carbonating medium provided by a CO₂ capsule 14 through feed line 15 and supporting a dispense tap 16 connected therewith by a delivery pipe 17.

- 5 Delivery pipe 17 exists as an extension to a smallbore tube 18 which reaches to the bottom of the bottle, tube 18 being of such bore and length, typically 2 mms and 30 cms respectively, as to provide a pressure drop between the interior of the bottle and atmosphere as will enable
10 satisfactory dispensing, notwithstanding high pressures, for example 2.5 bar, internally of the bottle.

- As an alternative, say in the context of a bottle wherein the height thereof is in excess of 30 cm, a tube of greater
15 bore, say 5 mm, may be used in conjunction with an auxiliary tube of the lesser internal diameter, the auxiliary tube being provided in coiled form and in fluid flow connection with the larger tube at any convenient location between the inlet orifice of the latter tube and
20 the tap outlet.

- Bottle fitting 11 is shown in greater detail in Fig.2, and will be seen to comprise a generally cylindrical body part 19 having a stepped through-bore 20 extending longitudinally
25 thereof, the upper end of bore 20 being screw-threaded to receive connection means, not shown, for delivery pipe 17 and the lower, reduced diameter, end receiving the small bore tube 18.

- 30 Inlet 13 is provided in the form of a transverse blind bore which connects with a small diameter, longitudinal blind bore 22 extending from the bottom face 23 of the body part 19, the outer end of the inlet being enlarged and screw-threaded to receive connection means 24 for inlet pipe 15.

- 35 Fitting 11 further includes a collar 25 for engagement with

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the threaded neck 26 of the bottle 12 and cooperable with an external flange 27 to the body part 19, a sealing ring 28 being interposed between the underside of such flange 27 and the annular end face of the bottle neck.

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Tap 16, see now Fig. 3, consists of a tubular body part 29 having a conical internal restriction 30 adjacent its lower end which defines a seating 31 for a valve member 32 supported by a valve stem 33, the valve stem 33 being
10 movable axially of the body part 29 by cam means, not shown, on actuation of handle 34 in an appropriate sense. The lower part of the valve stem 33 is in clearance in the body part 29 to define an annular space 35 therebetween, the annular space being sealed at its upper end by an O-ring
15 36 seated in a peripheral groove in a larger diameter upper region of the valve stem and the lower end of such space 35 being in fluid flow connection with the open end of the body part through the valve seating 31. The tubular body part 29 is provided with an inlet port 37 in register with the
20 annular space 35 to receive a fitting 38 (Fig.1) for delivery pipe 17.

On actuation of handle 34 in a requisite sense, the valve member 32 is lifted out of engagement with seating 31 to
25 allow flow of beverage from the bottle under the influence of the pressure existing within such bottle.

Conveniently, operation of the handle 34, flow of beverage through the tap, or the sensing of a pressure drop within the
30 bottle consequent upon dispensing will serve automatically to deliver a quantity of CO₂ from the capsule 14 to maintain the pressure within the bottle at a requisite level, means (not shown) appropriate to this being provided, although other means may be used to ensure that pressure internally
35 of the bottle is maintained at a level sufficient to maintain carbonation of the beverage and to effect dispensing. As an alternative to automatic means as aforesaid for delivering CO₂

to the space above the liquid in the container, manually
actuatable means may be provided for delivering a pulse of
CO₂ from the capsule to the container, such latter means
being actuated or not by the user on each dispense
5 operation.

The invention is not restricted to the exact features of the
embodiment hereindescribed, since alternative arrangements
will readily present themselves to one skilled in the art.

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Thus, for example, it may be preferred in some instances to
clamp the bottle fitting to the bottle neck, rather than to
rely upon a screw-threaded connection therebetween, the
attachment of the fitting being effected internally or
15 externally of the bottle neck, as preferred.

It is believed that by means of the invention the dispensing
of carbonated beverages, including such highly carbonated
beverages as lager beers, from plastics bottles of large
20 capacity of up to, say, ten litres can readily be effected,
and the deterioration of the contents of partly full bottles
of, for example, lemonade which presently is an encumbrance
to the more widespread acceptance of bottles of, say, three
litres capacity for reasons of economy is reduced or
25 eliminated.

More importantly, the invention makes realistic the sale of
such highly carbonated beverages as lager beers in containers
of the capacity herein mentioned.

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It is to be appreciated, however, that whilst the invention
is concerned primarily with the dispensing of carbonated
beverages, the 'make-up' medium being CO₂, the invention is
thought to be of application in the dispensing of non-

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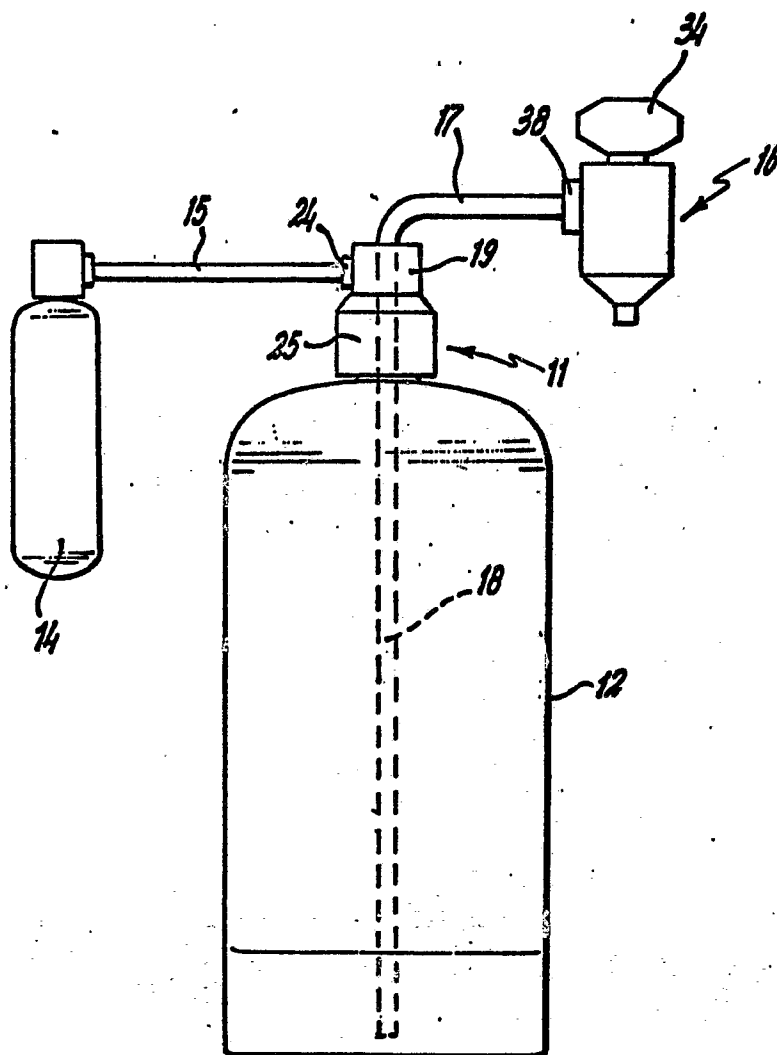
carbonated beverages, in which case the pressuring medium will
be, for example, nitrogen.

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CLAIMS

1. The method of dispensing beverage existing under pressure in a closed container through a dispense tap in fluid flow connection with the lower region of the said container via a small-bore tube, characterised by the progressive introduction of a pressurising/carbonating medium into the container to occupy the space above the free surface of the beverage as dispensing proceeds, the medium being supplied in an amount sufficient to maintain satisfactory dispensing.
2. A beverage dispense system for use in practising the method of claim 1, the system comprising a container for the beverage, inlet means for the supply of a pressurising/carbonating medium to the interior of the container and connectable with a supply of such medium, a dispense tap and a small bore tube connecting such tap with the lower region of the container.
3. The system as claimed in claim 1, wherein the container comprises a plastics bottle fabricated from polyethylene terephthalate.
4. The system as claimed in claim 2 or 3, wherein the small bore tube includes a portion of reduced diameter intermediate the ends thereof.
5. The system as claimed in claim 4, wherein the reduced diameter portion of the small-bore tube comprises a coil.
6. The system as claimed in any one of claims 2 to 5, including means sensitive to tap actuation or to beverage flow through the tap and adapted to control the said progressive introduction of medium into the container.

FIG. 1

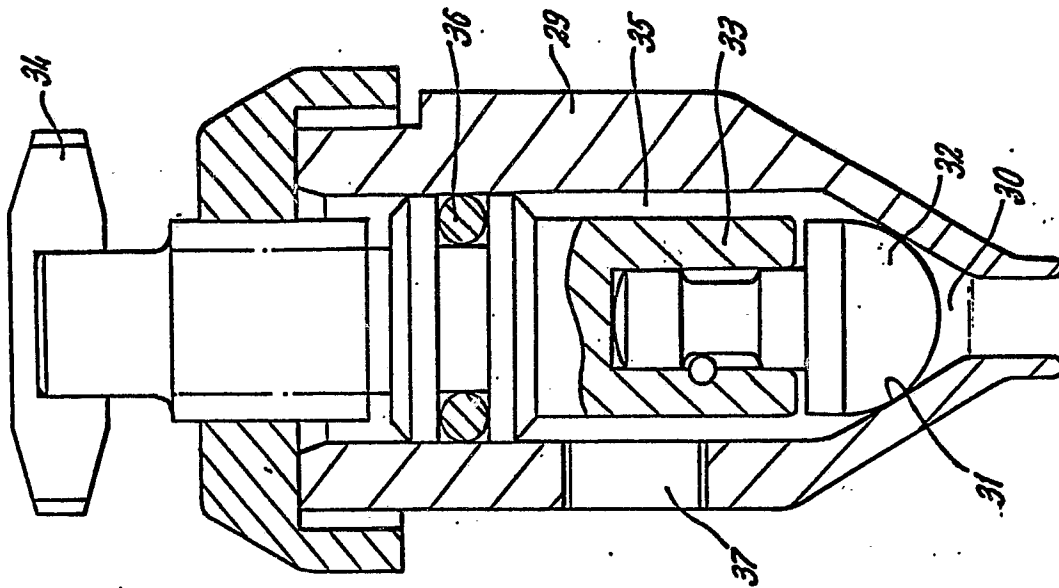


FIG. 3

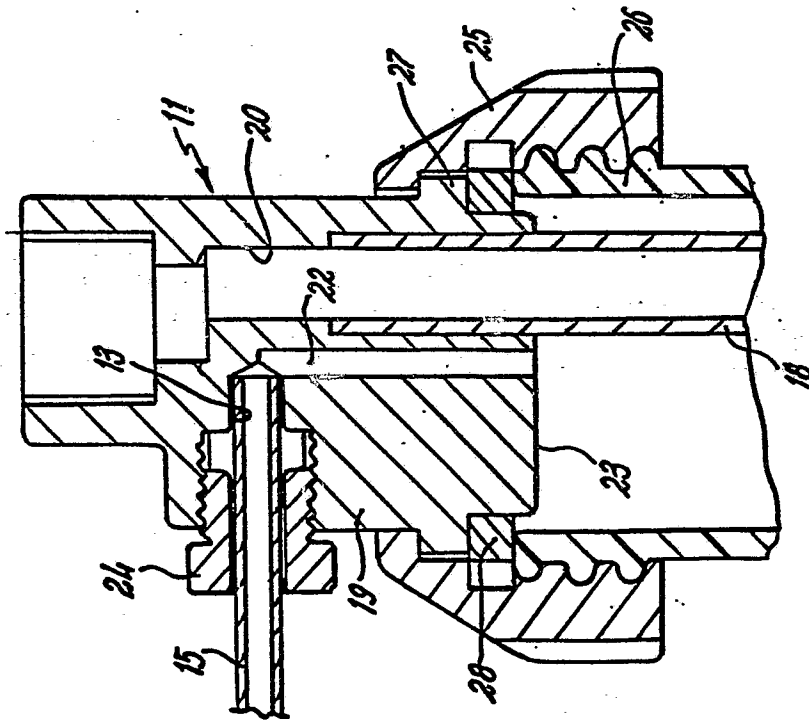


FIG. 2