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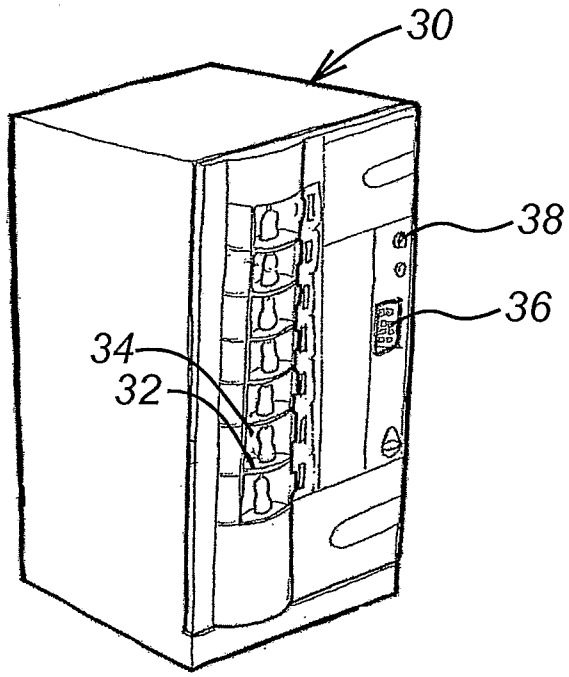
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(54) **Title:** DISPENSER FOR FILLING AND DISPLAYING BEVERAGE CONTAINERS



(57) **Abstract:** A beverage dispenser comprising: a storage unit (42) for storing a plurality of empty or partially empty containers (1, 15, 54); a filling unit for injecting a liquid into the said containers to produce filled containers; an enclosed display unit for displaying one or more of the filled containers prior to dispensing; a transfer mechanism for transferring the containers from the storage unit to the filling unit and from the filling unit to the display unit; a dispensing mechanism for dispensing filled containers from the display unit; and a control unit for actuating the filling unit, the transfer mechanism and the dispensing mechanism in response to an operator instruction. Also provided is a beverage dispensing system comprising a beverage dispenser according to the invention and a plurality of partially or completely empty containers.

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DISPENSER FOR FILLING AND DISPLAYING BEVERAGE CONTAINERS

The present invention relates to a beverage dispenser, and to beverage dispensing systems comprising a beverage dispenser and a plurality of partially or completely empty containers.

Various machines are known for dispensing chilled bottles, cartons or cans of beverage. For example, it is known to provide spiral dispensing machines for this purpose. The machines generally comprise a cabinet having a window in a front wall thereof for viewing the products to be dispensed. The cabinet contains a number of shelves, and above each shelf is provided a row of dispensing spirals each having an axis substantially perpendicular to the front wall, and each spiral extending substantially from the back of each shelf to a front edge of the shelf. A plurality of beverage containers are retained within the convolutions of each dispensing spiral. One or more electric motors are operable selectively to rotate each dispensing spiral to displace a beverage container in that spiral towards the front edge of the shelf, from where it falls into a collecting hopper that is accessible from outside the machine.

A drawback of conventional machines for dispensing filled beverage containers is that the filled beverage containers are heavy and bulky. The weight of the containers adds to shipping costs for delivery of the containers to the machine. The bulk of the beverage containers means that the machines can only be stocked with a limited number of containers, unless the machines are made undesirably large.

It is also known to provide beverage dispensing machines that contain a stack of empty cups, a reservoir of a beverage concentrate and a water supply, wherein the machine dispenses a measured amount of the concentrate into a cup, together with a sufficient amount of water as diluent, upon receipt of an instruction to dispense a beverage.

WO-A-2006095172 describes beverage dispensing machines that contain a large number of empty pouches attached to a ribbon support and wound on a reel, wherein the pouches can be supplied to a filling station in the dispensing machine and separated from the

ribbon support on demand after filling. The pouches may be filled with water or with water and a flavour concentrate.

It is also known to provide in-cup beverage dispensing systems, for example the system available under the Registered Trade Mark KLIX from Mars, Incorporated. In-cup systems are based on stacks of disposable cups, each containing a portion of beverage concentrate in its base. The cups are snap-fitted together in the stack, and the stack is then packaged, stored and transported conveniently by the vending operator. In use, the stack is removed from its packaging and loaded into the dispenser of a dispensing machine. In response to a dispense command, the machine automatically splits a cup from the bottom of the stack and fills it with water to form the desired beverage.

In a variant of the in-cup system, WO-A-2006123131 describes a dispensing system comprising a partially or completely collapsed pouch containing an individual portion of a beverage concentrate, wherein the pouch comprises an inlet and a seal that substantially seals the inlet, and a liquid dispensing mechanism adapted to release the seal on the inlet and to inject a liquid into the pouch through the inlet to produce an individual portion of the beverage inside the pouch.

These beverage dispensing systems provide the advantage that the beverage concentrate is shelf-stable and easy to transport. The concentrate is compact, and therefore a smaller dispensing machine is required. The water for dilution of the beverage is provided at the dispensing machine, typically from a conventional water supply with optional additional purification, heating or cooling in the dispensing machine. The disadvantage of these dispensing systems based on dilution of concentrates is that the consumer cannot see the finished beverage product until it has been dispensed. A further disadvantage is that the dispensing operation takes longer than dispensing of packaged beverages from spiral dispensers. It is hard to increase the speed of dispensing from concentrate because of the time needed to achieve good dispersion of the concentrate in the diluent water.

In a first aspect, the present invention provides a beverage dispenser comprising: a storage unit for storing a plurality of empty or partially empty containers; a filling unit for injecting a liquid into the said containers to produce filled containers; an enclosed

display unit for displaying one or more of the filled containers prior to dispensing; a transfer mechanism for transferring the containers from the storage unit to the filling unit and from the filling unit to the display unit; a dispensing mechanism for dispensing filled containers from the display unit; and a control unit for actuating the filling unit, the transfer mechanism and the dispensing mechanism in response to an operator instruction.

In a second aspect, the present invention provides a beverage dispensing system comprising a beverage dispenser according to the present invention and a plurality of partially or completely empty containers.

The underlying principle of the present invention is that the dispenser prepares a beverage in a suitable receptacle in advance of dispensing, by diluting a concentrate with water. The receptacle filled with the beverage is then displayed in the display unit prior to dispensing. The filled receptacle is dispensed from the display unit upon receipt of a dispensing instruction. In this way, the advantages of concentrate-based dispensing systems (low shipping costs, storage stability, high-density storage) are combined with the advantages of filled container dispensing (good product visibility, high speed). In addition, the invention permits the dispensing of a wide range of novel liquid food and beverage formats that are not sufficiently stable for storage and distribution in fully hydrated form, but that are stable as concentrates.

Suitably, the dispenser is adapted for the storage, display and dispensing of a plurality of different beverages. The beverages may be hot or cold beverages, and may include water (i.e. the pack is empty before filling and is filled only with water). Accordingly, the enclosed display unit comprises an optionally heated or cooled cabinet having a window for viewing of the filled containers. It is a further advantage of the present invention that only the display unit needs to be heated or cooled, unlike for example spiral vendors, in which the whole storage cabinet needs to be cooled in order to dispense cold drinks.

Suitably, the control unit is programmed such that the dispenser displays at least one filled container of each beverage type in the display unit between dispensing

instructions. The user thus has good visibility of each product type before choosing which product to dispense. For example, the dispenser may display from 1 to 5 filled containers, typically 1 or 2 filled containers in the display unit.

Suitably, the storage unit contains a plurality of containers each containing a different beverage concentrate, and the dispenser is programmed to display at least one filled container of each beverage type in the display unit between dispensing operations.

Suitably, any containers in the storage unit and the filling unit are not visible from outside the beverage dispenser.

Preferably, at least some of the containers before filling contain a substantially shelf-stable beverage concentrate, such as fruit-flavored syrups or powders, soluble coffee solids or soluble tea solids. Preferably, the total weight of the food or beverage concentrate in the containers before water injection is from about 0.5 grams to about 100 grams, preferably from about 1 gram to about 50 grams. In these embodiments, the machine fills the containers with water, which may optionally be heated or chilled before the filling step.

In other embodiments, at least some of the containers are empty before filling with water. The empty containers may be used to dispense water, for example chilled and/or purified water. In other embodiments, the dispensing machine may fill the empty containers with a beverage prepared from concentrate drawn from a reservoir in the machine, together with diluent water added to the concentrate before or after the concentrate is filled into the containers.

Suitably, the containers are pouches, bottles or cups. Preferably, the containers are at least in part transparent to allow an operator to view the beverage inside the filled containers in the display unit. The amount of liquid in the container after filling is suitably from 50 ml to 1000 ml, preferably from 100 ml to 500 ml, for example from 150 ml to 350 ml. This volume is appropriate for containing an individual portion of a food or beverage liquid, that is to say a portion suitable for consumption by one human individual at one time.

In certain embodiments, the containers may be collapsible containers, such as pouches. In these embodiments, the container is initially in a collapsed, sealed state containing little or no liquid. It may contain a concentrated food or beverage ingredient, as discussed further below. The concentrated ingredient is inherently storage stable due to its low water activity. The container can be stored and distributed in this compact, lightweight condition.

The collapsible container may for example be a collapsible carton made up of panels joined by fold lines. However, most suitably the collapsible container is a flexible pouch. The term "flexible pouch" refers to a closed container formed substantially or completely of a flexible sheet material. The sheet material normally comprises at least one continuous layer of thermoplastic film, or it may be a laminated sheet made up of more than one thermoplastic film layer. At least a portion of the sheet material may be transparent to allow inspection of the pouch contents. The sheet material is substantially impermeable to liquids, and it may also be substantially impermeable to gasses such as oxygen, especially when it is desired to maintain the freshness of the pouch contents. The sheet material making up the pouch may further comprise a metal layer, such as an aluminium layer, to render the material air-and light-impermeable and to provide aesthetic effects.

As already discussed, the body of the collapsible pouch preferably consists essentially of the flexible sheet material. The pouch may, for example, be a so-called pillow pouch, typically formed by continuous form-fill-seal equipment, or it may be formed by bonding together front and back faces of flexible sheet materials around their marginal edges. In certain embodiments, the pouch may be a stand-up pouch. That is to say, a pouch formed by bonding together front and back faces of sheet material around three edges, with a gusset sheet inserted and bonded to the respective fourth edges of the front and back sheets to form a base for the pouch. The total thickness of each flexible wall of the pouch is suitably in the range of from 50 micrometers to 1000 micrometers, for example 100 micrometers to 500 micrometers.

The pouch may be provided with a nip and/or a line of weakness and/or a tear strip to allow the container to be opened after filling. The pouches are partially or completely collapsed before liquid filling. Preferably, the containers are substantially free from entrapped gas before filling. This minimises the volume of the containers for storage and distribution purposes, and maximises the stability of the pouch contents. The flexible pouches may be folded, or rolled, up before the liquid injection step.

Suitably, the pouches are mounted on a flexible elongated support, such as a ribbon, for example as described in WO-A-2006123131, the entire content of which is incorporated herein by reference. The pouches may be delivered to the filling unit in similar fashion to that described in WO-A-2006123131.

In certain embodiments, the containers may comprise more than one compartment. A food or beverage ingredient may be present in one or more of the compartments. In the case of flexible pouches, the compartments may, for example, be separated by a line of sealing between the front and back faces of a pouch. In certain embodiments this line of sealing is releasable by the action of heat or pressure (e.g. from squeezing a pouch), whereby mixing of the compartment contents can be achieved after filling of the pouch. This mixing can be applied to achieve novel colour, flavour, temperature and/or texture effects in the product. Suitable multicompartment pouches and laminated film materials for the manufacture of such pouches are described, for example, in WO2004/058594, the entire content of which is incorporated herein by reference.

The containers in the dispensing system according to the present invention further comprise an inlet, and preferably further comprise a seal that substantially seals the inlet against the ingress or egress of liquid or oxygen etc. until the liquid filling step. Typically, the inlet comprises a substantially rigid neck or nozzle that is bonded into the containers. For example, the nozzle may extend through a hole in the container wall, and may further comprise a flanged base bonded in liquid-tight fashion to the sheet material of the container wall on the inside of the container. In other embodiments, the nozzle may be inserted in liquid-tight fashion between opposed sheets of material in an edge of a pouch, in similar fashion to the well known beverage brewing sachets described for example in GB-A-2123685. In these latter embodiments, it is not

necessary for the nozzle to have a flange inside the pouch, since the front and back faces of sheet material wrap around the sides of the nozzle in liquid-tight fashion. The nozzle is typically formed from molded thermoplastic, for example by injection molding.

The nozzle or neck has an opening therein for passage of liquids, for example the opening may be a tubular bore. The opening is initially sealed by the seal. The seal may, for example, comprise a membrane extending across the opening that is pierced by an injector on the liquid dispensing mechanism. In certain embodiments, the membrane may be an elastomeric septum or split septum that provides at least a degree of sealing after the injector has been withdrawn. Preferably, the seal does not comprise any frangible part that could be pushed into the pouch by the injector and thereby contaminate the contents. In certain embodiments, the seal could be provided by a mechanical valve arrangement, for example a biased valve such as a spring-loaded valve that is released by the action of the liquid dispensing mechanism. Alternative valve arrangements are any of the well known sports cap valves formed from two or more thermoplastic parts, wherein the valve is opened by twisting or pulling on the outer valve part.

The nozzle preferably projects outwardly from the container by at least about 5mm, and may be provided with a locking recess or projection, such as a flange, to enable the nozzle to be gripped by the liquid dispensing mechanism during liquid injection.

The containers in the dispensing system according to the present invention preferably further comprise a valve element that resists the escape of liquid from the liquid-filled container through the inlet after the liquid has been filled into the container. This permits at least limited movement of the filled container with minimal leakage after filling. In certain embodiments, the valve element allows liquid to escape through the inlet when a pressure difference is applied across the valve, for example by squeezing the container or applying suction to the inlet. Such an arrangement is especially convenient for controlled dispensing of liquid from the pouch. In other embodiments, the valve element substantially completely blocks the escape of liquid from the liquid-filled container. This is the case, for example, when a valve element is provided by a bias e.g. spring loaded valve in the inlet, or it is a valve of the sports drink type. Such

sealing arrangements are especially convenient when a container is further provided with a separate outlet opening, as described further below.

It will be appreciated that in yet other embodiments the liquid dispensing mechanism may further comprise a device for sealing the inlet after liquid filling step is complete. The sealing device may, for example, comprise a threaded neck on the inlet for attachment of a complementary threaded cap over the inlet. In certain embodiments, the sealing device may comprise a cap or a plug seal for forming an interference fit or a snap-fit on the inlet, wherein the plug or cap is attached to the inlet nozzle, for example by a hinge, for example the plug or cap and the hinge may be molded in one piece with the inlet nozzle.

A particularly preferred valve element is a split septum, or a septum having lines of weakness that are split by the action of the injector. In addition to low cost, these valve elements have the advantage that a drinking straw can be inserted through the septum for consumption of the container contents after filling. Accordingly, in these and other embodiments, the containers in the dispensing systems according to the present invention may further comprise a drinking straw attached to the outside of the container.

The container of the dispensing system according to the present invention may further comprise an outlet separate from the inlet. The outlet may be in the form of a nozzle or spout, which may be formed from thermoplastic material and secured to the container as described above in relation to inlet nozzle. The outlet may be dimensioned for insertion into the mouth for drinking directly from the container. The outlet is initially sealed in substantially liquid-tight fashion, for example by a screw cap, or it may comprise one of the many sports-drink closure assemblies, wherein the drinking spout can be opened by rotating the spout or pulling upwardly on the spout.

The storage unit of the beverage dispenser according to the present invention suitably stores at least 5, preferably at least 10, more preferably at least 20 containers for each beverage type. The storage unit may comprise a plurality of cup stacks as in a conventional in-cup dispenser, for example a carousel of 5 or more cup stacks. The storage unit may further comprise a conventional cup splitting mechanism for separating

a bottom cup from a selected cup stack for delivery to the filling unit. In other embodiments, the storage unit may comprise one or more cassettes or reels of pouches with associated pouch feeding mechanisms as described in WO-A-2006123131 or WO-A-2006095172.

The filling unit preferably comprises a clamp to hold the container, and in particular to hold the inlet of the container while all liquid filling is taking place. (In other embodiments, for example where the container is a cup, it may not be necessary to grip the container during filling.) For example, the clamp may grip an inlet nozzle or neck on the container. The injector tube and/or the clamp may be moveable in reciprocating relation in order to insert the injector tube into the inlet. Suitable clamps and injector nozzles are described for example in GB-A-2123685, GB-A-2123685, GB-A-2121762 and GB-A-2122881, all of which are incorporated herein by reference in their entirety. Typically, the filling unit is programmed to dispense a predetermined total volume of liquid into the container, and such volume is preferably from 50 to 1000ml, more preferably from 100 to 500ml, and most preferably from 150 to 350 ml. The liquid injected by the machine may for example be selected from ambient water, chilled water, hot water, water/ice slush, carbonated water and milk. A wide range of beverages may alternatively be injected into the pouch, for example where the dispenser incorporates a beverage mixer/dispenser.

Suitable filling units for pouches are described in WO-A-2006095172, the entire content of which is incorporated herein by reference.

It will be appreciated that the beverage dispenser according to the invention may suitably further comprises a pump and control therefore for injecting the said predetermined amount of liquid into the containers. Optionally, the beverage dispenser further comprises at least one tank for holding one or more liquids for injection into the containers.

In yet other embodiments, the filling unit may comprise a plurality of injectors for injecting a plurality of different ingredients into the container, for example it may comprise a water injector and a flavouring syrup injector.

The display unit and dispensing mechanism in the beverage dispenser according to the present invention may be of the spiral vendor type. That is to say, the filled container may be located in the convolutions of a spiral dispenser, and dispensed therefrom in conventional fashion in response to the operator instruction. In other embodiments, the display unit may comprise a shelf having a window for viewing the filled container and a door that is unlocked and/or automatically opened in response to the operator instruction to allow operator access to the filled container. The window may suitably be located in the door. Suitably, the display unit comprises a plurality of shelves and respective doors, one for each beverage type.

It will further be appreciated that the beverage dispenser according to the present invention preferably further comprises a control system adapted to receive an operator instruction and to inject liquid into a container in response to the instructions. The composition, temperature and volume of the injected liquid will be selected in accordance with the operator instructions.

Suitably, the systems according to the present invention comprise a beverage dispenser according to the present invention and a plurality of partially or completely empty containers stored in the storage unit of the dispenser. Suitably, at least two types of containers (i.e. containers containing at least two different beverage concentrate ingredient types) are stored, for example at least 5 types. Suitably, at least 5 containers of each type are stored, for example at least 10 containers of each type.

Specific embodiments of the present invention will now be described further, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 shows a schematic perspective view of a part of a dispensing system according to the present invention comprising a pouch and elements of a dispensing mechanism;
Fig. 2 shows a detail view of the inlet nozzle of the pouch in the embodiment of Fig. 1;
Fig. 3 shows the pouch for use in an alternative embodiment of the dispensing system of the present invention;

Fig. 4 shows a perspective view of a beverage dispensing machine according to the present invention;

Fig. 5 shows a perspective view of the beverage dispensing machine of Fig. 4, with the front panel of the machine opened to show the interior of the machine;

Fig. 6 shows a perspective view of a beverage container cassette for use in the machine of Fig. 4;

Fig. 7 shows a perspective view of an alternative beverage container cassette for use in the machine of Fig. 4; and

Fig. 8 shows a perspective view of a further alternative beverage container cassette.

Referring to Fig. 1, the dispensing system comprises a pouch 1 formed from front and back sheets of laminated thermoplastic film that are heat sealed together along side edges 2, 3, bottom edge 4 and top edge 5. A injection molded thermoplastic inlet nozzle 6 is inserted in top edge 5 in liquid-tight fashion between the front and back pouch sheets. Nozzle 5 has a substantially cylindrical central bore 7 into which the liquid injector tube 8 of the dispensing mechanism is inserted to inject liquid into the pouch in use. The distal end of the bore 7 has a circumferential flange 9, whereby the inlet nozzle 6 can be gripped by clamp arms 10 of the dispensing mechanism.

Referring to Fig. 2, the bore 7 is initially sealed by a foil sealing membrane 11 extending across the top of the bore 7. At the bottom of the bore 7 there is provided a X-cut elastomeric septum 12, through which the injector tube 8 can pass while liquid injection into the inlet is taking place. After liquid injection is complete and the injector 8 has been withdrawn, the X-cut septum 12 acts as a valve to resist escape of liquid from the pouch unless pressure is applied to the pouch, or suction is applied to the nozzle. Alternatively, a user can insert a drinking straw through the septum 12 to consume the beverage from the pouch.

Referring to Fig. 3, the dispensing system comprises a stand-up pouch 15 formed from front and back sheets of laminated thermoplastic material that are heat-sealed together along side edges 16, 17 and top edge 18. A bottom gusset piece 19 is heat-sealed to the front and back faces along bottom edges 20, 21 to form the base of the stand-up pouch. A nozzle 22 identical to that described in relation to Figs. 1 and 2 is inserted in top edge

18 of the stand-up pouch. A removable plug cap (not shown) can be used to seal the nozzle 22 after filling of the pouch.

A further feature of the stand-up pouch 15 is that the properties of the thermoplastic filling layers of the sheet material are selected so that a further, relatively weak seal 23 can be formed between the front and back sheets, extending diagonally across a top corner of the pouch to define a separate compartment 24 for a concentrate ingredient. After filling of the primary compartment 25 of the pouch and sealing of the inlet nozzle 22 with the cap, the pouch can be squeezed to burst the seal 23 and mix the contents of compartments 24 and 25. Details of thermoplastic films suitable for forming such multi-compartment pouches are given in WO2004/058594, the entire content of which is incorporated herein by reference.

Referring to Fig. 4, the dispensing machine comprises a cabinet 30 having a front panel. The front panel comprises a display unit comprising a stack of shelves 32 on which are displayed filled containers of different beverages that have been transferred to the display unit from the filling unit inside the machine. Each shelf 32 is screened by a curved transparent plastic panel 34 that is initially locked in a closed position that prevents access to the filled containers but allows the filled containers to be viewed.

The dispensing machine further comprises a control panel 36, which will normally incorporate a display, and a coin inlet 38 for coin-freed operation. In use, an operator selects a beverage by pressing appropriate keys on the control panel 36, and pays for the beverage with coins or other means such as a key card or by inputting a user code. Once the beverage has been selected and paid for, the plastic panel 34 in front of that beverage is released so that the operator can slide the panel to one side to access the beverage. Removal of the beverage and closing of the plastic panel initiates the filling of a further container with beverage of the same type, and transfer of the further container into the display unit to replace the container that has been sold.

Referring to Fig. 5, the front panel of the dispensing machine is hinged at one side so that it can be opened to access the inside of the cabinet 30. The inside of the cabinet 30 contains a water purifier and refrigerator unit 40 that takes water from the local public

supply and provides chilled water for filling the containers. The refrigerator unit also refrigerates the display unit of the machine. However, the rest of the interior of the machine does not need to be refrigerated.

The inside of the cabinet 30 further contains a plurality of cassettes 42 arranged in a rack for easy removal by sliding out of the cabinet 30. Each cassette 42 contains a plurality of beverage containers for filling with water. The beverage containers may contain a beverage concentrate, and may be shelf-stable, as described above. The beverage containers are mechanically fed from the cassettes to the filling unit of the machine, and then to the display unit.

Referring to Fig. 6, a single cassette 42 is shown in more detail. The cassette comprises a storage section 46 and a filling section 48 where the containers are filled with water prior to transfer to the display unit. The view in Fig. 7 shows the arrangement of the pouches inside the storage section 46. It can be seen that the pouches are suspended by their nozzle flanges 11 from slots 50, along which the pouches can travel to the filling section 48.

Referring to Fig. 8, an alternative cassette 52 is shown. In this embodiment, the containers are pouches 54 in the form of a continuous strip separated by lines of weakness 56. The strip of pouches is coiled inside the cassette 52, and the pouches are fed from the cassette 52 to a suitable mechanism to separate the pouches and feed them to a filling section and the display section.

The above embodiments have been described by way of example only. Many other embodiments falling within the scope of the accompanying claims will be apparent to the skilled reader.

CLAIMS

1. A beverage dispenser comprising: a storage unit for storing a plurality of empty or partially empty containers; a filling unit for injecting a liquid into the said containers to produce filled containers; an enclosed display unit for displaying one or more of the filled containers prior to dispensing; a transfer mechanism for transferring the containers from the storage unit to the filling unit and from the filling unit to the display unit; a dispensing mechanism for dispensing filled containers from the display unit; and a control unit for actuating the filling unit, the transfer mechanism and the dispensing mechanism in response to an operator instruction.

2. A beverage dispenser according to claim 1, wherein the dispenser is adapted for the storage, display and dispensing of a plurality of different beverages.

3. A beverage dispenser according to any preceding claim, wherein the enclosed display unit comprises an optionally heated or cooled cabinet having a window for viewing of the filled containers.

4. A beverage dispenser according to any preceding claim, wherein the control unit is programmed such that the dispenser displays at least one filled container of each beverage type in the display unit between dispensing instructions.

5. A beverage dispensing system comprising a beverage dispenser according to any of claims 1 to 4 and a plurality of partially or completely empty containers.

6. A beverage dispensing system according to claim 5, wherein the containers are pouches, bottles or cups.

7. A beverage dispensing system according to claim 5 or 6, wherein the containers before filling contain a substantially shelf-stable beverage concentrate.

8. A beverage dispensing system according to claim 7, wherein the storage unit contains a plurality of containers each containing a different beverage concentrate, and

the dispenser is programmed to display at least one filled container of each beverage type in the display unit between dispensing operations.

9. A beverage dispensing system according to claim 8, wherein the dispensing machine contains a plurality of container cassettes, each cassette containing a plurality of beverage containers containing a beverage concentrate of a particular type.

10. A beverage dispensing system according to any preceding claim, wherein the containers or the dispensing machine comprise elements to close the containers in substantially liquid-tight fashion after the step of filling.

11. A beverage dispensing system according to claim 10, wherein the containers are closed containers having an inlet port equipped with a valve element, whereby the containers can be filled with liquid through the valve element, but the valve element substantially prevents escape of liquid from the filled containers.

12. A beverage dispensing system according to claim 11, wherein the valve element comprises a septum, and the filling unit comprises an injector adapted to pierce the septum to inject liquid into the container.

13. A beverage dispensing system according to any of claims 6 to 12, wherein the containers are collapsible containers, such as pouches.

14. A beverage dispensing system according to any of claims 6 to 13, wherein the containers are at least in part transparent to allow an operator to view the beverage inside the filled containers in the display unit.

15. A beverage dispensing system according to any preceding claim, wherein any containers in the storage unit and the filling unit are not visible from outside the beverage dispenser.

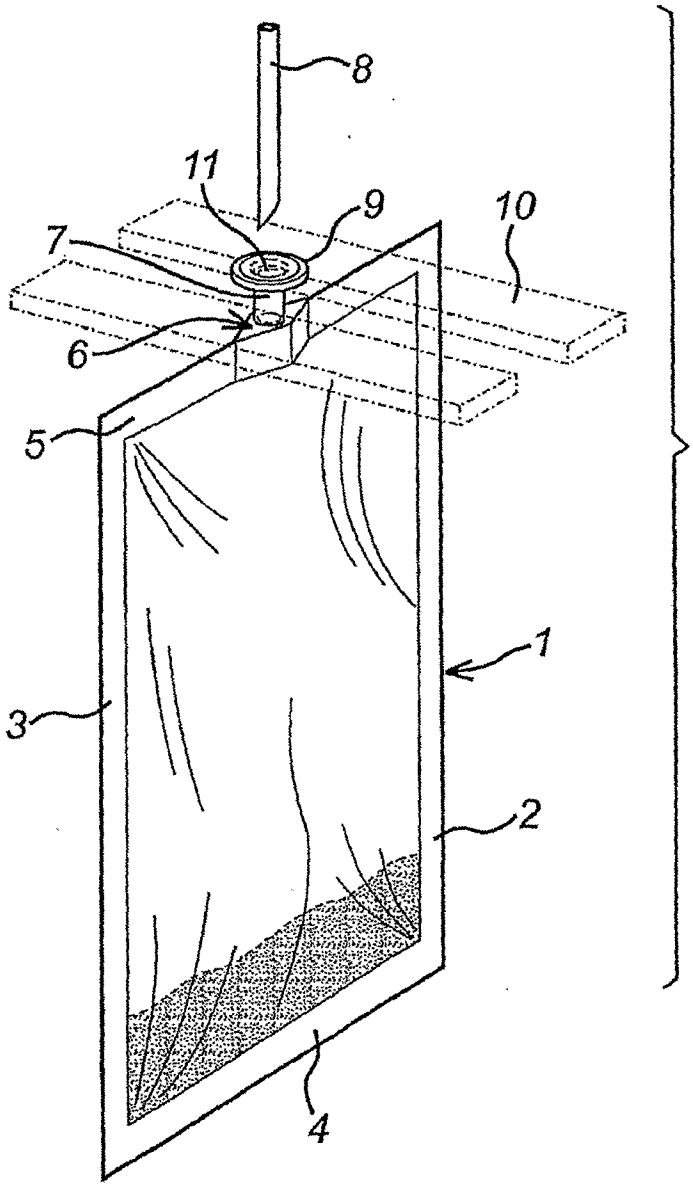


FIG. 1

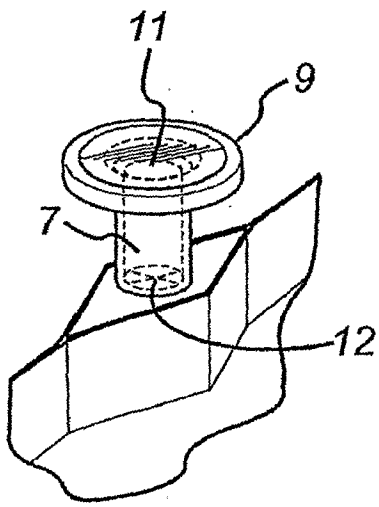


FIG. 2

FIG. 3

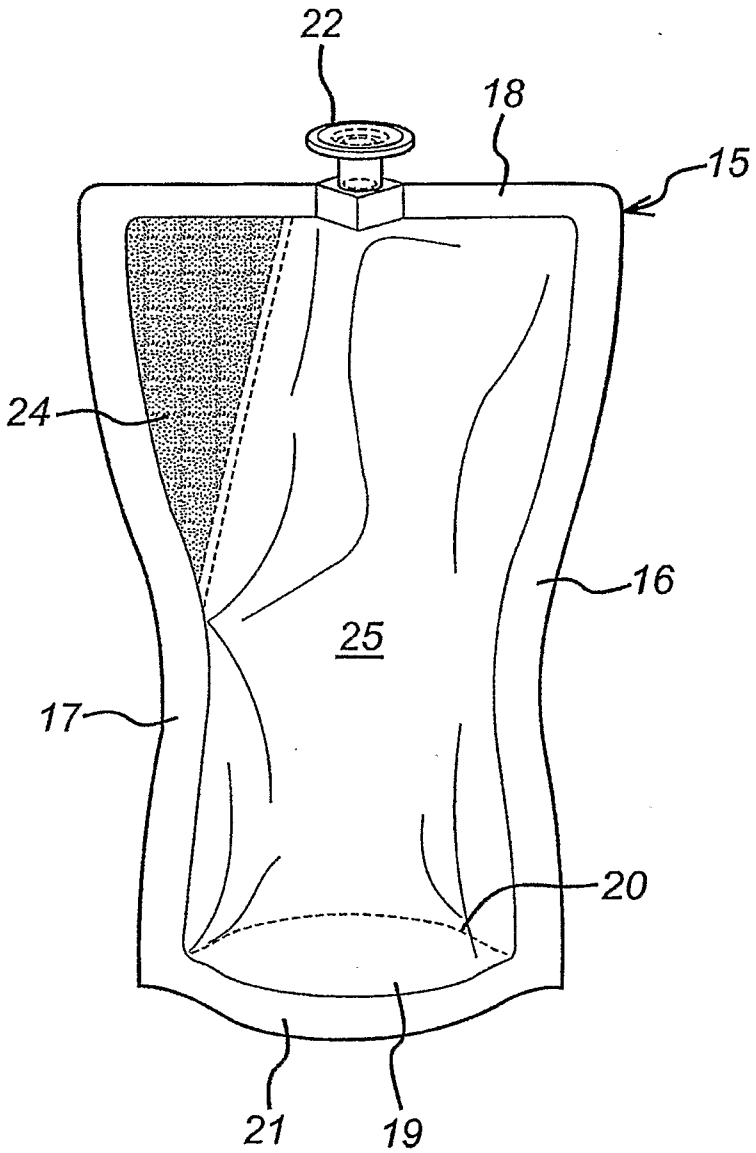


FIG. 4

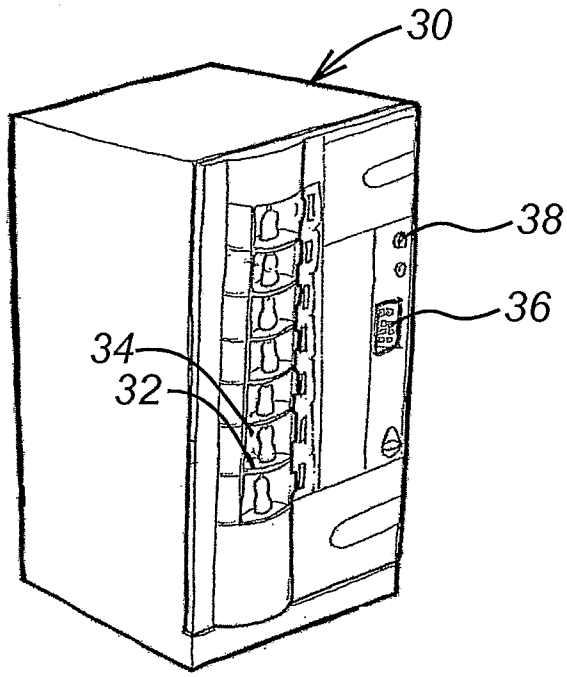


FIG. 5

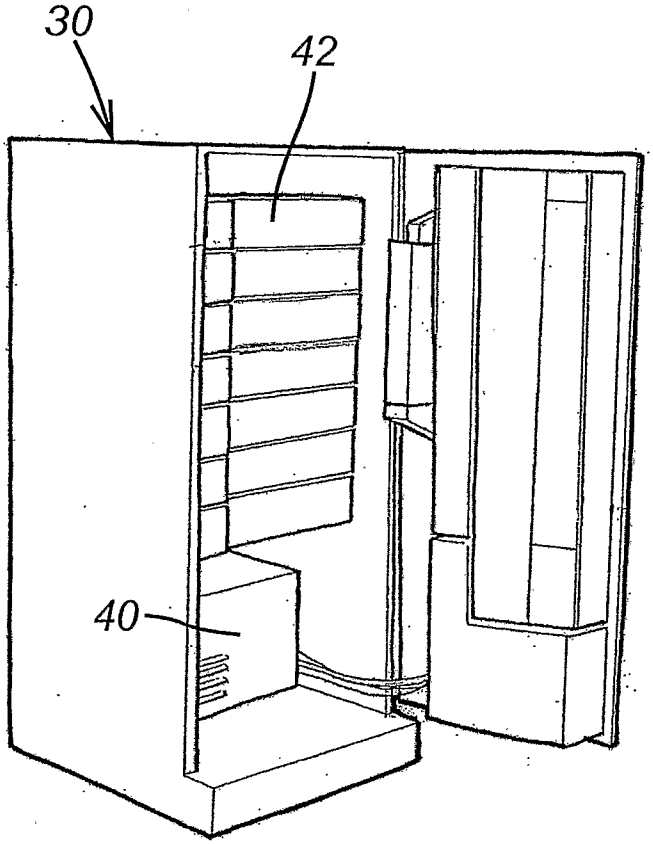


FIG. 6

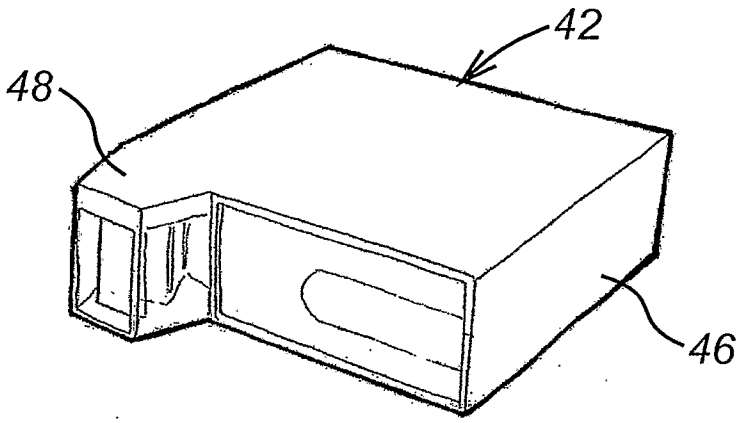


FIG. 7

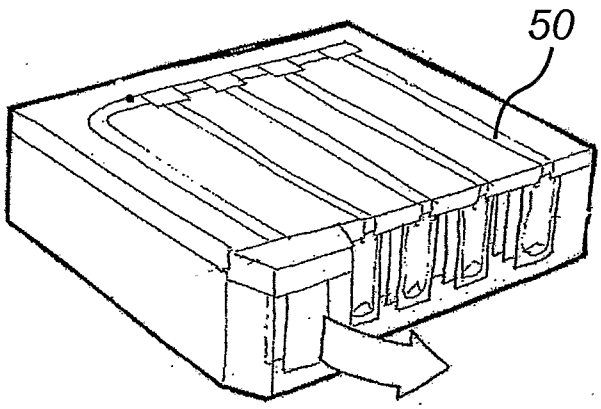
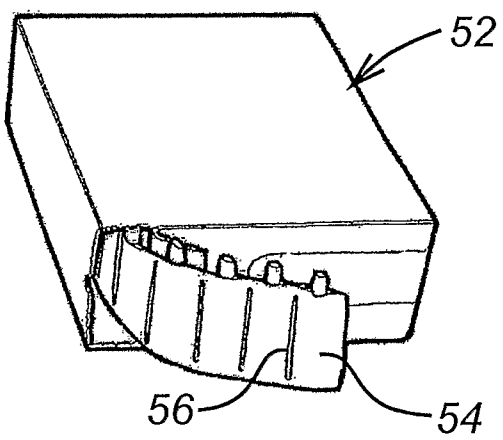


FIG. 8



INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2007/003632

A. CLASSIFICATION OF SUBJECT MATTER
INV. B65B43/12 G07F13/10

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
B65B G07F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2006/095172 A (WATERWERKZ LTD [GB]; DOUGLAS STEVEN [GB]; BARNETT GAVIN [GB]) 14 September 2006 (2006-09-14) cited in the application page 16, paragraph 5 - page 17, paragraph 3; figure 19	1
A	EP 0 084 695 A (GEN FOODS LTD [GB]) 3 August 1983 (1983-08-03) page 4, line 12 - line 27; figure 1	1
A	EP 0 844 593 A (FAS INTERNATIONAL S R L [IT]) 27 May 1998 (1998-05-27)	

☐ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

* Special categories of cited documents :

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Date of the actual completion of the international search	Date of mailing of the international search report
5 December 2007	13/12/2007

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Wartenhorst, Frank

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/GB2007/003632

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2006095172 A	14-09-2006	NONE	
EP 0084695 A	03-08-1983	NONE	
EP 0844593 A	27-05-1998	IT VI960188 A1	19-05-1998