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Remarks:

A request for correction of description and drawings has been filed pursuant to Rule 88 EPC. A decision on the request will be taken during the proceedings before the Examining Division (Guidelines for Examination in the EPO, A-V, 3.).

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(54) Concentrate dosing device for fruit juice dispensers

(57) It incorporates a Venturi device located between a sealed tank containing syrup or concentrate (arrow 14) and a water supply source (7) either from the main water supply network or from a tank, plus a depression valve (21) located at the Venturi device inlet which, when the moment comes, introduces air into the circuit and enables the syrup shortage detection (20) and inhibits top up water feed. It may be alternatively regulated through the pressure regulator, the Venturi device, or a combination of both. Enables alternative dispensing using a pouring tap (23), at the same that the maximum (9) and minimum (8) level detectors are substituted by a manually operated lever (22) or push button.

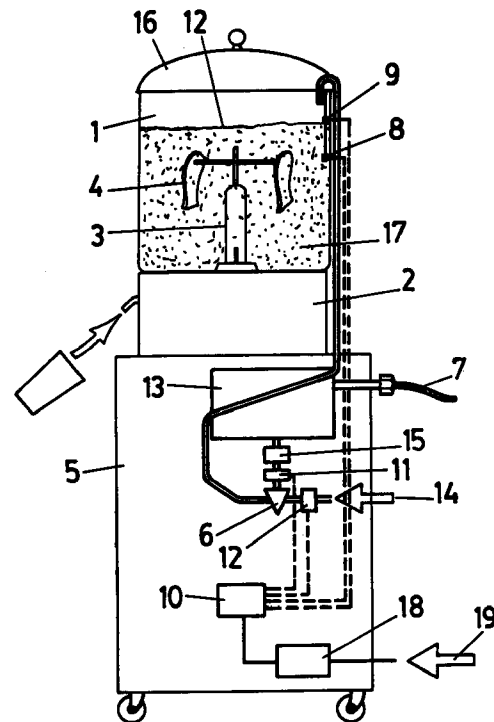


FIG. 1

Description

OBJECT OF THE INVENTION

The object of the invention is a concentrate doser for fruit juice dispensers that has been specially designed for its use with cold drink dispensing machines already used in the hotel business, restaurants and other places, in order to offer the consumer a drink made up of water plus a concentrate or syrup that restores the water required for its final consumption.

It has a "Venturi" type assembly located between a sealed syrup container and a water supply source that supplies water either from the water supply network or from a tank, so that the water may act as the syrup feeding means by way of a prior adjustment of the Venturi device with constant flow of one liquid or the other, taking the fruit juice to the inverted dome that incorporates adjustable level detectors and which establish a maximum and minimum level, in cooperation with a depression valve located at the Venturi feeding inlet and sending a signal to a processor that inhibits the commanding action of the water and acts upon syrup shortage warning means.

A variant of the (concentrate) level detector is the measurement of the flow through the usage of a flow meter previously set to a volume close to the capacity of the (concentrate) tank that acts by also cutting water supply off. Dosing means are equally arranged, alternative to each other, on the basis of the exclusive regulation of the concentrate and water mixture through the usage of the pressure regulator or the Venturi device itself, changing the passages or gauges, as well as through a combination of both means.

BACKGROUND OF THE INVENTION

There are currently available in the market fruit juice supplying machines of variable nature made up of a supporting base of a transparent recipient fitted with a cover, inside which is arranged the mixture of water and syrup in order to obtain, through their dilution, the desired fruit juice or cold drink.

The recipient consists of a transparent inverted dome that houses inside it a turning agitator that maintains the homogeneous suspension, the cover is removable and the mixture which constitution varies as a function of the final product is decanted through the resulting opening of the recipient. The capacity of the recipient varies, according to its manufacturer, between five and fifty litres which makes it advisable, for weight reasons, for the recipient to be continuously refilled by its attendant, dosing the mixtures of syrup with water, through the use of double pumps, piston driven or volumetric, of different flow rates, as well as solenoid valves used to control the flow rates of the different fluids and other mixture regulation means.

Let us mention, in respect of the latter, U.S. priority patent 8706058758448 and in respect of the former,

U.S. priority patent number 86071886888546, fitted with volumetric control dispenser.

U.S. patent 5000352, held by Robert K. Cleland and the prior one also held by the same person, number 4544084, about Drink Dispensers, incorporate fruit juice dispensers as well as liquid level meters and starting and stopping means for mechanical water and concentrate feeding devices, consisting on a double circuit piston driven pump, independently fed from the respective tank to the drink dispenser or supplier, place where the mixture of both fluids takes place through their interaction and, also, through the action of the juice distribution paddles. These piston driven pumps, which do not effect any mixing, are not at all related with the Venturi object of this patent specification.

Indeed, apart from the elimination of mechanical means that require maintenance and that have a cost much greater than that of the Venturi device, the advantage of the latter is that, besides feeding the supplying mechanism, it simultaneously mixes and doses.

Whenever no upper tank is fitted, the means used to dispense drinks and similar ones, normally used for the "tap" issue of very well known cold drinks, present as a defect the detection of the empty condition of the concentrate supply tanks, being it common to observe that the serving waiters are the ones usually charged with visually detecting the absence of concentrate in the glass served to the customer, disposing of the simple water contained therein and reloading the contents of the concentrate deposit.

Taking all of the above into consideration, the problems derived from the final cost of the doser, the added cost derived from the maintenance of the mechanical elements, of the better preparation of the mixture and prior dosage for the sale of the fruit juice, as well as the perfect regulation of the joint supply of water and concentrate, is duly solved by the invention object of this patent and its current addition certificate.

DESCRIPTION OF THE INVENTION

The purpose of the invention is to solve the above problems by fitting, to any of the fruit juice dispensers now existing in the market and of whatever make or brand, with means duly guaranteeing the accuracy of the mixture that will produce the fruit juice to be consumed, so as to produce the same aroma, flavour and, above all, degree of viscosity.

It is also the purpose of the invention to supply to the fruit juice dispenser water with homogeneous properties so that, irrespectively of where a fruit juice dispenser may be located, as long as it bears a brand name that guarantees the incorporation of the subject of this invention, the consumer will be reassured that the product quality is constant and fully reliable.

A further aim of the invention is to prevent manual refill of the recipient, avoiding the need to have a person supplying liquid and keeping product level within limits capable of being automatically regulated, so that the

recipient remains full at all times, clearly suggesting to the potential consumer the presence of newly prepared product.

All of the above advantages are made possible due to the fact that the development of the object of the invention allows the achievement of the purposes herein pursued. To that end the invention starts off a conventional dispenser made of an inverted dome recipient resting upon a base which, besides the cold generating elements, does also incorporate a cooling expander that penetrates within the inverted dome and, as is already common, a rotational agitating device.

This specification shall not deal, given that it is not the purpose of the invention, with a description of the chill production source, with the temperature control means controlling it nor with the constitution of the dispenser itself, given that, as will be made clear further on, they do not affect the additional adaptation of the invention to a dispenser without the own features of the unit adapted being altered but, on the contrary, the maintenance of the liquid at a constant level allows its operation under very good chill production unit conditions. A further important factor to point out is that, by fitting to the cover an air inlet with a filter is not necessary to uncover the dome of the recipient for purposes other than periodic cleaning operations, thus avoiding the possible contamination that may take place during the periodic refilling stages.

In accordance with the above, the invention is therefore applied to any dispenser available in the market, the invention basically consisting on the placement of a "Venturi" type assembly between a sealed tank containing fruit syrup and a water supply source supplying water from the supply network or from a tank, so that the water may act as the syrup feeding means by way of a prior adjustment of the Venturi device with constant flow of one liquid or the other, taking the already mixed product or the fruit juice to the dome acting as the dispenser tank and which incorporates two adjustable level detectors.

The device used to detect the lack of fruit syrup or concentrate in its tank, due to its having run out, is incorporated into the Venturi supply conduit and works in cooperation with a depression valve located at the entrance of concentrate to this Venturi device, so as to inhibit water supply feed.

The purpose of the depression valve is to incorporate air into the circuit, so that it may drag off the last few drops of the product through the short conduit section existing between the concentrate tank and the Venturi, quickly cleaning the pipe and aiding the action of the syrup presence detector, precisely fitted in this section, causing a breach or unbalance of internal pressure which, under other conditions, prevents or at least slows down the action of the detector, in respect of ordering the inhibition of the water feed command.

This instantaneous response becomes necessary whenever finishing alternatives are incorporated into the doser upper area, such as the pouring tap and other

conventional modalities as the decanting pump and others to be invented in the future whether they are of the accumulation or direct delivery types in which the tap or its alternative, the push button, may or may not act as simultaneous mechanical and electrical switching elements.

Remaining in the fruit juice supply tank option, the alternative to this combination of level detector plus depression valve is that of a syrup or fruit juice outlet contactor, previously set to a volume close to tank capacity so that whenever said volume is reached and, therefore, the tank is just about to be totally empty, water flow is then cut off by mechanical or electrical means until the tank has refilled, when the meter is then preset once again either manually or automatically, using conventional means.

The water may come from a treated liquid container tank, in which case the required flow rate is obtained either by gravity or using a pump. Direct water network supply is also appropriate, with the inter-placement of a continuous water treatment unit using osmotic, active coal or other type of filters, together with the inclusion of ion interchanging resins in order to finally obtain de-flavoured, odourless and soft water with the required pH level.

The processing circuit is a conventional one which may be selected from among those available in the market, as well as the remaining components which, organized in accordance with the invention, produce a new and advantageous effect fully covered by the spirit of the Law whenever it expresses, besides the novelty requirement, inventive activity and merit.

In the cases of elimination of the dispenser through the use of a dispensing recipient, the level detectors incorporated to it are also eliminated, including jointly with the new supplied the conventional mechanisms that would substitute the signal detected therein, both in the variant that incorporates the level detector plus the depression valve as in the other flow rate meter variant, mechanisms that are variable as per the previously mentioned water supply interruption method, which may furthermore be related to different approaches such as having an attending waiter available or being a self service machine.

The dosing means are equally alternatively arranged, based on the exclusive regulation of the concentrate and water mixture. For this purpose either the pressure regulator may be actuated, without touching the Venturi or the Venturi itself may be actuated, without operating the pressure regulator, alternatively both of them may also be simultaneously actuated.

Under any of the three graduation alternatives available, used separate or together, of the regulator and Venturi devices, the exclusive aim thereof is to achieve the dosing of the syrup or concentrate simultaneously with the mixture in the Venturi itself of both components, as well as fully independently of the type of doser used, the tank type, dispensing tap or other.

It is finally possible to combine the Venturi device with one or several solenoid operated valves, of the conventional product feeding type, for example, further drink components or, simply, carbonic gas coming from an additional tank, in the same way that it may also include whichever conventional cooling or warming means that the product to be dispensed may require.

DESCRIPTION OF THE DRAWINGS

In order to complete the description being effected and with the purpose of aiding a better and easier understanding of the features of the invention, this patent specification is supported, as integral part thereof, by a set of drawings where, with an illustrative but never limitative character the following has been duly represented:

Figure 1 represents the doser object of the invention, being identified therein the components mentioned in this specification.

Figure 2 is an example of a tap dispenser, pursuant to that described in this patent specification.

Figure 3 represents an automatic dispensing machine, of the type normally called "vending machines", showing the frontal section of the product selection and coin slot mechanisms, as well as the opening where glasses or cups are introduced for the drinks to be dispensed.

DESCRIPTION OF A PREFERRED EXECUTION EXAMPLE

Example 1. Upon examining the previously mentioned figure 1, it may be observed how the invention herein advanced consists of a concentrate doser for fruit juice dispensing machines, of the type that include an inverted dome (1) resting upon a base (2) which, besides the means used to generate chill (3) within the dome (1), does also incorporate a rotating agitator (4), as well as liquid dispensing means such as an outlet pipe under which is placed the glass that actuates the opening means, a frame (5) wheeled or not, characterized by its having a "Venturi" type assembly between a sealed syrup container, not shown and marked by the arrow (14) and a water supply source (7), either from the water supply network or from a tank, in such a way that the water acts as the syrup dragging mean through a prior adjustment of the Venturi device (6) with a constant flow rate of one liquid or the other, taking the mixed product or fruit juice to the dome (1) that acts as the dispensing tank and which incorporates two level detectors (8-9) capable of being regulated and which establish the maximum and minimum level thresholds (12).

It does furthermore incorporate, prior to the Venturi (6) device, and located in between, on the one hand, in respect of the final dispensing recipient (1) and, on the

other, in respect of the water supply tank or direct water supply network connection (7), as well as in respect of the concentrate tank inlet (14), a depression valve (21) that introduces into the circuit syrup sweeping air in the conduit portion located between the tank inlet (14) and the Venturi device (6) whenever the depression required for the instantaneous actuation of the syrup presence level detector (20), incorporated into this portion, is reached, which detector commands through the processor (10) the inhibition of the water feeding command (11) and which acts advantageously upon lack of syrup warning devices.

The regulation of the concentrate and water mixture is effected either graduating the regulator (15) without touching the Venturi device (6) or else adjusting the own Venturi device (6), without operating the regulator (15) or, alternatively, both devices may also be simultaneously adjusted, in order to achieve syrup dosing and simultaneously mixing it with water in the Venturi device.

The water, pursuant to the example, is supplied from the water supply network, through the inter-placement of a continuous water treatment unit (13) using osmotic, active carbon or other type of filters, together with the inclusion of ion interchanging resins to finally obtain unflavoured and odourless liquid, softening its calcium content with the appropriate pH level, arriving to the Venturi device through a flow rate regulator (15) that ensure dosing accuracy.

The syrup comes from a conventional container, of the type fitted with non rigid walls, that receives the product under vacuum and which is fitted with a membrane ready to receive a nozzle that interconnects the container, not shown, to the tank inlet (14) to the previously described circuit in order to dispense the already dosed mixture through the conduit and into the dome (1) fitted with a cover (16) that insulates the liquid (17) from outside.

The processor circuit incorporates a transformer-rectifier (18) to convert the alternating current supplied to continuous current and which is plug into the power supply network represented in the drawing by the arrow (19).

Example 2. The concentrate level detector (29) and the depression valve (21) are substituted by a concentrate outlet meter (conventional, not included in the figures), previously set as per the capacity of the concentrate recipient (14) which, through mechanical or electrical means, interrupt water flow until the consumable concentrate has been renewed, whereas the meter is then manually or automatically preset once again whenever the tank is newly topped up or refilled.

Example 3. Another execution variant, using a pouring tap (23) (Figure 2) or further conventional variations such as a decanting pump or others, incorporate conventional mechanisms that substitute the maximum (9) and minimum (8) liquid level detectors, by a lever (24) or manually operated push button (25) activated by a coin collection mechanism (26) (Figure 3) which oper-

ate, in either case, as power supply circuit breakers, also conventional.

Example 4. A further variant combines the Venturi device (6) with one or several solenoid valves (of the conventional type, not shown in the figures), to supply further drink or carbonic gas components.

This description is not extended any further on the understanding that any expert in the art would already have enough information to understand the scope of the invention and the advantages derived therefrom, as well as to enable him to reproduce it.

It is further understood that, as long as the essential features of the invention are not altered, both the variations in respect of the materials as the shape, size and arrangement of the elements may be varied within the same characteristics.

The terms used during the description and its sense must always be considered in a non limitative way.

Claims

1. Concentrate doser for fruit juice dispensers, applicable to dispensing devices that incorporate an inverted dome (1) resting upon a base (2) which, besides the means used to generate chill (3) within the dome (1), does also incorporate a rotating agitator (4), as well as liquid dispensing means such as an outlet pipe under which is placed the glass that actuates the opening means, a frame (5) wheeled or not, characterized by its having a "Venturi" type assembly between a sealed syrup container, not shown and marked by the arrow (14) and a water supply source (7), either from the water supply network or from a tank, in such a way that the water acts as the syrup dragging mean through a prior adjustment of the Venturi device (6) with a constant flow rate of one liquid or the other, taking the mixed product or fruit juice to the dome (1) that acts as the dispensing tank and which incorporates two level detectors (8-9) capable of being regulated and which establish the maximum and minimum level thresholds (12), further incorporating, prior to the Venturi (6) device, and located in between, on the one hand, in respect of the final dispensing recipient (1) and, on the other, in respect of the water supply tank or direct water supply network connection (7), as well as in respect of the concentrate tank inlet (14). Furthermore for the proper operation of the concentrate presence level detector (20), it incorporates a depression valve (21) that introduces into the circuit syrup sweeping air in the portion between the tank inlet (14) and the Venturi device (6) whenever it reaches the depression needed for the instantaneous actuation of the syrup presence level detector (20), incorporated into this portion, which commands through the processor (10) the inhibition of the water feed command (11)

and which acts advantageously upon syrup shortage warning means.

- 2. Concentrate doser for fruit juice dispensers, as per the prior claim, characterized because the water may be optionally supplied from the main water supply network, with the intermediate placement of a unit (13) that treats the water continuously using conventional means, which water arrives to the Venturi device through a flow rate regulator (15) that ensures dosing accuracy, arriving the syrup or concentrate from a conventional container of the type fitted with non rigid walls, that is inter-connected to the tank inlet (14) in order to, through the conduit, pour the already dosed mixture into the domed recipient (1), fitted with a cover (16) that insulates the liquid (17) from the outside.
- 3. Concentrate doser for fruit juice dispensers, as per the prior claims, characterized because the regulation of the concentrate and water mixture is effected either graduating the regulator (15) without touching the Venturi device (6) or vice versa, although both devices may also be simultaneously adjusted whereas, before the Venturi device (6) there is a depression valve (21) located as shown which incorporates into the circuit syrup sweeping air in the conduit portion located between the concentrate tank inlet (14) and the Venturi device (6) at the moment in which the level of depression previously established for the instantaneous actuation of the syrup or concentrate presence detector (20), incorporated in this portion, is generated, which commands through the processor the inhibition of the water feed command.
- 4. Concentrate doser for fruit juice dispensers, as per the first and third claims above, characterized because the depression valve (21) and the level detector (20) are replaced by a conventional syrup or concentrate outlet meter, previously reset either manually or automatically every time that the concentrate tank is topped up or refilled, as per the capacity of the recipient, so that water supply is cut off by the action of mechanical or electrical means until the consumable product has been renewed.
- 5. Concentrate doser for fruit juice dispensers, as per the first claim above, characterized because the dome (1) is replaced by a pouring tap (23) at the same time that the maximum (9) and minimum (8) level detectors are substituted by a lever (24) that acts as a switch and which acts upon a conventional power supply circuit breaker, also conventional.
- 6. Concentrate doser for fruit juice dispensers, as per the fifth claim above, characterized because the pouring tap (23) is replaced by other conventional

dispensing or decanting devices, such as the decanting pump or others.

7. Concentrate doser for fruit juice dispensers, as per the prior claims, characterized because the Venturi device (6) is combined with one or several solenoid valves used to introduce further components into the syrup drink or else carbonic gases. 5
8. Concentrate doser for fruit juice dispensers, as per the first and third claims above, characterized because the maximum (9) and minimum (8) level detectors, the depression valve (21) and the level detector (20) are replaced by a manually operated push button (25) activated by a coin collection mechanism (26). 10 15

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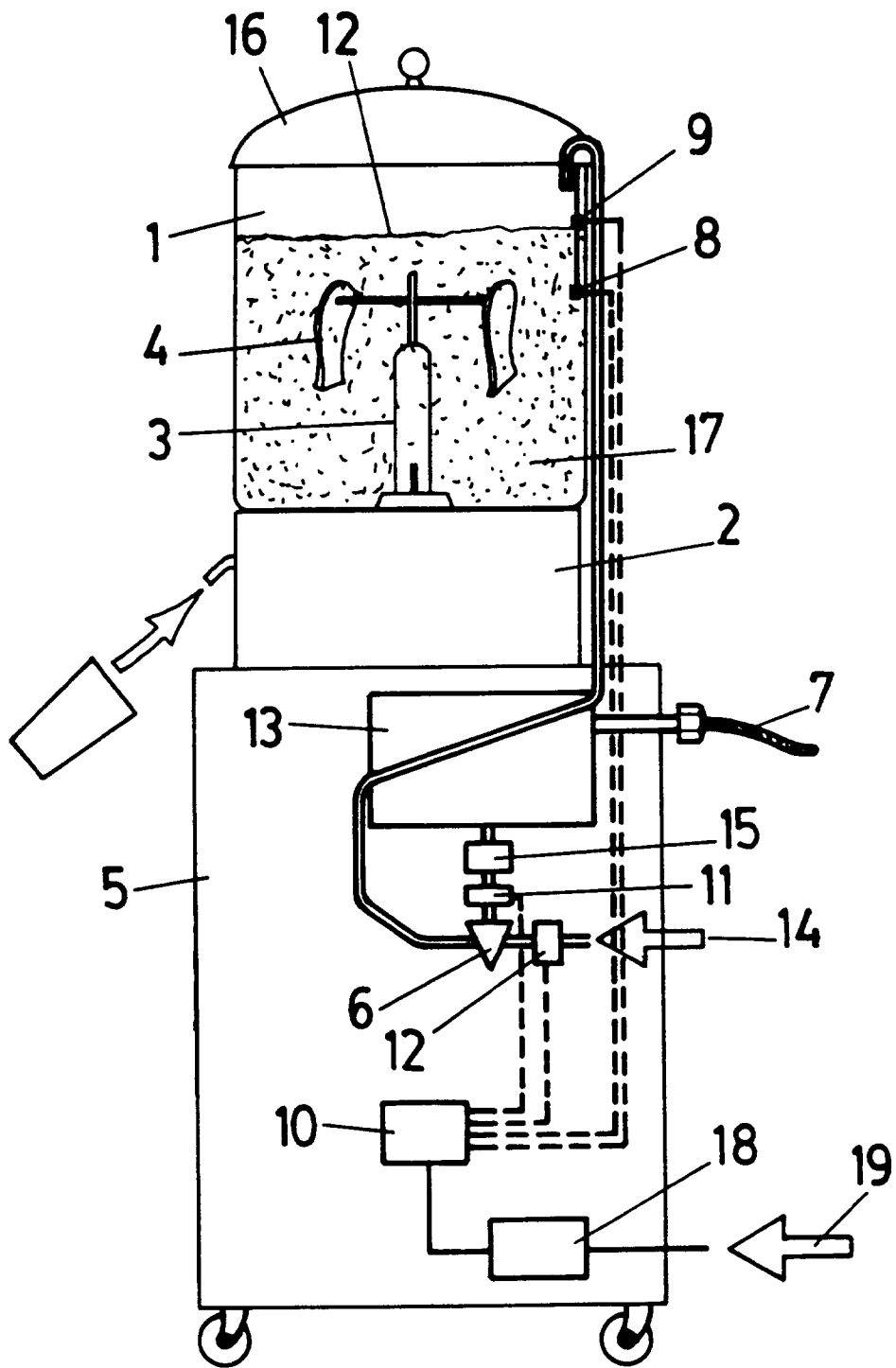


FIG. 1

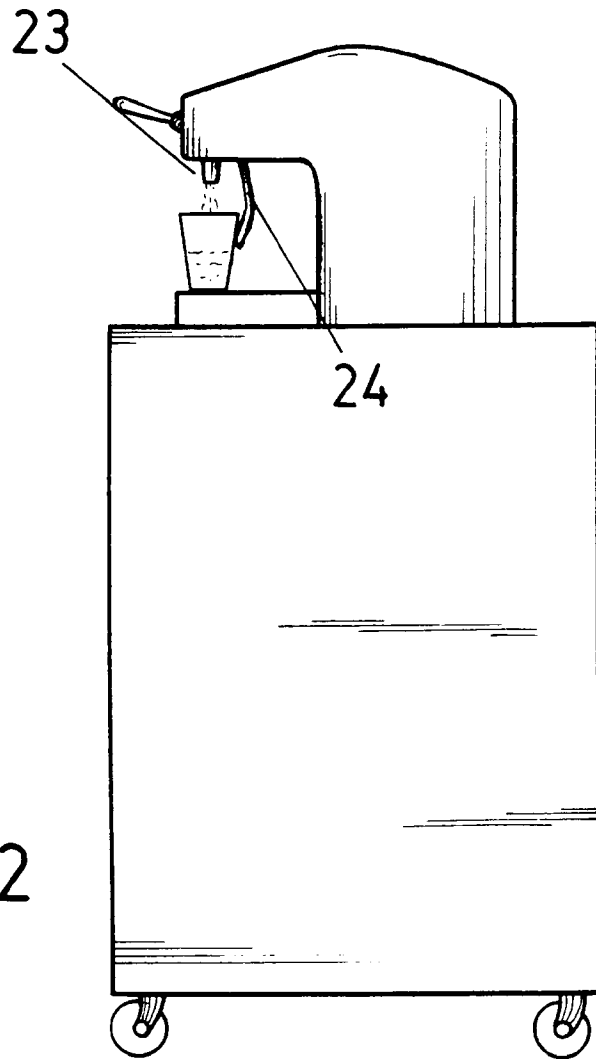


FIG.2

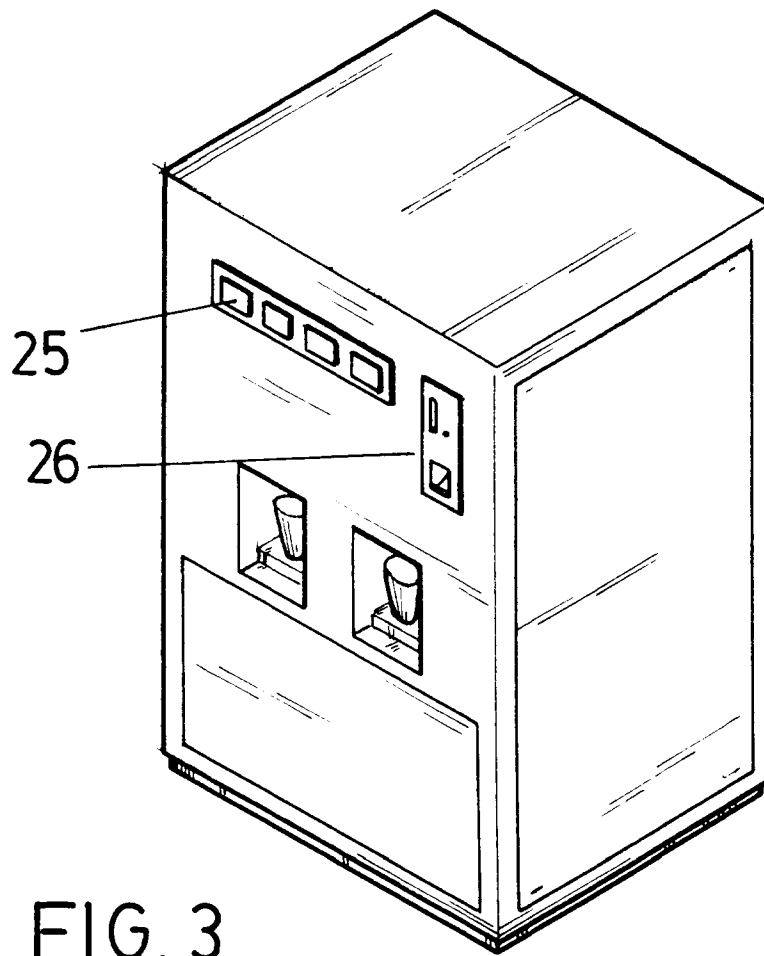


FIG. 3



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 95 50 0165

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.6)
A	US-A-2 993 683 (MILLS) * column 3, line 24 - line 55; figures 1,4-6 *	1	B67D1/00 B67D5/56
A	US-A-5 033 649 (COPELAND AND BURCH)		
D,A	US-A-4 544 084 (CLELAND)		
D,A	US-A-5 000 352 (CLELAND)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			B67D
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
THE HAGUE		1 July 1996	J.-P. Deutsch
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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