

FORM 2
THE PATENT ACT 1970
(39 OF 1970)
AND
The patent rules, 2003
COMPLETE SPECIFICATION
(See section 10: rule 13)

1. TITLE OF INVENTION

Regulated Liquid Dispensing Apparatus

2 APPLICANTS

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3. PREAMBLE TO THE DESCRIPTION

COMPLETE

Following specification particularly describes the invention and the manner in which it is to be performed.

4. DESCRIPTION.

Technical field of invention:

Present invention in general relates to regulated means a set volume dispensing apparatus generally for liquid and particularly for water.

Background of the Invention:

The term liquid dispenser means an apparatus comprising a hand operated valve and container to give out a set means predetermined volume of liquid such as water, oil or any other liquid to consumers in a single operation and subsequently the flow automatically stops and becomes ready for next operation. The operation is a single action unlike normal tap dispenser wherein the tap means valve is to be opened and closed and such dual operations the process becomes clumsy and wasteful.

Prior art:

While filling water through tap or pipe in container like bottle, cup etc there is inadvertent wastage of precious water due to spillage, negligence or on purpose as human judgment is required.

The water is a precious commodity, especially potable water hence a dispensing apparatus should be devised such that it is:

1. easy to function in single operation means no subsequent tap closing operation;
2. simple in construction;
3. operates on the incoming pressure of the tap water means self supporting;
4. liquid flow to stop automatically once the set volume is discharged to avoids undue wastage thence;
5. ready to serve next consumer immediately to avoid delayed operation;
6. provision to shut the flow whenever desired;

7. liquid volume setting.

Various water conserving devices for different public utilities are well known. Most of the devices either use motion sensors or infrared sensors to dispense the premeasured amount of water without input from the user as to the amount dispensed.

Primary drawback of these systems is their prohibitive cost and complexity in maintenance which has restricted their installation for various public utility purposes especially in developing countries.

In order to overcome these problems various attempts have been made previously.

US patent application 20060151523 discloses a metered liquid dispenser comprising: an inlet communicating with a liquid storage container; an outlet; a user interface for selecting a predetermined amount of liquid to be dispensed; and a control unit for controlling the amount dispensed through the outlet, the control unit comprising a flow meter measuring an amount of fluid dispensed through the outlet, and a control valve.

US patent 4153187 discloses a liquid dispenser having a metering chamber and a supply chamber disposed in side by side relationship and adapted for liquid communication with one another through a normally open supply valve. The liquid in the chambers are maintained at the same level. An outlet drain from the metering chamber through which liquid may be drained from the metering chamber and a normally closed outlet valve for controlling the flow of liquid through the outlet drain is provided. The supply valve and said outlet valve co-operate in such manner that upon opening the outlet valve to dispense liquid from the metering chamber, the supply valve closes and then subsequently re-opens for replenishing the metering chamber from the supply chamber only after the outlet valve has closed.

US 8,056,764 B2..2004 provides a hand-operated device that can be actuated to dispense a predetermined volume of liquid food product (LFP) for use in food preparation and food consumption is provided. The device includes an actuator, an opening, a reservoir for storing the food product, and a liquid metering device for controlling a volume of LFP dispensed at the opening. The device may include a heater that functions to heat and/or liquefy the food product. The device may also include a volume adjuster that allows a user to vary the predetermined volume of LFP dispensed with each actuation of the device.

Although various attempts have been made earlier in order to develop a device for water conservation yet they face the drawbacks of; either complexity in operation and/ or maintenance or prohibitive manufacturing cost. Hence there was a long felt need in the art to have simple apparatus means device, when installed would stop wastage of water and serve the consumer without any delay in between. Also with the help of present invention even if the actuating valve is left unattended there will be no spilling of water and hence no wastage.

Notwithstanding the prior art, the present invention is neither taught nor rendered obvious thereby.

STATEMENT:

Accordingly the following invention provides a novel waste free, regulated water dispensing apparatus which is simple, reliable, hand operated, single action, self supporting, self standing means works on the incoming liquid pressure for the entire operation without external energy source, uninterrupted subsequent operations wherein the said invention comprises a closed container may be in the form of a cylinder and having a leak proof sliding partition within like a piston, which divided the said cylinder in two compartments, say left and right compartment respectively and the said piston made to slide within the said cylinder from, say left compartment having higher water inlet pressure to say

right compartment having lower outlet pressure thereby filling the water in left compartment from the water supply line and discharging the water from right compartment to the outlet to the consumer and said left and right compartments having ports for the flow of water and the respective two ports connected by pipes to two ports of a double 'L' port 4 way valve (a standard embodiment) hitherto referred to as control valve and one of the remaining port connected to supply water line and the remaining connected to outlet for the consumer in such a manner that in one position of the said valve the water source is connected to say left compartment while outlet is connected to remaining say right compartment and in remaining position of the said valve the water source is connected to say right compartment while outlet is connected to remaining say left compartment means during such operation said piston assumes say right dead end position and stops while in next valve position said piston assumes left dead end position and in this manner the fixed volume in the respective compartment is filled and simultaneously discharges through the outlet and in this manner the said piston moves to and fro within the said cylinder and in doing so discharges regulated fixed volume of water to the consumer one by one by successive operating the valve in the respective positions and as per another embodiment the sliding piston is replaced by two bellows placed close by while said cylinder ports are attached to said bellows and control valve ports respectively and as per still another embodiment the said piston replaced by two flexible bags enclosed within the said container means cylinder while said cylinder ports are attached to bags and said control valve ports respectively. Further the changing the volume of the said cylinder by external means the discharge volume at the outlet be regulated.

BRIEF DESCRIPTION OF DRAWING:

This invention is described by way of example with reference to the following drawing where,

Figure 1A of sheet 1/2 shows the front elevation of the first embodiment comprising a piston when the control valve is in first position and actuates one of the compartments while Figure 1B of sheet 1/2 shows the front elevation of the first embodiment when the control valve is in remaining position and actuates remaining compartment.

Figure 2 of sheet 2/2 shows a slidably fitted spherical ball in place of the said piston. Figure 3 of sheet 2/2 shows the front elevation of the second embodiment comprising bellows replacing the piston compartments. Figure 4 of sheet 2/2 shows the front elevation of the third embodiment comprising flexible bags replacing piston compartments.

Figure 1A shows a container in the form of a closed cylinder 101 having a sliding piston 102 enclosed within, and the said piston 102 dividing the volume of the cylinder 101 in two compartments means regions such as 105 compartment on one side and 106 compartment on the other side. The piston 102 reaches one extreme position 102A referred to as left dead end while the volume 105 becomes minimum whereas volume 106 becomes maximum and while in another extreme position 102B referred to as right dead end the volume 105 becomes maximum whereas volume 106 becomes minimum. A port 110 meant for charging and discharging of the compartment 105 connected to a specific port of said control valve 116 via water connection 112. Similarly a port 111 meant for charging and discharging of the compartment 106 connected to a specific port of said control valve 116 via water connection 113. One of the ports of control valve 116 is connected to water supply line 114 while another port 115 is connected to outlet for the ultimate use of consumer. So when the control valve 116 is in 121A position the inlet supply flows through port 114 and diverted to 117 and through pipe line 112, then flows to compartment 105

through cylinder 101 port 110 and exert pressure on the piston 102 such that it moves till said dead end 102A thereby pushing the water in compartment 106 through cylinder port 111, through pipe line 113 to port 120 and diverted to outlet port 115 by control valve 116 to discharge the regulated water quantum to the consumer till compartment 106 is fully emptied means no more discharge and now when the control valve 116 is turned to remaining position 121B, as shown in Figure 1B, the inlet supply flows through port 114 and diverted to pipe line 113 by control valve 116, then flows to compartment 106 through cylinder 101 port 111 and exert pressure on the piston 102 such that it moves till said dead end 102B thereby pushing the water in compartment 105 through cylinder port 110, through pipe line 112 to port 117 and diverted to outlet port 115 to discharge the regulated water quantum to the consumer till compartment 105 is fully emptied means no more discharge. It means the said embodiment discharges the volume of water between dead end 102A and 102B to the consumer during one operation. The said volume 109 is set means adjusted by a stopper 103 comprising an adjustable threaded bolt and nut 108 combination.

In another embodiment the said piston 102 is replaced by a slidably fitted spherical embodiment as shown in Figure 2.

In still another embodiment the said piston 102, compartment 105 and 106 (Figure 1A and 1B) are replaced by separate bellows 305 and 306 respectively joined at 326 as shown in figure 3 while the remaining connections unaltered.

In still another embodiment the said piston 102, compartment 105 and 106 (Figure 1A and 1B) are replaced by separate flexible water tight bags 405 and 406 respectively as shown in figure 4 while the remaining connections unaltered.

In order that the manner in which the above-cited and other advantages and objects of the invention are obtained, a more particular description of the invention briefly described above will be referred, which are illustrated in the appended drawing. Understanding that these drawing depict only typical embodiment of the invention and therefore not to be considered limiting on its

scope, the invention will be described with additional specificity and details through the use of the accompanying drawing.

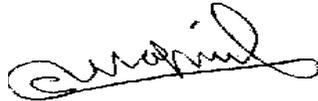
Detailed description:

The present invention provides a novel regulated liquid dispensing apparatus to be used at various personal or public outlets where a fixed means set quantity of liquid particularly water by default and to dispense with usual water wastage due to spillage etc. may be due to commission or omission. Further by giving fixed means set quantity of precious water to every consumer, a social justice is imparted.

The said invention comprises a closed container in the form of a cylinder 101 having a sliding piston 102 enclosed within, and the said piston 102 dividing the volume of the cylinder 101 in two compartments means regions such as 105 compartment on one side and 106 compartment on the other side. The piston 102 reaches one extreme position 102A referred to as left dead end while the volume 105 becomes minimum whereas volume 106 becomes maximum and while in another extreme position 102B referred to as right dead end the volume 105 becomes maximum whereas volume 106 becomes minimum. A port 110 meant for charging and discharging of the compartment 105 connected to a specific port of said control valve 116 via water connection 112. Similarly a port 111 meant for charging and discharging of the compartment 106 connected to a specific port of said control valve 116 via water connection 113. One of the ports of control valve 116 is connected to water supply line 114 while another port 115 is connected to outlet for the use of consumer. So when the control valve 116 is in 121A position the inlet supply flows through port 114 and diverted to 117 and through pipe line 112, then flows to compartment 105 through cylinder 101 port 110 and exert pressure on the piston 102 such that it moves till said dead end 102A thereby pushing the water in compartment 106 through cylinder port 111, through pipe line 113 to port 120 and diverted to outlet port 115 by control valve 116 to discharge the regulated water quantum to

the consumer till compartment 106 is fully emptied means no more discharge and now when the control valve 116 is turned to remaining position 121B, as shown in Figure 1B, the inlet supply flows through port 114 and diverted to pipe line 113 by control valve 116, then flows to compartment 106 through cylinder 101 port 111 and exert pressure on the piston 102 such that it moves till said dead end 102B thereby pushing the water in compartment 105 through cylinder port 110, through pipe line 112 to port 117 and diverted to outlet port 115 to discharge the regulated water quantum to the consumer till compartment 105 is fully emptied means no more discharge. It means the said embodiment discharges the volume of water between dead end 102A and 102B to the consumer during one operation. The said volume is adjusted 109 by a stopper 103 comprising an adjustable threaded bolt and nut 108 combination.

Additional advantages and modification will readily occur to those skilled in art. Therefore, the invention in its broader aspect is not limited to specific details and representative embodiments shown and described herein. Accordingly various modifications may be made without departing from the spirit or scope of the general invention concept as defined by the appended claims and their equivalents.



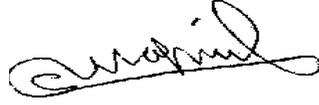
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CLAIMS

We claim:-

1. Regulated Liquid Dispensing Apparatus comprises a closed container of specific volume in the form of a cylinder having a leak-proof sliding piston enclosed within, and the said piston dividing the volume of the cylinder in two compartments means regions on its either side and the movement of the said piston means the volume thereby limited by the dimensions of the said cylinder and each end of the said cylinder having respective port to facilitate charging and discharging of the said compartments by liquid and the said piston made to move within the cylinder as per the pressure difference across the piston to either extreme dead end position and between such extreme movement the liquid with higher pressure compartment drives the liquid in low pressure compartment to outside utilities in such a manner that the high pressure liquid fills respective compartment and simultaneously empties the regulated volume of liquid in remaining compartment emptied in to the outlet and by swapping means exchanging the pressure in the compartment the action is reversed and the regulated volume of liquid in first compartment emptied in to the outlet and such action is achieved by a dedicated valve two way operation.
2. The said volume of cylinder as claimed in 1 adjusted by a stopper comprising an adjustable threaded bolt and nut combination.
3. Another embodiment of the said invention claimed in 1 where the said piston replaced by a sliding ball of suitable dimensions.
4. Another embodiment of the said invention claimed in 1 where the said piston, respective compartments replaced by two bellows.

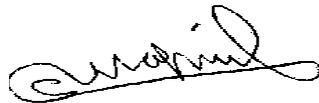
5. Another embodiment of the said invention claimed in 1 where the said piston and respective compartments replaced by two flexible, inflatable bags;



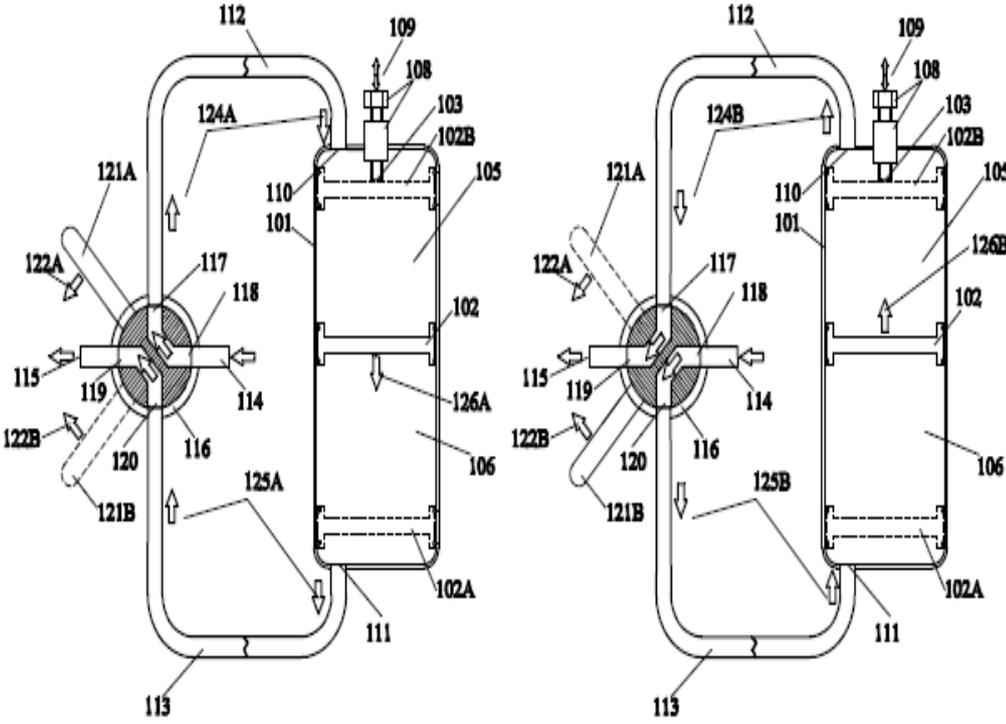
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ABSTRACT

Present invention in general relates to regulated means fixed volume dispensing apparatus generally for liquid and particularly for water. The regulated liquid dispensing apparatus, particularly designed for water dispensing at home, office, function, public places, railway compartment, stations and many other places where water outlets are not in controlled environment and colossal waste of water especially potable water is observed. The present invented apparatus is easy to operate means single stroke tap or valve action and no subsequent close action, simple in construction, operates on the incoming pressure of the tap water, automatically stops the flow of water after the dispensing controlled quantity of water thereby avoids undue wastage of water, ready to serve next consumer immediately and avoids delay, provision to shut the flow in emergency.



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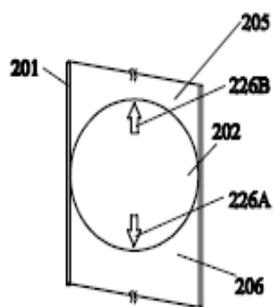


Figure-2

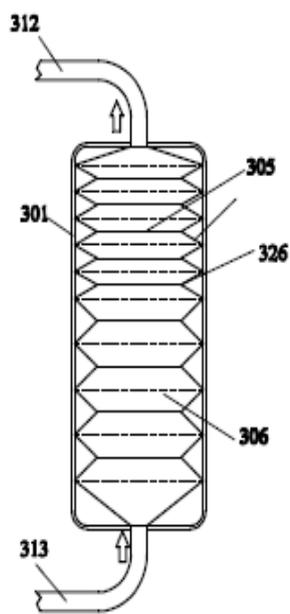


Figure-3

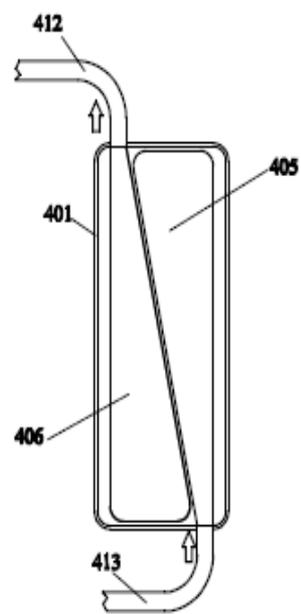


Figure-4

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