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(54) Title: IMPROVEMENTS IN FLUID OUTLETS

(57) Abstract:

This invention is concerned with fluid outlets and sets out to provide such outlets which incorporate an automatic shut-off valve. More particularly, the invention is directed to the provision of such outlets adapted for use in water supply regulation applications.

It is known that in areas where water is in short supply that there is need for water outlets that will minimise water wastage. As a result of this need, several water outlets of differing design have been proposed and developed. Most of these, so far as the inventor is aware, proceed on the basis that the valve in the mechanism has to be held open against spring pressure when depressed to allow fluid to flow. In more sophisticated mechanisms there is a form of time interval so that, when once depressed, the outlet will measure out a given quantity of water before shutting off automatically.

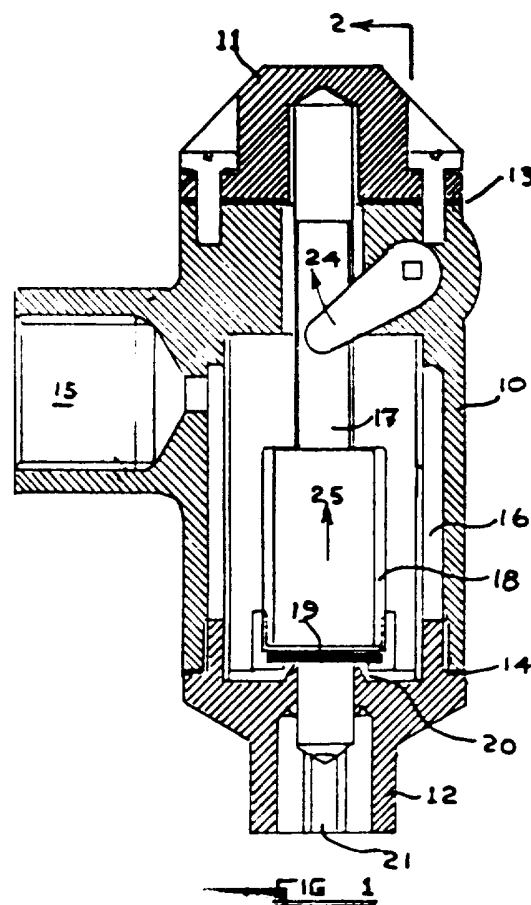


FIG. 1

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(56) Documents cited: GB 1595 137
FR 209 942 A1

SU 18307 A3
GB 1337 056

IMPROVEMENTS IN FLUID OUTLETS

This invention is concerned with fluid outlets and sets out to provide such outlets which incorporate an automatic shut-off valve. More particularly, the invention is directed to the provision of such outlets adapted for use in water supply regulation applications.

It is known that in areas where water is in short supply that there is need for water outlets that will minimise water wastage. As a result of this need, several water outlets of differing design have been proposed and developed. Most of these, so far as the inventor is aware, proceed on the basis that the valve in the mechanism has to be held open against spring pressure when depressed to allow fluid to flow. In more sophisticated mechanisms there is a form of time interval so that, when once depressed, the outlet will measure out a given quantity of water before shutting off automatically.

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The inventor's further researches have indicated that all known fluid outlets of the kind in question have this spring arrangement which will induce a shut-off of the flow. However, there is invariably a time delay and it has been observed that there is a tendency to override the shut-off spring by forcibly holding the valve open until the receptacle is filled, at which stage the pressure on the mechanism is removed and the time delay before automatic shut-off tends to result in the wastage of water since the container is already full to overflowing or has been removed before the valve override mechanism has been released.

It is particularly with this problem that the inventor is concerned and he has accordingly devised what he believes to be a novel outlet which is simple in construction by comparison with the prior art and which achieves its intended purpose.

According to the invention, there is provided a fluid outlet which comprises in working combination a principal housing incorporating fluid inlet and outlet means; within the body of the housing a piston coupled to an external actuating means; said piston being adapted to move within predetermined limits within the body of the housing; a secondary free floating cylinder adapted to move within a chamber and over the piston and further including a resiliently flexible sealing element adapted to engage a seat generally located within the region of the fluid outlet means.

Further according to the invention, a fluid outlet as defined above characterised by its method of operation wherein turning of the external actuating means clockwise will move the piston up in the cylinder and the vacuum created between the piston and the cylinder causes the cylinder to be lifted from the seat allowing fluid to flow from the inlet through to the outlet.

If the operating means is held in this position, the cylinder slowly falls under the force of gravity as fluid seeps between the piston and the cylinder wall, thereby releasing the vacuum and thereby creating a delayed shut-off of the outlet despite the fact that the actuating mechanism is retained in the depressed condition.

In addition, if the operating means is released at any time during the operating cycle, a spring located within the operating means causes the outlet to shut-off immediately, thus allowing smaller quantities of fluid to be released through the outlet at will.

The spring also ensures that the outlet is closed at all times other than when the operating means is actuated.

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In order to facilitate the further understanding of the invention, one presently preferred embodiment will now be described in detail with reference to the accompanying drawings. The description should not be interpreted as limiting the inventive concept.

FIG. 1 is a part-sectioned front and side elevation of a water outlet in accordance with the invention; and FIG. 2 is a part-sectioned front and side elevation of the unit of Fig. 1 showing the external actuating means.

Referring to both drawings, reference numeral 10 indicates generally the external body of the device which is provided with an upper capping member 11 and a lower capping member 12, both of which members are sealed into the body 10 by seals 13 and 14 respectively to form a watertight closure along with body 10.

An inlet for fluid 15 is provided in the wall of the body 10 and communicates with a chamber 16 within which chamber is located a piston 17 and associated cylinder 18, the lower end of cylinder 18 resting upon a sealing ring 19 which overlies a seat 20 which, in turn, overlies an outlet for fluid 21 located in the lower capping member 12.

An actuating mechanism 22 comprising a lever located on a spindle 23 is housed in the body 10, the spindle 23 being adapted to couple with piston 17 in a manner so that, when the lever 22 is displaced from a substantially vertical position towards an horizontal position in the direction of arrow 24, the piston 17 is raised in the direction of arrow 25 thereby opening chamber 16 to allow fluid to pass from inlet 15 through chamber 16 over seat 20 and out to outlet 21.

Simultaneously, raising of piston 17 tends to create a vacuum in the annulus 26 between cylinder 18 and lower portion of piston 17, this vacuum tending to restrain the descent of cylinder 18 towards sealing member 19 but not totally inhibiting such descent due to a seepage of fluid into the annulus from chamber 16 which will erode the partial vacuum created by actuating lever 22.

It will be apparent to those skilled in the art that the mechanism as proposed and described above yields a fluid-controlling outlet means having novel features not presently disclosed in the prior art and showing advantages over existing mechanisms of the kind in question.

In use, the unit may be coupled to a water main via inlet 15 whereafter it is ready for use. In the normal circumstances, actuating mechanism 22 will be in the substantially vertical position relative to the unit and piston and cylinder assembly 17 and 18 will rest upon seal 19, thus closing off seat member 20 and preventing fluid from leaking through outlet 21.

So soon as lever 22 is moved in the direction of arrow 24 piston 17 and its associated cylinder 18 are raised within annulus 26 and the bottom of cylinder 18 is withdrawn from sealing ring 19, thus allowing fluid to flow from inlet 15 through channel 16 over seat 20 and out of outlet 21. Simultaneously, a vacuum or partial vacuum is drawn in the annulus 26 surrounding cylinder 18 which tends to retain the cylinder in the upward direction following arrow 25.

However, pressure seepage of fluid passing from 15 through to 21 tends to seep past the piston shaft and into the annulus, thus eroding the partial vacuum and allowing the piston 17 and associated cylinder 18 to descend under action of gravity until the bottom of cylinder 18 seals off against seal 19, thus closing outlet 20 and preventing further outflow of fluid through outlet 21.

CLAIMS:

1. A fluid outlet comprising in working combination, a principal housing incorporating fluid inlet and outlet means; within the body of the housing a piston coupled to an external actuating means; said piston being adapted to move within predetermined limits within the body of the housing; a secondary free floating cylinder adapted to move within a chamber and over the piston and further including a resiliently flexible sealing element adapted to engage a seat generally located within the region of the fluid outlet means.

2. A fluid outlet as claimed in Claim 1 characterised by its method of operation wherein turning of the external actuating means clockwise will move the piston up in the cylinder and the vacuum created between the piston and the cylinder causes the cylinder to be lifted from the seat allowing fluid to flow from the inlet through to the outlet; the cylinder slowly falls under the influence of gravity as fluid seeps between the piston and the cylinder wall, thereby releasing the vacuum, irrespective of the position of the actuating mechanism.

3. A fluid outlet as claimed in Claim 1 or Claim 2 characterised by the provision of a spring located within the operating means which causes immediate shut-off of the outlet should the operating means be released at any time during the operating cycle.

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4. A fluid outlet substantially as herein described and as illustrated in the accompanying drawings.

DATED THIS 20th day of August 1990.



PATENT AGENT FOR THE APPLICANT

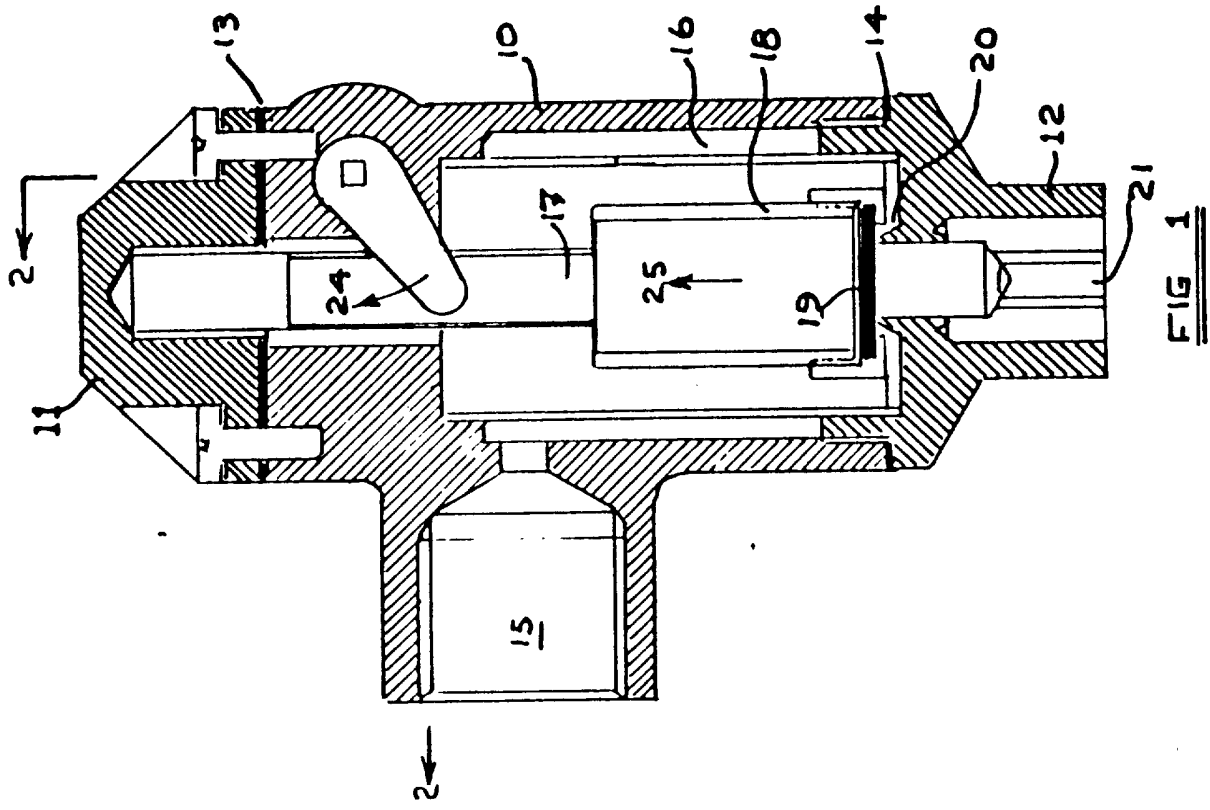


FIG 1

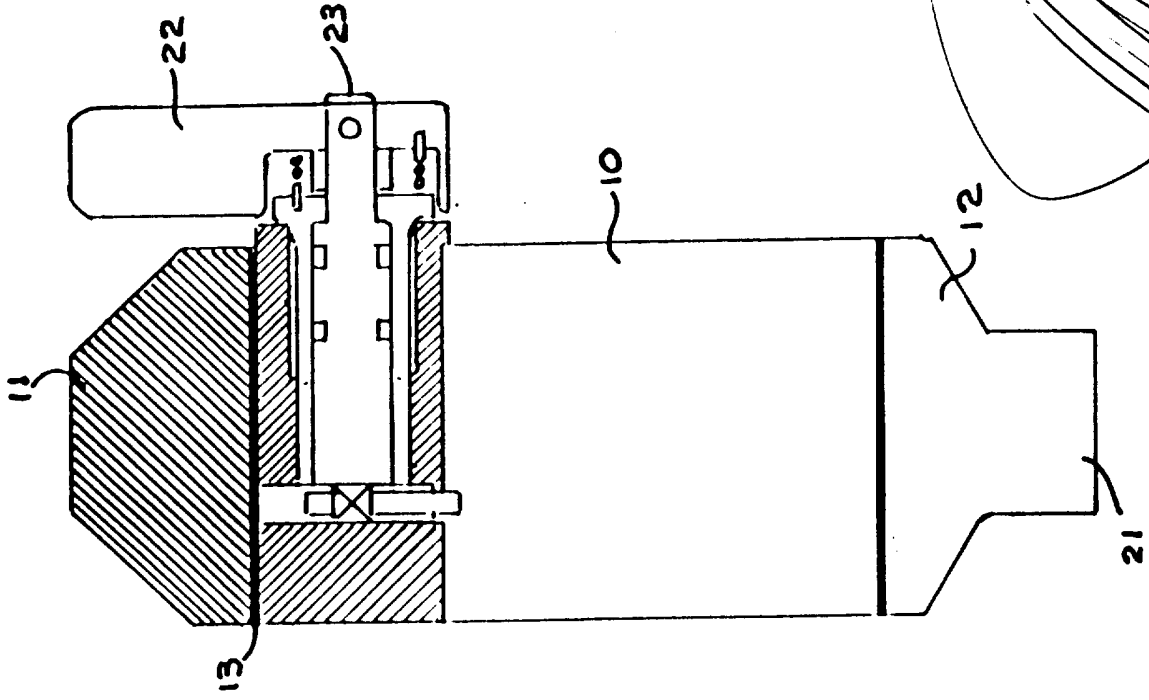


FIG 2

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