June 6, 1972 R. T. CORNELIUS 3,667,724

SOLENOID ACTUATED DISPENSING VALVE

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Fig. 1

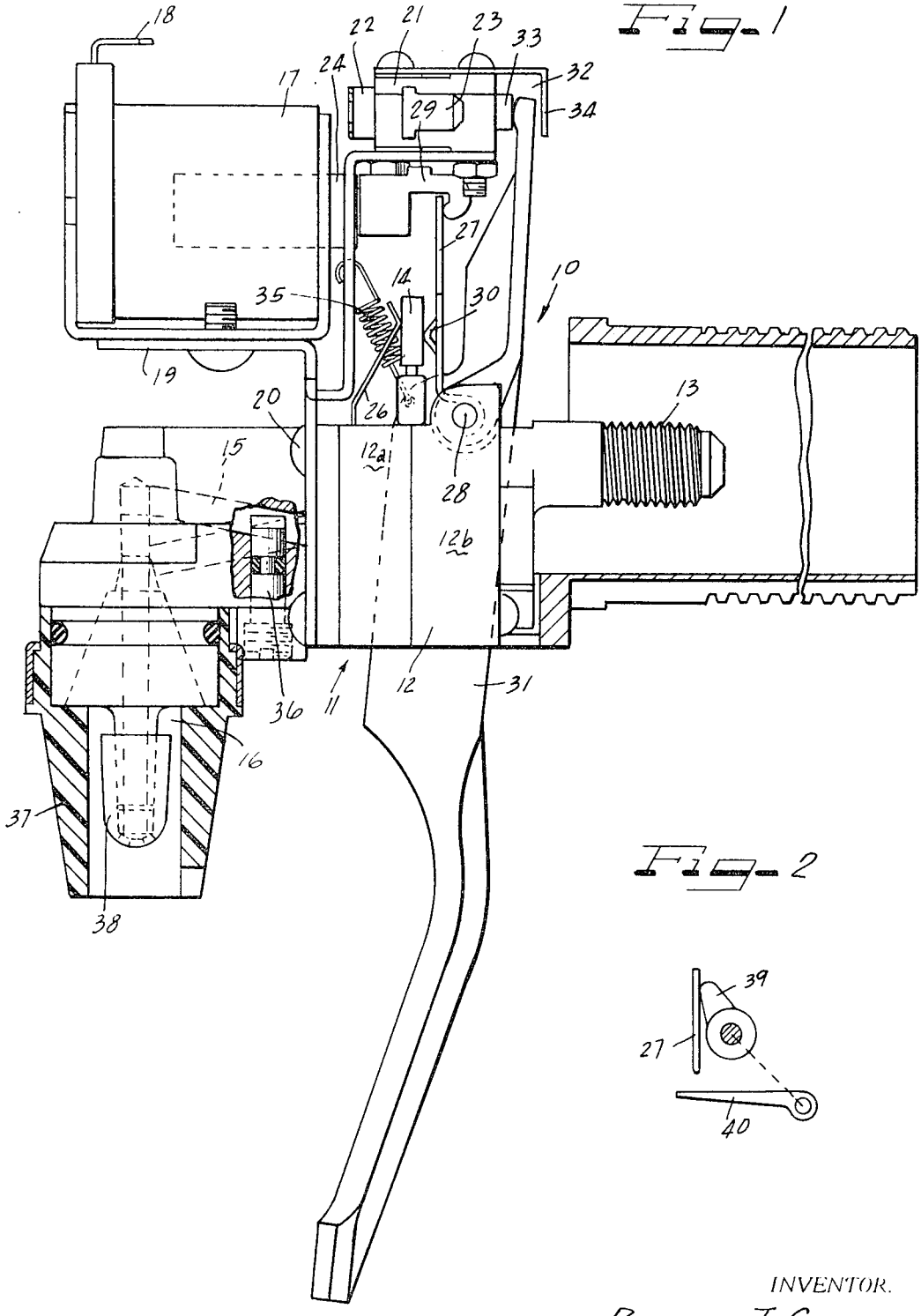


Fig. 2

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SOLENOID ACTUATED DISPENSING VALVE

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ABSTRACT OF THE DISCLOSURE

A dispensing device in the form of a mixing valve assembly has separate actuator arms for the fluids to be mixed, a solenoid having a plunger arranged to rock the actuator arms, and a selectively actuatable switch on the device connected in circuit with the solenoid. There is also included a manually movable lever located at the discharge nozzle for actuating the switch.

BACKGROUND OF THE INVENTION

Field of the invention

This invention relates generally to a dispensing valve assembly and more particularly to one that includes a switch actuated solenoid for operating the valve, preferably as a post-mix valve.

In my Patent No. 3,455,332, issued July 15, 1969, there is disclosed a post-mix valve which uses an actuating lever to mechanically actuate the two valve elements that regulate the flow of the two fluids that are to be mixed. I have found that there would be consumer demand for a device of that type, but which would require less force or energy on the part of the user to operate.

SUMMARY OF THE INVENTION

According to this invention, a dispensing device is provided wherein the valve elements are operated by an electric solenoid which is under the control of a selectively actuatable switch within the device.

Accordingly, it is an object of the present invention to provide an electrically operated dispensing device.

A further object of the present invention is to provide a dispensing device or mixing valve that can be operated using a minimum of force or energy on the part of the user.

Yet another object of the present invention is to be able to externally modify the ratio of the fluid ingredients being mixed.

A still further object of the present invention is to insure that the mixing is carried out in a thorough manner so as to avoid the need for possible stirring of the dispensed product or beverage.

Another object of this invention is to provide means by which one of the fluids can be dispensed without energizing the solenoid which normally controls the dispensing of such fluid.

Many other advantages, features and additional objects of the present invention will become manifest to those versed in the art upon making reference to the detailed description and the accompanying drawing in which a preferred structural embodiment incorporating the principles of the present invention is shown by way of illustrative example.

On the drawing:

FIG. 1 is a side elevational view, partly in cross section, of a dispensing device such as a mixing valve provided in accordance with the principles of the present invention, a cover having been removed to facilitate illustration; and

FIG. 2 is a fragmentary diagrammatic view of an auxiliary actuator carried by the cover.

As shown on the drawing:

The principles of the present invention are particularly

useful when embodied in a dispensing device or post-mix valve assembly such as illustrated in FIG. 1, generally indicated by the numeral **10**. The device **10** includes a valve assembly **11** having a housing **12** composed of portions **12***a* and **12***b* through which two fluid passages extend. One fluid passage has an inlet fitting **13** while the other fluid passage has a similar inlet disposed directly in back of the inlet **13**. Each of the fluid passages are under the control of a valve element (not shown) carried on the inner end of an actuator arm **14** that projects from the housing **12**, is pivotally supported by such housing, and which thereby opens and closes the associated passage in response to being rocked. One fluid passage is partially illustrated at **15** and the other fluid passage is partially illustrated at **16**. It is to be understood that certain advantages of the present invention can be obtained even though only one fluid passage is utilized where no mixing is needed.

An electric solenoid **17** having a terminal **18** is supported on a bracket **19** which is secured as by screws **20** to the housing **12**. The bracket **19** also supports a selectively actuatable electric switch **21** on another portion thereof, the switch **21** having terminals **22**, **23**. The solenoid **17** has a plunger **24** which is provided with means for rocking the actuator arm or arms **14** to a passage-opening position, against the force of a biasing spring or springs **26**. To this end, there is included a pair of intermediate levers **27**, one behind the other, which are pivoted on a pin **28** carried by the housing **12**. Further, the plunger **24** carries a hook **29** which embraces the upper ends of the intermediate levers **27** and has a lost motion connection therewith. The intermediate levers **27** have a pair of spaced bearing points **30**, one behind the other, for actuating the actuator arms **14**. By this construction, each of the intermediate levers **27** has a greater effective length between its pivot at **28** and the plunger-operated hook **29** than it does have between the pivot **28** and the actuator arm or arms **14**.

The electric switch **21** is selectively actuatable and is mounted in fixed position relative to the housing, and the terminals **21**, **22** are in circuit with the solenoid terminals such as **18** and with a source of power. The selective actuation of the switch **21** is obtained by a manually movable switch-actuating lever **31** which is also pivotally mounted on the pivot pin **28**. The lower end of the switch-actuating lever **31** extends downwardly so that it can be readily pushed rearwardly by the person who holds a glass or other receptacle under the outlet. The upper end of the switch-actuating lever **31** is disposed in a space **32** between the plunger **33** of the switch **21** and a lever limiting means **34**. A spring **35** acts between the bracket **19** and the switch-actuating lever **31** to tend to rock the lever **31** in a clockwise direction as viewed whereby the upper end of the lever **31** is normally in engagement with the limiting means **34**. The limiting means **34** further serve to prevent the lever from hitting the cover that is not shown, and also prevent the upper end of that lever from getting into the space that would be occupied by the cover during its being put on, so that the limiting means thus prevents any such type of interference.

There are three additional features that enhance the operation of this device when it has the two passages so that it is used as a mixing valve.

Ordinarily, the kinds of fluids that are usually mixed constitute refrigerated carbonated water and a flavored syrup. As the viscosity and the pressure on the supply of syrup is a constant, the amount of syrup that can be dispensed in a fixed period of time is regulated by the position of an externally adjustable flow restrictor **36** which extends partially by a selected amount into the downstream portion of the passage **15**. By setting the position

of the restrictor **36**, the Brix of the mixed beverage is thus controlled.

The syrup passage **15** extends vertically through the center of a spout **37**, while the other or water passage extends in the space surrounding the lower end of the passage **15**. Thus, at the discharge end of the passage **15**, the passage **16** is of annular cross section and surrounds the passage **15**. Over the lower end of the passage **15**, there is provided a multi-orifice nozzle **38** which sprays or finally divides the syrup laterally into the annular stream of carbonated water that surrounds it, thereby ensuring excellent mixing.

There preferably are two intermediate levers **27**, one for each of the actuator arms **14**, but both actuated by the hook **29**. In addition, there is provided a cam **39** (FIG. 2) which is pivotally supported on the cover at a point for engaging only one of the intermediate levers **27** near the hook **29**. The cam **39** is under the control of a manual lever **40** which thereby can be used to cause the cam to engage and to rock only one of the actuating arms **14**. Normally, this is for the purpose of withdrawing only one of the liquids, such as carbonated water.

For further details of the internal construction of the valve assembly **11**, including the interior of the housing **12** and the inner end of the actuator arm **14**, the reader is referred to my Patent No. 3,455,332.

Although various minor modifications might be suggested by those versed in the art, it should be understood that I wish to embody within the scope of the patent warranted hereon, all such embodiments as reasonably and properly come within the scope of my contribution to the art.

I claim as my invention:

1. A dispensing device comprising:

(a) a valve assembly including a housing having a fluid passage therethrough, said valve assembly including an actuator arm projecting from said housing and pivotably supported by it to open and close said passage in response to being rocked;

(b) a solenoid secured to said housing and having a plunger provided with means for rocking said actuator arm;

(c) a selectively actuable switch disposed in fixed relation to said housing and connected in circuit with said solenoid;

(d) a generally vertical switch-actuating lever pivotably supported on said housing for manually actuating said switch,

(e) a spring acting between said housing and said actuator arm;

(f) an intermediate lever pivoted at its lower end on said housing, engageable at an intermediate point with the outer end of said actuator arm, and driven at its outer end by said solenoid plunger; and

(g) said spring and said actuator arm providing a biasing force, through said intermediate lever, on said plunger to retract it when said solenoid is deenergized.

2. A dispensing device according to claim **1** in which said switch has a case, said case limiting pivotal movement of said switch-actuating lever in a switch-engaging direction.

3. A dispensing device according to claim **1** including means disposed in fixed relation to said switch for limiting pivotal movement of said switch-actuating lever in a switch-disengaging direction.

4. A dispensing device according to claim **3** including a spring urging said switch-actuating lever to engage said limiting means by which engagement the normal position of said actuating lever is controlled.

5. A dispensing device according to claim **1** including a hook on said plunger embracing the end of said intermediate lever.

References Cited

UNITED STATES PATENTS

2,132,204	10/1938	Davis et al.	251—232 X
3,221,936	12/1965	Spinuzza	222—76 X
2,327,366	8/1943	Nampa	251—138 X
2,616,607	11/1952	Perkins	251—138 X
3,289,948	12/1966	Fuerst	222—145
3,396,871	8/1968	McCann	222—145 X
3,102,712	9/1963	Zilk	251—138 X
3,163,177	12/1964	Welty et al.	251—129 X

FOREIGN PATENTS

1,17,645	2/1956	France	251—138

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