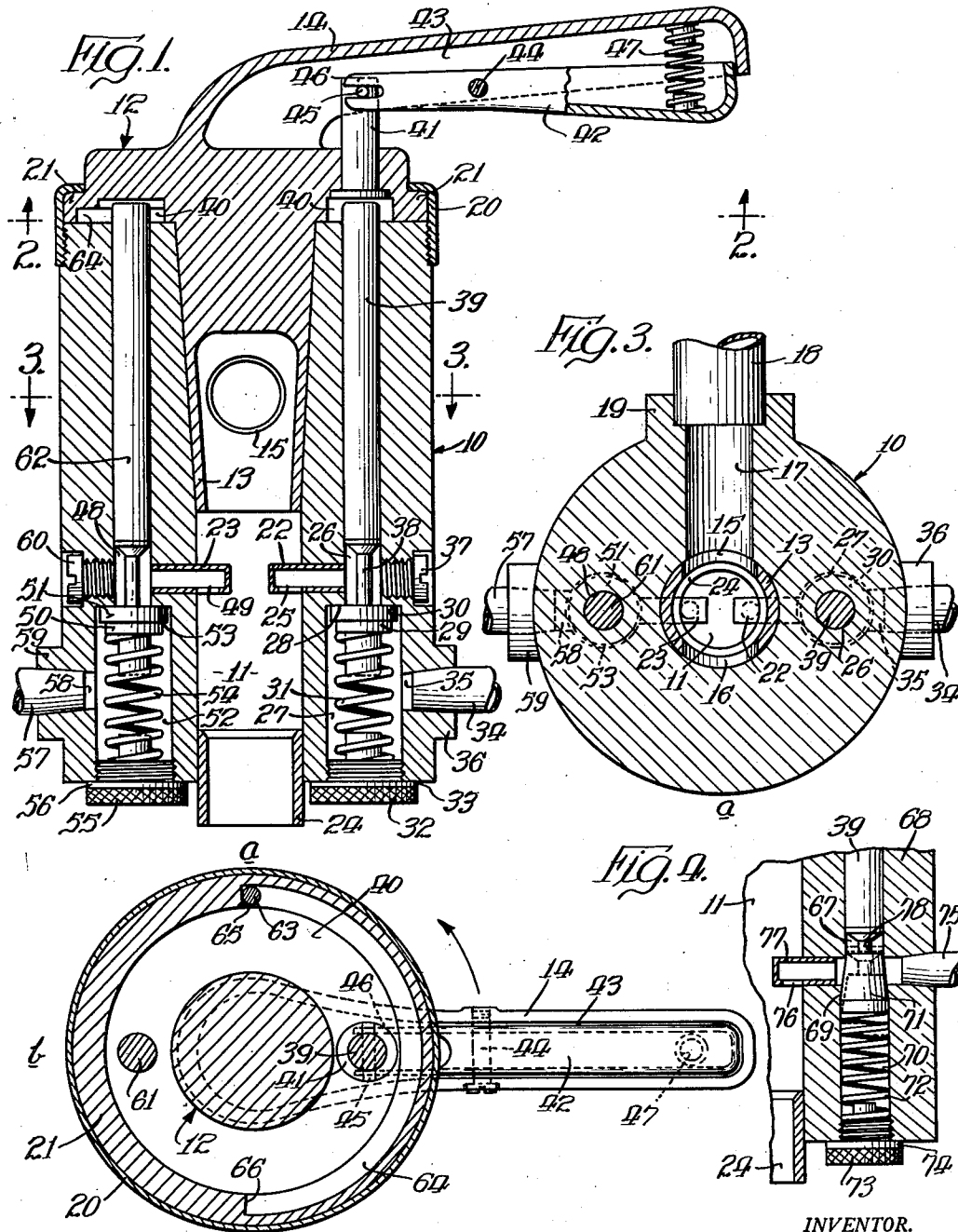


April 14, 1953

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DISPENSING VALVE

2,634,753

Filed April 25, 1950



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UNITED STATES PATENT OFFICE

2,634,753

DISPENSING VALVE

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Application April 25, 1950, Serial No. 157,944

6 Claims. (Cl. 137—635)

1

My invention relates generally to an improved dispensing valve for selectively intermixing two streams of fluid, and more particularly to a valve for selectively introducing one fluid food product into another, such as for example introducing ice cream, flavoring, or sherbet, into soft ice cream. By the term "fluid food product" I mean a food product of the type which may be pumped or otherwise propelled through a line for discharge from a dispensing valve.

The principal object of the present invention is to provide a dispensing valve by means of which an operator may selectively introduce one fluid substance into another. For example, my dispensing valve may be used to discharge soft ice cream either with or without a flavoring intermixed therewith, at the option of the operator of the valve.

Another important object of this invention is to provide a dispensing valve which can be quickly and easily taken apart for cleaning, and hence may be easily maintained sanitary.

Another object of my invention is to provide a dispensing valve of strong and durable construction, and which is characterized by dependable operation.

According to the invention, a valve body having a bore therein is provided with a valve member rotatable in the bore to open and close a first inlet passageway. The bore serves as the primary discharge or extrusion tube through which one of the fluid substances is discharged. A second inlet passageway opens into the bore, and is provided with its own closure valve. The apparatus is further equipped with actuating mechanism for the valve in said second passageway, while the rotatable valve member is provided with means for selectively engaging the actuating mechanism to open said valve in said second passageway when the valve member is turned to open the first inlet passageway. It is through the second inlet passage that the second fluid substance is introduced into the stream of the first substance flowing through the bore in the valve body. In a preferred embodiment of my invention, a plurality of secondary inlet passageways communicate with the bore of the valve body, each passageway being used to introduce a different flavoring, etc., into the first mentioned fluid substance. In this embodiment, a valve and actuating mechanism therefor are provided for each secondary inlet passageway, and the rotatable valve member is constructed such that whenever the first inlet passageway is open, one of the valve actuating mechanisms may be actuated.

2

In order that my invention may be more fully disclosed, reference is had to the accompanying drawing which illustrates several forms of dispensing valves embodying the foregoing and such other principles, advantages or capabilities as may be pointed out as this description proceeds, or as are inherent in the present invention. For purposes of clarity in exposition, the following description is explicit, and the accompanying drawing is detailed, but it is distinctly to be understood that said exposition is illustrative only, and that my invention is not restricted to the particular details recited in the specification or shown in the drawing.

In the drawing:

Figure 1 is a front view of a first embodiment of my invention, taken in central cross section;

Figure 2 is a bottom view taken in section on the line 2—2 of Figure 1;

Figure 3 is a plan view taken in section on the line 3—3 of Figure 1; and

Figure 4 is a front view taken in section and showing a valve and valve actuating mechanism comprising a portion of a second embodiment of my invention.

Like reference characters designate like parts in the drawing and in the description of my invention which follows.

Referring now to the drawing, and more particularly to the embodiment of Figure 1, the reference numeral 10 indicates generally a valve body, which has a bore 11 extending there-through. A cap indicated generally by the numeral 12 fits over the upper end of the valve body 10, and includes a valve sleeve 13 which extends downwardly into the bore 11, and a handle 14 by means of which the cap 12 is turned. As shown in Figure 3, the valve sleeve 13 has two ports 15 and 16 substantially diametrically opposite each other, hence each of the ports 15 and 16 may be registered with the inlet passageway 17 by turning the valve sleeve 13 through 180 degrees. A supply conduit 18 is connected to the inlet passageway 17 at the boss 19 of the valve body 10. A threaded flanged collar 20 is removably secured to the upper portion of the valve body 10, and fits over the shoulder portion 21 of the cap 12, to hold said cap 12 in place on the valve body 10.

Two cylindrical nozzles 22 and 23 extend into the bore 11 between the valve sleeve 13 and the discharge nozzle 24 at the lower end of the valve body 10. The inlet passageway 25 of the nozzle 22 communicates with the bore 26, which opens out of the valve body 10 beneath the cap 12. The bore 26 in turn connects with the chamber 27 to

3

form a shoulder 28. A plug valve 29 having a sealing plug 30 thereon seats against the shoulder 28, and is normally held in this position by the spring 31 within the chamber 27. A screw type plug 32 closes the lower end of the chamber 27, the washer 33 providing a fluid seal at this point. A supply conduit 34 is connected to the inlet 35 in the boss 36. A clean out plug 37 pierces the valve body 10 in alignment with the nozzle 22, so that the inlet passageway 25 therein may be cleaned.

Extending upwardly from the valve 29 is a valve stem 38, which is moved downwardly upon depression of the push rod 39 slidable in the bore 26. The push rod 39 normally extends above the valve body 10, and to provide clearance for this extended end portion the cap 12 includes a circular groove 40 (Figure 2). Referring again to Figure 1, the push rod 39 may be moved downwardly by means of a tappet 41 slidably mounted in the cap 12. A lever 42 fits within the recess 43 of the handle 14 and is pivoted to said handle by the pivot fastener 44 (Figure 2). A pin 45 extends through the upper portion of the tappet 41, and is removably engaged by the yoke 46 of the lever 42. A spring 47 is positioned between the outer end of the lever 42, and the handle 14, to maintain the tappet 41 normally in the "up" position shown in Figure 1.

Positioned approximately 180 degrees from the bore 26, is a second bore 48, which communicates with the inlet passageway 49 of the nozzle 23. A valve 50 having a sealing member 51 thereon, is positioned within the chamber 52, and seats against the shoulder 53 thereof. A spring 54 is anchored to the screw type plug 55, to hold the valve 50 normally in the closed position. The washer 56 provides a seal between the plug 55 and the valve body 10. A supply conduit 57 communicates with the chamber 52 through the inlet 58 in the boss 59. A clean out plug 60 penetrates the valve body 10 to the bore 48, and is in alignment with the inlet passageway 49. To operate the valve 50, a push rod 61 is positioned in the bore 48, in engagement with the valve stem 62.

As best shown in Figure 2, a stop pin 63 extends upwardly from the valve body 10 between the bores 26 and 48. An arcuate recess 64 is formed in the cap 12 to one side of the circular groove 40 to provide clearance for the stop pin 63, and includes two stop surfaces 65 and 66 at the opposite ends thereof.

While it will be apparent that my dispensing valve may be used to dispense a wide variety of substances, for purposes of illustration I describe below the operation of my device as used to selectively introduce one of two different flavoring liquids into soft ice cream paste. With the apparatus in the position shown in Figures 1-3, the inlet passageway 17 is open to the bore 11 through the port 15 in the valve sleeve 13, while the tappet 41 is positioned over the push rod 39. The supply conduit 18 is connected to a supply of soft ice cream which is under pressure; hence the ice cream flows through the passageway 17 into the bore 11. In that bore it flows downward, around the projecting nozzles 22 and 23. The supply conduit 34 is connected to a supply of flavoring, such as for example chocolate sirup, which is also under pressure. As long as the push rod 39 is in the position shown, however, the spring 39 maintains the sealing member 30 against the shoulder 28; hence no flavoring can flow into the inlet passageway 25. By squeezing

4

the handle 14, however, the operator moves the tappet 41 downwardly, and depresses the push rod 39, thereby opening the valve 29 and permitting a flow of flavoring through the passageway 25 into the body of soft ice cream which is being extruded down the bore 11. This produces a soft ice cream having the variegated cross sectional pattern known in the trade as ripple flavoring. However, as mentioned previously, the operator can control the flow of the flavoring into the basic flow of soft ice cream, so that if desired no flavoring is entrained in the discharged ice cream.

To close the valve, the operator merely swings the handle 14 in a counterclockwise direction, as viewed in Figure 2, toward the position indicated at *a*. This rotates the valve sleeve 13 to close off the inlet passageway 17. Moreover, as soon as the tappet 41 moves to one side of the push rod 39, the compressed spring 31 automatically seats the valve 30 against the shoulder 28. Upon releasing the handle 14, the spring 47 reacts against the lever 42 to move the tappet 41 into the position shown in Figure 1.

Advantageously, the supply conduit 57 may be connected to a supply of a different flavoring from that which is dispensed through the nozzle 22. Thus, for example, a supply of strawberry sirup might be connected to the conduit 57. Upon rotating the handle 14 counterclockwise to the position indicated at *b* in Figure 2, the tappet 41 is positioned over the push rod 61. In addition, rotation of the cap 12 into this position aligns the port 16 in the valve sleeve 13 with the inlet passageway 17; hence ice cream flows into the bore 11. Upon squeezing the handle 14, to move the tappet 41 downwardly, the sealing member 51 is moved away from the shoulder 53, so that the flavoring discharges from the nozzle 23 into the downwardly moving stream of ice cream.

Advantageously, as the handle 14 is moved to either side of the position *a* to discharge ice cream, the stop surfaces 65 or 66 engage the stop pin 63, to align accurately the handle 14 in the desired position. By means of my apparatus, therefore, it becomes a simple task for the operator to manipulate the valve to discharge either plain ice cream, or ice cream containing either of two different flavors.

The embodiment of Figures 1-3 also may be taken apart in a few minutes' time, and easily cleaned, this feature being particularly desirable when the valve is used to dispense food products, such as ice cream and other dairy products. More particularly, the valve may be disassembled, and all working parts thereof easily cleaned, by unscrewing the flanged collar 20, and removing the plugs 32 and 55 and the clean-out plugs 37 and 60, and uncoupling the supply conduits 18, 34, and 57. After this is done, the springs 31 and 54, the valves 29 and 50, and the push rods 39 and 62 drop out of the valve body 10. The valve sleeve 13 may also be lifted out of the bore 11 for cleaning. The clean-out plugs 37 and 60 provide a means for brushing and cleaning the inlet passageways 25 and 49 in the nozzles 22 and 23. If desired, the entire cap assembly 12 may be disassembled, by unscrewing the pivot fastener 44, since this permits sliding the yoke 46 from the pin 45, after which the tappet 41 may be removed from the cap 12. After the various components of my dispensing valve have been cleaned, the entire device may be reassembled in the reverse order. By making the components of the valve out of material such as Monel metal, a nickel-copper alloy, or other non-

5

corroding materials, my dispensing valve may be maintained strictly sanitary with little effort.

Figure 4 shows a second embodiment of my invention, in which the flavoring flowing into the bore 11 does not come in contact with the valve seating spring. More particularly, this embodiment comprises connecting the bore 67 in the valve body 68 with a tapered portion 69, which in turn connects with the chamber 70. A tapered valve member 71 is adapted to seat in the tapered portion 69, and is normally held in this position by the spring 72, which is anchored to the plug 73 closing the bottom of the chamber 70. A washer 74 provides a seal at this jointure. With the tapered valve member 71 in the position shown in Figure 4, no flavoring can flow from the supply conduit 75 to the inlet passageway 76 of the nozzle 77. Upon moving the push rod 39 downwardly, however, against the stem 78 extending upwardly from the valve member 71, said member 71 is deflected to the position shown in dotted outline in Figure 4. When this occurs, the flavoring flows around the stem 78 and into the inlet passageway 76, whence it is discharged into the ice cream moving down the bore 11. As soon as the downward pressure on the push rod 39 is released, the compressed spring 72 returns the valve member 71 to the position shown in full line in Figure 4.

While there may be a slight leakage of fluid around the tapered valve member 71 into the chamber 70, when said member 71 is deflected downwardly, this escaped fluid remains in the chamber 70 and cannot return to the inlet passageway 76. By merely unscrewing the plug 73 and uncoupling the supply conduit 75 from the body 68, all of the working parts shown can be easily removed for cleaning.

Having thus fully disclosed by novel dispensing valve, and demonstrated its utility by reference to certain specific embodiments thereof, I claim as my invention:

1. Apparatus for selectively introducing flavoring into soft ice cream or the like, comprising: a valve body having a circular bore therethrough, a first inlet passageway opening into said bore between the two ends thereof, a rotatable cap on said valve body over one end of said bore, said cap including a handle for turning said cap and a valve sleeve extending into said bore to cover said inlet passageway, said sleeve having two ports therein substantially diametrically opposite each other and each registrable with said inlet passageway upon turning said cap, a second and a third inlet passageway opening into said bore between said valve sleeve and the other end of said bore, each of said inlet passageways spaced approximately 90 degrees from and on opposite sides of said first inlet passageway, two valves, each of said valves in a different one of said second and third passageways, two push rods normally extending from said valve body beneath said cap, each of said push rods drivably connected to a different one of said two valves to open said valve when depressed, spring means urging said push rods toward said cap, said cap having an arcuate groove therein to provide clearance for the extended ends of said push rods as said cap is rotated, a tappet in said cap positioned to be in alignment with one of said push rods when one of said ports in said valve sleeve is in register with said first inlet passageway, a hand lever pivotally secured to said handle and extending therefrom, said lever drivably connected to said tappet to move said tappet toward

6

said valve when said hand lever is moved toward said handle, and spring means between said handle and said lever urging the latter away from said handle.

2. A sanitary knock-down dispensing valve for selectively introducing a fluid substance into a fluid food product, comprising: a valve body having a first circular bore extending therethrough, a first inlet passageway opening into said bore between the two ends thereof, a rotatable cap on said valve body over one end of said bore, said cap including a handle for turning said cap and a valve sleeve extending into said bore to cover said inlet passageway, said sleeve having a port therein registrable with said inlet passageway upon turning said cap, a flanged collar removably securing said cap on said valve body, a second inlet passageway opening into said bore between said valve sleeve and the other end of said bore, said valve body having a second circular bore therein comprising a first portion which communicates with said second inlet passageway and opens out of said valve body beneath said cap, and a second portion of enlarged diameter having an inlet therein, said first and second portions forming a shoulder at the intersection thereof, a valve in said second portion of said second bore, a removable plug closing the open end of said second portion, a spring between said plug and second valve to seat the latter against said shoulder, a stem extending from said valve into said first portion of said second bore, a push rod in said first portion normally extending from said valve body, said cap having a groove therein to clear the extended end of said push rod upon turning said cap, and means on said cap for depressing said push rod in said second bore when said port in said valve sleeve is in register with said first inlet passageway.

3. A sanitary knock-down dispensing valve for selectively introducing a fluid substance into a fluid food product, comprising: a valve body having a first circular bore extending therethrough, a first inlet passageway opening into said bore between the two ends thereof, a rotatable cap on said valve body over one end of said bore, said cap including a handle for turning said cap and a valve sleeve extending into said bore to cover said inlet passageway, said sleeve having a port therein registrable with said inlet passageway upon turning said cap, a flanged collar removably securing said cap on said valve body, a second inlet passageway opening into said bore between said valve sleeve and the other end of said bore, said valve body having a second circular bore therein comprising a first portion which opens out of said valve body beneath said cap, a second portion of enlarged diameter, and a tapered portion which interconnects said first and second portions and intersects said second inlet passageway, a valve member including a tapered portion which mates with said tapered portion of said second bore to close said second inlet passageway, a removable plug closing the open end of said second portion of said second bore, a spring between said plug and said valve member to seat the latter in said tapered portion, a push rod in said first portion normally extending from said valve body, a stem between said push rod and said tapered portion of said valve member, said cap having a groove therein to clear the extended end of said push rod upon turning of said cap, and means on said cap for depressing said push rod in said sec-

ond bore when said port in said valve sleeve is in register with said inlet passageway.

4. Apparatus for selectively introducing a first fluid substance into a second fluid substance, comprising: a valve body having a circular bore therethrough, a first inlet passageway opening into said bore between the two ends thereof, a rotatable cap on said valve body over one end of said bore, said cap including a handle for turning said cap and a valve sleeve extending into said bore to cover said inlet passageway, said sleeve having a port therein registrable with said inlet passageway upon turning said cap, a second inlet passageway opening into said bore between said valve sleeve and the other end of said bore, a valve in said second passageway, a valve actuating member in said valve body and drivably connected to said valve, a tappet in said cap positioned to be in alignment with said valve actuating member when said port in said valve sleeve is in register with said first inlet passageway, a lever pivotally mounted on said handle and drivably connected to said tappet, said lever being deflectable to move said tappet to engage said valve actuating member for opening said valve, and means normally holding said valve and said valve actuating member in the closed position until said lever is deflected.

5. Apparatus for selectively introducing flavoring into ice cream, comprising a valve body with a substantially smooth cylindrical bore therethrough to provide a mixing passageway and a substantially similar bore opening into said mixing passageway between the two ends thereof to provide a first inlet passageway, for ice cream; a rotatable cap on said valve body over one end of said mixing passageway, said cap including a handle for turning said cap and a valve sleeve extending into said mixing passageway to cover said inlet passageway, said sleeve having a port therein registrable with said inlet passageway upon turning said cap; at least one additional but smaller inlet passageway, for flavoring liquid, opening into said mixing passageway between said valve sleeve and the other end of the mixing passageway; a plug valve in said additional passageway, an actuating member for and drivably connected to said plug valve; a tappet in said cap, positioned to be in alignment with said actuating member when said port in said valve sleeve is in register with

said first inlet passageway; a lever pivotally mounted on said handle and drivably connected to said tappet, said lever being deflectable to move said tappet to engage said valve actuating member for opening said plug valve; and means normally holding said plug valve and the actuating member thereof in the closed position until said lever is deflected.

6. Apparatus for selectively introducing flavoring into ice cream, comprising a valve body having a first, substantially smooth cylindrical bore therethrough, for mixing, a second, substantially similar bore opening into the first bore between the two ends thereof, for ice cream; a third bore and passageway, for flavoring, ending in a cylindrical nozzle projecting into said first bore between the ends thereof, at a point remote from the end of the second bore along the axis of the first bore, a rotatable cap on said valve body over one end of said first bore, said cap including a handle for turning said cap and a valve sleeve extending into said first bore to cover said second bore but not said third one; said sleeve having a port therein registrable with said inlet passageway upon turning said cap; a valve in said third passageway; a valve actuating member in said valve body drivably connected to said valve; a tappet in said cap positioned to be in alignment with said valve actuating member when said port in said valve sleeve is in register with said second bore; a lever pivotally mounted on said handle and drivably connected to said tappet, said lever being deflectable to move said tappet to engage said valve actuating member for opening said valve; and means normally holding said valve and said valve actuating member in the closed position until said lever is deflected.

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