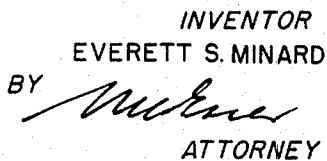


Filed Dec. 1, 1961

3,176,731

2 Sheets-Sheet 1



April 6, 1965

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FILLING VALVE FOR EASY MOUNTING AND
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3,176,731

Filed Dec. 1, 1961

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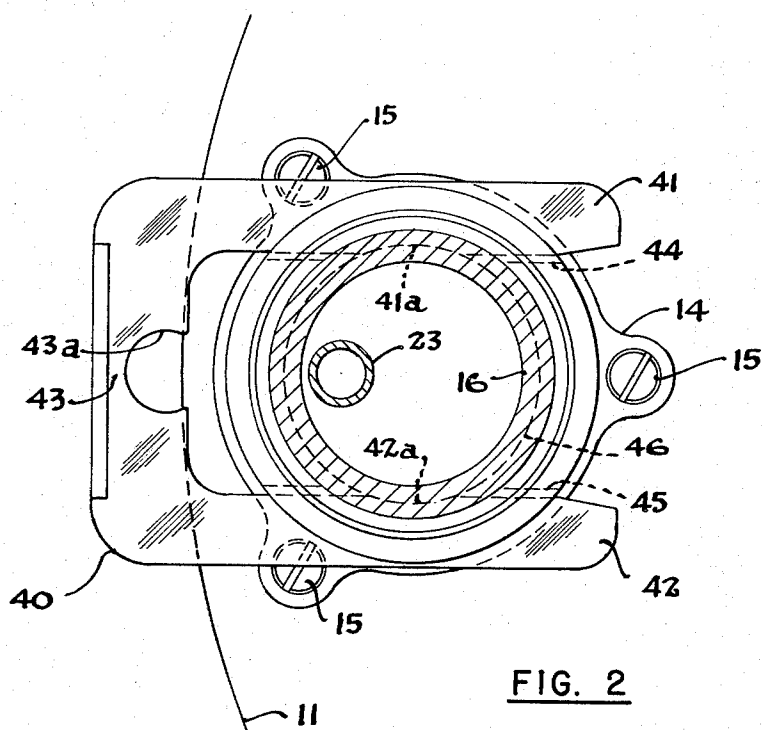


FIG. 2

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3,176,731

FILLING VALVE FOR EASY MOUNTING AND DISMOUNTING FROM A FILLING MACHINE

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Filed Dec. 1, 1961, Ser. No. 156,206
7 Claims. (Cl. 141-295)

This invention relates to an improved valving device for filling individual containers. More particularly, this invention relates to a valving device which is easily removed from and replaced on a receptacle filling machine.

Most liquid products marketed in cans or similar rigid containers are filled automatically with a high speed rotary filling machine. These machines employ valving devices which automatically deposit a predetermined amount of liquid, whether it be fruit juice or motor oil, in an individual can. For various reasons, such as a clogging of the valving device by foreign matter or the maintenance of sanitary conditions, the valving assemblies must be taken apart for cleaning and sterilization. Many of the valving structures currently in use are difficult to remove from the filling machine. This means that much time and effort must be spent in the cleaning operation. Others require the use of special tools or for the operator to reach into the reservoir containing the liquid. In disassembling other types of valving mechanisms of the type concerned with in this invention, numerous loose parts must be handled which are subject to being accidentally lost or misplaced.

It is, therefore, an object of the present invention to provide a valving device for a filling machine which is easily detachable therefrom.

It is another object of this invention to provide a valving device for a rotary type filling machine which can be removed from the machine without the need of special tools.

It is still another object of this invention to provide a valving apparatus for automatic filling machines which can be disassembled from the machine without reaching into the reservoir containing the liquid to be dispensed.

A further object of the present invention is to provide a valving structure for rotary type filling machines which requires the removal of a single part to effect severance of the valve from the machine.

The foregoing objects and other objects of the present invention will be readily appreciated by reference to the following detailed description when considered in conjunction with the accompanying drawings showing embodiments of the invention wherein:

FIGURE 1 is a view in side elevation of the valving device of the present invention operatively secured to a filling machine at the top and engaged by a container at the bottom.

FIGURE 2 is a view in horizontal section taken along line 2-2 of FIGURE 1.

Briefly stated, the apparatus of this invention involves a tubular valve body having a closing end wall and transverse passageways disposed at short distance from the wall. A valve sleeve is slidably mounted over the valve body and covers the transverse passageways. A flange surrounds the outlet of the filling machine and accommodates a portion of the valve body. Two oppositely disposed slots are provided in the flange and are disposed in a plane substantially transverse to the axis of the valve body. The valve body has a peripheral groove and is operatively connected to the flange by aligning the slots of the flange with the groove in the valve body. A U-shaped clip member has two leg portions for insertion into the matched slots and grooves. The leg portions spring outwardly to grip and hold the valve body in fluid

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tight contact with the outlet. A receptacle or can receiving member is threaded onto the sleeve and an upward force by the receptacle will cause the sleeve to move over the passageways. Liquid will then flow into the can and air is vented through a tube to the reservoir. Flow will stop when the level of liquid in the can reaches a predetermined point. To remove the valving device from the filling machine all that is needed is to remove the clip member.

In greater detail, a valving device 10 is shown in operable engagement with and adapted to be in liquid communication with the inside of the reservoir 11 or filling bowl of a filling machine (not shown) having an outlet 12. A flange 14 has a bore 14' aligned with outlet 12 and is secured to the reservoir 11 by means of screws 15. A tubular valve body 16 is accommodated by flange 14 and to assure a fluid tight fit between the surface of valve body and outlet 12, a resilient, rubber washer or seal 17 is placed therebetween. Valve body or stationary valve element 16 has outlet passageways 18 which are disposed transversely and eccentrically across the tubular valve body. An end wall 19 closes valve body 16 and presents a beveled stopping surface to form a valve seat 20 for the beveled end 21 of sleeve or movable tubular valve element 22. The stationary valve element 16 has a downwardly and outwardly inclined upper terminal end 16' in contact with the seal 17. A vent tube or conduit 23 communicates through end wall 19 and extends longitudinally through valve body 16 terminating near the top of reservoir 11.

Valve sleeve 22 is slidably mounted over valve body 16 for reciprocally covering passageways 18. A fluid tight fit is assured by means of rubber O ring 24 housed in groove 25 of valve body 16. Passageways 18 are maintained in a closed manner by means of a compression spring 27 biasing sleeve 22 against valve seat 20. Spring 27 is supported on valve assembly 10 by shoulder 28 on flange 14 and spring washer 29 on sleeve 22. A cover-type receptacle operated member or actuator 30 is threadably adjustable on sleeve 22 by means of threads 31. It has a skirt portion enclosing a seal pad 33. Contacting seal pad 33 is a receptacle or can 35 which by means of receiving member 30 is aligned with valve body 16. A lock nut 36 holds actuator 30 in the desired position on sleeve 22 for reasons to be later explained.

Valving device 10 is removably secured to the flange 14 from the outside of the reservoir 11 by means of a substantially flat U-shaped clip member or slide retainer 40 having a uniform thickness with two legs 41 and 42 joined by a bridge portion 43. This is best illustrated in FIGURE 2 where it will also be seen that flange 14 has two oppositely disposed and parallel slots 44 and 45. A peripheral groove 46 is machined in valve body 16 for matched alignment with slots 44 and 45 when valve body 16 is pressed against rubber washer 17. With groove 46 aligned with slots 44 and 45, two diametrically opposed grooves are in effect formed by groove 46 when engaged by legs 41 and 42. They are easily inserted since they have a uniform thickness slightly less than the width of slots 44 and 45 and groove 46. Legs 41 and 42 also have a width sufficient to extend from groove 46 to the adjacent portion of slots 44 and 45.

Concave sections 41a and 42a are provided on legs 41 and 42 respectively, and have the same radius of curvature as groove 46. Valve body 16 will be frictionally gripped by concave sections 41a and 42a since legs 41 and 42 are spaced from each other so that they are spread slightly outwardly and thereby create a springing action as they contact valve body 16 and seat in groove 46. To aid this springing action a semi-circular weakened area 43a is disposed midway between legs 41 and 42 in bridge 43.

Operation

To attach valving device 10 to outlet 12, the spring 27 is placed on spring washer 29 and washer 17 is pressed into place adjacent outlet 12. Valve body 16 is inserted in flange 14 to contact washer 17 and to align slots 44 and 45 with groove 46. A slight force should be necessary to compress washer 17 in matching slots 44 and 45 with groove 46. While pressing valve body 16 against washer 17, legs 41 and 42 are inserted into slots 44 and 45 until concave sections 41a and 42a seat themselves around groove 46 in a detent-like action. Releasing the force of valve body 16 against washer 17 will cause washer 17 to exert a force against valve body 16 and to hold the valve body tight against the upper face of clip member 40. Valving device 10 is thereby placed in a fluid tight engagement with outlet 12 since washer 17 is still placed under some compression.

A can 35 is next positioned beneath valve body 16 and the open end engages receptacle receiving member 30 and seal pad 33. Moving can 35 in the direction of reservoir 11 causes sleeve 22 to pass upwardly over and open passageways 18. In the meantime liquid will have been placed in reservoir 11 and will have filled valve body 16. Liquid will then flow out through passageways 18 and will fill can 35 with air or vapor being vented through vent tube 23. A temporary air-tight seal is made between can 35 and seal pad 33 and when liquid reaches the lower end 21 of sleeve 22 which is elevated over the opening of vent tube 23 and passageways 18, no further air can escape. No further product will enter the can because of the back pressure of the air trapped between receptacle receiving member 30 and the upper level of liquid in can 35. By adjusting the location of seal pad 33 in relation to the end 21 of valve sleeve 22, the amount of liquid product for each can is determined. When can 35, filled with a predetermined amount of product, is lowered from seal pad 33, sleeve 22 will pass back over passageway 18 and end 21 will be biased against valve seat 20 and prevent flow from outlet passageways 18.

When it is desirable to remove valving device 10 from outlet 12 all that is required is to exert a slight upward force on valve body 16 to relieve the tension of the valve body against the upper surface of clip member 40. The operator need only grasp the clip member by his fingers to remove it from slots 44 and 45 and groove 46. Valve body 16 will then be freed from flange 14 without further disassembling.

The present invention thus provides a valving device which is easily mounted and detached from the outlet of a filling machine. No special tools are required. In fact, only a slight force exerted by the hands is required to compress washer 17 and to move clip member 40 in and out of the previously described slots and groove. A sanitary method of disassembling is provided since the operator is not required to reach into the reservoir of the filling machine. Small parts such as screws, bolts or nuts need not be handled which means that time will be saved by not having to look for lost parts, securing new ones for replacement or removing the misplaced ones from the filling machine. Further, small parts can find their way into a filled can. All of these hazards are avoided by a valving device which is simple in construction and inexpensive to maintain and manufacture.

It will be apparent that certain modifications and changes will be necessary for adaptation to specific materials, from time to time as will be suggested to those skilled in the art. It is intended that all such modifications and changes as come within the spirit of this invention are intended as being within its scope as best defined by the appended claims wherein there is claimed.

1. In a valve assembly adapted for use with a receptacle filling machine, said machine having a reservoir and an outlet and said assembly having a tubular valve body with at least one outlet passageway therein, with means to open and and close said passageway, said means in-

cluding a biased valve sleeve reciprocally carried by said valve body and actuated by a receptacle operated member, the improvement comprising, a flange member associated with said reservoir and said outlet and adapted to receive a portion of said valve body, two opposed, parallel slots in said flange, a groove in said valve body, said slots and said groove positioned in a matched relationship when said valve body is inserted into said flange, a substantially flat U-shaped clip member comprising two leg portions accommodated by both said slots and said adjacent groove to retain said valve body in said flange, and a resilient seal positioned between said valve body and said reservoir adjacent said outlet whereby said entire valve assembly is completely detachable from the outside of said filling machine by the mere removal of said clip member.

2. In a filling machine: a reservoir having at least one flange, said flange having a bore, a valving device adapted to be in liquid communication with the inside of said reservoir and having a stationary valve element received in said bore and a co-operating movable valve element, a biasing means for urging said movable valve element downwardly into a closed position to prevent flow out of said valving device, an actuator, means for adjustably securing said actuator to said movable valve element, said actuator having a seal pad engageable with the open end of a receptacle, a vent conduit extending through said valving device into said reservoir to permit vapor to escape from the receptacle as it is being filled, and means disposed outside said reservoir and engageable with both said stationary valve element and said flange for enabling said valving device to be quickly mounted on and dismounted from said flange of said reservoir without disassembling said valving device.

3. In a filling machine: a reservoir, at least one valving device adapted to be in liquid communication with the inside of said reservoir, said valving device having a stationary valve element and a co-operating movable valve element, means for urging said movable valve element downwardly into a closed position to prevent flow out of said valving device, an actuator for actuating said movable valve element upwardly to an open position enabling flow out of said valving device into a receptacle, means adjustably connecting said actuator to said movable valve element, said valving device having a vent for permitting vapor to escape from the receptacle as it is being filled, and a slide retainer disposed outside said reservoir and engageable with said reservoir and said stationary valve element for enabling said valving device to be quickly mounted on and dismounted from said reservoir.

4. A filling machine as claimed in claim 3, wherein said reservoir includes a flange, one of said stationary valve element and said flange having a slot and the other having a groove, said slide retainer being adapted to extend across said slot into said groove.

5. In a filling machine: a reservoir, at least one valving device adapted to be in liquid communication with the inside of said reservoir, said valving device having a stationary valve element and a co-operating movable valve element, means for urging said movable valve element downwardly into a closed position to prevent flow out of said valving device, an actuator for actuating said movable valve element upwardly to an open position enabling flow out of said valving device into a receptacle, said actuator including a seal pad engageable by the open end of the receptacle, means adjustably connecting said actuator to said movable valve element, said valving device having a vent for permitting vapor to escape from the receptacle as it is being filled, and a flexible and resilient retainer disposed outside said reservoir and engageable with said reservoir and said stationary valve element for enabling said valving device to be quickly mounted on and dismounted from said reservoir.

6. In a filling machine: a reservoir, at least one flange secured to said reservoir, said flange having a bore, a valving device having a stationary valve element received

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in said bore and a co-operating movable valve element, an opening in said reservoir providing communication between the inside of said reservoir and said valving device, a resilient seal positioned in said bore in sealing contact with said stationary valve element and with said reservoir and its flange, and means disposed outside said reservoir for both holding said seal in compression and for enabling said valving device to be quickly mounted on and dismounted from said reservoir without disassembling said valving device.

7. In a filling machine: a reservoir having at least one flange, said flange having a bore, a valving device having a stationary valve element received in said bore and a co-operating movable valve element, an opening in said reservoir providing communication with said valving device, said stationary valve element having a downwardly

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and outwardly inclined upper terminal end, a resilient seal positioned in said bore in contact with said reservoir and with said upper terminal end of said stationary valve element, and means engageable with said stationary valve element and said flange for both enabling said valving device to be quickly mounted on and dismounted from said reservoir and for holding said seal in compression.

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