May 9, 1950 W. B. KOCHNER 2,506,837

SIPHON VALVE STRUCTURE

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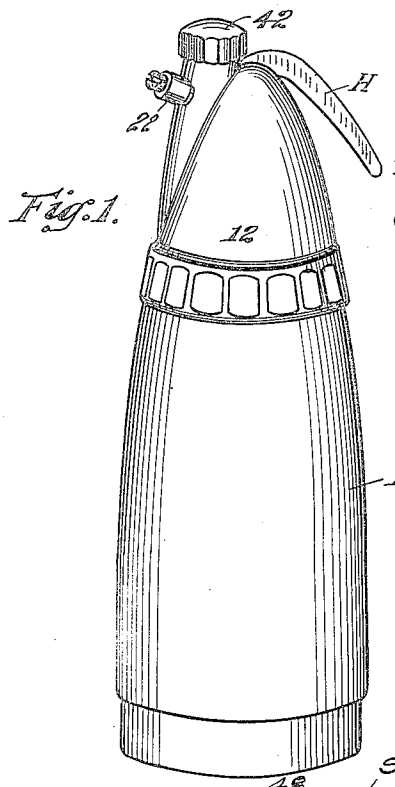


Fig. 1.

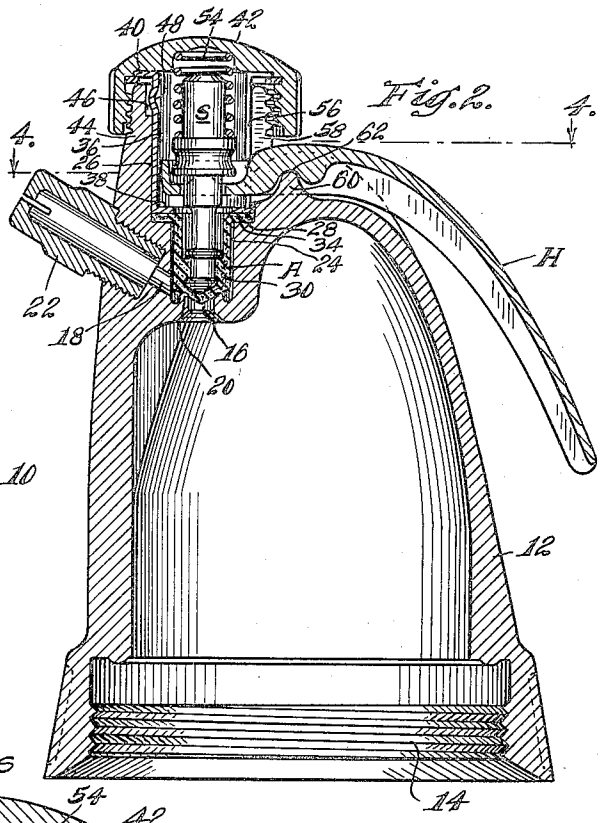


Fig. 2.

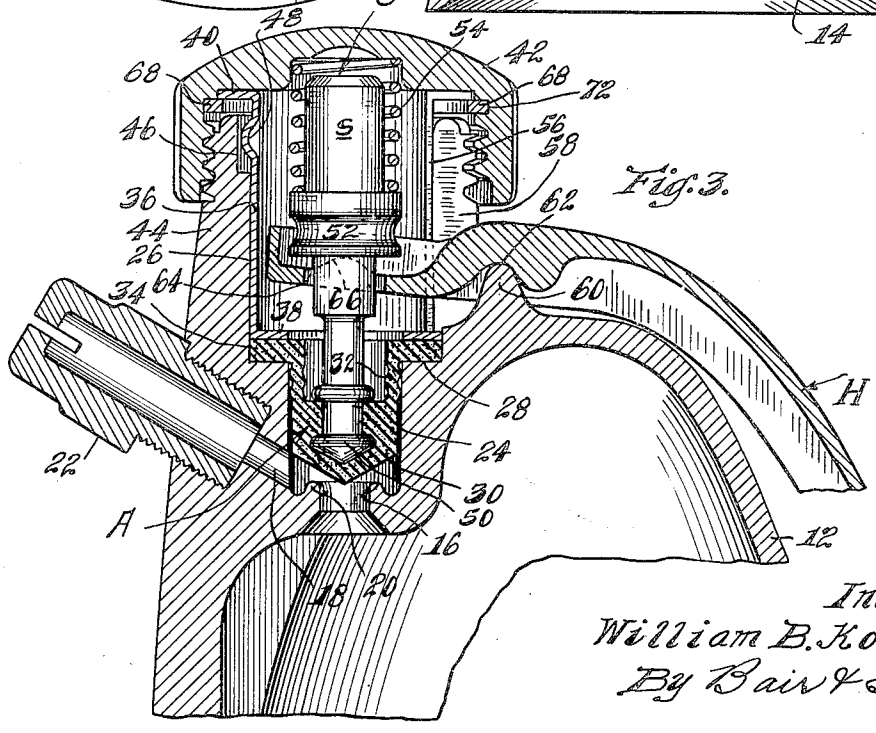


Fig. 3.

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Fig. 4.

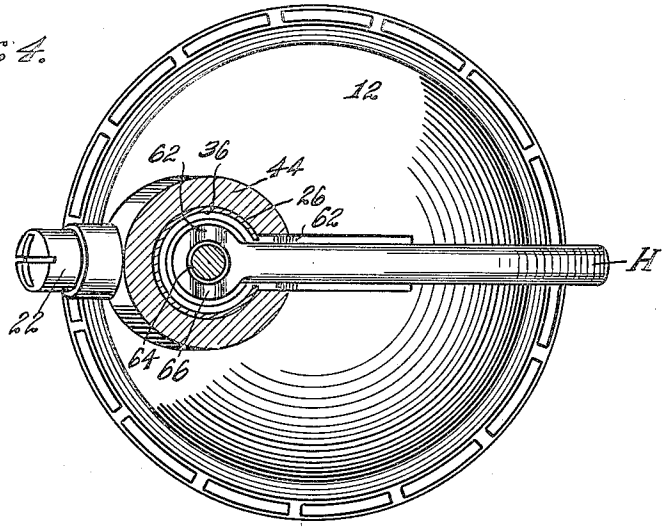


Fig. 5.

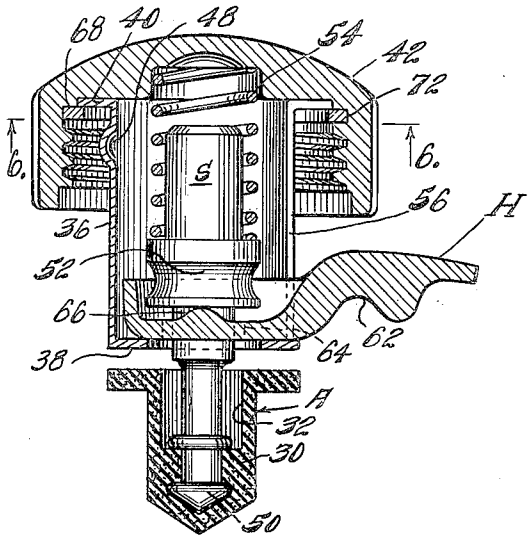
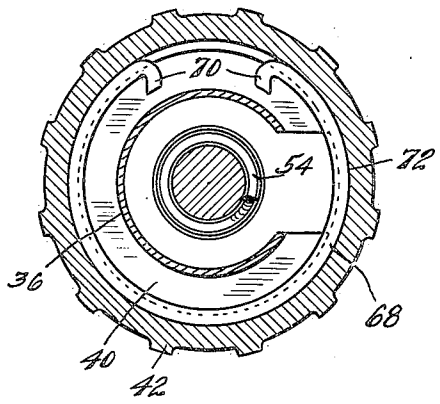


Fig. 6.



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SIPHON VALVE STRUCTURE

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Application May 10, 1946, Serial No. 668,952

11 Claims. (Cl. 251—134)

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My present invention relates to an aerating bottle or the like in which liquid, such as cream or the like, is adapted to be aerated or similarly treated, although the invention may be applied to other uses such as in connection with syphon bottles.

One object of my invention is to provide an aerator having a control valve structure of simple, durable, and inexpensive construction.

Another object is to provide a control valve structure in the form of an assembly which may be readily removed from the aerating or syphon bottle to permit cleaning, the parts being held together in a novel manner, and all those parts requiring cleaning being exposed for doing a quick and thorough job of cleaning in a minimum of time.

Still another object is to provide a valve assembly which when removed from the bottle leaves comparatively short and direct passageways in the bottle head that can be effectively cleaned in a minimum of time.

A further object is to provide a valve structure which may be readily operated by depressing a hand lever after the aerator has been filled with liquid and the liquid aerated, the operating lever being removable with the valve structure when the valve structure is removed for cleaning.

A still further object is to provide a valve assembly in which the valve parts remain assembled instead of being capable of coming readily apart as in my copending application, Serial No. 562,554, filed November 8, 1944, now Patent No. 2,484,232, issued October 11, 1949.

With these and other objects in view, my invention consists in the construction, arrangement and combination of the various parts of my device whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims and illustrated in the accompanying drawings, wherein:

Fig. 1 is a perspective view of an aerator or the like embodying my invention.

Fig. 2 is an enlarged vertical sectional view through the aerator showing the valve in closed position.

Fig. 3 is a further enlarged view showing the valve in opened position and by dotted lines in closed position.

Fig. 4 is a sectional view on the line 4—4 of Fig. 2.

Fig. 5 is a sectional view similar to Fig. 3 showing the valve assembly removed from the vase head for cleaning and showing how the parts stay together, and

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Fig. 6 is a sectional view on the line 6—6 of Fig. 5 showing the retainer ring in retaining position.

On the accompanying drawings I have used the reference numeral 10 to indicate a vase adapted to receive liquid, such as cream or an ice cream mix. Detachably mounted on the vase 10 is a vase head 12 provided with screw threads 14 adapted to coact with threads of the vase 10 in a well known manner. So that the head may be attached and detached relative to the vase as desired, the screw threaded connection includes a gasket to prevent leakage, but the gasket is not shown as it forms no part of my present invention.

In the vase head 12 I provide a vertical passageway 16 and a lateral passageway 18. The passageway 16 terminates in a valve seat 20 and the passageway 18 leads to a decorating nozzle 22 screwed into the vase head 12.

The vase head has a pair of bores 24 and 26 aligned with the passageway 16 and of different sizes with the transition from one size to the other forming a shoulder 28. A combined gasket and valve plug element A is provided having a valve plug portion 30, a cylindrical diaphragm portion 32, and a gasket ring portion 34. The element A may be made of rubber or the like and the gasket ring 34 thereof seats on the shoulder 28.

For seating the gasket ring 34 on the shoulder 28, I provide a sleeve 36 having an inturned flange 38 at its lower end and an out-turned flange 40 at its upper end. The flange 38 is adapted to contact the gasket ring 34 and a closure nut 42 is adapted to contact the flange 40. The nut 42 is knob-like in character and is threaded onto the upper end 44 of the valve head 12, which upper end is threaded for this purpose. The upper end 44 has a notch 46 therein with which a displaced portion 48 of the sleeve 36 coacts for preventing rotation of the sleeve 36 relative to the head 12.

A valve stem S is provided having a head 50 removably embedded in the valve plug portion 30 of the element A, and an enlargement 52 between its lower and upper ends. A spring 54 is mounted between the enlargement 52 and the closure nut 42 for normally seating the valve plug 30 on the valve seat 20.

The sleeve 36 is slotted at one side, as indicated at 56, and the head 12 has a slot 58 aligned therewith. The head also has a pivotal projection 60, and a handle H is provided with a depression 62 for pivotal coaction therewith. The

handle H has an opening 64 therein through which the stem S loosely extends and on opposite sides has a pair of rounded projections 66 adapted to contact the lower surface of the enlargement 52.

The sleeve 36 is held in position in the nut 42 by a retainer ring 68 which, as shown in Fig. 6, is in an incomplete circle and has an inturned end 70 with which the jaws of a pair of needle-nosed pliers may be engaged for contracting the ring while inserting it through the threads of the nut 42. The ring is then permitted to expand into an annular groove 72 cut into the nut to a depth approximately that of the largest diameter of the threads in the nut.

Practical operation

In the operation of my valve structure, the vase 10 having been filled with cream or the like and the cream aerated by the introduction of gas under pressure, the apparatus can be used for dispensing the aerated cream by tipping it to an inverted position with the nozzle 22 pointing approximately downward. The valve may then be opened from the position of Fig. 2 to the position of Fig. 3 by depressing the handle H. The discharge of aerated cream can be controlled by the degree of depression of the handle and by the length of time it is depressed.

When it is desirable to clean the valve structure, this may be readily done by unscrewing the knob 42 from the upper end 44 of the valve head so that the entire valve assembly, as shown in Fig. 5, may be removed from the aerator or syphon. An inspection of Fig. 3 makes it evident that the only surfaces needing cleaning aside from the interior of the vase 10 and 12 are the passageways 16 and 18, the nozzle 22, the bore 24, and the portions 30 and 32 of the element A. These portions 30 and 32 are fully exposed in Fig. 5. While the valve parts remain in assembled position and while the valve structure is removed, it is a comparatively easy matter to clean the passageways 16 and 18 and the bore 24 with a small brush, the nozzle 22 being removed during this operation if desired. The nozzle can then be cleaned separately.

My disclosed arrangement makes for convenience of cleaning the valve structure without the parts falling apart or being otherwise dis-assembled except when required. In that case, the retainer ring 68 may be removed so that the sleeve 36 can be removed from the nut 42 and the element A can be removed from the head 50 of the stem S. Thereafter, the handle H, the stem S, and the spring 54 can be removed and replaced, or other service performed on the device. While the parts are in the position of Fig. 5, the spring 54 tends to retain the handle H against the flange 38 of the sleeve 36 and the parts thus are held against any looseness between them.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope without sacrificing any of the advantages thereof.

I claim as my invention:

1. For use with a body member having a passageway therethrough, a valve seat interposed in said passageway, a bore aligned with said valve seat, and a shoulder spaced from said valve seat; a valve and operating assembly comprising a combined valve plug and gasket element of resilient material having a plug at one end, a gasket ring at its other end and a diaphragm connecting said ends together, a valve stem having a head imbedded in said plug end of said element to retain said element on said stem when said valve and operating assembly is removed from said body member, a sleeve for positioning in said bore to seal with gasket ring relative to said head, said sleeve having a slot in the side thereof and an inturned flange at its lower end, a closure nut threaded on said body member and engageable with said sleeve for confining said gasket ring between said sleeve and said shoulder, means extending through said slot and laterally into said sleeve for retracting said valve stem, a spring in said sleeve to normally seat said valve plug on said valve seat, and a retainer element in said nut to retain said sleeve therein the flange of said sleeve retaining said valve stem and its retracting means assembled when said valve and operating assembly is removed.

2. For use with a body member having a passageway therethrough, a valve seat interposed in said passageway, a bore aligned with said valve seat and a shoulder spaced from said valve seat; a valve and operating assembly comprising a combined valve plug and gasket element of resilient material having a valve plug at one of its ends, a gasket ring at its other end and a flexible tubular diaphragm connecting said ends together, a valve stem having a head embedded in said plug end of said element, means to seal said gasket ring relative to said body member, said means including a sleeve, a closure nut for propelling the sleeve toward the gasket ring said sleeve having an outturned flange in said nut, a retainer ring in said nut for engaging said flange and thereby retaining said sleeve therein, the parts of said valve and operating assembly being thereby retained assembled when said closure nut is removed from said body member, and an operating handle in pivotal contact with said body member, extending through a slot in the side of said sleeve and adapted to retract said stem upon pressure being applied to said handle causing it to pivot on said body member, said handle surrounding said stem and being retained assembled thereby.

3. For use with a body member having a passageway therethrough, a valve seat interposed in said passageway, a bore aligned with said valve seat, a shoulder and a second bore, said shoulder being between the first and second bores; a valve and operating assembly comprising a combined valve plug and gasket element having a plug at one end, a gasket ring at its other end and a flexible wall connecting said ends together, a valve stem for said plug end of said element and connected therewith, said valve stem having an enlargement, a flanged sleeve for positioning in said second bore, a nut removably positioned on said body member to engage said sleeve and cause it to engage said gasket ring between the inner end of the sleeve and said shoulder, a retainer ring sprung into said nut back of the flange of said sleeve for retaining it in position in said nut, a spring interposed between said last means and said valve stem to normally seat said valve plug on said valve seat, and means interposed between said enlargement and said element to retract said stem and valve plug, said means being operatively connected with said valve stem and independent of said body member.

4. For use with a body member having a pas-

sageway therethrough, a valve seat interposed in said passageway, a bore aligned with said valve seat, a second bore forming a continuation of said first bore and a shoulder between said bores; a valve and operating assembly including a combined valve plug and gasket element of resilient material having a valve plug at one end, a gasket ring at its other end and a flexible tubular diaphragm connecting said ends together, a valve stem having a head embedded in said plug end of said element and an enlargement intermediate its ends, a sleeve in which said valve stem is mounted, threaded means to engage said sleeve with said gasket ring said sleeve having a flange, a C-shaped retainer ring in said threaded means for retaining said flange and thereby said sleeve therein, said threaded means having an annular groove deeper than the interior of the threads of said threaded means to receive said retainer ring, a spring interposed between said threaded means and said enlargement, said spring normally seating said valve plug on said valve seat, and an operating handle surrounding said stem and engaging said enlargement to retract said stem and valve plug upon pressure being applied to said handle causing it to pivot against said body member at a point spaced from the axis of said stem.

5. For use with a body member having a passageway therethrough, a valve seat interposed in said passageway, a bore aligned with said valve seat, a second bore forming a continuation of said first bore and a shoulder between said bores; a valve and operating assembly comprising a combined valve plug and gasket element having a plug at one end, a gasket ring at its other end and a flexible tubular wall connecting said ends together, a sleeve for engaging said gasket ring said sleeve having an outturned flange, a closure nut threaded on said body member and engaging said sleeve to effect abutment of said gasket ring against said shoulder, said closure nut having at the top of said threads an annular groove deeper than the internal diameter of the threads, a retainer ring sprung into said annular groove for engaging said outturned flange and thereby retaining said sleeve in said nut, an enlargement on said stem within said sleeve, a spring interposed between said closure element and said enlargement, and a lever pivoted against said body member adjacent said sleeve and having a portion pivoted against said enlargement for retracting said valve stem and plug when said handle is depressed, said last portion surrounding said valve stem to prevent removal of the lever relative to the stem.

6. For use with a body member having a passageway therethrough, a valve seat interposed in said passageway, a bore aligned with said valve seat, a second bore forming a continuation of said first bore and a shoulder between said bores; a valve and gasket assembly comprising a combined valve plug and gasket element having a valve plug at one end and a gasket ring at its other end, said plug and ring being connected by a flexible wall portion of said element, a valve stem having one end removably connected with said valve plug a sleeve around said stem and having an annular flange, means to seal said gasket ring against said shoulder, a closure nut for operating said means, an enlargement on said stem, a spring interposed between said enlargement and said closure nut, a spring ring received in said closure nut back of said flange for retaining said sleeve in said nut, and an operating lever around said stem and adapted to engage and retract said enlargement and thereby said stem and valve plug upon pressure being applied to said lever for moving it to a dispensing position.

7. For use with a body member having a passageway therethrough, a valve seat interposed in said passageway, a bore aligned with said valve seat, a second bore forming a continuation of said first bore and a shoulder between said bores; a valve and operating assembly comprising a combined valve plug and gasket element of rubber or the like having a valve plug at one end, a gasket ring at its other end, said plug and ring being connected by a flexible tubular diaphragm portion of said element, a valve stem having one end removably imbedded in said valve plug, a sleeve in which said valve stem is movably mounted, said sleeve being removable from said body member, said sleeve engaging said gasket ring against said shoulder, closure means for said bore and operable to cause said sleeve to so engage said gasket ring, retainer means for said sleeve relative to said closure means, spring means to normally seat said valve plug on said valve seat, and an operating hand lever operably connected with said valve stem against removal therefrom and adapted to retract the same and said valve plug upon pressure being applied to said hand lever causing it to pivot against said body member.

8. A valve and operating assembly comprising an element having a valve plug at one end, a gasket ring at its other end and a flexible tubular diaphragm connecting said ends together, a valve spring to bias said valve plug to seated position, a valve stem connected with said valve plug, a sleeve to receive said stem, said sleeve having an out-turned flange at its upper end, a closure nut operatively connected with said sleeve to position and permit removal of the same, said closure nut having said out-turned flange received in its upper end and an annular groove below said out-turned flange, a retainer ring in said annular groove against said flange to retain said sleeve in assembled relation to said closure nut, an operating lever connected with said stem, and means for pivotally mounting said operating lever whereby pivotal movement thereof effects retraction of said valve plug from said valve seat against the bias of said valve spring.

9. For use with a body member having a passageway therethrough, a valve seat interposed in said passageway, a bore aligned with said valve seat, a second bore forming a continuation of said first bore and a shoulder between said bores; a removable valve and operating assembly mounted in said body member, a closure knob for said assembly threaded on said body member said assembly including a sleeve, said sleeve being in said body member and engaged by said closure knob for retaining it in position in said body member, said sleeve having an out-turned flange in said closure knob, and a retainer ring in said closure knob against said flange for retaining said sleeve in assembled relation to said knob.

10. For use with a body member having a passageway therethrough, a valve seat interposed in said passageway, a bore aligned with said valve seat, a second bore forming a continuation of said first bore and a shoulder between said bores; a removable valve stem and packing means therefor, the stem and packing means being connected together and constituting a valve operating assembly, a removable sleeve for engaging said

packing means with said body member, a closure knob to effect such engagement, and a retainer for said sleeve relative to said knob.

11. For use with a body member having a passageway therethrough, a valve seat interposed in said passageway, a bore aligned with said valve seat, a second bore forming a continuation of said first bore and a shoulder between said bores; a removable valve and operating assembly including tubular diaphragm means to seal said valve relative to said body member and serve as a valve plug, a retainer sleeve for said diaphragm to effect sealing of the diaphragm relative to said body member, a closure nut for the stem of said valve operable to propel the sleeve in a sealing direction, a retainer in said closure nut for said sleeve, said sleeve having an inturned flange to retain said valve stem against removal from said sleeve when said closure nut is removed from said body member.

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