Sept. 3, 1957 J. E. AYRES 2,805,003

VALVE ASSEMBLY FOR AEROSOL TYPE CONTAINERS

Filed Oct. 16, 1952 2 Sheets-Sheet 1

Fig. 1.

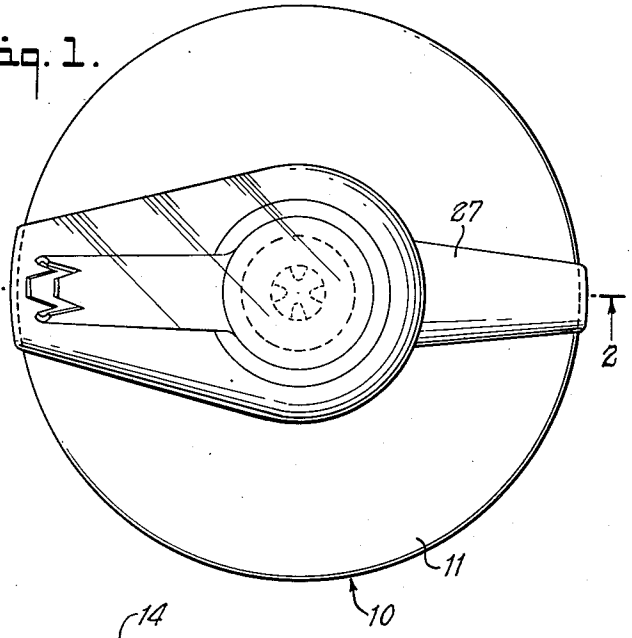
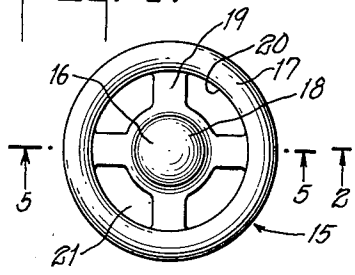


Fig. 4.



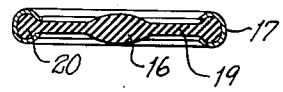


Fig. 5.

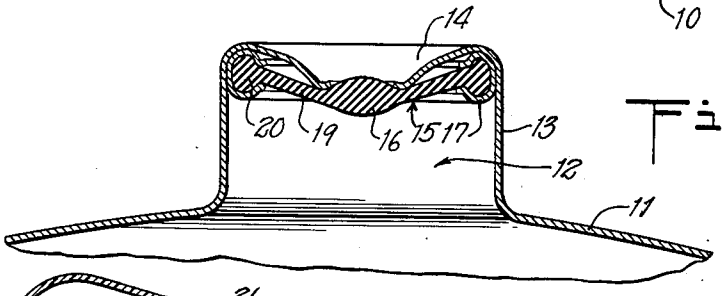


Fig. 3.

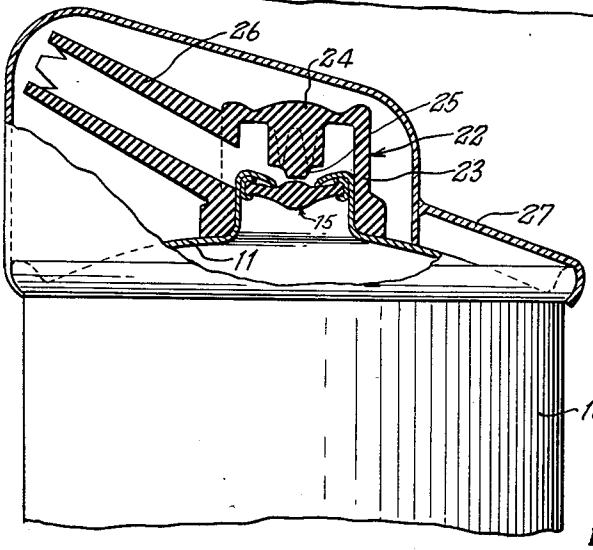


Fig. 2.

INVENTOR.
JOHN E. AYRES
BY
Burgess, Ryan & Hicks
ATTORNEYS

Sept. 3, 1957 J. E. AYRES 2,805,003

VALVE ASSEMBLY FOR AEROSOL TYPE CONTAINERS

Filed Oct. 16, 1952 2 Sheets-Sheet 2

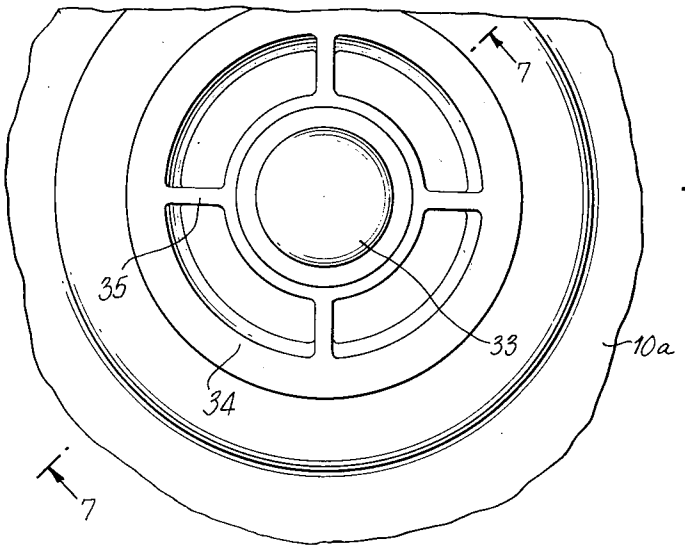


Fig. 6.

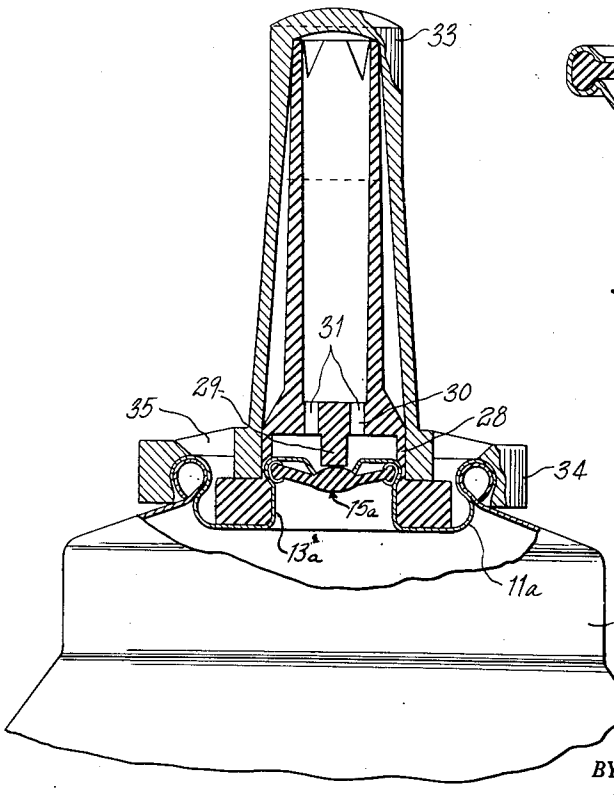


Fig. 7.

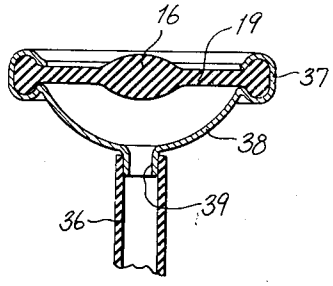


Fig. 8.

INVENTOR.
JOHN E. AYRES
BY
Burgess, Ryan & Hicks
ATTORNEYS

United States Patent Office 2,805,003 Patented Sept. 3, 1957

2,805,003

VALVE ASSEMBLY FOR AEROSOL TYPE CONTAINERS

John E. Ayres, Springfield, N. J., assignor, by direct and mesne assignments, to Oil Equipment Laboratories, Incorporated, Elizabeth, N. J., a corporation of New Jersey

Application October 16, 1952, Serial No. 315,052

5 Claims. (Cl. 222—394)

The present invention relates to valve mechanisms and relates more particularly to a valve-controlled dispensing mechanism for a pressurized container.

An object of the present invention is to provide a simple and inexpensive valve mechanism for use in pressurized containers of the type employed for dispensing whipped cream or similar products. The simplicity and low cost of a valve in such containers is of particular importance because after such containers are emptied they are thrown away. Another object of the present invention is to provide a valve for the dispensing mechanism of a pressurized container which may be readily installed during the manufacture of the container and which will permit the container to be filled and pressurized without difficulty.

Other objects and advantages of the present invention will be apparent and best understood from the following description and the accompanying drawings in which:

Fig. 1 is a plan view from the top of a pressurized container having a valve-controlled dispensing mechanism embodying the present invention;

Fig. 2 is a fragmentary side view of the container shown in Fig. 1 in partial section taken along the lines 2—2 of Fig. 1;

Fig. 3 is a fragmentary view in vertical section on an enlarged scale of a portion of the container shown in Fig. 1;

Fig. 4 is a plan view of a valve insert employed in the container shown in Fig. 1;

Fig. 5 is a section view taken along the line 5—5 of Fig. 4.

Fig. 6 is a plan view of a pressurized container having a modified form of dispensing mechanism embodying the invention;

Fig. 7 is a fragmentary side view of the container in partial section taken along the line 7—7 of Fig. 6; and

Fig. 8 is a vertical section view of a portion of a valve mechanism illustrating a further modification of the invention.

Referring now to the drawings in detail and in particular to Figs. 1 and 2 thereof, the structure shown therein comprises a container shell or body 10 which has a top or head portion 11. The top 11 has an opening therein which communicates with the interior of the container and through which the container may be filled or emptied. The opening in the container is located at the top of a recessed or depressed portion 12 in the top of the container which forms a necked portion having upstanding side walls 13. An annular flange 14 extends inwardly from and slopes downwardly from the top of the side walls 13 and forms an annular valve seat surrounding the opening in the container.

As shown in Figs. 2 and 3, a valve body or insert 15 is located inside of the recessed portion 12 and normally closes the opening in the top of the container. As shown best in Figs. 4 and 5, the valve insert 15 comprises a circular member 16 made of a material which is both stretchable and compressible such as rubber or a suitable

plastic with a stiffening rim 17 in the form of a metal clip extending around the outer edge thereof.

The valve member 16 is made in the form of a spider in which a solid central portion or hub 18 is connected by arms 19 to an annular portion 20 with openings 21 between the arms. The metal rim 17 holds the outer portion of the flexible member 16 rigid, but the central portion 18 may be flexed axially. When the valve insert is inserted in the recess 12 in the top of the container, the metal rim engages with the side-walls 13 and holds the valve insert firmly in place so that the valve insert in its entirety will not move relative to the side walls 13 when the valve is operated.

As shown best in Fig. 3, the inner or lowermost end of the downwardly extending flange 14 presses against the solid central portion 18 of the member 16 and distorts the flexible member slightly when the valve insert is inserted in the neck of the container. This places the flexible member under tension and the pressure exerted between the inner end of the annular flange or valve seat and the flexible member forms a tight seal at the points where it engages with the valve seat.

The valve insert is preferably installed in the top of the container prior to assembly of the top to the body of the container. Then after assembly of the container has been completed with the valve insert installed therein, the container may be filled and pressurized by employing a filling head which engages with the center portion of the valve insert and depresses the flexible member so as to move the central portion thereof out of engagement with the flange 14. The container can be filled and pressurized through the opening in the top thereof and the openings 21 in the valve insert. After the container has been pressurized, the pressure on the inside of the container also acts to hold the flexible member in engagement with the flange.

When the container has been filled and pressurized, an operating member 22 is placed over the opening in the top of the container and is secured to the container as shown in Fig. 2. The operating member 22 may be made of a flexible material such as rubber or a suitable plastic and comprises a chambered body 23 which is fitted over the neck 13 of the container. The body 23 has a flexible diaphragm 24 which extends across the top of the opening 12 in the top of the container and carries a downwardly projecting lug 25. The lug 25 is positioned above the center portion 18 of the flexible member 16 and engages therewith when the diaphragm is depressed. When the diaphragm is depressed sufficiently, the lug 25 will engage the center portion of flexible member 16 and force it out of engagement with the flange 14 on the neck of the container. This permits the contents of the container to flow out of the container under pressure through the opening in the top of the container and the openings 21 in the valve insert. Upon leaving the container the contents enter the chamber in the body of the operating member 22 and then may be discharged through a suitable outlet such as a spout 26 communicating with the chamber.

If desired, the operating member and spout may be enclosed by a cover 27 so as to keep the spout sanitary and to prevent accidental discharge of the contents of the container. The cover 27 is removably secured to the container and may be made of a suitable transparent material.

In the embodiment of the invention illustrated in Figs. 6 and 7, there is a container body 10*a* and a top 11*a* of a slightly different configuration. A recessed portion having side walls 13*a* is formed in the top of the container. The recessed portion has an opening therein and a valve body or insert 15*a* is located in the recessed portion, as described above, to normally close the discharge opening. The construction and operation of these parts is the same

as previously described and hence need not be repeated in detail. In this embodiment of the invention, there is a flexible operating member which may be made of rubber or suitable plastic and comprises a chambered body **28** which fits over the outside of the side walls **13***a* of the container. The operating member carries a downwardly projecting lug **29** which is supported on a web **30** above the center of the flexible portion of the valve body **15**. In this case, the web **30** has discharge passageways or openings **31** therein which communicate with the chamber in the body **28** and a spout **32** which extends vertically above body **28**.

In this arrangement, the valve may be operated by pushing downwardly or sideways on the upper portion of the operating member. This causes the side-walls of the body **28** to buckle which permits the lug **29** to be brought into engagement with the valve body.

Also, as shown in Figs. 6 and 7, a tamper-proof closure may be provided which consists of a cap **33** which encloses the spout **32** and a ring-shaped portion **34** which is secured to the top of the container. The ring-shaped portion **34** is connected to the cap **33** by arms **35**. By making the closure of frangible material, the cap **33** may be removed from the spout by twisting it relative to the ring **34** so as to break the arms **35**.

As shown in Fig. 8, the valve insert may be modified to provide for connection of a siphon tube **36** thereto if desired. In this form a metal ring **37** surrounds outer edge of the flexible member **16** and has a cup-shaped portion **38** extending inwardly beneath the flexible member. The cup-shaped portion **38** has an opening at the bottom thereof which is surrounded by a downwardly extending flange **39** to which one end of the siphon tube **36** is connected.

It will be understood that various changes and modifications may be made in the embodiments of the invention illustrated and described herein without departing from the scope of the invention as defined by the following claims.

I claim:

1. In a valve assembly for a pressurized container wherein the top of the container has an opening therein with upstanding side walls extending around said opening and an annular flange extending inwardly and downwardly from said side walls and defining said opening, said flange forming a valve seat, the improvement which comprises a valve member of a material which is stretchable and compressible, said valve member having an outer edge and a solid central portion with at least one aperture located between its outer edge and its solid central portion and a retaining member of rigid material frictionally engaging with upstanding side walls extending around an opening in the top of a container, said retaining member also engaging with and holding the outer edge of the valve member in a fixed position relative to said side walls with the solid central portion of said valve member in engagement with the lower end of an annular flange extending inwardly and downwardly from said side walls and defining the opening in the container.

2. In a valve assembly for a pressurized container, the improvement as defined in claim 1 wherein the outer edges of the valve member are held in a fixed position above the lower end of the downwardly extending annular flange and the solid portion of the valve member is normally held in engagement with said flange under tension.

3. In a valve assembly for a pressurized container, the improvement as defined in claim 1 wherein the retaining member is a metal rim and surrounds the outer edge of the valve member.

4. In a valve mechanism for a pressurized container, the improvement as defined in claim 1 wherein the retaining member includes a cup-shaped portion extending beneath the valve member in spaced relation thereto, said cup-shaped portion having an opening therein communicating with the interior of the container and a downwardly extending flange surrounding said opening.

5. In an aerosol type container, a head portion having an opening therein communicating with the interior of the container, an annular valve seat surface surrounding said opening, said head portion also defining on its interior side annular side walls surrounding said annular valve seat surface, a disk-shaped valve member of rubberlike material having an imperforate central portion, a continuous rim portion and at least one aperture intermediate said central portion and said rim portion, said central portion engaging said annular valve seat surface to close said opening and said rim portion being insertable within said annular side walls, and a retaining member of rigid material frictionally engaging the annular side walls to retain said rim portion in a fixed position adjacent to the top of said annular side walls, thereby tensionally stressing said valve member and resiliently holding said imperforate central portion thereof in sealing engagement with said annular valve seat surface.

References Cited in the file of this patent

UNITED STATES PATENTS

2,128,035	Boetel	Aug. 23, 1938
2,543,850	Henricson	Mar. 6, 1951
2,556,571	Bobbs et al.	June 12, 1951
2,579,977	Sjolin	Dec. 25, 1951
2,580,188	Nilsen	Dec. 25, 1951
2,612,293	Michel	Sept. 30, 1952
2,621,973	Lodes	Dec. 16, 1952
2,681,752	Jarrett et al.	June 22, 1954