FLEXIBLE NOZZLE OPERATED DISPENSING VALVE

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This invention relates to a dispenser valve structure. The invention is particularly useful in connection with the dispensing of whipped cream and the like from a container in which the cream is maintained under high pressure through the use of a compressed gas such as carbon dioxide, nitrous oxide, mixtures of said gases, etc.

An object of the invention is to provide a valve-equipped dispensing device for use with a container filled with a pressure fluid, the valve being effective for sealing the fluid against escape but being operated easily for the withdrawal of fluid in controlled amounts and in a form for accurate application to food bodies being served. Yet another object is to provide a dispenser in the form of a cap which may be applied readily to a container and having valve-equipped means enclosed by a guide tube for the application of a dispensed fluid. A still further object is to provide a valve-equipped dispenser nozzle of novel design and providing advantages which will be described in greater detail hereinafter.

The invention is shown in illustrative embodiments by the accompanying drawings, in which—

Fig. 1 is a side view in elevation of a container equipped with dispensing means embodying our invention; Fig. 2, an enlarged broken vertical sectional view showing the valve in seated position; Fig. 3, a view similar to Fig. 2 but showing the valve in open position; and Fig. 4, a vertical sectional view on a reduced scale of a modified form of dispenser.

In the illustration given, 10 designates a container which may be formed of metal or any other suitable material capable of withstanding relatively high pressures. The container 10 is equipped with a neck 11 which may have a rolled edge 12, as shown more clearly in Figs. 2 and 3. Seated within the neck 11 of the container is a cap 13 having a peripheral edge portion 14 rolled about the portion 22 of container 10. Preferably a resilient ring 15 of rubber or other suitable material is employed to provide a tight seal between the portions 12 and 14. The cap 13 is secured or fastened to the neck 11 by expanding the inside of the cap so that the pressure of the cap pressing against the inside of the neck 11 is sufficient to seal the cap and prevent leakage about the neck. It will be understood that any suitable light connection between the cap 13 and the container neck 11 may be employed.

The cap 13 is provided centrally with an opening, the opening being encompassed by a raised rim or ring 16. Extending through the rim 16 is a heavy plug or tubular body 17. The body 17 is provided with a central passage 18 terminating in a flared valve seat 19 on the inner side of the plug body 17. The plug body 17 is provided on its inner side with a head or enlargement 20 which extends about the valve seat 19.

The plug body 17 is enclosed by a tube or sleeve 21 which may be formed of rubber, plastic, or any other suitable material. If desired, the sheath or sleeve 21 may be formed integrally with plug 17.

We prefer to provide the tube or sleeve 21 with laterally extending openings 22 so that, in the dispensing of the whipped cream, the cream will be distributed evenly on all sides around the tube and adjacent the food body to which the cream is being applied. In the specific structure given, the tube 21 is provided near its tip end with spaced fingers 23 formed integrally with the tube 21 and providing the distribution spaces 22 therebetween.

Any suitable valve structure may be employed. In the illustration given, we provide a pin 24 slidably received within the bore or passage 18 of the closure plug 17 and having an outwardly flared head 25. The conical sides of the head 25 are adapted to engage the valve seat 19 and under the pressure of the fluid within the container, the head makes a line contact with the seat and under the pressure thus concentrated against this line contact an effective seal is obtained. Further, the thin peripheral portion of the enlargement of head 20 is flexed tightly against the cap wall so as to form a tight seal therewith which prevents the escape of fluid. The plug 17 is in the form of a hollow tube and the outer end of the tube is provided with laterally struck segments 26 which serve as stops to limit inward movement of the pin 24.

Operation

In the operation of the structure shown in Figs. 1 to 3, inclusive, the valve 25 is normally held in sealing position, as illustrated in Fig. 2, by the pressure of the fluid within the container. When it is desired to dispense a portion of whipped cream, the closure body 17 may be moved slightly laterally, as illustrated in Fig. 3. This movement causes the valve head 25 of the pin 24 to move away from the valve seat 19 and thus to provide an opening through which whipped cream may
pass through the passage 18 and outwardly through the tubular sheath 21. The expansion of the gas upon its release from the container chamber produces a whipping or expansion of the cream and the whipped product passes outwardly through the valve or tube 21 and thence laterally through the openings 22. Upon release of the pressure upon the plug body 17, the resilience of the body restores it at once to the position shown in Fig. 2 and the pressure of the fluid within the container moves the valve head 25 again to the sealing position shown in Fig. 2. Thus the closing of the valve is automatic and the only manual effort required for opening the valve is to press the flexible plug body 17 in a lateral direction. A great saving of time is brought about because the soda fountain operator or the dispenser can accurately control the amount dispensed by the pressure exerted upon the body 17 while instantly sealing off the flow of fluid by releasing the pressure.

The pin 24 is slideable within the passage 18 to facilitate opening and closing of the valve. In the modification shown in Fig. 4, the cap 13—equipped with a plug body 27 having a skirt 28 integrally formed therewith. The skirt is provided with tapered openings 29 through which the whipped cream is dispensed. In other respects, the structure is very similar to that shown in Figs. 1 to 3, inclusive.

The pin 24 may be hollow only at the top to allow the forming of laterally-sucked segments 28. The pin may be formed of metal, plastic or other suitable material and may be held in place by any type of segments, however formed. In the case of a plastic pin, the segments would be molded in place. It is important that the segments be not so large or so great in number as to obstruct the passage when charging the container with gas.

While in the foregoing specification, we have shown specific structures in great detail for the purpose of illustrating embodiments of the invention, such details of structure may be varied widely by those skilled in the art without departing from the spirit of our invention.

We claim:

1. In combination with a container cap having an opening therethrough, a resilient tubular plug extending through said opening and having a flange engaging the inner surface of said cap, said plug being provided with a tapered valve seat on its inner side, a pin of lesser diameter than the internal diameter of the passage extending through said body, said pin being provided with an integral tubular sleeve extending upwardly and enclosing the outer end of said pin, said sleeve being provided at its tip end with spaced fingers integral with the sleeve.

2. In combination with a container cap having an opening therethrough, a resilient tubular plug extending through said opening and having a flange engaging the inner surface of said cap, said plug being provided with a valve seat on its inner side, and a pin of lesser diameter than the internal diameter of the passage extending through said tubular plug, said pin being provided with a valve seat on its inner side, and a rigid metal pin of lesser diameter than the internal diameter of the passage of said tubular plug, said pin being provided on its inner end with a valve head adapted to engage said seat and being provided on its outer end with a lateral projection limiting inward movement of said pin, said tubular plug providing an integral tubular sleeve extending upwardly and enclosing the outer end of said pin, said sleeve being provided at its tip end with spaced fingers integral with the sleeve.

3. In combination with a container cap having an opening therethrough, a resilient tubular plug extending through said opening and having a flange engaging the inner surface of said cap, said plug being provided with a valve seat on its inner side, and a rigid metal pin of lesser diameter than the internal diameter of the passage of said tubular plug, said pin being provided on its inner end with a valve head adapted to engage said seat and being provided on its outer end with a lateral projection limiting inward movement of said pin, said tubular plug providing an integral tubular sleeve extending upwardly and enclosing the outer end of said pin.

4. In combination with a container cap having an opening therethrough, a resilient tubular plug extending through said opening and having a flange engaging the inner surface of said cap, said plug being provided with a valve seat on its inner side, and a rigid metal pin of lesser diameter than the internal diameter of the passage of said tubular plug, said pin being provided on its inner end with a valve head adapted to engage said seat and being provided on its outer end with a lateral projection limiting inward movement of said pin, said tubular plug providing a tubular sleeve extending upwardly and enclosing the outer end of said pin, said sleeve having openings adjacent its outer end for the lateral discharge of material therethrough.

5. In combination with a container cap having an opening therethrough, a resilient tubular plug extending through said opening and having a flange engaging the inner surface of said cap, said plug being provided with a tapered valve seat on its inner side, a pin of lesser diameter than the internal diameter of the passage of said body extending through said body, said pin being provided on its inner end with a valve head adapted to engage said seat and being provided on its outer end with a lateral projection limiting inward movement of said pin, and a tubular sleeve extending outwardly from said plug and enclosing the outer end of said pin.

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