L. R. SCHIEFER.

CLOSURE FOR FLUID RECEPTACLES.

APPLICATION FILED NOV. 6, 1915.

1,214,833. Patented Feb. 6, 1917.

Fig. 1.

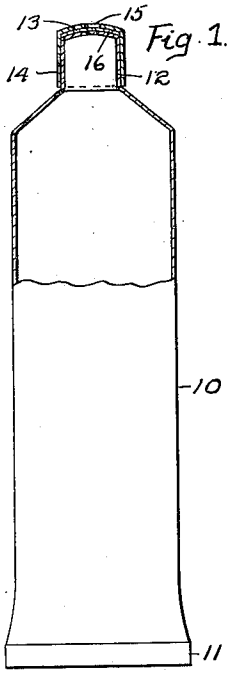


Fig. 3

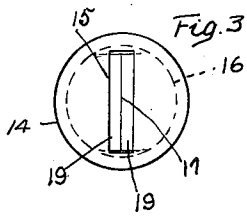


Fig. 4

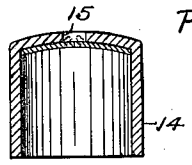


Fig. 5

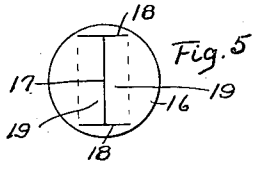


Fig. 6.

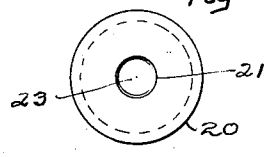


Fig. 7.

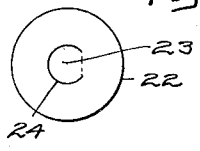


Fig. 2

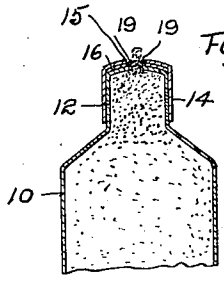
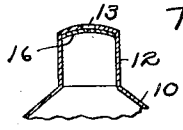


Fig. 8.



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ATTORNEYS.

UNITED STATES PATENT OFFICE.

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CLOSURE FOR FLUID-RECEPTACLES.

1,214,833. Specification of Letters Patent. Patented Feb. 6, 1917.

Application filed November 6, 1915. Serial No. 59,908.

To all whom it may concern:

Be it known that I, LAWRENCE R. SCHIEFER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented new and useful Improvements in Closures for Fluid-Receptacles, of which the following is a specification.

The invention relates to devices for automatically closing the discharge openings of fluid receptacles. It is common practice to store tooth paste, paints and other fluids in a semi-viscous state, in pliable metal tubes which are compressed by the hand to eject a quantity of the contents. So far as I am aware all such tubes are provided with a discharge opening, usually at the top of the neck which is closed by a cap, which cap is internally threaded and engaged on the externally threaded neck of the tube. In some cases the cap is merely held in frictional engagement with the neck. In all such the cap must be removed before the contents may be discharged and must be returned thereafter in order that the contents of the tube shall remain sanitary and be prevented from unintentionally discharging from the tube. The threading of the neck of the tube and the cap adds materially to the cost of the tube and the frictionally held cap is very unsatisfactory and inefficient.

The object of my invention is to provide a receptacle for fluids of the class described with means by which its discharge opening shall be automatically closed upon the release of the pressure which is exerted upon the tube to discharge its contents, and thereby provide a sanitary as well as a self-closing receptacle.

In the drawings I illustrate the application of my invention to a pliable tube which is adapted to be compressed by the hand of the user to discharge the contents of the same and in which—

Figure 1 is an elevational view of a tube, partly in section and provided with the invention; Fig. 2 a fractional cross-section of the tube illustrating the closing means at the time of discharge of the tube contents. Fig. 3 is a plan view of the cap; Fig. 4 a vertical cross-section of the cap; Fig. 5 a plan view of the valve; Fig. 6 a plan view of a modified form of cap; Fig. 7 a plan view of the valve for the discharge opening of the latter modification and Fig. 8 a fractional cross-sectional view of a modification of the closing means.

Referring to the drawings 10 is any form of pliable tube having one end 11 closed in suitable manner. The opposite end terminates in a neck 12 having a discharge slot 13 in its top. The closing means consists of a cap 14 provided with a slot 15 in its top, the cap being adapted to fit snugly over the neck. Suitably secured within the cap and against its top is a valve 16 formed preferably of rubber although it may be made of any suitable flexible material. For a tube having a longitudinal discharge opening the valve is formed by providing a slit 17 in the center of a sheet of the material and two parallel slits 18 at opposite ends of slit 17 thereby providing two flaps 19 which serve as the valve and which are immediately over the discharge opening in neck 12 and underneath opening 15 in cap 14, opening 15 being wider than opening 13 so that when the tube is compressed its discharging contents will elevate the two flaps or force them apart into aperture 15 and permit the contents to pass out through opening 13 and opening 15 in the cap. Upon releasing the pressure upon the tube the flaps instantly close together or fall into juxtaposition and thereby close both openings 15 and 13 against the further discharge of the tube contents.

In Figs. 6 and 7 where the tube has a round discharge opening, cap 20 is provided with a similar opening 21 and the valve 22 is formed by a single flap 23 which is provided by a curved slit 24 in the sheet of material. The cap in both cases is placed on the neck with the valve resting on the top of the neck, and for shipping or storing purposes a piece of paper or sticker could be pasted over opening 15 or 21 which the ultimate user would break or tear off.

In Fig. 8 I have eliminated the cap and inserted the valve within the neck itself where it operates precisely as before. I prefer the cap, however, as it is more convenient to insert the valve into it than into the neck.

It is evident that as the flap valve closes up upon the release of pressure upon the tube the contents of the tube are protected from contamination and will not escape unless the required pressure is exerted upon the tube.

I contemplate applying the valve in a similar manner to all containers where the same may be applicable.

What I claim is:

1. The combination with a collapsible tube having a discharge orifice, of a cap secured to the tube and over the orifice and having a discharge orifice in alinement with the first named orifice, two flap-valves secured to the inner face of the cap and adapted to be forced outwardly through and exteriorly of the discharge orifice in the cap by the moving contents of the tube when the tube is compressed and to automatically retract and close said opening upon the release of said compressing force.

2. The combination with a collapsible tube having a discharge orifice of a cap secured to the tube and over the orifice and having a discharge orifice in alinement with the first named orifice, a diaphragm secured within the cap and having two elastic flaps provided therein which are adapted to be opened outwardly by the moving contents of the tube when the tube is compressed, the flaps in the open position extending through and exteriorly of the orifice in the cap and preventing contact of the contents of the tube with the opposite walls of the said orifice, the said flaps upon the release of pressure on the tube automatically retracting and closing said orifice.

In witness whereof I hereunto subscribe my name this 4th day of November, 1915.

LAWRENCE R. SCHIEFER.