Jan. 18, 1927. 1,615,127

H. H. McNAUGHTON

COLLAPSIBLE TUBE

Filed July 23, 1926

Fig. 1.

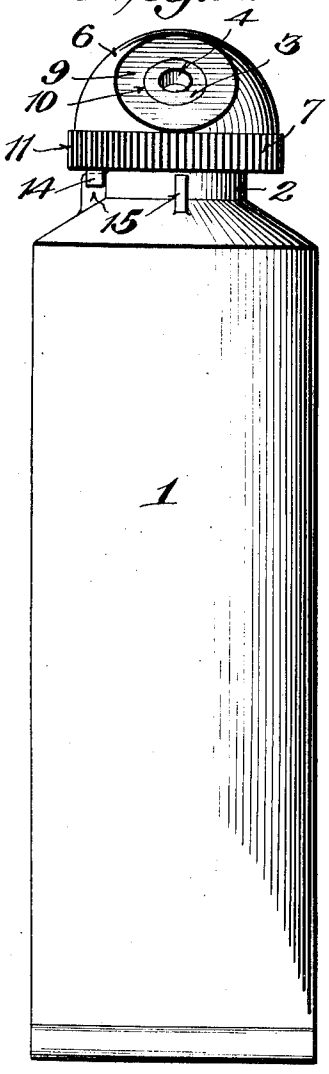


Fig. 2.

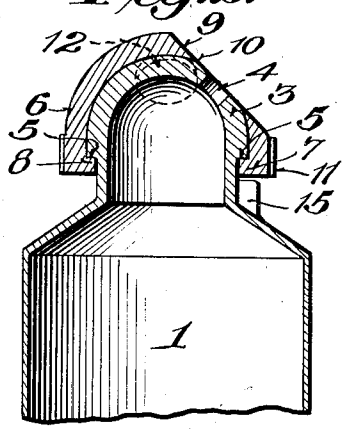


Fig. 3.

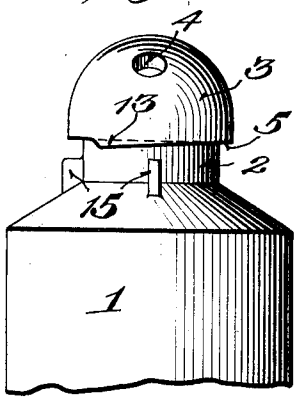


Fig. 4.

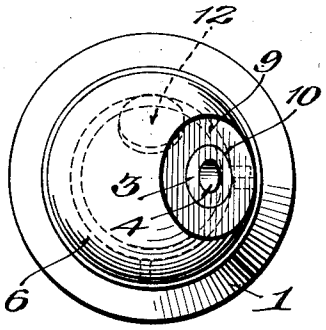


Fig. 5.

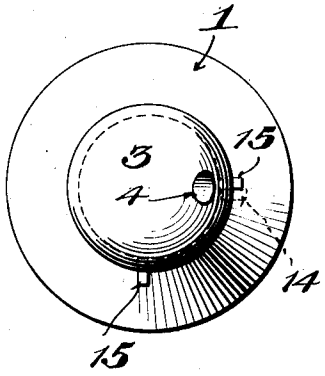
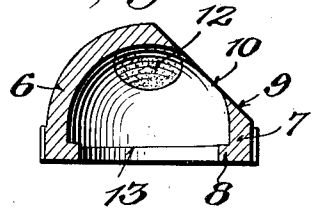


Fig. 6.



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UNITED STATES PATENT OFFICE.

HART H. McNAUGHTON, OF MARYVILLE, TENNESSEE.

COLLAPSIBLE TUBE.

Application filed July 23, 1926. Serial No. 124,459.

This invention relates to collapsible tubes, such as are commonly employed for containing and delivering tooth paste and other viscous or pasty materials, and the object of the invention to provide improved closure and delivery means to facilitate the uncovering and closing of the discharge or delivery opening of the tube.

It is an important object of the invention to provide for permanently mounting the closure member so as to effectively prevent loss or misplacement thereof, while at the same time permitting of the convenient manipulation of the closure member for opening and closing the delivery port of the tube.

The present invention provides a sanitary device in that its construction is such as to enable the convenient and effective removal by wiping of any excess pasty material which may be upon the delivery end of the tube, and in this connection to provide for severing the discharging material from the delivery port in such a manner as to leave the minimum amount of material upon the exterior of the tube.

A further object of the invention is to provide an effective sealing of the delivery port in the closed position of the closure member, and also to effect a tightening of the closure against the delivery end of the tube when the closure is moved into its closed position, thereby insuring the maximum sealing effect.

In the drawings:—

Figure 1 is a side elevation of a collapsible tube embodying the features of the present invention.

Figure 2 is a central longitudinal sectional view taken through the discharge end of the tube.

Figure 3 is a side elevation of the discharge end of the tube, the cap being removed therefrom.

Figure 4 is a plan view of the discharge end of the tube with the cap thereon and in its open position.

Figure 5 is a top plan view of the tube, the cap being removed therefrom.

Figure 6 is a sectional view of the cap taken through the discharge port therein.

In the drawing there has been shown a conventional form of collapsible tube 1, which may be materially varied as to shape, size, design and material. The tube has the usual cylindrical neck 2, which is surmounted by a substantially semi-spherical head 3, provided with a delivery port or opening 4, preferably disposed at about 45° to the longitudinal axis of the tube. The walls of the head are preferably thicker than the walls of the neck, thereby providing an outwardly directed annular shoulder 5 at the base of the head where it joins the neck.

The cap or closure member is designated 6 and is substantially semi-spherical in shape and embraces the head 3 with a working fit, so as to turn readily thereon. The cap has a cylindrical collar portion 7 rotatably embracing the neck 2 and provided with an internal flange 8 underlying the shoulder 5 to retain the cap upon the head and at the same time permit rotation of the cap upon the head and around the longitudinal axis of the neck 2. The flange portion 8 of the cap is swaged into place after the cap has been placed upon the head. The cap is cut away at 9 in a plane at substantially right-angles to the axis of the delivery port 4 and at an angle of about 45° to the longitudinal axis of the collar portion 7. The portion 9 of the cap is flat and has a central opening or port 10 at one side of the crown of the cap intended to be registered with the port 4 of the head for permitting delivery of the contents of the tube. By turning the cap on the neck 2 until the two ports are out of register, the tube may be closed. The peripheral edge of the port 10 in the cap is comparatively sharp and cleanly severs the discharging pasty material from the head, leaving little or nothing to be subsequently wiped from the flat face of the cap, while the flat face affords the best shape for conveniently wiping off any material which may adhere thereto. For convenience in manipulating the cap, it is provided with an external annular flange 11, which is roughened, as by knurling to provide a finger piece.

A disc of cork or other sealing element 12 is pressed into a recess provided therefor in the inner face of the cap and disposed in a position to come across the delivering port 4 of the head in the closed position of the cap.

Co-operating cam surfaces 13 are provided upon the engaging faces of the shoulder 5 and the flange 8, and these cam surfaces are so disposed as to draw the cap tightly upon the head when turning the cap into its closed position, thereby drawing the

sealing insert 12 tightly against the discharge port 4.

The sealing insert 12 is preferably composed of a resilient or compressible substance, such as cork, so that when the cap is drawn tightly downward by the cooperating cam surfaces 13 the insert will be forced into snug engagement with the discharge port 4 and thus effectively seal the tube and prevent leakage of the contents thereof or the admission of foreign substances thereto. This makes a practically air-tight seal and prevents the contents of the tube from hardening or drying, which is a source of great annoyance in the ordinary tube of this type.

Suitable stops 14 and 15 are provided upon the collar 7 and the neck 2 to limit the rotation of the cap upon the neck so as to insure the registration of the two ports when it is desired to open the tube for discharging a portion of its contents.

What is claimed is:

1. A collapsible tube having a partly spherical head provided with a delivery port, a partly spherical cap embracing and having a working fit upon the head and provided with a delivery port for registration with the port of the head, a sealing insert within the interior of the cap for sealing the delivery port of the head in the closed position of the cap, the head and cap having co-operating cam surfaces to tighten the cap upon the head and force the sealing insert into snug engagement with the delivery port of the head.

2. A collapsible tube having a cylindrical discharge neck of substantially smaller diameter than the body of the tube, said neck being surmounted by a partly spherical head having a delivery port, a partly spherical cap embracing and having a working fit upon the head and provided with a collar portion rotatably embracing the neck, the cap being provided with a delivery port for registration with the port of the head, the collar having an internal flange underlying an annular shoulder on the neck, one edge of said shoulder being out of alignment with the opposite edge thereof to engage said collar to tighten the cap on the head.

3. A collapsible tube having a cylindrical discharge neck of substantially smaller diameter than the body of the tube, said neck being surmounted by a partly spherical head having a delivery port, a partly spherical cap embracing and having a working fit upon the head and provided with a collar portion rotatably embracing the neck, the cap being provided with a delivery port for registration with the port of the head, a sealing insert within the interior of the cap, the collar having an internal flange underlying an annular shoulder on the neck, one edge of said shoulder being out of alignment with the opposite edge to engage said collar to tighten the cap on the head and force the sealing insert into snug engagement with the port of the head.

4. A collapsible tube having a substantially semi-spherical head provided with a delivery port at one side of the vertical axis of said head, a substantially semi-spherical cap embracing and having a working fit upon the head, said cap being provided with a delivery port for registration with the port of the head when in its open position, a recess within the interior of the cap and a sealing element therein adapted to enter into snug engagement with the delivery port of the head when in its closed position.

5. A collapsible tube having a substantially semi-spherical head provided with a delivery port at one side of the vertical axis of said head, a substantially semi-spherical cap embracing and having a working fit upon the head, said cap being provided with a delivery port for registration with the port of the head when in its open position, a recess within the interior of the cap and a sealing element therein adapted to enter into snug engagement with the delivery port of the head when in its closed position, the cap having a flat portion surrounding the port thereof disposed substantially at right angles to the axis of the port of the head.

6. In a collapsible tube, a partly spherical head having a delivery port, a partly spherical cap to rotatably conform thereto having a delivery port for registration with the port of the head, the cap being flat around the port thereof to form a knife edge on the periphery of said port, said flat portion lying in a plane at substantially right-angles to the axis of the port.

7. As a new article of manufacture, a partly spherical cap for dispensing tubes adapted to rotate on an axis through the crown thereof perpendicular to the plane of the open portion of the cap, said cap having a delivery port at one side of the crown thereof, the exterior of the cap being flat around the port to form a knife edge on the periphery of said port, said flat portion lying in a plane at substantially right-angles to the axis of the port.

8. As a new article of manufacture, a partly spherical cap for dispensing tubes adapted to rotate on an axis through the crown thereof perpendicular to the plane of the open portion of the cap, the periphery of said open portion having an internal flange, one edge of said flange being out of alignment with the opposite edge thereof to form a cam surface, said cap having a delivery port at one side of the crown thereof, the exterior of the cap being flat around the port to form

a knife edge on the periphery of said port, said flat portion lying in a plane at substantial right-angles to the axis of the port.

9. As a new article of manufacture, a partly spherical cap for dispensing tubes adapted to rotate on an axis through the crown thereof perpendicular to the plane of the open portion of the cap, said cap having a delivery port at one side of the crown thereof, the exterior of the cap being flattened to form a knife edge on the periphery of said port, a recess within the interior of the cap in horizontal alignment with the port, and a sealing element within the recess.

10. As a new article of manufacture, a partly spherical cap for dispensing tubes adapted to rotate on an axis through the crown thereof perpendicular to the plane of the open portion of the cap, the periphery of said open portion having an internal flange, one edge of said flange being out of alignment with the opposite edge thereof to form a cam surface, said cap having a delivery port at one side of the crown thereof, the exterior of the cap being flattened to form a knife edge on the periphery of said port.

11. As a new article of manufacture, a partly spherical cap for dispensing tubes adapted to rotate on an axis through the crown thereof perpendicular to the plane of the open portion of the cap, the periphery of said open portion having an internal flange, one edge of said flange being out of alignment with the opposite edge thereof to form a cam surface, said cap having a delivery port at one side of the crown thereof, the exterior of the cap being flattened to form a knife edge on the periphery of said port, a recess within the interior of the cap in horizontal alignment with the port, and a sealing element within the recess.

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