Jan. 6, 1931. F. WOLF 1,788,181

CLOSURE FOR COLLAPSIBLE TUBES AND OTHER RECEPTACLES

Filed Aug. 20, 1928 2 Sheets-Sheet 1

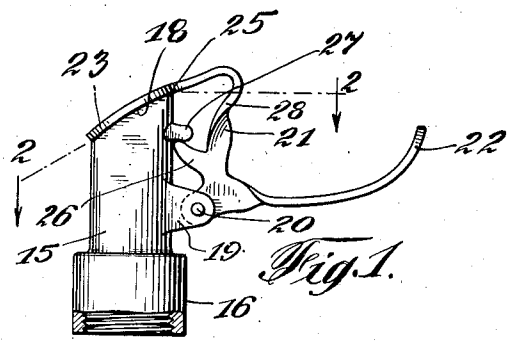


Fig. 1.

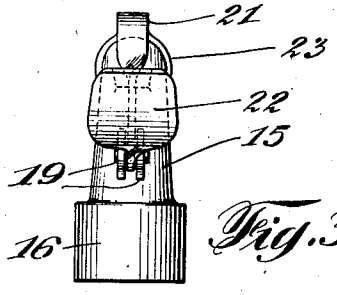


Fig. 3.

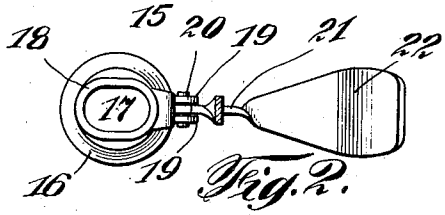


Fig. 2.

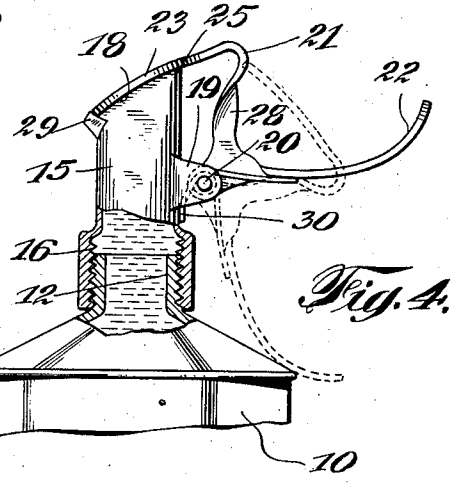


Fig. 4.

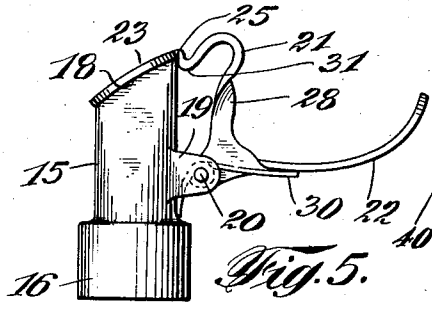


Fig. 5.

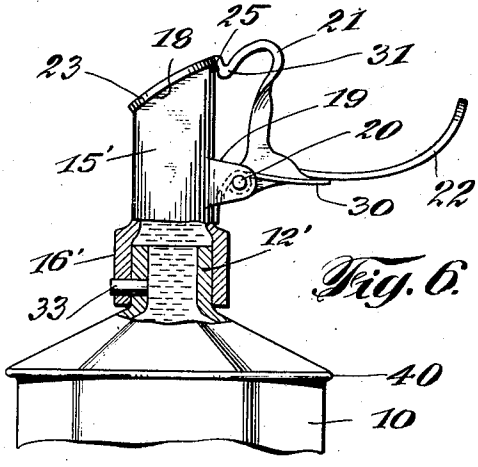


Fig. 6.

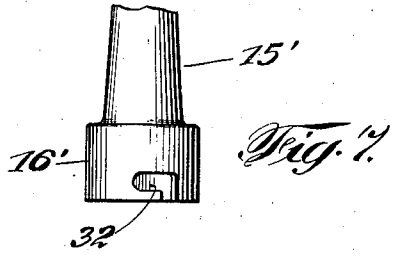


Fig. 7.

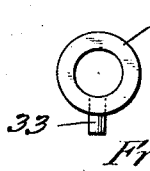


Fig. 8.

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CLOSURE FOR COLLAPSIBLE TUBES AND OTHER RECEPTACLES

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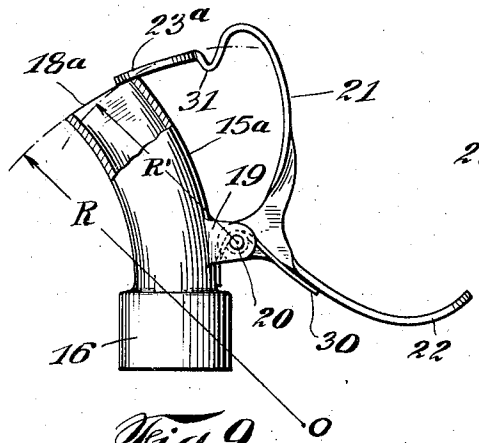


Fig. 9.

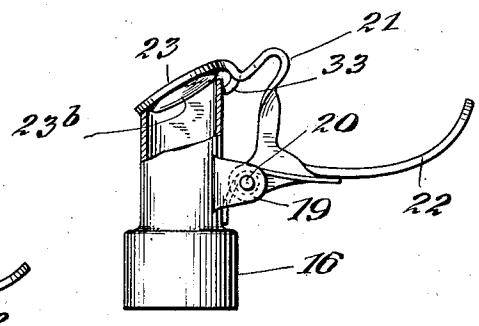


Fig. 10.

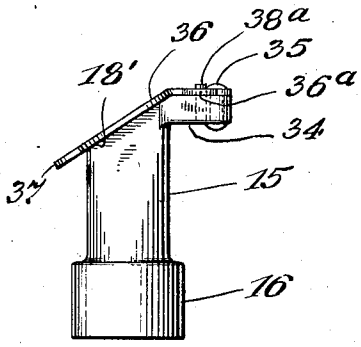


Fig. 11.

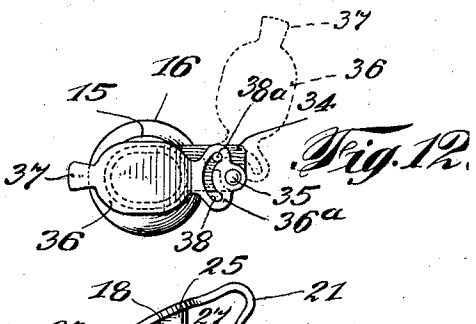


Fig. 12.

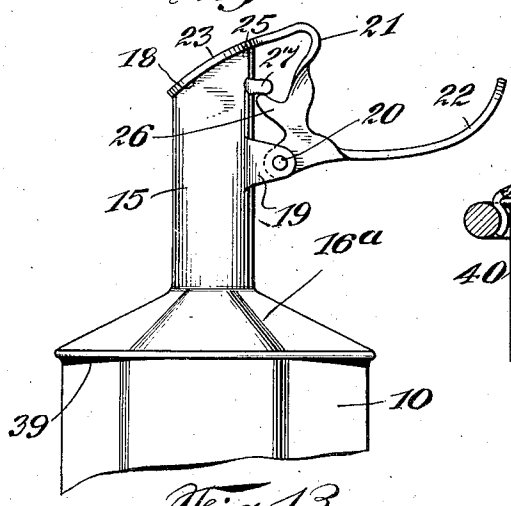


Fig. 13.

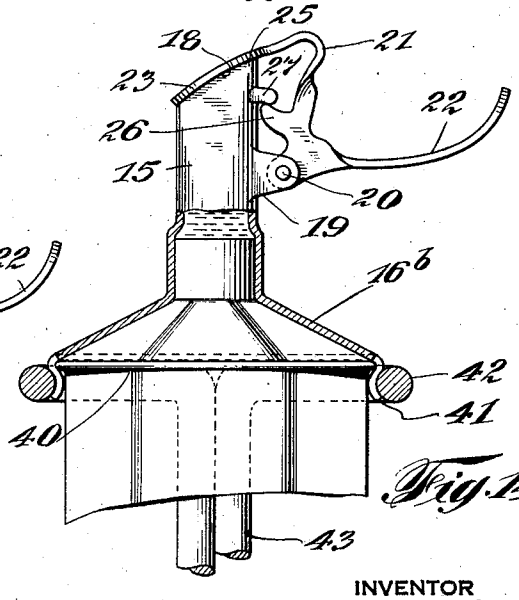


Fig. 14.

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Patented Jan. 6, 1931 1,788,181

UNITED STATES PATENT OFFICE

FRANK WOLF, OF NEW YORK, N. Y.

CLOSURE FOR COLLAPSIBLE TUBES AND OTHER RECEPTACLES

Application filed August 20, 1928. Serial No. 300,892.

This invention relates to closures for collapsible tubes and other receptacles. It has for its particular object to provide a very simple mechanism to open and close the outlet end of a tube in such a manner that it can be conveniently operated, always be handy and accessible, and at the same time maintain the outlet end of the tube clean and free from the contents of the tube; thus preventing portions of the material from lodging around the edges of the outlet, as is the case with some closure devices.

Another object is to provide an outlet nozzle which has its orifice remote from the end of the collapsible tube, and its rim so thin and fine that there is virtually no place for the material to accumulate.

A further object of the invention is to provide an auxiliary outlet member which may be readily attached to the outlet end of any collapsible tube now on the market.

An additional object is the provision of a special locking member on said outlet member, fitting only supplementary locking members on the tube, so that such a member may be used only with those tubes which have means adapted to cooperate therewith.

With this and other objects in view my invention consists of an auxiliary outlet nozzle of elongated shape with its orifice remote from its attachment end, and a very thin edge around the orifice. The preferred form is made up as a unitary member separate from the collapsible tube having a closure member thereon. This unitary member is adapted to be applied to the outlet end or head of a collapsible tube. The invention consists further in the provision in such an outlet nozzle of means engaging the screw-threaded portion of the outlet end of the collapsible tube, to render it applicable to a standard tube outlet. The invention consists further in the combination of such a unitary outlet member with special locking means engaging with corresponding locking means on the tube.

My invention consists further in the features hereinafter described and shown in the accompanying drawings and finally printed on it in the claims.

In the accompanying drawings,

Figure 1 is a side view of an embodiment of my invention, partly in section at the lower end;

Fig. 2 is a section on line 2—2 of Fig. 1;

Fig. 3 is a side view of Fig. 1, seen from the right;

Fig. 4 is a side view partly in section of another embodiment showing the attachment thereof to the threaded end of an ordinary collapsible tube;

Fig. 5 is a side view of still another embodiment;

Fig. 6 shows the connection thereof by means of a particular locking device, to a collapsible tube of special design; this view being partly in section;

Fig. 7 is a view of the locking means of this embodiment;

Fig. 8 is a plan view of part of the cooperating locking means of the tube shown in Fig. 6;

Fig. 9 is a side view partly in section of a further embodiment;

Fig. 10 is a view of still an additional embodiment particularly directed to the type of valve or closure employed;

Fig. 11 is a side elevational view of still further embodiment, with a horizontal sliding valve;

Fig. 12 is a plan view of the embodiment shown in Fig. 11;

Fig. 13 is a side view showing an auxiliary nozzle with a base or bottom shaped to secure it in place; and

Fig. 14 shows one more modification, partly in section, and somewhat similar to the device of Fig. 13.

The same numerals identify the same parts throughout.

Referring to the drawings and more particularly to Figs. 1, 2 and 3, the elongated auxiliary nozzle 15 has at one end an interiorly screw-threaded portion 16, which is adapted to engage the exterior screw-threads on the end 12 of a collapsible tube 10 of the usual type. At the other end, the nozzle 15 is provided with an orifice 17, and the rim portion or edge 18 is very thin and narrow so as to prevent the contents of the tube from collecting thereon. The edge 18 is very

slightly curved tranversely of the nozzle, as shown. The orifice is remote from the attaching end so as to have the outlet 17 as far away from the tube as possible. The nozzle itself is shown as straight but may be slightly curved, if desired. A valve or closure is supported by the nozzle, and this embodiment has a pair of perforated lugs 19 for receiving a pivot pin 20. On this pin 20 is pivotally carried an arm 21, which has a handle 22, and a closure or lid 23. This valve or lid seats on the rim 18 of the outlet nozzle 15 when the valve is closed. As the valve is closed it slides over the highest point 25 of the edge of the nozzle and the arm 21 is resilient to permit the lid to yield as it passes the point 25, and then fit tight on the edge 18. The arm 21 has a lug 26, which engages a projection 27 on the side of the nozzle. As the valve closes the lug 26 goes under the projection when the valve seats itself upon the rim 18. The projection 27 cooperates with the lug 26 and serves to press the valve against the seat. The valve 23 is slightly curved to match the curve of the end of the nozzle. After the valve passes over the edge of the end 25 of the nozzle it snaps into position. As illustrated at 28 the stem is twisted which aids in its flexibility. This form of closure member may be applied to a nozzle having screw-threads to engage the screw-threads on the end 12 of an ordinary collapsible tube, as shown in Fig. 4, or to any of the other forms of nozzle members shown.

It will be particularly noted that the wall of the outlet nozzle is relatively thin, and in consequence very little of the tube contents will adhere to the surfaces, and such as may gather will be readily scraped off by the valve; also, the auxiliary outlet nozzle acts as a continuation of the ordinary tube outlet, and assures a better discharge than coming from the short outlet of the tube.

The embodiment of Figs. 1, 2 and 3 is attached to an ordinary collapsible tube 10 having an internally threaded outlet neck 12 by screwing it on the neck 12. Such a tube with a threaded neck of this description is shown in Fig. 4.

As is further indicated in Fig. 4, I modify the embodiment of Figs. 1, 2 and 3, dispensing with the lug 26 and projection 27, and providing the nozzle 15 with the stop 29 adjacent the rim 18. The arm 21 is engaged by one end of a spring 30 which is mounted upon the pin 20 and has its other end press against the adjacent side of the nozzle 15. By pressing down upon the handle 22 the closure 23 is withdrawn as indicated in broken lines in Fig. 4; and whenever the handle 22 is released the spring 30 carries the arm 21 to move the closure back over the end of the nozzle 15 until it strikes the stop 29. This embodiment also screws upon the threaded neck 12 of an ordinary tube 10.

In the form shown in Fig. 5, the construction is the same as shown in Fig. 4, except that the stop 29 of the nozzle is omitted and the bend 31 in the arm 21 adjacent the lid or cap 23 acts as a stop by abuttting against the side of the nozzle 15 adjacent the highest point 25 thereof. This construction also may be screwed upon a collapsible tube to attach it to the tube.

Fig. 6 illustrates a form which is of the same construction as Fig. 5 except that the attaching end 16′ instead of being screw-threaded has a hole or slot 32 as shown in Fig. 7, and the outlet neck 12′ of the collapsible tube instead of being threaded has a stud 33 to engage the slot 32, as shown in Fig. 7. The nozzle instead of being made cylindrical may be made tapering or conical as at 15′.

Of course the form shown in Figs. 1, 2 and 3 may be arranged by means of a bayonet slot and stud instead of screw-threads, if desired, and so may the form shown in Fig. 4.

Fig. 9 shows a curved nozzle 15^a having an attaching end 16 which may be internally screw-threaded the same as in Fig. 1. The arm 21 has a cap or closure $23a$ and has the same general shape as shown in Fig. 5. A spring 30 impels this arm to move the valve 23^a to close the outlet end or orifice of the nozzle $15a$. The edge of this orifice $18a$ may be curved but this curvature is along the arc of a circle having a radius R and a center O, outside of the nozzle. The letter R′ indicates how the edge 18^a would appear if struck from the pin 20 as a center. It is therefore obvious that the edge $18a$ of the opening of the nozzle $15a$ tends to bend the arm 21 away from the pin 20 somewhat so that the lid 23^a will always fit tightly against the end of the nozzle $15a$.

In Fig. 10 the construction is somewhat similar to Fig. 5 except that the arm 21 has a tongue 33 to strike the side of the nozzle 15 adjacent its highest point and act as a stop for the closure 23. The under face of the closure 23 is shown as having a projection $23b$ in the form of a wide bulge or protuberance to fit within the orifice 17 of the nozzle 15 and actually to close the outlet of this nozzle.

Figs. 11 and 12 show a nozzle 15 with attaching end 16 and having the outlet end 18′ beveled in a diagonal direction. At the highest point of the nozzle is a bearing 34 which receives the pivot pin 35 extending in the direction of the length of the nozzle, and having a swinging closure 36. The closure has a projection 37 to provide a fingerhold; so that the closure can be swung from side to side to open or close the nozzle. The closure 36 has one end bent as shown at $36a$, this end being engaged by the pivot 35, and the projection has a curved slot 38 in which is a stop $38a$ secured to the bearing 34. This stop pin $38a$ limits the movement of the closure 36.

The three forms shown in Figs. 9, 10, 11

and 12 may have the end 16 internally screw-threaded to attach to a collapsible tube or they may be formed so as to be held by a bayonet joint the same as in Figs. 6 and 7.

Fig. 13 shows a form similar to Fig. 1 except that, in place of the internally screw-threaded end 16 I provide the nozzle 15 with a cone-shaped integral base or bottom 16*a*. This base has its edge swaged or crimped down over the projecting flange or seam 40 where the top of the tube 10 is attached to the body thereof. This form of nozzle can be put in place by just fitting it over the end of the tube 10 so that the neck 12 thereof will go inside of the nozzle 15 which may be threaded or smooth, as desired. The crimped or swaged edge 39 will prevent detachment of this nozzle. Of course instead of crimping the edge 39 I may form this edge with a number of projections or fingers to be bent under the collar 40, such a collar being shown in Figs. 4, 6 and 14.

In Fig. 14 the construction is similar to that of Fig. 13, except that the cone-shaped base 16*b* has a number of projections 41 which may be resilient and are bent so that they first go around the collar 40 and then are out-turned at their ends so as to extend away from the side of the tube 10. These projections or fingers 41 are compressed against the outside of the tube 10 by semi-circular members 42 which form the laterally bent ends of rods 43. These rods may be part of a support or stand for the tube and be moved towards and from each other like the jaws of a pocket-book. There will be two such rods 43 on each side of the tube and at their lower ends they will have suitable feet (not shown) on which these rods with the tube thereon may rest. The rods on one side may be hinged together and the rods on the opposite side of the tubes may have any suitable form of catch to engage one other. When the rods having the catch are fastened together the semi-circular portions 42 encircle the top of the tube gripping the fingers 41 to hold the nozzle in place and the tube is at the same time held fast within the stand formed by the parts 43. The cap in all forms except Figures 9 and 10 is curved slightly to fit the curved end of the nozzle 15.

In all of the embodiments, the auxiliary outlet nozzle is of elongated shape to position the orifice thereof remote from the outlet end of the collapsible tube itself, and providing the end of the outlet nozzle with a very thin edge; so that the least amount of material may adhere to the surface. The closure valve in all cases is so arranged that such material is readily removed by the valve, whereby the rim is maintained in clean condition. This enables the tooth brush or the shaving brush to readily wipe off any of the adhering material and there is nothing on the auxiliary outlet nozzle to act to collect or gather any of the material.

I have shown various embodiments of my invention but changes may be made therein without departing from the spirit of my invention as defined in the annexed claims.

I claim:

1. A closure for collapsible tubes consisting of an outlet nozzle body having an outlet edge surrounding a discharge orifice, the entire end edge and consequently the orifice itself being inclined downwardly and transversely of the body, a plate lid for closing the orifice and having an area sufficient to cover the entire inclined end edge, a holder for the lid comprising an arm to which one end of the lid is joined, a lug on the body to which the opposite end of the arm is pivoted, whereby to move the lid out of and into closed position, means associated with the arm to put the lid under constraint upon the end edge and cause the lid, when it is moved out of and into closed position, to exert scraping frictional contact on the end edge for removing any material gathered thereon.

2. A closure for collapsible tubes, consisting of an outlet member having a curved end with a discharge orifice, a cap for the discharge end of the orifice, and a holder for the cap connected to the outlet member and arranged to move the cap on an arc into open or closed position, the holder being resilient and dimensioned to give the cap an arc movement slightly less than the degree of curvature of the end, to secure a frictional clamping action of the cap on said end.

3. In a collapsible tube closure, an outlet member for a collapsible tube, having an outlet end and orifice, means on the member for cleaning the outlet end and closing the orifice, said means consisting of a plate-like lid and a single arm united at one end to one end of the plate-like lid, said arm being pivoted to the member and said plate-like lid being adapted to close the outlet orifice and to be moved frictionally across the outlet end by said arm, and a spring associated with said arm and normally urging the same into position for maintaining the lid under constraint upon the outlet end.

4. A nozzle for collapsible tubes, comprising an elongated material discharging body having a discharge end surrounding an orifice, the discharge end and hence the orifice being inclined downwardly and transversely of the body and said end about the orifice comprising an extremely thin edge, said inclination in cooperation with the thin edge adapted to insure the escape of material from the discharge end, a lid engaging the discharge end and closing the orifice, a holder for the lid consisting of a single arm united at one end to one end of the lid and pivoted on the body at the same side thereof from which projects the high ridge of the end inclination,

said arm being resilient and bowed to keep the lid under constraint upon the thin edge and to move the lid frictionally across the thin edge and in a direction to pass over the high ridge of the inclination.

5. A nozzle for collapsible tubes, comprising an elongated material dispensing body having a discharge end and orifice, and opposite thereto an end adapted for attachment to a tube, the discharge end about the orifice comprising an extremely thin obliquely inclined edge adapted to insure the escape of material therefrom, a lid engaging the discharge end and closing the orifice, a holder for the lid provided with a pivot intermediate the length of the body and on the same side from which projects the high point of the oblique inclination, said holder being resilient and arranged to swing the lid on an arc of a circle frictionally across the thin edge and in a direction to pass over the high ridge of the inclination with a snapping action.

6. A nozzle for collapsible tubes, comprising a material discharging body having a discharge end and orifice, the discharge end about the orifice comprising an extremely thin obliquely inclined edge adapted to insure the escape of material therefrom, a lid engaging the discharge end and closing the orifice, a holder for the lid consisting of a single arm united at one end to one end of the lid and pivoted to the body for movement on an arc of a circle frictionally across the thin obliquely inclined edge and thereby to remove any material gathered thereon, and stop means for limiting the movement of the lid.

In testimony that I claim the foregoing as my invention, and have signed my name hereto.

FRANK WOLF.