July 18, 1933. H. A. SCHELL 1,919,044

PASTE TUBE WITH MEASURING DEVICE AND CAPTIVE CAP

Filed April 12, 1932

Fig. 1

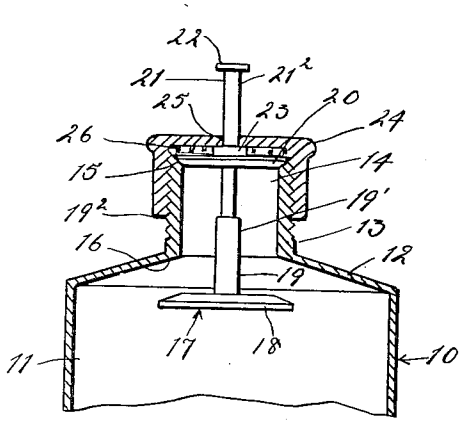


Fig. 2

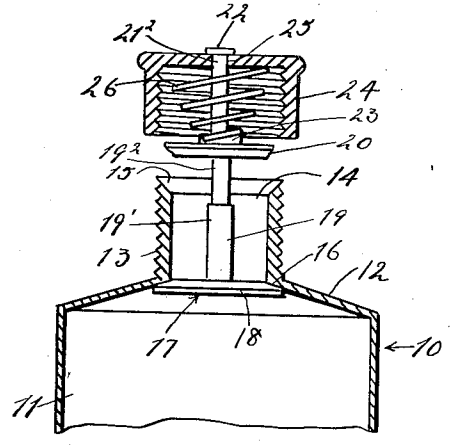
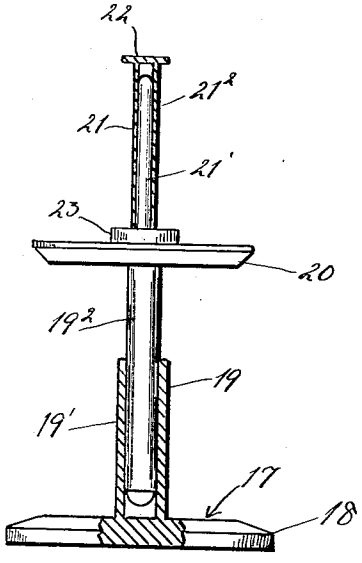


Fig. 3.



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PASTE TUBE WITH MEASURING DEVICE AND CAPTIVE CAP

Application filed April 12, 1932. Serial No. 604,677.

My invention relates to new and useful improvements in a paste tube with measuring device and captive cap, and has for one of its objects to improve the device illustrated in my Patent #1,848,846, dated March 8, 1932.

Another object of the invention is to provide a paste tube having an automatic measuring device to which a captive cap is connected for finally closing the outlet or mouth of the tube.

A further object of the invention is to provide a captive cap slidably connected with the measuring device which cap is spring actuated in one direction for normally moving the cap away from the primary valve disc, closure or head of the measuring device and the movement of said cap being such that it will project above the primary valve disc, closure or head or at least reach a location where the inner edge of the cap will be adjacent said valve disc, closure or head in order not to interfere with the removal of the contents or paste of the tube after being measured.

A still further object of the invention is to provide in a device of the kind described, a measuring device consisting of a secondary closure or valve disc operable within the tube toward and away from the neck or outlet thereof, a stem connected with the said secondary closure or valve disc and extending through the outlet or mouth of the tube, a primary closure, valve disc or head on the outer end of the stem to limit the inward movement of the secondary closure or valve disc, said head also acting as the means by which the secondary closure or valve disc may be initially moved and carried throughout a portion of its stroke by the paste during its ejectment from the tube, a post outside of the primary closure or valve disc, a cap slidably mounted on said post for connection with the neck of the paste tube, which cap is normally forced outward by a spring between the secondary closure and said cap, and means on the outer end of the post to limit the outward movement of the cap.

With these and other ends in view, this invention consists in the details of construction and combination of elements hereinafter set forth and then specifically designated by the claims.

In order that those skilled in the art to which this invention appertains may understand how to make and use the same, I will describe its construction in detail, referring by numerals to the accompanying drawing forming a part of this application, in which:—

Fig. 1 is a vertical longitudinal sectional view of the upper portion or outlet end of a paste tube to illustrate an embodiment of a captive cap in accordance with my invention applied to the measuring device with all of the parts shown in their closed positions.

Fig. 2 is a similar view illustrating the positions assumed by the several parts after the cap has been released from the tube and the measuring device actuated due to squeezing of the tube for ejecting paste therefrom.

Fig. 3 is an enlarged view partly in section and partly in elevation of the parts making up the measuring device and the anchorage for the captive cap but with the latter and its spring removed.

In carrying out my invention as herein embodied, 10 represents a flexible, pliable, collapsible paste holding tube of any ordinary, usual or well known construction including the body 11 which in particular is the collapsible portion, and an end wall 12 provided with a neck 13 preferably exteriorly threaded and having an outlet or mouth 14 which, while not absolutely essential, I prefer to surround by a conical seat 15 and another seat 16 is provided by the inner surface of the end wall 12.

The measuring device 17, essentially, includes a secondary closure or valve disc 18 for operation within the tube and for movement toward and away from the outlet or mouth 14 or the seat 16, in particular, which said secondary closure or outlet will engage at the end of the outward stroke.

A stem 19 is carried by the secondary closure or valve disc 18 and preferably comprises a female member 19′ and a male member 19^2 of a compression rivet, one of said members, as the female member 19′, being

formed with the secondary closure or valve disc 18 and the other or male member 19^2 being formed with the primary closure, valve disc or head 20. Of course it will be understood that any other suitable form of stem for connecting the secondary and primary closures may be used. While the closures may be of any suitable construction and configuration, it is preferable that they both be of conical or frusto-conical shape as illustrated and I found in actual practice that the best results are obtained when at least the primary closure, valve disc or head 20 is of conical or frusto-conical shape. The valve disc or head 20 which constitutes the primary closure coacts with the seat 15 to close the mouth or outer end of the outlet 14 when the paste tube is not in use and said primary closure is normally maintained in a closed position by a cap to be presently described.

The operation of the measuring device, the parts so far described, is the same as that set forth in the above referred to patent. As a cap is to be used with the tube in order to hold the measuring device in its inward or inoperative position and also prevent contamination of the contents of the tube from outside sources as well as preventing accidental ejectment of the contents of the tube, I have found it advisable to provide means to guard against the cap becoming mislaid or lost and have evolved a means for anchoring the cap to the measuring device in such a way that said cap will not interfere with the operations of said measuring device and the ejectment of the contents of the tube.

To the above ends I have provided the measuring device with an anchoring post 21, preferably comprising the male member 21′ and the female member 21—2 of a compression rivet. One of these members, as the male member 21′, may be formed with the primary closure, valve disc or head 20 and the other or female member 21—2 is provided at its outer end with a flange 22. If found desirable a lug 23 may be formed at the base of the post 21.

On the post 21 is slidably mounted a cap 24 which will fit over and can be secured to the neck 13 of the tube and for purposes of illustration, said cap is shown internally threaded for engagement with the external threads on the neck 13. In order to slidably mount the cap 24 on the post 21, the end wall of said cap is provided with a hole 25 through which the post projects and the sliding movement of said cap is limited in one direction by the primary closure, valve disc or head 20, and in the other direction by the flange 22 at the outer end of the post.

A spring 26 of any suitable or desirable type, shape or configuration, is located between the primary closure, valve disc or head 20, and the inside of the end wall of the cap 24 and where said spring is of the helical type as herein illustrated it surrounds the post 21 and the lug 23 and said spring is preferably produced from material having a diameter less than the height of the lug 23 so that when the cap 24 is telescoped over the neck 13 of the tube and said spring contracted, the end wall of the cap 24 will engage the lug 23 without actually binding the spring between said end wall of the cap and the primary closure, valve disc or head 20.

From the foregoing description, it will be obvious that the cap 24 is anchored or held captive upon the post 21 although having a limited sliding movement which will permit said cap to be telescoped over and fastened upon the neck 13 of the tube after the primary closure 20 is seated upon the outer end of the tube neck and will also permit said cap to be moved outward by the spring away from the primary closure 20 as soon as said cap is released from the tube neck.

In operation, the measuring device and captive tube are positioned as shown in Fig. 1, when the tube is first filled with paste and also after each use thereof. When it is desired to obtain some paste from the tube, the cap 24 is first released or backed off from the neck 13 of the tube at which time the spring 26 will move said cap 24 to the outer end of the post 21 as shown in Fig. 2, but the measuring device will remain in the position shown in Fig. 1.

Now by squeezing the tube so as to collapse the walls thereof, some of the paste or contents of the tube will be expelled or ejected and said paste will act upon the primary closure, valve disc or head 20 and begin to move the same outward and the flow of the paste toward the outlet will also act upon the secondary closure or valve disc 18 so that the measuring device will be carried along in a straight line until the secondary closure 18 engages the end wall 12 and more particularly the seat 16 thereby cutting off any further flow of the paste.

The cap 24 being held in its outer position by the spring 26 will be moved along with the measuring device so as to be practically out of the way.

That portion of the paste lying between the end of the neck and the primary closure 20 may be removed and each time the device is operated in this manner the quantity of past that can be removed will be the same, thus providing for the accurate dispensing of predetermined quantities of the contents of the tube.

As soon as the dispensed paste has been removed, the measuring device and the cap 24 may be reset by moving the cap toward the neck of the tube which will cause the primary closure 20 to seat itself upon the outer end of the neck and thereafter the

spring will be compressed to permit the cap to be fastened upon said neck.

It might be well to state that the several parts of the invention disclosed herein may be made of metal, fibre, hard rubber or other suitable material or some of said parts may be made of one material and the other parts of another or different material and various changes may be made in the relative sizes or proportions or shapes and configurations.

Of course I do not wish to be limited to the exact details of construction as herein shown, as these may be varied within the limits of the appended claims without departing from the spirit of my invention.

Having thus fully described my invention, what I claim as new and useful is:—

1. A measuring device and captive cap for paste tubes, comprising a stem slidable longitudinally through the outlet of a collapsible paste tube, a secondary closure on the inner end of said stem to control the discharge of paste from the tube, a primary closure fixed to the outer end of the stem to be carried along by the discharging paste for moving the secondary closure to a closed position, a post extending outwardly from the primary closure, a cap for threaded connection with the neck of said tube and slidably mounted on the post, means at the outer end of the post to prevent displacement of the cap from said post, and means to move said cap outward along the post upon being released from the neck of the tube.

2. A measuring device and captive cap for paste tubes, comprising a stem slidable longitudinally through the outlet of a collapsible paste tube, a secondary closure on the inner end of said stem to control the discharge of paste from the tube, a primary closure fixed to the outer end of the stem to be carried along by the discharging paste for moving the secondary closure to a closed position, a post extending outwardly from the primary closure, a flange on the outer end of the post, a cap slidably mounted on the post between the primary closure and the flange, and a spring surrounding the post between the end wall of the cap and the primary closure to move said cap outward along the post.

3. The structure set forth in claim 2, in combination with a lug at the base of the post and of a height greater than the diameter of the spring material.

4. In a device of the kind described, a tube including an end wall and a neck having an outlet therethrough, a stem formed from the members of a compressible rivet, a closure at each end of said stem, one of said closures cooperating with the interior of the end wall of the tube to control the discharge of paste through the outlet and both of said members to be carried along by the discharging paste whereby the stem will be retained in substantially a central position and the inner member moved into complete engagement with the inner surface of said end wall, a post extending from the outer closure and formed from the elements of a compression rivet, a flange on the outer end of said post, a cap for the tube and adapted to be fastened to the neck thereof and slidably mounted upon said post between the flange and the adjacent closure, and a spring to move said cap outward along said post.

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