Jan. 12, 1932. R. H. BAPTISTE 1,841,275

DISPENSING DEVICE

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Fig. 1.

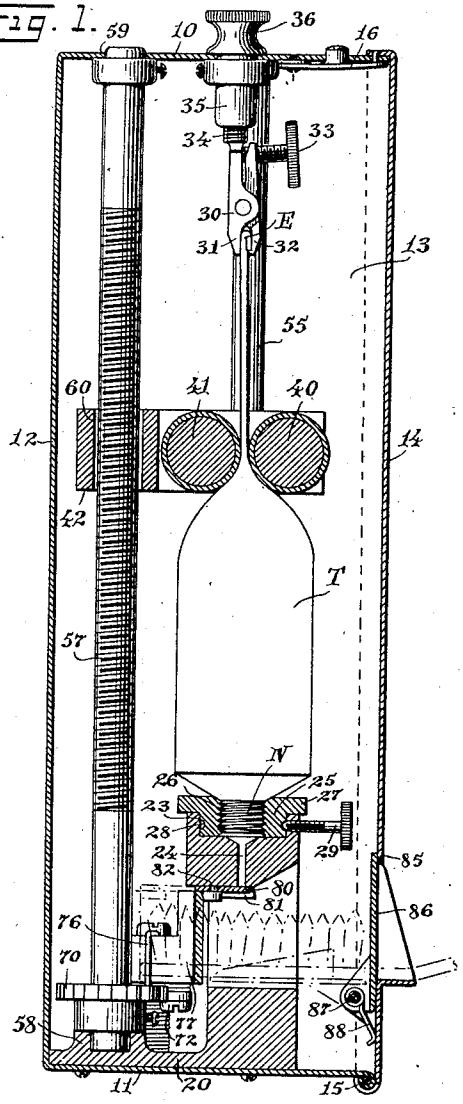


Fig. 1a.

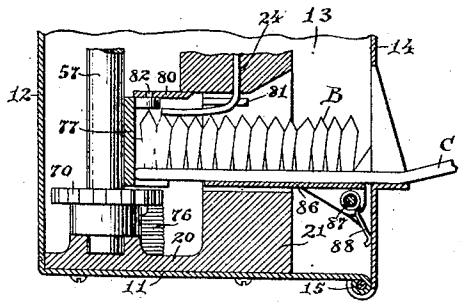
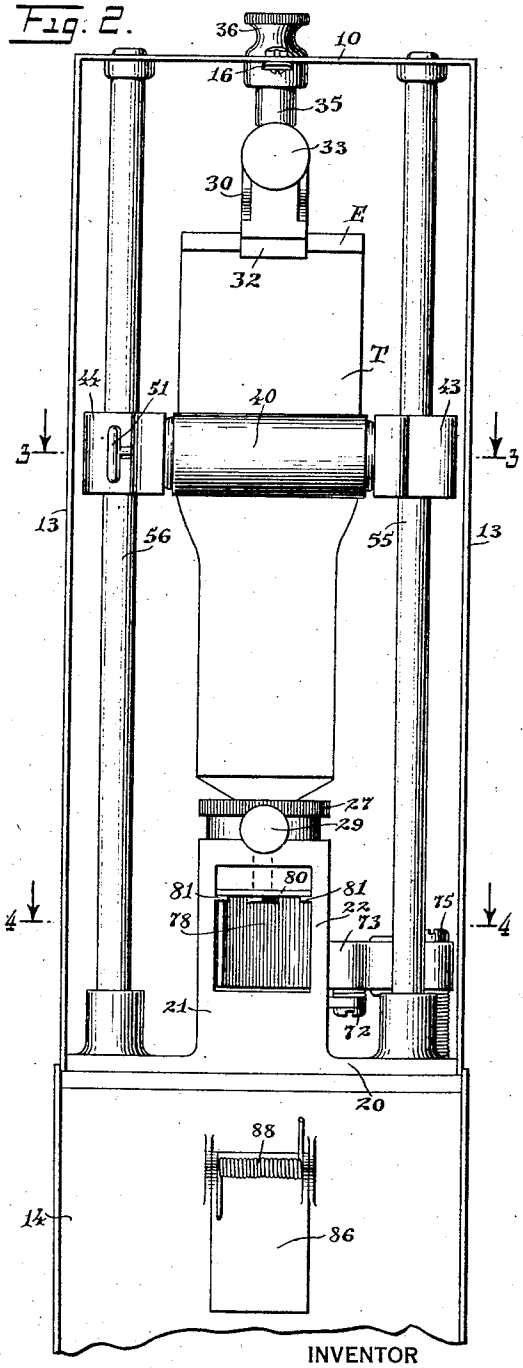


Fig. 2.



INVENTOR

Robert H. Baptiste

BY

Munn & Co

ATTORNEYS

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Fig. 3.

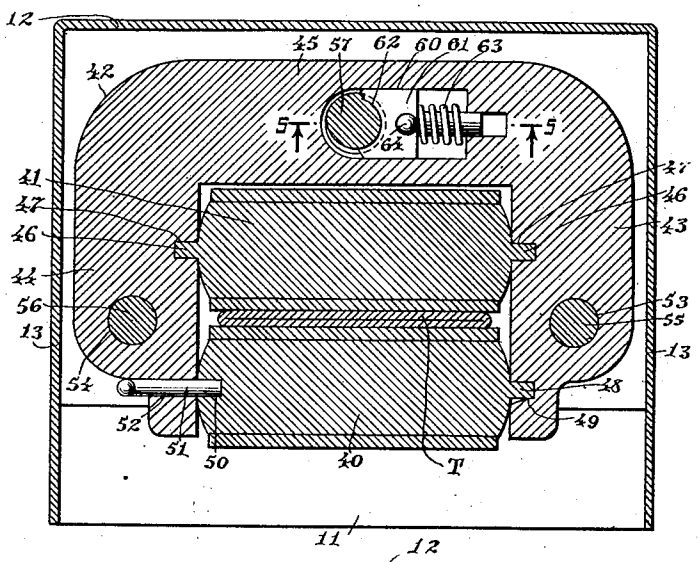


Fig. 4.

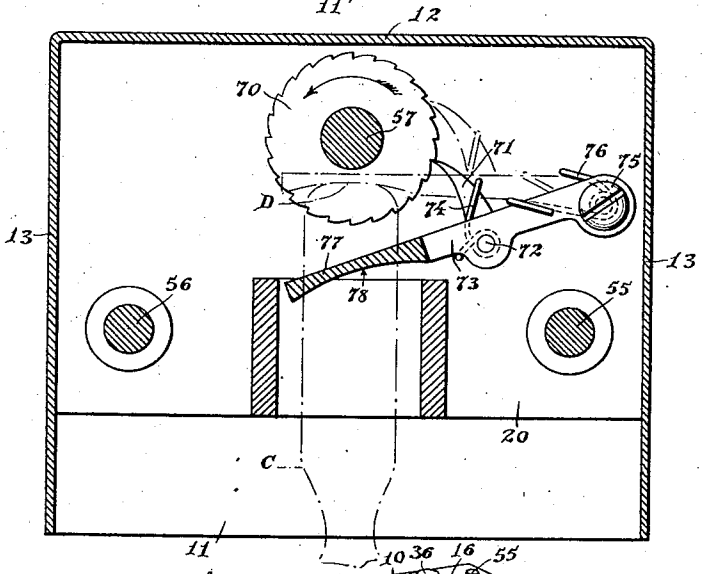
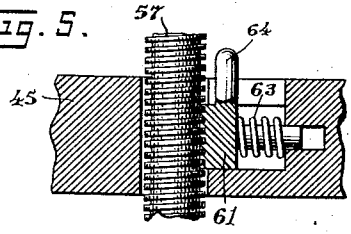


Fig. 5.



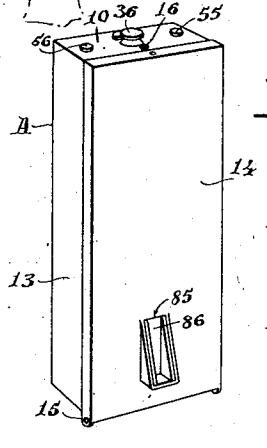


Fig. 6.

INVENTOR
Robert H. Baptiste
BY
Munn & Co
ATTORNEYS

Patented Jan. 12, 1932 1,841,275

UNITED STATES PATENT OFFICE

ROBERT H. BAPTISTE, OF CATSKILL, NEW YORK

DISPENSING DEVICE

Application filed April 18, 1929. Serial No. 356,154.

This invention relates generally to dispensing devices, and refers more particularly to an improved apparatus for dispensing substances which are packaged in collapsible containers, such as tubes of tooth paste or the like.

Primarily, the invention contemplates a device of the character set forth which affords means for receiving, supporting and operating upon a collapsible tube to successively effect the discharge of a uniform quantity of the contents of the tube to obviate the possibility of waste by over feeding.

As a further object, the invention comprehends in a device of the character set forth when applied to its principal use as a dispenser for tooth paste, means operable by the insertion of a tooth brush for feeding a predetermined quantity of tooth paste from a tooth paste tube onto the bristles of the brush whereby to eliminate the necessity of handling the tube, removing the closure cap and replacing said cap.

The invention further aims to provide an automatically operable valve mechanism for opening and closing the outlet of the supply.

The invention further embodies adjustable means for accommodating collapsible tubes of different lengths and for compensating for variations in the size of the threaded neck of the tube.

Further features of the invention reside in the provision of an apparatus or device of the character set forth which is comparatively simple in its construction and mode of operation, economical to produce and which is highly efficient in its purpose.

With the above recited and other objects in view, reference is had to the following description and accompanying drawings, in which there is exhibited one example or embodiment of the invention, while the claims define the actual scope of the same.

In the drawings:

Figure 1 is a vertical sectional view through the device with a tooth paste tube in position therein.

Figure 1*a* is a similar fragmentary view illustrating the feeding of the tooth paste onto the tooth brush.

Figure 2 is a front view of the device with the cover swung to an open position.

Figure 3 is an enlarged horizontal sectional view taken approximately on the line indicated at 3—3 in Figure 2.

Figure 4 is a similar sectional view taken approximately on the line indicated at 4—4 in Figure 2.

Figure 5 is a fragmentary transverse sectional view taken approximately on the line 5—5 of Figure 3.

Figure 6 is a perspective view on a reduced scale of the dispensing device.

Referring to the drawings by characters of reference, the device or apparatus includes a substantially box-like casing A which is preferably disposed in a vertical position and which includes a top wall 10, a bottom wall 11, a rear wall 12 and side walls 13, leaving the front of the casing open. A front covering wall 14 is preferably connected to the casing at the lower front end by a hinge 15 and a suitable latch 16 is provided at the forward upper end for holding the cover 14 in a closed condition.

Within the casing a base 20 is supported by and attached to the bottom wall 11, and said base is provided medially of its forward portion with an upstanding member 21 formed with an opening 22 extending completely therethrough from the front to the rear of the member. The upper end of the member 21 is provided with a circular socket 23 from which a depending aperture 24 extends and communicates with the opening 22. An annular collar 25 is seated in the socket 23 and said collar is provided with an internal thread 26. The upper end of the collar, which is disposed above the upper end of the member 21, is provided with an annular flange 27, the periphery of which is serrated or otherwise formed to permit of manual rotation thereof. The outer periphery of the collar, which fits in the socket 23, is provided with an annular groove 28 and a screw or other equivalent retaining element 29 extends through the member 21 into the socket 23 and engages within the groove 28 for the purpose of removably retaining the collar in place. In practice, the internal thread 26 of the collar

is designed to receive and engage with the threaded neck N of the collapsible tube T and it is to be understood that a number of collars 25 having threaded openings 26 respectively of varying diameters may be used to compensate for variation in the sizes of the threaded necks N of tubes of different types and sizes. In effect, the collar 25 is swiveled in the upper end of the member 21 so that in positioning the collapsible tube T in place, the threaded neck may be drawn into the collar by rotation of the same in one direction and the neck may be detached from the collar by rotation of the collar in the opposite direction.

In order to provide means for supporting the closed end E of the tube, a clamp 30 is employed which is supported from the upper end 10 of the casing A. This clamp includes a fixed jaw 31 and a movable jaw 32, together with means such as a screw 33, for opening and closing the jaws and for holding the same in their relatively moved positions. The fixed jaw 31 is provided with an upwardly projecting threaded shank 34 which is received by an internally threaded tubular stem 35 swiveled in the upper wall 10 and provided with an externally disposed manipulating head 36, by virtue of which the clamp 30 may be vertically adjusted to coincide with variations in the length of the collapsible tube.

In order to provide means for feeding the contents of the tube T through the neck N and thence through the feed aperture 24, a pair of pressure rollers 40 and 41 is provided, which are journaled in a carrier 42 for vertical movement therewith. The carrier 42 is of substantially U-shaped construction including transversely spaced side arms 43 and 44 joined by a rearwardly disposed transversely arranged bight portion 45. The rear roller 41 is formed with trunnions 46 which are journaled in bearing openings 47 in the arms 43 and 44. The front roller 40 is provided at one end with a trunnion 48 which is journaled in a bearing opening 49 in the arm 43, while the opposite end of the roller 40 is provided with a concentric opening 50 adapted to receive a removable trunnion 51 which is insertable through a bearing opening 52 in the arm 44. This permits of the displacement of the front roller for the purpose of facilitating the positioning or removal of the tube T within the device. In order to guide the carrier 42 vertically within the casing, the arms 43 and 44 are provided with vertical guide openings 53 and 54 respectively, through which vertical rods 55 and 56 extend, said rods being rigidly secured at their upper and lower ends in any desired manner, preferably by the anchoring of the upper ends to the upper wall 10 of the casing and the anchoring of the lower ends to the base 20. The feeding means further includes a feed screw shaft 57 which extends vertically of the casing A adjacent the rear wall and medially of the transverse dimension of the casing. The feed screw shaft has its lower end arranged in a step bearing 58, which is preferably formed on the base 20 and has its upper end journaled in a bearing opening 59 in the top wall 10 of the casing. The feed screw shaft extends through a slot 60 in the bight portion 45 of the carrier 42, and a block 61 is arranged for sliding movement in the slot 60, which block is provided with a concave threaded surface 62 adapted to mate with the threads on the feed screw shaft 57. A spring 63 normally functions to advance the block in a direction to engage the concave threaded surface 62 with the threads of the feed screw shaft. The block 61 is further provided with an upwardly projecting handle 64 for retracting the block against the action of the spring 63 so that the carrier 42 may be moved vertically without rotating the feed screw shaft 57.

In order to provide means for successively turning the feed screw shaft in a counterclockwise direction, as indicated by the arrow in Figure 4, for the purpose of moving the carrier 42 downwardly so that the pressure rollers 40 and 41 contacting with diametrically opposite sides of the tube T will express the contents of the tube through the neck and feed aperture 24, a ratchet wheel 70 is employed. The ratchet wheel 70 is keyed to the feed screw shaft 57 at its lower end and a ratchet pawl 71 is designed to cooperate with the teeth of the ratchet wheel. The ratchet pawl is fulcrumed as at 72 to a lever 73 and a spring 74 functions to press the ratchet pawl 71 into engagement with the toothed periphery of the ratchet wheel. The lever 73 is fulcrumed as at 75 and is provided with a spring 76 which functions to normally swing the lever forwardly from the dotted line position in Figure 4 to the full line position. The free end 77 of the lever is of a size and configuration approximating the transverse area of the opening 22 and is formed with a forward concave face 78, the purpose of which will be hereafter brought out.

In order to provide means for normally closing the feed aperture or outlet 24, a slide valve plate 80 is mounted on the upper wall of the opening 22 for fore and aft sliding movement between said upper wall and the beads or ribs 81. In order to automatically effect movement of the slide valve plate 80, the free end 77 of the lever 73 is coupled to the valve plate 80 by a coupling pin 82.

The cover wall 14 is provided with a doorway 85 disposed in alignment with the opening 22 in the member 21 and a door 86 is hinged as at 87 to the cover wall 14 for inward and downward swinging movement against the action of a spring 88 which normally moves the door 86 to a closed position.

In operation, the tube T with the cap removed is threadedly engaged with the col-

lar 25. The upper closed end of the tube is then engaged by the clamp 30 which is suitably adjusted to coincide with the length of the tube. While the tube is being positioned in place with respect to the device, the carrier 42 with the front roller 40 removed is elevated to a point above the upper closed end E of the tube. After the tube is positioned and clamped in place, the front roller 40 is replaced in the carrier so that the peripheries of the rollers engage diametrically opposite points of the upper closed end of the tube. The device is now ready for use, and the user by inserting the bristle end B of the tooth brush C into the casing through the doorway 85, swings the door 86 downwardly. The forward end D of the tooth brush head exerts a thrust on the concave face 78 of the end 77 of the lever. The initial swinging of the lever retracts or moves the valve plate 80 to uncover the feed or discharge aperture 24 and continued inward movement of the brush causes the pawl 71 to turn the ratchet wheel 70 in the counterclockwise direction indicated by the arrow in Figure 4. This turns the feed screw shaft 57 thereof, which causes the carrier 42 and pressure rollers 40 and 41 to move downwardly with respect to the fixed tube T. Obviously, pressure is exerted on the tube for feeding therefrom a predetermined quantity of the contents of the tube onto the tooth brush bristles B while the same are being moved rearwardly. This spreads the discharged quantity of the contents over the bristles. When the brush is withdrawn, the spring 76 swings the lever 73 forwardly to the normal position while the pawl 71 freely ratchets over the peripheral teeth of the ratchet wheel 70. Obviously, the ratchet wheel and shaft 57 are not turned in the opposite direction so that the carrier 42 and pressure rollers 40 and 41 remain stationary until the next operation. As the lever is swung forwardly, the coupling pin or connection 82 moves the valve plate 80 to cut off the contents and to again close the feed or discharge aperture 24. As the brush is withdrawn through the doorway 85, the spring 88 functions to again close the door 86 so that the casing is completely closed against the entrance of dust, dirt or other foreign matter which may tend to settle upon and contaminate the surfaces of the device. When the contents have been completely dispensed from the tube, it is obvious that the same may be removed and replaced by a fresh tube, as previously explained.

What is claimed is:

1. In a device for dispensing the contents of collapsible tubes, tube supporting means including a member having a threaded recess within which the threaded outlet neck of the tube is engaged, said member having an opening and a feed aperture leading therefrom to the recess, a valve plate normally covering the feed aperture and movable to a position to uncover the same, said tube supporting means further including a clamp adapted to grip the closed end of the tube, means movable longitudinally of the tube from its closed end to the outlet neck for exerting a pressure thereon to discharge the contents therefrom, feeding means for successively moving said pressure exerting means a predetermined distance upon each operation of the feeding means to discharge uniformly measured quantities of the contents and a connection between said feeding means and the valve plate for moving said valve plate to an open position upon initial movement of the feeding means.

2. A device for dispensing the contents of a collapsible tube including means for supporting the tube from its opposite ends, a pair of pressure rollers movable longitudinally of the tube from its closed end to its open end for exerting a pressure thereon to effect the discharge of the contents therefrom, a carrier supporting said pressure rollers, a rotary screw feed shaft, means on the carrier engageable with and disengageable from the screw feed shaft adapted when engaged with said shaft to cause movement of the carrier and actuating means for successively turning the shaft a predetermined distance upon each operation thereof.

3. A device for dispensing the contents of a collapsible tube including means for supporting the tube from its opposite ends, a pair of pressure rollers movable longitudinally of the tube from its closed end to its open end for exerting a pressure thereon to effect the discharge of the contents therefrom, a carrier supporting said pressure rollers, a rotary screw feed shaft, means on the carrier engageable with and disengageable from the screw feed shaft adapted when engaged with said shaft to cause movement of the carrier and actuating means for successively turning the shaft a predetermined distance upon each operation thereof, one of said pressure rollers being removably associated with the carrier to facilitate the positioning and removal of the tube with respect to the device.

4. In a device for dispensing the contents of collapsible tubes, tube supporting means including a member having a recess, a collar swiveled in said recess having a threaded bore with which the threaded outlet neck of the tube is engageable, said member having an opening therethrough and a feed aperture leading therefrom to the recess, a valve plate normally covering the feed aperture at its outlet end and slidable to a position to uncover the same, said supporting means further including a clamp adapted to grip the closed end of the tube, means movable longitudinally of the tube from its closed end to the outlet neck for exerting a pressure there-

on to discharge the contents therefrom, feeding means for successively moving the pressure exerting means a predetermined distance upon each operation of the feeding means to discharge uniformly measured quantities of the contents, a connection between said feeding means and the valve for sliding the valve plate to an open position upon initial movement of the feeding means and actuating means for the feeding means disposed in line with the opening of said feeding means whereby passage of an article through said opening to actuate the actuating means will position the same relative to the outlet end of the feed aperture.

5. In a device for dispensing the contents of collapsible tubes, tube supporting means including a member having a recess, a collar swiveled in said recess having a threaded bore with which the threaded outlet neck of the tube is engageable, said member having an opening therethrough and a feed aperture leading therefrom to the recess, a valve plate normally covering the feed aperture at its outlet end and slidable to a position to uncover the same, said supporting means further including a clamp adapted to grip the closed end of the tube, means movable longitudinally of the tube from its closed end to the outlet neck for exerting a pressure thereon to discharge the contents therefrom, feeding means for successively moving the pressure exerting means a predetermined distance upon each operation of the feeding means to discharge uniformly measured quantities of the contents, a connection between said feeding means and the valve for sliding the valve plate to an open position upon initial movement of the feeding means, actuating means for the feeding means disposed in line with the opening of said feeding means whereby passage of an article through said opening to actuate the actuating means will position the same relative to the outlet end of the feed aperture and a casing for said device having a doorway in alignment with the opening in said member and a spring closed door for normally closing the same.

6. In a device for dispensing the contents of a collapsible tube, including means for supporting the tube, pressure means for exerting pressure on the tube to effect a discharge of the contents therefrom, a carrier supporting said pressure means, a rotary screw feed shaft, means on the carrier engageable with and disengagable from the screw feed shaft and adapted when engaged with said shaft to operate the carrier and means for turning the shaft.

7. In a device for dispensing the contents of collapsible tubes, tube supporting means, a member having an opening and a feed aperture for receiving and discharging the contents of the tube, a valve member normally closing the feed aperture, a lever having an arm disposed for engagement by a brush, means connecting the lever with the valve member for operating the latter, and means operable by the lever for exerting pressure on the tube to effect the discharge of the contents of the tube.

8. In a device for dispensing the contents of collapsible tubes, tube supporting means, a member having an opening and a feed aperture for receiving and discharging the contents of the tube, guides, a valve plate movable in the guides normally closing the feed aperture, a lever having an arm disposed for engagement by a brush, pivotal means connecting the lever with the valve plate for operating the latter, and means operable by the lever for exerting pressure on the tube to effect the discharge of the contents of the tube.

9. In a device for dispensing the contents of collapsible tubes, tube supporting means, a member having an opening and a feed aperture for receiving and discharging the contents of the tube, a valve member normally closing the feed aperture, a lever having an arm for engagement by a brush, pivotal means connecting the lever with the valve member for operating the latter, means for exerting pressure on the tube to effect the discharge of the contents therefrom, a shaft, means by which the rotation of the shaft is adapted to operate the third mentioned means, a ratchet wheel secured to the shaft, and a pawl pivoted to the lever and engaging the ratchet wheel.

10. In a device for dispensing the contents of collapsible tubes, tube supporting means, a member having an opening and a feed aperture for receiving and discharging the contents of the tube, a valve member normally closing the feed aperture, a lever having an arm disposed for engagement by a brush, pivotal means connecting the lever with the valve member for operating the latter, means for exerting pressure on the tube to effect the discharge of the contents of the tube, a shaft having means for operating the second mentioned means, a ratchet on the shaft, and a pawl mounted on the lever for operatively engaging the ratchet.

ROBERT H. BAPTISTE.