

April 9, 1963

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3,084,722

PASTE DISPENSER FOR COLLAPSIBLE TUBES

Filed March 17, 1961

2 Sheets-Sheet 1

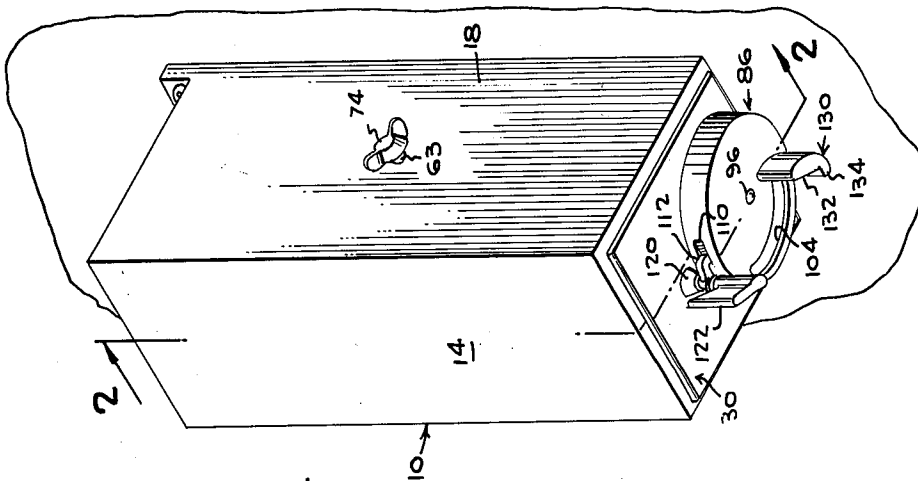
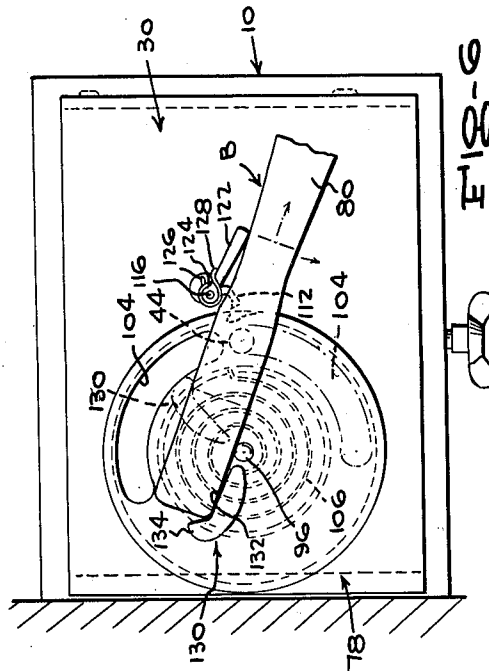
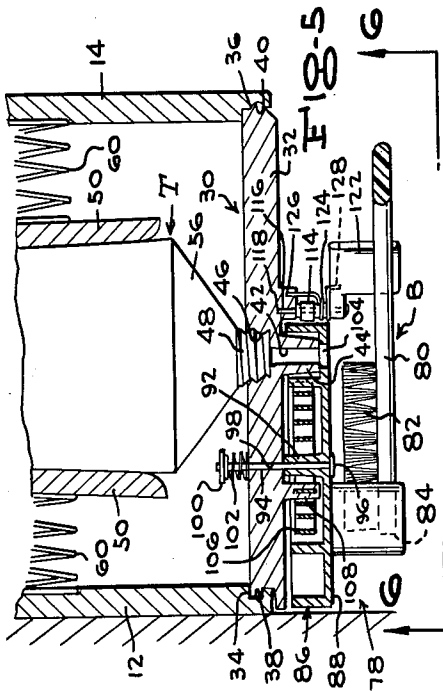


FIG-1

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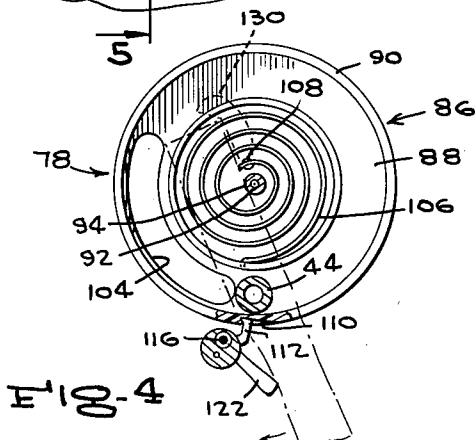
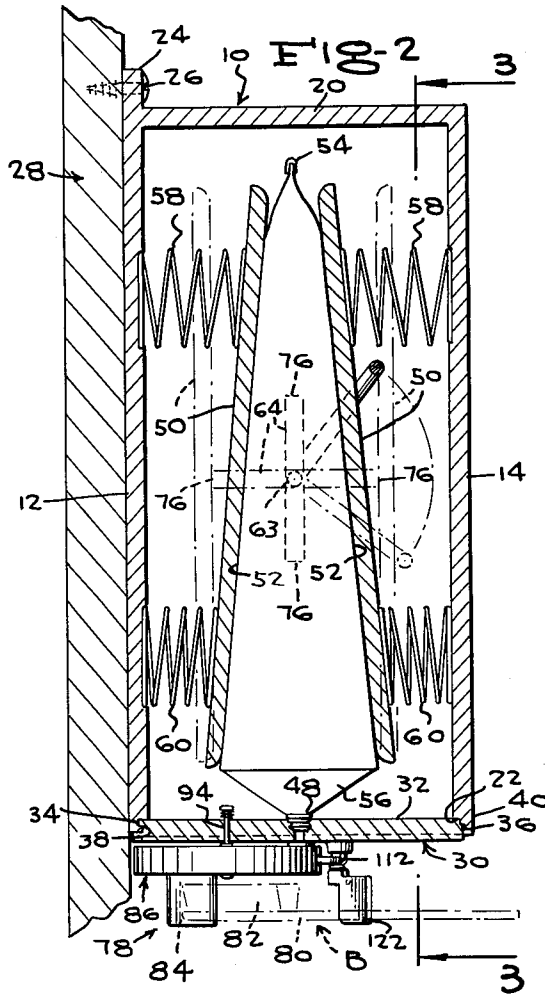
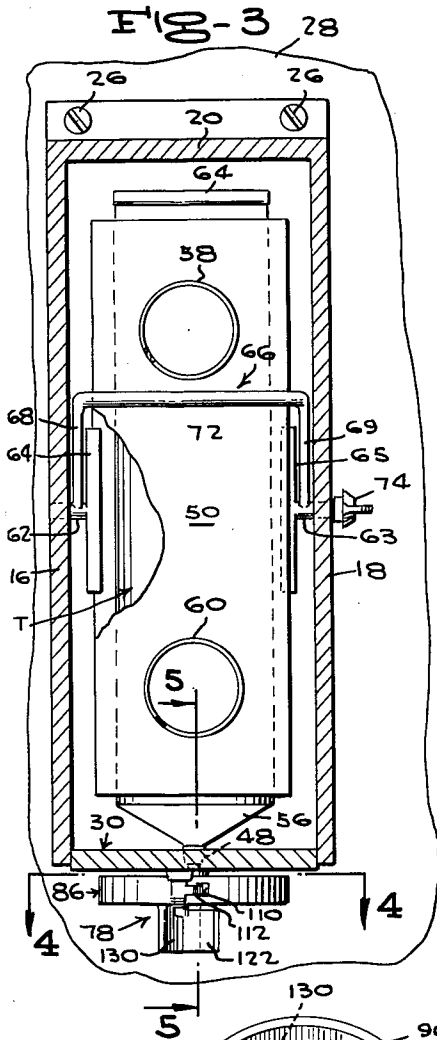
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PASTE DISPENSER FOR COLLAPSIBLE TUBES

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2 Sheets-Sheet 2



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3,084,722
PASTE DISPENSER FOR COLLAPSIBLE TUBES
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Filed Mar. 17, 1961, Ser. No. 96,538
6 Claims. (Cl. 141—362)

This invention relates to a novel and improved paste dispenser for collapsible tubes.

The primary object of the invention is the provision of a simpler, more practical, and more efficient dispenser of the kind indicated which involves a pair of spring-pressed pressure plates adapted to engage opposed sides of a collapsible tube with equal and uniform squeezing pressure, the pressure plates being convergent toward the closed or sealed end of a collapsible tube, and divergent toward the neck-equipped end of the tube, whereby the paste in the tube is under constant pressure, and whereby as discharge of paste from the tube progresses, the tube is progressively collapsed, from its sealed end toward its neck-equipped end, so that paste is discharged from the neck, at a substantially uniform rate, and the tube is more completely emptied of paste through the neck before the tube is required to be replaced in the dispenser.

Another object of the invention is the provision of a dispenser of the character indicated above, wherein the pressure plates and their operating springs are enclosed in a protective casing, adapted to be mounted on a support, and manual means is provided on the casing for spreading the pressure plates, against the resistance of their springs, to accept a fresh collapsible tube therebetween.

A further object of the invention is the provision, in a dispenser of the character indicated above, of novel and improved toothbrush operated, spring rotated valving means for a port of the casing, into which the uncapped neck of a collapsible tube is adapted to be seated, for producing, controlling, and stopping dispensing of paste on a toothbrush.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is a perspective view of a dispenser of the present invention, showing the same mounted vertically on a support;

FIGURE 2 is an enlarged vertical transverse section taken on the line 2—2 of FIGURE 1, and showing a collapsible tube in place in the dispenser, and the plate spreading means in released position and in applied position, and showing, in phantom lines, application of a toothbrush to the valving means;

FIGURE 3 is a vertical transverse section taken on the line 3—3 of FIGURE 2, a part of a pressure plate being broken away;

FIGURE 4 is a horizontal section taken on line 4—4 of FIGURE 3, showing, in phantom lines, application of a toothbrush to components of the valving means;

FIGURE 5 is a further enlarged fragmentary vertical section taken on the line 5—5 of FIGURE 3, and showing a tooth brush applied to components of the valving means; and,

FIGURE 6 is a bottom plan view taken on the line 6—6 of FIGURE 5.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, the illustrated device comprises an elongated hollow casing 10, herein shown as being rectangular, but adapted to have other shapes and cross sections. The illustrated cas-

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ing 10 comprises a back wall 12, a front wall 14, side walls 16 and 18, a top wall 20, and an open lower end 22. The back wall 12 can be extended beyond the top wall 20 and be provided with holes 24 to accept screws 26 for mounting the device to a support, such as a vertical wall 28.

The open lower end 22 of the casing 10 is provided with a removable cover 30, which is herein illustrated as being a snap-in plate 32 having on opposed ends thereof transverse ribs 34 and 36, adapted to securably engage in transverse grooves 38 and 40, formed in the facing surfaces of the back and front walls 12 and 14, respectively, at their lower ends. The cover 30 is provided with a central discharge port which is constituted by a vertical bore 42 extending downwardly through a pendant dispensing nipple 44, extending downwardly from the cover, the bore 42 having, at its upper end, an enlarged diameter threaded socket 46, into which the neck 48 of a collapsible tube T is adapted to be screwed. This arrangement provides accurate positioning of and adequate support of a collapsible tube T, spacedly within the casing 10.

A pair of opposed, similar, constant pressure plates 50 is provided, which are rigid and of substantially the same length and width, the plates 50 being flat and straight. The plates 50 are preferably slightly shorter than the overall length of and slightly wider than the tube T. Collapsible tube T, such as a tooth paste tube have relatively flat opposed sides 52, which converge toward the closed or sealed end 54 thereof, and flare toward the enlarged diameter conical end 56, from the center of which the discharge neck 48 extends. Accordingly, the pressure plates when applied to the flat sides 52 of a tube T inserted therebetween, as shown in FIGURE 2, diverge downwardly, and initially conform to the flare of the tube sides 52, under the pressure of expanding spring means compressed between the back and front walls of the casing and the pressure plates.

Suitable expanding spring means comprises opposed pairs of upper and lower coil springs 58 and 60, respectively, which are positioned close to the upper and lower ends of the plates 50, and are secured, in suitable manner, to the plates 50 and to the front and back casing walls. The upper and lower springs 58 and 60 are preferably of substantially the same size and strength, but because of the greater compression of the lower springs 60, due to the downward divergence of the pressure plates 50, as shown in FIGURE 2, the lower springs 60 exert more pressure upon the paste within the tube T, than do the upper springs 58. However, the compressive pressure of the upper springs 58 supplements the compressive pressure of the lower springs so that the resultant overall compressive pressure is distributed by the rigid plates 50 lengthwise of the tube T, in a manner to urge the paste within the tube T, downwardly toward and through its discharge neck 48, at constant pressure.

In order to facilitate insertion of a tube T between the pressure plates 50, with the cover 30 removed, spreading means is provided, which can have the form of transverse horizontal rotary stub shafts 62 and 63 which are journaled centrally in the casing side walls 16 and 18 and carry spreader cross arms 64 and 65, respectively, and positioned between the plates 50 at their edges. A U-shaped stop yoke 66 has its legs 68 and 69 positioned at and out of contact with the side edges of the plates 50 and fixed to the stub shafts 62 and 63, and its bight portion 72 disposed at the outer side of one of the plates 50. The bight portion 72 is positioned, at an angle of about 45° to the plate 64, to engage the outer side of a plate 50, when the shaft 62 is rotated in either direction, in a manner to prevent the shafts 62 and 63, and hence the spreader arms 64 and 65, from being rotated more than about ninety degrees, in either direction, as indicated in

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FIGURE 2, by means of an external handle 74 fixed, preferably outside of the right-hand casing side wall 18. This stop arrangement conduces to quick and accurate operation of the spreading means, by preventing the spreader plates 64 and 65 from over-running their contacts with the inner surfaces of the pressure plates 50. In operation, the shafts 62 and 63 are rotated, by means of the handle 74, so as to rotate the spreader arms 64 and 65 from an inoperative position, extending along the plates, to an operative position crosswise of the plates 50, wherein the ends 76 of the arms make cam engagements with the plates and spread them apart, against the resistance of the springs 58 and 60, to easily accept a collapsible tube therebetween. Insertion of a collapsible tube in the device involves threading its neck 48 into the socket 46 in the cover 30, entering the tube between the spread plates 50, and snapping the cover 30 into the lower end 22 of the casing 10.

Mounted on the underside of the cover 30 and associated with the dispensing nipple 44, is a valving assembly, generally designated 78, which is adapted to be actuated by a toothbrush B having an elongated body 80 having upstanding bristles 82, at its forward end 84. The assembly 78 comprises a circular pan-shaped rotor 86 having a flat bottom wall 88 and an upstanding peripheral side wall 90. A central vertical tubular boss 92 rises from the bottom wall 88 and receives the lower part of a vertical pin 94 having an enlarged head 96, on its lower end, which bears against the underside of the bottom wall 88. The pin 94 extends upwardly through a bore 98 in the cover plate 32, at one side of and radially spaced from the nipple 44, and a head 100 is removably secured on the upper end of the pin 94, and compresses a helical spring 102 between itself and the upper surface of the cover 30, whereby the rotor 86 is tensioned upwardly for preserving a close sliding engagement between the upper surface of the rotor bottom wall 88 and the lower end of the nipple 44, as shown in FIGURE 5. The bottom wall 88 is formed with a concentric arcuate dispensing slot 104 which is adapted to be registered, at times with the nipple 44 for dispensing paste onto the bristles 82 of the toothbrush B.

The rotor 86 is normally rotated to a position wherein the dispensing slot 104 is out of registry with the nipple 44, wherein the nipple is closed by the rotor bottom wall 88, by means of a spiral spring 106 which surrounds the boss 92 and is suitably secured at one end, to a pendant lug 108 on the cover 30, and at its other end, to the rotor side wall 90.

The rotor side wall 90 is provided with a short circumferential detent slot 110, into which a detent hook 112 of a releasable locking assembly is normally releasably engaged, for holding the rotor 86 in a position wherein the slot 104 is out of registry with the nipple 44 and the spring 106 is under some tension. The hook 112 is fixed to and extends laterally from a tubular standard 114 which is journaled on a vertical pin 116 whose upper end is fixed, as indicated at 118, in an eccentric pendant lug 120 on the cover 30. A wing 122 is fixed on and extends laterally and downwardly from the standard 114, and a positioning spring 124 is coiled around the standard 114 and has an upper arm 126 secured to the lug 120, and a lower arm 128 engaged with the side of the wing 122 remote from the hook 112 which extends laterally from the other side of the wing, as shown in FIGURES 5 and 6, and urges the hook toward engagement in the detent slot 110. At the opposite side of the rotor 86 from the locking assembly, in the normal position of the rotor 86, a stop shoe 130 is fixed to and extends downwardly from the rotor bottom wall 88. The shoe 130 has a flat surface 132, located substantially on a diameter of the rotor 86, at the remote end of which is located a stop shoulder 134 which projects laterally from the surface 132.

In operation, a toothbrush B is placed beneath the rotor 86 with its bristles extending upwardly, with its forward

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end 84 of its body 80 engaged with the shoulder 134 and a related side thereof engaged with the shoe surface 132, and with its opposite side engaged with the wing 122 of the locking assembly, the toothbrush then being pushed forwardly against the shoulder 134, at the same time that it is moved laterally, against the wing 122, so that the hook 112 is disengaged from the slot 110 and the rotor 86 is rotated, against the resistance of the spring 106, so as to register the dispensing slot 104 with the nipple 44, as shown in phantom lines in FIGURE 6, and effect a discharge of paste through the nipple 44 and the slot 104, onto the toothbrush bristles 82.

The amount of paste dispensed onto the toothbrush is controlled and determined by the amount that the rotor 86 is rotated out of its normal or starting position, by a toothbrush, in the manner outlined above, since upon disengagement of the toothbrush from the shoe 130 the direction of rotation of the rotor 86 is immediately reversed by the spring 106, and the dispensing of paste through the slot 104 is proportional to the length of the slot 104 extending beyond the nipple 44, as the rotor is freed to be returned to its starting position by the spring 106. As the rotor 86 is returned to its starting position, the detent hook 112 re-enters the detent slot 110 and locks the rotor 86 against vagrant rotation and with its bottom wall 88 in closure relation to the lower end of the nipple 44.

Although there has been shown and described a preferred form of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. A paste dispenser for a collapsible tube, comprising: a casing having an open end and surrounding walls, a cover plate removably engaged in said open end, said cover plate having a tube neck receiving discharge port extending therethrough, a pair of opposed pressure plates for engaging opposite sides of a tube inserted therebetween with its neck engaged in said port, and tube compressing spring means comprising springs compressed between the pressure plates and adjacent portions of the surrounding walls, said spring means serving as the sole support of the pressure plates on the walls, and pressure plate spreading means mounted on portions of the surrounding walls, said spreading means comprising spreader arms positioned between the pressure plates having ends engageable with the facing surfaces of the pressure plates, and means for rotating the spreader arms for camming the pressure plates away from each other against the resistance of said spring means.

2. A paste dispenser for a collapsible tube, comprising: a casing having an open end and surrounding walls, a cover plate removably engaged in said open end, said cover plate having a tube neck receiving discharge port extending therethrough, and valving means mounted on said cover plate for opening and closing said port, said port comprising a nipple extending laterally from the cover plate and a bore extending through the nipple and the cover plate and having a threaded socket to receive and threadably connect a tube neck to the cover plate, said valving means comprising a pan-shaped rotor located at the outer side of and axially journaled on the cover plate on an axis at one side of said nipple, said rotor having a bottom wall slidably engaged with the outer end of the nipple, said bottom wall having an arcuate dispensing slot registrable at times with the nipple for dispensing paste from the dispenser, and means for turning the rotor from a starting position in which its bottom wall closes the outer end of the nipple and a finishing position in which said dispensing slot is registered with the nipple.

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3. A paste dispenser for a collapsible tube, comprising: a casing having an open end and surrounding walls, a cover plate removably engaged in said open end, said cover plate having a tube neck receiving discharge port extending therethrough, and valving means mounted on said cover plate for opening and closing said port, said port comprising a nipple extending laterally from the cover plate and a bore extending through the nipple and the cover plate and having a threaded socket to receive and threadably connect a tube neck to the cover plate, said valving means comprising a pan-shaped rotor located at the outer side of and axially journaled on the cover plate on an axis at one side of said nipple, said rotor having a bottom wall slidably engaged with the outer end of the nipple, said bottom wall having an arcuate dispensing slot registrable at times with the nipple for dispensing paste from the dispenser, and means for turning the rotor from a starting position in which its bottom wall closes the outer end of the nipple and a finishing position in which said dispensing slot is registered with the nipple, and return spring means for rotating said rotor from a finishing position to its starting position and for resisting rotation of the rotor from its starting position to a finishing position.

4. A paste dispenser for a collapsible tube, comprising: a casing having an open end and surrounding walls, a cover plate removably engaged in said open end, said cover plate having a tube neck receiving discharge port extending therethrough, and valving means mounted on said cover plate for opening and closing said port, said port comprising a nipple extending laterally from the cover plate and a bore extending through the nipple and the cover plate and having a threaded socket to receive and threadably connect a tube neck to the cover plate, said valving means comprising a pan-shaped rotor located at the outer side of and axially journaled on the cover plate on an axis at one side of said nipple, said rotor having a bottom wall slidably engaged with the outer end of the nipple, said bottom wall having an arcuate dispensing slot registrable at times with the nipple for dispensing paste from the dispenser, and means for turning the rotor from a starting position in which its bottom wall closes the outer end of the nipple and a finishing position in which said dispensing slot is registered with the nipple, and return spring means for rotating said rotor from a finishing position to its starting position and for resisting rotation of the rotor from its starting position to a finishing position, and releasable detent means on said cover plate for locking the rotor in its starting position.

5. A paste dispenser for a collapsible tube, comprising: a casing having an open end and surrounding walls, a cover plate removably engaged in said open end, said cover plate having a tube neck receiving discharge port extending therethrough, and valving means mounted on said cover plate for opening and closing said port, said port comprising a nipple extending laterally from the cover plate and a bore extending through the nipple and the cover plate and having a threaded socket to receive and threadably connect a tube neck to the cover plate, said valving means comprising a pan-shaped rotor located at the outer side of and axially journaled on the cover plate on an axis at one side of said nipple, said rotor having a bottom wall slidably engaged with the outer end of the nipple, said bottom wall having an arcuate dispensing slot registrable at times with the nipple for

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dispensing paste from the dispenser, and means for turning the rotor from a starting position in which its bottom wall closes the outer end of the nipple and a finishing position in which said dispensing slot is registered with the nipple, and return spring means for rotating said rotor from a finishing position to its starting position and for resisting rotation of the rotor from its starting position to a finishing position, and releasable detent means on said cover plate for locking the rotor in its starting position, said rotor having a side wall provided with a circumferential detent slot which is a part of said detent means, said detent means further comprising a detent hook pivoted on the cover plate at one side of the rotor and engageable in the detent slot only in the starting position of the rotor, and actuating spring means urging said hook toward the rotor.

6. A paste dispenser for a collapsible tube, comprising: a casing having an open end and surrounding walls, a cover plate removably engaged in said open end, said cover plate having a tube neck receiving discharge port extending therethrough, and valving means mounted on said cover plate for opening and closing said port, said port comprising a nipple extending laterally from the cover plate and a bore extending through the nipple and the cover plate and having a threaded socket to receive and threadably connect a tube neck to the cover plate, said valving means comprising a pan-shaped rotor located at the outer side of and axially journaled on the cover plate on an axis at one side of said nipple, said rotor having a bottom wall slidably engaged with the outer end of the nipple, said bottom wall having an arcuate dispensing slot registrable at times with the nipple for dispensing paste from the dispenser, and means for turning the rotor from a starting position in which its bottom wall closes the outer end of the nipple and a finishing position in which said dispensing slot is registered with the nipple, and return spring means for rotating said rotor from a finishing position to its starting position and for resisting rotation of the rotor from its starting position to a finishing position, and releasable detent means on said cover plate for locking the rotor in its starting position, said rotor having a side wall provided with a circumferential detent slot which is a part of said detent means, said detent means further comprising a detent hook pivoted on the cover plate at one side of the rotor and engageable in the detent slot only in the starting position of the rotor, and actuating spring means urging said hook toward the rotor, a rotor rotating shoe extending laterally from the rotor at the side thereof remote from said detent hook in the starting position of the rotor, said shoe having a surface and a lateral shoulder at one end of the surface, and said detent hook having a lateral wing thereon, in combination with a toothbrush having an elongated body having a forward end and bristles on the body extending toward the dispensing slot of the rotor, the forward end of the toothbrush body having a side laterally engaged with said shoe surface with its forward end against said shoulder, said body having an opposite side engaged with said detent hook wing.

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