June 29, 1965 R. S. HAMILTON 3,191,803

DENTIFRICE DISPENSER IN COMBINATION WITH COOPERATING TOOTHBRUSH

Filed Jan. 6, 1965 4 Sheets-Sheet 1

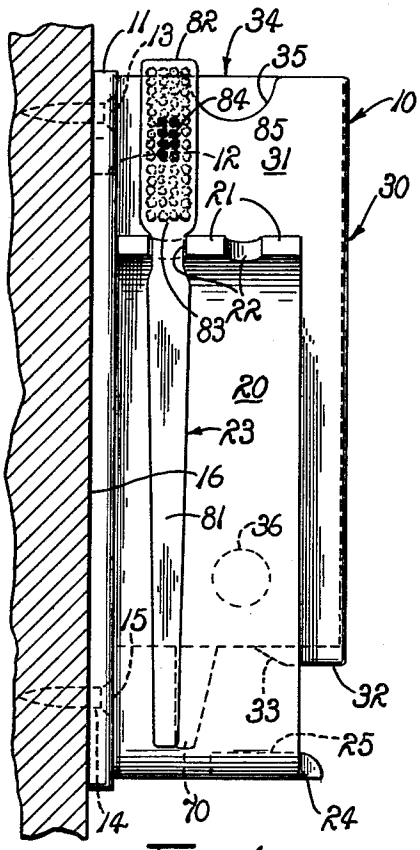


FIG. 1.

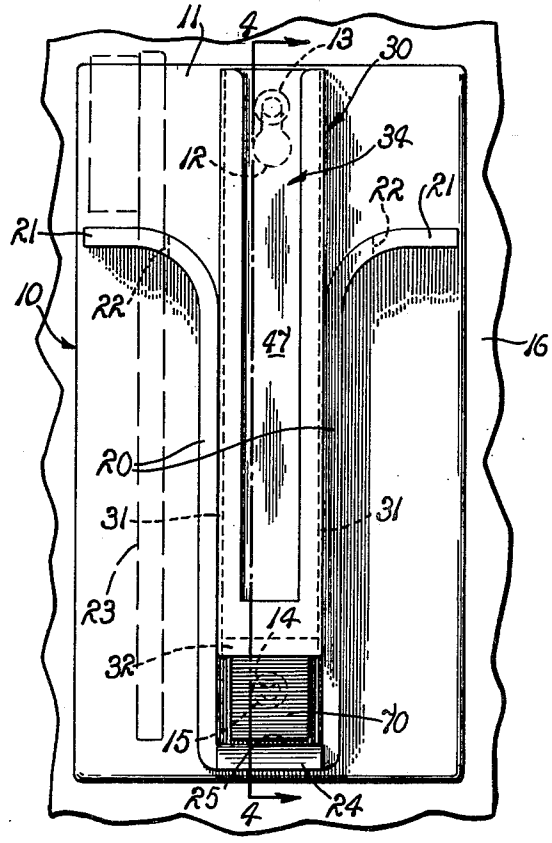


FIG. 2.

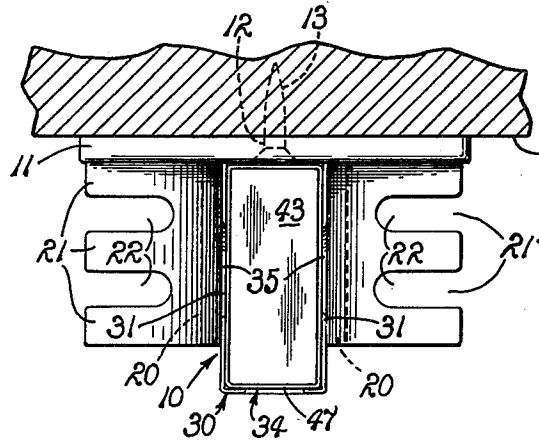


FIG. 3.

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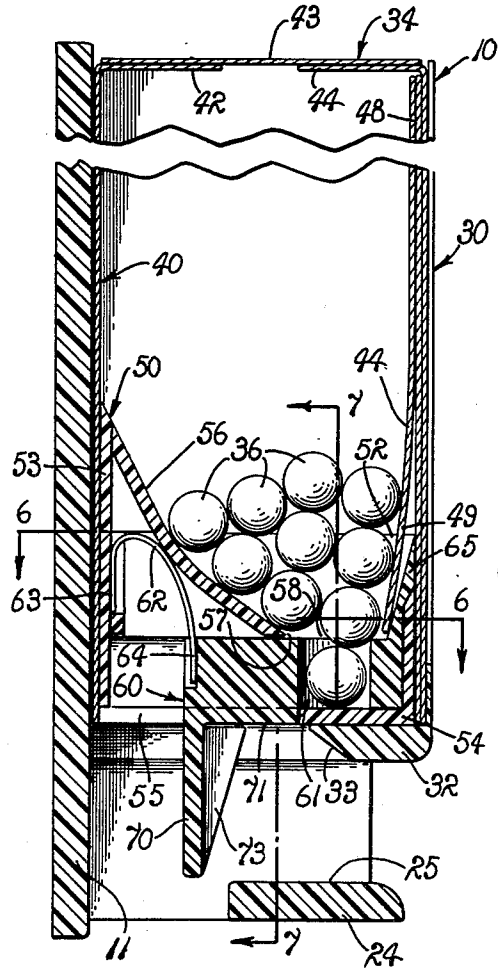


FIG. 4.

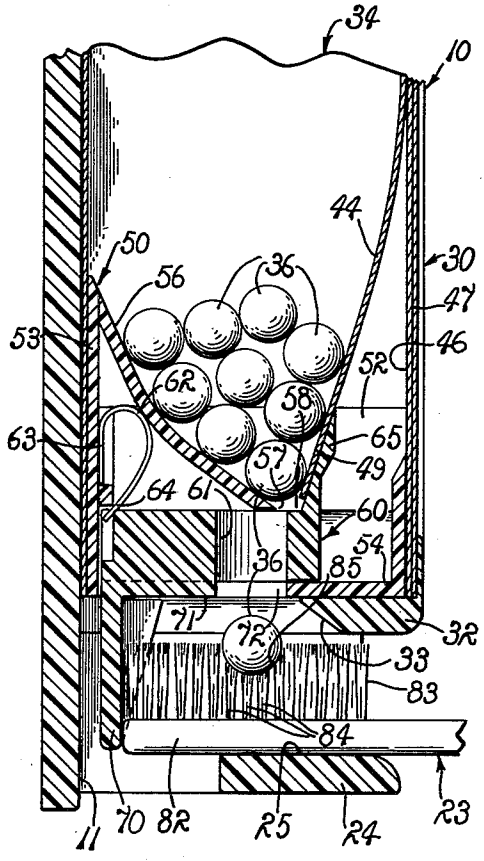


FIG. 5.

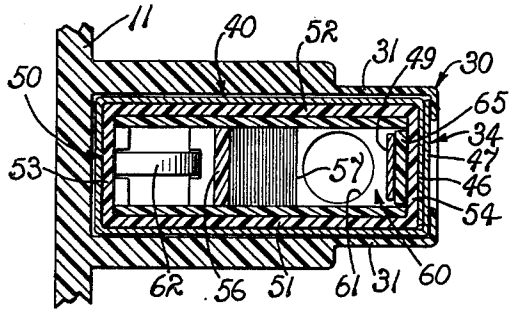


FIG. 6.

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DENTIFRICE DISPENSER IN COMBINATION WITH COOPERATING TOOTHBRUSH

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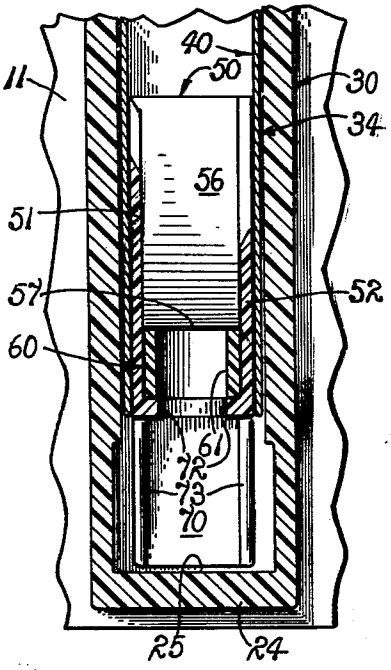


FIG. 7.

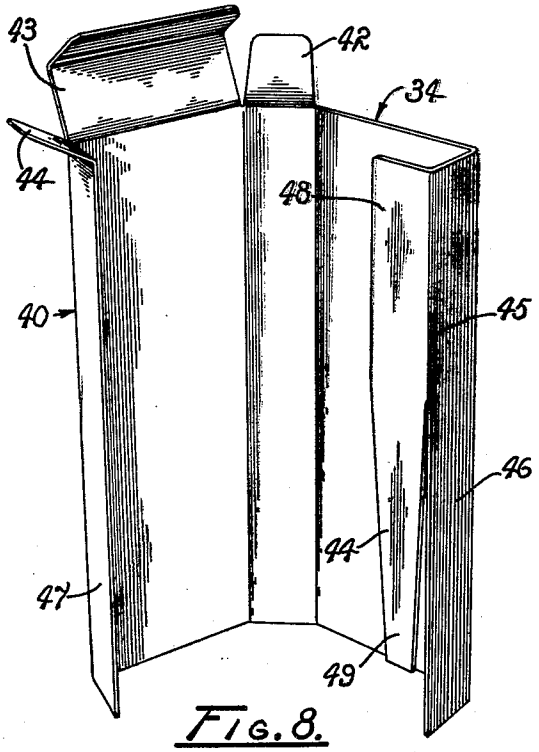


FIG. 8.

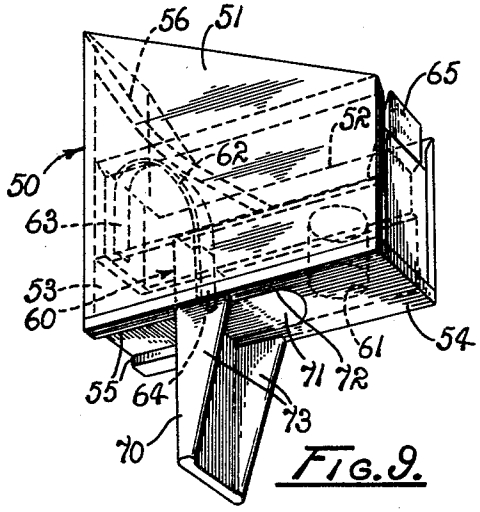


FIG. 9.

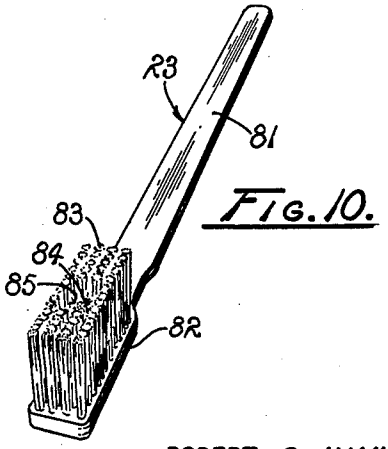


FIG. 10.

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DENTIFRICE DISPENSER IN COMBINATION WITH COOPERATING TOOTHBRUSH

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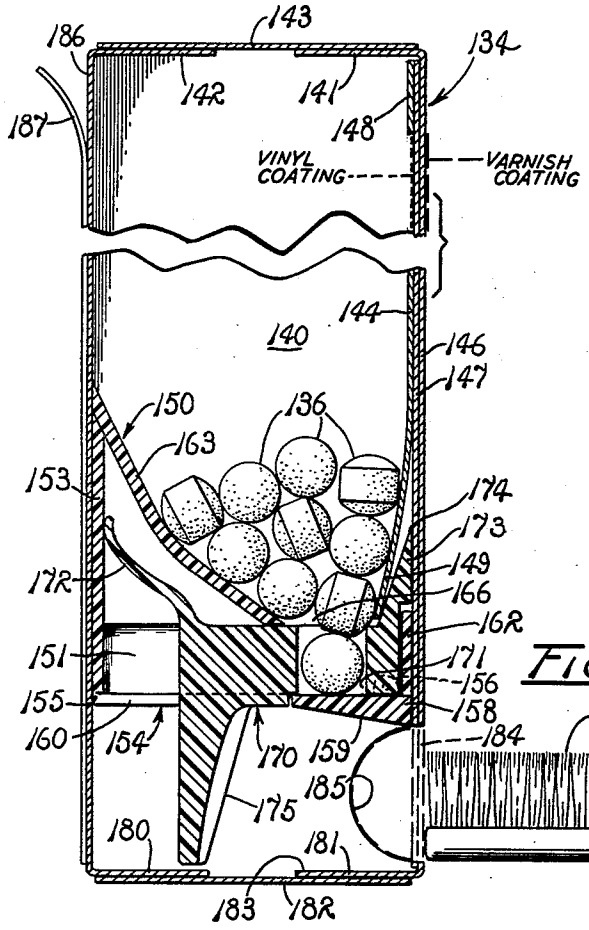


FIG. 11.

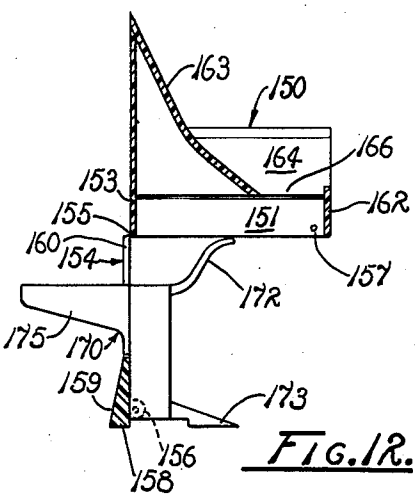


FIG. 12.

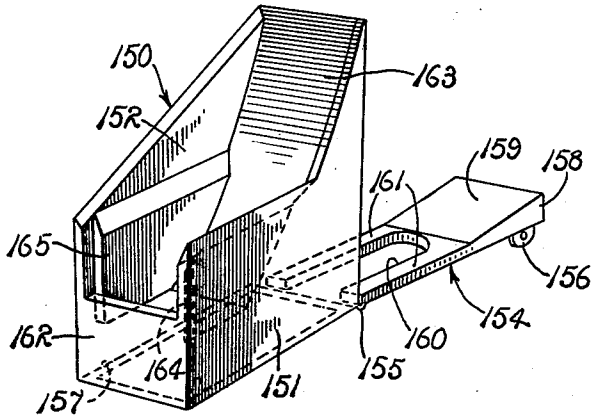


FIG. 13.

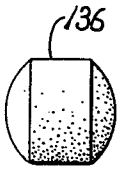


FIG. 14.

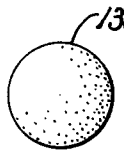


FIG. 15.

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United States Patent Office 3,191,803 Patented June 29, 1965

3,191,803

DENTIFRICE DISPENSER IN COMBINATION WITH COOPERATING TOOTHBRUSH

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Filed Jan. 6, 1965, Ser. No. 424,461
19 Claims. (Cl. 221—200)

This application is a continuation-in-part of U.S. patent application Serial No. 286,783, filed June 10, 1963, now abandoned. The present invention relates to a dentifrice dispenser in combination with a cooperating toothbrush adapted to operate the dispenser, including means to receive the dispensed dentifrice at a predetermined depository location on the toothbrush. One form of the invention particularly relates to a unitary dispenser and magazine which conveniently serves as a marketing container for the dentifrice.

Previously known dentifrice packages include rigid metal containers adapter to hold a supply of finely pulverized dentifrice powder, flexible tubes designed to contain a paste dentifrice, and glass bottles to confine and dispense a liquid dentifrice. Regardless of the type of container, or the nature of the dentifrice, the normal manner of dispensing the dentifrice is to place the discharge orifice of the container in contact with the toothbrush of a user. Hygienists recognize that such a practice is particularly undesirable in the event that several persons obtain dentifrice from the same supply container.

In addition to the un-hygienic aspects of previously known dentifrice containers and dispensers, it is a recognized fact that such containers are subjected to distortion and breakage, particularly by children. Also, many dentifrice users do not employ an optimum quantity for most effective oral hygiene, which results in wasting of the dentifrice or ineffective dental cleaning practices. Accordingly, previously known dentifrice containers and dispensers have been unsatisfactory in achieving maximum economy and efficiency in preventive dental care.

Certain types of dispensers and cooperating dentifrice supply magazines have been known in the past, however, none have provided an integral dispensing and supply container which serves as a unitary marketing package. In addition, such previously designed dispensers were not adaptable to economic fabrication because of their inherent structural characteristics; were not compatible with contemporary merchandising methods; and were incapable of coacting properly with a toothbrush to insure uniform dispensing and spreading of the dentifrice.

Therefore, it is an object of the present invention to provide a dentifrice dispenser adapted to dispense a uniform, predetermined quantity of dentifrice so as to achieve efficient utilization thereof.

Another object of the invention is to provide a dentifrice supply container with a dispensing means in combination with a toothbrush to insure a dispensing of a uniform quantity and accurate deposition of such dispensed dentifrice on the toothbrush.

Another object is to provide in a dentifrice dispenser adapted to hold a supply of discrete particles of dentifrice, means to agitate such supply and insure accurate dispensing of the same.

Another object of the invention is to provide a novel dentifrice supply magazine and dispensing apparatus therefor adapted to be engaged by a toothbrush, and including means to support the toothbrush during periods of non-use.

Another object is to provide an integral dispensing and supply container for dentifrice which conveniently serves as a unitary package to enhance customer appeal and achieve marketing economies.

Another object is to provide such a container which

lends itself to economical fabrication and ease of assembly.

Another object is to provide such a container which dependably maintains the dentifrice in an hygienic condition and in a state as packaged, while precluding entry of moisture from environmental atmosphere, such as the humid condition existent in residential bathrooms.

A further object is to provide a toothbrush in combination with a dentifrice supply and dispensing means operable by the toothbrush, including means to effect a uniform distribution of dentifrice on the toothbrush.

These, together with other objects, will become more fully apparent upon reference to the following description and accompanying drawings.

In the drawings:

FIG. 1 is a view in side elevation of a dentifrice dispenser and toothbrush embodying the principles of the present invention.

FIG. 2 is a view in front elevation of the dispenser and toothbrush of FIG. 1.

FIG. 3 is a top plan view of the dispenser of FIG. 1 with the toothbrush removed.

FIG. 4 is a somewhat enlarged, fragmentary view in vertical longitudinal section taken on line 4—4 of FIG. 2, and showing the dispensing mechanism of the invention in a pellet receiving position.

FIG. 5 is similar to FIG. 4, but showing the dispensing mechanism in a dispensing position, with the toothbrush fragmentarily illustrated in a receiving position.

FIG. 6 is a view in horizontal transverse section taken on line 6—6 of FIG. 4.

FIG. 7 is a view in fragmentary vertical, transverse section taken on line 7—7 of FIG. 4.

FIG. 8 is an isometric view of the wall means in an unfolded, unassembled condition which, when assembled, forms the magazine employed in the dispenser of FIG. 1.

FIG. 9 is a perspective view of the dispensing head of the apparatus illustrated in FIG. 4.

FIG. 10 is a perspective view of the toothbrush illustrated in FIGS. 1, 2 and 5.

FIG. 11 is a fragmentary view in vertical longitudinal section, similar to FIG. 4, but showing a second embodiment of the invention adapted for dispensing and spreading dentifrice on a conventional toothbrush, as well as the toothbrush of the first form.

FIG. 12 is a reduced scale view in vertical longitudinal section of the dispensing head of the second embodiment, and shown in an unassembled condition as initially fabricated.

FIG. 13 is a perspective view of the dispensing head of the second embodiment.

FIG. 14 is a view in front elevation of a typical, somewhat spherical, pellet employed in a commercial form of the invention.

FIG. 15 is a view in side elevation of the pellet of FIG. 14.

Referring in greater particularity to FIGS. 1 and 2 of the drawings, a combined dentifrice dispenser and toothbrush holder is illustrated therein as supporting a toothbrush subsequently to be described and adapted for specific cooperation with the dispenser of the present invention. The dispenser is provided with a support body generally indicated at 10 which incorporates a mounting plate 11. To facilitate mounting of the support body, the plate 11 is provided with a transverse, keyhole slot 12 adapted to receive the shank of a mounting screw 13. The plate 11 is also provided with a transverse bore 14, longitudinally spaced from the keyhole slot 12 and having a slightly flared outward opening for the flush reception of the head of a mounting screw 15. A wall is fragmentarily illustrated at 16 into which the screws 13 and

15 are secured to maintain the support body 10 in a vertically upright position, as illustrated in FIGS. 1 and 2.

As can be seen more clearly in FIGS. 2 and 3, the support body 10 is provided with a pair of laterally opposed, substantially identical brackets 20. The brackets extend forwardly from the mounting plate 11 and are provided with a plurality of spaced, individual fingers 21, which thereby define receiving slots 22, each adapted to admit a toothbrush 23. Although the slots 22 of the brackets 20 are adapted to support toothbrushes of conventional design, the dispenser of the present invention is more specifically intended to be used in combination with a toothbrush embodying the principles of the present invention and described in greater detail below. A lower guide plate 24 is provided with an upper surface 25 and is integrally joined to the forward opposed brackets 20 to define a path of travel for the toothbrush 23 during operation of dispensing means to be described below.

A magazine rack 30 is forwardly outwardly projected from the mounting plate 10 and joined to the brackets 20. The magazine rack includes a pair of laterally opposed walls 31 joined at their lower forward end by a distributor plate 32 provided with a beveled wiping edge 33. The relationship of the distributor plate and wiping edge to the guide plate 24 can be seen most clearly by reference to FIG. 1. Each of the opposed walls 31 is provided with inwardly directed flanges to retain a magazine 34 of rectangular form within the rack 30. The walls 31 are each provided with an upwardly opening notch 35 to facilitate insertion and removal of the magazine 34. The magazine is adapted to contain a plurality of individual pellets 36, such as the one illustrated in dashed lines in FIG. 1.

The individual pellets need not necessarily be of spherical configuration, but may be of any substantially regular form having a smooth peripheral surface to facilitate gravitational movement toward the lower portion of the magazine when supported in a substantially vertical position, as shown in FIGS. 1 and 2. In the present invention, each of the pellets 36 is fabricated of a suitable dentifrice and provided with a surface coating capable of maintaining the general configuration of the pellet as fabricated. Examples of suitable materials are commercially available powdered dentifrice compressed in pellet form with or without a surface glaze and any commercially available toothpaste of sufficiently high viscosity and provided with a glazed surface coating to assist maintenance of the desired circumferential configuration. Other suitable pellet forms and compositions will readily occur to those skilled in pharmaceutical preparations.

The structural details of the magazine 34 are most clearly shown in FIGS. 4–9. The magazine includes an outer wall 40, shown in an unfolded, unassembled condition in FIG. 8. The wall is provided with opposed upper end flaps 41 and 42 and a closing top flap 43, all of which are individually hingedly joined to the side wall portion of the outer wall 40. An elongated agitator leaf 44 is joined at its upper portion to the wall 40 by means of a web 45. The wall 40 includes terminal joining panels 46 and 47 which are rigidly secured to each other by a suitable adhesive, as illustrated in FIGS. 4 and 5. To facilitate proper functioning of the agitator leaf 44, the proximal upper end 48 thereof is also adhered to the joining panel 46 while the distal end 49 is disposed internally of the magazine 34 and adapted to engage the supply of pellets 36.

The lower end of the magazine 34, when considered in operating position, as illustrated in FIGS. 4 and 5, is adapted to be closed by a dispensing head 50 illustrated separately in FIG. 9. The dispensing head is adapted to be rigidly secured, as by a suitable adhesive, to the wall means 40 when assembled in rectangular form, as described above. The head 50 includes a pair of laterally opposed side walls 51 and 52 joined at their rearward edges by a web 53 and at their lower forward edges by a closure plate 54. The plate 54 is upwardly extended a sufficient distance to be joined to the panel 46 of the wall means 40. A pair of laterally opposed guide rails 55 are rearwardly extended from the plate 54. A rear wall 56 is sloped downwardly, inwardly to form a delivery chute and terminates at a forward edge 57, thereby to define a discharge orifice for the magazine in combination with the distal end 49 of the agitator leaf 44. Such relationship is more clearly illustrated in FIGS. 4 and 5 of the drawings.

As a metering means to dispense the dentifrice pellets 36, dispensing slide 60 is mounted for fore and aft reciprocal movement along a path of travel defined by the closure plate 54 in conjunction with the guide rails 55. The slide 60 is provided with an open charging chamber 61, which, in the form of the invention illustrated, is a cylindrical bore. As shown in FIG. 4, the charging chamber 61 is indexed immediately beneath the discharge orifice 58 of the magazine when the slide 60 is in a forward charging position. A return spring 62 is anchored at 63 to the rear web 53 and engages a spring seat 64 provided on the slide 60. A forward agitator finger 65 is upwardly integrally extended from the slide 60 and inserted forwardly of the leaf 44. This arrangement facilitates actuation of the agitator leaf upon movement of the slide 60 from the charging position shown in FIG. 4 to a dispensing position illustrated in FIG. 5.

An operating lever 70 depends from the rearward end of the slide 60 and is integrally joined thereto to facilitate movement of the slide from a charging position to a dispensing position. A closure plate 71 extends forwardly from the lever to close a delivery slot 72 defined by the guide rails 55 and the plate 54. When the slide 60 is moved to a rearward dispensing position, the delivery slot is opened by reason of the closure plate 71 also being moved rearwardly. To facilitate engagement of the operating lever 70 by the toothbrush 23, laterally spaced forwardly projecting guide flanges 73 are integrally joined to the lever 70.

The details of the toothbrush 23 are more clearly evident in FIGS. 5 and 10 wherein a handle 81 is integrally joined to a brushing head 82. The head is provided with a plurality of upstanding bristles 83 of substantially predetermined length surrounding a group of similar bristles 84 which are shorter than said predetermined length. Accordingly, the shorter bristles surrounded by the longer bristles forms a depository cavity 85 which is dimensioned relative to the size and configuration of the pellets 36 so as to receive a single pellet.

The cavity 85 is located on the toothbrush head 82 so that the cavity is indexed immediately below the delivery slot 72 when the head of the toothbrush engages the operating lever 70 and moves along a path of travel rearwardly toward the mounting plate 11 to effect movement of the slide 60 to a dispensing position, as shown in FIG. 5. The relative dimensions of the shorter bristles 84 as well as the elevational spacing between the wiping plate 32 and the upper surface 25 of the guide plate 24 are so arranged and constructed that upon movement of the toothbrush 23 forwardly in withdrawal movement away from the operating lever 70, the pellet 36 resting in the cavity 85 is engaged by the beveled wiping edge 33 to effect a substantially uniform spreading and distributing of the dentifrice over the longer bristles 83 rearwardly in the path of travel of such withdrawal movement.

Operation

The operation of the described embodiment of the subject invention is believed to be readily apparent and is briefly summarized at this point. After the magazine 34 has been fabricated by folding the wall means 40 in a rectangular form and rigidly secured to the dispenser head 50, a supply of individual dentifrice pellets 36 is placed in

the magazine through the upper opening, normally closed by the top flap 43. The closed magazine is, of course, marketed in such filled and closed condition. The magazine is then inserted between the opposed walls 31 of the magazine rack 30, so as to be supported in a substantially vertical position, as illustrated in FIGS. 1, 2, 4 and 5, wherein the pellets 36 are gravitationally urged toward the discharge orifice 58.

As the initial step in performing personal dental cleansing with the dispenser and toothbrush of the present invention, the brushing head 82 of the toothbrush 23 is inserted between the distributing plate 32 and the guide plate 24. So that the toothbrush head 82 is supported at a proper elevation, it is rested upon the upper surface 25 of the guide plate 24. Rearward movement of the toothbrush along the fore and aft path of travel defined by the laterally opposed brackets 20 in conjunction with the guide plate 24, effects a movement of the operating lever 70. The forwardly extended guide flanges 73 insure the central location of the depository cavity 85 relative to the dispensing head 50 so that it is disposed immediately below the delivery slot 72 and the chamber 61, when the dispensing slide 60 is in a rearward, dispensing position.

It will be noted that during movement of the slide 60 from the receiving position shown, wherein the slide 60 blocks the passageway between the magazine 34 and the delivery slot 72, in FIG. 4 to the dispensing position shown in FIG. 5, the agitator leaf 44 is moved into engagement with the supply of pellets 36 remaining in the magazine, thereby to effect a mechanical agitation thereof. This agitation insures that, upon the return of the slide 60 to a receiving charging position, a single pellet will gravitationally pass through the discharge orifice 58 into the open charging chamber 61. In the event of extremely high humidity existing in the area in which the dispenser is installed, such as the bathroom of a family residence, the dentifrice pellets have a tendency to adhere to each. Accordingly, the agitator leaf 44 is most effective to insure that a pellet is received in the charging chamber upon a return of the slide to a forward receiving position.

Assuming that a supply of pellets have been placed in the magazine, and that the slide 60 is in a forward receiving position, a single pellet will pass through the discharge orifice 58 and rest in the open charging chamber 61, which is closed at its lower end by the plate 54. Subsequent engagement of the operating lever 70 by the toothbrush and movement of the slide to a dispensing position, as shown in FIG. 5, permits dispensing of such a single pellet upon the toothbrush and depositing of such pellet in the cavity 85.

After a pellet has been dispensed into the cavity 85, as illustrated in FIG. 5, withdrawal of the toothbrush 23 along the path of travel defined by the guide plate 24 and the opposed brackets 20 results in a striking of the beveled wiping edge 33 of the distributor plate 32 by that portion of the pellet 36 projecting above the elevation of such plate. Consequently, withdrawal movement of the toothbrush away from the operating lever 70 simultaneously causes a uniform spreading of the dentifrice contained in the pellet 36 along the bristles 83 rearwardly of the pellet in the path of withdrawal movement. It will be observed that none of the longer bristles come into actual contact with the distributor plate 32 so that the un-hygienic aspects of the common, or family, toothpaste tube are not present in the dispenser of the subject invention.

In addition to sanitary, hygienic dispensing of dentifrice, the present invention permits an economy of utilization not attainable with previously known dentifrice containers and dispensers. Regardless of the supply quantity, a uniform amount is dispensed each time the operating lever 70 is actuated by the toothbrush, such quantity being predetermined to satisfy the dental needs of average users. Accordingly, the full supply of dentifrice is available for use and such supply is economically dispensed in uniform amounts by the present invention.

In addition to hygienic, economic dispensing and uniform spreading of the dentifrices on the toothbrush, the dispenser provides for adequate storage of the toothbrush during periods of non-use. Following conventional brush cleaning practices, the toothbrush 23 is inserted in one of the receiving slots 22 and rested upon a support bracket 20, as illustrated in FIGS. 1 and 2.

Accordingly, the present invention provides a dispenser adapted to hold an adequate supply of dentifrice, capable of economical accurate dispensing of such supply in uniform quantities, distributing the dentifrice over the bristles of the toothbrush, and also serving as a resting support of the brush following the use thereof.

Second form of invention

A second embodiment is illustrated in FIG. 11 wherein a combination magazine and dispenser is shown at 134, which incorporates a distributor plate for individual dentifrice pellets 136 held in the supply magazine. The magazine for the pellets is formed by an outer wall 140 having an initial configuration substantially similar to that of the first form shown in FIG. 8, except that closure flaps are provided at both ends of the resulting magazine. The wall is provided with opposite upper end flaps 141 and 142 and a closing top flap 143, all of which are individually hingedly joined to the side wall portion of the outer wall 140. An elongated agitator leaf 144 is joined at its upper portion to the wall 140 by means of a web, not visible in FIG. 11. The wall 140 also includes terminal joining panels 146 and 147 which are shown in overlying relation in FIG. 11, with the magazine in an assembled condition. To facilitate proper functioning of the agitator leaf 144, the proximal upper end 148 thereof is adhered to the joining panel 146 during assembly, while the distal end 149 is disposed internally of the magazine 134 and adapted to engage the supply of pellets 136.

The wall 140 is preferably formed of a suitably rigid chip board material and is coated with a thermoplastic substance, such as polyvinyl, to facilitate welding of the joining panels 146, 147 during assembly of the magazine 134. Other suitable materials will readily occur to those skilled in the art of fabricating containers from non-metallic materials, however, the thermoplastic material selected for a surface coating must be capable of being welded at a temperature below the melting and/or charring temperature of the material from which the side wall 140 is formed. The exterior surface of the side wall 140 is imprinted with suitable labeling legends and coated with a varnish to enhance customer appeal, thereby not requiring additional external packaging. This facilitates an economy of fabrication and merchandising distribution of the dentifrice product.

As can be seen more clearly in FIGS. 11, 12, and 13, a dispensing head 150 is formed of a suitable thermoplastic material and dimensioned to be received in the open end of the magazine formed by side wall 140. The dispensing head 150 is provided with opposed side walls 151, 152 which are substantially parallel, but terminate in respective upper edges at unequal levels. The side walls provide respective beveled edges angularly related to each other. Stated differently, the laterally opposed side walls are of an unequal height and terminate in respective upper edges arranged in non-parallel relation. This construction is substantially similar to that shown in FIG. 9 of the first form, and is so configured to enhance agitation of the pellets during gravitational dispensing and thereby prevent bridging of the delivery throat and dispensing orifice by the pellets.

The side walls 151, 152 are joined by a web 153 at the rear of the dispensing head. A closure plate 154 is mounted integrally with the dispensing head 150 and joined to the web 153 by a flexible, attenuated membrane 155. This permits molding of the head in one piece and

economizes in assembly costs. The plate is provided with a pair of laterally projecting opposite lugs **156**, each adapted for respective reception in a recess **157** provided in each of the walls **151, 152**. A beveled distributor plate **158** extends downwardly from the closure plate **154**, when in an assembled position, as shown in FIG. 11. The distributor plate **158** affords a downwardly facing surface **159** adapted to contact a dentifrice pellet **136** and force it into the bristles of a cooperating toothbrush, while concurrently effecting spreading of the pellet thereon. A slot **160** is formed in the closure plate **154** and is defined by laterally opposed guide rails **161**.

The side walls **151, 152** are joined by a forward web **162**, which serves to limit forward movement of a metering and dispensing slide to be described below. A sloping rearward wall **163** is secured to the side walls and extends forwardly downwardly between a pair of laterally opposed dimension control plates **164, 165**, which define a discharge throat in conjunction with the sloping rearward wall **163** and the lower end **149** of agitator leaf **144**. The throat terminates in a discharge orifice indicated at **166** in FIG. 11, as an escape passage for the individual dentifrice pellets **136**.

The dispensing head **150** is fabricated of a thermoplastic material having substantially the same melting temperature as the coating provided on the chip board wall **140** of the magazine. Preferably, the dispensing head is formed of the same material, such as polyvinyl, so that assembly and fabrication of the integral magazine and dispensing unit is permitted by conventional plastic welding techniques. Accordingly, the temperature of the coating is raised to permit welding of the magazine to the dispensing head **150**.

A metering and dispensing slide **170** is formed of a material having a higher melting temperature than that of the dispensing head, to avoid undesirable bonding of these component parts during the welding of the dispensing head to the magazine wall. A material found to be satisfactory is polyurethane. The slide **170** is formed with a charging chamber **171** which is indexed immediately beneath the discharge orifice **166** when the slide is in a forward charging position in contact with the forward web **162**. A resilient return finger **172** is integrally rearwardly extended from the slide, and engages the rear web **153** of the dispensing head. In the position shown in FIG. 11, the rear finger **172** is slightly flexed so as to urge the slide forwardly and maintain it in the charging position, as shown. The finger is of sufficient resiliency to permit movement of the slide to a rearward dispensing position, susbtantially identical to that of the first form shown in FIG. 5. Since the dispensing mechanism provided in the integral dispensing and marketing package of this second form is intended for operation only during a definitely limited service life, the slide **170** and dispensing head **150** can be fabricated of inexpensive materials and designed for an approximate service life of 100 to 150 cycles of operation.

The dispensing slide **170** is provided with an upwardly extending forward agitator finger **173** having a beveled entry point **174**. This configuration facilitates assembly of the dispensing head and the magazine, while the slide is carried internally of the head, so as to insure proper positioning of the agitator finger **173** forwardly of the distal end **149** of the agitator leaf **144**. An operating lever **175** is downwardly integrally extended from the slide **170**, and is adapted to be engaged by a toothbrush, such as that shown in FIG. 10, or by a conventional contemporary toothbrush.

The wall **140** of the magazine **134** is provided with opposed lower end flaps **180, 181** and a closing bottom flap **182**. When closed and sealed, as by heat welding, these flaps provide an upper guide surface **183** disposed at a predetermined distance below the distributor plate **158**. The downward extension of the wall **140** is provided with a removable portion **184** to form a notch-like opening **185**. The removable portion is shown in dashed lines in FIG. 11, and conventional practices are employed in defining the notches by weakened areas in the wall **140**. To facilitate mounting of the integral magazine and dispenser **134** on a suitable surface, such as a residential wall, an adhesive coating **186** is provided on the rear wall of the magazine and protected by a removable cellophane strip **187**.

A conventional toothbrush indicated at **190** can be utilized with the integral magazine and dispenser **134**. The toothbrush is provided with the usual handle **191** and a plurality of tufts of bristles **192** affording a depository surface **193**.

Operation of second form

The magazine **134** is formed of the wall **140** in a manner similar to that of the first form, except that the dispensing head **150**, complete with slide **170**, is first assembled and inserted within the enclosure formed by the wall **140**. The design of the dispensing head permits insertion of the slide **170** prior to swinging of the closure plate **154** in the direction of the dashed line of FIG. 12. The cooperating locking lugs **156** and recesses **157** insure retention of the slide in an assembled position within the dispensing head. The resilient return finger **172** urges the slide toward a forward charging position shown in FIG. 11.

The assembled dispensing head is then inserted within the magazine chamber formed by the enclosing wall **140**. The beveled entry point **174** of the agitator finger **173** is disposed forwardly of the agitator leaf **144**, so that reciprocal movement of the slide toward and from a dispensing position effects mechanical agitation of the pellets **136**. With the dispensing head so positioned, the terminal flaps **146, 147** are bonded together, as by heat welding of the polyvinyl surface coating. Concurrently, the dispensing head **150** is welded to the wall **140**, by reason of the inner surface coating of polyvinyl. It is to be noted that such a design and fabrication forms a hermetically sealed magazine chamber with the top flap **143** closed and the dispensing slide **170** in the forward position as shown in FIG. 11. Consequently, even prolonged storage of the pellets in a humid environment precludes adhesion of the pellets or possible disintegration due to moisture absorption.

At the initial packaging, the lower end flaps **180, 181** and bottom closure flap **182** are also sealed to provide a unitary magazine and dispensing container. With a supply of pellets packed in the magazine chamber, the container conveniently serves as a marketing package. Accordingly, no permanently installed dispensing mechanism is required, and the particular design of the magazine and dispensing apparatus permits an economy of fabrication and merchandising. The lack of such an economy in previously available dentifrice dispensing apparatus financially prohibited their use and denied them commercial success.

The magazine **134** is merchandised in the configuration as shown in FIG. 11, except that the removable portion **184** remains intact until removed by a purchaser. The protective cellophane strip **187** is removed after purchase, and the magazine is mounted on a supporting surface, such as a medicine cabinet or wall structure by means of the adhesive coating **186**. Following removal of wall portion **184**, the toothbrush **190**, or the brush shown in FIG. 10, is inserted with the head portion of the handle **191** in contact with the upper guide surface **183** of the magazine **134**. Engagement of the operating lever **175** by the toothbrush urges the slide rearwardly to a dispensing position, wherein the charging chamber **171** is no longer blocked by the upper surface of the distributor plate **158**. Consequently, the pellet **136** is gravitationally deposited on the surface **193** afforded by the bristles **192**. Retraction of the brush causes the pellet **136** resting thereon to contact the lower beveled surface **159** of the

distributor plate 158. Further retraction of the brush urges the pellet downwardly into the bristles, and, depending upon the viscosity and coating of the pellet 136, effects a spreading of the pellet over the bristles.

Concurrently with such retraction of the toothbrush, the resilient finger 172 urges the dispensing slide 170 to a forward charging position. Since the agitator finger 173 is forwardly of the agitator leaf 144, reciprocal movement of the slide insures mechanical agitation of the pellets within the magazine. Upon movement of the slide 170 toward the forward charging position, as shown in FIG. 11, the pellets are permitted to move under the influence of gravity downwardly through the discharge throat defined by the sloping wall 163, the distal end 149 of the agitator leaf, and the dimension control plates 164, 165.

Even with spherically configured pellets as shown in the first form of the invention, there is a tendency for such pellets to bridge the throat, merely by reason of the aggregate weight of the pellets in the magazine and the coefficient of friction between contiguous pellets. With pellets such as those illustrated in FIGS. 14 and 15, which are being used commercially, the bridging problem is aggravated. It was found to be impractical to form the pellets in spheres, and the configuration shown in FIGS. 14 and 15 was selected to accommodate practical limitations in the forming punch and die. With a supply of pellets so configured, bridging of the discharge throat of the dispenser always occurred, unless the dispensing head of the present invention was used, which insures positive mechanical agitation by reason of the variation in elevation of the upper edges of the side walls which define the discharge throat. By designing the side walls 151, 152 of the dispensing head with respective beveled upper edges disposed at different levels, additional mechanical agitation of the pellets is provided as they progress downwardly into the discharge throat. This prevents mechanical bridging of the throat by the pellets. The fact that such upper beveled edges are angularly related to each other imparts a compound downward spiral motion of the pellets, which further enhances mechanical agitation thereof and absolutely precludes bridging of the pellets under normal operating conditions. This mechanical agitation is present in both forms of the invention, and is particularly desirable in the second form, since the magazine and dispensing apparatus is formed in an integral package.

Accordingly, the present invention provides an integral magazine and dispensing mechanism for dentifrice pellets which permits an economy of merchandising and dependability in use heretofore not obtainable. The invention is equally well suited for use with the toothbrush having a cavity formed in the bristles thereof, as well as with conventional toothbrushes providing the usual depository surface on the bristles.

Although the invention has been herein shown and described in what are conceived to be the most practical and preferred embodiments, it is recognized that departures may be made therefrom within the scope of the invention, which is not to be limited to the details disclosed herein but is to be accorded the full scope of the claims so as to embrace any and all equivalent devices and apparatus.

Having described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A dentifrice dispensing apparatus comprising an integral wall of a configuration adapted to be folded and assembled to form an enclosing magazine and provided with opposite upper and lower closure flaps; a dispensing head disposed internally of the magazine and providing a discharge throat terminating in an orifice permitting passage of a single dentifrice pellet; a supply of pellets carried within the magazine; a metering means carried by the magazine and adapted for reciprocal movement between charging and dispensing positions, said metering means having an operating lever engageable by a toothbrush; and a removable portion of said side wall closing an access opening permitting entry of a toothbrush for engagement with said actuating lever.

2. A dentifrice dispensing apparatus comprising a hermetically sealed magazine formed by an enclosing wall and defining a supply chamber for a plurality of pellets and a dispensing chamber; dispensing means mounted within the magazine and dividing the internal cavity of the container into said supply and dispensing chambers; and metering means carried by said dispensing means for engagement with a toothbrush, said metering means mounted for reciprocal movement to and from a dispensing position and having a charging chamber arranged to permit individual gravitational depositing of said pellets on the toothbrush upon engagement of the metering means thereby and movement to said dispensing position.

3. A dentifrice dispensing apparatus comprising an enclosing wall of substantially impervious material and arranged in a configuration to form a supply magazine; a thermoplastic substance covering said wall to form a surface coating; a dispensing head dimensioned to be received within said wall when formed into an enclosing magazine structure, said dispensing head being fabricated of a thermoplastic material compatible with said coating material and having a substantially identical melting temperature, the magazine wall and said dispensing head being thermally bonded to form a unitary structure; and a dispensing slide carried by said dispensing head, and formed of a material having a melting temperature substantially higher than said coating material.

4. In a dentifrice dispensing apparatus, the combination of a supply magazine containing a plurality of dentifrice pellets; and a dispensing head adapted to be fitted to said magazine to serve as a dividing wall therein and define one of the limits of a supply chamber therein, said dispensing head having laterally opposed side walls defining a discharge throat, said side walls extending upwardly to terminate in respective upper edges arranged at respective unequal heights in the supply chamber to effect mechanical agitation of the pellets during gravitational movement thereof into said throat.

5. The dentifrice dispensing apparatus of claim 4 wherein said upper edges are angularly related to each other.

6. The dispensing apparatus of claim 4 wherein one of said upper edges is disposed substantially horizontally and the other is inclined with respect to a horizontal plane, when the supply magazine is disposed in an upright, substantially vertical operative position.

7. A unitary dentifrice supply magazine and dispensing apparatus comprising an enclosing wall formed to define a supply chamber therein; a dispensing head disposed in circumscribed relation to said wall and defining one of the limits of said chamber, the dispensing head having a body portion including opposed side walls and fore and after interconnecting web portions, a bottom closure plate hingedly connected to one of said web portions, and interfitting means carried respectively by said closure plate and the body portion to maintain said closure plate in an assembled closed position; a dispensing slide adapted to be partially received within said dispensing head and having an extending actuating lever; said closure plate having a slot through which said actuating lever extends when in an assembled position; and a guide surface carried by said magazine for supporting a toothbrush at a predetermined elevation during reciprocal movement therealong to operate said dispensing slide.

8. The dispensing apparatus according to claim 7 wherein said closure plate carries a distributor plate spaced above said guide surface a predetermined distance to urge a pellet downwardly into the toothbrush during withdrawal thereof away from said actuating lever.

9. The dispensing apparatus according to claim 8 wherein said closure plate supports said slide for reciprocal movement between dispensing and charging positions.

10. A dentifrice dispensing apparatus comprising an

integral wall of a configuration permitting folding and assembly of the wall to form an enclosing magazine having a chamber containing a supply of dentifrice pellets and oriented in a substantially vertical normal operating position, said wall having an agitator leaf extended therefrom and disposed internally of the magazine for engagement of the pellets; a dispensing head mounted internally of the magazine and secured to said wall intermediate the upper and lower limits thereof, the head having a body portion including laterally opposed side walls defining a discharge throat and terminated to form a lower discharge orifice, said side walls extending upwardly to terminate in respective upper edges arranged at respective different elevation levels in the supply chamber to effect mechanical agitation of the pellets during gravitational movement thereof into said throat, fore and aft web portions interconnecting said side walls, a bottom closure plate hingedly connected to one of said web portions and having a slot formed therein, and interfitting means carried respectively by said closure plate and the body portion to maintain said closure plate in an assembled closed position; a dispensing slide adapted to be partially received within the dispensing head and having an extending actuating lever, the slide being mounted on the closure plate in an assembled position with said lever extended through said slot for engagement by a toothbrush, the slide having a resilient portion in engagement with one of the web portions of said dispensing head and having an agitator finger disposed adjacent to the other of said web portions for engagement of the agitator leaf upon movement of the slide to a dispensing position and release of the finger upon being urged to a charging position by said resilient portion, the slide having a charging chamber disposed below said discharge orifice when in said charging position; said wall being extended beyond the lower limits of said dispensing head to form a hermetically sealed package and having a removable portion to provide an opening in the wall, when removed, to permit access to the actuating lever by a toothbrush, the wall terminating at the lower end in a closure flap providing a surface of support for said toothbrush; and a distributor plate carried by said dispensing head to urge a dentifrice pellet into said toothbrush following dispensing of a pellet and during withdrawal of the brush.

11. The dentifrice dispensing apparatus of claim 10 wherein said agitator leaf is provided with a free distal end disposed in said discharge throat for mechanical agitation of the pellets during movement of the slide in a direction toward a dispensing position and said distal end is urged in an opposite direction by the gravitational movement of the pellets into said throat upon return of the slide to said charging position.

12. The dispensing apparatus of claim 11 wherein one of the upper edges of said side walls defining the throat is disposed substantially horizontally and the other is inclined with respect to a horizontal plane, when the supply magazine is oriented in said normal operating position.

13. In combination with a toothbrush having bristles providing a pellet receiving cavity; an apparatus for dispensing dentifrice in the form of pellets comprising a support body having a rack, a toothbrush guide channel disposed beneath the rack, and a discharge passage communicating between the rack and the channel; means mounted in the rack of the body for delivering dentifrice pellets to the passage; metering means mounted in the body between the dentifrice delivering means and the channel for reciprocal movement between predetermined dispensing and passage-blocking positions; and toothbrush engageable means disposed in the channel having controlling connection to the metering means adapted to move said metering means from blocking to dispensing position in response to toothbrush engagement, the said passage being in such spaced relation to said toothbrush engageable means and the toothbrush being proportioned relative to such spacing so that said receiving cavity is disposed in registry with the passage when the metering means is in said dispensing position.

14. In combination with a toothbrush having bristles defining a pellet receiving cavity in predetermined spaced relation to an end of the brush; an apparatus for dispensing dentifrice in the form of pellets comprising a support body having a magazine receiving rack, a toothbrush guide channel disposed beneath the rack, and a discharge passage communicating between the rack and the channel; a magazine containing dentifrice pellets removably mounted in the rack of the housing having an orifice in registry with the passage; metering means mounted in the body between the magazine and the channel for reciprocal movement between predetermined dispensing and passage-blocking positions; resilient means mounted in the housing urging the metering means into a blocking position; and toothbrush engageable means disposed in the channel having controlling connection to the metering means and being adapted to move said metering means from a blocking to a dispensing position in response to toothbrush insertion into the channel, said engageable means being disposed relative to said passage when the metering means has been moved to the dispensing position and the toothbrush being proportioned relative to such disposition so that the receiving cavity is disposed in registry with the passage when the toothbrush is in engagement with said engageable means while maintaining said dispensing position.

15. Dentifrice dispensing apparatus comprising a support body; a supply magazine having a discharge orifice therein and adapted to hold a supply of individual dentifrice pellets so that the pellets are gravitationally urged toward the orifice; the magazine having a wall member providing a flexible leaf extending therefrom and affording a movable end disposed adjacent to said orifice; means mounting the magazine on the body; dispensing means operatively associated with the magazine and adapted to dispense said pellets in single units upon movement of said means to a dispensing position; and operating means extended from said magazine and connected to the dispensing means to move said dispensing means to said dispensing position; and agitator means operatively connected to said operating means to effect mechanical agitation of said leaf and said supply of pellets during movement of the dispensing means toward a dispensing position.

16. In combination, dentifrice dispensing apparatus comprising a support body; a supply magazine mounted on the body and adapted to hold a supply of discrete dentifrice pellets; means operatively associated with the magazine and adapted to dispense said pellets in single units upon movement of said means to a dispensing position; operating means extended from said magazine and connected to said dispensing means, said operating means being engageable by a toothbrush head to move the dispensing means to a dispensing position; a toothbrush having a head adapted to engage the operating means and being provided with a plurality of upstanding bristles of substantially uniform predetermined length surrounding a group of similar bristles shorter than said length thereby to form a depository cavity, said bristles and dispensing means being arranged so that a single pellet is deposited in said cavity upon engagement of said operating means and movement of said dispensing means to a dispensing position; guide means mounted on the body and defining a path of travel for the toothbrush head at a predetermined elevation during movement toward the operating means, actuation thereof, and withdrawal therefrom; and dentifrice distributing means mounted on the body in elevationally spaced relationship to said guide means so that a pellet so deposited in the cavity of the toothbrush is engaged by the distributing means during withdrawal movement of the toothbrush and distributed over said surrounding bristles rearwardly of the pellet in the path of movement during withdrawal.

17. A dentifrice dispensing apparatus comprising a support body; a supply magazine having a discharge orifice therein and adapted to hold a supply of individual dentifrice pellets so that the pellets are gravitationally urged toward the orifice; means mounting the magazine on the body; means connected to the magazine and adapted to receive single pellets from said discharge orifice and to dispense a single pellet upon movement of said means to a dispensing position; toothbrush engageable operating means extended from the magazine and connected to the dispensing means to move said means to said dispensing position; guide means carried on the body and adapted to support a toothbrush in engagement with said operating means in a receiving position below said dispensing means when in said dispensing position and for reciprocal movement toward and from said position; and a distributor plate carried in fixed position on said body having a surface extended downwardly and away from the dispensing position and adapted to contact and to spread a discharged pellet on a toothbrush when said toothbrush is moved away from said operating means along the path of travel defined by said guide means.

18. The apparatus of claim 17 wherein said distributor plate is provided with a downwardly facing beveled edge to effect a gradual compression and spreading of the pellet as said toothbrush is moved away from said operating means.

19. In combination, dentifrice dispensing apparatus comprising a support body; a supply magazine mounted in the body and having confining wall means adapted to hold a supply of discrete dentifrice pellets and having a discharge orifice; a dispensing head secured to the magazine including a dispensing slide provided with a charging chamber having open upper and lower ends and adapted to receive a single pellet at a time; means mounting the slide in the head for reciprocal movement between a receiving position wherein the charging chamber is disposed below said discharge orifice gravitationally to receive a pellet and a discharging position; a plate closing the lower end of said chamber when the slide is in a receiving position; said dispensing head being provided with a delivery slot located beneath said open charging chamber when the slide is in the discharging position; biasing means carried in the head and urging the slide toward said receiving position; operating means extended from said slide outwardly from the head and engageable to move the slide to said discharging position; a toothbrush having a head adapted to engage said operating means and being provided with a plurality of upstanding bristles of substantially uniform predetermined length surrounding a group of similar bristles of shorter length thereby forming an upwardly disposed cavity, said bristles being arranged on the toothbrush head in relation to said delivery slot to dispose the cavity directly beneath the slot when the slide is in a discharging position so that a single pellet is deposited in said cavity upon engagement of said operating means by the toothbrush and movement of said dispensing means to the dispensing position; guide means mounted on the body and defining a path of travel for the toothbrush head at a predetermined spaced relation to the plate during movement toward and from said dispensing position; and dentifrice distributing means mounted on the body in fixed elevationally spaced relationship to said guide means having a surface extended downwardly and away from the dispensing position so that a pellet so deposited in the cavity of the toothbrush is engaged by the distributing means during withdrawal movement of the toothbrush and distributed over said surrounding bristles rearwardly of the pellet relative to the path of movement of the toothbrush during withdrawal.

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