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C. O. CLEMENT

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POWDER DISPENSER

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Fig. 1.

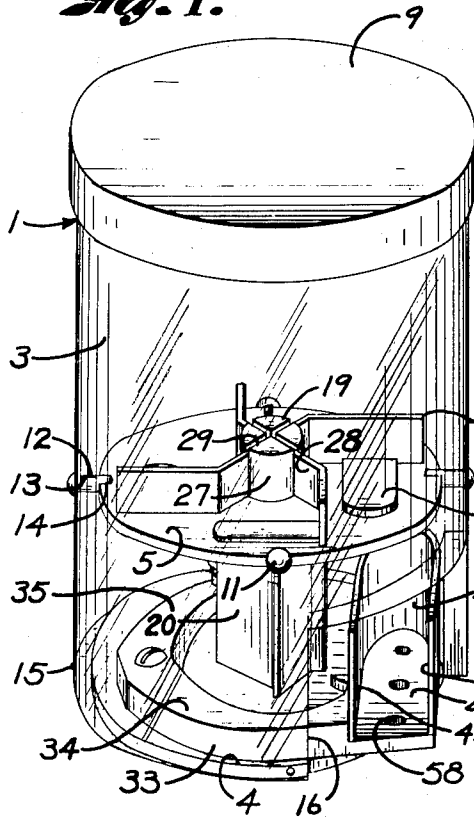


Fig. 2.

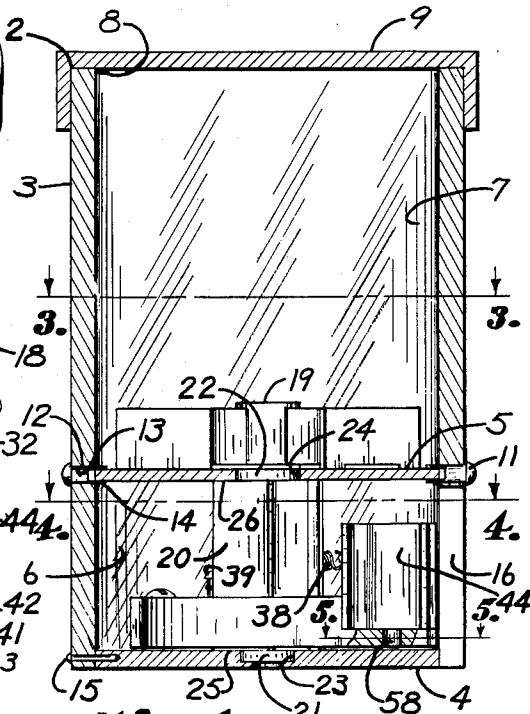


Fig. 3.

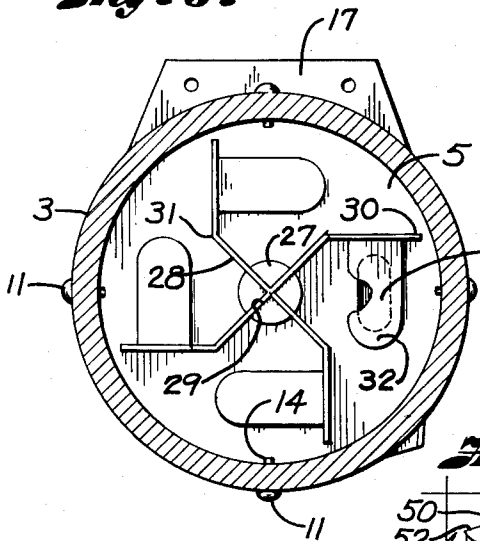


Fig. 4.

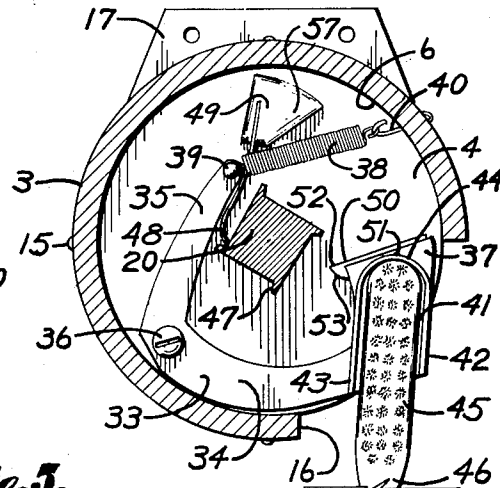


Fig. 5.



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POWDER DISPENSER

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5 Claims. (Cl. 222—127)

This invention relates to a powder dispenser, particularly adapted for tooth powder and has for its principal object to provide a dispenser of this character for dispensing tooth powder directly upon the bristles of a tooth brush.

Other objects of the invention are to provide a dispenser with mechanism actuated by thrust of the tooth brush under the discharge opening of the dispenser, to provide a powder agitating mechanism which operates in conjunction with valving means for keeping the powder in loose condition and assuring positive delivery of the powder through the discharge opening, and to provide a simple actuating mechanism that is positive in operation.

It is also an object of the invention to provide a tooth powder dispenser which dispenses tooth powder in a sanitary condition.

In accomplishing these and other objects of the invention hereinafter pointed out, I have provided improved structure, the preferred form of which is illustrated in the accompanying drawings wherein:

Fig. 1 is a perspective view of a dispenser constructed in accordance with the present invention.

Fig. 2 is a central vertical section through the dispenser.

Fig. 3 is a horizontal section on the line 3—3 of Fig. 2.

Fig. 4 is a horizontal section on the line 4—4 of Fig. 2.

Fig. 5 is a fragmentary section on the line 5—5, Fig. 2, particularly illustrating the pawl for operably engaging the teeth on the shaft of the agitator.

Referring more in detail to the drawings:

1 designates a powder dispenser constructed in accordance with the present invention which includes a casing 2 having a wall 3 which may be in the form of a cylinder as illustrated, a bottom 4 and a transverse partition 5 that is spaced above the bottom 4 to provide a lower compartment 6 for containing the actuating mechanism and an upper compartment 7 for containing the powder to be dispensed. The compartment 7 has a top opening 8 through which the powder is poured into the compartment 7, the open top being closed by a removable cap or cover 9. The partition 5 has an elongated opening 10 offset from the axial center of the compartment and through which powder is dispensed as later described.

The casing 2 may be formed of any suitable material such as metal or plastic, which may be one of the transparent plastics whereby the contents and actuating mechanism are visible through the wall of the casing, as illustrated in the drawings.

In the illustrated instance, the partition 5 is shown as supported within the casing by fasteners 11 having shank portions 12 extending through openings 13 in the wall 3 and which have slotted inner ends 14 to engage and support the partition in position. The bottom 4 may be formed as a separate part that is retained in position by pins 15 extending through the wall of the casing and into the periphery of the bottom 4, as shown in Fig. 2.

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The side wall 3 of the casing is provided with an arcuate opening 16 between the bottom 4 and the partition 5 for insertion of the head of a tooth brush on which the powder is dispensed from the discharge opening 10.

5 The casing thus described may be provided with a laterally extending bracket 17 by which the dispenser may be attached to a suitable support (not shown).

Tooth powders tend to pack within their containers.

Therefore, to assure positive feed of the tooth powder through the discharge opening and to provide valve means for controlling the opening, the upper compartment is provided with an agitator 18 which, in the illustrated instance, is of rotary type and has a shaft 19. The shaft 19 is positioned axially within the dispenser and has a body portion 20 of rectangular cross section as shown in Fig. 4 that is located within the lower compartment 6. The ends of the body portion 20 have spindle portions 21 and 22 that are journaled respectively in a socket 23 formed in the bottom 4 and in an opening 24 of the partition 5, as best shown in Fig. 2, with the ends of the body portion forming shoulders 25 and 26 engaging the bottom and partition respectively for retaining the shaft from axial movement. The spindle 22 projects upwardly into the container 7 and provides a hub 27 carrying radially disposed blades 28 that are inset within radial slots 29 formed in the spindle, as best shown in Figs. 1 and 3. The outer ends 30 of the blades, or those portions which move over the discharge opening 10, are turned as at 31 to lie in planes substantially parallel with planes extending through the axis of rotation with the outer end 30 of one blade at one side of the rotor being offset from the corresponding blade at the opposite side of the rotor, as shown in Fig. 3.

Connected with the end portion 30 of each blade on the trailing side thereof is a substantially flat tongue shape valving member 32 that moves into valving relation with the discharge opening 10 for interrupting flow of powder and for uncovering the opening to dispense powder onto a tooth brush that is inserted through the opening 10 of the casing and in position to receive the powder on the bristles thereof.

Oscillatably mounted within the compartment 6 is an actuator 33 in the form of a bell crank lever having an arm 34 substantially conforming to the curvature of the inner side of the wall 3 and engaging thereagainst when the actuator is in idle position. The other arm 35 of the bell crank extends inwardly across the container, as shown in Fig. 4. The actuator thus described is pivotally mounted on a screw or the like 36 threaded into the bottom 4 at a point adjacent the wall 3 and spaced from the opening 16 so that a head 37 on the arm 34 is in registry with the discharge opening, as shown in Figs. 1 and 4.

The actuator is normally retained in retracted position with the arm 34 in contact with the inner wall of the casing by means of a coil spring 38 having one end secured to a pin 39 on the arm 35 and the other end engaging a hook 40 that is fixed to the wall of the casing, as shown in Fig. 4. The head 37 of the actuator carries a pocket 41 having walls 42 and 43 spaced apart to receive the head 45 of the tooth brush 46 therebetween and which are connected by a substantially semicircular wall portion 44 to provide an abutment for the head of the tooth brush, as later described.

The shaft is normally retained with the agitator in position so that one of the valve tongues 32 is closing the opening 10. This is effected by providing the body portion of the shaft at the corners thereof with teeth 47 that are successively engaged by a spring leaf click 48 which is supported by a lug 49 extending upwardly from the bottom 4, as best shown in Fig. 4. The teeth 47 are also adapted to be engaged by a pawl 50 pivotally

mounted within a horizontal slot of the head 37 of the actuator on a pin 51, as shown in Fig. 5. The pawl has an end 52 thereof projecting from the head of the actuator so as to be in position for engaging one of the teeth 47 when the actuator is moved under thrust of a tooth brush, as later described, to effect rotation of the shaft a sufficient distance to move one of the valving members from uncovering relation with the discharge opening and bring the succeeding valve tongue into covering relation.

The opposite face of the pawl is round as indicated at 53 to move retractively over the teeth of the shaft at the time the brush is withdrawn and the actuator is returned to normal position by the spring 38. The pawl 50 is retained in position to engage the teeth 47 by a spring 54 engaging between a tail portion 55 of the pawl and in the bottom of a socket 56 in the head portion of the actuator, as shown in Fig. 5.

Inward movement of the actuating lever is limited by a stop or lug 57 which projects from the bottom 4 and is located so that the shaft is moved a sufficient distance for the click 48 to drop back of a tooth 47. The head of the actuator or bottom of the pocket 41 may be provided with openings 58 to allow discharge of any powder that may spill from the brush.

In using a dispenser constructed and assembled as described, it is mounted on a suitable support with the opening 16 in convenient position for insertion of the head of a tooth brush within the pocket 41 of the actuator. The cover is then removed and a supply of powder is poured into the compartment 7 after which the cover is reapplied to keep the powder in sanitary condition. To dispense the powder, the bristle end of the tooth brush is placed within the pocket 41 with the bristles uppermost, as shown in Fig. 4, and a forward thrust is applied to the handle to position the end of the brush head against the curved end of the pocket and effect movement of the actuator against action of the spring 38. This movement of the actuator brings the end 52 of the pawl 50 into engagement with a tooth 47 to effect partial rotation of the shaft which moves the agitator a sufficient distance to effect uncovering of the discharge opening 10 and to effect movement of a succeeding blade of the agitator across the discharge opening to push the powder therethrough onto the bristles of the brush and carry the succeeding valving tongue into closing relation with the opening to suspend flow of powder from the container.

Inward movement of the tooth brush is limited by the head of the actuator engaging the lug 57 that extends upwardly from the bottom 4, as shown in Fig. 4. In this position the shaft is moved a sufficient distance to effect engagement of the click back of one of the teeth 47 to prevent retractive movement of the shaft when the tooth brush is withdrawn and the spring 38 returns the actuator to its normal position. During this movement the rounded end 53 of the pawl 50 rides over the succeeding tooth of the shaft, the pawl spring 54 yielding sufficiently to permit passing of the pawl after the spring 54 returns the pawl to position for re-engagement with the tooth when the dispenser is again actuated.

From the foregoing it is obvious that the dispensing mechanism is readily operated incidental to placement of the tooth brush in position to receive the powder and that the agitator moved thereby stirs the powder to prevent bridging thereof over the opening 10. It is also obvious that the blades act to push the loosened powder through the discharge opening where it falls onto the bristles of the brush in a substantially measured quantity.

Attention is directed to the fact that the relative location of the pawl 50, click 39, teeth 47, and the shape and pivotal mounting of the actuator assure a complete followthrough of the rotor by the thrust applied through the brush so that the parts do not stop in a position which leaves the discharge opening uncovered. Thus the powder is dispensed on the brush while the brush is in motion in a forward direction, and the flow is automatically

stopped during withdrawal of the brush and return of the actuator lever to its retracted position.

What I claim and desire to secure by Letters Patent is:

1. A tooth powder dispenser of the character described including a powder container having a discharge opening, a powder agitator on the container, valving means operable with the agitator and movable over the discharge opening for controlling discharge of powder through said opening, an actuator for the agitator carried by the container to reciprocate thereon, a ratchet connection between the actuator and the agitator, said actuator having a pocket movable under the opening of the container for receiving the head of a tooth brush therein to effect movement of the actuator upon thrust of the brush against said pocket, means for returning the actuator to normal position under withdrawal of the brush from the pocket, and a means for normally retaining the agitator in position to close said discharge opening when the actuator returns to said normal position.

2. A tooth powder dispenser of the character described including a casing, a partition extending horizontally across the casing to provide an upper compartment for containing powder and a lower compartment, said partition having a discharge opening therein, a powder agitator on the powder compartment, valving means operable with the agitator for controlling the discharge opening, an actuator movably carried in the lower compartment, a driving connection between the actuator and the agitator, said actuator having a pocket movable under the discharge opening for receiving the head of a tooth brush therein and to effect movement of the actuator upon thrust of the brush against said pocket when the brush is brought into position under the discharge opening, means for returning the actuator to normal position under withdrawal of the brush from the pocket, and a click for normally retaining the agitator in position to close the discharge opening.

3. A tooth powder dispenser of the character described including a casing, a partition extending horizontally across the casing to provide an upper compartment for containing powder and a lower compartment, said partition having a discharge opening therein, a powder agitator on the powder compartment, valving means operable with the agitator for controlling the discharge opening, an actuator movably carried in the lower compartment, a shaft having a portion journaled in the partition and connecting the agitator with the actuator, said shaft having ratchet teeth thereon, a pawl carried by the actuator for engaging said teeth to effect rotation of the agitator, said actuator having a part to be engaged by a tooth brush when the tooth brush is thrust under said discharge opening whereby the actuator is operated to move the agitator, a spring connected with the actuator to return the actuator when the brush is withdrawn from under said opening, and a click for engaging said teeth to prevent retractive movement of the agitator.

4. A tooth powder dispenser of the character described including a casing, a partition extending horizontally across the casing to provide an upper compartment for containing powder and a lower compartment, said partition having a discharge opening therein, a powder agitator in the powder compartment, valving means operable with the agitator for controlling the discharge opening, an actuator movably carried in the lower compartment, a driving connection between the actuator and the agitator, means for returning the actuator to normal position, and a click for normally retaining the agitator in position to close the discharge opening.

5. A powder dispenser including a powder container having a bottom provided with a discharge opening through which the material flows from the container, a powder agitator having rotatable support in the container, a circular series of valve elements carried by the agitator and movable therewith over said bottom, each of said elements having a planar portion of such extent as to

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completely cover said opening when in registry therewith to shut off flow through the discharge opening directly in plane with the inner face of said bottom, an actuator movably carried by the container below said bottom, a driving connection between the actuator and the agitator, said discharge opening on the lower side of said bottom being unobstructed to assure free flow of powder and eliminate possibility of powder lodging within said discharge opening that might be retained therein during periods between operations of the actuator, said actuator having means for engagement by a tooth brush when moved under said bottom and across said discharge opening for rotating of the agitator and effecting movement of one valve element from covering relation with said

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opening and a following valve element into subsequent covering relation with said discharge opening at the end of rotation of the agitator, and means for returning the actuator to normal position upon withdrawal of the brush.

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