Dec. 7, 1943. H. P. McNAIL 2,336,409

DISPENSING CAP FOR TOOTH POWDER CONTAINERS

Filed Sept. 25, 1941

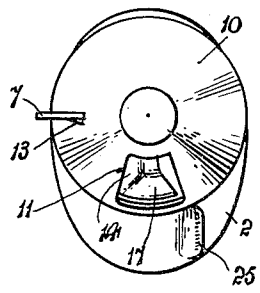

Fig. 1.

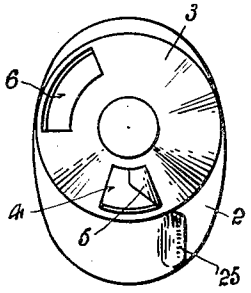

Fig. 4

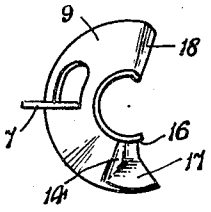

Fig. 6.

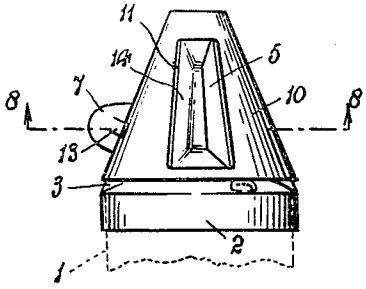

Fig. 2.

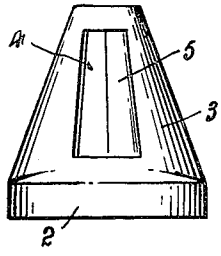

Fig. 5.

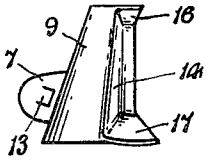

Fig. 7.

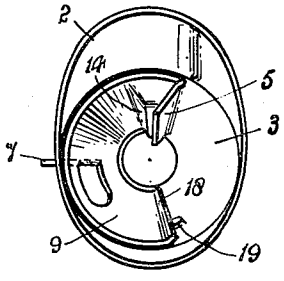

Fig. 3.

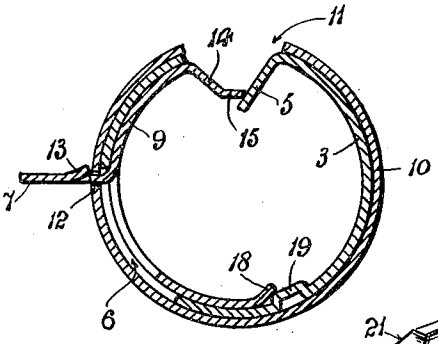

Fig. 8.

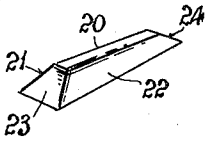

Fig. 10.

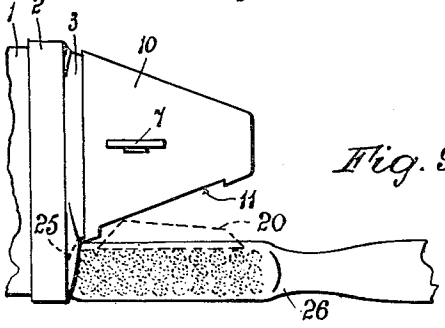

Fig. 9.

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DISPENSING CAP FOR TOOTH POWDER CONTAINERS

Howard P. McNail, Detroit, Mich.

Application September 25, 1941, Serial No. 412,270

5 Claims. (Cl. 221—116)

This invention relates to a form of dispensing cap which may be applied to or incorporated in the design of any type of container for tooth powder and similar products which it is desirable to dispense directly on to the surface of a brush; and has for its object to provide a simply operable structure which will not only measure a desired amount of powder to be dispensed but which will form the measured amount of powder into a more or less compacted tablet of suitable shape, structure, and durability to remain on the surface of the brush, without undue tendency to spill therefrom as the brush is removed from the dispenser to the point of actual use.

More particularly, the invention contemplates a dispensing device which will form a tablet having a relatively broad base to rest on the bristles of the brush and bevelled side walls approximating the normal angle of repose of the material, thus reducing any natural tendency of the material to change its formed shape after the dispenser is removed therefrom; and a still further object is to provide a tablet forming dispenser which has a tendency to compact the granules of material together by pressure during the formation of the said tablet.

A further object is to provide means whereby the final formation of the tablet is effected in the somewhat accelerated manner producing a "snap" or slight jarring of the forming parts, which has a tendency to effect the final dislodging of the formed tablet from the enveloping surfaces of the dispensing apparatus.

A still further object is to provide a combination of arrangements in the dispensing apparatus so devised as to lend themselves to ready assembly in a simple manner, while at the same time being correctly positioned in operative relation on to the other and maintaining desirable frictional and nesting characteristics which assure easy and efficient functioning of the device.

Still further objects and advantages, subsidiary to the aforesaid objects or resulting from the construction or operation of the invention as it may be carried into effect, will become apparent as the said invention is hereinafter further disclosed.

In carrying the said invention into effect, I may utilize the novel construction and arrangement of parts hereinafter described, by way of example, having reference to the accompanying drawing, wherein:

Figure 1 is a plan view of the top of a container equipped with the improved dispensing device;

Figure 2 is a front elevation of the same;

Figure 3 is a plan of underside of the same;

Figure 4 is a a view similar to Figure 1 with the outer rotatable cap and inner rotatable liner removed;

Figure 5 is a front elevation of the same;

Figure 6 is a plan view of the rotatable liner removed;

Figure 7 is a front elevation of the same;

Figure 8 is an enlarged sectional view taken on a plane indicated by the line 8—8 in Figure 2;

Figure 9 is a side elevation of the container top and dispenser illustrating a tooth brush positioned relative thereto; and

Figure 10 is a perspective view showing the general shape of the compacted powder mass delivered by the dispenser.

Similar characters of references indicate similar parts in the several figures of the drawing.

This invention is primarily intended to meet certain desirable requirements in the dispensing of individual applications of tooth powder, and in the drawing I have shown a powder container 1 having an end closure 2 which in this case is provided with a hollow conical extension 3. The interior of this extension is in free communication with the interior of the said container 1 so that it may readily receive powder therefrom.

The said extension 3 is provided with an elongated opening 4 extending from a point near the base to a point near the extremity of the said extension, and a wing 5 is projected inwardly of the conical extension from one of the edges of the said opening 4. The said wing 5 is preferably arranged at a distinct angle to the radius of the conical extension 3 as clearly illustrated in Figure 8. A second opening 6 is also provided in the conical extension at a point somewhat remote from the first opening 4, as clearly seen in Figure 4, this second opening having for its purpose to provide clearance for the travel of a thumb piece 7 extending outwardly and radially from a rotatable liner 9 housed within the said conical extension 3. The form and purpose of this liner will be later further explained.

The extension 3 is surmounted by a rotatable cap 10, having an opening 11 therein corresponding to the opening 4 of the stationary conical extension 3 and also having a slit 12 therein through which the said thumb piece 7 of the liner 9 extends, whereby the said cap 10 and the said liner 9 are connected together for simultaneous rotation, in one or other direction, by the simple movement of the thumb piece 7 through the arc lim-

ited by the length of the slot 6 through which the said thumb piece 7 passes.

As will be obvious, assembly of the described parts is very simple. The cap 10 is simply placed over the extension 3 with the slit 12 registering with any part of the slot 6, and the liner is then inserted within the extension 3, the thumb piece 7 being passed through the slot 6 and the slit 12, when the parts may thereafter be locked together by means of a tongue 13, which may be sprung or otherwise forced out laterally from the thumb piece to engage with the cap 10. The conical nature of the parts renders unnecessary any further securing or positioning means.

The liner 9 is not a complete cone, but preferably extends around somewhat more than half the inner wall of the conical extension 3, as clearly shown in Figure 3, both to permit free operation and ease of assembly. This liner is characterized by its having an inwardly depressed portion formed in its leading edge, which is opposed to the wing 5 of the stationary conical extension 3, the depression being further characterized by an angularly disposed wall 14, the free marginal portion 15 of which engages the free marginal portion of the wing 5 when the liner is rotated in the required direction for that purpose.

The upper and lower ends of the depression are bounded by end walls 16 and 17, preferably inclined toward each other as clearly shown in Figure 7, so that, when the depressed portion of the liner is moved into engagement with the wing 5 of the stationary cone, a pocket is formed which is the counterpart of the shape of a somewhat tapered prism, which shape is shown in Figure 10 as a preferred form of compacted tooth powder tablet which it is desired to dispense.

The other edge of the liner is provided with an inwardly bent or offset lip 18 which, in the dispensing position of the parts, snaps into engagement with a projection 19 formed within the stationary conical extension 3, and also serves to cause the liner to flex inwardly and ride over this extension when the liner is rotated away from the dispensing position.

In the drawing the assembled parts are all shown in the dispensing position, wherein the tablet of tooth powder is formed by the closure of the indented portion of the liner against the wing 5 of the stationary member 3. This may be considered as the open or dispensing position, and it will be obvious that when the liner 9 is rotated (in an anti-clockwise direction as shown in Figure 8) to a closed position, the angularly disposed wall 14 of the liner will be rotated away from and into spaced relation to the said wing 5 thus permitting loose powder within the stationary cone 3 to enter freely between the walls 14 and 15. At the same time such rotation of the outer cap 10 will cause it to close the opening 4 and thereby prevent the escape of powder.

The movement of the liner to the dispensing position shown in Figure 8 will gather this powder between the relatively inclined wing 5 and the wall 14 as they are brought together, resulting in the compacting of a desired amount thereof and the formation of a more or less stable tablet 20 such as is shown in Figures 9 and 10.

I prefer that the angularity of the walls 14, 16, and 17 of the indentation, and of the wing 5, be such that they will form a compacted mass having bevelled sides 21 and 22, and bevelled ends 23 and 24, as this not only facilitates the tablet in freeing itself as the dispensing action is completed, but also provides a form of tablet with a broad base and inclined sides especially adapted to rest on the bristles of the tooth brush without spilling or losing its form while the tooth brush is brought into actual oral use.

The dislodgement of the tablet from its formative walls is further promoted by the action of the lip 18 snapping into position in front of the projection 19 and thereby adding a "flip" or suddenly accelerated motion of the liner into a jarring contact with the wing 5 which serves to finally dislodge the tablet of tooth powder from the dispenser.

Most tooth powders are of such a nature that they readily lend themselves to compacting in the manner described, and, although the discharge opening of the dispenser increases progressively as the wall 14 approaches the wing 5 of the tablet-forming device, it is not found, in actual practice, that any material escape of the contents from the device takes place with such tooth powders. However, there are some powders of such a dry nature, as pure sodium perborate, which are not so readily compacted, or which when compacted have no great tendency to retain the compacted form, but the bevelled nature of the sides of the form tablet, being substantially that of the angle of repose of the material, serves to prevent spillage or breakdown of the tablet structure when it is deposited on the brush. It should be borne in mind that, although the outlet of the dispenser is progressively opening during the tablet-forming operation, this outlet may be actually closed by holding the bristles of the brush in position thereover. Therefore, any tendency which the powder might otherwise have to prematurely escape from the tablet-forming device is circumvented by the presence of the brush during the compacting operation.

25 is a recess formed and positioned in the cap 2 of the container to act as a locating stop whereby the tooth brush 26 may be definitely positioned with the respect to the outlet of the dispenser to receive the compacted tablet of tooth powder.

This invention may be developed within the scope of the following claims without departing from the essential features of the said invention, and it is desired that the specification and drawing be read as being merely illustrative and not in a strictly limiting sense.

What I claim is:

1. In a tooth powder dispenser, a container, a substantially conical extension thereof having a side discharge opening, a wing extending inwardly at an angle to the radius from one edge of said opening, a rotatable liner within said extension having a depressed wall portion movable to impinge against said wing and forming therewith when in such impingement a powder-compacting pocket at said opening, and an outer rotary cap enveloping said extension and coupled to said liner, said cap also having an opening therein positioned to register with said discharge opening when said liner is moved to bring the depressed wall portion thereof into impingement with said wing.

2. In a tooth powder dispenser, a container, a substantially conical extension thereof having a side discharge opening, a wing extending inwardly at an angle to the radius of said extension from one edge of said opening, a rotatable liner within said extension having a depressed wall portion movable to impinge against said wing and forming therewith when in such impinge-

ment a powder-compacting pocket at said opening, said depressed portion having a main side wall disposed at an angle to said wing whereby the formed pocket is of a substantially wedge shaped character, and an outer rotary cap enveloping said extension and coupled to said liner, said cap also having an opening therein positioned to register with said discharge opening when said liner is moved to bring the depressed wall portion thereof into impingement with said wing.

3. In a tooth powder dispenser, a container, a substantially conical extension thereof having a side discharge opening, a wing extending inwardly from an edge of said opening, a rotatable liner within said extension having a depressed wall portion movable to impinge against said wing and forming therewith when in such impingement a powder-compacting pocket at said opening, an outer rotary cap enveloping said extension, said cap also having an opening therein positioned to register with said discharge opening when said liner is moved to bring the depressed wall portion thereof into impingement with said wing, and a thumb piece extending from said liner through and engaging said cap to secure said liner and said cap together for rotary operation.

4. In a tooth powder dispenser, a container, a substantially conical extension thereof having a side discharge opening, a wing extending inwardly from one edge of said opening, a rotatable liner within said extension having a depressed wall portion movable to impinge against said wing and forming therewith when in such impingement a powder-compacting pocket at said opening, an outer rotary cap enveloping said extension and coupled to said liner, said cap also having an opening therein positioned to register with said discharge opening when said liner is moved to bring the depressed wall portion thereof into impingement with said wing, an inclined member on the edge of said liner remote from said depressed portion, and means in said conical extension cooperating with said inclined portion to accelerate the final closing movement of said liner against said wing.

5. In a tooth powder dispenser, a container, a substantially conical extension thereof having a side discharge opening, a wing extending inwardly from one edge of said opening, a rotatable liner within said extension having a depressed wall portion movable to impinge against said wing and forming therewith when in such impingement a powder-compacting pocket at said opening, an outer rotary cap enveloping said extension and coupled to said liner, said cap also having an opening therein positioned to register with said discharge opening when said liner is moved to bring the depressed wall portion thereof into impingement with said wing, and means for locating a tooth brush in correct position relative to said discharge opening to receive a charge of tooth powder from said opening.

HOWARD P. McNAIL.