Feb. 11, 1969 M. JAMES 3,426,949

DISPENSER FOR POWDERS

Filed Oct. 11, 1967 Sheet 1 of 2

Fig. 1.

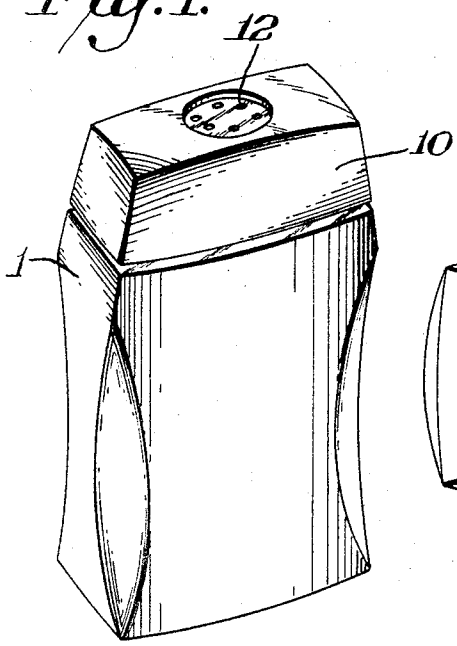



Fig. 2.

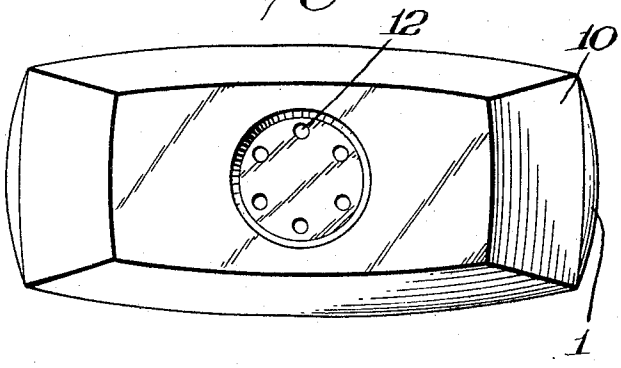



Fig. 3.

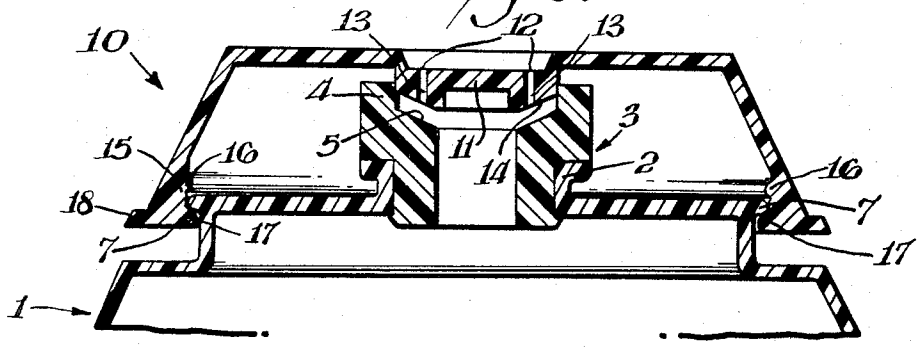
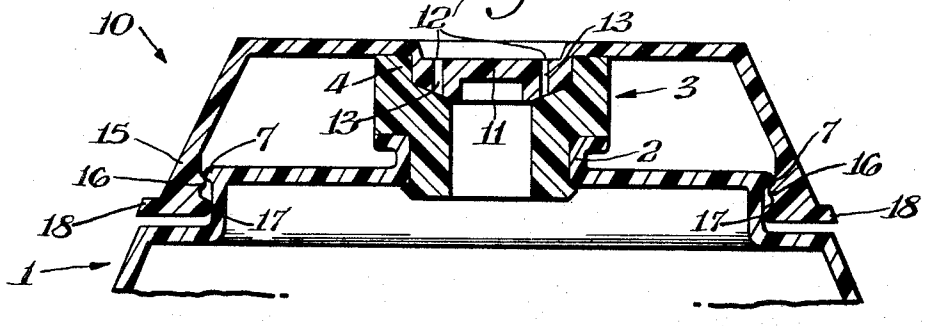



Fig. 4.



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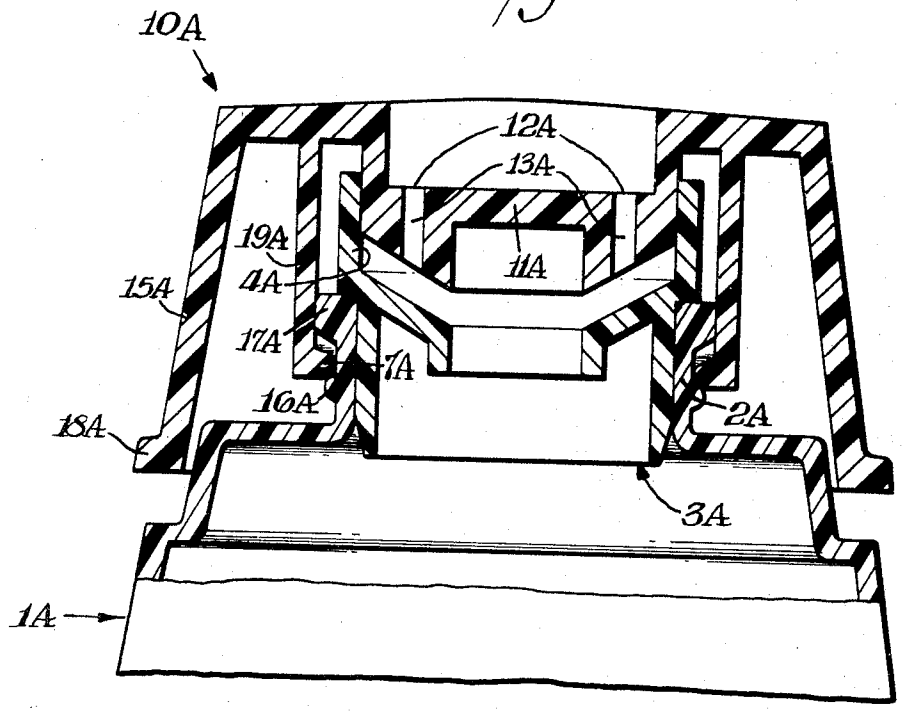
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Fig. 5.



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3,426,949

# DISPENSER FOR POWDERS

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Int. Cl. B65d 83/06, 41/14; F16k 25/00

## ABSTRACT OF THE DISCLOSURE

A nonpressurized powder dispenser having a cap with central boss fitted to and movable axially along the neck of the container between a closed position, in which the boss is seated against a shoulder in the neck, thereby sealing the lower extremities of dispensing apertures in the boss, and an open position. The cap has a resilient plastic depending apron which extends to the periphery of the container, and ridge means engageable in the two extreme positions with corresponding means on the container. The shoulder may be provided by an annular insert in the neck.

### *Background of the invention*

This invention relates to a dispenser, in particular to a nonpressurized dispenser for powders.

The dispensing of powders from containers presents many problems. The dispensing apparatus should not leak or permit the contents to be easily lost by accidental spilling. Also, the dispensing should be easily operated and preferably provide a means of adjusting the rate of dispensing. The instant apparatus overcomes many of these difficulties to a large extent and provides an easily constructed dispenser which can be operated with one hand.

### *Summary of the invention*

This invention provides a nonpressurized dispenser for powders, such as talcum powder, comprising a container with an open neck and a cap with a boss which is fitted to and movable axially along the neck between a closed and open position. In the open position, dispensing apertures about the periphery of the boss are in direct communication with the interior of the container. Movement toward the closed position is stopped by a substantial shoulder about the interior of the neck which meets the boss at the interior extremity of the dispensing apertures, thereby sealing the apertures. The shoulder is conveniently provided by an annular insert fitted to the neck. The cap has a depending apron made of resilient plastic which extends to the periphery of the container, and has ridge means about its interior surface which engage corresponding means about the upper periphery of the container to restrain the cap in the closed position and to stop movement toward the open position, thereby preventing disengagement of the cap from the container.

### *Brief description of the drawing*

For a better understanding of the instant invention, reference is made to the accompanying drawings. FIG. 1 and FIG. 2 shows isometric and top views, respectively, of a container having an embodiment of the instant invention as the dispensing apparatus; FIG. 3 is a vertical cross-sectional view of an embodiment of the invention in the open position; FIG. 4 is a vertical cross-sectional view of that embodiment in the closed position, and FIG. 5 is vertical cross-sectional view of another embodiment of the invention in the open position.

### *Detailed description of the invention*

According to this invention, there is provided a dispenser comprising a container and a cap serving as a



dispensing member which has a boss fitted to and movable axially along the container neck between an open, dispensing position and a closed position. In the closed position, communication between the dispenser aperture or apertures of the cap, which are located about the periphery of the boss, and the interior of the container is cut off by engagement of the lower surface of the boss with a shoulder about the interior surface of the container neck, thereby sealing the lower extremities of the apertures.

It is preferable that the surface of the shoulder and the lower surface of the boss which engages the shoulder in the closed positions be inclined surfaces of equal angle, extending toward the interior of the container. Thus, the shoulder would have a concave frusto-conical surface which would facilitate the flow of powder when the cap is in the open position and provide a good seal for the dispensing apertures in the closed position.

The container preferably comprises an annular insert situated in the neck of the container, and the shoulder is provided on this insert. Such an insert can be accurately molded with a shoulder of the desired configuration more easily than can the neck of the container itself. The insert might be constructed of a resilient plastic material such as high density polyethylene or polypropylene and be press-fitted into the neck. It might also have a lip about its lower edge which will serve to lock the insert into place in the neck.

The cap is formed with a depending apron made of resilient plastic, such as high density polyethylene or polypropylene, which extends over the top surface of the container. It is by means of force applied to this apron that the cap is moved axially between the open and closed positions.

Interengageable ridges are provided on the cap and the body of the container to restrain the axial motion at certain desired positions. An inclined ridge means engages when the cap is in the closed position, thus restraining the cap in that position to avoid loss of contents due to accidental spilling, and a substantially square ridge means engages to stop the axial motion toward the open position, thus preventing disengagement of the cap from the container. These ridge means might be provided by a pair of ridges about the interior surface of the apron which can engage a ridge about the upper periphery of the container. The inner ridge of the apron has an inclined surface and is positioned such that it engages the container ridge when the cap is in the closed position, thereby restraining the cap in that position. The outer ridge of the apron has a substantially square surface and is positioned such that it will engage the container ridge when the cap is in the extreme open position, thereby preventing disengagement of the cap from the container. Alternatively, the ridges might be provided on the exterior surface of the neck of the container and on the interior surface of a resilient plastic collar attached to the cap, axially concentric to the boss and located between the boss and the apron.

One embodiment of the dispenser of the instant invention will be described with reference to FIGS. 1–4 in the accompanying drawings.

The dispenser comprises a container **1** suitably made of a rigid plastics material such as rigid polyvinyl chloride, and a cap **10**, serving as a dispensing member.

The container **1** has a cylindrical neck **2** (FIGS. 3 and 4) in which is press-fitted an insert **3** which is suitably constructed of a resilient plastics material such as high density polyethylene or polypropylene. The insert **3** has at its upper part a cylindrical wall **4**, the lower extremity of whose inner surface joins a conical shoulder **5** which is disposed transversely of the container neck **2**. The con-

tainer 1 is formed with a ridge 7 for a purpose that will appear hereinafter.

The cap 10, which is suitably constructed of a resilient plastics material such as high density polyethylene or polypropylene, has a central boss 11 in which are situated dispensing apertures 12 communicable (FIG. 3) via passages 13 with the interior of container 1. The lower surface 14, at which surface passages 13 terminate, is conical, with an angle equal to that of conical shoulder 5 on insert 3. The central boss 11 of the cap 10 is fitted to insert 3 with a sliding fit, and can be made to slide between the dispensing position shown in FIG. 3 and the closed position in FIG. 4, in which position communication between the apertures 12 and the interior of container 1 is cut off as a result of the engagement of the conical surfaces 5 and 14 on the insert 3 and the cap 10, respectively. The sliding fit between the boss 11 and the cylindrical wall 4 of insert 3 is such that a powder seal exists between them at all positions of the boss 11 in the insert 3.

The cap 10 is formed with a depending apron 15, whose interior surface is formed with a ridge 16 of inclined surface which is engageable by the ridge 7 at the upper part of container 1 to urge into sealing engagement the conical surfaces 5 and 14 of the insert 3 and the cap 10. At its lower interior periphery, the apron 15 has a second ridge 17 of substantially square surface which, when the cap is moved from the closed position to the dispensing position, engages ridge 7 on the container 1 to prevent disengagement of the cap 10 from the container 1.

At its lower exterior periphery, the apron 15 has a ridge 18. When the dispenser is grasped in the hand, upward pressure from the thumb on ridge 18 is adequate to distort the apron 15 and snap the ridge 16 on the apron 15 over the ridge 7 on the container 1, so that the cap 10 moves from its closed position to a dispensing position.

In production, the container 1 is filled with powder through the relatively wide neck 2, the insert 3 is then inserted and pressed home, the boss 11 of cap 10 is then located in the insert, and finally the cap 10 is pressed downwards to cause engagement of ridges 7 and 16, leaving the dispenser member in closed position.

The embodiment of FIG. 5, shown in the open position, differs from that of FIGS. 3–4 in the manner in which the interengageable ridge means are provided. The cap 10A of the dispenser of FIG. 5 is provided with a collar 19A made of resilient plastics material, such as high density polyethylene or polypropylene, which is axially concentric to the boss 11A. At the lower interior extremity of collar 19A is ridge 7A, which is engageable by inclined ridge 16A on the exterior surface of neck 2A to urge cap 10A into the closed position. Ridge 7A engages a second, substantially square ridge 17A on the neck 2A when the cap 10A is moved from the closed position to the open position, thereby preventing disengagement of the cap 10A from the container 1A. The embodiment of FIG. 5 is otherwise similar in operation to that of FIGS. 3–4, with depending apron 15A being provided with lip 18A to which force is applied to move the cap 10A from one position to another.

In a modification of the dispenser, the apron 15 or neck 2A may be provided with an additional inclined ridge situated between ridges 16(A) and 17(A). This additional ridge will enable an intermeditae dispensing position to be selected, so as to enable a relatively light dusting of powder to be obtained.

It might also be beneficial to have the surface of the cap at the upper extremities of the apertures internally recessed, that is, to have a depression in the surface of the cap above the central boss. This feature will render the cap more flexible, allowing the restraining inclined ridge means to be snapped more easily between the open and closed positions.

Similarly, it is preferable for the horizontal cross section of the cap to be an elongated rectangle with the container of similar cross section. Thus, the short side of the container can be easily held in the hand, while the long side of the cap can be more easily flexed to engage and disengage the restraining inclined ridge means. Additionally, it is beneficial to have a lip about the exterior surface of the apron which extends beyond the periphery of the container, as illustrated in FIGS. 3–5 of the drawings. This provision makes it easier to exert pressure on the apron when opening and closing the dispenser.

Also, the vertical corners of the container might be indented as illustrated in FIG. 1 of the drawings, to render the container more easily held.

In an alternative construction, which can for example be adopted when the container has an upper part that is cylindrical, axial movement of the cap between its closed and dispensing positions can be obtained by providing interengageable quick-pitch or coarse screw threads on the interior surface of the apron of the dispenser member and at the upper part of the container, for example on the upper exterior surface of the insert or else on the body of the container.

Resort may be had to such modifications and equivalents as fall within the spirit of the invention and the scope of the appended claims.

What is claimed is:

1. A nonpressurized dispenser for powders comprising a container with an open neck, said neck having a substantial shoulder about its interior surface, and a cap having a boss fitted to the interior of said neck that seats against said shoulder, said boss having dispensing apertures about its periphery the lower extremities of which can mate with said shoulder, said cap being movable axially between a closed position, in which said boss is seated against said shoulder thereby sealing the lower extremities of said apertures, and an open position, in which said apertures are in communication with the interior of the container, said cap having a depending apron made of resilient plastic which extends to the periphery of the container, and said dispenser having an inclined ridge means connecting the cap to the container, which restrains the cap in the closed position, and a substantially square ridge means connecting the cap to the container, which stops said axial motion toward the open position.

2. The dispenser of claim 1 wherein said shoulder is provided by a resilient plastic annular insert press-fitted to the neck of said container.

3. The dispenser of claim 1 wherein said shoulder and the surface of said boss at the lower extremities of said apertures are each a frusto-conical surface of equal angle extending toward the interior of the container.

4. The dispenser of claim 1 wherein said inclined and substantially square ridge means are provided by interengageable ridges situated about the interior surface of the apron and the upper periphery of the container.

5. The dispenser of claim 1 wherein said cap has a resilient plastic collar axially concentric to said boss and located between said boss and said apron, and said inclined and substantially square ridge means are provided by interengageable ridges situated about the interior surface of the collar and about the neck of the container.

6. The dispenser of claim 1 wherein said apron has a lip about its exterior surface which extends beyond the periphery of said container.

7. The dispenser of claim 1 wherein the surface of the cap at the upper extremities of said apertures is internally depressed.

8. The dispenser of claim 1 wherein the vertical corners of said container are indented.

9. The dispenser of claim 1 wherein the horizontal cross-section of the cap is an elongated rectangle.

10. A nonpressurized dispenser for powders comprising a container the vertical corners of which are indented, said container having an open neck with a resilient plastic annular insert press-fitted to said neck, said insert having a concave frusto-conical shoulder about its interior

surface, and a cap of elongated rectangular horizontal cross-section with a central boss fitted to the interior of said insert that seats against said shoulder and has dispensing apertures about its periphery the lower extremities of which can mate with said shoulder, said cap having a surface at the upper extremities of said apertures which is internally depressed and said cap being movable axially between a closed position, in which said boss is seated against said shoulder thereby sealing the lower extremities of said apertures, and an open position, in which said apertures are in communication with the interior of the container, said cap having a depending apron made of resilient plastic which extends to the periphery of the container and has a lip about its exterior surface which extends beyond the periphery of the container, said cap having a resilient plastic collar axially concentric to said boss and located between said boss and said apron, and said dispenser having an inclined ridge means connecting



the collar to the neck of the container, which restrains the cap in the closed position, and a substantially square ridge means connecting the collar to the neck of the container, which stops said axial motion toward the open position.

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